No. 2016-2604

United States Court of Appeals for the Federal Circuit

FRONT ROW TECHNOLOGIES, LLC
Plaintiff-Appellant,

v.

NBA MEDIA VENTURES, LLC; MLB ADVANCED MEDIA, L.P.; MERCURY RADIO ARTS, INC.; GBTV, LLC; MAJOR LEAGUE BASEBALL PROPERTIES, INC.; PREMIERE RADIO NETWORKS; INC.; TURNER SPORTS INTERACTIVE, INC. & TURNER DIGITAL BASKETBALL SERVICES, INC,
Defendants-Appellees,

On appeal from the United States District Court for the District of New Mexico, Consolidated Case No. 1:10-CV-00433-JB/SCY, Hon. John O. Browning, District Judge

FRONT ROW TECHNOLOGIES, LLC'S CORRECTED BRIEF OF APPELLANT

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CERTIFICATE OF INTEREST

Counsel for Plaintiff-Appellant Front Row Technologies, LLC certifies the following:

1. The full name of every party I represent is:

Front Row Technologies, LLC.

2. The name of the real party-in-interest I represent is:

Front Row Technologies, LLC.

3. The parent corporation and publicly held companies that own 10 percent or more of the stock of the party I represent is:

This Disclosure Information Is Not Applicable.

4. The names of all law firms and the partners or associates that appeared for each party represented by me in the trial court or are expected to appear in this Court are:

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Davis & Gilchrist (trial court only): Bryan J. Davis, William G. Gilchrist.

Dated: December 20, 2016

/s/*Michael W. Shore*
Michael W. Shore

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TABLE OF ABBREVIATIONS

"Front Row" refers to Front Row Technologies, LLC.

"Appellees" refers to all defendants-appellees collectively.

"MLBAM" refers to MLB Advanced Media, L.P., a defendant and appellee.

"Mercury" refers to Mercury Radio Arts, Inc., a defendant and appellee.

"GBTV" refers to GBTV, LLC, a defendant and appellee.

"Premiere" refers to Premiere Radio Networks, Inc., a defendant and appellee. GBTV and Premiere are the "Beck defendants," named for radio and TV personality Glenn Beck.

"NBAMV" refers to NBA Media Ventures, LLC, a defendant and appellee.

"TSI" refers to Turner Sports Interactive, Inc., a defendant and appellee.

"TDBS" refers to Turner Digital Basketball Services, Inc., a defendant and appellee. It is part of the "Turner Defendants" with TSI, Time Warner, Inc., Turner Broadcasting System, Inc., and Turner Sports, Inc. (the latter three of which were dismissed from the case, Appx3453-3456).

"*Mayo*" refers to *Mayo Collaborative Servs. v. Promethius Labs., Inc.*, 132 S.Ct. 1289 (2012).

"*Alice*" refers to *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014).

The "'184 patent" refers to United States Patent No. 8,086,184 titled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," which duly and legally issued on December 27, 2011.

The "'895 patent" refers to United States Patent No. 8,270,895, titled Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," which duly and legally issued on September 18, 2012.

The "'856 patent" refers to United States Patent No. 7,812,856, titled "Providing Multiple Perspectives of a Venue Activity to Electronic Wireless Hand Held Devices," which duly and legally issued on October 12, 2010.

The "'460 patent" refers to United States Patent No. 8,401,460, titled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," which duly and legally issued on March 19, 2013.

The "'027 patent" refers to United States Patent No. 8,583,027, titled "Methods and Systems for Authorizing Computing Devices for Receipt of Venue-Based Data Based on the Location of a User," which duly and legally issued on November 12, 2013.

STATEMENT REGARDING ORAL ARGUMENT

Front Row requests oral argument. This area of patent law is evolving daily. The patents in suit do not fit neatly into any categories of patents that this Court has encountered before in prior patent-eligibility appeals. Oral argument can only assist the Court because the dispositive issues have not been authoritatively decided.

STATEMENT OF JURISDICTION

This is an appeal from a lawsuit Front Row filed in the United States District Court for the District of New Mexico, Albuquerque Division, alleging patent infringement by Appellees. The district court had jurisdiction under 28 U.S.C. §§ 1332, 1338. The district court rendered a final judgment. This appeal is properly before this Court under 28 U.S.C. § 1295(a)(1) because it is an appeal from a final judgment of a case arising under the patent laws of the United States.

STATEMENT OF RELATED CASES

There is no related case that was previously before this or another appellate court. There is no case known to counsel that will directly affect or be directly affected by this Court's decision in the pending appeal.

INTRODUCTION

In one stroke of its pen, the district court vaporized a patent portfolio representing years of work, hundreds of thousands of dollars in development costs, and tens of thousands of dollars in filing and maintenance fees. This swath of destruction occurred without: (a) a claim construction hearing, (b) an agreement on representative claims, (c) input from experts or (d) even a passing reference to the work of multiple experienced examiners who found the claims patentable. The Court should reverse.

The patents-in-suit claim patent-eligible subject matter—a novel system for digitally capturing video with cameras from several visual perspectives at a live venue, compressing this video into digital data packets for streaming over wireless data networks, transmitting the packeted video data only to authorized handheld devices, and receiving the data wirelessly with authorized handheld devices capable of processing the streamed data for video display to the end users. The systems and methods patented provide the end users the ability to choose between the multiple video perspectives in real time and instantaneously start the process again. In some the claims, the system can determine the location of end-users for authorization or to provide additional services based on the handheld device's location.

When Front Row claimed these features in 2000, the closest technology available was portable analog handheld televisions that only permitted users to receive television broadcasts one channel at a time, such as the Sony Watchman (introduced in 1982 and discontinued in 2000) or Casio TV-980 (introduced in October 2001). These prior art devices did not include end user authorization, bi-directional communication to enable authorization, perspective selection by end users, or user-location determination. Front Row therefore claims paradigmatic exemplars of the types of "new and useful process" and "new and useful improvement" to existing technology, and new technological systems, that the patent laws are designed to promote and protect.

STANDARD OF REVIEW

This Court reviews dismissals under Federal Rules of Civil Procedure 12(b)(6) and 12(c) under the law of the regional circuit. *Juniper Networks, Inc. v. Shipley*, 643 F.3d 1346, 1350 (Fed. Cir. 2011). The District of New Mexico is in the Tenth Circuit. 28 U.S.C. § 41. The Tenth Circuit reviews Rule 12(b)(6) and Rule 12(c) dismissals de novo. *Ramirez v. Dept. of Corrections, Colo.*, 222 F.3d 1238, 1240 (10th Cir. 2000).

ISSUE PRESENTED

Whether the district court correctly determined that the five patents in suit are directed toward patent-ineligible subject matter through its cursory evaluation of three representative claims, which did not include any claim from the '460 or '184 patents, and its failure to require Appellees to present any evidence of the state of the art as of the patents' priority dates.

STATEMENT OF THE CASE

I. The Front Row Story.

On August 25, 2000, Luis Ortiz and his pregnant wife[1] attended a concert in Dallas, Texas.[2] The smells and crowd quickly proved to be overwhelming for her.[3] So Luis and Mrs. Ortiz moved just outside the venue where they could still hear the music but could not see the concert.[4]

Luis was disappointed that he could not see the show.[5] To distract himself, Luis pulled out his Palm V PDA and began fiddling with it.[6] Inspiration struck and the basic concept behind all the ideas now embodied in Front Row's patent portfolio was born.

Shortly thereafter, in September 2000, Luis shared his idea with Kermit Lopez so that they could collaborate and further build on the invention.[7] On October 26, 2000, Luis and Kermit filed U.S. Patent Application No. 60/243,561, which contained far more features than Luis's initial conception. Today, Front Row has a portfolio of 16 issued U.S. Patents, 7 pending U.S.

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[1] Appx3610.
[2] Appx3610.
[3] Appx3610.
[4] Appx3610.
[5] Appx3611.
[6] Appx3611.
[7] Appx3611.

applications, and 2 pending applications in India. Products incorporating Front Row licensed technology have been used worldwide in auto racing, football, and other sporting venues.

II. The Patents-in-Suit.

Front Row Technologies is the owner of all rights, title and interest in and under the following patents-in-suit:

(1) U.S. Patent No. 8,086,184 ("'184 patent"), "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," issued on December 27, 2011, and which, through various continuations, claims a priority date of October 26, 2000. Appx722-757.

(2) U.S. Patent No. 8,270,895 ("'895 patent"), "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," issued on September 18, 2012, and which, through various continuations, claims a priority date of October 26, 2000. Appx759-794.

(3) U.S. Patent No. 7,812,856 ("'856 patent"), "Providing Multiple Perspectives of a Venue Activity to Electronic Wireless Hand Held Devices," issued on October 12, 2010 and which is the granted patent of provisional application No. 60/243,561, filed October 26, 2000. Appx796-830.

(4) U.S. Patent No. 8,401,460 ("'460 patent"), "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," issued on March 19, 2013, and which, through various continuations, claims a priority date of October 26, 2000. Appx984-1019.

(5) U.S. Patent No. 8,583,027 ("'027 patent"), titled "Methods and Systems for Authorizing Computing Devices for Receipt of Venue-

> Based Data Based on the Location of a User," which duly and legally issued on November 12, 2013 and which, through various continuances, claims a priority date of October 26, 2000. Appx3658-3694.

The patents all claim the benefit filing date of U.S. Provisional Application No. 60/243,561 ("'561 Application"). Appx744, Appx781, Appx817, Appx1006, Appx3681. All but one, the '856 patent, trace their lineage to the '561 Application through U.S. Patent No. 7,149,549 (the "'549 patent"). Appx744, Appx781, Appx1006, Appx3681.

The '549 patent solved prior unfulfilled attempts to provide "venue-based interactive entertainment to enhance the fan experience at live events." *See* Appx3681-3682 (citing to '549 provisional application and discussing background of invention). Prior systems had tried touch-screen technology integrated directly into seats at venues, which could distract the attendee and required substantial expenditures for seat-integrated technologies susceptible to swift obsolescence. *E.g.,* Appx781-783. Thus, the parent application for all patents in suit other than the '856 patent stated that the inventors "realize that a solution to these problems lies in the use of wireless hand held devices," the use of which would allow "real-time team and venue information [to] be readily provided to fans without the expense and problems associated with present in-seat integrated technical environments." *Id.* The '856 patent describes a similar

purpose and solution. Appx817-818. In essence, a system was needed that could be adapted, or updated easily as users' personal technology developed over time.

III. District Court Litigation.

Front Row initially filed this lawsuit against MLBAM in the United States District Court for the District of New Mexico on May 5, 2010. Appx146-232. Front Row added the NBAMV parties as defendants in its second amended complaint on July 19, 2010. Appx320-447. On January 24, 2011, Front Row sought leave to file an amended complaint to add new parties and patents. Appx619-648.[8]

Front Row filed its claims against Mercury, GBTV and Premiere on April 23, 2013 and alleged infringement of four current patents in suit—all but the '027 patent—and five others that Front Row subsequently dropped. Appx649-1056. Front Row also sued the Turner Defendants on July 10, 2013, and this Court consolidated the cases in April 2014. Appx3335-3452, Appx3592-3593. On March 31, 2016, Front Row filed its fifth amended complaint in which it alleged

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[8] Front Row sued MLBAM, Mercury, GBTV and Premiere on May 25, 2012, in the Northern District of Texas for infringement of a different patent (the "'321 patent"). That court, upon the defendants' motion, transferred the case to the District of New Mexico. Appx3275-3285. After transfer, the lawsuit for infringing the '321 patent was consolidated with this one but Front Row dropped the '321 patent from this case. Appx2152-2159.

that the Appellees infringe the five patents-in-suit. Appx2128-2151. That same day, the district court entered, as an order of the court, the parties' stipulation to dismiss all claims, counterclaims and defenses related to the patents that Front Row dropped from this lawsuit. Appx2152-2159.

On October 21, 2015, the Appellees moved to dismiss this case under Rule 12(c), which Front Row opposed. Appx1057-1165; Appx1425-1459. The district court held an oral hearing on the motion on January 5, 2016. Appx1869-2066. On August 30, 2016, the district court issued its memorandum opinion, Appx1-140, and final judgment. Appx141-145.

In its opinion, the district court held: (1) "the clear-and-convincing evidence standard does not apply to patent eligibility disputes under 35 U.S.C. § 101";[9] (2) the court could "examine the patents' subject-matter eligibility before claim construction";[10] (3) the court itself could select representative claims;[11] (4) "that all of Front Row's patents are directed to abstract ideas, because their claims describe these ideas in vague and broad terms";[12] and (5) "that Front Row's

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[9] Appx2. Contrary to that holding, the district court purported to apply that standard. Appx92.
[10] *Id.*
[11] Appx2-3.
[12] Appx3.

claims do not contain an inventive concept or meaningful limitation in scope."[13] The district court granted Appellees' motion in its entirety and dismissed this case with prejudice. Appx141-145.

IV. The Representative Claims.

The district court's opinion analyzed only three claims from the five patents in suit (of 98 total claims) to render its finding as to the eligibility of all claims at issue. First, the court determined that Claim 15 of the '856 patent "adequately represents ***most*** of the independent system claims"[14] in the '856 and '184 patents; it did not state that Claim 15 represents dependent system claims in the '856 and '184 patents. Appx93, Appx104-105.[15] Second, it determined that Claim 1 of the '895 patent represented "***most***" of the system claims found in the '895, '460 and '184 patents. Appx93; Appx112. Third, it held that Claim 1 of the '027 patent "adequately represents" all of that patent's independent and dependent claims. Appx93, Appx114.

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[13] *Id.*

[14] Unless otherwise stated, all emphases in quoted phrases has been added, and all internal citations and quotations have been omitted.

[15] The district court said broadly that the representative claims represent the dependent claims, *see* Appx115-116, but did not specify any dependent claims or limitations to which the '856 patent's claim applied.

Claim 15 of the '856 patent claims:

> A method for displaying a particular perspective of a venue-based activity at least one authorized hand held device having a display screen, said method comprising the steps of:
>
> simultaneously capturing a plurality of video perspectives of a venue-based activity utilizing more than one camera located at a sports and entertainment venue;
>
> processing said plurality of video perspectives at a server into encrypted video data packet for display on a touch-sensitive display screen associated with said at least one authorized hand held device provided in the form of at least a smart phone or personal digital assistan[t], said at least one hand held device further comprising at least one 802.11 wireless module for access to a wireless local area network and a cellular communications module for communication with a wireless cellular communications network;
>
> wirelessly transmitting said encrypted video packet over an 802.11 wireless local area network to said at least one authorized hand held device said plurality of video perspectives of a venue-based activity from said server;
>
> processing said plurality of video perspectives at said at least one authorized hand held device into decrypted video data packet for display on said touch-sensitive display screen associated with said at least one authorized hand held device; and
>
> displaying a particular video perspective on said touch-sensitive display screen, in response to a user selection of said particular video perspective from among said plurality of video perspectives.

Appx829-830.

Claim 1 of the '895 patent claims:

> At least one server, comprising:
>
> memory capable of storing entertainment venue-based data comprising video captured of live entertainment occurring in front of a live audience from more than one camera located in at least one entertainment venue;
>
> at least one processor capable of authenticating via a security code at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data;
>
> at least one processor processing the venue-based data including video captured from the more than one camera into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by said at least one remote hand held device; and
>
> at least one port capable of streaming said venue-based data as streamed data from said at least one server so that said entertainment venue-based data may be wirelessly received as said streamed data by at least one remote hand held device authorized to receive said entertainment venue-based data through at least one wireless data communications network, in order to permit said entertainment venue-based data to be accessible wirelessly as said streamed data via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one venue for viewing via said at least one remote hand held device, said video captured from said more than one camera located at said at least one entertainment venue.

Appx793.

Claim 1 of the '027 Patent claims:

> A method for authorizing access by a user of at least one service associated with an event at a venue based on a location of said user as determined by information derived from communication between a computing device in the form of a wireless handheld device carried and utilized by said user and assets of a data communications network, said method comprising:
>
> determining a location of at least one user based on communications of at least one computing device comprised of a wireless handheld device utilized by said at least one user with said data communications network supporting data communications of said at least one computing device;
>
> authorizing said at least one computing device to receive said at least one service based on said location as determined by said data communications network, wherein said at least one service includes streaming video accessed from a server wherein streaming video captured by at least one video camera operating within at least one entertainment venue is processed for delivery to subscribers of the at least one service and wherein said authorizing said at least one computing device further comprising preventing said at least one computing device from receiving said at least one service beyond or within a particular geographic area based on said location determination by said data communication network.

Appx3693.

The district court's opinion contained charts tracking the similarities between its chosen representative claims and the other patent claims they represented. The district court did not analyze independent claim 20 of the '184 patent. Appx756-757. The district court also did not state why the various dependent

claims failed to meet the eligibility requirement other than claiming they were not "materially distinct" from the independent claims. Appx116.

SUMMARY OF ARGUMENT

Despite writing a 140-page opinion, the district court performed only a cursory analysis of the patents in suit with no substantial discussion of the *Alice* factors. The patents themselves describe and claim systems and methods for, *inter alia,* authenticating remote users and enabling them to display venue-based multi-perspective video data on authorized handheld devices in real-time, and by doing so create a completely new type of mousetrap, or at least a better one, that United States patent policy, enshrined in the Constitution, is designed to protect.

The Front Row patents, which claim priority to 2000, were ahead of their time in setting forth substantial, detailed, concrete processes and methods to capture video from multiple perspectives at venue events, format it for digital network transmission, and transmit it digitally and wirelessly to authorized event attendees and authorized remote users, and furthermore, enabling user location to be determined for further authorization and access to additional services. The Front Row patents are specific and directed to patent-eligible concepts.

The district court's determination that the patents are abstract and that they further lack inventive concept, measured by their year 2000 priority date,

contradicts both the scope of the patents themselves, which are directed to solving specific problems in the art, and this Court's prior precedents. The Court should examine the patents' inventive concepts from the perspective of whether they actually contain new, original, non-abstract inventions at the time of their provisional application filing. The advantages the patents claim over existing art, and the solutions they provide constitute inventive concepts that pass step two of the *Alice* test. The Court should reverse the district court's determination and remand this case for further proceedings.

ARGUMENT

I. Appellate Review of Rule 12 Dismissals.

A dismissal based on the pleadings alone is appropriate only if the well-pleaded factual allegations in the complaint, construed in the light most favorable to the plaintiff, actually establishes the claimed defense. *Tomlinson v. El Paso Corp.,* 653 F.3d 1281, 1285 (10th Cir. 2011). This Court, applying Tenth Circuit law, must accept Front Row's factual allegations as true and consider them in the light most favorable to Front Row. *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1338 (Fed. Cir. 2013), *vacated on other grounds by WildTangent, Inc. v. Ultramercial, LLC,* 134 S. Ct. 2870 (2014).

Because an issued patent is statutorily presumed valid, 35 U.S.C. § 282, this

Court held "it will be rare that a patent infringement suit can be dismissed at the pleading stage for lack of patentable subject matter." *Ultramercial*, 722 F.3d at 1338. When district courts review patents against § 101 challenges, the patent's disqualifying characteristic "should exhibit itself so manifestly" that it overrides both the "broad statutory categories of eligible subject matter" and the structure of the Act. *Research Corp. Techs. v. Microsoft Corp.,* 627 F.3d 859, 868 (Fed. Cir. 2010). The structure of the Patent Act is "the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act," not § 101. *Id.*

II. The § 101 Patent-Eligibility Analysis.

A. The Abstract Idea Concept.

This Court has stated that "a search for a single test or definition in the decided cases concerning § 101 from this court, and indeed from the Supreme Court, reveals that at present there is no such single, succinct, usable definition or test." *Amdocs (Israel) Ltd. v. Openet Telecom Inc.*, No. 2015-1180, ___ F.3d ___, 2016 WL 6440387 at *3 (Fed. Cir. Nov. 1, 2016). The district court held that Front Row's patents were directed at patent-ineligible subject matter—an abstract idea—and therefore not patentable under 35 U.S.C. § 101. Appx2. Its conclusion is wrong. Although the district courts must make complex analyses

under § 101, they must still follow the law and utilize methodologies designed to produce a correct result.

To help determine patent eligibility, this Court stated the reviewing court should "examine earlier cases in which a similar or parallel descriptive nature can be seen" to guide its decision making. *Amdocs* at *4. That does not mean district courts should merely look at cases involving similar technology and reach the conclusion of "me too." Such cursory examinations do not eradicate the confusion over what an "abstract idea" is—as *Amdocs* demonstrates, "similar or parallel" descriptive natures can be in the eye of the beholder. *Compare id.* at *6-*14 *with id.* at * 21-27 (Reyna, J., dissenting). The lack of a test or set of concrete parameters that have been consistently applied to determine what ideas are or are not abstract has made this area of the law difficult to apply for both practitioners and courts.[16] Nonetheless, examination of earlier cases with similar inventions should reveal that Front Row's patents are directed to patent-eligible subject matter. This is not a close case.

The Patent Act says "[w]hoever invents or discovers any new and useful

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[16] A blunter assessment from one commenter is "[p]ut simply, the problem is that no one understands what makes an idea 'abstract,' and hence ineligible for patent protection." Mark A. Lemley, et al., *Life After* Bilski*,* 63 STAN. L. REV. 1315, 1316 (June 2011).

process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor." 35 U.S.C. § 101. The Supreme Court has identified Section 101 as a "permissive approach to patent eligibility" that Congress designed "to ensure that ingenuity should receive liberal encouragement." *Bilski v. Kappos*, 561 U.S. 593, 601 (2010).[17] Thus "[i]t is obvious that the subject matter described in § 101 is expansive." *Amdocs*, 2016 WL 6440387 at *3. Section 101 has a wide scope because the Constitution itself enshrines the value of promoting "the Progress of Science and the useful Arts." U.S. CONST. Art. 1, § 8, cl. 8.

A Section 101 analysis "begins by identifying" if the claimed invention is within any of the four "statutorily provided categories of patent-eligible subject matter"—processes, machines, manufactures and compositions of matter. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S.Ct. 1289, 1296-97 (2012); *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 713 (Fed. Cir. 2014). Front Row's patents fit within the *Mayo* list. Section 101's broad patentability principles have only three exceptions: laws of nature, physical phenomena, and abstract ideas. *Id.*

[17] Unless otherwise stated, all internal quotations are omitted from quoted materials and all emphases are added by Front Row.

The Congressional instruction that "[a] patent shall be presumed valid"[18] and six decades of Congressional policy supporting "liberal encouragement" of scientific ingenuity has resulted in a remarkable expansion of the United States economy, due in large part on patentees' willingness to spend hundreds of millions, if not billions, of dollars in filing, maintenance and patent prosecution fees so their inventions can have the protections statutorily granted to United States patents. Inventors have filed patents and driven the United States economy to innovative heights previously unseen in human history believing that the patent office and its knowledgeable patent examiners can properly apply § 101 to their patent applications.

Patents should not be invalidated through semantic analyses about what "abstract" means. But today a patentee who paid its fees and trusted that the examiner knows what is patent-eligible ***expects*** to have its patents challenged, and often nullified, based upon a semantic-laden parlor game as to determine the parameters of "abstractness," with no more than lip service to any presumption of validity, no claim construction to define claims in the context of the specification's teachings, and no evidence by the parties as to the state of the art that would inform a district court of the inventions' contexts.

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[18] 35 U.S.C. § 282(a).

B. The Front Row Patents are Not Abstract.

The district court's application of the abstract idea exception described in *Alice Corp. v. CLS Bank Intl.*[19] cannot be correct. The Supreme Court has not set firm boundaries of what constitutes an abstract idea in all areas of technology, and federal courts have struggled with identifying the exception's parameters.[20] Nonetheless, the level of detail in the Front Row patents, the numerous inventive concepts inherent in the patents, and this Court's cases involving similar technology, demonstrate that the district court presumed abstractness and ineligibility instead of affording the patents their statutory presumption of validity. 35 U.S.C. § 282(a).

1. The Court's Approach to the Abstract Idea Exception.

In *Alice,* the Supreme Court recognized that to some degree all inventions "embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Id.* at 2354. It noted that the three exclusions from patent-

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[19] 134 S. Ct. 2347 (2014).

[20] *See, e.g.*, Annal D. Vyas, *Alice in Wonderland v. CLS Bank: The Supreme Court's Fantastic Adventure Into Section 101 Abstract Idea Jurisprudence*, 9 AKRON INTELL. PROP. J. 1, 3 (2015); Robert Mazzola, *The 101 Conundrum: Creating a Framework to Solve Problems Surrounding Interpretation of 35 U.S.C. § 101*, 14 CHI.-KENT J. INTELL. PROP. 400 (2015) (noting "the Supreme Court's § 101 jurisprudence is replete with inconsistencies and fails to provide practicing attorneys and judges with adequate guidance.").

eligible subject matter arose from the concern that upholding a patent and its attendant legal monopoly over abstract ideas would "tend to impede innovation more than it would tend to promote it." *Mayo*, 132 S.Ct. at 1293 (2012). This Court first examines if the patent claims are directed towards an ineligible abstract idea. *Alice,* 134 S. Ct. at 2355.

When described at a certain level of generality, any claim can be "directed" to an abstract idea. *See Fairfield Indus., Inc. v. Wireless Seismic, Inc.*, No. 4:14-CV-2972, 2014 WL 7342525, at *4 (S.D. Tex. Dec. 23, 2014). But this Court has instructed district courts ***not*** to do exactly what the district court in this case did—delve for and extract an abstract idea from a patent and then evaluate patent eligibility. *McRO, Inc. dba Planet Blue v. Bandai Namco Games Am., Inc.,* 837 F.3d 1299, 1312 (Fed. Cir. 2016) ("We do not assume that such claims are directed to patent ineligible subject matter").[21] Instead, this Court has instructed district courts that claims must be "considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter." *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015). That analysis requires examining the claims through the prism of the specification. *Enfish LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016).

[21] Hereafter "*McRO.*"

The district court did not analyze Front Row's claims in light of the specification. Indeed, the district court's entire analysis of how "Front Row's Claims are Directed to Abstract Ideas" in Section Four of its opinion contains ***no*** examination of the specification of any patent in suit. Appx116-125. Nor does it examine any of the prior art cited on the face of the patents. *Id.* Somehow, with no explanation of how or why, the district court held that "Front Row's claims are directed to two abstract ideas: (i) sending video of an event to handheld devices over wireless networks; and (ii) authorizing handheld devices to receive streaming video based on a user's location." Appx116.[22]

2. Specificity Cannot be Abstract.

The Merriam-Webster Dictionary defines abstract as "relating to or involving ***general*** ideas or qualities rather than specific people, objects, or actions."[23] Contrary to its ultimate decision, the district court's own description of the

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[22] The district court also noted that "Front Row's claims do not fall squarely within any existing cases' facts" because Front Row sought to patent neither an algorithm nor a fundamental business practice performed by computer. Appx117 (discussing cases). It did, however, disagree with Appellees' argument that compared Front Row's claims and handheld televisions because "Front Row's claims include features, such as authorizing a ***specific*** device to receive video, that are not possible with conventional television." Appx117, n. 28.

[23] http://www.merriam-webster.com/dictionary/abstract (last accessed December 13, 2016).

"abstract" ideas in the Front Row patents demonstrates that they are not abstract because they are not general. The specific factors identified by the district court in describing the claims in Front Row's patents undercut, and are facially inconsistent with, its ultimate holding.

The first idea the district court identified is sending video of a ***specific*** event to a ***personal*** handheld device over wireless networks. Appx116. The second idea the district court identified requires individually ***authorizing*** various personal handheld devices to receive video based on the specific ***location*** of the ***specific*** user. Appx116. Those ideas, as stated, are not abstract—they require specific video formats (digitally captured, compressed into data packets), transmissions of a defined type of event by a defined method (via a wireless data network capable of sending compressed, packeted video), and limit the type of receiver to wireless handheld devices capable of receiving the digitally formatted live event video, authenticating/authorizing access by described methods such as the user's identity and/or location, then processing the data (decompressing and reassembling packets) and selectively displaying it on authorized wireless handheld devices. Appx793-794, Appx756, Appx829-830, Appx1018-1019.

The district court's own analysis of similar cases shows that it misapplied the law. It found "[t]he representative claim in *Affinity Labs* was similar to the

representative claims here" because that "claim effectively covered the abstract idea of disseminating regionally broadcasted content to users outside of a region." Appx121 (citing *Affinity Labs of Tex. LLC v. DIRECTV LLC,* 109 F. Supp. 3d 916, 935 (W.D. Tex. 2015)). Although this Court has since affirmed that ruling, it did so by noting out-of-region broadcasting was a familiar concept for "information distribution that is ***untethered to any specific or concrete way*** of implementing it." *Affinity Labs of Tex. LLC v. DIRECTV LLC,* 838 F.3d 1253, 1258 (Fed. Cir. 2016). Front Row's claims have specific implementation methods.

The claim at issue in *Affinity Labs* did not require authentication by a specific user at a specific location; the Front Row patents are more precise and concrete in scope and implementation, as examining the representative claims demonstrates. The '856 patent, claim 15, requires capturing multiple video perspectives ***at a venue***, processing them into a digital encrypted data packet that can be wirelessly transmitted to a specifically authorized receiving handheld device. Appx829-830. That handheld device specifically must comply with the IEEE 802.11 standard[24] for media access control and physical layer specification over a wireless local area network ("WLAN"), provide access to a wireless

[24] IEEE is the acronym for the Institute of Electrical and Electronics Engineers.

cellular data network, allow receiving compressed, packeted video data over the wireless or cellular network, be able to process the compressed packet at the handheld and display it there only in response to an authorization protocol to verify the receiver is an authorized recipient. Appx829-830 (Claims 15, 16 of '856 patent). Claim 1 of the '895 patent itself contains at least ***five*** specific requirements to meet the limitation for the port capable of streaming the venue-based data. Appx793.[25] *Affinity Labs* is distinguishable.

The district court noted that "[t]he representative claim in *Ultramercial IV* [772 F.3d at 712] recited eleven steps" that "resemble" Front Row elements. Appx124-125. But the district court failed to distinguish between the specificity required by the patents-in-suit that state how the videos are transformed into video data, compressed, and transmitted over WLAN or a cellular data network, what standard governs the selected wireless data networks, and the protocols required for authentication[26] versus the broad general scope of the *Ultramercial*

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[25] *See* n. 26.

[26] *E.g.,* '895 Patent, claim 1 requires a server with (a) memory capable of storing entertainment venue-based data from more than one camera; (b) at least one processor capable of authenticating a remote handheld device to provide the user wireless access to the data; (c) at least one processor that (i) can process the data into a format suitable for streaming over wireless data networks such that the data (ii) is capable of further processing for viewing by at least one remote handheld device; (d) at least one port capable of streaming

claims which constituted simply "showing an advertisement before delivering free content." *Ultramercial,* 772 F.3d at 715. The *Ultramercial* patents applied far more broadly—the user only needed a computer with internet access. *See id.*

Unlike the patents at issue in *Intellectual Ventures I LLC v. Capital One Bank (USA),* which the district court also relied upon,[27] the Front Row patents also do not simply take a long-prevalent fundamental practice and perform it on computers. 792 F.3d 1363, 1369-70 (Fed. Cir. 2015). The district court noted that a person without a computer cannot perform Front Row's claims, Appx121, which is fundamentally different from the patents at issue in *Intellectual Ventures* because those patents just used a machine to accelerate the process used in longstanding business activities.[28] The processes Front Row patented were not business activities previously available—a concert attendee in 2000 could not obtain a digital, interactive video transmission of what was occurring at the

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venue-based data (i) at least one server so the data (ii) may be wirelessly received (iii) by an authorized remote handheld device (iv) through a wireless data communications network such that (v) the data can be accessed wirelessly. Appx793.

[27] Appx117-118; Appx125-126.

[28] For other invalidated patents involving computer implementation of fundamental business practices, *see e.g., Alice,* 134 S.Ct. at 2357 (mediated settlement); *Bilski v. Kappos,* 561 U.S. 593, 604-611 (2010) (risk hedging); *Mortgage Grader, Inc. v. First Choice Loan Services. Inc.*, 811 F.3d 1314 (Fed. Cir. 2016) (targeted content); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2014) (price-optimization for consumer goods).

venue from multiple video feeds on a PDA or smartphone over a wireless data network and then have the device respond to an authorization request based on defined criteria before receiving and decompressing the packets and then displaying them; instead the year 2000 concert attendee could only access closed-circuit one-way analog broadcasts on the portable televisions available.

The case most directly analogous to this one is *Contentguard Holdings, Inc. v. Amazon.com, Inc.,* 142 F. Supp. 3d 510 (E.D. Tex. 2015). *Contentguard* similarly included claims that involved distributing digital content to at least one computing device once the device had been authenticated. *Id.* A sample claim required (a) distributing digital content to (b) at least one recipient computing device in accordance with (c) usage rights information, by (d) "determining . . . if the at least one recipient computing device is trusted," (e) sending the digital content only if the recipient device has been determined trusted to receive the digital content and (f) "sending usage rights information indicating how the digital content may be rendered" by the receiving device. *Id.* at 512-13.

The *Contentguard* court held the claims were directed towards systems of managing digital rights via trusted devices, not abstract ideas. *Id.* at 515-16. The trusted devices in *Contentguard* included only "devices that maintain physical, communications, and behavioral integrity, rather than all devices that are

capable to receive content via the Internet." *Id.* Such a system, with detailed elements in the claims, constitutes a ***process***, which is specifically patentable. 35 U.S.C. § 101. But Front Row's patents are even more limited and specific than those in *Contentguard*.

Front Row's patents do not apply to all devices capable of receiving content via the Internet or over a cellular network as those devices existed in 2000 or today; instead Front Row's technology is limited to authorized handheld two-way communication devices[29] that can receive content via specific types of wireless data networks in specified types of secure transmissions accomplished by specific methods. Appx14. As here, the *Contentguard* defendants argued that the steps at issue could be performed using standard or well-known technologies. 142 F. Supp. 3d at 516. The *Contentguard* court disagreed, holding that not all the steps or limitations themselves were "purely conventional, even though they may be performed using conventional technology." *Id.* Similarly, Front Row's patents state that only authorized handheld devices can receive the compressed video data packets after achieving authorization. Appx793-794, Appx756, Appx829-

[29] The district court did not construe "handheld device"; the proper construction is "a wireless device intended to be held in one's hand or hands during use, such as a smart phone, personal digital assistant (PDA), or tablet computing device." Appx2348-2351.

830, Appx1018-1019, Appx3693.

The district court distinguished *Contentguard* by stating "[i]t is difficult to imagine any form of [digital rights management] not preempted under this vague description of a limiting method for digital content." Appx122. That same "vague" description does not apply to Front Row's patents because they describe specific and concrete methods and systems that make allow a user to access live-video of an event on an authorized handheld device. Appx793-794, Appx756, Appx829-830, Appx1018-1019, Appx3693.

3. Proper Analysis Considers the Specification and State of the Art.

Since *Alice*, various decisions have held patents similar to the patents-in-suit are valid. This Court held "the directed to inquiry" under *Alice* filters the claims, "considered in light of the specification," on whether as a whole the claims are "directed to excluded subject matter." *Enfish LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). For example, this Court found a patent for automating realistic lip synchronization in animation patent-eligible because it claimed "a distinct process" that used "a combined order of specific rules" to render information into "a specific format." *McRO,* 837 F.3d at 1315. Front Row's patents also claim specific processes, procedures and steps for obtaining, transmitting and receiving video by specific users for specific events

by applying specific rules. Appx793-794, Appx756, Appx829-830, Appx1018-1019.

One district court held that a patent directed towards transmitting data from an information source via a broadcast server to remote computing devices was directed toward patent-eligible subject matter. *SimpleAir, Inc. v. Google, Inc.*, 136 F. Supp. 3d 745, 750 (E.D. Tex. 2015). That court rejected defendants' argument that the invention claimed the abstract idea of "packaging and transmitting information." *Id.*

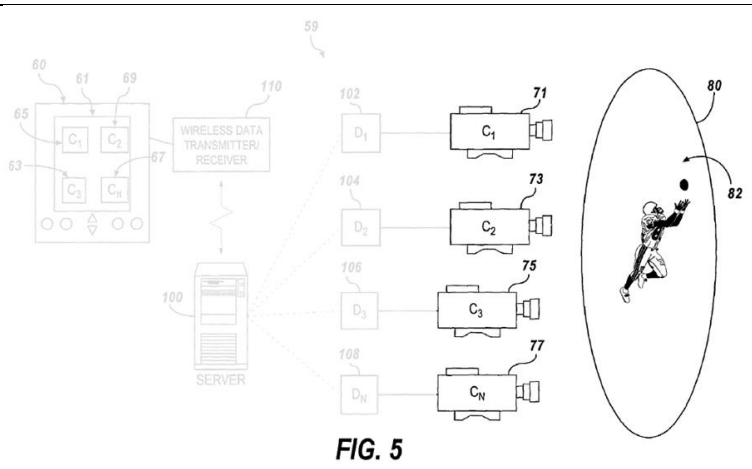
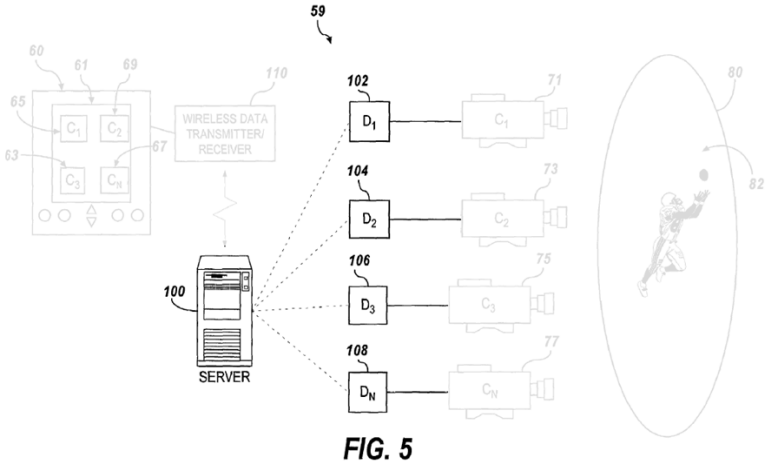
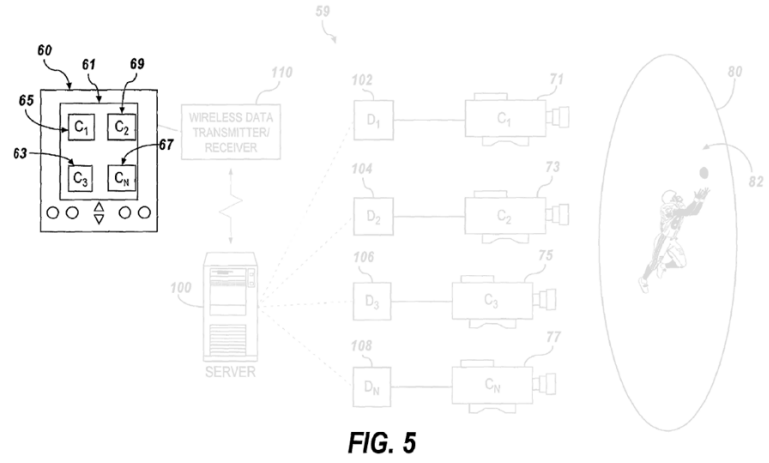
Front Row's patents are not software or computer-operation patents. *See Enfish*, 822 F.3d at 1337, 1338 ("the claims are directed to an improvement of an existing technology" and such claims "are directed to an improvement in the functioning of a computer"). The Front Row patents also do not add conventional computer components to well-known business practices because the business practices in the Front Row patents did ***not*** previously exist in 2000.

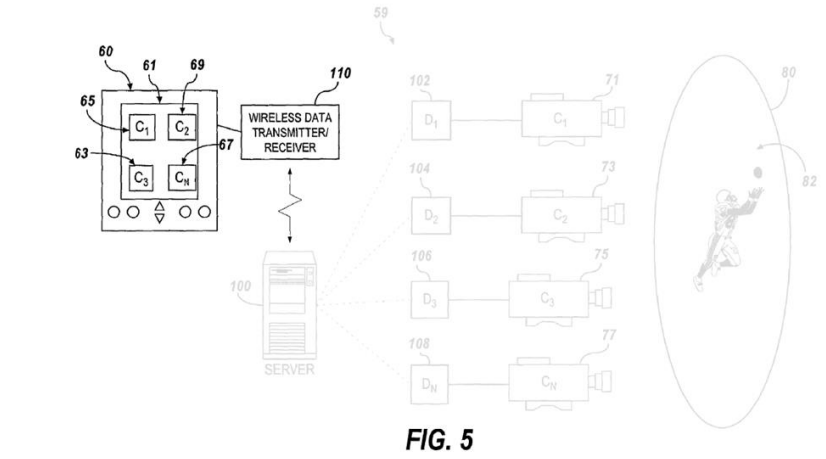
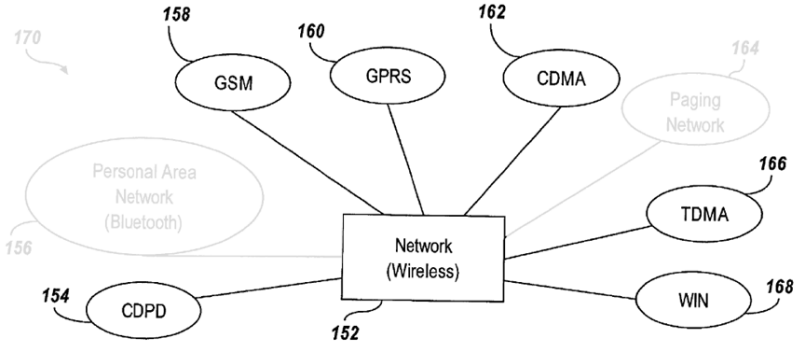
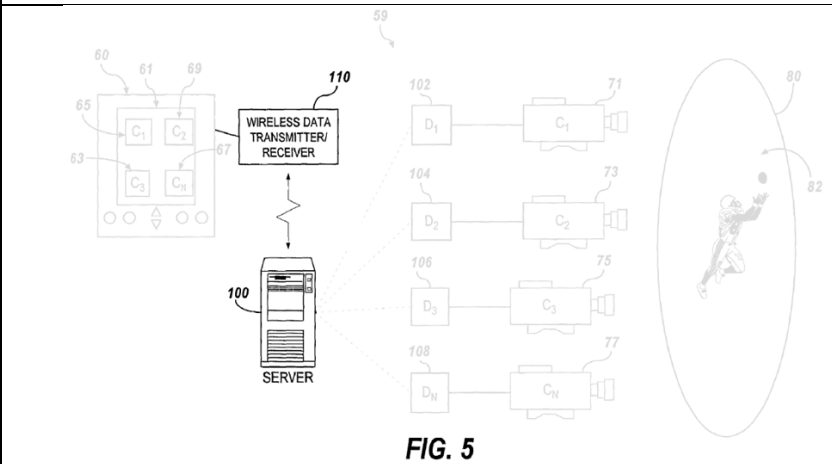
Front Row's patents are directed to particular devices for specific end-users to obtain video transmissions in a manner and according to specific steps that had ***never before been attempted***; they cannot be common business practices. *See DDR Holdings LLC v. Hotels.com, L.P.,* 773 F.3d 1245, 1257 (Fed. Cir. 2014) (noting claims stood apart from invalidated patents because they did not take a

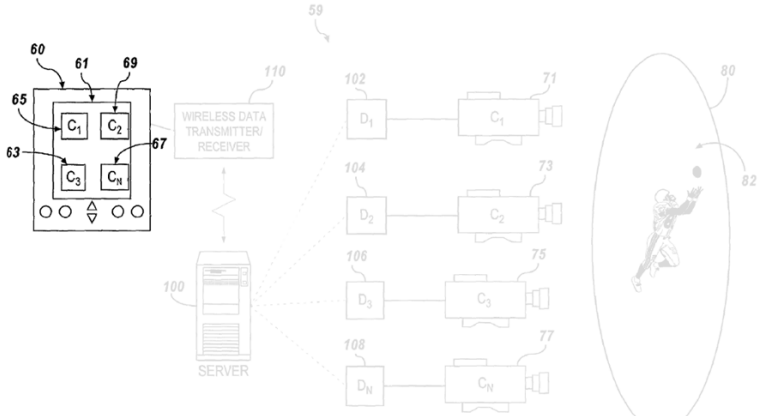
preexisting business practice and require its performance on the internet). Thus, the '027 patent notes it "provide[s] methods, systems and servers for authorizing computer devices for receiving venue-based data based on the location of the user";[30] the '856 patent notes it "provide[s] improved methods and systems for delivering real time video provided at an entertainment venue to a hand held device." Appx818.

The representative claims all require at least four tangible elements—an entertainment venue with multiple cameras to capture activity, a server to process the multiple camera perspectives, a data communications network to transmit the data packets, and an authorized handheld device capable of two-way communication to become authenticated to receive, process and display the video perspectives—as Claim 15 of the '856 patent shows:

[30] Appx3682.

15. A method . . . comprising the steps of: simultaneously capturing a plurality of video perspectives of a venue-based activity **utilizing more than one camera** located at a **sports** and entertainment **venue**;	 FIG. 5
processing said plurality of video perspectives at a **server** into encrypted **video data packet**	 FIG. 5
for display on a **touch-sensitive display screen** … said at least **one hand held device**	 FIG. 5

further comprising at least one 802.11 wireless module for access to a **wireless local area network** and a cellular communications module for communication with a **wireless cellular communications network**;	 FIG. 5  FIG. 10
wirelessly transmitting said encrypted video packet … from said **server**;	 FIG. 5

processing said plurality of video perspectives at said at least one **authorized hand held device** into decrypted video data packet for display on said touch-sensitive display screen …	 FIG. 5

Every element is directed toward using a real, tangible "device" that is "hand held" and "touch sensitive." These elements show the patents are not abstract. The Court should reverse the district court's judgment.[31]

C. The Patents' Inventive Concepts Make Them Patent Eligible.

If the claims are not abstract, the eligibility inquiry ends, as it should here. *Alice,* 134 S.Ct. at 2359; *McRO, Inc.*, 837 F.3d at 1313. But if a claim is directed towards an abstract idea, the court must consider the elements of each claim, both individually and as an ordered combination, to determine whether the additional elements transform the abstract idea into one that is patentable. *Alice,*

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[31] As the district court noted, the technology described in the Front Row patents existed when Front Row filed the parent patents from which most of the patents-in-suit derived. That is not the proper analysis; it is an argument for obviousness under 35 U.S.C. § 103 or anticipation 35 U.S.C. § 102.

134 S.Ct. at 2359.

The Supreme Court has cautioned that "we tread carefully in construing this exclusionary [patentability] principle lest it swallow all of patent law." *Alice*, 134 S. Ct. at 2354. To that end, this Court must distinguish between patents that claim the "building blocks of human ingenuity," which are not directed to patent-eligible subject matter, and the patents that integrate the building blocks into "something more" that demonstrates some level of inventiveness. *Id.*

Front Row's patents satisfy the second step of the *Alice* test. *Id.* at 2350. This second step is the search for an "inventive concept," or some element or combination of elements sufficient to ensure that the claim in practice amounts to "significantly more" than a patent on an ineligible concept. *Id.*; *see DDR Holdings,* 773 F.3d at 1255.

1. A Rational Approach to Inventive Concept Analysis.

In response to *Alice, Enfish,* and to set forth a uniform system for § 101 analysis, the Southern District of New York has established five factors relevant to whether a claimed invention "merely attempts to monopolize ineligible subject matter in a particular setting, or whether it actually works an improvement in human knowledge." *Iron Gate Sec. v. Lowe's Co.*, 15-cv-8814 (KBF), 2016 WL 4146140, at *8 (S.D.N.Y. Aug. 3, 2016). The *Iron Gate* factors

analyze if the patent (1) recites an improvement, (2) recites a benefit, (3) recites "something new," (4) has one or more particular applications, and (5) the steps and limits to be followed in applying the invention. *Id.* at *10. Not all five factors need be present for the patent to meet step two of *Alice. See id.*

In three recent cases, the Southern District of New York rejected § 101 challenges to patents on technology similar to Front Row's patents. ***First***, in *Iron Gate*, Iron Gate Security's patent-in-suit related to "storage of and access to multimedia data and, more particularly, to methods and apparatus for instantly indexing multimedia data associated with real time events for analysis and retrieval." *Iron Gate*, *supra*, at *2. The representative claims in *Iron Gate* required processing motion data from a sensor in real time, indexing that data with pre-existing data at the time of the data-capture, and generating an index by cross-indexing the real-time ad pre-existing data. *Id.* at *11.[32] Those particular requirements, plus the court's finding that "the claimed invention purports to improve upon existing multimedia data indexing techniques by allowing for indexing to occur contemporaneously to capture, which confers advantages that

[32] The *Iron Gate* court held that these factors demonstrated the patent was not directed at an abstract idea and stated that "many of the same aspects that support the determination that the '693 Patent is not directed to an abstract idea at *Alice* step one also support the conclusion that . . . the claims nonetheless contain an inventive concept." *Id.* at *13.

had not been achieved in the prior art," rendered the patent in suit patent-eligible. *Id.* at *13.

Second, the Southern District of New York rejected § 101 challenges to a patent that created "a method to allow for accountability regarding the financial resources spent on advertising." *TNS Media Res., LLC v. TiVO Res. And Analytics, Inc.*, 11-cv-4039 (KBF), 2016 WL 6993768 at *3 (S.D.N.Y. Nov. 29, 2016). The court held the representative claim patent-eligible because the method "directly addresses" the problems that the patent sought to solve and contained sufficient inventive concepts because it "provides for the improvement needed: a method that can only be implemented on a computer given the size and complexity of the task at hand, and a step-by-step way to collect, store, cleanse, and analyze data." *Id.* at *11.

Third, the same court recently rejected § 101 challenges to a series of patents that protected sensitive information transmitted by telecommunications. *Verint Sys., Inc.*, *v. Red Box Recorders Ltd.*, 14-cv-5403 (KBF), 2016 WL 7156768 (S.D.N.Y. Dec. 7, 2016). In *Verint*, the district court decried how "recent motions seeking determinations of patent ineligibility suffer from [ ] reductionist simplicity—from characterizing as simply a mousetrap that which is in fact a better mousetrap." *Id.* at *1. In finding that U.S. Patent No. 7,774,854, (the "'854

patent") which recites steps similar to those in the Front Row patents,[33] was ***not*** abstract, the district court noted both the "concrete steps required" to accomplish the claimed inventions and the numerous improvements the specification claimed over the existing art. *Id.* at *6-*7.

Here, the district court ignored the claimed improvements for each of the Front Row patents of using wireless technologies with handheld devices instead of fixed hardware installed at the venues. Appx744-745, Appx 781-782, Appx817-818, Appx1006-1007, Appx3681-3682. The district court also ignored the equipment cost reduction to venues and user benefits that flowed from the

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[33] Claim 1 of the '854 patent is a method claim that included: (1) receiving, at a communication monitoring server, an interactive communication responsive to an agent request via a communication network; (2) routing the communication to an agent; (3) recording the communication (at least in part); (4) electronically identifying the confidential information to be protected; and (5) preventing unauthorized access to the information during replay of the communication.

Claim 25, a method claim, required: (1) A computer-readable medium having a computer program with computer-executable instructions for protecting information provided to an agent communication network, (2) receiving an interactive communication via a communication network, (3) electronically identifying the confidential information; (4) recording at least a portion of the communication; and preventing unauthorized access to the information such that, if confidential information has been recorded, at least a portion of it is rendered unintelligible without an authorization to access the information.

Verint, *supra*, at *6-*7.

inventions. *Id.* It further ignored the specific, detailed, and concrete steps that the patents required to practice the claims and the particular applications of Front Row's inventions to various emerging wireless networking technologies,[34] which helped obviate the threat of obsolescence that accompanied any fixed interactive equipment installed at a venue. *Id.* Thus, the Front Row patents claimed improvements, recited benefits, recited new approaches, had one or more particular applications, and specified the steps and limits to be followed in applying the invention.

This Court should adopt the Southern District of New York's approach because it is designed to determine if a patent-in-suit is worthy of patenting and scrutinizes reductive descriptions "with great care" instead of affirming lower court decisions that purport to ascertain the purpose and scope of claimed inventions without factual support from persons with ordinary skill in the art. *See Verint, supra*, at *1.

2. How the District Court's Analysis of Inventive Concept is Wrong.

Relying on its own narrow selection of elements from a fraction of the asserted claims, the district court cast all of Front Row's asserted patents as

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[34] Appx746-751, Appx 783-788, Appx819-824, Appx1008-1013, Appx3683-3688 (discussing use with smart cards, cellular data networks, wireless data networks, wireless intelligent networks, and other emerging technologies).

directed towards broad concepts with a generic directive to use a general-purpose computer. Appx120 ("Unlike the claims in *Enfish*, the 'plain focus' of Front Row's claims is on 'economic or other tasks for which a computer is used in its ordinary capacity,' rather than on an 'improvement to computer functionality itself.'") (quoting *Enfish*, 822 F.3d at 1336). That analysis has no weight or merit—the specific limitations in the representative claims demonstrate that the Front Row patents create a substantial process containing inventive concepts that could be performed only by using a handheld computer in a capacity ***not*** conceived before the patents' 2000 priority dates.

The district court noted that claim 15 of the '856 patent sets out a method consisting of (i) acquiring data; (ii) authorizing a device to receive the data; (iii) processing the data; (iv) transmitting the data; and (v) displaying the data. Appx101. To reach that conclusion, the district court ignored limitations that required transmitting multiple perspectives of video through data packets, that the receiving device be able to communicate its authorization to receive the data packets over a wireless data network, and then process the data packets for selective video display only on authorized handheld devices. Appx829-830.

The district court said claim 1 of the '895 patent described a server, with: (i) memory for storing video; (ii) a processor to authenticate a hand-held device; (iii)

a processor to process the video; and (iv) a port to stream the data to the hand-held device. Appx105. And it characterized claim 1 of the '027 patent as describing "a method that: (i) determines a handheld device user's location; and (ii) authorizes devices within a certain area to receive streaming video" without noting that the computing device required by each patent had to be capable of providing location data wirelessly over a wireless data network and that the transmitting system had to be capable of determining that location to authorize delivery of the data based on bidirectional data communication with the handheld device. Appx113; Appx793; Appx3693.

These claims are akin to the system, process and method claims this Court found patent-eligible in *Amdocs*. *Amdocs (Israel) Limited v. Openet Telecom, Inc.*, ___ F.3d. __, 2016 WL 6440387 at *11 (Fed. Cir. 2016). The Court found the system claims of one patent in *Amdocs* patentable because the representative claim required "specific structure of various components (network devices, gatherers, ISMs, a central event manager, a central database, a user interface server, and terminals or clients)." *Id.* at *9-11. It found patents covering processes and methods to implement that system patentable because they depended upon the same unique system architecture. *Id.* at *11-*15.

The district court also claimed that the various dependent claims in the

patents did not make them "materially distinct" from the independent claims. Appx116. That explanation is incomplete—the Patent Act states that "dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim"; the district court therefore had to determine whether adding the elements of the dependent claims to the extant independent claims set forth an inventive concept that rendered the claims patent-eligible. 35 U.S.C. § 282(a). Because it failed to analyze the dependent claims, the district court's order cannot remain intact.

The unique combination of limitations presented in the '856, '895, '184 and '460 patents—from simultaneously capturing multiple video perspectives, to processing the video perspectives into encrypting video data packets for transmission by WiFi and cellular data networks to devices capable of being authenticated through two-way data communication, then processing and selectively displaying the video on touch-screen sensitive handheld devices only to the extent authorized for that specific user—constitute the inventive concept that, even if the patents are directed to an abstract idea, render the subject matter patent-eligible. *E.g.,* Appx793, Appx829-830. And the location-verification requirements in the '027 patent for both the receiving device and the transmitting device help further establish that it contains a sufficient inventive concept to

render it patent-eligible. *See SiRF Tech., Inc. v. Intl. Trade Comm'n,* 601 F.3d 1319, 1332-33 (Fed. Cir. 2010). For these reasons, at minimum, the Court should reverse the district court's dismissal order.

3. The District Court Misapplied the Inventive Concept Test by Not Finding Clear and Convincing Evidence to Support Appellees' Defense.

i. The district court's reversible error.

The district court committed reversible error by misapplying the clear and convincing evidence standard to § 101 motions. Appx67-76, Appx92. The Supreme Court has held that alleged infringers must prove all facts in support of their infringement defenses by clear and convincing evidence. *Microsoft Corp. v. i4i Ltd. Partnership,* 131 S.Ct. 2238, 2242 (2011).[35]

Fifty years ago, the Supreme Court noted that there are three conditions for patenting, those embodied in Sections 101, 102, and 103 of the Patent Act. *Graham v. John Deere Co. of K.C.*, 383 U.S. 1, 17 (1966) ("While the ultimate question of patent validity is one of law, the [§] 103 condition, which is but one

[35] There is no other credible way to read the *i4i* holding. To the extent that Appellees relied upon facts to show entitlement to dismissal as a matter of law, they had to prove such facts by clear and convincing evidence. This is not an arcane issue. *See e.g., Eli Lilly & Co. v. Barr Labs., Inc.,* 251 F.3d 955, 962 (Fed.Cir.2001) (holding that to obtain summary judgment on invalidity, the movant must "submit such clear and convincing evidence of invalidity so that no reasonable jury could find otherwise").

of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries."). Each has attendant fact issues.

For obviousness under § 103, a jury decides factual issues such as: (1) the scope and content of prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) determines secondary considerations such as commercial success, long-felt need, and the failure of others. *See id.* Similarly, a § 101 determination requires determining facts that include: (1) the scope and extent of, *i.e.*, abstract ideas in the invention field; (2) the criteria for ordinary skill in the pertinent art; (3) the scope and extent of an inventive concept in the patents and (4) objective evidence that relevant practitioners find the invention is transformative. Jesse D.H. Snyder, *Have We Gone Too Far: Does the Seventh Amendment Compel Fact-Finding Before Reaching a Decision on Patent-Eligible Subject Matter?*, 14 CHI.-KENT J. INTELL. PROP. 436, 452 (Spring 2015).

A Rule 12(c) motion that relies upon factual matters outside the pleadings must be reviewed by the district court as one for summary judgment under Rule 56. FED. R. CIV. P. 12(d). Because a granted patent is presumed valid, 35 U.S.C. § 282, and the Appellees must prove invalidity by clear and convincing evidence, any factual matters they need to show—such as the "factual

elements" the district court ruled were present in its discussion of inventive concept, Appx92—must meet the clear and convincing evidence standard. *i4i Ltd. Partnership,* 131 S.Ct. at 2242.

To prove entitlement to judgment as a matter of law, Appellees had to demonstrate that they provided sufficient evidence to meet their own burden of proof. *See Bose Corp. v. Consumers Union of U.S., Inc.*, 466 U.S. 485, 513 (1984) (holding that a court can accept facts supporting one party and still find no clear and convincing evidence as a matter of law); *Monarch Knitting Machinery Corp. v. Sulzer Morat GmbH*, 139 F.3d 877, 880-81 (Fed. Cir. 1998) (for summary judgment motions, "a court must view the evidence presented [under] the substantive evidentiary burden that would inhere at trial"). Appellees did not submit ***any*** facts to support their claim that the Front Row patents used generic components generically. That failure cannot support a clear and convincing evidentiary burden and cannot have forced Front Row to meet its burden to counter Appellees' evidence.[36]

Where a party claims that a combination of elements is "conventional," it

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[36] *See* Appx1447-1448. ("Defendants are asking the Court to infer, on supposedly the pleadings alone that Plaintiff's patented combinations are conventional, and to make that inference to invalidate an entire patent portfolio without clear or convincing evidence that Defendants' version of the ***facts*** is correct.").

should have to supply ***some*** evidence to convince the trier of fact of that conventionality. *See Diamond v. Diehr*, 450 U.S. 175, 188 (1981) (stating "a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use."). Appellees provided no evidence that Front Row's ***combinations of steps*** in the representative claims were conventional. The district court's analysis, based on the specifications of the patents, also did not show that such combinations were conventional and it had no other evidence before it upon which to make such a finding. *See* Appx92.[37]

Whether a limitation is "conventional" on a patent's priority date can only be a question of fact, not law.[38] The "conventional" aspects of any invention will vary—a novel concept in 2000 may become conventional by 2007 or 2016. This is especially true in the fields of digital imaging, wireless data transmission, data processing and authorization.

Appellees sought to prove an affirmative defense of ineligibility but failed to produce clear and convincing evidence that would enable a fact-finder to find

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[37] To the extent it cited evidence, whether from the patents-in-suit or elsewhere, the district court failed to view it in the light most favorable to Front Row. *Compare Tomlinson v. El Paso Corp.,* 653 F.3d 1281, 1285 (10th Cir. 2011) (Rule 12(c) standard) *with* Appx92.

[38] In the absence of the parties' agreement.

that the combination of patent elements was conventional at the relevant time: the patents' priority dates of October and November 2000. Because defendants must prove all factual elements of their infringement defense with clear and convincing evidence, Appellees' failure alone should have prevented the district court from granting Appellees' motion. *See i4i Ltd. Partnership,* 131 S.Ct. at 2242.

Nonetheless, the district court invalidated all 98 claims of Front Row's asserted patents by accepting Appellees' unsubstantiated attorney-arguments reflecting ***2016*** technological knowledge and applying it to evaluate patents from 16 years earlier through the prism of its own "general historical observations" that the district court said "courts routinely make in deciding legal questions." Appx91. The district court did so even though Front Row's claims "do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet." *DDR Holdings,* 773 F.3d at 1257.

As its own technological historian regarding the conventional application of specific devices through multiple technical fields, the district court was "willing to conclude, by clear and convincing evidence, that broadcasters have captured and transmitted video 'for some time,' and that the concepts were 'well-known' at the time of Front Row's claimed invention." Appx92. The district court

reached that conclusion without reference to the ***combination*** of elements specified in the patents, without any findings regarding whether the ***combination*** of concepts was new and useful, and without reference to whether such combinations were conventional in 2000. *Id*. The district court's holding, which contradicts its underlying finding that fact issues existed, shows that it failed to properly analyze a crucial fact issue: the state of the art before the October 2000 priority date for Front Row's patents.

ii. How the district court's analysis caused reversible error.

The district court took the most abstract approach possible to Front Row's patents. Despite that approach, the district court made the state of the art part of its analysis in ruling upon the Appellees' motion while ***failing*** to view such facts in the light most favorable to Front Row.

The district court's logic is inherently suspect—whether "broadcasters have captured and transmitted video for some time" and if transmitting signals through a transmitter to a receiver "were well-known at the time of Front Row's claimed invention" are irrelevant. Appx92. Similarly irrelevant is the district court's finding that "the television industry has recorded video and transmitted it in a format that can be received by different devices, including portable televisions." Appx92. Because the district court distinguished between one-way

analog handheld televisions and the two-way digital handheld devices described in the Front Row patents, Appx16, and it failed to analyze how the combination of transmitter, compression into data packets, transmission over wireless data networks, reception by authorized users, and interactive use through user control was inventive, the district court's analysis is inherently flawed. Ultimately, to find the Front Row element combinations conventional, the district court relied upon a parallel it previously rejected and misapplied the Rule 12(c) standard.

Similar to the *SimpleAir* patents,[39] Front Row's patents claim capturing multiple video perspectives and then packaging or processing that video data into a format that can be streamed or sent over a wireless network to authorized remote handhelds. *E.g.,* Appx793-794, Appx756, Appx829-830, Appx1018-1019. Whether Front Row's technology was "conventional, routine, or well-known at the time" of patenting constitutes a distraction because this Court must examine "whether the function performed" by the components, for each step of the patented process, is conventional. *Alice,* 134 S.Ct. at 2359. The district court's analysis only determined if each claim element was known in the art,[40] but this Court has previously held that analysis is too cursory. *Bascom Global Internet*

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[39] *SimpleAir, Inc. v. Google Inc.*, No. 2:14-CV-00011-JRG, 2015 WL 5675281, at *4 (E.D. Tex. Sept. 25, 2015); *see supra*.
[40] Appx131.

Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341, 1350 (Fed. Cir. 2016) ("The inventive concept inquiry requires more than recognizing that each claim element, by itself, was known in the art.").

Although smartphones and streaming video data over wireless communications networks are ubiquitous today, they were not in 2000. Front Row's patents long pre-date the iPhone, which started the smartphone revolution upon its 2007 release.[41] Concepts for streaming live event videos barely existed in 2000—as the patents note, interactive multimedia at concert and sport venues utilized touchscreen technologies in the seat-backs, which required miles of electrical and data cable, required expensive retrofitting for older venues, and could be easily damaged by users. Appx817. Yet the district court dismissed Front Row's step-by-step process and method claims by construing the "abstract" concept broadly and decoupling the "inventive concept" issue from the time of the invention. This is legal error.

The *Mayo/Alice* inventive concept requirement necessarily forces courts to determine at least some level of the claimed inventions' novelty. The Supreme Court said 35 years ago that § 101 is a general statement of the subject matter

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[41] *See* Appx817 (mentioning available communications devices like Palm Pilots, Handspring Visors or Windows CE devices).

that can be patented, that "§ 102 covers in detail the conditions relating to novelty" and therefore "whether a particular invention is novel is wholly apart from whether the invention falls into a category of statutory subject matter." *Diamond v. Diehr*, 450 U.S. 175, 189-90 (1981). The *Diamond* court's intent to foreclose examining novelty during a Section 101 challenge applied only to step one of the later-developed *Mayo/Alice* test because *Diamond* held that "[t]he 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining ***whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter***." 450 U.S. at 188-89.

The inventive concept requirement, however, necessarily creates overlap between the eligibility and novelty requirements—"inventive" means "having or showing an ability to think of new ideas and methods."[42] If a court engages in determining whether an inventive concept exists, it must evaluate to some degree whether the patent has new ideas and methods and therefore is novel.[43]

In *Mayo,* the Supreme Court noted that *Diamond* had upheld a process patent

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[42] http://www.merriam-webster.com/dictionary/inventive.new, last accessed December 15, 2016.

[43] This inquiry is distinct from, and broader than, the novelty requirement in § 102 because the anticipation defense to patent infringement requires proof that all elements of the claimed invention be disclosed in a single prior art reference. *E.g., In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009).

that used the well-known Arrhenius equation because the defendant "nowhere suggested that all these steps, or at least the combination of those steps, were ***in context*** obvious, already in use, or purely conventional." *Id.* "Purely conventional" has since become shorthand for "uninventive"; indeed, even this Court has viewed the phrase without reference to the ***context*** of the patent—namely, without analyzing the state of the art at the time of patenting. *E.g., Affinity Labs of Tex., LLC v. DIRECTV, LLC,* 838 F.3d 1253, 1265 (Fed. Cir. 2016).

But divorcing whether a combination of steps is "purely conventional" from the context of the patent is contrary to the Supreme Court's instructions. *See Verint Sys., Inc.*, *v. Red Box Recorders Ltd.*, 14-cv-5403 (KBF), 2016 WL 7156768 at *4 (S.D.N.Y. Dec. 7, 2016) (citing *Alice* to support principle that claims that allege an improvement in a technical field meet inventive concept test). The *Mayo* and *Alice* opinions indicate that if the steps set forth in a patent ***in context*** are purely conventional, then the patent lacks an inventive concept. *Alice*, 134 S.Ct. at 2359; *Mayo,* 132 S.Ct. at 1297-98 (rejecting patent on medical concept in use for decades). This Court has held that an inventive concept can exist "in the non-conventional and non-generic arrangement of known, conventional pieces."

Bascom, 827 at 1350.[44] Such "non-conventional" and "non-generic" arrangements are measurable only by the state of the art on the patent's priority date.

Failing to examine the "inventive concept" from the time of patenting separates the patent from its context, which contradicts *Mayo* and *Alice.* That failure further results in employing hindsight bias to evaluate inventiveness years after the invention's creation. *See Ameritox, Ltd. v. Millennium Health, LLC*, 88 F. Supp. 3d 885, 914 (W.D. Wis. 2015) (because "*Alice* now expressly requires that courts look at patented elements in ***combination*** when assessing inventive concept (as did *Mayo*) the concern of hindsight bias has as much relevance to a § 101 challenge as it does a § 103 challenge."). Thus, one commenter noted "[p]ut in proper view, the question of what is a transformative inventive concept begs for a jury to make a factual determination." Snyder, *supra,* at 454. Or, as Judge Rader cautioned, "what has become routine in 2013 [is] to determine what was inherent in a concept in the early 1990s [which] injects hindsight into the eligibility analysis and fails to recognize that patent eligibility, like all statutory

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[44] Although the district court cited *Bascom* in various parts of its opinion, it did not analyze this crucial aspect of the *Bascom* holding although Front Row brought this exact portion of the holding to its attention. Appx46; Appx2951-2953.

patentability questions, is to be measured as of the filing date." *CLS Bank Int'l v. Alice Corp. Pty*., 717 F.3d 1269, 1301 (Fed. Cir. 2013) (Rader. J., dissenting).

An inventive concept analysis ***must*** relate back to the priority date of the patents, and require proof of the then-current state of the art by a person with ordinary skill in the art, or technological advances will render any patented technology "conventional" under § 101 soon after the patentee files its patent application. Appellees put no evidence into the record that describes the state of the art in October 2000 or what persons of ordinary skill in the art at that time would have known or believed about the inventions described in Front Row's patents. The district court's conclusions regarding a lack of inventive concept therefore have no basis in the record.

Sixteen years of technological innovation is a tremendous amount of time.[45] Viewing "inventive concepts" and "conventional usage" in a vacuum without reference to the state of the art at the time of patenting provides no guidance

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[45] Consider Moore's Law, described in the landmark paper by Intel founder Gordon Moore. It states that every two years, the amount of components that can be "crammed" onto integrated circuits will double – or will have 256 components in year 2016 for every one component in year 2000. Gordon E. Moore, *Cramming More Components Onto Integrated Circuits,* 38 ELECTRONICS 82 (1965) available at http://www.cs.utexas.edu/~fussell/courses/cs352h/papers/moore.pdf; last accessed November 9, 2016.

for a court or litigant as to what an inventive concept is and renders "inventive concept" and "conventional usage" equivalent to obscenity—concepts with no bounds other than "I know it when I see it." *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring).

For this reason, at minimum, the district court improperly dispatched this case at the pleading stage. It accepted its own inaccurate view of 2000 technology and the Appellees' various arguments to find "by clear and convincing evidence, that broadcasters have captured and transmitted video 'for some time,' and that the concepts were 'well-known' at the time of Front Row's claimed invention"[46] without reference to facts in the record or to facts the court specifically found that were not subject to reasonable dispute and were either generally known to the court or capable of accurate and ready determination from unquestionable sources. *See* FED. R. CIV. P. 201(b)(1)-(2) (stating requirements for judicial notice of adjudicative facts). Indeed, the district court reached its conclusion even though it found that "whether the claims rely on 'generic' or 'conventional' components, whether the claims' functions are specified at a 'high level of generality,' and whether the claims provide the requisite 'inventive concept'" all are issues that "have some factual

[46] Appx87, Appx92.

elements." Appx92. The district court then decided these factual issues without evidence and without analyzing the facts in the light most favorable to Front Row. Appx87-92. This is improper.

4. The Front Row Patents Contain Ordered Combinations of Elements That Demonstrate Their Inventive Concepts.

Front Row's patents use advances in ***digital*** communications at the time to compress information for reception in recently introduced digital handheld devices adapted with the capacity for two-way interactive communication between the transmitter and the receiver—technical features that devices with operations based on broadcasted analog signals at the time of invention could not achieve.

That use of "conventional" technology in an unconventional and previously unused manner is the quintessence of a "new and useful process" or at least a "new and useful improvement" of an existing set of processes. 35 U.S.C. § 101. Separating an examination of whether the process is new and useful, and therefore inventive, from an eligibility analysis is contrary to the Patent Act because Section 101 states that new and useful processes are patentable. *Cf. KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 418–19 (2007)("[I]nventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is

already known."). Appellees argued that Front Row's "only apparent contribution is to take a 'basic concept' already present in handheld televisions and say 'let's do it on a PDA or cell phone' using known conventional technology." Appx1063. But that characterization, which the district court properly rejected, fails to account for the patents' purpose.

Front Row's claims created a new paradigm—a system for transmitting multiple viewing perspectives of an event to users over encrypted networks and allowing the users to choose the perspectives they wanted to see. *E.g.,* Appx793, Appx829, Appx3693. This Court has recognized that "[o]n a fundamental level, the creation of new compositions and products based on combining elements from different sources has long been a basis for patentable inventions." *DDR Holdings,* 773 F.3d at 1258 n. 5 (Fed. Cir. 2014) ("Modern inventions very often consist merely of a new combination of old elements or devices, where nothing is or can be claimed except the new combination."); *see also Veracode, Inc. v. Appthority, Inc.*, No. CV 12-10487-DPW, 2015 WL 5749435, at *12 (D. Mass. Sept. 30, 2015) ("a series of conventional elements may together form an unconventional, patentable combination.").

Thus, this Court has previously noted that "an inventive concept can be found in the non-conventional and non-generic arrangement of known,

conventional pieces." *Bascom Global Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350 (Fed. Cir. 2016). Whether such an "arrangement of known, conventional pieces" is non-conventional and non-generic necessarily must be measured from the time of the invention, not the time of the lawsuit. Because Front Row's ***combination*** of elements as claimed is unique and innovative, particularly considering the state-of-the-art at the time of the invention, it is patent-eligible.

The following ordered combination of technical features are well supported and taught in all of Front Row's patent specifications, and in particular with reference to Figures 5, 6, 8, 9 and 10 of all asserted patents: (1) simultaneously capturing a plurality of video perspectives of a venue-based activity utilizing more than one camera, (2) processing the video perspectives in data packets at a server, (3) authorizing at least one handheld device for receipt of the data packets, (4) wirelessly transmitting the data packets over the wireless data network, (5) processing the data packets into video for selective display video at the handheld device. *E.g.,* Appx802-803, Appx805-807. This ordered sequence, uses the capabilities of extant technology such as wireless data and cellular communications networks, in ways they had not been used previously—*i.e.,* using cellular communications networks like CDMA to handle the digital data

packets even though handheld devices had not received and displayed video as of 2000 or exploiting wireless intelligent networks' storage capacities to maintain subscriber and user information in the authentication features of the patents. Appx824, Appx 1013, Appx754, Appx788.

The district court had no information with which to deny the significant innovations in these new ordered combinations because neither Appellees nor the district court's own historical knowledge demonstrated when or how the combination of elements in Front Row's patents could have become conventional. The district court's decision to sweep aside the patents' inventive concepts because it said the additional components in the claims were "generic, and the claims use them in conventional ways" lacked any historical context. Appx134. Any such "conventional use" is a product of the year 2016, not of the 2000 priority date. How can a patent with a 2000 priority date become "conventional" and lack an inventive concept in 2016 when such conventional uses of the "generic" components only became routine years ***after*** the priority date? That paradox demonstrates why the district court's ruling must be reversed.

Analog broadcasting did not require authentication from receiving devices due to the one-way nature of analog broadcasting. Appx117. Broadcasts did not stream their content in a processed digital format over wireless packet-

based data networks. *Id.* Thus, for example, claim 15 of the '856 patent explicitly recited several concepts that were inventive in 2000 even though they are commonplace today—(1) simultaneously capturing a plurality of video perspectives; (2) processing the video perspectives into encrypted video data packets for wireless streaming; (3) wirelessly transmitting that video in encrypted video data packets; and (4) allowing the authorized user to decrypt the video data packets and choose a particular video perspective on the touch-sensitive display screen. Appx829-830.

When a court engages in the inventive concept search under step 2 of the *Alice* analysis, it must view the presence or absence of an inventive concept from the standpoint of the patent's priority date, not the date on which the parties are arguing about patent eligibility.[47] The district court failed to make Appellees prove the absence of an inventive concept, committed hindsight analysis, and this Court should reverse the district court's ruling.

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[47] The Supreme Court has held that "[t]he 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether ***the subject matter of a claim*** falls within the § 101 categories of possibly patentable subject matter." *Diamond v. Diehr*, 450 U.S. 175, 188–89 (1981). Step 2 of *Alice* applies only if the court first finds the claims directed to patent ineligible subject matter. Nonetheless, this Court improperly applied *Diamond's* analysis to *Alice* Step 2. *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016).

D. Front Row's Claims Do Not Cause Preemption Concerns.

The Supreme Court created limits on patentable subject matter to ensure that a field of inquiry will not be preempted by the existence of a patent. *Mayo*, 132 S. Ct. at 1294. Thus, courts are leery of patents that may impede, rather than incentivize, innovation. *California Inst. of Tech. v. Hughes Commc'ns Inc.*, 59 F. Supp. 3d 974, 990 (C.D. Cal. 2014). A well-tailored invention seeking to solve a specific problem with specific claim limitations should not cause preemption concerns, at least where the invention is new and useful. *Ameritox,* 88 F. Supp. 3d at 908.

This Court has held that the absence of "complete preemption" does not transform a patent's subject matter from ineligible to eligible. *Ariosa Diags., Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015). Instead, preemption should be addressed in connection with the two-step process from *Alice* because they are intrinsic to that framework. *Id.*

Front Row's patents and claims do not come close to preempting the field of providing streamed video of an event to a device. The Appellees acknowledged that numerous claim elements of the asserted patents describe additional requirements that guard against preemption. Appx1079.

The district court held, without any analysis, that "Front Row's claims

include terms with considerable breadth, such as 'venue-based activity,' which would make it extremely difficult for any future developer to create an application to stream data from stadiums to mobile telephones." Appx131-132. The district court's conclusion is incorrect because it ignored the importance of the "venue attendee" and the purpose of the patented systems to provide that "venue attendee" with the multimedia information that the patented inventions are designed to deliver. *E.g.,* Appx818-819 ('856 Patent at 2:64-3:9). The district court also ignored how the Front Row patents require specific authorization steps using particular wireless protocols like IEEE 802.11 or cellular communications to display video only to authorized users on handhelds with features that included touchscreen displays or were either smartphones or tablets. *E.g.,* Appx793-794.

The district court noted that the preemption doctrine seeks to prevent a patentee from disproportionately tying up the use of an "abstract idea" but failed to consider the extent of the market for such idea nor how Front Row's patents could disproportionately preempt invention in the area if the Appellees, as they claimed, do not infringe. Ultimately, the district court did not analyze how presumptively valid patents would preempt a field of invention when the specifications teach the ability to stream video and venue information to

attendees and to limit the recipients of such information. The Court should overturn the district court's ruling.

E. The '027 Patent Has A Specific Limitation That Renders it Patentable Under § 101.

The claims of the '027 patent require streaming video captured of real-life events at a venue. The '027 patent's claims are valid for at least the same reasons as the representative claims of the '895, '856, '460 and '184 patents, but the '027 patent satisfies § 101 for an additional reason.

The Federal Circuit has noted the complexity of location-based technologies in holding that "the presence of the GPS receiver places a ***meaningful limit on the scope of the claims***" such that the claims were directed towards a patentable machine. *SiRF Tech., Inc. v. Intl. Trade Comm'n*, 601 F.3d 1319, 1333 (Fed. Cir. 2010) (emphasis in original).[48] In *SiRF Tech.,* this Court held patentable an invention in which the GPS receiver was integral to the claims at issue.

The '027 patent's claimed invention must be capable of determining a user's

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[48] *SiRF Tech* has been cited with approval by various district courts since *Alice. E.g., Intellectual Ventures I, LLC v. Canon Inc.*, No. CV 13-473-SLR, 2015 WL 6872446, at *21 n. 37 (D. Del. Nov. 9, 2015); *Chamberlain Grp., Inc. v. Linear LLC*, No. 14-CV-05197, 2015 WL 4111456, at *10 (N.D. Ill. July 7, 2015); *Intellectual Ventures I LLC v. Manufacturers & Traders Trust Co.*, 76 F. Supp. 3d 536, 546 (D. Del. 2014).

location. The concept of location-based filtering in claim 1 is central to the '027 patent's claims and thereby limits its applicability to handheld devices that contain such location-based filters. Appx3693. Such location-based filters are functionally equivalent to a GPS receiver and enable the authorization processes determine if the user is at the venue or enable the transmitter to blackout the transmission for users who are off-site or within a specified blackout range. Appx3690-3693.

The district court held that the '027 patent is just directed to the same abstract idea of tailoring content based on location as the patent invalidated in *Intellectual Ventures I. Compare* 792 F.3d at 1369 *with* Appx11. But this Court found the *Intellectual Ventures* patent ineligible because "our precedent is clear that merely adding computer functionality to increase the speed or efficiency of the process does not confer patent eligibility on an otherwise abstract idea." 792 F.3d at 1369.

The '027 Patent does not add computer functionality to a business process; it creates and defines the process itself. That is an inventive concept. *See SiRF Techs.,* 601 F.3d at 1332-33 ("We are not dealing with a situation in which

there is a method that can be performed without a machine.").[49] It also contains a specific limitation that the Court has previously relied upon to find an allegedly abstract patent patent-eligible. The Court should follow its *SiRF* holding and find the '027 patent is directed to a patent-eligible or, at minimum, has inventive concepts that render it valid.

The district court misapplied this Court's precedents in reviewing the '027 patent. The Court should reverse the district court's decision.

CONCLUSION

Front Row's asserted claims are not abstract ideas, include inventive concepts, and do not preempt any broad concepts. Instead, each of the patents claims are patent-eligible. The district court's holding that the patents are not directed to patent-eligible concepts is wrong. Because the patented inventions are not patent-ineligible, Front Row has stated a claim for relief upon which judgment can be granted and a claim for relief that is not foreclosed by the

[49] The Court should also consider the state of the art at the time of the invention in determining the validity of the '027 patent. As of the '027 patent's priority date of October 26, 2000, television broadcasters did not authorize access to their transmissions based on a wireless device's location. Appx750-752; Appx3681-3682. These capabilities were not compatible with the analog broadcasts prevalent at that time. *Id.* The analog signal's strength is its only geographic limitation; the reception capacity of the receiving device is unknown and completely uncontrolled by the transmission entity.

pleadings. The Court should reverse the district court's decision to grant Appellees' motion to dismiss and remand this case to the district court.

Date: December 15, 2016

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CERTIFICATE OF SERVICE

I certify that on the 20th day of December, this corrected brief was filed through the Court's CM/ECF system and served upon all parties in compliance with Fed. Cir. R. 25(e).

/s/*Michael W. Shore*
Michael W. Shore

CERTIFICATE OF COMPLIANCE

I certify that this motion complies with the Court's typeface requirements and page limitations for motions. The typeface is 14-point Calisto MT, which is a proportional type font with serifs. The brief contains 13,738 words in the portions of the brief not exempt from the word count limitations.

/s/*Michael W. Shore*
Michael W. Shore

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IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF NEW MEXICO

FRONT ROW TECHNOLOGIES, LLC,

Plaintiff,

vs. No. CIV 10-0433 JB/SCY

NBA MEDIA VENTURES, LLC,
MLB ADVANCED MEDIA, L.P.,
MERCURY RADIO ARTS, INC.,
GBTV, LLC, MAJOR LEAGUE
BASEBALL PROPERTIES, INC ., &
PREMIERE RADIO NETWORKS, INC.,

Defendants.

consolidated with

FRONT ROW TECHNOLOGIES, LLC,

Plaintiff,

vs. No. CIV 12-1309 JB/SCY

MLB ADVANCED MEDIA, L.P.,
MERCURY RADIO ARTS, INC.,
d/b/a 'THE GLEN BECK PROGRAM,
INC.', & GBTV, LLC,

Defendants.

consolidated with

FRONT ROW TECHNOLOGIES, LLC,

Plaintiff,

vs. No. CIV 13-1153 JB/SCY

NBA MEDIA VENTURES,
TURNER SPORTS INTERACTIVE, INC.
& TURNER DIGITAL BASKETBALL

SERVICES, INC.,

Defendants.

consolidated with

FRONT ROW TECHNOLOGIES, LLC,

Plaintiff,

vs. No. CIV 13-0636 JB/SCY

TURNER SPORTS INTERACTIVE, INC., AND TURNER DIGITAL BASKETBALL SERVICES, INC.,

Defendants.

MEMORANDUM OPINION AND ORDER

THIS MATTER comes before the Court on the Defendants' Motion for Judgment on the Pleadings Pursuant to Fed. R. Civ. P. 12(c), filed October 21, 2015 (Doc. 229)("Motion"). The Court held a hearing on January 5, 2016. The primary issues are: (i) what evidentiary standard applies to patent eligibility disputes under 35 U.S.C. § 101; (ii) whether the Court must wait until a later stage to examine the subject-matter eligibility of Plaintiff Front Row Technologies, LLC's patents; (iii) whether the Court may select representative claims, and what those claims should be; (iv) whether Front Row's patents are directed to patent-ineligible abstract ideas; and (v) if Front Row's patents are directed to patent-ineligible abstract ideas, whether the claims' elements, as a whole, contain an inventive concept sufficient to transform the claimed abstract idea into a patent-eligible invention. First, the Court concludes that the clear-and-convincing evidence standard does not apply to patent eligibility disputes under 35 U.S.C. § 101. Second, the Court concludes that it may proceed to examine the patents' subject-matter eligibility before claim construction. Third, the Court concludes that it may select representative claims and adopts a

modified set of the Defendants' proposed representative claims. Fourth, the Court concludes that all of Front Row's patents are directed to abstract ideas, because their claims describe these ideas in vague and broad terms. Finally, the Court determines that Front Row's claims do not contain an inventive concept or meaningful limitation in scope. The Court thus grants the Defendants' Motion in its entirety and dismisses this case with prejudice.

FACTUAL BACKGROUND

The Court takes its facts from the Plaintiff's Fourth Amended Complaint for Patent Infringement and Jury Demand, filed April 23, 2013 (Doc. 149)("Fourth Amended Complaint").[1]

Front Row[2] is a New Mexico limited liability company that holds patents related to streaming video on mobile devices. See Fourth Amended Complaint ¶¶ 1-20, at 1-5. Front Row owns "all rights, title, and interest in and under" ten such patents:

1. United States Patent No. 8,090,321 ("321 patent"), titled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," which duly and legally issued on January 3, 2012;

2. United States Patent No. 8,086,184 ("184 patent"), titled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," which duly and legally issued on December 27, 2011;

3. United States Patent No. 8,270,895 ("895 patent"), titled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," which duly and legally issued on September 18, 2012;

[1]The Court recognizes that, while the Motion was pending, Front Row filed a new complaint. See Plaintiff's Fifth Amended Complaint for Patent Infringement and Jury Demand, filed March 31, 2016 (Doc. 287)("Fifth Amended Complaint"). The Fifth Amended Complaint dropped some of Front Row's original claims against the Defendants. See Fifth Amended Complaint ¶¶ 23-74, at 5-21. The Court nonetheless draws on the Fourth Amended Complaint for its factual background, because the parties' briefing repeatedly refers to claims absent from the Fifth Amended Complaint. The parties' arguments make more sense when considered under the Fourth Amended Complaint.

[2]Inventors Luis Ortiz and Kermit Lopez founded Front Row in 2000. See Motion at 6.

4. United States Patent No. 7,812,856 ("856 patent"), titled "Providing Multiple Perspectives of a Venue Activity to Electronic Wireless Hand Held Devices," which duly and legally issued on October 12, 2010;

5. United States Patent No. 7,796,162 ("162 patent"), titled "Providing Multiple Synchronized Camera Views for Broadcast from a Live Venue Activity to Remote Viewers," which duly and legally issued on September 14, 2010;

6. United States Patent No. 7,884,855 ("855 patent"), titled "Displaying Broadcasts of Multiple Camera Perspective Recordings from Live Activities at Entertainment Venues on Remote Video Monitors," which duly and legally issued on February 8, 2011;

7. United States Patent No. 7,782,363 ("363 patent"), titled "Providing Multiple Video Perspectives of Activities through a Data Network to a Remote Multimedia Server for Selective Display by Remote Viewing Audiences," which duly and legally issued on August 24, 2010;

8. United States Patent No. 8,184,169 ("169 patent"), titled "Providing Multiple Video Perspectives of Activities through a Data Network to a Remote Multimedia Server for Selective Display by Remote Viewing Audiences," which duly and legally issued on May 22, 2012;

9. United States Patent No. 8,401,460 ("460 patent"), titled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices over a Telecommunications Network," which duly and legally issued on March 19, 2013; and

10. United States Patent No. 7,376,388 ("388 patent"), titled "Broadcasting Venue Data to a Wireless Hand Held Device," which duly and legally issued on May 20, 2008.

Fourth Amended Complaint ¶¶ 11-20, at 3-5. Front Row alleges that all of these patents are valid and enforceable. See Fourth Amended Complaint ¶¶ 21-31, at 5-6.

Defendant and Counterclaimant MLB Advanced Media, L.P. ("MLB Media") is in the business of broadcasting sporting events through electronic and wireless means, and selling software to support that broadcasting. Fourth Amended Complaint ¶ 2, at 1-2. Its primary product relevant to this litigation is "At Bat 13," Major League Baseball's official smartphone application. Fourth Amended Complaint ¶ 33, at 6.

Defendants and Counterclaimants Mercury Radio Arts, Inc. and GBTV, LLC create and distribute multimedia content over the internet. See Fourth Amended Complaint ¶¶ 3-4, at 2.

They are both associated with talk show host and radio personality Glenn Beck. See Fourth Amended Complaint ¶¶ 4-5, at 2.

Defendant and Counterclaimant Premiere Radio Networks, Inc. is a "national radio network that produces radio programming and services for radio stations, and distributes its own and various third-party radio programs to radio station affiliates throughout the world." Fourth Amended Complaint ¶ 5, at 2.

Defendant and Counterclaimant NBA Media Ventures, LLC ("NBA Media"), like MLB Advanced Media, L.P., is in the business of broadcasting sporting events through electronic and wireless means, and of selling software to support that broadcasting. See Fourth Amended Complaint ¶¶ 6, 37, at 2, 8. Its primary products relevant to this litigation are "NBA League Pass Mobile" and "NBA League Pass Broadband," which provide video of National Basketball Association games to consumers over the internet. Fourth Amended Complaint ¶¶ 37, at 8.

Front Row filed its Fourth Amended Complaint on April 23, 2013. See Fourth Amended Complaint for Patent Infringement and Jury Demand, filed April 23, 2013 (Doc. 149)("Complaint"). The Complaint alleges that the Defendants infringed its patents by: (i) selling applications that capture live video of entertainment events and transmit it over a cellular communications network to hand held mobile devices; and (ii) knowingly inducing their customers to infringe on the patent by providing applications that those customers would use to access live video of entertainment events. See Complaint ¶¶ 33-37, at 6-8. They target in particular Major League Baseball's MLB.TV, At Bat 13, Postseason.TV, MiLB.TV, and MiLB applications; the National Basketball Association's NBA League Pass Mobile and NBA League Pass Broadband applications; and Mercury Radio Arts, Inc., GBTV, LLC, and Premiere Radio

Networks, Inc.'s TheBlaze TV and TheBlaze TV Plus applications. See Complaint ¶¶ 33, 35, 37, at 6-8.

PROCEDURAL BACKGROUND

The current case consists of four consolidated cases. Front Row filed its first lawsuit in the District of New Mexico on May 5, 2010. See Plaintiff's Original Complaint for Patent Infringement and Jury Demand, filed May 5, 2010 (Doc. 1). Front Row filed its second lawsuit on May 25, 2012, in the United States District Court for the Northern District of Texas. See Complaint, filed May 25, 2012 (Doc. 1 in Front Row Techs., LLC v. MLB Advanced Media, L.P., No. 3:12-cv-01639-K (N.D. Tex.)(Kinkeade, J.)(the "Second Action")).

On December 17, 2012, the Honorable Ed Kinkeade, United States District Judge for the Northern District of Texas, transferred the Second Action to the District of New Mexico. See Order, filed December 17, 2012 (Doc. 44 in the Second Action). The Second Action then received a new case number, No. CIV 12-1309 JB/SCY (D.N.M.). On February 12, 2013, the Honorable William P. Johnson, United States District Judge for the District of New Mexico, consolidated the Second Action with this case. See Order Consolidating Civil Cases, filed February 12, 2013 (Doc. 65 in the Second Action).

Front Row filed its third lawsuit on July 10, 2013. See Plaintiff Front Row Technologies, LLC's Original Complaint for Patent Infringement, filed July 10, 2013 (Doc. 1 in Front Row Techs. v. Time Warner Inc. et al, No. CIV 13-0636 JB/SCY)("the Third Action"). The Court granted the parties' joint consolidation motion on December 3, 2013. See Proposed Order, filed December 3, 2013 (Doc. 43 in the Third Action).

Front Row filed its fourth lawsuit on December 5, 2013. See Plaintiff Front Row Technologies, LLC's Original Complaint for Patent Infringement, filed December 5, 2013 (Doc.

1 in Front Row Techs., LLC v. NBA Media Ventures, No. CIV 13-1153 JB/SCY (D.N.M.)("the Fourth Action")). The Honorable Judith C. Herrera, United States District Judge for the District of New Mexico, consolidated the Fourth Action with this case on April 22, 2014. See Order of Consolidation, filed April 22, 2014 (Doc. 65 in the Fourth Action).

1. **The Complaint.**

Front Row seeks extensive relief against all Defendants, including: (i) a declaration that Front Row "exclusively owns" all of the patents; (ii) a declaration that all of the patents are valid and enforceable; (iii) a declaration that all of the Defendants are liable for past and present infringement, "both literally and under the doctrine of equivalents," on certain patents; (iv) all damages to which Front Row is entitled; and (vi) permanent injunctions against the Defendants for infringing certain patents. Complaint ¶¶ (a)-(f), at 32-33.

2. **The Motion.**

The Defendants moved for judgment on the pleadings pursuant to rule 12(c) of the Federal Rules of Civil Procedure and 35 U.S.C. § 101 on October 21, 2015. See Motion at 1. The Defendants begin by citing Alice Corp. Pty. v. CLS Bank International, 134 S. Ct. 2347 (2014)("Alice"), which they state applied the "fundamental principle" that "[a]n abstract idea is not patentable" to "invalidate patent claims that purported to implement an abstract idea using conventional computer technology." Motion at 1. The Defendants contend that Front Row has patented "the abstract idea of providing video of an event to viewers using admittedly known systems and handheld devices." Motion at 2. They ask the Court to follow the example of other district courts, which have invalidated "dozens of patents under 35 U.S.C. § 101 that claimed broad concepts and added nothing more than a generic directive to 'apply it with a computer.'" Motion at 1.

The Defendants first contend that the Court should address subject-matter eligibility at the pleadings stage, before construing the patents' claims or beginning discovery. See Motion at 5. They explain that this approach "avoids the needless burden on the Court and the parties of unnecessary discovery, claim construction proceedings, and motion practice." Motion at 5. They cite a concurring opinion from the United States Court of Appeals for the Federal Circuit, which states that "subject matter eligibility is *the* primal inquiry, one that *must* be addressed at the outset of litigation." Motion at 6 (emphasis in Motion).

The Defendants then argue that the Court should select "representative claims" rather than analyze every patent in dispute. Motion at 7. They note that the claims are "substantially similar and linked to the same abstract idea," and "belong to the same patent family, involve the same technology, and share similar or identical patent specifications." Motion at 7 (quoting Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n, 776 F.3d 1343, 1348 (Fed. Cir. 2014)("Content Extraction"). They note that other courts have invalidated claims from multiple patents after examining only one representative claim in detail. See Motion at 7. They thus conclude that the "number of patents and claims at issue in this case is thus no barrier to deciding the issue of patentability at the present stage." Motion at 7. The Defendants then proceed to their primary subject-matter eligibility arguments. See Motion at 7-8.

a. The Video Patents.

First, the Defendants focus on Front Row's Video Patents.[3] See Motion at 7-8. They explain that, under Alice, courts "look to the 'basic character' or 'purpose' of the claims to

[3]The Defendants include nine of Front Row's ten relevant patents in their definition of "Video Patents." Motion at 3-4. These patents include the 388 patent, the 363 patent, the 162 patent, the 856 patent, the 855 patent, the 184 patent, the 169 patent, the 895 patent, and the 460 patent. See Motion at 3-4. The Court adopts the Defendants' terminology for the sake of simplicity in describing the Motion.

determine whether a patent claims an abstract idea." Motion at 8 (quoting Internet Patents Corp. v. Active Network, Inc., 790 F.3d 1343, 1348 (Fed. Cir. 2015)("Internet Patents"), and Affinity Labs of Texas, LLC v. DirecTV, LLC, 109 F. Supp. 3d 916, 924 (W.D. Tex. 2015)(Smith, J.)("Affinity Labs")(currently on appeal in Affinity Labs of Texas, LLC v. DirecTV, LLC, cv15-1845 (Fed. Cir. 2016)). They assert that the Video Patents "each claim the same basic and abstract idea of providing video to handheld devices." Motion at 8. They select the 184 patent as a case study, arguing that it "claims the abstract steps of acquiring video, authorizing a device to receive the video, sending the video, and accessing the video for display on a handheld device." Motion at 9. They cite to handheld televisions and similar products that were already "well-known" at the time Front Row made its alleged invention. Motion at 9. They also contend that the case is analogous to a series of patent decisions invalidating video-related patents. See Motion at 12-14 (citing Affinity Labs, 109 F. Supp. 3d at 938; Broadband iTV, Inc. v. Hawaiian Telcom, Inc., 136 F. Supp. 3d 1228, 1238 (D. Haw. 2015)(Kay, J.); and Cyberfone Sys., LLC v. CNN Interactive Grp., Inc., 558 F. App'x 988, 991 (Fed. Cir. 2014)("Cyberfone")).

The Defendants then argue that Front Row's Video Patents fail the second step in Alice's patent eligibility test -- the "inventive concept" stage -- for three reasons. Motion at 14. First, they state that "the claims rely entirely on generic hardware components and conventional software processes to perform 'well-understood, routine, and conventional activities commonly used in industry.'" Motion at 14 (quoting Content Extraction, 776 F.3d at 1348). They explain that the Video Patents' references to a "handheld device," "server," or "video camera" are generic and well-known terms used to perform generic functions. Motion at 15. They complain that "the claims merely take the 'basic concept' already present in handheld portable televisions,

and say 'do it on a PDA [Personal Digital Assistant] or a cell phone' using known technology." Motion at 18 (citation omitted).

Second, the Defendants argue that the Video Patents' limitations do not represent inventive concepts. See Motion at 14. That the Video Patents limit themselves to video captured in entertainment venues, require authentication or wireless transmission, or call for particular camera positions, the Defendants contend, does not change their reliance on an abstract idea and vague, generic computer elements. See Motion at 18-19. The Defendants describe the Video Patents' limitations as "token postsolution components." Motion at 20 (quoting Bilski v. Kappos, 561 U.S. 593, 612 (2010)).

Third, the Defendants state that the Federal Circuit uses a "machine-or-transformation test" as a "useful clue" in analyzing whether a patent contains an inventive concept. Motion at 20 (quoting Ultramercial, Inc. v. Hulu, LLC, 772 F.3d 709, 716 (Fed. Cir. 2014)("Ultramercial IV").[4] They contend that the Video Patents' claims "fail the 'machine-or-transformation' test because they are not tied to any particular machine and do not transform any article into a different thing." Motion at 14. They explain that the Video Patents' references to generic wireless handheld devices and other tools are not ties to "any particular machine." Motion at 14. They also note that the Video Patents "do not even purport to transform any physical object or article into another state. They merely involve the transmission of information." Motion at 20.

[4]The Ultramercial case has repeatedly bounced back and forth between the Federal Circuit and the Supreme Court. See Ultramercial, LLC v. Hulu, LLC, 457 F. App'x 920 (Fed. Cir. 2011)("Ultramercial I"); Ultramercial, LLC v. Hulu, LLC, 657 F.3d 1323 (Fed. Cir. 2011)("Ultramercial II"); WildTangent, Inc. v. Ultramercial, LLC, 132 S. Ct. 2431 (2012); Ultramercial, Inc. v. Hulu, LLC, 722 F.3d 1335 (Fed. Cir. 2013)("Ultramercial III"); WildTangent, Inc. v. Ultramercial, LLC, 134 S. Ct. 2870 (2014); Ultramercial IV, 772 F.3d at 709. The Court assigns roman numerals to specific cases to distinguish between them.

The Defendants conclude that the other independent and dependent claims[5] that Front Row asserts "also fail to add meaningful limitations that either remove the claims from the realm of abstract ideas or impart an inventive concept." Motion at 21. They cite the other claims' "trivial" and "generic" limitations, as well as their "same abstract idea of providing video to handheld devices." Motion at 21-22.

b. The 027 Patent.

The Defendants proceed to attack Front Row's 027 Patent, which they say "claims the abstract idea of allowing access to video based on location." Motion at 22. They break the 027 Patent's claims down into two basic elements: (i) determining user location; and (ii) allowing reception of data based on that location. See Motion at 22. They explain that the Federal Circuit rejected a similar patent that tailored comment based on a viewer's location or address, analogizing the claims to newspaper inserts and stating that "this sort of information tailoring is 'a fundamental . . . practice long prevalent in our system.'" Motion at 23-24 (quoting Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d 1363, 1369 (Fed. Cir. 2015)). They compare the 027 Patent's claims to sports television broadcast blackouts, which are already in use to encourage fans to attend sporting events in person. See Motion at 24. The 027 Patent, they argue, merely extends the abstract idea of "allowing access to services based on location" to a wireless handheld device. Motion at 24.

The Defendants then argue that the 027 Patent's claims do not present an innovative concept. See Motion at 25. They note that the patent contains only two limitations: "(1) that

[5]An independent claim does not reference any other claim. A dependent claim references another claim, cannot stand on its own, and does not make sense without an independent claim. For example, a dependent claim could be "[t]he motor vehicle of claim 1, in which the fluid supply is a tank of compressed gas, and the motor is a variable-displacement fluid motor." How Do I Read a Patent?, Brown & Michaels, P.C. (2015), http://www.bpmlegal.com/howtopat5.html.

location of the user is 'based on communications' between the 'wireless handheld device' and a 'data communications network,' and (2) that the data, or 'service,' is 'streaming video' captured by a 'video camera' in an 'entertainment venue' that is 'processed for delivery to subscribers.'" Motion at 25. The Defendants complain that these limitations are well-established, conventional activities, and that they "are written in purely functional terms and fail to describe how they are performed." Motion at 25. They contend that the 027 Patent also fails the machine-or-transformation test, because it "it is not tied to a particular or novel machine, but instead relies on the same generic computers, networks, and handheld devices as the Video Patents," and "does not transform any physical object or article into another state." Motion at 26. The transmission of data, it suggests, is insufficient to meet the machine-or-transformation test. See Motion at 26. As in their comments on the Video Patents, the Defendants extend these arguments to cover all of the 027 Patent's dependent and independent claims. See Motion at 26-27.

3. The Response.

Front Row responded to the Motion on December 14, 2015. See Plaintiff's Response in Opposition to Defendants' Motion for Judgment on the Pleadings Pursuant to Fed. R. Civ. P. 12(c), filed December 14, 2015 (Doc. 256)("Response"). Front Row begins with a general caution that "[d]ismissal for lack of the patentable subject matter should be 'the exception, not the rule.'" Response at 2 (quoting Ultramercial IV, 722 F.3d at 1338–39). It notes that the Court must view the facts as asserted in its pleadings in the light most favorable to it. See Response at 2. It also reminds the Court that issued patents are "statutorily presumed valid." Response at 2. It thus argues that the Defendants must prove invalidity "by clear and convincing evidence." Response at 2 n.1.

Front Row then attacks the Defendants' reliance on representative claims. See Response at 3. It asserts that the Defendants' assumption that their handpicked claims represent all of the remaining claims "makes the presumption of validity of ***each*** claim an illusory, hollow standard." Response at 3 (emphasis in original). It argues that the Court should not use any representative claims absent its agreement on the precise claims at issue: "Each claim stands on its own merits because 'a party challenging the validity of a claim, *absent a pretrial agreement or stipulation,* must submit evidence supporting a conclusion of invalidity of *each* claim the challenger seeks to destroy.'" Response at 4 (quoting StoneEagle Servs., Inc. v. Pay-Plus Sols., Inc., No. 8:13-CV-2240-T-33MAP, 2015 WL 518852, at *5 (M.D. Fla. Feb. 9, 2015)(Covington, J.)("StoneEagle")(emphasis in original)). It details the differences between the representative claims and its other claims, noting that they have different limitations, such as the required use of a graphical user interface ("GUI"). Response at 3-4.

Front Row focuses the bulk of its arguments on the Alice test. See Response at 5-21. First, it attempts to rebut the Defendants' argument that its claims are abstract. See Response at 5. It notes that "any claim, described at a certain level of generality, can be challenged as directed to an abstract idea." Response at 5 (citing Fairfield Indus., Inc. v. Wireless Seismic, Inc., No. 4:14-CV-2972, 2014 WL 7342525, at *4 (S.D. Tex. Dec. 23, 2014)(Ellison, J.)). It quotes another recent case: "The question before the Court, according to the Ineligible Concept Step of the *Alice* test, is not whether the Court is able reach into a patent and extract an abstract idea from which to determine patent-eligibility; such an exercise would render the Ineligible Concept Step a mere formality." Response at 6 (quoting SimpleAir, Inc. v. Google Inc., 136 F. Supp. 3d 745, 751 (E.D. Tex. 2015)(Gilstrap, J.)("SimpleAir")). Instead, it contends, the Court must examine its patents' claims on a more specific level. See Response at 5-6.

Front Row then attacks the Defendants' proposed representative claims, arguing that they are not abstract ideas. See Response at 6-7. It explains that the 184 Patent's Claim 1 includes specific claim elements requiring "that communication occur over ***a wireless network*** to ***a wireless device***, in ***response to authentication***, and that ***video-data comprising more than one video*** captured by cameras at a venue ***is acquired by authenticated handheld devices for display***." Response at 6 (emphasis in Response). It makes similar arguments with respect to the 895 Patent's Claim 1. See Response at 6-7. It compares these claims to the claims in Contentguard Holdings, Inc. v. Amazon.com, Inc., 142 F. Supp. 3d 510 (E.D. Tex. 2015)(Gilstrap, J.)("Contentguard"), which it says held that similar claims "'were not directed towards abstract ideas, but were instead directed towards systems of managing digital rights via trusted devices.'" Response at 7 (quoting Contentguard, 142 F. Supp. 3d at 512). It adds that, as with the patents that the district court upheld in Contentguard, its patents are "limited to authorized handheld devices that can receive content via a wireless network in specified types of secure manner." Response at 7. It also cites to Simpleair, which it says upheld patents directed towards similar "patent-eligible methods and systems of 'using a central broadcast server' to package and transmit 'data from an online information source to remote computing devices.'" Response at 8 (quoting Simpleair, 136 F. Supp. 3d at 750). It argues that the Court should reject the Defendants' approach to the elements:

> Whether the elements of Front Row's technology are "conventional, routine, or well-known at the time" of patenting is not the point. Instead, the Court must examine "whether the function performed by the computer at each step of the process is [p]urely conventional." This Court must address the claim limitations ***as a whole***, not only on an element-by-element basis.

Response at 8 (citations omitted).

Front Row then turns its attention to the machine-or-transformation test. See Response at 9. It contends that this test does not require "transformation of the underlying physical object." Response at 9. For example, it explains, visual depictions representing physical objects may be patent-eligible. See Response at 9 (citing In re Abele, 684 F.2d 902, 908 (C.C.P.A. 1982), overruled on other grounds by In re Bilski, 545 F.3d 943 (Fed. Cir. 2008)). It then draws an analogy to its own patent:

> This process electronically transforms real-world objects (*i.e.*, baseball players participating in a game at a MLB ballpark) into video, which is then transformed to a format that can be streamed to wireless devices over a secure and user authenticated network. It is of no import that the real-world objects are not changed in the process. For example, the information is further limited by claim 1 of the '895 patent when it is processed "into a format for streaming over wireless networks as streamed data that is capable of being viewed." These transformations readily meet the machine-or-transformation test.

Response at 9-10. It argues that its claims do not involve the mere transmission of information, because they capture video of physical objects, transmit it, and then display it to an authenticated user. See Response at 10-11.

Front Row also argues that its claims recite an inventive concept. See Response at 13-18. It emphasizes the danger of hindsight bias, stating that smart phones, mobile devices, and streaming video were not yet ubiquitous when it obtained its patents. See Response at 13-14 (citing Ameritox, Ltd. v. Millennium Health, LLC, 88 F. Supp. 3d 885, 914 (W.D. Wis. 2015)(Conley, J.)). It cautions the Court that using "what has become routine in 2013 to determine what was inherent in a concept in the early 1990s injects hindsight into the eligibility analysis and fails to recognize that patent eligibility, like all statutory patentability questions, ***is to be measured as of the filing date***." Response at 14 (quoting CLS Bank Int'l v. Alice Corp. Pty., 717 F.3d 1269, 1301 (Fed. Cir. 2013)(Rader, J., dissenting)(emphasis in Response)). Front Row asserts that it can show at trial "that a person of ordinary skill in the art in October 2000

would have believed that it would be extremely expensive and technologically impractical to receive broadcasted television signals of live events in a wireless packet-based data network." Response at 14. It observes that the portable televisions that the Defendants discuss received only analog signals,[6] and that, at the time, there was no way to broadcast these signals through a computer data network. See Response at 14-15. Moreover, it notes that there was no way for broadcasters to require authentication from receiving devices, given that they could not receive information back from the handheld devices. See Response at 15. It also points to the 184 Patent, which it says requires specialized hardware such as "a transmitter for wirelessly streaming" content. Response at 15-16.

Even assuming that none of its claim elements are novel, Front Row argues, the Federal Circuit has recognized that "the creation of new compositions and products based on combining elements from different sources has long been a basis for patentable inventions." Response at 17 (quoting DDR Holdings, LLC v. Hotels.com, L.P., 773 F.3d 1245, 1258 n.5 (Fed. Cir. 2014)("DDR Holdings")). It adds that if any known element in a claim could defeat subject-matter eligibility, "obviousness under § 103 would always default to ineligibility" in violation of Supreme Court of the United States precedent. Response at 17 (quoting Exergen Corp. v. Kaz USA, Inc., No. CV 13-10628-RGS, 2015 WL 8082402, at *6 (D. Mass. Dec. 7, 2015)(Stearns, J.)("Exergen")). Front Row contends that the Defendants' Motion is effectively a motion for summary judgment, because the law requires the Defendants to disclose at least some evidence that a combination of elements is not new or useful. See Response at 18.

[6]Merriam-Webster's Dictionary defines "analog" as "relating to, or being a mechanism in which data is represented by continuously variable physical quantities." Analog, Merriam-Webster, http://www.merriam-webster.com/dictionary/analog.

Front Row concludes that its claims "do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet." Response at 18 (quoting DDR Holdings, 773 F.3d at 1257). Front Row explains that its claims, like those in DDR Holdings, describe a solution that is "***necessarily rooted in computer technology*** in order to overcome a problem specifically arising in the realm of computer networks." Response at 18 (quoting DDR Holdings, 773 F.3d at 1257).

Front Row suggests that although Alice does not specifically reference preemption,[7] its claims do not raise preemption concerns. See Response at 19 ("Preemption is the idea that allowing a patent on an invention may impede rather than incentivize innovation."). It contends that its "asserted patents and claims do not come close to preempting the field of providing streamed video of an event to a device," because they contain "additional requirements that guard against preemption." Response at 20.

Front Row also addresses the Defendants' arguments that the 027 Patent is invalid under § 101. See Response at 20. It contends that the 027 Patent satisfies the "machine" prong of the "machine-or-transformation" test, because it can determine a user's location. Response at 20. It cites the Federal Circuit's decision in SiRF Technologies, Inc. v. International Trade Commission, 601 F.3d 1319, 1332-33 (Fed. Cir. 2010)("SiRF Technologies"), which held that "the presence of the GPS receiver in the claims places a meaningful limit on the scope of the claims." Response at 20 (quoting SiRF Technologies, 601 F.3d at 1332). It again attacks the Defendants' reliance on portable television sets, noting that "[t]he only geographic limitation of an analog signal is the signal strength and the receptive strength of the receiving device which is

[7]Front Row acknowledges that "preemption concerns are inherently addressed within the two-step *Alice* framework." Response at 20.

unknown, varies between receiving devices and is completely uncontrolled by the transmission entity." Response at 21.

Finally, Front Row argues that the Court should consider patentability only after claim construction and discovery are complete. See Response at 1. It explains that a decision at this stage would require the Court to make a complex determination "in a ***complete vacuum***." Response at 21 (quoting Phoenix Licensing, L.L.C. v. CenturyLink, Inc., No. 2:14-CV-965-JRG-RSP, 2015 WL 5786582, at *3 (E.D. Tex. Sept. 30, 2015)(Gilstrap, J.))(emphasis in Response). Instead, it says, the Court must require the Defendants to prove that "no plausible construction of [the] Plaintiff's claims would satisfy the abstractness test." Response at 21. It quotes a case requiring that a Defendant "show, as a matter of law, ***that every possible plausible construction of each of the forty-nine claims asserted therein render the patent ineligible***." Response at 22 (quoting A Pty Ltd. v. HomeAway, Inc., No. 1-15-CV-158 RP, 2015 WL 5883364, at *6 (W.D. Tex. Oct. 8, 2015)(Pitman, J.)(unpublished)(emphasis in Response)). Front Row denies that any of the "narrow, exceptional circumstances" justifying a pre-claim construction patent eligibility ruling apply here. Response at 22. It also attacks the Defendants' reliance on Ultramercial IV, noting that their quoted language appears in a concurrence rather than the majority opinion. See Response at 23.

4. The Reply.

The Defendants replied on December 23, 2015. See Defendants' Reply in Support of their Motion for Judgment on the Pleadings Pursuant to Fed. R. Civ. P. 12(c), filed December 23, 2015 (Doc. 257)("Reply"). The Defendants state that "[t]he Court should not be distracted from a straightforward application of the two-step analysis prescribed by the Supreme Court in *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014)." Reply at 1. The Defendants again argue that

the Video Patents fail the "abstract idea" test, "because they claim nothing more than the abstract idea of providing video to handheld devices." Reply at 1. They dispute Front Row's contention that Alice's first step requires the Court to look at every specific claim limitation, arguing that it may focus instead on "the purpose or basic character of the claims." Reply at 1 (quoting Internet Patents, 790 F.3d at 1348). The Defendants distinguish Contentguard:

> *Contentguard* analyzed the use of "trusted" devices, which were "specific and non-generic" devices, 2015 WL 5853984, at *4, construed by the court to require three specific types of "integrities": "physical, communication, and behavioral," *id.* at *2. By contrast, the Video Patents are not limited to "specific and non-generic" devices. Rather, as the Video Patents recite, the "handheld device" can be "a Personal Digital Assistant (PDA), paging device, WAP[8]-enabled mobile phone, and other associated handheld computing devices *well known in the art*."

Reply at 4. They contend that SimpleAir is similarly irrelevant, noting that the claims there were "non-abstract because they specified the manner in which data was transmitted from the 'central broadcast server' to the 'remote computing devices' by describing specific features: parsing, data blocks, addressing data blocks, and data channels." Reply at 5 (quoting SimpleAir, 136 F. Supp. 3d at 747-48).

The Defendants also deny that Front Row has presented any inventive concept. See Reply at 5-6. First, they argue that the novelty of Front Row's patents over the prior art is meaningless for the Alice analysis. See Reply at 6 (citing Diamond v. Diehr, 450 U.S. 175, 188-89 (1981)). They again contend that the relevant claims "'amount to nothing significantly more than an instruction to apply the abstract idea' using a wireless handheld device and the Internet." Reply at 6 (quoting Alice, 134 S. Ct. at 2360 (internal quotations omitted)). They assert that Front Row fails to "explain *how* the patents disclose any improvements or inventive concepts

[8]"WAP" stands for Wireless Application Protocol, a "secure specification that allows users to access information instantly via handheld wireless devices such as mobile phones, pagers, two-way radios, smartphones and communicators." Vangie Beal, WAP - Wireless Application Protocol, Webopedia, http://www.webopedia.com/TERM/W/WAP.html.

that advance upon the technology that Front Row admits was well known in the art." Reply at 1-2 (emphasis in original). Second, they attack Front Row's argument that its claims are patent-eligible in "combination." Reply at 7. They explain that the Federal Circuit in DDR Holdings "created a solution that overrides the routine and conventional use of the Internet." Reply at 7 (citing DDR Holdings, 773 F.3d at 1258-59). They contend that the Video Patents, on the other hand, merely "use routine and conventional hardware and software components and expect them to perform nothing more than their basic, routine, and well-known functions." Reply at 7. They remind the Court that Front Row did not invent "streaming video, a new wireless protocol, a new form of authentication, a new handheld device, or any improvements to any of these." Reply at 7. They add that Front Row has not cleared the machine-or-transformation test by transforming live objects into video, because its Video Patents "do not purport to modify or improve the video data at all." Reply at 8. The Defendants predict that Front Row's position "would mean that all inventions involving images or video automatically would be patentable." Reply at 2.

The Defendants assert that the 027 Patent fails the machine-or-transformation test. See Reply at 9-10. They distinguish SiRF Technologies on the grounds that the Federal Circuit allowed claims mentioning a GPS receiver, because the claims "*explicitly* require the use of a particular machine (a GPS receiver) and *could not be performed without the use of such a receiver*." Reply at 10 (quoting SiRF Technologies, 601 F.3d at 1331, 1332 (emphasis added)). The Defendants assert that the 027 Patent does not require a GPS receiver, or any other "particular machine or apparatus." Reply at 10 (quoting SiRF Technologies, 601 F.3d at 1332).

The Defendants also attempt to refute Front Row's procedural arguments. See Reply at 10-12. They note that Front Row relies on Ultramercial, Inc. v. Hulu, LLC, 722 F.3d 1335 (Fed. Cir. 2013)("Ultramercial III"), which the Supreme Court vacated following Alice. See Reply at

11. They contend that Front Row has not demonstrated that claim construction is necessary, because it "fails to identify a single disputed claim term affecting the Section 101 analysis, as it is required to do." Reply at 2. Absent any specific dispute over claim construction, the Defendants urge, the Court may proceed directly to subject-matter eligibility. See Reply at 11. The Defendants also contend that there is no need for discovery on the state of the art in 2000, because the Defendants' "patents themselves already state that the claim elements were well known." Reply at 12.

5. The Hearing.

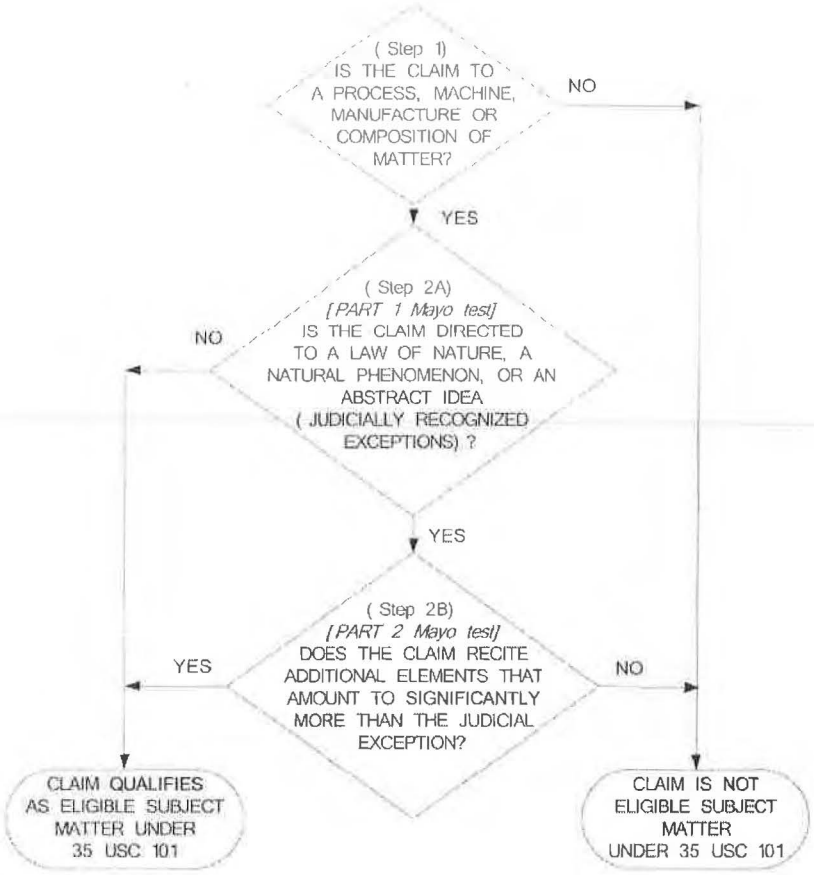
The Court held a hearing on January 5, 2016. See Transcript of Motion Proceedings at 1-2 (Court)(taken January 5, 2016), filed January 19, 2016 (Doc. 269)("Tr."); Notice of Defendants' Filing of Presentation from January 5, 2016, Hearing, filed January 7, 2016 (Doc. 263)("Defendants' PowerPoint"); Notice of Plaintiff's Filing of Presentation and Associated Documents Presented During January 5, 2016 Hearing, filed January 6, 2016 (Doc. 261)("Front Row's PowerPoint"). The parties largely stuck to the arguments in their briefing. See Tr. at 5:21-192:17 (Court, Shore, Weaver). The Court began the hearing by asking for a background session on Alice. See Tr. at 3:21-4:10 (Court).

Although the Defendants began with an extensive background on § 101, Alice, and the patent system as a whole, see Tr. at 6:20-20:11 (Court, Shore, Weaver), and Front Row stated its intention to cover the same ground, see Tr. at 50:16-18 (Shore), both parties addressed topics intertwined with the case's merits, see Tr. at 6:20-60:25 (Court, Shore, Weaver). The Defendants noted that "over 70 percent of Section 101 motions at the pleadings stage since Alice have been granted." Tr. at 23:8-12 (Weaver). They also relied heavily on Affinity Labs, which invalidated claims they describe as "basically identical to the basic subject matter that's claimed

here." Tr. at 25:9-10 (Weaver). Front Row described Alice's scope as extremely narrow: "Abstract idea, put it on a computer? It has to literally almost be that bad for the Alice decision to come into play." Tr. at 30:18-21 (Shore). See id. at 31:8 ("Alice is not about rewriting 101."). It emphasized that many of the Defendants' cited cases "were attempts to patent math" and similarly abstract concepts. Tr. at 33:18-24 (Shore). It focused on the United States Patent and Trademark Office ("USPTO") guidance for patent examiners, explaining that no examiner has challenged Front Row's patents under § 101, see Tr. at 35:4-7 (Shore), and that the guidance postdates Affinity Labs, see Tr. at 36:23-37:10 (Shore). It also suggested that Affinity Labs could be reversed on appeal. See Tr. at 41:9-25 (Shore).

Front Row described its conception of the Alice test, which included an extra "Step 1" to determine whether the claim is to "a process, machine, manufacture, or composition of matter." See Tr. at 39:4-21 (Shore).[9]

[9]The Court will use the Alice test, rather than Front Row's test, for the sake of clarity and because the parties agree that all relevant patents have cleared Step 1 of Front Row's test. See Tr. at 42:3-4 (Shore).



Front Row's PowerPoint at 12. It alleged that the Defendants "abstracted the abstract[s]" to create oversimplified and abstract descriptions of two of its Video Patents. Tr. at 43:25 (Shore). It provided an example of a patent that is abstract --

> a Major League Baseball patent that was rejected under 101. Take a look at these claims. It's "A method for performing pitch classification: Receiving, at a computing device" -- again, totally generic, a computing device could be anything -- "one or more pitch properties corresponding to a ball thrown by a pitcher." A pitch property corresponding to a ball thrown by a pitcher. That's what every baseball scout has been looking at since the 1800s.

Tr. at 43:14-25 (Shore). It explained that this patent referred to "a computing device" -- a "purely functional reference" rather than "a hand-held device" or "a device with a graphical user interface with multiple specific inputs." Tr. at 44:15-45:17 (Shore). Front Row described the next step, in which claims must "impose meaningful limitations to impart patent-eligibility." Tr.

at 49:13-14 (Shore). It cited to a recent USPTO office action on one of its applications, which did not reject the claims under § 101. See Tr. at 51:4-14 (Shore).

The Defendants attempted to rebut Front Row's § 101 arguments. See Tr. at 53:25-54:13 (Weaver). They attacked Front Row's attempt "to elevate [the USPTO guidelines] to some sort of court precedent," describing the argument as "just nonsensical." Tr. at 54:14-16 (Weaver). They noted that the guidelines are not binding on courts and, in any case, change frequently to reflect new patent opinions. See Tr. at 54:14-25 (Weaver). They complained that patent examiners' decisions not to raise § 101 concerns for Front Row's other patents are irrelevant: "Well, if that was the way the law worked, we would never bring in court a 102 argument, a 103 argument, or a 101 argument. Because by definition, the patent has gotten through the patent office, and so it would make the whole notion of invalidity a pointless gesture." Tr. at 56:13-18 (Weaver).

The Defendants also doubted whether the clear-and-convincing evidence standard applies to the § 101 analysis, noting that courts have split on the question. See Tr. at 57:1-10 (Weaver). They added that neither the Supreme Court nor the Federal Circuit has ruled on the issue. See Tr. at 57:19-24 (Weaver). In any case, they maintained that they had "surpassed the clear and convincing evidentiary standard." Tr. at 57:12-14 (Weaver).

The Defendants compared the Video Patents to the patents invalidated in Ultramercial IV. See Defendants' PowerPoint at 63-66. The claims in Ultramercial IV, they explained, involved a method for "distribution of copyrighted material, video, over the Internet, via a facilitator," including a complicated series of eleven steps. Tr. at 59:15-25 (Weaver). The Defendants asserted that the Federal Circuit, considering claims far more complex and specific than Front Row's claims, concluded "that the abstract idea was nothing more than displaying an

advertisement in exchange for delivering free content." Tr. at 60:7-9 (Weaver). The Defendants maintained that the Ultramercial IV patent's inclusion of "certain additional limitations, such as consulting an activity log," was not enough to render its abstract idea patent-eligible. Tr. at 60:19-25 (Weaver).

The Defendants then stepped back to analyze the Video Patents under the Alice test. See Tr. at 62:6-8 (Weaver). On Step 1, they noted that the "basic character or purpose of the claim" does not include limits such as a "wireless communications network" or "authentication." Tr. at 62:21-63:4 (Weaver). They thus defended their reliance on the first sentences in the Video Patents' abstracts. See Tr. at 63:17-64:7 (Weaver). On Step 2, they reminded the Court that, "if you simply recite the basic functions that allow [an idea] to occur on a computer, like processing, like storing, like transmitting, receiving, those aren't enough." Tr. at 68:19-22 (Weaver). They reviewed many of Front Row's claimed limitations, including the hand held device, the "wireless packet-based data network," the video cameras, the server, the processor, and the memory, explaining how each component is generic and used only in a conventional sense. Tr. at 70:15-73:12 (Weaver). They also attacked Front Row's theory that the combination of these elements constitutes an inventive concept:

> The briefing is very clear, Your Honor, that in order for the combination of elements to provide that inventive concept, you're looking for the "how" element. How does it do these things? And the claims of the video patents are noticeably absent of the how. It just simply says you're going to collect the data, you're going to . . . process it so that it can be streamed. [It d]oesn't describe how the processing is going to occur. And then you're going to send that to an authenticated device; just says an authenticated device, you're going to authenticate it. And then the device receives it and views it. There is no particularity involved . . . there. And when they try and bring in particularity, which they do in some of the dependent claims, they're well-known concepts that don't add anything beyond the basic claims.

Tr. at 75:9-25 (Weaver).

The Defendants then attempted to distinguish Front Row's cited cases. See Tr. at 76:10-13 (Weaver). DDR Holdings, they argued, patented "a unique solution that applies things in a nonconventional manner," whereas the Video Patents involve "a hand-held computing device acting in a very conventional manner to receive video from a particular venue." Tr. at 78:1-7 (Weaver). Contentguard, the Defendants asserted, involved far more specific claims related to device authentication. See Tr. at 78:21-79:11 (Weaver). They argued that the claims in SimpleAir, unlike Front Row's claims, "specified the manner in which the data was transmitted from the central broadcast server to the remote computing devices by describing specific features associated with that." Tr. at 80:1-4 (Weaver). They also pointed out that "simply transforming data from one format to another has never been held to be patent-eligible saving under the transformation prong." Tr. at 82:12-15 (Weaver).

The Defendants rejected the notion of a preemption analysis separate from the Alice test. See Tr. at 85:18-22 (Weaver). They pointed to Ariosa Diagnostics, Inc. v. Sequenom, Inc., 788 F.3d 1371 (Fed. Cir. 2015)("Ariosa"), which they argued held that the Alice test effectively incorporates any required preemption analysis. See Tr. at 86:9-15 (Weaver)(citing Ariosa, 788 F.3d at 1379). They argued that Alice and Ultramercial IV held "that simply narrowing something to a particular field of use, a particular technological environment, et cetera, won't save a claim. That doesn't save it from preemption concerns." Tr. at 86:19-24 (Weaver).

The Defendants argued that Front Row's system claims[10] should rise and fall with its method claims.[11] See Tr. at 87:2-4 (Weaver). They remarked that the system claims cover the

[10]"A system claim provides a different approach to protecting the invention. Instead of protecting the steps taken to execute an inventive process, we protect the novel components that carry out those steps." Cynthia Gilbert, Anatomy of a System Claim, Hyperion Law, April 6, 2011, http://hyperionlawboston.com/blog/2011/04/anatomy-system-claim/. See Arris Grp., Inc. v. British Telecommunications PLC, 639 F.3d 1368, 1376 (Fed. Cir. 2011)("Claims which recite

devices used to carry out the method claims' procedures, and that both share the same basic components. See Tr. at 87:4-13 (Weaver). They also noted that the Alice court applied roughly the same analysis. See Tr. at 87:19-88:2 (Weaver).

Front Row began by focusing on its procedural arguments. See Tr. at 97:2-98:3 (Shore). It first explained why the Court should hold a claims construction hearing before invalidating any of its patents:

> [I]f we went through a claims construction [hearing] and claims construction discovery and expert testimony, the defendants would take the position in those proceedings that these were incredibly limited patents. . . . [T]hey're trying to take a free shot and say, [g]uess what, these things are so broad that they cover the abstract idea, this incredibly abstract idea, and therefore, they're not required to tie themselves to any claims construction that would make them infringe. And so what they're trying to do here is basically, without consent, without agreement, without anything else, handpick claims, claim that they are so abstract at the 50,000 foot level that they never have to address whether or not they infringed them at that 50,000 foot level.

Tr. at 97:4-21 (Shore). Front Row again denies that the Supreme Court or the Federal Circuit require § 101 determinations before claim construction hearings. See Tr. at 90:3-5 (Shore). It complained that the Defendants' quoted section of the concurrence in Ultramercial IV, which states that "the district court properly invoked Section 101 to dismiss Ultramercial's infringement on the pleadings," omits the same opinion's comment that "no formal claim construction was required because the asserted claims disclosed no more than an abstract idea 'garnished with accessories,' and there was no reasonable construction that would bring them

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a 'system,' 'apparatus,' 'combination,' or the like are all analytically similar in the sense that their claim limitations include elements rather than method steps.").

[11]"A method claim is a series of steps of manipulation, whether the steps would be performed wholly by machine or partly by a person, so long as they are not purely mental steps (an algorithm, which is dealt with in connection with electronics and computer claims). EBS Dealing Res., Inc. v. Intercontinental Exch., Inc., 379 F. Supp. 2d 521, 524 (S.D.N.Y. 2005)(Clark, J.).

within patentable subject matter." Tr. at 98:17-99:1 (Shore). It stated that the Defendants must "show the court that no reasonable construction would bring any of the claims of any of the patents-in-suit within patentable subject matter." Tr. at 99:1-5 (Shore). It suggested that, to make this showing, the Defendants would need to have expert testimony and to avoid any possible hindsight bias. See Tr. at 100:9-16 (Shore). The Court, it warned, should avoid analyzing the issue alone, "on a trust me basis from the defendants." Tr. at 102:1-4 (Shore).

Front Row repeatedly argued that the Court should require the Defendants "to take precise claims construction positions if they're going to make a 101 argument." Tr. at 101:1-3 (Shore). It explained that the Defendants, given their argument that Front Row's patents cover a broad swathe of material, ought to be willing to stipulate to infringement. See Tr. at 101:7-23 (Shore). It cited the Honorable Rodney Gilstrap, United States District Judge for the Eastern District of Texas:

> The difficulty of making a substantive ruling on the validity of an issued patent in what is -- in essence -- a complete vacuum cannot be understated. While the claim language of some patents may be so clear that the court need only undertake a facial analysis to render it invalid at the pleading stage, that will not be the norm and is certainly not the case here.

Tr. at 102:10-18 (Shore)(quoting Phoenix Licensing, L.L.C. v. CenturyLink, Inc., 2015 WL 5786582, at *3). Front Row argued that the same principle applies here, and pointed to what it called misleading comparisons between its claims and the claims in Ultramercial IV. See Tr. at 102:19-103:7 (Shore). It identified a series of claim construction disputes, which distinguished it from the patent holder in Affinity Labs. See Tr. at 103:12-106:3 (Shore). It also attacked the Defendants' reliance on patent abstracts, insisting that "[a]nybody who practices before the patent office, anybody who has been doing this more than six months would say, to take the

abstract, something that's required to be in the patent, and use it to prove that a patent is abstract is silly." Tr. at 107:7-11 (Shore).

Front Row acknowledged that Alice's second step is confusing and explained that its requirement of "substantially more" actually refers to more limitations -- in other words, a narrower claim. Tr. at 107:15-108:8 (Shore). It cited a series of cases holding that defendants must show, by clear-and-convincing evidence, that no plausible claim construction would satisfy the abstractness test or that the constructions most favorable to plaintiffs would not satisfy the test. See Tr. at 108:12-17 (Shore). For example, it explained that the Defendants described the Video Patents as "claiming nothing more than the abstract idea of providing video to hand-held devices." Tr. at 109:20-23 (Shore)(citing Reply at 5). It responded that the relevant patent had to acquire video captured within a venue, authenticate the recipient, and wirelessly stream the compressed video from a server to a hand held device. See Tr. at 110:2-16 (Shore). All of these steps, it stated, would rely on specific devices, such as the server and "a hand-held device that's capable of de-packeting, decompressing the data" -- a device that may not have even existed in 2000. Tr. at 110:20-22 (Shore). It argued that no courts have selected and analyzed representative claims absent the parties' agreement. See Tr. at 115:14-117:15 (Shore). It attacked the Defendants' reliance on Content Extraction, noting that the case did not involve any objection to the defendants' selected representative claims. See Tr. at 124:6-8 (Shore).

Front Row then argued that the clear-and-convincing standard applies at the § 101 stage. See Tr. at 119:19-120:6. It argued that the Supreme Court has held that any invalidity defense must be proved by clear-and-convincing evidence. See Tr. at 119:21-25 (Shore)(citing Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. 91, 95 (2011)).

Front Row also reinforced its reliance on USPTO guidelines. See Tr. at 120:7-8 (Court, Shore). It explained that two courts recently relied on the guidelines and even compared their representative claims to the claims in dispute in their cases. See Tr. at 120:8-25 (Shore)(citing Finjan, Inc. v. Blue Coat Sys., Inc., No. 13-CV-03999-BLF, 2015 WL 7351450, at *9 (N.D. Cal. Nov. 20, 2015)(Freeman, J.), and Intellectual Ventures I LLC v. Symantec Corp., 100 F. Supp. 3d 371, 403 (D. Del. 2015)(Stark, J.)).

Front Row then analyzed the Defendants' proposed representative claims. See Tr. at 122:5-9 (Shore). It pointed to the claims' limitations:

> These nonrepresentative claims include specific types of . . . graphical user interfaces; they have selection means to selectively retrieve and display said streaming video. They actually have some means plus function claims, which actually pull in from the specification very specific limitations. There is also the simultaneous capture of two camera views via primary and a slave camera, simultaneous synchronized display. Again, clearly far beyond abstract. They actually call out a specific wireless network, not any wireless network. And that specific wireless network has specific features that we'd get into when we got into claims construction expert testimony. And cellular telecommunications network. And again, it has to be a cellular telecommunications network capable of authorizing the receipt, actually receiving, transmitting, and taking in packeting and compressed data. Touch screens that have very specific functionality, not a generic touch screen; very detailed touch screens with very detailed and specific functionality. And GPS with a specified capability to do location within a very certain limited area. And again, it's not your general, generic GPS. And even if it was a general, generic GPS, in combination with the other elements, the guidelines of the USPTO say that GPS is actually something that would make it qualify under 101.
>
> . . . .
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> And smartphones with very specified features. Again, it has to be smartphones with a touch screen, it has to be smartphones with the ability to receive, compress, and decompress the data. This is not any smartphone. This is not a generic smartphone. It's a smartphone that has a capability to do certain very specialized things, very specialized things that would have been very rare in the year 2000. Certainly not generic.

Tr. at 122:10-124:3 (Shore).

Front Row condemned the Defendants' attempt to ignore or oversimplify its claims' limitations. See Tr. at 125:1-2 (Shore). It explained that, to determine whether the GUI feature is novel, the Court must examine what functions it must complete to meet the overall combination claims. See Tr. at 125:11-14 (Shore). These functions, it added, included "a GUI based menu . . . [that] has to select segments of the streaming video signal, and those segments have to be viewable on the GUI menu driven by a touch screen display, as real time or prerecorded video footage." Tr. at 126:2-7 (Shore).

It also rejected the Defendants' summary of the 184 Patent's first claim as "the abstract steps of acquiring video, authorizing a device for receiving the video, sending the video, and accessing the video on a hand-held device." Tr. at 126:21-24 (Shore). It explained that the claim requires more complex processes:

> The communication occurs over a wireless packet-based data network. So you need to understand what is a wireless packet-based data network. That is a network where you have compression. You have compression of the video. The video has to be captured of a live human being, a live object, a real thing at a venue, a real thing. It's not the retransmission of existing video. It is capturing that video, compressing it, breaking it into packages. And after breaking it into packages, sending it over a wireless packet-based data network to a wireless device that must be capable of receiving compressed packeted data, displaying it in response to authentication, and then later in other patents it has to be via graphical user interface that is capable of responding to commands to do that. The video comprising more than one video captured by cameras is acquired by authenticated hand-held devices for display.

Tr. at 127:2-19 (Shore). These limitations, it argued, are far more detailed than the "on a computer" limitation that Alice rejected. Tr. at 128:5-7 (Shore). See id. at 129:22-25 (Shore)("We're not saying receive it over the Internet. We're saying you have to receive it in a certain way, in a certain sequence, within a certain system.").

Front Row also argued that its claims passed the machine-or-transformation test. See Tr. at 130:23-131:8 (Shore). It reminded the Court that the transformation prong does not require

transforming a physical object into something physically different. See Tr. at 131:1-4 (Shore). It stated that its system captures "live human beings" with a camera, digitizes the resulting images, breaks the digitized images into "pieces or packets," places them on a network, sends them to "a GPS-controlled area," and displays them on authenticated mobile devices. Tr. at 131:9-132:19 (Shore). This process, Front Row said, would not have been known in 2000, given that the field had no technique for live streaming unpacketed data. See Tr. at 133:12-23 (Shore). Front Row added that no human could perform this process:

> I would love to meet the person who could do that. This is not an algorithm case. This is not a math case. This is not a software case. And the idea that they would say in their reply brief that a human could do what these packets do with a pencil and paper . . . . I mean, it's crazy what they're willing to say.

Tr. at 155:4-14 (Shore).

The state of the art, Front Row stated, is important to understanding the § 101 issues. See Tr. at 140:4-6 (Shore). It criticized the Defendants' reliance on Diamond v. Diehr, explaining that the case held only the state of the art irrelevant in considering the Alice test's first step. See Tr. at 140:4-23 (Shore). It argued that

> you can't make the determination that what is being claimed is a generic computer or a generic graphic user interface, or a network, or a generic server, unless you know what a server, a graphical user interface, and all those things were at the time of the invention. That comes with expert testimony.

Tr. at 141:10-16 (Shore). It contended that PDAs and other such devices "were not generic at the time the patents were filed," and suggested that the Court hear evidence on the state of the art at the time. Tr. at 130:19-22 (Shore). For example, it noted that "a wireless data network" mentioned in the patent refers to a specific type of wireless data network "capable of transmitting compressed, packeted data in real time." Tr. at 144:1-5 (Shore).

Front Row took every opportunity to remind the Court that § 101 "is one of a multipart test for patentability" and argued that "this first hurdle is not designed to be so high that it subsumes all of the other hurdles you have to cross." Tr. at 137:21-23 (Shore). It argued that other hurdles to a valid patent, such as obviousness, could prevent every video system from becoming patented. See Tr. at 137:10-17 (Shore).

Front Row also remarked that the Court must consider their claims' elements in combination rather than individually. See Tr. at 146:8-15 (Shore). It argued that the Court cannot accept the Defendants' argument that each individual element of its claims is generic, because "claim limitations must be considered in an ordered combination." Tr. at 146:23-25 (Shore). Moreover, it stated that improvements on current inventions are patent-eligible. See Tr. at 147:1-5 (Shore).

Front Row concluded its arguments by pointing the Court to a specific phrase in Alice disapproving patents that recite "purely functional and generic" elements. Tr. at 160:24-161:1 (quoting Alice, 134 S. Ct. at 2347). It argued that the Supreme Court used the word "purely" to limit its decision's scope. Tr. at 161:1-2. It also repeated a local version of its combination argument: "[I]f these lawyers were defending Walter White, they would come in and say, Judge, you can't convict him of anything because he didn't possess anything but Sudafed, battery acid, drain cleaner, lantern fuel, and antifreeze. Forget the fact that when you mix those up, it's methamphetamine." Tr. at 161:9-15 (Shore).[12]

The Defendants began by attacking Front Row's suggestion that they stipulate to infringement. See Tr. at 164:6-16 (Weaver). They stated that "no court -- and he didn't cite a

[12]This quote refers to Walter White, a character in Breaking Bad, a television show broadcast on ABC between January, 2008 and September, 2013. The show was set in Albuquerque, where the Court sits.

case -- says that, in order to challenge a patent under 101, you have to stipulate that you infringe -- not the claim. Your Honor, but the definition of what is the abstract idea." Tr. at 164:10-15 (Weaver)(emphasis added). They added that courts may use "a very short description of what that abstract idea is" in applying the Alice test. Tr. at 165:12-15 (Weaver)("Infringement is a different analysis than 101 eligibility, and whether something is abstract or not.").

The Defendants attempted to reinforce their arguments that Front Row's claim elements were conventional by pointing to Front Row's patent applications. See Tr. at 165:21-166:17 (Weaver). They cited to elements mentioned in Front Row's patent specifications such as packet-based data, Bluetooth, and compression to argue that these elements were conventional and well known in 2000. See Tr. at 167:5-168:8 (Weaver). They focused on the GUI in particular, explaining that the Court does not "have to spend your common sense at the door" and that a GUI is "an interface that the user uses to interact with the electronic device. If it's on a touch screen, you touch the different things that you want." Tr. at 169:11-14 (Weaver). The sheer number of limitations, they argued, is not decisive: "[I]f each one of those limitations, considered by itself, doesn't add an inventive concept, then adding all 11 of them together, you still end up with zero plus zero, 11 times equals zero, unless you can show you did it in an innovative way." Tr. at 172:12-17 (Weaver).

The Defendants also responded to two of Front Row's procedural arguments. See Tr. at 172:20-177:23 (Weaver). First, they argued that claim construction would make no difference here. See Tr. at 173:9-15 (Weaver). In Cyberfone, they asserted, the Federal Circuit held that a claim construction issue must be specific and actually impact the § 101 analysis to delay it. See Tr. at 173:2-15 (Weaver). They allowed that Front Row presented a series of claim construction disputes at the hearing, but argued that it failed to describe how any dispute would alter the § 101

analysis. See Tr. at 173:18-174:12 (Weaver). Second, they argued that the parties need not agree on representative claims for the Court to use them in its § 101 analysis. See Tr. at 174:13-19 (Weaver). They cited to Content Extraction, noting that, although the plaintiff initially did not object to the defendant's proposed representative claims, it "vociferously objected on appeal." Tr. at 175:21-24 (Weaver). They explained that the district court did its own analysis to determine whether the claims were representative, that the Federal Circuit affirmed its decision, and that both courts invalidated 242 separate claims without the plaintiff's agreement. See Tr. at 175:24-176:9 (Weaver). They cited other cases which they argued selected representative claims over a party's objection. See Tr. at 176:15-177:15 (Weaver)(citing Wireless Media Innovations, LLC v. Maher Terminals, LLC, 100 F. Supp. 3d 405, 409 (D.N.J. 2015)(Linares, J.), aff'd, 636 F. App'x 1014 (Fed. Cir. 2016), and Listingbook, LLC v. Mkt. Leader, Inc., 144 F. Supp. 3d 777, 789 (M.D.N.C. 2015)(Biggs, J.)). They argued, as a fallback position, that the representative claims were in fact representative and that the Court would reach the same conclusions if it analyzed every claim in the case on an individual basis. See Tr. at 174:20-175:15 (Weaver).

The Court permitted the parties to proceed to the 027 Patent. See Tr. at 177:24-178:2 (Court, Weaver). The Defendants defended their reliance on the patent's abstract:

> I didn't suggest for a second, Your Honor, that because a characterization of a patent appears in the abstract, that that's where you conduct your entire analysis. We didn't do that. We didn't suggest it. I am simply pointing to the language in the abstract on these patents that describes, at a high level, what these patents are directed to.

Tr. at 178:18-25 (Weaver). They also explained that they did not "have to prove that every single element in the claim has been practiced forever in that combination in order to reach 101." Tr. at 179:24-180:1 (Weaver). Meeting such a requirement, they asserted, would invalidate a

claim under § 102. See Tr. at 180:1-3 (Weaver). They cited Intellectual Ventures I LLC v. Capital One Bank (USA) for the proposition that "tailoring content based on the viewer's location or address is the sort of information tailoring that's been a fundamental practice long prevalent in our system." Tr. at 180:15-18 (Weaver)(citing Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d at 1369).

The Defendants then moved to bolster their Step 2 arguments. See Tr. at 180:22-181:5. They argued that Front Row's limitations

> fail to impart an inventive concept, because they rely on generic computer implementation. And the 027 patent importantly fails to describe how to perform these. Merely saying you're using wireless packet data network isn't how. That's the what. How are you using the wireless packet data network to solve the latency issues, to solve the bandwith issues . . . .[13]

Tr. at 181:6-13 (Weaver). They also attacked Front Row's conception of the machine-or-transformation test, explaining that not "all claims that claim GPS receiver[s] pass the test." Tr. at 182:22-25 (Weaver). They distinguished SiRF Technologies on the grounds that the 027 Patent "does not recite or require a receiver or any other specific machine. And it, basically, just recites this generic hardware; the hand-held device is going to talk to the wireless communications server, and somehow, it's going to determine location." Tr. at 183:17-22 (Weaver). They added that Front Row does not explain how its claims filter content based on location data, or whether the filtering is software or hardware. See Tr. at 184:2-11 (Weaver).

Front Row then made its final arguments. See Tr. at 186:1-192:7 (Court, Shore). It began by explaining that it did not have the burden to identify any representative claims or specific claims constructions. See Tr. at 186:8-11 (Shore). It noted that the 169 Patent's Claim 23 specifically requires a GPS chip set. See Tr. at 187:5-7 (Shore).

[13]Bandwith, in this context, refers to "the transmission capacity of an electronic communications device or system" or "the speed of data transfer." Bandwith, Dictionary.com

Front Row focused on the 027 Patent. See Tr. at 188:10-12 (Shore). It described the 027 Patent's preamble as "extraordinarily limiting, and frankly, unknown in the art at the time." Tr. at 189:5-6 (Shore). It summarized its objections:

> [T]he '027 patent is probably, in my opinion, the worst example of the bad faith filing of this 101 motion. And how they present it and how they argue it, it's wrong. And a proper claims construction, with expert testimony, would point out that this is a relatively narrow patent, with very severe requirements on the systems. The systems have to be able to do certain things.

Tr. at 191:1-9 (Shore). It allowed that "some of these elements existed" before the patent, but argued that "they've never been combined the way they've been combined" here. Tr. at 191:13-18 (Shore).

The Defendants concluded that the Court should extend its rulings on the representative claims to the other claims. See Tr. at 194:1-9 (Weaver). They argued that the claims, rather than the specifications, must provide the inventive concept. See Tr. at 194:10-15 (Weaver). They urged the Court to review the patent specification, however, noting that "most of it is them simply requiring all the prior art systems that existed at the time." Tr. at 194:19-20 (Weaver).

The Court closed the hearing with its inclinations:

> The Supreme Court really hasn't defined "abstract." And so you have to look at the Federal Circuit, and you have to look at the district court cases. So I'm going to have to spend time there. I'm going to have to give some thought as to whether this is the time to make a ruling on 101. And the plaintiffs may be right that this is not the time to do it. And I'm going to have to give that some thought. And I don't have, really, any sort of inclination on that. But my sense is that, if and when we reach the 101 issue, whether it's now or down the road, I do have concerns about the patentability of these patents under 101.

Tr. at 196:10-24 (Court).

6. The Supplementary Briefing.

The parties filed a series of notices of supplemental authority to inform the Court of recent decisions related to § 101. The Defendants filed the first such notice on January 8, 2016.

See Defendants' Notice of Supplemental Authority Regarding Their Motion for Judgment on the Pleadings Pursuant to Fed. R. Civ. P. 12(c), filed January 8, 2016 (Doc. 265)("First Supplement"). The First Supplement informed the Court of the Honorable John Love, United States Magistrate Judge for the Eastern District of Texas' Report and Recommendation in Rothschild Location Techs. LLC v. Geotab USA, Inc., No. 6:15-CV-682-RWS-JDL, 2016 WL 2847975 (E.D. Tex. May 16, 2016)(Schroeder, J.)("Rothschild")(adopting Judge Love's Report and Recommendation). The Defendants explain that Judge Love recommended invalidating a patent involving GPS devices under § 101. See First Supplement at 1 (citing 2016 WL 2847975, at *1). They argue that the Report and Recommendation: (i) placed the burden on the patentee to identify claim terms and proposed constructions relevant to a § 101 inquiry; and (ii) concluded that the patent's reference to a GPS device did not render its claims non-abstract. See First Supplement at 1.

Front Row responded on January 12, 2016. See Plaintiff's Response to Notice of Authority (Dkt. 265) and Supplemental Response to Defendants' Oral Argument on Motion to Dismiss (Dkt. 229), filed January 12, 2016 (Doc. 266)("Second Supplement"). Front Row first notes that the Report and Recommendation is "irrelevant and not dispositive" because "it is not a decision by a court created under Article III of the Constitution." Second Supplement at 1. It adds that the parties to the case still had time to object to the Report and Recommendation. Second Supplement at 1. It explains that, in Rothschild, there was "only one claim term that the plaintiffs believed needed construction, the defendants did not dispute the plaintiffs' preferred construction of the term, and the parties had no significant claim disputes or factual issues." Second Supplement at 1.

Front Row, without receiving leave or other authorization from the Court, proceeds to re-argue various issues presented at the hearing. See Second Supplement at 2-9; D.N.M. Local Rule 7.4(b) ("The filing of a surreply requires leave of the Court.") Front Row repeats its arguments that the representative claims are not representative. See Second Supplement at 2. It contends that the Court should consider the claims and the specification together, because they are both part of a fully integrated written instrument. See Second Supplement at 2-3. It objects to the Defendants' argument that its claims' language does not teach how to achieve their purposes: "The language of patent's claims is not recited to teach the invention; its purpose is to set the parameters of the monopoly that the patent holder obtains when the patent issues." Second Supplement at 3. It quotes the Federal Circuit: "Specifications teach. Claims claim." Second Supplement at 4 (quoting SRI Int'l v. Matsushita Elec. Corp. of Am., 775 F.2d 1107, 1121 n.14 (Fed. Cir. 1985)). They add that this principle refutes the Defendants' objection that their claims "fail to teach the new and inventive combinations of the known elements claimed." Second Supplement at 4. They assert that their patents teach persons with ordinary skill in the art "how to make the claimed inventions using claimed combinations of interconnected and integrated elements and components." Second Supplement at 6.

The Defendants strongly objected to the Second Supplemental Notice's new arguments on January 21, 2016. See Defendants' Objection to Plaintiff's Supplemental Response to Defendants' Oral Argument on Motion to Dismiss, filed January 21, 2016 (Doc. 270)("Third Supplement"). They explain:

> The Court's Rules provided Plaintiff the opportunity to file a response to Defendants' Motion limited to twenty-four pages, D.N.M. L.R. 7.5, and Plaintiff had every opportunity during an all-day hearing before the Court on January 5, 2016, to provide its responses to Defendants' oral arguments. Nothing in the Court's Rules authorize a party to reopen unilaterally the briefing to present additional arguments at this late stage.

Third Supplement at 1. The Defendants decline to address any of Front Row's new arguments "unless the Court requests it." Third Supplement at 2.

Front Row replied on January 25, 2016. See Plaintiff's Response to Defendants' Objection and Notice of Supplemental Authority, filed January 25, 2016 (Doc. 271)("Fourth Supplement"). It attempts to explain its filing:

> Plaintiff's response and citation of additional supplemental authority are explicitly allowed under Local Rule 7.8, which states that, if controlling, or pertinent and significant authority comes to the attention of a party, that party may advise the court "after oral argument but before a decision." Local Rule 7.8 does not require that the supplemental authority issue after oral argument; instead it requires only that such authority comes to a party's attention before the Court renders its decision.

Fourth Supplement at 1. It also adds another argument related to the hearing, explaining that recent cases have cited USPTO guidelines. See Fourth Supplement at 2. Front Row directs the Court to Xlear, Inc. v. STS Health, LLC, No. 2:14-CV-00806-DN, 2015 WL 8967574 (D. Utah Dec. 15, 2015)(Nuffer, J.), which it says "held the claims at issue patentable after finding those claims similar to a claim identified as patentable by the USPTO." Fourth Supplement at 2-3 (citing Xlear, Inc. v. STS Health, LLC, 2015 WL 8967574, at *5).

Front Row filed a notice of supplemental authority with two cases on January 26, 2016. See Plaintiff's Notice of Supplemental Authority Pursuant to Local Rule 7-8, filed January 26, 2016 (Doc. 272)("Fifth Supplement"). First, Front Row points to Advanced Marketing Systems, LLC v. CVS Pharmacy, Inc., No. 6:15-CV-134-JRG-KNM, 2016 WL 1741396 (E.D. Tex. May 3, 2016)(Mitchell, M.J.), which it says determined that a § 101 analysis would be "best left until after claim construction." Fifth Supplement at 1 (citing Advanced Mktg. Sys., LLC v. CVS Pharmacy, Inc., 2016 WL 1741396, at *6). It notes that Judge Gilstrap adopted this Report and Recommendation. See Fifth Supplement at 1. Second, Front Row refers to a Patent Trial and

Appeal Board decision, which it contends held that the petitioner "oversimplified" claims and failed to consider the elements as "ordered combinations." Fifth Supplement at 1 (citing NRT Tech. Corp v. Everi Payments, Inc., No. CBM2015-00167 (PTAB Jan. 22, 2016)).

On March 31, 2016, Front Row filed its Fifth Amended Complaint. See Fifth Amended Complaint at 1. The Fifth Amended Complaint alleges infringement of the 184, 895, 856, 460, and 027 Patents. See Fifth Amended Complaint ¶¶ 23-75, at 5-21. The Court approved the parties' stipulations on the same day. See Stipulation and Order to Dismiss All Claims, Counterclaims, and Defenses Related to Patents Dropped in Plaintiff's Fifth Amended Complaint for Patent Infringement, filed March 31, 2016 (Doc. 288)("Stipulation"). The Stipulation dismissed the 388, 363, 162, 855, and 169 Patents. See Stipulation at 4.

On April 13, 2016, the Defendants filed a notice to describe the Fifth Amended Complaint's effect on the Motion. See Defendants' Notice Regarding Effect of Fifth Amended Complaint on Defendants' Pending Motion for Judgment on the Pleadings, filed April 13, 2016 (Doc. 289)("Sixth Supplement"). The Defendants contend that, "[b]y eliminating half of the patents Plaintiff previously asserted, the Fifth Amended Complaint (1) undermines any argument that Defendants' proposed representative claims for a Section 101 analysis are not truly representative and (2) underscores -- by removing many purportedly novel claim elements -- the unpatentability of Front Row's claims." Sixth Supplement at 1. The Defendants explain that the Fifth Amended Complaint dropped five of Front Row's patents and state that "[t]he only issue before the Court now is whether the asserted claims of the five remaining patents are directed to patent-eligible subject matter." Sixth Supplement at 1-2. First, they argue that Front Row has dropped many of the claims that it complained the 184 and 027 Patents' claims did not represent, including "all claims containing the graphical user interface and GPS chipset limitations." Sixth

Supplement at 2. Second, they argue that the remaining claims were "concededly well-known" and do not transform abstract ideas into patent-eligible applications. Sixth Supplement at 3. They urge the Court to grant the Motion based on their representative claims. See Sixth Supplement at 3.

Front Row responded to this filing on April 20, 2016. See Plaintiff's Response to Defendants' Notice Regarding Effect of Fifth Amended Complaint on Defendants' Pending Motion for Judgment on the Pleadings, filed April 20, 2016 (Doc. 292)("Seventh Supplement"). First, Front Row disputes that the Defendants' chosen claims are "representative of the 64 claims asserted from five different patents in Plaintiff's Fifth Amended Complaint." Seventh Supplement at 2. It points to limitations absent from the representative claims, including an "802.11 wireless standard network,"[14] a "cellular telecommunications network," a "touchscreen display," a "smartphone," a "cellular telephone," a "tablet computer device," and "storing subscriber information . . . in a database." Seventh Supplement at 2-3.

Second, Front Row repeats its arguments that the Court must not engage in factfinding, noting that it must "'accept all facts pleaded by the ***non-moving party*** as true and grant all reasonable inferences from the pleadings in that party's favor.'" Seventh Supplement at 4 (quoting Sanders v. Mountain Am. Fed. Credit Union, 689 F.3d 1138, 1141 (10th Cir. 2012)(emphasis in Seventh Supplement)).

[14]An 802.11 wireless standard network is a standardized wireless network that allows various devices to communicate with each other. See In re Innovatio IP Ventures, LLC Patent Litig., No. 11 C 9308, 2013 WL 5593609, at *12 (N.D. Ill. Oct. 3, 2013)(Holderman, J.). Wi-Fi networks are based on this standard. See Realtek Semiconductor Corp. v. LSI Corp., No. C-12-03451 RMW, 2012 WL 4845628, at *1 (N.D. Cal. Oct. 10, 2012)(Whyte, J.). It "was developed under the patronage of the Institute of Electrical and Electronics Engineers ('IEEE')." Microsoft Corp. v. Motorola, Inc., No. C10-1823JLR, 2012 WL 395734, at *1 (W.D. Wash. Feb. 6, 2012)(Robart, J.).

Third, Front Row cites to Treehouse Avatar LLC v. Valve Corp., No. CV 15-427-SLR, 2016 WL 1129726 (D. Del. Mar. 22, 2016)(Robinson, J.), which it says covered claims requiring "the creation, storage, and display, over a network, of an avatar 'that is indicative of the individuality of the network user.'" Seventh Supplement at 4 (quoting Treehouse Avatar LLC v. Valve Corp., 2016 WL 1129726, at *10). Front Row explains that the decision denied a defendant's motion to dismiss under § 101 on the grounds that its claims were "necessarily routed in computer technology in order to overcome a problem specifically arising in the realm of computer networks." Seventh Supplement at 5. Front Row argues that this case is similar, because the claims "require sending, over a network, an image representative of one or more persons." Seventh Supplement at 5. Front Row concludes by repeating its arguments that its claims are neither generic nor indefinite. See Seventh Supplement at 5-6.

Front Row filed another supplement on May 12, 2016. See Plaintiff's Notice of Binding Supplemental Authority Concerning Invalidity Under Section 101 Pursuant to Local Rule 7-8, filed May 12, 2016 (Doc. 306)("Eighth Supplement"). Front Row explained that a new Federal Circuit case, Enfish, LLC v. Microsoft Corp., No. 2015-1244, 2016 WL 2756255 (Fed. Cir. May 12, 2016)("Enfish"), "clarifies that the first step is not to be taken lightly but is the highest hurdle to overcome for a defendant asserting a Section 101 defense." Eighth Supplement at 1. Front Row argues that the Federal Circuit's consideration of claims' character "as a whole" during Step 1 "makes clear that a court considering a Section 101 defense should never reach the second step unless the claimed invention completely, or wholly involves ***only*** an abstract idea. If any part of the claimed invention is not abstract, the inquiry stops at the first step." Eighth Supplement at 2 (quoting Enfish, 2016 WL 2756255, at *4).

Front Row filed the next supplement to provide the Court with guidance from the USPTO. See Plaintiff's Notice of Supplemental Authority Concerning Invalidity Under Section 101 Pursuant to Local Rule 7-8, filed May 16, 2016 (Doc. 308)("Ninth Supplement"). Front Row contends that the new guidance emphasizes the importance of evaluating a claim's elements in combination. Ninth Supplement at 1. Further, Front Row argues that it tends to make patents including "generic components" more likely to pass § 101. Ninth Supplement at 1.

The Defendants replied to Front Row's Eighth and Ninth Supplements on May 19, 2016. See Defendants' Response to Plaintiff's Notices of Supplemental Authority Concerning Invalidity Under Section 101 Pursuant to Local Rule 7.8, filed May 19, 2016 (Doc. 320)("Tenth Supplement"). The Defendants contend that neither of Front Row's new authorities "involves a change in the law or presents any basis for altering the analysis set forth in Defendants' Motion for Judgment on the Pleadings." Tenth Supplement at 1. First, they contend that Enfish does not make a major change, "because the asserted patents do not claim any improvement to technology" or "computer functionality." Tenth Supplement at 1. They note that the Enfish invention has technological advantages including "'increased flexibility, faster search times, and smaller memory requirements.'" Tenth Supplement at 1 (quoting Enfish, 2016 WL 2756255, at *6).

Second, the Defendants argue that the new USPTO guidelines are consistent with their understanding of the § 101 analysis and their past arguments. See Tenth Supplement at 2. They point to a recent decision by the USPTO's Patent Trial and Appeal Board invalidating "an online content delivery patent similar to Plaintiff's Video Patents." Tenth Supplement at 2 (citing Motorola Mobility, LLC, CBM2015-00004, 2016 WL 1133073, at *22 (Mar. 21, 2016)). They

also notify the Court that Judge Schroeder adopted the Report and Recommendation in Rothschild. See Tenth Supplement at 3.

The Defendants filed yet another supplement four days later. See Defendants' Notice of Binding Supplemental Authority Regarding their Motion for Judgment on the Pleadings Pursuant to Fed. R. Civ. P. 12(c), filed May 23, 2016 (Doc. 321)("Eleventh Supplement"). The Defendants point to a new Federal Circuit case which they say "affirmed dismissal based on Section 101 invalidity of a patent claiming methods and apparatus for taking, storing, transmitting, and organizing digital images." Eleventh Supplement at 1 (citing In re TLI Commc'ns LLC Patent Litig., 823 F.3d 607, 609 (Fed. Cir. 2016)). They quote the Federal Circuit, which stated that the claims were "directed to the use of conventional or generic technology in a nascent but well-known environment, without any claim that the invention reflects an inventive solution to any problem presented by combining the two." Eleventh Supplement at 1 (quoting In re TLI Commc'ns LLC Patent Litig., 823 F.3d at 612).

Front Row responded to this supplement on June 3, 2016. See Plaintiff's Resposne to Defendant's Notice of Binding Supplemental Authority Regarding their Motion for Judgment on the Pleadings Pursuant to Fed. R. Civ. P. 12(c), filed June 3, 2016 (Doc. 330)("Twelfth Supplement"). Front Row disagrees with the Defendants' interpretation of In re TLI Communications LLC Patent Litigation, noting that the claim in that case does not "describe a new telephone, a new server, or a new physical combination of the two." Twelfth Supplement at 1 (quoting In re TLI Commc'ns LLC Patent Litig., 823 F.3d at 612). Front Row asserts that its patents, on the other hand, claim new physical combinations of hardware, software, and data networks. See Twelfth Supplement at 1.

Front Row filed its next notice of supplemental authority on July 5, 2016. See Plaintiff's Notice of Binding Supplemental Authority Concerning Invalidity under Section 101 Pursuant to Local Rule 7-8, filed July 5, 2016 (Doc. 350)("Thirteenth Supplement"). Front Row cites another new Federal Circuit case, arguing that it shows that the unconventional arrangement of conventional pieces can result in patent-eligible subject-matter. See Thirteenth Supplement at 1 (citing Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, No. 2015-1763, 2016 WL 3514158, at *8 (Fed. Cir. June 27, 2016)("Bascom")).

The Defendants responded on July 12, 2016. See Defendants' Response to Plaintiff's Notice of Supplemental Authority Concerning Invalidity Under Section 101 Pursuant to Local Rule 7.8, filed July 12, 2016 (Doc. 372)("Fourteenth Supplement"). The Defendants deny that Bascom supports Front Row's arguments. See Fourteenth Supplement at 1. First, the Defendants argue that Bascom confirms that the Court may reach § 101 issues at any appropriate stage. See Fourteenth Supplement at 1. Second, they contend that Bascom approved an "ordered combination of elements" as patent-eligible because, unlike Front Row's patents, it claimed a "***specific, discrete implementation*** of the abstract idea of filtering content." Fourteenth Supplement at 1 (quoting Bascom, 2016 WL 3514158, at *7)(emphasis in Fourteenth Supplement).

On July 15, 2016, Front Row filed another supplement, explaining that three patents and applications "concerning sports and entertainment video streaming similar to the Front Row patents at issue in this case have been examined at the USPTO and not been the subject of any *Alice* 101 rejections." Plaintiff's Notice of Supplemental Authority Concerning Invalidity Under Section 101 Pursuant to Local Rule 7-8 at 1, filed July 15, 2016 (Doc. 353).

LAW REGARDING MOTIONS TO DISMISS UNDER RULE 12(b)(6)

Rule 12(b)(6) authorizes a court to dismiss a complaint for "failure to state a claim upon which relief can be granted." Fed. R. Civ. P. 12(b)(6). "The nature of a Rule 12(b)(6) motion tests the sufficiency of the allegations within the four corners of the complaint after taking those allegations as true." Mobley v. McCormick, 40 F.3d 337, 340 (10th Cir. 1994)(Brorby, J.). The complaint's sufficiency is a question of law; and, when considering a rule 12(b)(6) motion, a court must accept as true all well-pled factual allegations in the complaint, view those allegations in the light most favorable to the non-moving party, and draw all reasonable inferences in the plaintiff's favor. See Tellabs, Inc. v. Makor Issues & Rights, Ltd., 551 U.S. 308, 322 (2007)("[O]nly if a reasonable person could not draw . . . an inference [of plausibility] from the alleged facts would the defendant prevail on a motion to dismiss."); Smith v. United States, 561 F.3d 1090, 1098 (10th Cir. 2009)(Briscoe, J.)("[F]or purposes of resolving a Rule 12(b)(6) motion, we accept as true all well-pled factual allegations in a complaint and view these allegations in the light most favorable to the plaintiff.")(citing Moore v. Guthrie, 438 F.3d 1036, 1039 (10th Cir. 2006)).

A complaint need not set forth detailed factual allegations, yet a "pleading that offers labels and conclusions or a formulaic recitation of the elements of a cause of action" is insufficient. Ashcroft v. Iqbal, 556 U.S. 662, 678 (2009)(citing Bell Atl. Corp. v. Twombly, 550 U.S. 544, 555 (2007)). "Threadbare recitals of the elements of a cause of action, supported by mere conclusory statements, do not suffice." Ashcroft v. Iqbal, 556 U.S. at 678. "Factual allegations must be enough to raise a right to relief above the speculative level, on the assumption that all the allegations in the complaint are true (even if doubtful in fact)." Bell Atl. Corp v. Twombly, 550 U.S. at 555 (citation omitted).

To survive a motion to dismiss, a plaintiff's complaint must contain sufficient facts that, if assumed to be true, state a claim to relief that is plausible on its face. See Bell Atl. Corp. v. Twombly, 550 U.S. at 570; Mink v. Knox, 613 F.3d 995, 1000 (10th Cir. 2010)(Seymour, J.). "A claim has facial plausibility when the pleaded factual content allows the court to draw the reasonable inference that the defendant is liable for the misconduct alleged." Ashcroft v. Iqbal, 556 U.S. at 678 (citing Bell Atl. Corp. v. Twombly, 550 U.S. at 556). "Thus, the mere metaphysical possibility that some plaintiff could prove some set of facts in support of the pleaded claims is insufficient; the complainant must give the court reason to believe that this plaintiff has a reasonable likelihood of mustering factual support for these claims." Ridge at Red Hawk, LLC v. Schneider, 493 F.3d 1174, 1177 (10th Cir. 2007)(Kelly, J.)(emphasis omitted). The United States Court of Appeals for the Tenth Circuit has stated:

> "[P]lausibility" in this context must refer to the scope of the allegations in a complaint: if they are so general that they encompass a wide swath of conduct, much of it innocent, then the plaintiffs "have not nudged their claims across the line from conceivable to plausible." The allegations must be enough that, if assumed to be true, the plaintiff plausibly (not just speculatively) has a claim for relief.

Robbins v. Oklahoma, 519 F.3d 1242, 1247 (10th Cir. 2008)(quoting Bell Atl. Corp. v. Twombly, 550 U.S. at 570)(citations omitted).

Although affirmative defenses must generally be pled in the defendant's answer, not argued on a motion to dismiss, see Fed. R. Civ. P. 8(c), there are exceptions where: (i) the defendant asserts an immunity defense -- the courts handle these cases differently than other motions to dismiss, see Glover v. Gartman, 899 F. Supp. 2d 1115, 1137-39, 1141 (D.N.M. 2012)(Browning, J.)(citing Pearson v. Callahan, 555 U.S. 223 (2009) and Robbins v. Oklahoma, 519 F.3d 1242 (10th Cir. 2008)); and (ii) where the facts establishing the affirmative defense are apparent on the face of the complaint, see Miller v. Shell Oil Co., 345 F.2d 891, 893 (10th

Cir. 1965)(Hill, J.)("Under Rule 12(b), a defendant may raise an affirmative defense by a motion to dismiss for the failure to state a claim. If the defense appears plainly on the face of the complaint itself, the motion may be disposed of under this rule.").

LAW REGARDING RULE 12(C)[15]

"After the pleadings are closed -- but early enough not to delay trial -- a party may move for judgment on the pleadings." Fed. R. Civ. P. 12(c). A rule 12(c) motion is designed to provide a means of disposing of cases when the material facts are not in dispute between the parties. See Kruzitis v. Okuma Mach. Tool, Inc., 40 F.3d 52, 54 (3d Cir. 1994)("Under Rule 12(c), we will not grant judgment on the pleadings unless the movant clearly establishes that no material issue of fact remains to be resolved and that he is entitled to judgment as a matter of law.")(internal quotation marks omitted). A "[j]udgment on the pleadings should not be granted 'unless the moving party has clearly established that no material issue of fact remains to be resolved and the party is entitled to judgment as a matter of law.'" Park Univ. Enters., Inc. v. Am. Cas. Co. of Reading, Pa., 442 F.3d 1239, 1244 (10th Cir. 2006)(citing United States v. Any & All Radio Station Transmission Equip., 207 F.3d 458, 462 (8th Cir. 2000)).

"Any party may move for judgment on the pleadings if no material facts are in dispute and the dispute can be resolved on both the pleadings and any facts of which the Court can take

[15]In patent cases, Federal Circuit law applies if a question involves an issue of substantive patent law. Regional Circuit law applies if the question does not involve patent law. See In re Deutsche Bank Trust Co. Americas, 605 F.3d at 1377; Advanced Cardiovascular Sys., Inc. v. Medtronic, Inc., 265 F.3d 1294, 1307 (Fed. Cir. 2001); In re Spalding Sports Worldwide, Inc., 203 F.3d 800, 803 (Fed. Cir. 2000)("In reviewing district court judgments, we apply the law of the circuit in which the district court sits with respect to nonpatent issues, but we apply our own law to issues of substantive patent law."); Sulzer Textil A.G. v. Picanol N.V., 358 F.3d 1356, 1362-63 (Fed. Cir. 2004)("We answer this question on an issue by issue basis and will apply the law of the regional circuit to which district court appeals normally lie, unless the issue pertains to or is unique to patent law.")(quotations omitted); Viam Corp. v. Iowa Exp.-Imp. Trading Co., 84 F.3d 424, 428 (Fed. Cir. 1996).

judicial notice." Ramirez v. Wal-Mart Stores, Inc., 192 F.R.D. 303, 304 (D.N.M. 2000)(citing Fed. R. Civ. P. 12(c)). A motion pursuant to rule 12(c) is generally treated in the same manner as a motion to dismiss under rule 12(b)(6). See Ramirez v. Wal-Mart Stores, Inc., 192 F.R.D. at 304 (citing Irish Lesbian & Gay Org. v. Giuliani, 143 F.3d 638 (2d Cir. 1998)). The court will grant a motion for judgment on the pleadings if the pleadings demonstrate that the moving party is entitled to judgment as a matter of law. See Ramirez v. Wal-Mart Stores, Inc., 192 F.R.D. at 304.

A court considering a motion for judgment on the pleadings should "accept all facts pleaded by the non-moving party as true and grant all reasonable inferences from the pleadings in favor of the same." Park Univ. Enters., Inc. v. Am. Cas. Co. of Reading, Pa., 442 F.3d at 1244. The court must view the facts presented in the pleadings and draw the inferences therefrom in the light most favorable to the nonmoving party. See Ramirez v. Wal-Mart Stores, Inc., 192 F.R.D. at 304. All of the nonmoving party's allegations are deemed to be true, and all of the movant's contrary assertions are taken to be false. See Nat'l Metro. Bank v. United States, 323 U.S. 454, 456-57 (1945); Ramirez v. Dep't of Corr., 222 F.3d 1238, 1240 (10th Cir. 2000); Freeman v. Dep't of Corr., 949 F.2d 360, 361 (10th Cir. 1991).

The same standards that govern a motion to dismiss under rule 12(b)(6) also govern a motion for judgment on the pleadings under rule 12(c). See Atl. Richfield Co. v. Farm Credit Bank, 226 F.3d 1138, 1160 (10th Cir. 2000). Under rule 12(b)(6), a court may dismiss a complaint for "failure to state a claim upon which relief can be granted." Fed. R. Civ. P. 12(b)(6). "The nature of a Rule 12(b)(6) motion tests the sufficiency of the allegations within the four corners of the complaint after taking those allegations as true." Mobley v. McCormick, 40 F.3d 337, 340 (10th Cir. 1994). The sufficiency of a complaint is a question of law, and when

considering and addressing a rule 12(b)(6) motion, a court must accept as true all well-pleaded factual allegations in the complaint, view those allegations in the light most favorable to the non-moving party, and draw all reasonable inferences in the plaintiff's favor. See Moore v. Guthrie, 438 F.3d 1036, 1039 (10th Cir. 2006); Hous. Auth. of Kaw Tribe v. City of Ponca City, 952 F.2d 1183, 1187 (10th Cir. 1991).

A complaint need not set forth detailed factual allegations, yet a "pleading that offers labels and conclusions or a formulaic recitation of the elements of a cause of action" is insufficient. Ashcroft v. Iqbal, 556 U.S. 662, 678 (2009)(citing Bell Atl. Corp. v. Twombly, 550 U.S. 544, 555 (2007)). "Threadbare recitals of the elements of a cause of action, supported by mere conclusory statements, do not suffice." Ashcroft v. Iqbal, 556 U.S. at 678. "Factual allegations must be enough to raise a right to relief above the speculative level, on the assumption that all the allegations in the complaint are true (even if doubtful in fact)." Bell Atl. Corp v. Twombly, 550 U.S. at 555 (citation omitted).

To survive a motion to dismiss, a plaintiff's complaint must contain sufficient facts that, if assumed to be true, state a claim to relief that is plausible on its face. See Bell Atl. Corp. v. Twombly, 550 U.S. at 570; Mink v. Knox, 613 F.3d 995, 1000 (10th Cir. 2010). "A claim has facial plausibility when the pleaded factual content allows the court to draw the reasonable inference that the defendant is liable for the misconduct alleged." Ashcroft v. Iqbal, 556 U.S. at 678 (citing Bell Atl. Corp. v. Twombly, 550 U.S. at 556). "Thus, the mere metaphysical possibility that some plaintiff could prove some set of facts in support of the pleaded claims is insufficient; the complainant must give the court reason to believe that this plaintiff has a reasonable likelihood of mustering factual support for these claims." Ridge at Red Hawk, LLC

v. Schneider, 493 F.3d 1174, 1177 (10th Cir. 2007)(emphasis omitted). The Tenth Circuit has stated:

> "[P]lausibility" in this context must refer to the scope of the allegations in a complaint: if they are so general that they encompass a wide swath of conduct, much of it innocent, then the plaintiffs "have not nudged their claims across the line from conceivable to plausible." The allegations must be enough that, if assumed to be true, the plaintiff plausibly (not just speculatively) has a claim for relief.

Robbins v. Oklahoma, 519 F.3d 1242, 1247 (10th Cir. 2008)(quoting Bell Atl. Corp. v. Twombly, 550 U.S. at 570 (citations omitted)).

In reviewing a pro se complaint, the court applies the same legal standards applicable to pleadings that counsel drafts, but is mindful that the complaint must be liberally construed. See Hall v. Bellmon, 935 F.2d 1106, 1110 (10th Cir. 1991). But "[t]he broad reading of the plaintiff's complaint does not relieve the plaintiff of alleging sufficient facts on which a recognized legal claim could be based." Hall v. Bellmon, 935 F.2d at 1110.

> [T]he [pro se] plaintiff whose factual allegations are close to stating a claim but are missing some important element that may not have occurred to him, should be allowed to amend his complaint. Nevertheless, conclusory allegations without supporting factual averments are insufficient to state claim on which relief can be based. This is so because a pro se plaintiff requires no special legal training to recount the facts surrounding his alleged injury, and he must provide such facts if the court is to determine whether he makes out a claim on which relief can be granted. Moreover, in analyzing the sufficiency of the plaintiff's complaint, the court need accept as true only the plaintiff's well-pleaded factual contentions, not his conclusory allegations.

Hall v. Bellmon, 935 F.2d at 1110 (citations omitted).

LAW REGARDING PATENT-ELIGIBLE SUBJECT-MATTER

An inventor or discoverer may patent "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof . . . subject to the conditions and requirements of this title." 35 U.S.C. § 101. The Supreme Court has

carved out three specific exceptions to § 101's broad eligibility grant: "laws of nature, physical phenomena, and abstract ideas."[16] Bilski v. Kappos, 561 U.S. at 601. See Gottschalk v. Benson, 409 U.S. 63, 67 (1972)("Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work."). "Patent eligibility under 35 U.S.C. § 101 is an issue of law[.]" OIP Techs., Inc. v. Amazon.com, Inc., 788 F.3d 1359, 1362 (Fed. Cir. 2015).

The Supreme Court and the Federal Circuit have repeatedly disagreed over the scope of the exception for abstract ideas. The conflict became particularly apparent in In re Bilski, 545 F.3d 943 (Fed. Cir. 2008)(en banc), where a patent applicant challenged the USPTO's denial of his application "for a method of hedging risk in the field of commodities trading." 545 F.3d at 949. The USPTO concluded that the "transformation of non-physical financial risks and legal liabilities of the commodity provider, the consumer, and the market participants is not patent-eligible subject matter." In re Bilski, 545 F.3d at 950 (quotation omitted). The Federal Circuit held that the Supreme Court had created only one § 101 test:

> The Supreme Court, however, has enunciated a definitive test to determine whether a process claim is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than to pre-empt the principle itself. A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.

In re Bilski, 545 F.3d at 954. The Supreme Court rejected the Federal Circuit's conclusion:

> This Court's precedents establish that the machine-or-transformation test is a useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under § 101. The machine-or-transformation test is not the sole test for deciding whether an invention is a patent-eligible "process."

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[16]"While these exceptions are not required by the statutory text, they are consistent with the notion that a patentable process must be 'new and useful.'" Bilski v. Kappos, 561 U.S. at 601-02 (2010)(quoting 35 U.S.C. §101).

Bilski v. Kappos, 561 U.S. at 604. It even added that "nothing in today's opinion should be read as endorsing interpretations of § 101 that the Court of Appeals for the Federal Circuit has used in the past." Bilski v. Kappos, 561 U.S. at 612. Instead of providing a replacement test, however, the Supreme Court instead compared the specific claims at issue to its prior decisions on abstract ideas. See 561 U.S. at 609 ("Rather than adopting categorical rules that might have wide-ranging and unforeseen impacts, the Court resolves this case narrowly on the basis of this Court's decisions . . . ."). The Supreme Court thus eviscerated the Federal Circuit's approach to § 101 without providing a specific replacement.

The Supreme Court's next major statement concerned a "natural phenomena" patent. Mayo Collaborative Servs. v. Prometheus Labs., Inc., 132 S. Ct. 1289, 1293 (2012)("Mayo"). In that case, a laboratory producing tests secured patents embodying "relationships between concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm." 132 S. Ct. at 1296. The Federal Circuit concluded that the patents were valid, because they passed the machine-or-transformation test -- it specifically noted that "the claimed processes specify the steps of (1) 'administering a [thiopurine] drug' to a patient and (2) 'determining the [resulting metabolite] level.'" 132 S. Ct. at 1296. The Supreme Court again reversed and invalidated the patents. See 132 S. Ct. at 1297. It first recognized that "too broad an interpretation of this exclusionary principle could eviscerate patent law. For all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." 132 S. Ct. at 1293. It explained, however, that the laboratory's patents "set forth laws of nature -- namely, relationships between concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm." 132 S. Ct. at 1296. Second, the Supreme Court considered whether

the claims "also contain other elements or a combination of elements, sometimes referred to as an 'inventive concept,' sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself." 132 S. Ct. at 1294 (quoting Parker v. Flook, 437 U.S. 584, 594 (1978)("Flook")). Patents that "simply state the law of nature while adding the words 'apply it,'" the Supreme Court explained, do not amount to the required inventive concept. 132 S. Ct. at 1290. Applying this principle to the laboratory's patent, the Supreme Court rejected the patents:

> To put the matter more succinctly, the claims inform a relevant audience about certain laws of nature; any additional steps consist of well-understood, routine, conventional activity already engaged in by the scientific community; and those steps, when viewed as a whole, add nothing significant beyond the sum of their parts taken separately.

132 S. Ct. at 1298.

The Supreme Court extended this framework to abstract ideas in Alice. That case involved "a computer-implemented scheme for mitigating 'settlement risk' (*i.e.,* the risk that only one party to a financial transaction will pay what it owes) by using a third-party intermediary." Alice, 134 S. Ct. at 2351-52. The Supreme Court formalized the test that it applied in Mayo "for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." Alice, 134 S. Ct. at 2355. "First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts." 134 S. Ct. at 2355. Second, if so,

> we then ask, "[w]hat else is there in the claims before us?" *Id.,* at ——, 132 S.Ct., at 1297. To answer that question, we consider the elements of each claim both individually and "as an ordered combination" to determine whether the additional elements "transform the nature of the claim" into a patent-eligible application. *Id.,* at ——, 132 S.Ct., at 1298, 1297. We have described step two of this analysis as a search for an "'inventive concept'" -- *i.e.,* an element or combination of elements that is "sufficient to ensure that the patent in practice amounts to

> significantly more than a patent upon the [ineligible concept] itself." *Id.*, at ——, 132 S.Ct., at 1294.

134 S. Ct. at 2355.

The Supreme Court then applied this test and invalidated the claims at issue. See 134 S. Ct. at 2356-57. First, it concluded that the claims, on their face, were directed to an abstract idea -- "the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk." 134 S. Ct. at 2356. It explained that the patents were similar to those in Bilski v. Kappos, but declined to set out a specific definition for "abstract ideas":

> In any event, we need not labor to delimit the precise contours of the "abstract ideas" category in this case. It is enough to recognize that there is no meaningful distinction between the concept of risk hedging in *Bilski* and the concept of intermediated settlement at issue here. Both are squarely within the realm of "abstract ideas" as we have used that term.

134 S. Ct. at 2357. Second, the Supreme Court held that the patents' method claims, "which merely require generic computer implementation, fail to transform that abstract idea into a patent-eligible invention." 134 S. Ct. at 2357. It explained:

> [T]he mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention. Stating an abstract idea "while adding the words "apply it" is not enough for patent eligibility. Nor is limiting the use of an abstract idea "to a particular technological environment." Stating an abstract idea while adding the words "apply it with a computer" simply combines those two steps, with the same deficient result. Thus, if a patent's recitation of a computer amounts to a mere instruction to "implemen[t]" an abstract idea "on . . . a computer," that addition cannot impart patent eligibility.

134 S. Ct. at 2358 (citations omitted). The Supreme Court noted that the claims did not: (i) "purport to improve the functioning of the computer itself"; (ii) "effect an improvement in any other technology or technical field"; or (iii) considered as an ordered combination, add anything "that is not already present when the steps are considered separately." 134 S. Ct. at 2359. It applied the same analysis to the patent-holder's system claims, which recited "purely functional

and generic" hardware, such as a data processing system with a communications controller. 134 S. Ct. at 2360. The Supreme Court rejected these claims as well, noting that "the system claims are no different from the method claims in substance. The method claims recite the abstract idea implemented on a generic computer; the system claims recite a handful of generic computer components configured to implement the same idea." 134 S. Ct. at 2360.[17]

[17]The Supreme Court's guidance in Alice has proven confusing for the Federal Circuit and district courts, which have raised two primary criticisms. First, some courts have argued that the two-step test is really a one-step test. In McRO, Inc. v. Sony Computer Entertainment America, LLC, 55 F. Supp. 3d 1214 (C.D. Cal. 2014)(Wu, J.), for example, the district court commented:

> Describing this as a two-step test may overstate the number of steps involved. If the claim is not "directed" to a patent-ineligible concept, then the test stops at step one. If the claim is so directed, but we find in step two that the claim contains an "inventive concept" that "transforms" the nature of the claim into something patent eligible, then it seems that there was a categorization error in finding the claim -- which is considered "as an ordered combination" -- "directed to an abstract idea" in step one.

55 F. Supp. 3d at 1220. It compared the Alice test to Justice Potter Stewart's comments on pornography -- that "I know it when I see it." McRO, Inc. v. Sony Computer Entm't Am., LLC, 55 F. Supp. 3d at 1220 (quoting Jacobellis v. State of Ohio, 378 U.S. 184, 197 (1964)(Stewart, J., concurring)). See Amerock Corp. v. Unican Sec. Sys. Corp., No. 76-0002-CIV.8, 1981 WL 48185, at *3 (E.D.N.C. Sept. 24, 1981)(Merhige, J.)(quoting the same sentence). It concluded that "comparisons to previously adjudicated patents -- or more precisely, to past cases' characterizations of those patents -- have done the heavy lifting." 55 F. Supp. 3d at 1220.

Second, courts have argued that the Alice test's results depend entirely on courts' preferred characterization of the patented idea. See Fairfield Indus., Inc. v. Wireless Seismic, Inc., No. 4:14-CV-2972, 2014 WL 7342525, at *4 (S.D. Tex. Dec. 23, 2014)(Ellison, J.)("[A]ny claim, described at a certain level of generality, can be challenged as directed to an abstract idea."). Courts may independently characterize the patented idea and need not accept either party's suggestions. In Cogent Medicine, Inc. v. Elsevier Inc., 70 F. Supp. 3d 1058 (N.D. Cal. 2014)(Whyte, J.)("Cogent Medicine"), the defendants argued that a patent embodied "the abstract idea of providing users with a personal library interface containing medical literature." 70 F. Supp. 3d at 1063. The plaintiff proposed a far narrower definition. See 70 F. Supp. 3d at 1063. The Honorable Ronald White, United States District Judge for the Northern District of California, rejected these proposals and adopted the far broader abstract idea of "maintaining and searching a library of information." 70 F. Supp. 3d at 1063. It invalidated the patents, explaining that they were "the equivalent of human mental work." 70 F. Supp. 3d at 1065. A

Alice has had an extraordinary impact on patent litigation. See Kenneth Adamo, Comment in Where Do We Stand One Year After Alice?, Law360, June 17, 2015, http://www.law360.com/articles/668773/where-do-we-stand-one-year-after-alice ("No U.S. Supreme Court patent case has ever had so large an effect in so short a time as Alice Corp. Pty. Ltd. v. CLS Bank Int'l."); Michael Renaud, Courtney Quish, Sean Casey, & Matthew Karambelas, Patentability of Software Post-Alice: How Do Courts Determine Whether an Idea is Abstract?, Mintz Levin Intellectual Property Advisory, January 12, 2015 ("While software has not fared well in courts following Alice, there have been cases upholding software patents."); Robert R. Sachs, Two Years After Alice: A Survey of the Impact of a "Minor Case", Bilskiblog, Fenwick & West, June 16, 2016, http://www.bilskiblog.com/blog/2016/06/two-years-after-alice-a-survey-of-the-impact-of-a-minor-case.html#_ftnref16 (tracking patent eligibility decisions per month after Alice); Dugan, Ben, Estimating the Impact of Alice v. CLS Bank Based on a Statistical Analysis of Patent Office Subject Matter Rejections, February 23, 2016, http://ssrn.com/abstract=2730803 ("[I]t is highly likely that well over a hundred thousand issued patents have been invalidated by the Supreme Court's recent focus on, and resulting reduction in, the scope of subject matter that is eligible for patenting."). The great majority of the Federal Circuit's post-Alice opinions on § 101 have affirmed district courts' decisions invalidating patents on subject-matter eligibility grounds.[18] Only a small number of these opinions have reversed determinations that patents were not subject-matter eligible.[19]

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court's choice to describe a patent's idea as simple or complex, in short, may determine its validity.

[18]See buySAFE, 765 F.3d at 1355 ("The claims are squarely about creating a contractual relationship -- a 'transaction performance guaranty' -- that is beyond question of ancient lineage."); Content Extraction, 776 F.3d at 1349 ("[N]one of CET's claims amount to 'significantly more' than the abstract idea of extracting and storing data from hard copy

The Federal Circuit has attempted to provide guidance on the Alice test in this developing and unstable environment. It recently addressed Step 1 in Enfish. See 822 F.3d at 1335. In that case, a software developer corporation patented an "innovative logical model for a computer database" that, "[c]ontrary to conventional logical models . . . includes all data entities in a single

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documents using generic scanning and processing technology."); Digitech Image Techs., LLC v. Elecs. for Imaging, Inc., 758 F.3d 1344, 1351 (Fed. Cir. 2014)(invalidating "device profile" claims and method claims); Planet Bingo, LLC v. VKGS LLC, 576 F. App'x 1005, 1008 (Fed. Cir. 2014)(unpublished)("Planet Bingo")(rejecting claims that "recite methods and systems for managing a game of Bingo")(internal quotation omitted); Ultramercial IV, 772 F.3d at 717; Lendingtree, LLC v. Zillow, Inc., No. 2014-1435, 2016 WL 3974203, at *6 (Fed. Cir. July 25, 2016); Shortridge v. Found. Constr. Payroll Serv., LLC, No. 2015-1898, 2016 WL 3742816, at *1 (Fed. Cir. July 13, 2016); In re TLI Comme'ns LLC Patent Litig., 823 F.3d at 613 ("[T]he claims' recitation of a 'telephone unit,' a 'server', an 'image analysis unit,' and a 'control unit' fail to add an inventive concept sufficient to bring the abstract idea into the realm of patentability."); In re Brown, No. 2015-1852, 2016 WL 1612776, at *2 (Fed. Cir. April 22, 2016)(per curiam)("While it is true that a hair cut would not result without practicing the final step of cutting hair, step (e) merely instructs one to apply the abstract idea discussed above with scissors. Such a limitation is not the type of additional feature *Alice* envisioned as imparting patent eligibility."); In re Smith, 815 F.3d 816, 818 (Fed. Cir. 2016)("Applicants' claims, directed to rules for conducting a wagering game, compare to other 'fundamental economic practice[s]' found abstract by the Supreme Court."); Mortgage Grader, Inc. v. First Choice Loan Servs. Inc., 811 F.3d 1314, 1325 (Fed. Cir. 2016); Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App'x 914, 919 (Fed. Cir. 2015)(rejecting claims covering testing a vehicle's operator for impairments); Versata Dev. Grp., Inc. v. SAP Am., Inc., 793 F.3d 1306, 1331 (Fed. Cir. 2015)("Versata's concept of organizational hierarchies for products and customers is abstract because it represents a disembodied concept, a basic building block of human ingenuity -- it is little more than determining a price, essentially a method of calculating."); Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d at 1367; Internet Patents Corp. v. Active Network, Inc., 790 F.3d 1343, 1349 (Fed. Cir. 2015); OIP Techs., Inc. v. Amazon.com, Inc., 788 F.3d at 1362 (rejecting claims covering a system of pricing a product for sale); Allvoice Developments US, LLC v. Microsoft Corp., 612 F. App'x 1009, 1018 (Fed. Cir. 2015)(unpublished); Content Extraction, 776 F.3d at 1347 (holding that the recitation of a scanner did not save claims directed to the "concept of data collection, recognition, and storage"); In re BRCA1- & BRCA2-Based Hereditary Cancer Test Patent Litig., 774 F.3d 755, 764 (Fed. Cir. 2014).

[19]Bascom, 2016 WL 3514158, at *1 ("BASCOM has alleged that the claims of the '606 patent contain an "inventive concept" in their ordered combination of limitations sufficient to satisfy the second step of the Supreme Court's *Alice* test."); Enfish, 822 F.3d at 1336; DDR Holdings, 773 F.3d 1245 (Fed. Cir. 2014)(concluding that a patent's claims passed Step 2 of the Alice test).

table, with column definitions provided by rows in that same table." 822 F.3d at 1330. This "self-referential" model could search and store data more effectively, and allowed for more flexibility in designing a database. 822 F.3d at 1333. The software developer brought a patent infringement action against the Microsoft Corporation, arguing that one of Microsoft's products created and manipulated self-referential tables. See 822 F.3d at 1333. The district court granted summary judgment in Microsoft Corporation's favor, concluding that "that the claims were directed to the abstract idea of 'storing, organizing, and retrieving memory in a logical table' or, more simply, 'the concept of organizing information using tabular formats.'" 822 F.3d at 1337 (quoting Enfish, LLC v. Microsoft Corp., 56 F. Supp. 3d 1167, 1176 (C.D. Cal. 2014)(Pfaelzer, J.)).

The Federal Circuit seized the opportunity to discuss Alice's Step 1. See Enfish, 822 F.3d at 1334. It first explained:

> The Supreme Court has not established a definitive rule to determine what constitutes an "abstract idea" sufficient to satisfy the first step of the *Mayo/Alice* inquiry. Rather, both this court and the Supreme Court have found it sufficient to compare claims at issue to those claims already found to be directed to an abstract idea in previous cases.

Enfish, 822 F.3d at 1334 (citation omitted). It emphasized, however, that "the first step of the inquiry is a meaningful one, i.e., that a substantial class of claims are *not* directed to a patent-ineligible concept." 822 F.3d at 1335 (emphasis in original). It concluded that the first step "cannot simply ask whether the claims *involve* a patent-ineligible concept, because essentially every routinely patent-eligible claim involving physical products and actions *involves* a law of nature and/or natural phenomenon -- after all, they take place in the physical world." 822 F.3d at 1335 (emphasis in original). Instead, it instructed district courts to apply "a stage-one filter to claims, considered in light of the specification, based on whether 'their character as a whole is

directed to excluded subject matter.'" 822 F.3d at 1335 (quoting Internet Patents, 790 F.3d at 1346). It added that not all improvements in computer-related technology, including software innovations, are abstract and that courts could address them in Step 1. See Enfish, 822 F.3d at 1335 (citing "a chip architecture" and "an LED display"[20] as examples of non-abstract improvements in computer-related technology). The Federal Circuit then analyzed the patents before it:

> [T]he first step in the *Alice* inquiry in this case asks whether the focus of the claims is on the specific asserted improvement in computer capabilities (i.e., the self-referential table for a computer database) or, instead, on a process that qualifies as an "abstract idea" for which computers are invoked merely as a tool. As noted *infra,* in *Bilski* and *Alice* and virtually all of the computer-related § 101 cases we have issued in light of those Supreme Court decisions, it was clear that the claims were of the latter type -- requiring that the analysis proceed to the second step of the *Alice* inquiry, which asks if nevertheless there is some inventive concept in the application of the abstract idea. *See Alice,* 134 S.Ct. at 2355, 2357-59. In this case, however, the plain focus of the claims is on an improvement to computer functionality itself, not on economic or other tasks for which a computer is used in its ordinary capacity.

Enfish, 822 F.3d at 1335-36. It noted that: (i) the claims were not directed "to *any* form of storing tabular data, but instead are specifically directed to a *self-referential* table for a computer database"; (ii) the self-referential table functioned differently from other database structures; (iii) the self-referential table offered significant and unique benefits, such as faster search times. 822 F.3d at 1337. That the claims could be run on a general purpose computer, it said, did not doom them. See 822 F.3d at 1338 (explaining that the claims, unlike the claims in other cases, were directed to an improvement in a computer's functioning and did not add conventional computer components to existing business practices). The claims' failure to reference physical components was similarly non-dispositive. See 822 F.3d at 1339 ("To hold otherwise risks

[20]An LED, or "light emitting diode" display, "is a flat panel that uses light emitting diodes as the video display." What is an LED Display?, Future Electronics, available at http://www.futureelectronics.com/en/optoelectronics/led-displays.aspx.

resurrecting a bright-line machine-or-transformation test . . . or creating a categorical ban on software patents."). The Federal Circuit concluded that it was "not faced with a situation where general-purpose computer components are added post-hoc to a fundamental economic practice or mathematical equation. Rather, the claims are directed to a specific implementation of a solution to a problem in the software arts." 822 F.3d at 1339. It thus held that the relevant claims were patent-eligible without proceeding to Step 2. See 822 F.3d at 1339.

The Federal Circuit has provided additional guidance on the ideas that may be subject-matter eligible. First, mathematical algorithms are ineligible, even if they are executed on a generic computer. See DDR Holdings, 773 F.3d at 1256 (citing Gottschalk v. Benson, 409 U.S. 63, 72 (1972)). Second, certain fundamental or conventional economic and business practices are ineligible. These include, among other things: (i) hedging, see Alice, 134 S.Ct. at 2356; (ii) treating advertising as a currency, see Ultramercial IV, 772 F.3d at 717; (iii) creating a "transaction performance guaranty" using a computer, buySAFE, Inc. v. Google, Inc., 765 F.3d 1350, 1355 (Fed. Cir. 2014)("buySAFE"); (iv) "handling insurance-related information," Accenture Global Services, GmbH v. Guidewire Software, Inc., 728 F.3d 1336, 1344 (Fed. Cir. 2013)("Accenture"); and (v) "managing a stable value protected life insurance policy," Bancorp Services., L.L.C. v. Sun Life Assurance Company of Canada (U.S.), 687 F.3d 1266, 1278 (Fed. Cir. 2012)("Bancorp").

The Federal Circuit addressed the second step in DDR Holdings. In that case, the plaintiff/patentee secured a patent for a system to prevent online shoppers from following a link from one merchant's website to another merchant's website, thereby costing the first merchant significant business. See 773 F.3d at 1257. The system, which creates a web page to imitate the second merchant's website: "1) incorporates 'look and feel' elements from the host website, and

2) provides visitors with the opportunity to purchase products from the third-party merchant without actually entering that merchant's website." 773 F.3d at 1258.

The Federal Circuit noted, at Step 1, that "identifying the precise nature of the abstract idea is not as straightforward as in *Alice* or some of our other recent abstract idea cases." 773 F.3d at 1257. It bypassed the issue by determining that, "under any of these characterizations of the abstract idea, the '399 patent's claims satisfy *Mayo/Alice* step two." 773 F.3d at 1257. It then addressed Step 2. See 773 F.3d at 1257. It first explained that the relevant claims were different from claims that merely involve both a computer and the Internet:

> [T]hese claims stand apart because they do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet. Instead, the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.

773 F.3d at 1257 (emphasis added). It dismissed the defendants' argument that the claims were analogous to "a warehouse store that contains a kiosk for selling a third-party partner's cruise vacation packages," explaining that a customer in a warehouse is not "suddenly and completely transported outside the warehouse store and relocated to a separate physical venue associated with the third-party." 773 F.3d at 1258. The claims, it explained, would allow online merchants to retain control over their customers, thus solving a problem that the Internet's unique nature causes. See 773 F.3d at 1258.

The Federal Circuit distinguished the claims from the claims in Ultramercial IV, noting "that not all claims purporting to address Internet-centric challenges are eligible for patent." 773 F.3d at 1258. It continued:

> The '399 patent's claims are different enough in substance from those in *Ultramercial* because they do not broadly and generically claim "use of the Internet" to perform an abstract business practice (with insignificant added activity). Unlike the claims in *Ultramercial,* the claims at issue here specify how

> interactions with the Internet are manipulated to yield a desired result -- a result that overrides the routine and conventional sequence of events ordinarily triggered by the click of a hyperlink. Instead of the computer network operating in its normal, expected manner by sending the website visitor to the third-party website that appears to be connected with the clicked advertisement, the claimed system generates and directs the visitor to the above-described hybrid web page that presents product information from the third-party and visual "look and feel" elements from the host website. When the limitations of the '399 patent's asserted claims are taken together as an ordered combination, the claims recite an invention that is not merely the routine or conventional use of the Internet.

DDR Holdings, 773 F.3d at 1258-59. It added that the claims did not preempt every technique or application of increasing sales by making two websites appear similar. See 773 F.3d at 1259. The Federal Circuit concluded:

> To be sure, the '399 patent's claims do not recite an invention as technologically complex as an improved, particularized method of digital data compression. But nor do they recite a commonplace business method aimed at processing business information, applying a known business process to the particular technological environment of the Internet, or creating or altering contractual relations using generic computer functions and conventional network operations, such as the claims in *Alice, Ultramercial, buySAFE, Accenture*, and *Bancorp.*

DDR Holdings, 773 F.3d at 1259.

Many of the other cases discussing Step 2 have distinguished their claims from the claims in DDR Holdings. In Bascom, the patentee/plaintiff secured a patent on a system located on an Internet Service Provider's servers that allowed users, such as parents or employers, to filter Internet content on an individual basis. See 2016 WL 3514158, at *2. The system, it said, prevented computer-literate users from circumventing blocks, did not require installation on individual computers, did not require different software for different computers, and could be easily updated to filter new websites with objectionable content. See 2016 WL 3514158, at *2. AT&T, the alleged infringer, argued that these claims "were directed to the abstract idea of 'filtering content,' 'filtering Internet content,' or 'determining who gets to see what,' each of which is a well-known 'method of organizing human activity' like the intermediated settlement

concept that was held to be an abstract idea in *Alice*." 2016 WL 3514158, at *3. It "analogized the idea of filtering content to a parent or librarian forbidding children from reading certain books[.]" 2016 WL 3514158, at *3.

The Federal Circuit first concluded that the claims were "directed to filtering content on the Internet." 2016 WL 3514158, at *5. It described this concept as "an abstract idea because it is a longstanding, well-known method of organizing human behavior, similar to concepts previously found to be abstract." 2016 WL 3514158, at *5. It allowed that the patentee had not invented local computers, ISP servers,[21] network accounts, or filtering. See 2016 WL 3514158, at *6. It nonetheless held that the ordered combination of limitations created an inventive concept -- "the installation of a filtering tool at a specific location, remote from the end-users, with customizable filtering features specific to each end user." 2016 WL 3514158, at *6. It explained that the claims did not "merely recite the abstract idea of filtering content along with the requirement to perform it on the Internet" or "a set of generic computer components." 2016 WL 3514158, at *7. Instead of preempting all ways of filtering content on the internet, the claims recited "a specific, discrete implementation of the abstract idea of filtering content." 2016 WL 3514158, at *7. Because the claimed invention was a "software-based invention[] that improve[s] the performance of the computer system itself," it was similar to the claims in DDR Holdings. 2016 WL 3514158, at *7 (citing Alice, 134 S. Ct. at 2351).

The Federal Circuit reached the opposite conclusion in In re TLI Communications LLC Patent Litigation. See 823 F.3d at 613. The patentee/plaintiff there secured a patent for a method and system of taking, transmitting, and organizing digital images "simply, fast and in

[21] An ISP is an Internet Service Provider, such as Comcast. See Brian Fung, The Copyright Case that Should Worry All Internet Providers, The Washington Post (August 12, 2016), available at https://www.washingtonpost.com/news/the-switch/wp/2016/08/12/the-copyright-case-that-should-worry-all-internet-providers/.

such way that the information therefore may be easily tracked." 823 F.3d at 610. Specifically, the patent's claims taught the use of classification data, such as dates or timestamps, and referenced a "telephone unit" and a "server." 823 F.3d at 610.

The Federal Circuit concluded that "the claims are directed to the abstract idea of classifying and storing digital images in an organized manner and fail to add an inventive concept sufficient to confer patent eligibility." 823 F.3d at 611. First, it noted that although claims "directed to an improvement to computer functionality" might not be abstract, the claims before it were "directed to the use of conventional or generic technology in a nascent but well-known environment, without any claim that the invention reflects an inventive solution to any problem presented by combining the two." 823 F.3d at 612. The specification did not "describe a new telephone, a new server, or a new physical combination of the two." 823 F.3d at 612. Instead, it discussed its physical components in purely functional terms -- the telephone unit, for example, had "the standard features of a telephone unit" and some features of "a digital photo camera of the type which is known." 823 F.3d at 612. Second, the Federal Circuit rejected the patentee's argument that the physical components, taken together, added an inventive concept to the abstract idea. See 823 F.3d at 615. It explained that the specification recited "abstract functional descriptions devoid of technical explanation as to how to implement the invention." 823 F.3d at 615. It concluded with a comparison to its earlier opinions:

> Just as "[s]teps that do nothing more than spell out what it means to 'apply it on a computer' cannot confer patent-eligibility," *Intellectual Ventures I,* 792 F.3d at 1371–72 (citing *Alice,* 134 S.Ct. at 2359), here, steps that generically spell out what it means to "apply it on a telephone network" also cannot confer patent eligibility.

In re TLI Communications LLC Patent Litigation, 823 F.3d at 615.

ANALYSIS

The Court will grant the Motion and dismiss this case, because Front Row's patents are not subject-matter eligible under 35 U.S.C. § 101. First, the clear-and-convincing evidence standard applies. Second, the Motion is ripe for decision because the parties' claim construction disputes would not change the outcome and the patents themselves contain the necessary background information. Third, the 856 Patent's Claim 15, the 895 Patent's Claim 1, and the 027 Patent's Claim 1 accurately represent Front Row's other claims. Fourth, these claims are directed to patent-ineligible abstract ideas. Fifth, these claims do not disclose inventive concepts sufficient to transform their abstract ideas into patent-eligible inventions. The Court thus grants the Defendants' Motion and dismisses this case with prejudice.

I. THE COURT WILL REQUIRE THE DEFENDANTS TO MEET THE CLEAR-AND-CONVINCING EVIDENCE STANDARD.

The Court concludes that the clear-and-convincing evidence standard of proof applies to the Motion. Front Row argues that a patent infringement defendant must prove any invalidity defense by clear-and-convincing evidence. See Tr. at 119:21-25 (Shore)(citing Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. at 95). The Defendants contend that neither the Supreme Court nor the Federal Circuit has addressed the issue, and that district courts have reached different conclusions. See Tr. at 57:19-24 (Weaver).

In Microsoft Corp. v. I4I Ltd. Partnership, Justice Sotomayor gave an authoritative statement on point, in which Justices Scalia, Kennedy, Ginsburg, Breyer, Alito, and Kagan joined:

> Under § 282 of the Patent Act of 1952, "[a] patent shall be presumed valid" and "[t]he burden of establishing in-validity of a patent or any claim thereof shall rest on the party asserting such invalidity." 35 U.S.C. § 282. We consider whether § 282 requires an invalidity defense to be proved by clear and convincing evidence. We hold that it does.

Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. at 95. The Supreme Court noted that the Federal Circuit had consistently adhered to this interpretation of 35 U.S.C. § 282 for almost thirty years. See Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. at 95 (citing Am. Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350, 1360 (Fed. Cir. 1984)). Justice Breyer authored a separate concurrence, in which Justices Scalia and Alito joined, emphasizing the distinction between questions of fact and questions of law:

> I believe it worth emphasizing that in this area of law as in others the evidentiary standard of proof applies to questions of fact and not to questions of law. *See, e.g.*, *Addington v. Texas*, 441 U.S. 418, 423 [] (1979). Thus a factfinder must use the "clear and convincing" standard where there are disputes about, say, when a product was first sold or whether a prior art reference had been published.

Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. at 114 (Breyer, J., concurring). Justice Breyer added that, "[b]y preventing the 'clear and convincing' standard from roaming outside its fact-related reservation, courts can increase the likelihood that discoveries or inventions will not receive legal protection where none is due." 564 U.S. at 115.

The Federal Circuit attempted to apply the Supreme Court's guidance to § 101 in CLS Bank International v. Alice Corporation Pty., 717 F.3d 1269 (Fed. Cir. 2013)(en banc). The Federal Circuit explained that, "[b]ecause we believe the presumption of validity applies to all challenges to patentability, including those under Section 101 and the exceptions thereto, we find that any attack on an issued patent based on a challenge to the eligibility of the subject matter must be proven by clear and convincing evidence." CLS Bank Int'l v. Alice Corp. Pty., 717 F.3d at 1304-05. It noted that the evidentiary standard was "consistent with the Supreme Court's admonition to cabin the judicially created exceptions to Section 101[.]" 717 F.3d at 1305.

This statement does not, however, settle the issue. The Supreme Court affirmed the Federal Circuit's opinion in CLS Bank International v. Alice Corporation Pty. on other grounds,

and did not mention any evidentiary standard. See Alice, 134 S. Ct. at 2352. The Federal Circuit subsequently applied the clear and convincing standard in Ultramercial III: "[T]he high level of proof applies to eligibility as it does to the separate patentability determinations. Accordingly, any attack on an issued patent based on a challenge to the eligibility of the subject matter must be proven by clear and convincing evidence." Ultramercial III, 722 F.3d at 1342 (citing Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. at 97). The Supreme Court vacated Ultramercial III, however, for reconsideration in light of Alice. See WildTangent, Inc. v. Ultramercial, LLC, 134 S. Ct. at 2870.

District courts have interpreted the recent Supreme Court and Federal Circuit decisions in four primary ways.[22] See 6A-19 Chisum on Patents § 19.02 ("Whether the presumption is primarily a procedural device, merely shifting the burden of proof on issues of fact that are pertinent to a legal conclusion on validity, or a rule of deference to the determination of patentability by the Patent and Trademark Office, is a long-disputed question."). One group of courts has concluded that the clear-and-convincing evidence standard does not apply. These

[22]One district court blamed the split on the Supreme Court and Federal Circuit's lack of guidance:

> This dispute stems in large measure from Justice Breyer's concurrence in *Microsoft v. i4i Ltd. P'Ship,* —— U.S. ——, 131 S.Ct. 2238 [] (2011). There, Justice Breyer noted that the clear and convincing evidence standard "applies to questions of fact and not to questions of law" and "[w]here the ultimate question of patent validity turns on the correct answer to legal questions -- what these subsidiary legal standards mean or how they apply to the facts as given -- *today's strict standard of proof has no application.*" *Id.* at 2253 (emphasis added). Interestingly, no other opinion in *Microsoft* addresses this issue, and neither the Supreme Court nor the Federal Circuit has revisited the standard of proof applicable to § 101 challenges since *Microsoft.* As a result of this deafening silence, district courts, not surprisingly, are split over the standard of proof applicable to § 101 challenges.

In re TLI Commc'ns LLC Patent Litig., 87 F. Supp. 3d 773, 797 (E.D. Va. 2015)(Ellis, J.).

courts note that Ultramercial III no longer has precedential effect because the Supreme Court vacated it. They reason that neither Alice nor Ultramercial IV discussed standards of evidence:

> Notably, the Federal Circuit's opinion on remand made no mention of any presumption of validity attaching in a case under Section 101; nor did it mention a clear and convincing evidence standard. But, in a concurring opinion, Judge Mayer opined that "no presumption of eligibility should attach when assessing whether claims meet the demands of section 101." *Ultramercial [IV]*, 772 F.3d at 720 (Fed. Cir. 2014)(Mayer, J., concurring).

Esoterix Genetic Labs. LLC v. Qiagen Inc., 133 F. Supp. 3d 349, 355 n.4 (D. Mass. 2015)(Burroughs, J.)([I]t is unclear, if there is a presumption of validity or if the clear and convincing evidence standard applies in Section 101 challenges."). See Modern Telecom Sys. LLC v. Earthlink, Inc., No. SA CV 14-0347-DOC, 2015 WL 1239992, at *7 (C.D. Cal. Mar. 17, 2015)(Carter, J.)("Because, ordinarily, no evidence outside the pleadings is considered in resolving a motion to dismiss or a motion for judgment on the pleadings, it makes little sense to apply a 'clear and convincing evidence' standard -- a burden of proof -- to such motions."); TNS Media Research, LLC v. Tivo Research & Analytics, Inc., No. 11 CIV. 4039 (SAS), 2016 WL 817447, at *10 (S.D.N.Y. Feb. 22, 2016)(Scheindlin, J.)("The presumption of validity -- and its concomitant clear and convincing evidence standard -- does not apply to section 101 claims."); Wireless Media Innovations, LLC v. Maher Terminals, LLC, 100 F. Supp. 3d 405, 411 (D.N.J. 2015)(Linares, J.)("With no authoritative law binding the Court as to an applicable standard, the Court adopts Judge Mayer's approach and will not afford Plaintiff's Patents the presumption of subject matter eligibility.").

A second group of courts concludes that Ultramercial III is no longer good law, but agree with its reasoning at the pleading stage. See Genetic Techs. Ltd. v. Bristol-Myers Squibb Co., 72 F. Supp. 3d 521, 527 (D. Del. 2014)(Stark, J.), aff'd sub nom. Genetic Techs. Ltd. v. Merial L.L.C., 818 F.3d 1369 (Fed. Cir. 2016). The Honorable Leonard Stark, Chief United States

District Judge for the District of Delaware, commented in 2014 that "the Court finds the reasoning in *Ultramercial* at least persuasive here insofar as it concerns the procedural mechanics of a § 101 challenge at the 12(b)(6) stage -- particularly the significant burden on a movant given the limited factual record, if any, before the Court." Genetic Techs. Ltd. v. Bristol-Myers Squibb Co., 72 F. Supp. 3d at 527.

A third group of courts follows Justice Breyer's reasoning, applying the clear-and-convincing standard only to factual questions. In Affinity Labs, the district court cited Judge Mayer's concurrence in Ultramercial IV and explained that § 101 "involves a legal analysis as to whether the basic character of the claimed subject matter is patent ineligible and thus largely implicates questions of law." Affinity Labs, 2015 WL 3757497, at *5. It concluded that the clear-and-convincing standard applies only "[t]o the extent that questions of fact exist." 2015 WL 3757497, at *5. See TriPlay, Inc. v. WhatsApp Inc., No. CV 13-1703-LPS, 2015 WL 1927696, at *5 (D. Del. April 28, 2015)(Burke, M.J.)("[E]ven assuming that the 'clear and convincing' evidence standard is applicable to Section 101 challenges, it would apply only to the resolution of factual disputes, not to the resolution of pure issues of law."), report and recommendation adopted in part, rejected in part, No. CV 13-1703-LPS, 2015 WL 4730907 (D. Del. Aug. 10, 2015)(Stark, J.); 01 Communique Lab., Inc. v. Citrix Sys., Inc., 151 F. Supp. 3d 778, 787 (N.D. Ohio 2015)(Lioi, J.)("In this Court's view, the most reasoned approach is to apply the clear and convincing evidentiary standard of proof to invalidity defenses under § 101 to the extent that analysis involves underlying factual issues, but not to the purely legal portion of the § 101 analysis."); The Presumption of Administrative Correctness: The Proper Basis for the Clear and Convincing Evidence Standard, 10 Fed. Circuit Bar Journal 143, 146 (2000)("The

evidentiary standard for establishing patent invalidity can, therefore, relate only to the proof of facts that underlie the ultimate legal presumption of validity.").

A fourth group of courts holds that the clear-and-convincing evidence standard continues to apply to all aspects of § 101 challenges. The Honorable Sharon Coleman, United States District Judge for the Northern District of Illinois, adopted this position in Trading Technologies International, Inc. v. CQG, Inc., No. 05-CV-4811, 2015 WL 774655 (N.D. Ill. Feb. 24, 2015)(Coleman, J.)("Trading Technologies"). Judge Coleman first acknowledged the force of Justice Breyer's reasoning in Microsoft Corp. v. I4I Ltd. Partnership, noting that, "because the section 101 eligibility inquiry is purely a question of law and there is no statutory presumption of eligibility, it should not be subject to the clear and convincing burden of proof." Trading Technologies, 2015 WL 774655, at *3. She nonetheless concluded that the clear-and-convincing evidence standard applies to the subject-matter eligibility question as a whole, because: (i) 35 U.S.C. § 282 requires that patents are presumed valid; (ii) it is "well established that a party seeking to overcome that presumption must do so by clear and convincing evidence"; and (iii) she was "duty-bound to apply the law as enacted by Congress and signed by the President, and in light of the Federal Circuit's interpretation thereof," and the parties did not present any authority eliminating the presumption of validity. 2015 WL 774655, at *3 (citing Nystrom v. TREX Co., 424 F.3d 1136, 1149 (Fed. Cir. 2005)). She held that, "until the Federal Circuit or the United Supreme Court mandates otherwise, [the infringer] must show by clear and convincing evidence that the patents-in-suit claim patent-ineligible subject matter." Trading Technologies, 2015 WL 774655, at *3.

The Honorable Mark Davis, United States District Judge for the Eastern District of Virginia, reached a similar conclusion in CertusView Technologies, LLC v. S & N Locating

Services, LLC, 111 F. Supp. 3d 688 (E.D. Va. 2015)(Davis, J.). Judge Davis explained that he also found Justice Breyer's reasoning more convincing, but explained that he was "duty-bound to apply the law as enacted by Congress and signed by the President, and in light of the Federal Circuit's interpretation thereof." 111 F. Supp. 3d at 707. See Wolf v. Capstone Photography, Inc., No. 2:13-CV-09573, 2014 WL 7639820, at *5 (C.D. Cal. Oct. 28, 2014)(Snyder, J.)("Wolf")("[A] challenger must overcome the presumption that every issued patent is presumed to have been issued validly absent clear and convincing evidence to the contrary.")(internal quotations omitted)); Carfax, Inc. v. Red Mountain Techs., 119 F. Supp. 3d 404, 410 (E.D. Va. 2015)(Lee, J.); Ameritox, Ltd. v. Millennium Health, LLC, 88 F. Supp. 3d 885, 914 (W.D. Wis. 2015)(Conley, J.); Bascom Research, LLC v. LinkedIn, Inc., 77 F. Supp. 3d 940, 945 (N.D. Cal. 2015)(Illston, J.); Enfish, LLC v. Microsoft Corp., 56 F. Supp. 3d 1167, 1170 (C.D. Cal. 2014)(Pfaelzer, J.)("Despite misgivings about the standard's relevance to § 101, the Court must follow binding precedent."); reversed and vacated on other grounds by Enfish, 822 F.3d 1327.

The Court concludes that the fourth approach -- applying the clear-and-convincing standard to both legal and factual determinations -- is correct for two reasons. First, and most importantly, this position is consistent with the limited Supreme Court and Federal Circuit authority on point. The Supreme Court's last decision to address this question held that defenses to patent infringement claims, including § 101, must be proved by clear-and-convincing evidence. See Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. at 95; 69 C.J.S. Patents § 670 ("It is generally the rule in an action for patent infringement that every reasonable doubt should be resolved in favor of the validity of the patent and that the invalidity of the patent should be proved by clear and convincing evidence."). The Federal Circuit's last direct discussion, in Ultramercial III, conformed to this holding. See Ultramercial III, 722 F.3d at 1342. Although

the Supreme Court vacated Ultramercial III in Alice, it did not comment on the standard of evidence or burdens involved in the process. The Federal Circuit has since cited Microsoft in its opinions. See Biosig Instruments, Inc. v. Nautilus, Inc., 783 F.3d 1374, 1377 (Fed. Cir. 2015)("A patent is presumed valid under 35 U.S.C. § 282 and, consistent with that principle, a [fact finder is] instructed to evaluate . . . whether an invalidity defense has been proved by clear and convincing evidence.")(internal quotations omitted)(alteration in original); SSL Servs., LLC v. Citrix Sys., Inc., 769 F.3d 1073, 1089 (Fed. Cir. 2014)("A party must prove an invalidity defense by clear and convincing evidence."); Virnetx, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1323 (Fed. Cir. 2014); Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd., 807 F.3d 1283, 1293 (Fed. Cir. 2015)("The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity, 35 U.S.C. § 282, which the party must prove by clear and convincing evidence.")(quotations omitted).

Courts concluding that the clear-and-convincing standard does not apply at all have not cited sufficient authority to support their statements. Judge Mayer's concurrence in Ultramercial IV -- which reasons that, because the Supreme Court has taken up several § 101 cases without mentioning any presumption of eligibility, there is no such presumption for § 101 and thus no clear-and-convincing standard -- is not sufficient to overcome Supreme Court and Federal Circuit authority directly on point. See Ultramercial IV, 772 F.3d at 720-21.

The Court cannot assume that the Supreme Court will overrule Microsoft Corp. v. I4I Ltd. Partnership. See Rodriguez de Quijas v. Shearson/Am. Exp., Inc., 490 U.S. 477, 484 (1989)("If a precedent of this Court has direct application in a case, yet appears to rest on reasons rejected in some other line of decisions, the Court of Appeals should follow the case which directly controls, leaving to this Court the prerogative of overruling its own decisions.");

Agostini v. Felton, 521 U.S. 203, 237 (1997)("We do not acknowledge, and we do not hold, that other courts should conclude our more recent cases have, by implication, overruled an earlier precedent."). The Defendants have not cited any controlling authority to support their arguments. See CertusView Techs., LLC v. S & N Locating Servs., LLC, 111 F. Supp. 3d at 707 ("[T]he Defendants have not presented any authority indicating that the presumption of validity no longer applies to challenges to a patent's validity under section 101.").

Second, it is difficult to tease out legal and factual issues under § 101. As the Federal Circuit has observed, "the analysis under § 101, while ultimately a legal determination, is rife with underlying factual issues." Ultramercial III, 722 F.3d at 1339. The Supreme Court has recognized that "PTO examiners must make various factual determinations -- for instance, the state of the prior art in the field and the nature of the advancement embodied in the invention." Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. at 96. See id. at 91 ("While the ultimate question of patent validity is one of law, the same factual questions underlying the PTO's original examination of a patent application will also bear on an invalidity defense in an infringement action.")(citations and quotations omitted); Affinity Labs, 109 F. Supp. 3d at 933 ("Although the issue of invalidity under § 101 presents a question of law, the court recognizes that a legal conclusion may contain underlying factual issues.")(quotation omitted). But see TNS Media Research, LLC v. Tivo Research & Analytics, Inc., 2016 WL 817447, at *10 ("[T]his Court's determination of patent-eligibility requires no extraneous information, no factual record -- only the patents themselves."). Requiring infringers to present clear-and-convincing evidence of invalidity under § 101 tends to reinforce § 282's command that "[a] patent shall be presumed valid." 35 U.S.C. § 282.

When a jury takes the Court's jury instructions, and finds that a defendant possessed a firearm, the courts call that issue a question of fact. The Court tells the jury to find that issue beyond a reasonable doubt. While the courts feel comforted saying that the jury decided a factual issue, the jury is deciding whether the defendant violated a federal statute. The Constitution and federal law demand that the jury reach its decision beyond a reasonable doubt. Asking the Court to apply the clear and convincing standard is not a very different task. The Court is basically tasked with being relatively certain that the patent is invalid. Fifty-one percent will not do; it has to be more. It does not have to be beyond a reasonable doubt -- but the evidence has to be clear. The nation's trial judges, of all people, are used to dealing with such evidentiary standards. Applying a clear and convincing standard is also consistent with the Supreme Court's instruction that the lower courts consider the standard of evidence in deciding motions for summary judgment. See Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 254 (1986)(holding that a judge considering a summary judgment motion "must bear in mind the actual quantum and quality of proof necessary to support liability"). Justices Breyer, Scalia, and Alito's separation of legal issues and factual issues in their concurring opinion in Microsoft Corp. v. I4I Ltd. P'ship is not only unnecessary and unreasonable, but also unhelpful. The district courts can handle the task that the Supreme Court gave them in Microsoft Corp. v. I4I Ltd. P'ship, and the district courts should not decline that duty, or ignore the Supreme Court's distinction direction because they pretend to know better than the Supreme Court what the standard should be.

II. THE MOTION IS RIPE FOR DECISION BECAUSE IT DOES NOT REQUIRE CLAIM CONSTRUCTION OR FURTHER FACTUAL DEVELOPMENT.

The Court will decide the Motion without a claim construction hearing because of the parties' limited disputes. The Defendants urge the Court to decide the Motion before any claim

construction or discovery. See Motion at 5. Front Row responds that this action "is only warranted in narrow, exceptional circumstances, none of which Defendants have shown applies here." Response at 22.

The Court may decide the Motion without waiting for a claim construction hearing. "Courts may . . . dispose of patent-infringement claims under § 101 whenever procedurally appropriate." Bascom, 2016 WL 3514158, at *4. See Cyberfone, 558 F. App'x at 992 ("There is no requirement that the district court engage in claim construction before deciding § 101 eligibility."); Genetic Techs. Ltd. v. Merial L.L.C., 818 F.3d 1369, 1374 (Fed. Cir. 2016)("In many cases, too, evaluation of a patent claim's subject matter eligibility under § 101 can proceed even before a formal claim construction."); OIP Techs., Inc. v. Amazon.com, Inc., 788 F.3d at 1364 (resolving § 101 dispute on the pleadings).

Claim construction is unnecessary when "[t]he basic character of the claimed subject matter is readily ascertainable from the face of the patent. Cardpool, Inc. v. Plastic Jungle, Inc., No. C 12-04182 WHA, 2013 WL 245026, at *4 (N.D. Cal. Jan. 22, 2013)(Alsup, J.)("Cardpool"). See Lumen View Tech. LLC v. Findthebest.com, Inc., 984 F. Supp. 2d 189, 205 (S.D.N.Y. 2013)(Cote, J.)("The claimed process elements of Claim 1 are straightforward. No components are opaque such that claim construction would be necessary to flush out its contours."). Courts may also see no need for claim construction where "the claim language is relatively simple and neither party has identified any disputes presently ripe for claim construction." Clear with Computers, LLC v. Altec Indus., Inc., No. 6:14-CV-79, 2015 WL 993392, at *3 (E.D. Tex. Mar. 3, 2015)(Gilstrap, J.).

Claim construction may also be unnecessary where a claim construction hearing would not have any effect on claims' subject-matter eligibility. See DietGoal Innovations LLC v.

Bravo Media LLC, 33 F. Supp. 3d 271, 289 (S.D.N.Y. 2014)(Englemayer, J.)("Nor would claim construction shed light on any dispositive legal issue; the computerized process disclosed in the '516 Patent is invalid under § 101, under any reasonable construction. Claim construction would not assist the Court in resolving the § 101 claim of invalidity."), aff'd, 599 F. App'x 956 (Fed. Cir. 2015). In Content Extraction, for example, the patentee complained that the district court erred "by declaring its claims patent-ineligible under § 101 at the pleading stage without first construing the claims or allowing the parties to conduct fact discovery and submit opinions from experts supporting their claim construction positions." 776 F.3d at 1349. The Federal Circuit rejected this argument, explaining that, "[a]lthough the determination of patent eligibility requires a full understanding of the basic character of the claimed subject matter, claim construction is not an inviolable prerequisite to a validity determination under § 101." Content Extraction, 776 F.3d at 1349. It noted that, "even when construed in a manner most favorable to CET, none of CET's claims amount to 'significantly more' than the abstract idea of extracting and storing data from hard copy documents using generic scanning and processing technology." 776 F.3d at 1349. Courts bypass claim construction to avoid delay on § 101 rulings "while the parties continue to expend significant resources which will not impact or aid the Court in reaching this decision." Clear with Computers, LLC v. Altec Indus., Inc., 2015 WL 993392, at *3.

Section 101 determinations, however, often depend on "the scope and meaning of the claims," which may be resolved through claim construction. Internet Patents, 790 F.3d at 1348. The Federal Circuit has thus noted that "it will ordinarily be desirable -- and often necessary -- to resolve claim construction disputes before a § 101 analysis, for the determination of patent eligibility requires a full understanding of the basic character of the claimed subject matter."

Bancorp, 687 F.3d at 1273-74. See Phoenix Licensing, L.L.C. v. CenturyLink, Inc., No. 2:14-CV-965-JRG-RSP, 2015 WL 5786582, at *3 (E.D. Tex. Sept. 30, 2015)(Gilstrap, J.)("[A] proper analysis under *Mayo* would be premature and improper given the extent of the parties' present claim construction disputes."); StoneEagle, 2015 WL 518852, at *4 ("In this case, the parties dispute the basic character of the claimed subject matter."). In short, "the Federal Circuit seems to have concluded that claim construction is desirable, unless in reviewing the patents at issue, a district court concludes that it isn't." Intellectual Ventures I LLC v. Erie Indem. Co., 134 F. Supp. 3d at 908. See A Pty Ltd. v. HomeAway, Inc., 2015 WL 5883364, at *5 ("District courts are divided on the necessity of claim construction prior to determining the eligibility of patents that rely on computer implementation.").

The Court concludes that the Motion is ripe for decision for three reasons. First, the claims' basic characters are relatively straightforward. Second, the parties have not identified any disputed claim constructions that prevent the Court from addressing the § 101 merits at this stage. Finally, Front Row's alleged factual disputes do not require the Court to make complex factual determinations.

A. THE COURT DOES NOT REQUIRE CLAIM CONSTRUCTION TO UNDERSTAND THE CLAIMS' BASIC CHARACTER.

The claims' basic character is evident from the patents, and there is no need for expert testimony or other extrinsic evidence. Claim construction is unnecessary when "[t]he basic character of the claimed subject matter is readily ascertainable from the face of the patent." Cardpool, 2013 WL 245026, at *4. The Court does not need evidence from outside the pleadings to understand the basic issues here. See StoneEagle, 2015 WL 518852, at *4 (citing expert report, separate patent's prosecution history, and a declaration, all of which were outside the pleadings, in denying motion for judgment as a matter of law). Even if the parties had cited

extensive extrinsic evidence, the Court would not necessarily take it into account. See Cardpool, 2013 WL 245026, at *4 (declining to consider the plaintiff's evidentiary materials, "given the Rule 12 procedural posture").

As discussed in greater detail below, the Court concludes that the 856 Patent's Claim 15 is directed to the idea of sending video of an event to handheld devices over wireless networks. The 460, 184, and 895 Patents are directed toward the same basic concept as the 856 Patent. The 027 Patent is directed to the idea of authorizing handheld devices to receive streaming video based on a user's location.

B. THE PARTIES' CLAIM CONSTRUCTION DISPUTES DO NOT RULE OUT JUDGMENT BEFORE CLAIMS CONSTRUCTION.

Second, the parties' specific claim construction disputes do not prevent the Court from making a determination at this stage.[23] As Front Row acknowledged at the hearing, the

[23]Front Row's argument that it need not present its own set of claim constructions, which relies on a single district court case, does not accurately reflect the law. See Front Row's PowerPoint at 13; Data Distribution Techs., LLC v. BRER Affiliates, Inc., No. CIV. 12-4878 JBS/KMW, 2014 WL 4162765, at *7 (D.N.J. Aug. 19, 2014)(Simandle, J.)("Data Distribution")("Plaintiff has not provided proposed constructions and has no obligation to do so at this time."). The Federal Circuit, and many other district courts, have commented on patentees' failures to provide proposed claim constructions. See Cyberfone, 558 F. App'x at 992 n.1 ("Cyberfone argues that claim construction must precede the § 101 analysis, but does not explain which terms require construction or how the analysis would change. It merely points to claim language that we consider here."); Clear with Computers, LLC v. Altec Indus., Inc., 2015 WL 993392, at *3 ("[N]either party has identified any disputes presently ripe for claim construction."); Uniloc USA, Inc. v. E-MDS, Inc., No. 6:14-CV-00625-RWS, 2015 WL 10791906, at *3 (E.D. Tex. Aug. 19, 2015)(Schroeder, J.)("Were the court to accept Uniloc's conclusory arguments, the Court would endorse a rule that a § 101 motion can only precede claim construction with a patentee's blessing. But there is no such rule."); Boar's Head Corp. v. DirectApps, Inc., No. 2:14-CV-01927-KJM, 2015 WL 4530596, at *7 (E.D. Cal. July 28, 2015)(Mueller, J.)("Although it is defendants' burden to show ineligibility, a court should look to the plaintiff to show some factual dispute requiring claim construction."); DietGoal Innovations LLC v. Bravo Media LLC, 33 F. Supp. 3d 271, 289 (S.D.N.Y. 2014)(Engelmayer, J.)("[T]he claims of the '516 Patent are sufficiently 'straightforward' that formal claim construction is not necessary to understand their content.").

Defendants must show that "no plausible construction of Plaintiff's claims would satisfy the abstractness test or that the constructions most favorable to Plaintiff would not satisfy the test." Front Row's PowerPoint at 27 (quoting Data Distribution, 2014 WL 4162765, at *8)(emphasis added). See Cogent Medicine, 70 F. Supp. 3d at 1065 (invalidating patent "using the constructions most favorable to" the patentee); Intellectual Ventures I LLC v. Erie Indem. Co., 134 F. Supp. 3d at 904 ("The court also dismissed the idea that courts are precluded from considering § 101 challenges at the pleading stage because there has not yet been discovery or claim construction. Rather, courts must simply construe the claims in favor of the plaintiff at the pleading stage to appropriately resolve the issue.")(internal quotations omitted).

Unlike the court in Data Distribution, which acknowledged that "the best way for a court to apply constructions most favorable to the plaintiff is to apply the plaintiff's proposed constructions, the Court need not "presume, *sua sponte,* the constructions that would be most favorable." 2014 WL 4162765, at *8.[24] It can instead adopt Front Row's proposed constructions to evaluate whether its patents are patent-eligible.

#	Claim Term	Patent/Claim	Front Row's Proposed Construction	Defendants' Proposed Construction
1	Venue-based data	895: 1, 8, 15 460: 1, 10, 13 184:1, 12, 20	Multimedia data that includes video and may also include other sports, advertising, or entertainment information	data and information, such as video, audio, advertisements, promotional information, propaganda, historical information, statistics, event scheduling, and so

[24]The Court has the benefit of the parties' proposed claim constructions, because they were preparing for a claims construction hearing at the time that the Court announced its inclination to grant the Motion. See Front Row's Preliminary Claim Constructions and Intrisic & Extrinsic Evidence at 1-8, filed May 13, 2016 (Doc. 307-1)("Front Row's Constructions"); Defendants' Proposed Constructions and Identification of Intrinsic and Extrinsic Evidence at 1-10, filed May 13, 2016 (Doc. 307-2)("Defendants' Constructions").

				forth, associated with a particular venue and generally not retrievable through public networks
2	Processor capable of authenticating/ Processor capable . . . of authenticating	895: 1, 8, 15 460: 13	Plain and ordinary meaning, not §112(6): Processor capable of "performing a process by which subjects, normally users, establish their identity to a system" Alternate §112(6) Construction: Structure: a Processor Function: A process by which subjects, normally users, establish their identity to a system	Defendants contend that this limitation is governed by 112 ¶ 6: Function: authenticating a handheld device Structure: none disclosed, therefore indefinite
3	format suitable for streaming over wireless data networks as streamed data	895: 1, 8, 15 460: 1, 10, 13	Plain and ordinary meaning	Indefinite
4	Streaming	895: 1, 8, 15 460: 1, 10, 13 184: 1, 12, 20 027: 1, 7	Providing a steady flow of data that a user can access as it is transmitted	transmitting data continuously, not as segments for download and storage
5	Streaming video	027: 1, 7	Providing a steady flow of video data that a user can access as it is transmitted	transmitting video data continuously, not as segments for download and storage
6	Wirelessly transmitting said encrypted video packet over an 802.11 wireless local area network to said at least one authorized hand held device said plurality of video perspectives of a venue-based activity from said server	856: 15	Plain and ordinary meaning no construction necessary	Indefinite

7	Hand held device/Handheld device	895: 1, 8, 15 460: 1, 10, 13 184: 1, 12, 20	A wireless device intended to be held in one's hand during use, such as a smart phone, personal digital assistant (PDA), or tablet computing device	a device designed to be carried and used in a person's hand
8	Remote hand held device	895: 1, 4-6, 8, 11-13, 15, 18 460: 1-4, 8, 10-13, 17-19	A wireless device intended to be held in one's hand during use, such as a smart phone, personal digital assistant (PDA), or tablet computing device remote from said server	Indefinite
9	Entertainment venue/venue	895: 1, 8, 15 460: 1, 10, 13 184: 12 856: 15 027: 1, 7	Sports stadiums, arenas, or other entertainment facilities that feature live entertainment in front of an audience	a sports stadium, concert hall, or arena, "entertainment" does not require construction
10	Authenticating/ Authentication	184:1, 2, 12, 14, 20 895: 1, 8, 15 460: 1, 10, 13	A process by which subjects, normally users, establish their identity to a system	verifying the identity of
11	Authentication module	184: 12	Plain and ordinary meaning, not §112(6): Software, hardware, or combination of both that verifies the identity of a client Alternate §112(6) Construction: Structure: software, hardware, or combination of both Function: verifies the identity of a client	Defendants contend this element is governed by 112 ¶ 6. Function: authenticating a handheld device Structure: none provided, therefore indefinite
12	Locations within and remote from said at least	184:1, 12, 20 895: 1, 8, 15	Plain and ordinary meaning: Locations	Indefinite

	one venue/Locations within or remote from said at least one venue/Locations within or remote from said at least one entertainment venue	460: 1, 10, 13	inside or outside of a venue	
13	Instructions	184: 20 460: 1, 10	Front Row does not believe the preamble is limiting and, thus, does not need to be construed. Alternatively, should be construed as its plain and ordinary meaning: computer code that tells a computer to perform an operation	Defendants contend this limitation is governed by 112 ¶ 6: Function: storing, processing, and streaming or transmitting venue-based data; also for authenticating a handheld device Structure: none disclosed, therefore indefinite
14	[At least one] server	460:1, 10, 13 895: 1, 8	Front Row does not believe the preamble is limiting and, thus, does not need to be construed. Alternatively, should be construed as its plain and ordinary meaning: A combination of hardware, software, and stored data on a packet-based network that provides a service to a client	"at least one" – No construction required. Plain and ordinary meaning. "server" -- "a computer that provides a service to a client device"
15	"video captured by more than one video camera"/ "video . . . captured from more than one camera"	895: 1, 8, 15 460: 1, 4, 10, 11, 13, 17, 19 184: 1, 12, 20 856: 15 027: 1, 13	Plain and ordinary meaning: video recorded by multiple cameras	"two or more videos acquired from a particular venue for simultaneous display"

Front Row's Constructions (providing the first four columns); Defendants' Constructions (providing the last column).

Front Row raises three issues relevant to patentability that claim construction could resolve: (i) whether the claims require capturing video of real-life objects; (ii) whether the claims require "transforming images representative of real-world objects into data packets capable of being securely transmitted wirelessly to only authorized recipients on limited types of devices"; and (iii) the proper boundaries of the 027 Patent's location-based limitations. Front Row's PowerPoint at 31. Front Row then lists a large number of claims, explaining only that "[c]onstructions of some or all of the following terms are relevant to this question[.]" Front Row's PowerPoint at 32-36. This sort of conclusory statement does not explain "how the analysis would change" after claim construction. Cyberfone, 558 F. App'x at 992. See Tr. at 174:8-12 (Weaver)("[T]hey showed a laundry list of claim language . . . but they didn't say: If you construe the claim this way, it will change the 101 analysis, and here's how."); Protegrity USA, Inc. v. Netskope, Inc., No. 15-CV-02515-YGR, 2015 WL 6126599, at *3 (N.D. Cal. Oct. 19, 2015)(Rogers, J.)("Protegrity")("[W]here a patentee fails to explain which terms require construction or how the analysis would change were those constructions adopted, the Court may rule on the validity challenge prior to construing claims.")(internal quotations omitted)(emphasis added); Wolf, 2014 WL 7639820, at *6 ("But beyond the conclusory statement that these terms would 'have to be construed in order to determine whether they cover an abstract idea,' plaintiff offers no argument as to how claim construction would aid the court in applying § 101 to these non-technical terms.").

Even accepting Front Row's preferred claim constructions, the Court concludes that the claims would not satisfy § 101's requirements. This problem is particularly obvious with respect

to Front Row's three specific questions. Adopting Front Row's proposed constructions does not clarify "whether the claims require capturing video of real-life objects." Front Row's PowerPoint at 31. The proposed constructions do not even mention this issue. Nor do they strengthen any of Front Row's arguments on the machine or transformation test. Further, interpreting "[l]ocations within and remote from said at least one venue," to mean "[l]ocations inside or outside of a venue," does not expand or shrink any location-based limitations on the 027 Patent. Front Row's Constructions at 6.

On a more general, level, the Court does not see how a decision on any of Front Row's constructions would affect its patents' subject-matter eligibility, because the distinctions between the parties' constructions are insignificant for § 101 purposes. Claim construction is necessary "only where claim construction disputes are relevant to the § 101 question." Eclipse IP LLC v. McKinley Equip. Corp., No. SACV 14-154-GW AJWX, 2014 WL 4407592, at *5 (C.D. Cal. Sept. 4, 2014)(Wu, J.)("Eclipse IP"). See Boar's Head Corp. v. DirectApps, Inc., No. 2:14-CV-01927-KJM, 2015 WL 4530596, at *7 (E.D. Cal. July 28, 2015)(Mueller, J.)("Boar's Head")("Courts that have declined to decide Rule 12 motions prior to engaging in claim construction have found there are possible constructions of key claim terms that, if adopted, could render the claims subject matter eligible."). For example, the distinction between a "process by which subjects, normally users, establish their identity to a system," Front Row's Constructions at 1, and "verifying the identity of" a user, Defendants' Constructions at 7, is unlikely to make a difference to a court "distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts," Alice, 134 S. Ct. at 2355. Cases concluding that claim construction disputes required a hearing involved more stark disputes. In StoneEagle, for example, the Defendants argued that

the patent specification defined "store-valued card" to include physical credit and debit cards. 2015 WL 518852, at *4. The plaintiff countered that the claim applied "only to virtual stored-value cards, not credit or debit cards." 2015 WL 518852, at *4. The Honorable Virginia Covington, United States District Judge for the Middle District of Florida, tied the disputed claims to specific aspects of the patentability inquiry: "At the very least, proper construction of the term 'stored-value card' is necessary prior to an assessment of whether the claims implicate a fundamental economic practice, and whether the claims comprise a sufficiently inventive process." 2015 WL 518852, at *4. The Court cannot soundly conclude that resolution of the disputes listed above will affect whether Front Row's claims implicate any fundamental economic practice, or comprise an inventive concept.

C. FRONT ROW'S ALLEGED FACTUAL DISPUTES DO NOT RULE OUT JUDGMENT BEFORE CLAIMS CONSTRUCTION.

The Court will decide the Motion, despite Front Row's argument that there are unresolved factual disputes, because the relevant findings either are defined in the patents themselves or are the type of findings that courts routinely make when deciding legal questions. Front Row contends that the Motion is "procedurally improper," because it asks the Court to "make findings of fact about the state of the art in 2000 that go far beyond anything contained in the pleadings." Seventh Supplement at 3. It raises six specific examples of disputed factual findings from the Defendants' arguments:

> 1. Since the dawn of television, moreover, broadcasters have captured video in one location and transmitted it wirelessly for display in another location . . . . The television industry has thus employed these basic concepts of video transmission "for some time" and these concepts were "undisputedly well-known' at the time of Plaintiff's claimed invention." [Motion] at 9.
>
> 2. The television industry has done the same for decades with video by recording video and sending it in a format that can be received by different devices, including portable televisions. [Motion] at 10-11.

> 3. [T]he claims rely entirely on generic hardware components and conventional software processes to perform "well-understood, routine, and conventional activities commonly used in the industry." [Motion] at 14.
>
> 4. [E]ach of Plaintiff's claimed components are generic terms for widely understood elements. Each Element, furthermore, is used to perform its generic function -- e.g. the video camera captures video and the wireless network sends data wirelessly. [Motion] at 15.
>
> 5. The generic functions of Plaintiff's software -- "transmitting," "capturing," "acquiring," "authenticating," "receiving," "processing," "accessing," "displaying," -- are basic computing functions "specified at a high level of generality." [Motion] at 16-17.
>
> 6. Plaintiff's patent claims also fail to provide the requisite "inventive concept" because they do not describe the "mechanism" by which these generic functions are performed. [Motion] at 17.

Seventh Supplement at 3-4. Front Row continues:

> None of these "facts" are found in the pleadings and, because this is a motion for judgment on the pleadings, no evidence, such as testimony from an expert about whether the claims only recite generic functions with a description of the "mechanism" those "generic functions are performed," is in the record that would allow the Court to determine the veracity of these factual allegations.

Seventh Supplement at 4. The Defendants assert that: (i) the Court need not make factual findings that the claim elements were well known, because the patents themselves establish the fact; and (ii) there is no need to conduct discovery on the state of the art, because it is irrelevant to the § 101 determination.[25] See Reply at 12. The Court agrees with the Defendants for two primary reasons.

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[25]The Defendants' argument that the claims' novelty -- and thus the state of the art in 2000 -- is irrelevant to the § 101 inquiry raises a confusing area within the law on § 101. Section 101 provides that a person who invents or discovers "any new and useful process" may obtain a patent. 35 U.S.C. § 101 (emphasis added). Section 102 deals with "novelty," attempting to ensure that patents do not issue for inventions that have already been claimed. See 35 U.S.C. § 102. One line of authority holds that courts should not consider novelty at all in their § 101 decisions. The foundational case, Diamond v. Diehr, held that "[t]he 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the

subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." Diamond v. Diehr, 450 U.S. at 190. More recent cases have cited this principle with approval. See Netflix, Inc. v. Rovi Corp., 114 F. Supp. 3d 927, 937 (N.D. Cal. 2015)(Hamilton, J.)("[T]he search for an 'inventive concept' places no importance on the novelty of the abstract idea. A novel abstract idea is still an abstract idea, and is therefore unpatentable.").

Cases attempting to reconcile Diamond v. Diehr and Alice have held that Step 2 is a sort of boundary-drawing exercise, intended to minimize a claim's possible preemptive effect. In HealthTrio, LLC v. Aetna, Inc., No. 12-CV-03229-REB-MJW, 2015 WL 4005985 (D. Colo. June 17, 2015)(Watanabe, M.J.), for example, the Honorable Michael Watanabe, United States Magistrate Judge for the District of Colorado, attempted to define the "inventive concept" that Alice requires. 2015 WL 4005985, at *6. Judge Watanabe concluded that the inventive concept "has more to do with limiting the patent's preemptive scope as it does with the actual innovation." 2015 WL 4005985, at *6. He reasoned that, "[i]n searching for 'an inventive concept,' . . . courts are to focus on whether the claimed application is something more than just a generic application [of] the abstract idea itself -- and not on related concepts that arise later in the patent-validity analysis, like novelty or non-obviousness." 2015 WL 4005985, at *6. Another district court recently rejected an argument based on novelty:

> Defendant's argument, however, treads too closely to allegations of novelty and obviousness. While it may be true that ancient civilizations used . . . movable barriers, that analysis is more appropriately addressed as a question of what constitutes the prior art and whether the '977 Patent claims hold any novelty over the teachings of the prior art.

Chamberlain Grp., Inc. v. Linear LLC, 114 F. Supp. 3d 614, 627 (N.D. Ill. 2015)(St. Eve, J.). In these courts' approach, the inventive concept is a limit that prevents a patent's claims from preempting an entire abstract idea. See Alice, 134 S. Ct. at 2357 ("A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'")(quoting Mayo, 132 S. Ct. at 1294)).

This line of cases, however, is in tension with the language that other courts use in evaluating "inventive concept" arguments. Alice held that "[s]imply appending conventional steps, specified at a high level of generality," is not enough to supply an inventive concept. Alice, 134 S. Ct. at 2357. Yet it is unclear how courts can evaluate whether steps are conventional without implicitly or explicitly discussing their novelty. Several controlling cases have thus incorporated novelty concepts into their analyses. In Ultramercial IV, for example, the Federal Circuit noted that "any novelty in implementation of the idea is a factor to be considered only in the second step of the *Alice* analysis." Ultramercial IV, 772 F.3d at 715. See Neochloris, Inc. v. Emerson Process Mgmt. LLLP, 140 F. Supp. 3d 763, 771 (N.D. Ill. 2015)(Chang, J.)(holding that "novelty" is relevant to the Alice test). The Federal Circuit has also contrasted "traditional" and "inferior" inventions with a "new type of database program," thereby applying some concept of novelty. Enfish, 822 F.3d at 1330, 1337. The Court need not resolve this issue definitively, because: (i) it can draw any necessary factual findings from the patents themselves; and (ii) it can consider general, historical observations in making its decision.

First, the Court will not require extrinsic evidence to make its determination. In Mortgage Grader, Inc. v. First Choice Loan Services, Inc., 811 F.3d 1314 (Fed. Cir. 2016)("Mortgage Grader"), the Federal Circuit affirmed a district court's decision to grant summary judgment against a patentee under § 101. See 811 F.3d at 1325. The patentee argued that the parties' expert declarations and other materials created factual disputes that the jury would have to resolve. See 811 F.3d at 1325. The Federal Circuit rejected this argument, explaining that the district court "did not rely on these materials in its § 101 analysis. Instead, in making its patent-eligibility determination, the district court looked only to the claims and specifications of the patents-in-suit." Mortgage Grader, 811 F.3d at 1325.

The Patents' specifications and claims provide extensive descriptions of the claimed inventions, and define their systems' components. See, e.g., 856 Patent 17:1-15, 17-25 (defining the SS7 signaling standard and the XML standard); 460 Patent 16:16-19 (defining GPRS technology). In short, "the terms that might need to be construed in this case are largely defined in the Patents, and those definitions amount to 'little more than synonyms for generic conventional computer processing steps,' or conventional computer components." Intellectual Ventures I LLC v. Erie Indem. Co., 134 F. Supp. 3d 877, 909 (W.D. Pa. 2015)(Hornak, J.)(quoting Tranxition, Inc. v. Lenovo (U.S.) Inc., No. 3:12-CV-01065-HZ, 2015 WL 4203469, at *12 (D. Or. July 9, 2015)(Hernandez, J.)). Several district courts have relied on the specifications' information. See Whitepages, Inc. v. Isaacs, No. 16-CV-00175-RS, 2016 WL 3971270, at *5 (N.D. Cal. July 25, 2016)(Seeborg, J.)("The factual averments in Greenflight's counterclaim, in combination with the history set out in the specification, adequately afford the requisite level of understanding."); CertusView Techs., LLC v. S & N Locating Servs., LLC, 111 F. Supp. 3d at 704 ("[T]he Court finds that it need not rely on any factual matter other than that

presented in the specifications of the patents-in-suit themselves."). In short, the parties' arguments here "rely largely on facts already in the record," a sign that claim construction is not required. Boar's Head, 2015 WL 4530596, at *7. See id. at *7 ("Courts also have considered the extent to which extrinsic facts may be helpful or relevant in construing the claims, and the substance of the parties' arguments.").

Second, courts routinely make similar findings while evaluating § 101 challenges. See Alice, 134 S. Ct. at 2356 (citing various outside sources, including a law review article and a treatise, to support its conclusion that intermediated settlement is an "abstract idea"); buySAFE, 765 F.3d at 1355 (citing a textbook and concluding that creating a transaction performance guarantee is "beyond question of ancient lineage"). One district court has described these findings as "well-known, general historical observations." Network Apparel Grp., LP v. Airwave Networks Inc., 154 F. Supp. 3d 467 (W.D. Tex. 2015)(Manske, M.J.). See California Institute, 59 F. Supp. 3d at 979 n.6 ("Eligibility questions mostly involve general historical observations, the sort of findings routinely made by courts deciding legal questions."); Affinity Labs, 109 F. Supp. 3d at 926 ("several Federal Circuit cases have made general historical observations in ruling on a 12(b)(6) motion.")(citing buySAFE, 765 F.3d at 1354-55, Ultramercial IV, 772 F.3d at 723 (Mayer, J., concurring), and Content Extraction, 776 F.3d at 1347). But see VS Techs., LLC v. Twitter, Inc., No. 2:11CV43, 2012 WL 1481508, at *4 (E.D. Va. Apr. 27, 2012)(Morgan, J.)("However, Plaintiff ignores the fact that there may be underlying factual questions that the jury must answer in order to reach a conclusion on validity."). The facts that Front Row highlights -- such as whether "broadcasters have captured video in one location and transmitted it wirelessly for display in another location" -- are the general historical observations that courts routinely make in deciding legal questions. Seventh Supplement at 3.

In any case, the Court is willing to conclude, by clear and convincing evidence, that broadcasters have captured and transmitted video "for some time," and that the concepts were "well-known" at the time of Front Row's claimed invention. Seventh Supplement at 3. That the television industry has recorded video and transmitted it in "a format that can be received by different devices, including portable televisions," is similarly not open to reasonable dispute. Seventh Supplement at 4.

Finally, courts regularly decide Front Row's final four questions without holding evidentiary hearings. Front Row's proposed questions include whether the claims rely on "generic" or "conventional" components, whether the claims' functions are specified at a "high level of generality," and whether the claims provide the requisite "inventive concept." Seventh Supplement at 14.[26] Numerous courts have decided these and similar questions before claim construction and without additional evidentiary briefing. See Gametek LLC v. Zynga, Inc., No. CV-13-2546 RS, 2014 WL 1665090, at **5-6 (N.D. Cal. Apr. 25, 2014)(Seeborg, J.)(considering preemption, claim limitations, and well-understood, routine, and conventional activity before granting a motion to dismiss); Wolf v. Capstone Photography, Inc., No. 2:13-CV-09573, 2014 WL 7639820, at *12 (C.D. Cal. Oct. 28, 2014)(Snyder, J.)(describing claims as using "conventional" methods).

[26]Some courts have described these questions as legal conclusions. See California Institute, 59 F. Supp. 3d at 979 ("The parties primarily dispute legal conclusions drawn from undisputed facts, such as the conventionality of claim elements or the relevance of certain claim elements to the § 101 issue."); Boar's Head, 2015 WL 4530596, at *7 ("Although plaintiff presents these issues as 'necessary factual predicates,' they more closely resemble the questions a court must consider in determining a patent's eligibility, that is, questions of law that many courts have decided without claim construction."). As discussed above, the Court concludes that these questions have some factual elements. In any case, the precise characterization here is irrelevant, because courts routinely decide similar issues without evidentiary hearings.

III. THE 856 PATENT'S CLAIM 15, THE 895 PATENT'S CLAIM 1, AND THE 027 PATENT'S CLAIM 1 FAIRLY AND ACCURATELY REPRESENT THE OTHER CLAIMS.

The Court selects the 856 Patent's Claim 15, the 895 Patent's Claim 1, and the 027 Patent's Claim 1 as representative claims. First, district courts may select representative claims despite the parties' disagreement or the number of claims. Second, these claims accurately represent the other claims because they are substantially similar and linked to the same abstract idea. Finally, the dependent claims do not alter the Court's calculus because they make only minor variations to the independent claims.

A. THE COURT MAY SELECT REPRESENTATIVE CLAIMS, DESPITE FRONT ROW'S DISAGREEMENT AND THE NUMBER OF CLAIMS INVOLVED.

The Court concludes that it may identify representative claims here. First, the Court does not require a pretrial agreement or stipulation from Front Row to designate representative claims. In Content Extraction, an infringement defendant selected two of the patentee's claims as representative, arguing that "none of the other claims included anything more than minor changes in format or phrasing." Content Extraction, 776 F.3d at 1346. The patentee did not contest the defendant's argument, and the district court held that the patents claimed ineligible subject matter. See 776 F.3d at 1346. On appeal, the patentee argued that the representative claims were not actually representative. See Third Brief for Appellant at 8-13, filed April 28, 2014 (Doc. 56 in Content Extraction v. Wells Fargo Bank, No. 13-cv-1588 (Fed. Cir. 2014)). The Federal Circuit affirmed the district court's decision:

> The district court, however, correctly determined that addressing each claim of the asserted patents was unnecessary. After conducting its own analysis, the district court determined that PNC is correct that claim 1 of the 'nah 855 patent and claim 1 of the '416 patent are representative, because all the claims are "substantially similar and linked to the same abstract idea." *CET,* 2013 WL 3964909, at *5 (citing *Bilski,* 561 U.S. at 612, 130 S.Ct. 3218). Moreover, CET

> never asserted in its opposition to PNC's motion that the district court should have differentiated any claim from those identified as representative by PNC. Nor did CET identify any other claims as purportedly containing an inventive concept. If CET disagreed with PNC's or the district court's assessment, CET could have identified claims in its opposition brief that it believed would not be fairly represented by claims 1 of the '855 and '416 patents for purposes of PNC's § 101 challenge.

Content Extraction, 776 F.3d at 1348 (emphasis added). Despite the patentee's failure to dispute the representative nature of its claims, the Federal Circuit conducted an independent review, and agreed that "1) the claims of the asserted patents are substantially similar in that they recite little more than the same abstract idea, and 2) claim 1 of the '855 patent and claim 1 of the '416 patent are representative." Content Extraction, 776 F.3d at 1348.

District courts have interpreted Content Extraction in numerous ways. One line of authority, which Front Row urges the Court to follow, allows courts to use representative claims only if the parties have agreed on them in advance. See Tr. at 124:16-125:4 (Shore).[27] Front Row cites to StoneEagle, which relies on a 1984 Federal Circuit case holding that "'a party challenging the validity of a claim, *absent a pretrial agreement or stipulation,* must submit evidence supporting a conclusion of invalidity of *each* claim the challenger seeks to destroy.'" StoneEagle, 2015 WL 518852, at *5 (quoting Shelcore, Inc. v. Durham Indus., Inc., 745 F.2d 621, 625 (Fed. Cir. 1984)("Shelcore")(emphasis in StoneEagle)).

At least two courts have placed the burden on the patentee to point out flaws in proposed representative claims. See Pragmatus Telecom, LLC v. Genesys Telecommunications Labs.,

[27]Front Row's citation to Exergen does not establish a rule requiring the parties' agreement on representative claims. In Exergen, an alleged infringer attempted to apply a rule of patent prosecution -- that "permits a patent application to claim only one 'independent and distinct invention'" -- to a judicial validity determination. 2015 WL 8082402, at *5 (quoting 37 C.F.R. § 1.141). The district court rejected this attempt, explaining that a separate judicial opinion invalidating a single claim in a patent does not automatically invalidate every other claim. See Exergen, 2015 WL 8082402, at *5. The court did not discuss representative claims.

Inc., 114 F. Supp. 3d 192 (D. Del. 2015)(Andrews, J.)("Genesys"), gave a separate interpretation of Content Extraction: "The Federal Circuit has held that the district court is not required to individually address claims not asserted or identified by the non-moving party, so long as the court identifies a representative claim and all the claims are substantially similar and linked to the same abstract idea." 114 F. Supp. 3d at 198 (emphasis added)(quotation omitted). Under this interpretation, the Court cannot select representative claims if Front Row points to specific claims it believes are not represented. See Genesys, 114 F. Supp. 3d at 198. Similarly, in Intellectual Ventures I LLC v. Erie Indemnity Co., the patentee "oppose[d] the designation of representative claims and insist[ed] on a claim by claim, fully *Markman*-ized analysis." 134 F. Supp. 3d at 908. The district court declined, explaining that: (i) the chosen claims were representative, because they were "'substantially similar and linked to the same abstract idea'" as the other independent claims; and (ii) the patentee "failed to identify any other claims that 'purportedly contain an inventive concept.'" 134 F. Supp. 3d at 908 (quoting Content Extraction, 776 F.3d at 1348).

Other courts have placed the burden on the movant, declining to designate representative claims where the movant has not discussed any non-designated claims in detail. The district court adopted this approach in Versata, where the patentee objected to the challenger's proposed representative claims:

> There is no indication that the parties have agreed that the particular claims focused upon are representative for purposes of the Court's Section 101 analysis. And with Defendants having given negligible attention to the remainder of the claims, the Court does not find it wise or appropriate to make a final determination as to the subject matter eligibility of such claims at this time.

Versata, 2015 WL 5768938, at *4.

The Court concludes, however, that Content Extraction permits it to designate representative claims, even absent the parties' agreement and in the face of the patentee's specific objections. First, although Content Extraction mentioned the absence of a dispute at the district court level, it independently "reviewed all the claims of CET's asserted patents" and held that they were "substantially similar in that they recite little more than the same abstract idea." 776 F.3d at 1349. It could have reached the same conclusion regardless of the parties' agreement. Second, Content Extraction is distinguishable from Shelcore. Shelcore, which set out a requirement applicable "at trial," requires either a "pretrial agreement or stipulation." 745 F.2d at 625. Content Extraction took place at a much earlier stage, and involved neither an affirmative agreement nor a stipulation. See Content Extraction, 776 F.3d at 1349. Third, other district courts have cited Content Extraction without mentioning the need for an agreement, stipulation, or acquiescence by either side. See Aatrix Software, Inc. v. Green Shades Software, Inc., No. 3:15-CV-164-HES-MCR, 2016 WL 1375141, at *9 (M.D. Fla. March 30, 2016)(Schlesinger, J.)(applying the Court's interpretation of Content Extraction and independently designating certain claims representative); Zimmers v. Eaton Corp., No. 2:15-CV-2398, 2016 WL 4094870, at *5 (S.D. Ohio Aug. 2, 2016)(Marbley, J.)("[A] district court is not required to individually address claims not asserted or identified by the non-moving party if the court determines that certain claims are representative because they are substantially similar and linked to the same abstract idea."); Multimedia Plus, Inc. v. Playerlync, LLC, No. 14CV8216, 2016 WL 4074439, at *6 (S.D.N.Y. July 29, 2016)(Pauley, J.)(not mentioning pretrial stipulations or agreements on representative claims); Idexx Labs., Inc. v. Charles River Labs., Inc., No. CV 15-668-RGA, 2016 WL 3647971, at *2 (D. Del. July 7, 2016)(Andrews, J.)(same); Becton, Dickinson & Co. v. Baxter Int'l, Inc., 127 F. Supp. 3d 687, 689 n.3 (W.D. Tex.

2015)(Yeakel, J.)("Becton")("Where claims are substantially similar and linked to the same abstract idea, the court may dispose of the other claims in the patent with less detail.")(quotation omitted); Summit 6 LLC v. HTC Corp., No. 7:14-CV-00014-O, 2015 WL 11117867, at *4 (N.D. Tex. May 28, 2015)(O'Connor, J.)("Plaintiff . . . argue[s] that the claims are all presumed to be valid and must each be challenged in the absence of agreed representative claims. However, the Federal Circuit specifically dismissed this argument in *Content Extraction*, 776 F.3d at 1348.").

Finally, a ban on selecting representative claims absent the patentee's agreement would effectively grant the patentee a veto over § 101 determinations. A plaintiff litigating in bad faith, with a very large number of claims at stake, could refuse to agree that any of them were representative, effectively guaranteeing a claim construction hearing and its associated costs to put it in a better settlement position. Like the district court in Uniloc USA, Inc. v. E-MDS, Inc., albeit in a different context, the Court will not "endorse a rule that a § 101 motion can only precede claim construction with a patentee's blessing." 2015 WL 10791906, at *3.

The number of claims does not preclude the use of representative claims here. Front Row contends that "invalidating a large swath of claims without addressing each individual claim is impermissible." Response at 3. Numerous other cases, however, have invalidated large numbers of claims by examining representative claims. See Open Text S.A. v. Box, Inc., 78 F. Supp. 3d 1043, 1044-45 (N.D. Cal. 2015)(Donato, J.)(invalidating five patents based on an analysis of one representative claim); Money Suite Co. v. 21st Century Ins. & Fin. Servs., Inc., No. CV 13-1747-GMS, 2015 WL 436160, at *1 (D. Del. Jan. 27, 2015)(Sleet, J.)(invalidating 887 claims based on a single representative claim).

B. THE COURT'S REPRESENTATIVE CLAIMS FAIRLY AND ACCURATELY REPRESENT THE OTHER CLAIMS.

The Court's representative claims fairly and accurately represent the other claims in this case, because they are "substantially similar" to the other claims and all of the claims are "linked to the same abstract idea." Content Extraction, 776 F.3d at 1348. The Defendants have identified Claim 1 of the 184 Patent and Claim 1 of the 895 Patent as representative claims. See Motion at 8-9; Sixth Supplement at 2. Front Row contends that the Defendants handpicked these two claims and that they are not representative at all. See Seventh Supplement at 2. It cites "additional limitations" which it says are not present in the Defendants' selected claims:

Additional Limitations	Patent/Claim
802.11 wireless standard network	Claims 3, 10, 17 of the '895 patent Claim 6 of the '460 Patent
Cellular telecommunications network	Claims 2, 9, 16 of the '895 patent Claim 5 of the '460 Patent
Touchscreen display	Claim 10 of the '184 Patent Claims 6, 13, 18 of the '895 patent Claim 11, 17, 19 of the '460 Patent
Touch-sensitive display screen	Claim 15 of the '856 Patent
Smartphone/Smart phone	Claim 10 of the '184 Patent Claims 4, 7, 11, 14 of the '895 patent Claim 15 of the '856 Patent Claim 3, 12, 18 of the '460 Patent
Cellular telephone	Claims 9, 18 of the '184 Patent
Tablet computing device	Claims 5, 7, 12, 14 of the '895 patent
Storing subscriber information . . . in a database	Claims 4, 10 of the '027 Patent

Seventh Supplement at 2-3. The Court agrees with the Defendants on the 895 Patent's Claim 1, and will adopt it as representative. The Defendants have proposed that the Court select the 184 Patent's Claim 1 as the representative method claim. See Seventh Supplement at 2. The Court will instead analyze the 856 Patent's fifteenth claim, which appears to include an additional step for "processing" video "into [an] encrypted video data packet." 856 Patent at 26:52-61. Selecting a superficially complex claim will help to ensure that the Court does not overlook any

important elements. The Court will consider the 027 Patent separately, because it is not substantially similar to the representative claims in the 856 and 895 Patents.

The Federal Circuit has not expanded on Content Extraction's test for representative claims. Several opinions have identified representative claims without extensive analysis. See Versata, 793 F.3d at 1312 ("Claim 17 is representative."); In re TLI Comme'ns LLC Patent Litig., 823 F.3d at 610 ("Claim 17 is representative."). It has noted that there may be "no meaningful distinction between the method and system claims or between the independent and dependent claims," where "the system claims recite the same basic process as the method claims, and the dependent claims recite only slight variations of the independent claims." Planet Bingo, 576 F. App'x at 1007. Several district courts have provided similarly limited analysis. See Hewlett Packard Co. v. ServiceNow, Inc., No. 14-CV-00570-BLF, 2015 WL 1133244, at *2 n.3-6 (N.D. Cal. Mar. 10, 2015)(Freeman, J.); Tuxis Techs., LLC v. Amazon.com, Inc., No. CV 13-1771-RGA, 2015 WL 1387815, at *5 (D. Del. Mar. 25, 2015)(Andrews, J.).

Other courts have created guidelines for the Court to follow. In Intellectual Ventures I LLC v. Erie Indemnity Co., for example, the district court explained that "the § 101 analysis 'is the same regardless of claim type, i.e., method claim, system claim, computer readable medium claim, etc.'" 134 F. Supp. 3d at 908 (quoting Trading Technologies, 2015 WL 774655, at *1). Another court has reasoned that, in Alice, Mayo, and Bilski, the Supreme Court held "that various claim types (method, system, etc.) directed to the same invention should rise and fall together." Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 56 F. Supp. 3d 813, 820 (E.D. Va. 2014)(Brinkema, J.). See Bancorp, 687 F.3d at 1277 ("On the facts of this case, we hold that the district court correctly treated the asserted system and medium claims as no different from the asserted method claims for patent eligibility purposes.").

As an initial matter, the Court notes that Front Row's Patents are in the same patent family, involve very similar technology, and share similar patent specifications. Their background descriptions and brief summaries also share many elements. These similarities alone, however, do not permit the Court to designate a representative claim. See Genesys, 114 F. Supp. 3d at 199 ("Defendants have not demonstrated that the eight claims of the '314 patent are representative of the other three patents -- even if they all share a common specification."). The Court will thus analyze the specific claims in greater detail.

1. Claim 15 of the 856 Patent Adequately Represents Most of the Independent System Claims.

The 856 Patent's Claim 15 presents a method claim:

> A method for displaying a particular perspective of a venue-based activity at least one authorized hand held device having a display screen, said method comprising the steps of:
>
> > simultaneously capturing a plurality of video perspectives of a venue-based activity utilizing more than one camera located at a sports and entertainment venue;
> >
> > processing said plurality of video perspectives at a server into encrypted video data packet for display on a touch-sensitive display screen associated with said at least one authorized hand held device provided in the form of at least a smart phone or personal digital assistan[t], said at least one hand held device further comprising at least one 802.11 wireless module for access to a wireless local area network and a cellular communications module for communication with a wireless cellular communications network;
> >
> > wirelessly transmitting said encrypted video packet over an 802.11 wireless local area network to said at least one authorized hand held device said plurality of video perspectives of a venue-based activity from said server;
> >
> > processing said plurality of video perspectives at said at least one authorized hand held device into decrypted video data packet for display on said touch-sensitive display screen associated with said at least one authorized hand held device; and

> displaying a particular video perspective on said touch-sensitive display screen, in response to a user selection of said particular video perspective from among said plurality of video perspectives.

856 Patent at 26:46-27:7. This claim essentially sets out the following method: (i) acquiring data, such as video, at a venue; (ii) authorizing a device to receive the data; (iii) processing the data; (iv) transmitting the data; and (v) displaying the data on a handheld device. See 856 Patent at 26:46-27:7. Comparing the 856 Patent's Claim 15 to the other independent method claims shows their numerous similarities:

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
856:15	A method for displaying a particular perspective of a venue-based activity at least one authorized hand held device having a display screen, said method comprising the steps of: simultaneously **capturing** a plurality of video perspectives of a venue-based activity utilizing more than one camera located at a sports and entertainment venue;	associated with said at least one **authorized** hand held device provided in the form of at least a smart phone or personal digital assistance, said at least one hand held device further comprising at least one 802.11 wireless module for access to a wireless local area network and a cellular communications module for communication with a wireless cellular communications network;	**processing** said plurality of video perspectives at a server into encrypted video data packet for display on a touch-sensitive display screen	**wirelessly transmitting** said encrypted video packet over an 802.11 wireless local area network to said at least one authorized hand held device said plurality of video perspectives of a venue-based activity from said server;	processing said plurality of video perspectives at said at least one authorized hand held device into decrypted video data packet for **display** on said touch-sensitive display screen associated with said at least one authorized hand held device; and **displaying** a particular video perspective on said touch-sensitive display screen, in response to a user selection of said particular video perspective from among said plurality of video perspectives.
184:1	**acquiring** venue-based data via at least one server, said venue-based data comprising more than one video captured by more than one video camera capturing	**authenticating** at least one hand held device for receipt of said venue-based data to said at least one hand held device from said at least one		wirelessly **streaming** said venue-based data from said at least one server to said at least one hand held device through a wireless packet	**accessing** said venue-based data via said at least one hand held device for **display** of said more than one video captured by said more than one video camera capturing said more than one video

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
	video within said at least one venue;	server;		based data network, in response to said authenticating said at least one hand held device, in order to permit said venue-based data to be accessible via said at least one hand held device at locations within and remote from said at least one venue; and	within said at least one venue.
856:1	A method for providing venue-based data to hand held devices, said method comprising the steps of: **capturing** video images from more than one perspective of a venue-based activity using more than one video camera located at a sports and entertainment venue;		providing said video images to a server to **process** said more than one video perspective captured by more than one video camera into venue-based data formatted for wireless transmission via wireless data networks to more than one hand held device, each of said more than one hand held device further comprising at least one of a personal digital assistant and a smart phone, said more than one hand held device including at least one 802.11 wireless module for access to a wireless local area network and	retrieving said venue-based data from said server and wirelessly **transmitting** said venue-based data to at least one hand held device located at said sports and entertainment venue over said wireless local area network and also wirelessly transmitting said venue-based data to at least one hand held device located outside of said sports and entertainment venue over said wireless cellular communications network.	

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
			a cellular communications module for communication with a wireless cellular communications network, said more than one hand held device further comprising a touch-sensitive display screen to simultaneously and singularly display said venue-based data and to accept user input via said touch-sensitive display screen; and		
856:14	**capturing** video images from more than one perspective of a venue-based activity using more than one video camera located at a sports and entertainment venue;		providing said video images to a server to **process** said more than one video perspective captured by more than one video camera into venue-based data formatted for wireless transmission via wireless data networks to more than one hand held device, each of said more than one hand held device further comprising at least one of a personal digital assistant and a smart phone, said more than one hand held device including	wirelessly **transmitting** venue-based data including video captured from multiple perspective by cameras located at said a sports and entertainment venue to at least one hand held device among said more than one hand held device located at said sports and entertainment venue over said wireless local area network from said server; wirelessly transmitting said venue-based data to at least one hand held device among said more	**displaying** at least one video perspective processed as data on said touch-sensitive display screen of said more than one hand held device.

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
			at least one 802.11 wireless module for access to a wireless local area network and a cellular communications module for communication with a wireless cellular communications network, said more than one hand held device further comprising a touch-sensitive display screen to simultaneously and singularly display said venue-based data and to accept user input via said touch-sensitive display screen;	than one hand held device located at or outside of said sports and entertainment venue over said wireless a cellular communications network; and	

856 Patent at 24:39-28:38; 184 Patent at 25:24-26:2 (emphasis added).

After comparing the various independent method claims, the Court concludes that they are substantially similar and directed to the abstract idea of sending video of an event to handheld devices over wireless networks. The first step in all of the claims uses cameras at an entertainment venue to capture video. The second step, which is present in some of the claims, authorizes specific devices to receive the video. The third and fourth steps process the data and wirelessly transmit it to a handheld device. The fifth step accesses the data and displays it on the handheld device.

2. Claim 1 of the 895 Patent Adequately Represents Most of the Independent System Claims.

The 895 Patent's Claim 1 presents a system claim:

> At least one server, comprising:
>
> memory capable of storing entertainment venue-based data comprising video captured of live entertainment occurring in front of a live audience from more than one camera located in at least one entertainment venue;
>
> at least one processor capable of authenticating via a security code at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data;
>
> at least one processor processing the venue-based data including video captured from the more than one camera into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by said at least one remote hand held device; and
>
> at least one port capable of streaming said venue-based data as streamed data from said at least one server so that said entertainment venue-based data may be wirelessly received as said streamed data by at least one remote hand held device authorized to receive said entertainment venue-based data through at least one wireless data communications network, in order to permit said entertainment venue-based data to be accessible wirelessly as said streamed data via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one venue for viewing via said at least one remote hand held device, said video captured from said more than one camera located at said at least one entertainment venue.

895 Patent at 25:41-25:5. This claim essentially describes a server, with: (i) memory for storing video; (ii) a processor to authenticate a hand-held device; (iii) a processor to process the video; and (iv) a port to stream the data to the hand-held device. See 895 Patent at 25:41-25:5. Comparing the 895 Patent's Claim 1 to the other independent system claims shows their numerous similarities:

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
895:1	At least one server, comprising: memory capable of **storing** entertainment venue-based data comprising video captured of live entertainment occurring in front of a live audience from more than one camera located in at least one entertainment venue;	at least one processor capable of **authenticating** via a security code at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data;	at least one processor **processing** the venue-based data including video captured from the more than one camera into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by said at least one remote hand held device; and	at least one port capable of **streaming** said venue-based data as streamed data from said at least one server so that said entertainment venue-based data may be wirelessly received as said streamed data by at least one remote hand held device authorized to receive said entertainment venue-based data through at least one wireless data communications network, in order to permit said entertainment venue-based data to be accessible wirelessly as said streamed data via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one venue	for **viewing** via said at least one remote hand held device, said video captured from said more than one camera located at said at least one entertainment venue.
895:8	At least one server, comprising: memory capable of **storing** entertainment venue-based data that comprises video captured of live entertainment occurring in front of a live audience from more than one camera located in at least one entertainment venue;	at least one processor capable of **authenticating** via a security code at least one remote hand held device to provide at least one user of said at least one remote hand held device	at least one processor **processing** the venue-based data including video captured from the more than one camera into a format suitable for streaming over wireless data networks as streamed	at least one port capable of **streaming** said entertainment venue-based data as streamed data from said at least one server so that said entertainment venue-based data may be wirelessly streamed to at least one remote hand held device	for **viewing** via said at least one remote hand held device, said video captured from said more than one camera located at said at least one entertainment venue.

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
		wireless access to said entertainment venue-based data;	data that is capable of further processing for viewing by said at least one remote hand held device; and	authorized to receive said entertainment venue-based data through at least one wireless data communications network, in order to permit said entertainment venue-based data to be accessible wirelessly as said streamed data via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one entertainment venue	
895:15	A system, comprising: memory capable of **storing** entertainment venue-based data comprising video captured of live entertainment occurring in front of a live audience from more than one camera located in at least one entertainment venue;	at least one processor capable of **authenticating** via a security code at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data;	at least one processor **processing** the venue-based data including video captured from the more than one camera into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by said at least one remote hand held device; and	at least one port capable of **streaming** said entertainment venue-based data as streamed data from said at least one server so that said entertainment venue-based data may be wirelessly received as said streamed data by and/or streamed to at least one remote hand held device authorized to receive said entertainment venue-based data through at least one wireless data communications network, in order to permit said entertainment venue-based data	for **viewing** via said at least one remote hand held device, said video captured from said more than one camera located at said at least one entertainment venue.

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
				to be accessible wirelessly as said streamed data via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one entertainment venue	
460:1	At least one server that includes a computer-readable medium tangibly embodying computer-executable instructions, said computer-executable instructions comprising instructions for: **acquiring** entertainment venue-based data that comprises video of live entertainment occurring in front of a live audience captured from more than one camera located in at least one entertainment venue;	**authenticating** at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data; and	**processing** said entertainment venue-based data including video of live entertainment occurring in front of a live audience captured from the more than one camera located in at least one entertainment venue into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by at least one remote hand held device;	**transmitting** said entertainment venue-based data after processing from said at least one server so that said entertainment venue-based data may be received and further process for viewing by at least one remote hand held device authorized to receive said venue-based data through at least one wireless data communications network, in response to said authenticating of said at least one remote hand held device to wirelessly access said entertainment venue-based data, in order to permit said entertainment venue-based data to be accessible via said at least one remote hand held device by said at least one user of said at	for **viewing** via said at least one remote hand held device.

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
				least one remote hand held device at locations within or remote from said at least one entertainment venue	
460:10	At least one server that includes a computer-readable medium tangibly embodying computer-executable instructions, said computer-executable instructions comprising instructions for: **acquiring** entertainment venue-based data that comprises video of live entertainment occurring in front of a live audience captured from more than one camera located in at least one entertainment venue;	**authenticating** at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data; and	**processing** said entertainment venue-based data including video of live entertainment occurring in front of a live audience captured from the more than one camera located in at least one entertainment venue into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by at least one remote hand held device;	**transmitting** said entertainment venue-based data after processing from said at least one server so that said entertainment venue-based data may be streamed to at least one remote hand held device authorized to receive said venue-based data through at least one wireless data communications network, in response to said authenticating of said at least one remote hand held device to wirelessly access said entertainment venue-based data, in order to permit said entertainment venue-based data to be accessible via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one entertainment venue	for further processing and **viewing** via said at least one remote hand held device.
460:13	At least one server, comprising: memory capable of **storing** entertainment venue-	**authenticating** at least one remote hand held device to	at least one processor capable of **processing**	at least one port capable of **transmitting** said entertainment	**viewing** via said at least one remote hand held device.

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
	based data that comprises video of live entertainment occurring in front of a live audience from more than one camera located in at least one entertainment venue;	provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data; and	said entertainment venue-based data including video of live entertainment occurring in front of a live audience captured from the more than one camera located in at least one entertainment venue into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by at least one remote hand held device,	venue-based data, after its processing into a format suitable for streaming over wireless data networks as streamed data, from said at least one server so that said venue-based data may be received by or streamed to at least one remote hand held device authorized to receive said venue-based data through at least one wireless data communications network, in response to said authenticating of said at least one remote hand held device to wirelessly access said entertainment venue-based data, in order to permit said entertainment venue-based data to be accessible via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one entertainment venue for further processing and	
184:12	A system for wirelessly providing venue-based data to at least one hand held device, said system	at least one **authentication** module for authenticating at least one	at least one server for storing and **processing** venue-based	at least one transmitter for wirelessly **streaming** said venue-based data	for **display** of said more than one video captured by said more than one video camera capturing said more

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
	comprising: at least one entertainment venue including more than one video camera **capturing** more than one video of performers engaged in an entertainment activity within said at least one entertainment venue; at least one server for **storing** and processing venue-based data;	hand held device for authorized acceptance of said venue-based data to said at least one hand held device; and	data;	from said at least one server to said at least one hand held device through a wireless packet based data network, in response to authenticating said at least one hand held device via said at least one authentication module, in order to permit said venue-based data to be accessible via said at least one hand held device at locations within and remote to said at least one venue	than one video within said at least one entertainment venue
856:16	An entertainment venue multimedia system configured with a data processing system and wireless infrastructure for providing venue-based data to authorized hand held devices located within and outside of an entertainment venue via data communication networks including cellular communications and local wireless networking capabilities, said multimedia system comprising: more than one venue-based camera **capturing** a different video perspective within an entertainment venue;		a server receiving and **processing** more than one video perspective received from said more than one venue-based camera;	wireless data communication networks including a wireless local area network and a wireless cellular communications network in communication with said server, said wireless data communication networks accessing and **transmitting** said more than one video perspective from said server to more than one hand held device; and	
184:20	A system for	**authenticating**		wirelessly	**accessing** said venue-

Claims	Capturing/Storing Video	Authorizing a Device	Processing Data	Transmitting Data	Accessing/Displaying Video
	wirelessly providing venue-based data to at least one hand held device, said system comprising: at least one server; a processor and a data bus coupled to said processor; computer-usable medium embodying computer code, said computer-usable medium being coupled to said data bus, said computer program code comprising instructions executable by said processor and configured for: **acquiring** venue-based data via said at least one server, said venue-based data comprising video captured by more than one video camera capturing more than one video within said at least one venue;	at least one hand held device for receipt of said venue-based data to said at least one hand held device from said at least one server;		**streaming** said venue-based data from said at least one server to said at least one hand held device through a wireless packet based data network, in response to said authenticating said at least one hand held device, in order to permit said venue-based data to be accessible via said at least one hand held device at locations within and remote from said at least one venue; and	based data via said at least one hand held device for **display** of said more than one video captured by said more than one video camera capturing said more than one video within said at least one venue.

895 Patent at 25:42-28:28; 460 Patent at 25:39-28:28; 184 Patent at 26:5-28:10 (emphasis added).

After comparing the various independent system claims, the Court concludes that they are substantially similar and directed to the abstract idea of sending video of an event to handheld devices over wireless networks. They list the hardware required to carry out the steps listed in the 856 Patent's Claim 15.

3. Claim 1 of the 027 Patent Adequately Represents the 027 Patent's Independent Claims.

The 027 Patent's Claim 1 presents a method claim:

> A method for authorizing access by a user of at least one service associated with an event at a venue based on a location of said user as determined by information derived from communication between a computing device in the form of a wireless handheld device carried and utilized by said user and assets of a data communications network, said method comprising:
>
> > determining a location of at least one user based on communications of at least one computing device comprised of a wireless handheld device utilized by said at least one user with said data communications network supporting data communications of said at least one computing device;
> >
> > authorizing said at least one computing device to receive said at least one service based on said location as determined by said data communications network, wherein said at least one service includes streaming video accessed from a server wherein streaming video captured by at least one video camera operating within at least one entertainment venue is processed for delivery to subscribers of the at least one service and wherein said authorizing said at least one computing device further comprising preventing said at least one computing device from receiving said at least one service beyond or within a particular geographic area based on said location determination by said data communication network.

027 Patent at 26:8-35. This claim describes a method that: (i) determines a handheld device user's location; and (ii) authorizes devices within a certain area to receive streaming video. See 027 Patent at 26:8-35. Comparing the 027 Patent's Claim 1 to its other independent claims shows their numerous similarities:

Claim	Determining Location	Authorizing Streaming Video Based on Location
027:1	A method for authorizing access by a user of at least one service associated with an event at a venue based on a location of said user as determined by information derived from communication between a computing device in the form of a wireless handheld device carried and utilized by said user and assets of a data communications network, said method comprising: **determining a location** of at least one user based on communications of at least one computing	**authorizing** said at least one computing device to receive said at least one service based on said location as determined by said data communications network, wherein said at least one service includes streaming video accessed from a server wherein streaming video captured by at least one video camera operating within at least one entertainment venue is processed for delivery to subscribers of the at least one service and wherein said authorizing said at least one computing device further

	device comprised of a wireless handheld device utilized by said at least one user with said data communications network supporting data communications of said at least one computing device;	comprising preventing said at least one computing device from receiving said at least one service beyond or within a particular geographic area based on said location determination by said data communication network.
027:7	A system for authorizing access by a user of at least one service associated with an event at a venue based on a location of said user as determined by information derived from communication between a computing device in the form of a wireless handheld device carried and utilized by said user and assets of a data communications network, said system comprising: a processor; a data bus coupled to said processor; and a computer-usable medium embodying computer code, said computer-usable medium being coupled to said data bus, said computer program code comprising instructions executable by said processor and configured for: **determining a location** of at least one user based on communications of at least one computing device comprising a wireless handheld device utilized by said at least one user with said data communications network supporting data communications of said at least one computing device; and	**authorizing** said at least one computing device to receive said at least one service based on said location as determined by said data communications network, wherein said at least one service includes streaming video accessed from a server wherein streaming video captured by at least one video camera operating within at least one entertainment venue is processed for delivery to subscribers of the at least one service and wherein said instructions for authorizing said at least one computing device further comprising instructions for preventing said at least one computing device from receiving said at least one service beyond or within a particular geographic area based on said location determination by said data communication network.
027:13	At least one server for authorizing access by a user of at least one service associated with an event at a venue based on a location of said user as determined by information derived from communication between a computing device in the form of a wireless handheld device carried and utilized by said user and assets of a data communications network, said at least one server comprising: at least one processor capable of **determining a location** of at least one user based on communications of at least one computing device comprising a wireless handheld device utilized by said at least one user with said data communications network supporting data communications of said at least one computing device; and	at least one processor capable of **authorizing** said at least one computing device to receive said at least one service based on said location as determined by said data communications network, wherein said at least one service includes streaming video accessed from a server wherein streaming video captured by at least one video camera operating within at least one entertainment venue is processed for delivery to subscribers of the at least one service and wherein said authorizing said at least one computing device further comprising preventing said at least one computing device from receiving said at least one service beyond or within a particular geographic area based on said location determination by said data communication network.

027 Patent at 26:8-28:46 (emphasis added).

After comparing the various independent system claims, the Court concludes that they are substantially similar and directed to the abstract idea of authorizing handheld devices to receive streaming video based on a user's location.

4. The Representative Claims Also Represent the Dependent Claims.

Many of Front Row's arguments against selecting representative claims rely on limitations recited in the dependent claims. See, e.g., 895 Patent at 26:9-12 ("802.11 wireless standard network"); 895 Patent at 26:6-8 ("cellular telecommunications network"); 895 Patent at 28:18-22 ("touchscreen display"); 895 Patent at 27:6-8 ("tablet computing device"); 460 Patent at 28:20-21 ("Smartphone"); 184 Patent at 25:63-64 ("cellular telephone"). The Honorable Lee Yeakel, United States District Judge for the Western District of Texas, recently dismissed similar claims as an obstacle to selecting a representative claim. See Becton, 127 F. Supp. 3d at 689 n.3. Judge Yeakel explained that, despite the patentee's "arguments to the contrary, the dependent claims of the '887 Patent introduce only slight variations of the independent claims, variations which do not change the validity calculus; thus the court need not consider each claim distinctly." Becton, 127 F. Supp. 3d at 689 n.3. Like the claims in Becton, the additional claims here introduce only slight variations to the representative independent claims. District courts have dismissed similar differences as immaterial. See Intellectual Ventures I LLC v. Erie Indem. Co., 134 F. Supp. 3d at 910 (dismissing "user request," the automatic activation of a discovery agent, and a "processor" as immaterial differences); Listingbook, LLC v. Mkt. Leader, Inc., 144 F. Supp. 3d 777, 789 (M.D.N.C. 2015)(Biggs, J.)("Each of these dependent claims narrows the method of Claim 1 by adding details and functions to improve the information exchange and collaborative process, but none of these claims changes the concept at the core of the claimed method."). Although the dependent claims slightly narrow the representative claims' scope, "while these claims may have a narrower scope than the representative claims, no claim contains an inventive concept that transforms the corresponding claim into a patent-eligible application of the otherwise ineligible abstract idea." Content Extraction, 776 F.3d at 1349 (quotations

omitted). In short, the Court has reviewed the dependent claims, with a focus on Front Row's listed claims, and concludes that none of them are materially distinct from the representative independent claims. See 3 Annotated Patent Digest § 15:49 ("[W]here the patentee fails to argue the validity of a dependent claim separate from an independent claim, the law will presume that the validity of the dependent claim stands or falls with the independent claim.").

IV. FRONT ROW'S CLAIMS ARE DIRECTED TO ABSTRACT IDEAS.

The Defendants contend that Front Row's claims are directed to the abstract ideas of "providing video of an event to viewers" and "allowing access to video based on location." Motion at 2, 22. Front Row responds that the Defendants "oversimplify" and "ignore" significant concrete limitations. Response at 6. The Court has examined Front Row's representative claims to determine whether they are "directed to a patent-ineligible concept." Alice, 134 S. Ct. at 2355. It concludes that Front Row's claims are directed to two abstract ideas: (i) sending video of an event to handheld devices over wireless networks; and (ii) authorizing handheld devices to receive streaming video based on a user's location. See 856 Patent at 26:46-27:7; 895 Patent at 25:41-25:5; 027 Patent at 26:12-35.

There is no clear guide to Alice's Step 1. See Mobile Telecommunications Techs., LLC v. United Parcel Serv., Inc., No. 1:12-CV-3222-AT, 2016 WL 1171191, at *3 (N.D. Ga. Mar. 24, 2016)(Totenberg, J.)("Mobile Telecommunications")("Striking the proper balance in identifying those 'abstract ideas' that are too ephemeral to be patentable is not an easy task, as courts have repeatedly observed."). As the Federal Circuit has explained,

> The Supreme Court has not established a definitive rule to determine what constitutes an "abstract idea" sufficient to satisfy the first step of the *Mayo/Alice* inquiry. Rather, both this court and the Supreme Court have found it sufficient to compare claims at issue to those claims already found to be directed to an abstract idea in previous cases.

Enfish, 822 F.3d at 1334 (citation omitted). Front Row's claims do not fall squarely within any existing cases' facts. Unlike the claims in Gottschalk v. Benson, Front Row's claims do not attempt to patent mathematical algorithms. See Gottschalk v. Benson, 409 U.S. at 65. Nor do they attempt to cover a fundamental business practice, such as hedging, see Alice, 134 S.Ct. at 2356, using advertisements as currency, see Ultramercial IV, 772 F.3d at 717, managing a life insurance policy, see Bancorp, 687 F.3d at 1278, or using a transaction performance guaranty, see buySAFE, 765 F.3d at 1355.[28] The Court will thus compare the claims here to the Federal Circuit's broader statements on Step 1.

First, the Court concludes that its identification of the relevant abstract ideas -- (i) sending video of an event to handheld devices over wireless networks; and (ii) authorizing handheld devices to receive streaming video based on a user's location -- does not oversimplify Front Row's claims. The Supreme Court has instructed district courts to examine the claims "[o]n their face" and determine what they are "drawn to." Alice, 134 S. Ct. at 2356. The Federal Circuit has added that courts should examine claims' "character as a whole." Enfish, 822 F.3d at 1335. See Internet Patents, 790 F.3d at 1348 ("[W]e start by ascertaining the basic character of the subject matter[.]"); Ultramercial IV, 772 F.3d at 715 (describing "the concept embodied by the majority of the limitations"). The Federal Circuit recently drew a line between Step 1 and Step 2:

[28]The Court disagrees, however, with the Defendants' comparison between Front Row's claims and hand held televisions. Although "broadcasters have captured video in one location and transmitted it wirelessly for display in another location" for "decades, at least since the dawn of television," Front Row's claims include features, such as authorizing a specific device to receive video, that are not possible with conventional television. Defendants' PowerPoint at 30. The Defendants' comparison between Front Row's 027 Patent and a newspaper determining "whether a person will receive a newspaper advertisement based on the person's location" is more convincing. Defendants' PowerPoint at 77. See Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d at 1369 ("This sort of information tailoring is "a fundamental . . . practice long prevalent in our system[.]")(quoting Alice, 134 S. Ct. at 2350.).

> [W]e have described the first-stage inquiry as looking at the "focus" of the claims, their "character as a whole," and the second-stage inquiry (where reached) as looking more precisely at what the claim elements add -- specifically, whether, in the Supreme Court's terms, they identify an "inventive concept" in the application of the ineligible matter to which (by assumption at stage two) the claim is directed.

Elec. Power Grp., LLC v. Alstom S.A., No. 2015-1778, 2016 WL 4073318, at *3 (Fed. Cir. Aug. 1, 2016)("Electric Power")(quotations omitted)(quoting Enfish, 822 F.3d at 1335-36).

The Federal Circuit has also, however, cautioned district courts that "describing the claims at such a high level of abstraction and untethered from the language of the claims all but ensures that the exceptions to § 101 swallow the rule." Enfish, 822 F.3d at 1337. The Court concludes that its summaries strike the proper balance, describing the claims' underlying purpose without overgeneralizing their requirements. Front Row's claims do not merely "*involve* a patent-ineligible concept." Enfish, 822 F.3d at 1335 (emphasis in original). They describe two patent-ineligible concepts and not much else. The Federal Circuit has also used less specific definitions. In Intellectual Ventures I LLC v. Capital One Bank (USA), for example, the Federal Circuit concluded that a patent for

> storing, in a database, a profile keyed to a user identity and containing one or more user-selected categories to track transactions associated with said user identity, wherein individual user-selected categories include a user pre-set limit; and causing communication, over a communication medium and to a receiving device, of transaction summary data in the database for at least one of the one or more user-selected categories, said transaction summary data containing said at least one user-selected category's user pre-set limit

was directed to the abstract idea of "budgeting." 792 F.3d at 1367. Similarly, in Ultramercial IV, the Federal Circuit concluded that a patent for "receiving copyrighted media, selecting an ad, offering media in exchange for watching the selected ad, displaying the ad, allowing the consumer access to the media, and receiving payment from the sponsor of the ad," was directed to the abstract idea of "showing an advertisement before delivering free content." Ultramercial

IV, 772 F.3d at 715. Finally, Front Row's own briefing on other motions describes streaming "live video of the band onto my PDA" as "the basic concept behind all the ideas now embodied in Front Row's patent portfolio." Defendants' PowerPoint at 27 (quoting Plaintiff Front Row Technologies, LLC's Motion to Dismiss MLB Advanced Media, L.P.'s Inequitable Conduct Counterclaim at 3, filed November 26, 2013 (Doc. 187)).

Second, Front Row's claims do not amount to "improvements to computer-related technology." Enfish, 822 F.3d at 1335. The Supreme Court first questioned whether claims "purport to improve the functioning of the computer itself or effect an improvement in any other technology or technical field" in Alice. 134 S. Ct. at 2351. Alice applied this test at Step 2, see 134 S. Ct. at 2351, but the Federal Circuit moved it to Step 2 in Enfish, see 822 F.3d at 1335. It provided several examples of possible improvements, including "chip architecture, an LED display," and software creating "non-abstract improvements" in computer technology. Enfish, 822 F.3d at 1335. The self-referential table in Enfish provided numerous benefits, including increased flexibility and faster searches, and required less programmer time and memory than other tables. See 822 F.3d at 1337. Front Row's claimed inventions do not provide any similar benefits. Front Row did not invent streaming video, digital video, a new wireless protocol, or even an improvement to any component. Compare Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc., No. 2015-1570, 2016 WL 3606624, at *4 (Fed. Cir. July 5, 2016)("Rapid Litigation")("Through the recited steps, the patented invention achieves a better way of preserving hepatocytes.") with Electric Power, 2016 WL 4073318, at *4 ("In *Enfish*, we applied the distinction to reject the § 101 challenge at stage one because the claims at issue focused not on asserted advances in uses to which existing computer capabilities could be put, but on a specific improvement -- a particular database technique -- in how computers could carry out one of their basic functions of

storage and retrieval of data."). Its claims do not improve the functioning of any of their generic physical components, such as PDAs or cellular telephones. They do not create any "non-abstract" software improvements, such as faster processing times or flexibility. Enfish, 822 F.3d at 1335. Unlike the claims in Enfish, the "plain focus" of Front Row's claims is on "economic or other tasks for which a computer is used in its ordinary capacity," rather than on an "improvement to computer functionality itself." Enfish, 822 F.3d at 1336. See Electric Power, 2016 WL 4073318, at *4 ("The present case is different [from Enfish]: the focus of the claims is not on such an improvement in computers as tools, but on certain independently abstract ideas that use computers as tools.").

Third, although a human being without a computer cannot perform Front Row's claims, this fact is not dispositive. Courts applying Alice's Step 1 have considered whether the patents claim a method that human beings can perform without a machine. See SiRF Technologies, 601 F.3d at 1333 ("We are not dealing with a situation in which there is a method that can be performed without a machine."); CyberSource Corp. v. Retail Decisions, Inc., 654 F.3d 1366, 1372 (Fed. Cir. 2011)("All of claim 3's method steps can be performed in the human mind, or by a human using a pen and paper."); Content Extraction, 776 F.3d at 1347 ("The concept of data collection, recognition, and storage is undisputedly well-known. Indeed, humans have always performed these functions."); Mortgage Grader, 811 F.3d 1314, 1324 (Fed. Cir. 2016)("The series of steps covered by the asserted claims . . . could all be performed by humans without a computer."). Not all claims that require computer assistance, however, are patent-eligible. See Internet Patents, 790 F.3d at 1348 (invalidating claims directed to "the idea of retaining information in the navigation of online forms"); Cyberfone, 558 F. App'x at 992 ("Although methods that can be performed in the human mind alone are not eligible for patent protection,

CyberSource, 654 F.3d at 1373, the category of patent-ineligible abstract ideas is not limited to methods that can be performed in the human mind.").

Front Row's patents cover methods and systems that cannot be performed with pen and paper, such as capturing and transmitting video. This fact alone does not make its claims concrete and patent-eligible. Front Row's claims are similar to the claims in Affinity Labs,[29] which covered "a means for delivering regionally broadcasted radio or television content to an electronic device located outside a region of the regionally broadcasted content." Affinity Labs, 109 F. Supp. 3d at 919. Like the patentee in Affinity Labs, Front Row defends its claims on the ground that its claims use handheld devices and other specific pieces of hardware. See Response at 6; Affinity Labs, 109 F. Supp. 3d at 924. The Court agrees with the Affinity Labs court that "under this view, it is difficult to foresee any patent that utilizes a computer component classified as abstract." Affinity Labs, 109 F. Supp. 3d at 924.

Fourth, Front Row's citations to Contentguard and SimpleAir do not compel the opposite conclusion. Contentguard, which is currently on appeal to the Federal Circuit, involved a broad patent covering digital rights management[30] techniques. See Contentguard, 142 F. Supp. 3d at 512. The representative claim covered:

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[29]The Court recognizes that some aspects of the Affinity Labs opinion may not survive appellate review. Specifically, the opinion held that Alice's Step 1 could be analyzed using a "quick look" test, waiting until the second step to look at "specific claim elements." Affinity Labs, 109 F. Supp. 3d at 924. It relied on Enfish, LLC v. Microsoft Corp., 56 F. Supp. 3d 1167 (C.D. Cal. 2014)(Pfaelzer, J.), which the Federal Circuit vacated in part in Enfish. See Enfish, 822 F.3d at 1330; Enfish, LLC v. Microsoft Corp., 56 F. Supp. 3d at 1173. Any potential flaws in this part of Affinity Labs, however, do not affect the portions of the opinion on which the Court relies.

[30]Digital rights management ("DRM") is a general term used to describe technology that controls access to copyrighted material using technological means. See Julia Layton, How Digital Rights Management Works, http://computer.howstuffworks.com/drm1.htm.

> A computer-implemented method of distributing digital content to at least one recipient computing device to be rendered by the at least one recipient computing device in accordance with usage rights information, the method comprising:
>
> > determining, by at least one sending computing device, if the at least one recipient computing device is trusted to receive the digital content from the at least one sending computing device;
> >
> > sending the digital content, by the at least one sending computing device, to the at least one recipient computing device only if the at least one recipient computing device has been determined to be trusted to receive the digital content from the at least one sending computing device; and
> >
> > sending usage rights information indicating how the digital content may be rendered by the at least one recipient computing device, the usage rights information being enforceable by the at least on[e] recipient computing device.

Contentguard, 142 F. Supp. 3d at 512-13. Judge Gilstrap concluded that this claim was "directed toward patent-eligible methods and systems of managing digital rights using specific and non-generic 'trusted' devices and systems." Contentguard, 142 F. Supp. 3d at 515. The trusted devices and systems, he explained, are limited to devices that "maintain physical, communications, and behavioral integrity, rather than all devices that are capable to receive content via the internet." 142 F. Supp. 3d at 515. Front Row argues that its patents also limit the handheld devices to devices "capable of receiving streaming video over the internet, rather than all devices capable of receiving content over the Internet." Front Row's PowerPoint at 51. The Court respectfully disagrees with Judge Gilstrap's approach to this claim. It is difficult to imagine any form of DRM not preempted under this vague description of a limiting method for digital content. A developer attempting to create limits on copyrighted content, for example, would likely find the limitation for "physical, communications, and behavioral integrity" prevented the vast majority of possible DRM techniques. Contentguard, 142 F. Supp. 3d at 515.

The Court disagrees with Judge Gilstrap's conclusions in SimpleAir for similar reasons. SimpleAir involved claims "generally concerned with systems and methods for transmitting data to remote computing devices." SimpleAir, 136 F. Supp. 3d at 747. For example, one representative claim covered:

> A system to transmit data from an information source to remote computing devices, the system comprising:
>
> > a central broadcast server configured to receive data from at least one information source and process the received data with at least one parser; an information gateway communicatively coupled to the central broadcast server, the information gateway configured to build data blocks from the parsed data and assign addresses to the data blocks;
> >
> > a transmission gateway communicatively coupled to one or both of the central broadcast server and the information gateway, the transmission gateway configured to prepare the addressed data blocks for transmission to receivers communicatively coupled with the remote computing devices and cause the addressed data blocks to be transmitted to the receivers;
> >
> > a plurality of remote computing devices configured to receive the addressed data blocks transmitted from the transmission gateway utilizing the receivers, wherein the remote computing devices are capable of being notified of the receipt of the transmitted data blocks by the receivers whether the remote computing devices are online or offline from a data channel associated with each remote computing device.

SimpleAir, 136 F. Supp. 3d at 748. Judge Gilstrap concluded that the patents "are not directed toward an abstract idea, because they are directed toward patent-eligible methods and systems of 'using a central broadcast server' to package and transmit 'data from an online information source to remote computing devices.'" SimpleAir, 136 F. Supp. 3d at 750. As with the claim in Contentguard, this claim encompasses a broad swathe of human activity. It effectively claims the idea of packing and transmitting information, because supposedly "key features" -- such as a

"central broadcast server" -- recite components that any similar system would require. SimpleAir, 136 F. Supp. 3d at 750.

Fifth, many of the other district courts which have examined comparable claims have reached the same conclusions. The representative claim in Affinity Labs was similar to the representative claims here:

> A broadcast system, comprising:
>
> > A network based resource maintaining information associated with a network available representation of a regional broadcasting channel that can be selected by a user of a wireless cellular telephone device; and
> >
> > a non-transitory storage medium including an application configured for execution by the wireless cellular telephone device that when executed, enables the wireless cellular telephone device:
> >
> > to present a graphical user interface comprising at least a partial listing of available media sources on a display associated with the wireless cellular telephone device, wherein the listing includes a selectable item that enables user selection of the regional broadcasting channel;
> >
> > to transmit a request for the regional broadcasting channel from the wireless cellular telephone device; and to receive a streaming media signal in the wireless cellular telephone device corresponding to the regional broadcasting channel, wherein the wireless cellular telephone device is outside of a broadcast region of the regional broadcasting channel, wherein the wireless cellular telephone device is configured to receive the application via an over the air download.

Affinity Labs, 109 F. Supp. 3d at 919-20. The claim effectively covered the abstract idea of disseminating regionally broadcasted content to users outside of a region. See 109 F. Supp. 3d at 924. It is very similar to Front Row's representative claims, as it includes a wireless handheld device, a storage medium, and streaming data. See 856 Patent; 895 Patent. The representative claim in Ultramercial IV recited eleven steps, including "receiving" media products from a

content provider, "restricting general public access" to a media product, and "facilitating the display of a sponsor message to the consumer." 772 F.3d at 712. The Federal Circuit held that these steps, which resemble many claim elements in Front Row's representative claims, recited "an abstraction -- an idea, having no particular concrete or tangible form." 772 F.3d at 715. The patentee's recitation of "merely novel or non-routine components to the claimed idea" did not "necessarily turn[] an abstraction into something concrete." 772 F.3d at 715. As in Ultramercial IV, Front Row's recitation of "key limitations" does not change its abstract ideas into patent-eligible processes. Front Row's PowerPoint at 49.

The 027 Patent's Claim 1 is also similar to the claim in Intellectual Ventures I LLC v. Capital One Bank (USA), which recited a method of "tailoring content based on the viewer's location or address." 792 F.3d at 1369. The Federal Circuit held that the claim was directed towards an abstract idea:

> This sort of information tailoring is "a fundamental . . . practice long prevalent in our system . . . ." [Alice, 134 S. Ct. at 2356]. There is no dispute that newspaper inserts had often been tailored based on information known about the customer -- for example, a newspaper might advertise based on the customer's location. Providing this minimal tailoring -- e.g., providing different newspaper inserts based upon the location of the individual -- is an abstract idea.

Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d at 1369. The 027 Patent is directed to the same abstract idea -- restricting content based on a user's location.

V. FRONT ROW'S CLAIMS, CONSIDERED INDIVIDUALLY AND AS AN ORDERED COMBINATION, DO NOT CONTAIN ANY INVENTIVE CONCEPT.

The Court's conclusion that Front Row's claims are directed towards patent-ineligible abstract ideas does not end the inquiry. Alice's Step 2 requires the Court to "determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." Alice, 134 S. Ct. at 2355 (quoting Mayo, 132 S. Ct. at 1297-98). In other words, the Court must

search for an "inventive concept" -- an "element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" Alice, 134 S. Ct. at 2355 (quoting Mayo, 132 S. Ct. at 1294)(brackets in Alice). The Court concludes that Front Row's claims do not contain an inventive concept sufficient to make them patent-eligible.

There is no checklist of claim elements for Step 2, and Front Row's claims again do not fall squarely within the facts of any existing cases. They do not present a solution "necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks." DDR Holdings, 773 F.3d at 1257. Nor do they represent a "software-based invention that improves the performance of the computer system itself." Bascom, 2016 WL 3514158, at *7 (brackets omitted). On the other hand, they do not use the exact phrase "apply it with a computer" that the Supreme Court condemned in Alice. Alice, 134 S. Ct. at 2350. See Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d at 1370 ("Steps that do nothing more than spell out what it means to apply it on a computer cannot confer patent-eligibility.")(internal quotations omitted). As in Step 1, the Court will thus examine other courts' Step 2 analyses to help it determine whether Front Row's claims contain any inventive concepts.

A. THE 856 PATENT'S CLAIM 15 DOES NOT CONTAIN AN INVENTIVE CONCEPT.

The 856 Patent's Claim 15 does not contain any inventive concept for four reasons. First, it adds only generic and conventional elements to the abstract idea of sending video of an event to handheld devices over wireless networks. "[A]ppending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable." Mayo, 132 S. Ct. at 1300. Claim 15 mentions limitations such as a "cellular telecommunications network," a "server," a "touch-sensitive

display screen," and a "802.11 wireless module." 856 Patent at 26:46-27:7. It requires: (i) acquiring data, such as video, at a venue; (ii) authorizing a device to receive the data; (iii) processing the data; (iv) transmitting the data; and (v) displaying the data on a handheld device. See 856 Patent at 26:46-27:7.

None of these limitations are sufficient to make the claim patent-eligible. Its references to authorizing or authenticating data, for example, are not specific and are similar to limitations that other courts have dismissed. See Secure Mail Sols. LLC v. Universal Wilde, Inc., No. CV157562DOCGJSX, 2016 WL 3392414, at *13 (C.D. Cal. Feb. 16, 2016)(Carter, J.)("Additionally, the Court notes that the claims' general language regarding authentication or encoding of data are not sufficiently inventive."); Kinglite Holdings Inc. v. Micro-Star Int'l Co., No. CV1403009JVSPJWX, 2015 WL 6437836, at *10 (C.D. Cal. Oct. 16, 2015)(Selna, J.)("[T]he '304 Patent claims, viewed individually and as an ordered combination, simply instruct the practitioner to implement the abstract idea of authentication with routine, conventional activity on a generic computer."); Network Apparel Grp., LP v. Airwave Networks Inc., 154 F. Supp. 3d 467, 490 (W.D. Tex. 2015)(Manske, M.J.)(describing an authentication step as "a well-understood, routine, conventional activity in the computer networking field that does not make the claim patent-eligible"). Processing data for display is similarly conventional. See CertusView Techs., LLC v. S & N Locating Servs., LLC, 111 F. Supp. 3d 688, 710 (E.D. Va. 2015)(Davis, J.)(invalidating claim as conventional and noting that it "simply involves using generic computer components to perform the conventional computer function of processing data to display an input image on a display device"). Transmitting data, even over a cellular data network, is not unconventional. See Joao Bock Transaction Sys., LLC v. Jack Henry & Associates, Inc., 76 F. Supp. 3d 513, 523 (D. Del. 2014)(Robinson, J.)("Joao Bock").

Second, the 856 Patent's Claim 15 merely "limit[s] an abstract idea to one field of use" and "add[s] token postsolution components [that do] not make the concept patentable." Bilski v. Kappos, 561 U.S. at 612. See Alice, 134 S. Ct. at 2358 ("*Flook* stands for the proposition that the prohibition against patenting abstract ideas cannot be circumvented by attempting to limit the use of [the idea] to a particular technological environment."); Flook, 437 U.S. at 590 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). This claim effectively takes a subject-matter ineligible idea -- the concept of sending video of an event to handheld devices over wireless networks -- and limits it to entertainment venues.[31]

Third, considered "as an ordered combination," Claim 15's elements "add nothing . . . that is not already present when the steps are considered separately." Alice, 134 S. Ct. at 2359. In defining this test, Alice considered whether the relevant claims "purport to improve the functioning of the computer itself or effect an improvement in any other technology or technical field." Alice, 134 S. Ct. at 2359. See Enfish, 822 F.3d at 1339 (recognizing that "an analysis of whether there are arguably concrete improvements in the recited computer technology could take place under step two"). In DDR Holdings, the Federal Circuit recognized that the claims, "taken together as an ordered combination," improved internet shopping by "overcom[ing] a problem specifically arising in the realm of computer networks." DDR Holdings, 773 F.3d at 1265. In Bascom, the Federal Circuit noted that the claims "may be read to improve[] an existing technological process." Bascom, 2016 WL 3514158, at *7 (internal quotations omitted). Front

[31]On a broader level, the Court questions the usefulness of a Step 2 that merely ensures that the patent does not preempt a broad swathe of the abstract idea's possible applications. If Front Row had kept its patents the same, but focused on covering non-venue-based sports events such as the Tour de France, the claim would not be any less of an abstract idea. Moreover, there would be no purpose in forcing defendants to pay claim construction costs to have such patents invalidated.

Row did not invent or even improve the hardware components, general processes, and other concepts on which its claims rely. Taken as a whole, the claims do not create any new innovation, such as an improvement in online shopping, or an improved filter for web browsers.

Fourth, Claim 15 does not pass the machine-or-transformation test. Front Row does not argue that its claims represent a novel machine. See Ultramercial IV, 772 F.3d at 716-17 ("The claims of the '545 Patent, however, are not tied to any particular novel machine or apparatus, only a general purpose computer.")(internal citations omitted). Although a cellular telephone or computer "is a tangible system (in § 101 terms, a 'machine')," if "that were the end of the § 101 inquiry, an applicant could claim any principle of physical or social sciences by reciting a computer system configured to implement the relevant concept." Alice, 134 S. Ct. at 2358. Moreover, "the Internet is not sufficient to save the patent under the machine prong of the machine-or-transformation test." Ultramercial IV, 772 F.3d at 716.

The Court concludes that Claim 15 does not make the required transformation. Front Row accurately notes that the transformation prong does not require any physical transformation. It relies on In re Abele, which it says held that "the electronic transformation of the data itself into a visual depiction in *Abele* was sufficient; the claim was not required to involve any transformation of the underlying physical object that the data represented." Response at 9 (quoting In re Bilski, 545 F.3d at 963)(emphasis added). Other courts have adhered to this general principle. See Prompt Med. Sys., L.P. v. Allscriptsmysis Healthcare Sols., Inc., No. 6:10-CV-71, 2012 WL 678216, at *5 (E.D. Tex. Feb. 13, 2012)(Davis, J.)("The Federal Circuit has explained that the transformation of raw data into a form that represents physical and tangible objects is a patent-eligible transformation of articles."). Front Row proposes two possible transformations:

> Capture and transformation of real world objects (i.e. baseball players at a MLB game) into packeted data capable of being transmitted over a wireless network via the internet to be received only by authenticated devices;
>
> After receipt of the packeted data by authenticated devices, a second transformation into a video of the real world objects on an authenticated device's display that includes a GUI.

Front Row's PowerPoint at 56. Neither of these definitions, however, sufficiently transform the data. Claim 15 does not literally transform "real world objects," such as baseball players, into "packeted data." Front Row's PowerPoint at 56. It instead merely transmits and reproduces captured data, without altering the underlying video. See Ultramercial IV, 772 F.3d at 717 ("Any transformation from the use of computers or the transfer of content between computers is merely what computers do and does not change the analysis."). In In re Abele, on the other hand, the claims took raw data, manipulated it to remove artifacts, and generated an improved scan image. See 684 F.2d at 909. Front Row does not cite any cases holding that merely recording or photographing a physical object transforms it into data. Under such a rule, any patent involving video or imaging would pass the machine-or-transformation test. At least one case, on the other hand, has invalidated claims based on image capture and transmission. See Affinity Labs, 2015 WL 3764356, at *25.

The Court's ruling on the overall Motion would not change even if Claim 15 satisfied the machine-or-transformation test. The machine-or-transformation test is "just an important and useful clue" for "what constitutes a 'process.'" Bilski v. Kappos, 561 U.S. at 603. See DDR Holdings, 773 F.3d at 1256 ("[T]he machine-or-transformation test, by itself, is not sufficient to render a claim patent-eligible, as not all transformations or machine implementations infuse an otherwise ineligible claim with an 'inventive concept.'")(quoting Mayo, 132 S. Ct. at 1301).

Other Federal Circuit opinions do not even discuss the test. See Content Extraction, 776 F.3d at 1348; Planet Bingo, 576 F. App'x at 1008.

Finally, the Court concludes that a separate preemption analysis is unnecessary. Although the preemption concern "undergirds our § 101 jurisprudence," it is not a freestanding test for patent-eligibility. Alice, 134 S. Ct. at 2358. See Rapid Litigation, 2016 WL 3606624, at *7 ([P]re-emption is not the test for determining patent-eligibility[.]"). In Ariosa, for example, the parties disagreed on whether "the principle of preemption" is an independent argument in a § 101 challenge. Ariosa, 788 F.3d at 1378-79. The Federal Circuit explained that it is not:

> The Supreme Court has made clear that the principle of preemption is the basis for the judicial exceptions to patentability. *Alice,* 134 S.Ct. at 2354 ("We have described the concern that drives this exclusionary principal as one of pre-emption"). For this reason, questions on preemption are inherent in and resolved by the § 101 analysis. . . . Where a patent's claims are deemed only to disclose patent ineligible subject matter under the *Mayo* framework, as they are in this case, preemption concerns are fully addressed and made moot.

Ariosa, 788 F.3d at 1379. In any case, Front Row's "token" components preempt a significant set of possible inventions. Bilski v. Kappos, 561 U.S. at 612. That they leave some avenues open is not dispositive. See Ariosa, 788 F.3d at 1379 ("[T]he absence of complete preemption does not demonstrate patent eligibility."); Tenon & Groove, LLC v. Plusgrade S.E.C., No. CV 12-1118-GMS-SRF, 2015 WL 1133213, at *4 (D. Del. Mar. 11, 2015)(Sleet, J.)("Leaving open some avenues with which to practice the underlying idea, however, does not guarantee patent eligibility."). "Instead, the focus is on whether the claim risks '*disproportionately* tying up the use of the underlying' abstract idea." Kaavo Inc. v. Cognizant Tech. Sols. Corp., No. CV 14-1192-LPS-CJB, 2016 WL 476730, at *13 (D. Del. Feb. 5, 2016)(Burke, M.J.)("Kaavo")(quoting Alice, 134 S. Ct. at 2354-55)(emphasis in Kaavo). Front Row's claims include terms with considerable breadth, such as "venue-based activity," which would make it extremely difficult

for any future developer to create an application to stream data from stadiums to mobile telephones. 856 Patent at 24:39. The Court does not "apprehend how slight -- and extremely general -- modifications . . . prevent the claims from monopolizing their underlying abstract ideas." Morsa v. Facebook, Inc., 77 F. Supp. 3d 1007, 1016 (C.D. Cal. 2014)(Staton, J.).

B. THE 895 PATENT'S CLAIM 1 DOES NOT CONTAIN AN INVENTIVE CONCEPT.

The 895 Patent's Claim 1 does not contain any inventive concept. First, Front Row's system claims are substantially similar to its method claims. The 895 Patent's Claim 1 describes a server with: (i) memory for storing video; (ii) a processor to authenticate a hand-held device; (iii) a processor to process the video; and (iv) a port to stream the data to the hand-held device. See 895 Patent at 25:41-25:5. These physical components merely provide a way to carry out the steps that the 856 Patent's Claim 15 lists. See Walker Digital, LLC v. Google, Inc., 66 F. Supp. 3d 501, 511 (D. Del. 2014)(Stark, J.)("Similarly, the system claims recited in claims 23, 24, 27, 32, and 33 merely take the abstract idea of claims 1, 2, 5, 10, and 11 and list generic computer components (processor, memory) to implement the abstract idea."). Both claims are substantially similar and directed to the abstract idea of sending video of an event to handheld devices over wireless networks. In Alice, the Supreme Court noted that "the system claims are no different from the method claims in substance" and held that the system claims were also patent-ineligible under § 101. 134 S. Ct. at 2360. Although the Alice patentee conceded that "its media claims rise or fall with its method claims," 134 S. Ct. at 2360, the Federal Circuit has applied the same rule absent any concessions, see Accenture, 728 F.3d at 1344 ("Because the system claim and method claim contain only minor differences in terminology [but] require performance of the same basic process, they should rise or fall together.")(citations and quotations omitted). As one district court noted,

> [t]he fact that the asserted claims are apparatus claims, not method claims, does not change the court's analysis. Indeed, if that were the case, then "applying a presumptively different approach to system [or apparatus] claims generally would reward precisely the type of clever claim drafting that the Supreme Court has repeatedly instructed [the Court] to ignore."

Joao Bock, 76 F. Supp. 3d at 523 (D. Del. 2014)(quoting CLS Bank Int'l v. Alice Corp. Pty., 717 F.3d at 1289).

Second, the system claims are ineligible even considered separately from the method claims. The 895 Patent mentions a "server," "memory," a "processor," and a "remote hand-held device." 895 Patent at 25:41-25:5. These basic functions are insufficient to establish an inventive concept. In In re TLI Communications LLC Patent Litigation, the Federal Circuit considered a server that "receives data, extract[s] classification information . . . from the received data, and stor[es] the digital images . . . taking into consideration the classification information." In re TLI Commc'ns LLC Patent Litig., 823 F.3d at 614 (quotations omitted). It concluded:

> These steps fall squarely within our precedent finding generic computer components insufficient to add an inventive concept to an otherwise abstract idea. *Alice,* 134 S.Ct. at 2360 ("Nearly every computer will include a 'communications controller' and a 'data storage unit' capable of performing the basic calculation, storage, and transmission functions required by the method claims."); *Content Extraction,* 776 F.3d at 1345, 1348 ("storing information" into memory, and using a computer to "translate the shapes on a physical page into typeface characters," insufficient confer patent eligibility); *Mortg. Grader,* 811 F.3d at 1324-25 (generic computer components such as an "interface," "network," and "database," fail to satisfy the inventive concept requirement); *Intellectual Ventures I,* 792 F.3d at 1368 (a "database" and "a communication medium" "are all generic computer elements"); *BuySAFE v. Google, Inc.,* 765 F.3d 1350, 1355 (Fed. Cir. 2014)("That a computer receives and sends the information over a network -- with no further specification -- is not even arguably inventive.").

In re TLI Commc'ns LLC Patent Litig., 823 F.3d at 614. Front Row argues that the 895 Patent's Claim 1 is different, because it requires more specific and concrete components:

> a wireless communications data network, authentication via a specific security code, at least one remote hand held device, and a processor processing venue-based data including video captured by more than one camera into a format

> suitable for streaming over a wireless data network . . . for viewing by said at least one remote hand held device.

Response at 6-7. These additional components, however, are generic, and the claims use them in conventional ways. As the Supreme Court explained in Alice, certain concrete components -- such as a "data storage unit" or "communications controller" -- may still be "purely functional and generic." Alice, 134 S. Ct. at 2360. See id. at 2351 ("The method claims recite the abstract idea implemented on a generic computer; the system claims recite a handful of generic computer components configured to implement the same idea."). In Content Extraction, for example, the claims mentioned an "automated digitizing unit" and a computer. 776 F.3d at 1348. The Federal Circuit described the components as "generic" and concluded that they held no inventive concept. 776 F.3d at 1348. See Wolf v. Capstone Photography, Inc., No. 2:13-CV-09573, 2014 WL 7639820, at *12 (C.D. Cal. Oct. 28, 2014)(Snyder, J.)("The most specific piece of technology recited by the claims is still generic: a 'component worn by the sporting event participant . . . [that] trigger[s] a camera to take a photograph' by interfacing with 'a sensor' and can include 'a passive component,' a 'bar code,' an 'inductive circuit,' or an 'active component.'"); Intellectual Ventures I LLC v. Manufacturers & Traders Trust Co., 76 F. Supp. 3d at 546 n.5 (holding that references to "a telephone, pager, PDA, or the like" were generic). That the claims discuss a generic cellular telephone rather than a generic computer does not mean that they supply an inventive concept. See Affinity Labs, 109 F. Supp. 3d at 925 ("Claim 1 takes the abstract idea and says 'apply it' to a wireless, cellular telephone device acting as a generic computer."); Joao Bock, 76 F. Supp. 3d at 523 ("The computer components are being employed for basic functions, including storage, transmitting and receiving information[.]").

Front Row's patent specifications also show that these techniques were "well-known at the time of filing." Content Extraction, 776 F.3d at 1348. See, e.g., 388 Patent at 8:50-55

("[T]hose skilled in the art will appreciate that hand held device 11 can be implemented as a specific type of a hand held device, such as a Personal Digital Assistant (PDA), paging device, WAP-enabled mobile phone, and other associated hand held computing devices well known in the art."); 895 Patent at 7:32-37 (using identical phrasing); 388 Patent at 11:28 ("Transmitters are well known in the art[.]"); 895 Patent at 10:3-4 (using identical phrasing); 388 Patent at 11:51-53 ("Those skilled in the art can appreciate that touch screen interfaces are well known in the art and further explanation thereof may be not necessary."); 895 Patent at 10:27-29 (using identical phrasing); 388 Patent at 16:43-45 (discussing Cellular Digital Packet Data networks); 895 Patent at 15:12-14 (using identical phrasing); 895 Patent at 14:59-61 (mentioning Bluetooth technology). The 895 Patent also recognizes conventional security features:

> For example, hand held television[s] are available for receiving public television broadcasts, but the basic technology can be modified on such devices so that they may be adapted to (e.g., proper authentication, filters, security codes, or the like) receive venue-based RF transmissions from at least one venue-based RF source (e.g., a wireless camera, or data from a camera transmitted wirelessly through a transmitter)(emphasis added).

895 Patent at 7:22-39. In short, even Front Row has admitted that its claims' steps "consist of well-understood, routine, conventional activity." Mayo, 132 S. Ct. at 1298. As with the 856 Patent's Claim 15, the 895 Patent's Claim 1 uses generic components to "limit[] an abstract idea to one field of use." Bilski v. Kappos, 561 U.S. at 612.

Further, considering the elements in the 895 Patent's Claim 1 "as an ordered combination" does not reveal any inventive concept. Alice, 134 S. Ct. at 2359. The system has not overcome a problem "specifically arising in the realm of computer networks," DDR Holdings, 773 F.3d at 1265, or improved any "existing technological process," Bascom, 2016 WL 3514158, at *7. Front Row's citation to Messaging Gateway Solutions, LLC v. Amdocs, Inc., No. CV 14-732-RGA, 2015 WL 1744343 (D. Del. Apr. 15, 2015)(Andrews, J.), is

distinguishable. The patent in that case "solved a problem specific to the realm of computer networks in a way that was rooted in computer technology" by translating text messages from cellular telephones into messages that computers can understand. 2015 WL 1744343, at *5. Front Row's claim provides no such benefit.

Finally, the 895 Patent's Claim 1 fails the machine-or-transformation test for the reasons set out above. The system claim recites more hardware components, but they are even less specific than the components in the 856 Patent's Claim 15. As in Ultramercial IV, the components are "not tied to any particular novel machine or apparatus," 772 F.3d at 716-17, but are instead linked to a "server" that contains "processors" and "ports." 895 Patent at 25:41-25:5.

C. THE 027 PATENT'S CLAIM 1 DOES NOT CONTAIN AN INVENTIVE CONCEPT.

The 027 Patent's Claim 1, despite its differences from the other representative claim, does not add any inventive concept. The claim is directed to the abstract idea of authorizing handheld devices to receive streaming video based on a user's location. The method determines a user's location based on a handheld device's communications with a "computing device." 027 Patent at 26:12. It then authorizes the user to receive streaming video from an entertainment video based on his or her location. See 027 Patent at 26:12-35. These steps barely recite any limitations beyond the abstract concept -- they add that the user's location is determined based on communications between a wireless handheld device and a communications network, and that the data consists of streaming video from a video camera in an entertainment video. See Defendants' PowerPoint at 79. They fail to impart an inventive concept for three reasons.

First, the 027 Patent's Claim 1 recites generic features, such as "a computing device in the form of a wireless handheld device," a "data communications network," and "a processor." 027 Patent at 26:56-67. Just as "[n]early every computer will include a 'communications

controller' and a 'data storage unit' capable of performing [] basic calculation, storage, and transmission functions," Alice, 134 S.Ct. at 2360, practically every "computing device" will include a processor, and a "wireless handheld device" will be able to access a "data communications network," 027 Patent at 26:8-35. See Mortgage Grader, Inc. v. First Choice Loan Servs. Inc., 811 F.3d at 1324-25 (" [T]he claims 'add' only generic computer components such as an 'interface,' 'network,' and 'database.' These generic computer components do not satisfy the inventive concept requirement."). Front Row's claims use these generic components in conventional ways. They do not solve a problem unique to the Internet. See Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d at 1371.

Second, the 027 Patent's Claim 1 fails to explain how the elements will accomplish their intended result. "[T]he Federal Circuit has invalidated patents under § 101 for not qualifying as an inventive concept because it did not specify how the patent performs the steps claimed in the patent." Affinity Labs, 109 F. Supp. 3d at 926. Claim 1 recites that it will determine a user's location "based on communications" and "authorize" a user's device to receive streaming video, but does not explain how it will accomplish either aim. 027 Patent at 26:8-35. See TDE Petroleum Data Solutions, Inc. v. AKM Enterprise, Inc., No. 2016-1004, 2016 WL 4271975, at *2 (Fed. Cir. Aug. 15, 2016)("As we discussed at greater length in [Electric Power], the claims of the '812 patent recite the *what* of the invention, but none of the *how* that is necessary to turn the abstract idea into a patent-eligible application.)(emphasis in original); Kaavo, 2016 WL 476730, at *12 ("Here again, reciting the step of 'determining,' without describing a sufficiently specific way of doing the 'determining,' would be simply to claim a well-known, generic function of computers."). The complete absence of explanation here would effectively foreclose a great range of possible handheld device applications based on location. See Internet Patents,

790 F.3d at 1348 ("As the district court observed, claim 1 contains no restriction on how the result is accomplished.").

Finally, the 027 Patent's Claim 1 does not satisfy the machine-or-transformation test. Front Row argues that the claim satisfies the machine prong, because "the claimed machine or invention is ***capable of determining the location of a user***, and the receiving device is ***blocked from receiving service beyond a particular geographic area***." Front Row's PowerPoint at 79 (emphasis in original). It cites SiRF Technologies for the proposition that "the presence of the GPS receiver in the claims places a meaningful limit on the scope of the claims." 601 F.3d at 1332-33. These arguments are unconvincing, however, because the 027 Patent's Claim 1 does not mention a GPS receiver and the category of "handheld devices capable of working within ***data communications networks*** to determine a location" is not specific enough to satisfy the machine-or-transformation test. Front Row's PowerPoint at 81 (emphasis in original).

IT IS ORDERED that: the requests in the Defendants' Motion for Judgment on the Pleadings Pursuant to Fed. R. Civ. P. 12(c), filed October 21, 2015 (Doc. 229), are granted.

UNITED STATES DISTRICT JUDGE

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IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF NEW MEXICO

FRONT ROW TECHNOLOGIES, LLC,

Plaintiff,

vs. No. CIV 10-0433 JB/SCY

NBA MEDIA VENTURES, LLC,
MLB ADVANCED MEDIA, L.P.,
MERCURY RADIO ARTS, INC.,
GBTV, LLC, MAJOR LEAGUE
BASEBALL PROPERTIES, INC ., &
PREMIERE RADIO NETWORKS, INC.,

Defendants.

consolidated with

FRONT ROW TECHNOLOGIES, LLC,

Plaintiff,

vs. No. CIV 12-1309 JB/SCY

MLB ADVANCED MEDIA, L.P.,
MERCURY RADIO ARTS, INC.,
d/b/a 'THE GLEN BECK PROGRAM,
INC.', & GBTV, LLC,

Defendants.

consolidated with

FRONT ROW TECHNOLOGIES, LLC,

Plaintiff,

vs. No. CIV 13-1153 JB/SCY

NBA MEDIA VENTURES,
TURNER SPORTS INTERACTIVE, INC.
& TURNER DIGITAL BASKETBALL
SERVICES, INC.,

Defendants.

consolidated with

FRONT ROW TECHNOLOGIES, LLC,

Plaintiff,

vs. No. CIV 13-0636 JB/SCY

TURNER SPORTS INTERACTIVE, INC., AND TURNER DIGITAL BASKETBALL SERVICES, INC.,

Defendants.

MEMORANDUM OPINION AND ORDER

THIS MATTER comes before the Court on: (i) the Memorandum Opinion and Order, filed August 30, 2016 (Doc. 357)("Patent MOO"); and (ii) the Stipulation to Dismiss Without Prejudice All Counterclaims Pursuant to Fed. R. Civ. P. 41(a)(1)(A)(ii), filed August 31, 2016 (Doc. 358)("Stipulation"). The Patent MOO dismissed all of Plaintiff Front Row Technologies, LLC's claims against all of the Defendants with prejudice. In the Stipulation, the Defendants stipulated to the dismissal of their counterclaims against Front Row Technologies, LLC without prejudice. See Stipulation at 1-2. There being no claims remaining before the Court, the Court enters final judgment.

IT IS ORDERED that final judgment is entered, and this action is dismissed with prejudice.

UNITED STATES DISTRICT JUDGE

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US008086184B2

(12) **United States Patent**
Ortiz et al.

(10) **Patent No.: US 8,086,184 B2**
(45) **Date of Patent: Dec. 27, 2011**

(54) **TRANSMITTING SPORTS AND ENTERTAINMENT DATA TO WIRELESS HAND HELD DEVICES OVER A TELECOMMUNICATIONS NETWORK**

(75) Inventors: **Luis M. Ortiz**, Albuquerque, NM (US); **Kermit D. Lopez**, Albuquerque, NM (US)

(73) Assignee: **Front Row Technologies, LLC**, Albuquerque, NM (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **12/884,810**

(22) Filed: **Sep. 17, 2010**

(65) **Prior Publication Data**

US 2011/0230133 A1 Sep. 22, 2011

Related U.S. Application Data

(63) Continuation of application No. 12/329,631, filed on Dec. 7, 2008, now Pat. No. 7,826,877, which is a continuation of application No. 11/738,088, filed on Apr. 20, 2007, now Pat. No. 7,620,426, which is a continuation of application No. 11/498,415, filed on Aug. 2, 2006, now Pat. No. 7,376,388, which is a continuation of application No. 09/708,776, filed on Nov. 8, 2000, now Pat. No. 7,149,549.

(60) Provisional application No. 60/243,561, filed on Oct. 26, 2000.

(51) **Int. Cl.**

H04H 40/00	(2008.01)
H04M 3/42	(2006.01)
H04W 4/00	(2009.01)
H04S 4/00	(2006.01)

(52) **U.S. Cl.** **455/66.1**; 455/414.1; 455/435.1; 455/3.06; 455/899

(58) **Field of Classification Search** 455/550.1, 455/566, 567, 414.1, 3.06, 435.1, 66.1, 899
See application file for complete search history.

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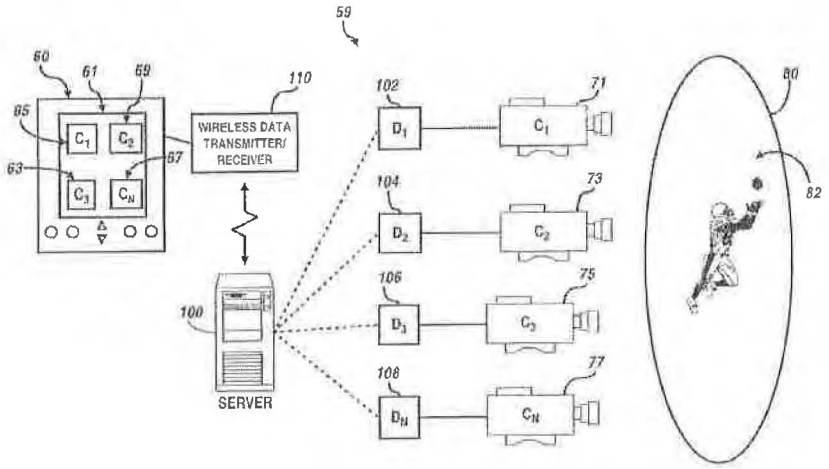
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Primary Examiner — Tilahun B Gesesse
(74) *Attorney, Agent, or Firm* - Kermit D. Lopez; Luis M. Ortiz; Ortiz & Lopez, PLLC

(57) **ABSTRACT**

A method and system for wirelessly providing venue-based data to one or more hand held devices. Venue-based data can be acquired from one or more venues. The venue-based data can be authenticated and wirelessly transmitted to one or more hand held devices through one or more wireless telecommunications networks, in response to authenticating the venue-based data and/or the hand held device(s) and/or a user of the hand held device(s), in order to permit the venue-based data to be accessible via one or more hand held devices at locations remote from the venue(s).

20 Claims, 19 Drawing Sheets



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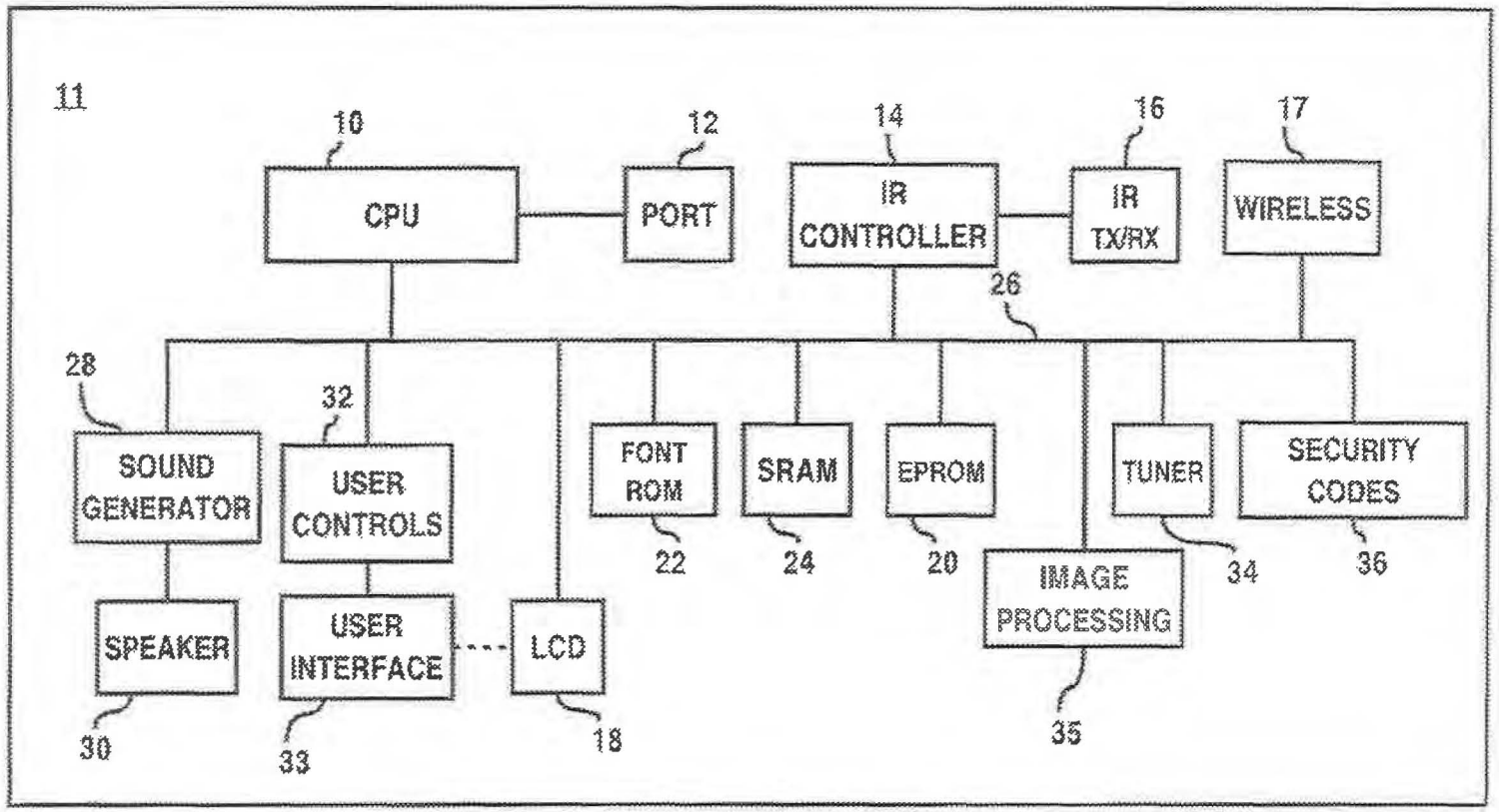

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FIG. 1

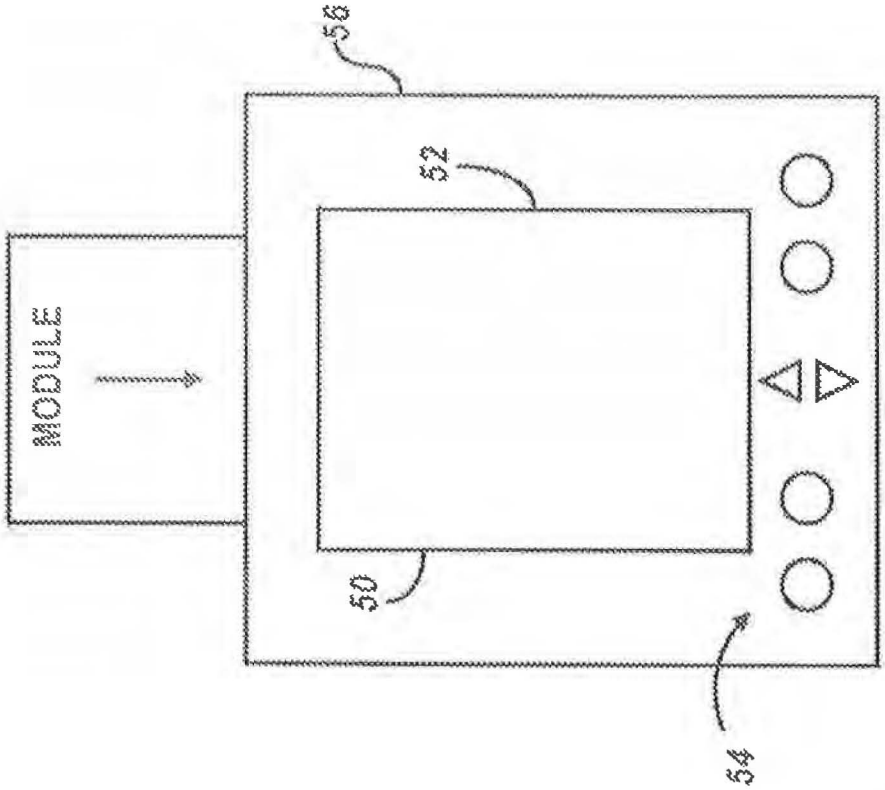


FIG. 3

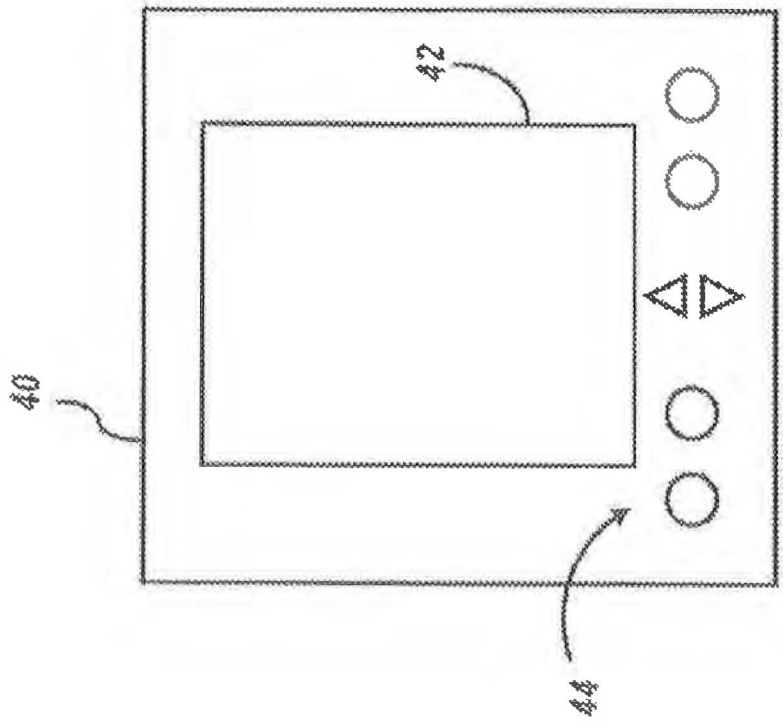


FIG. 2

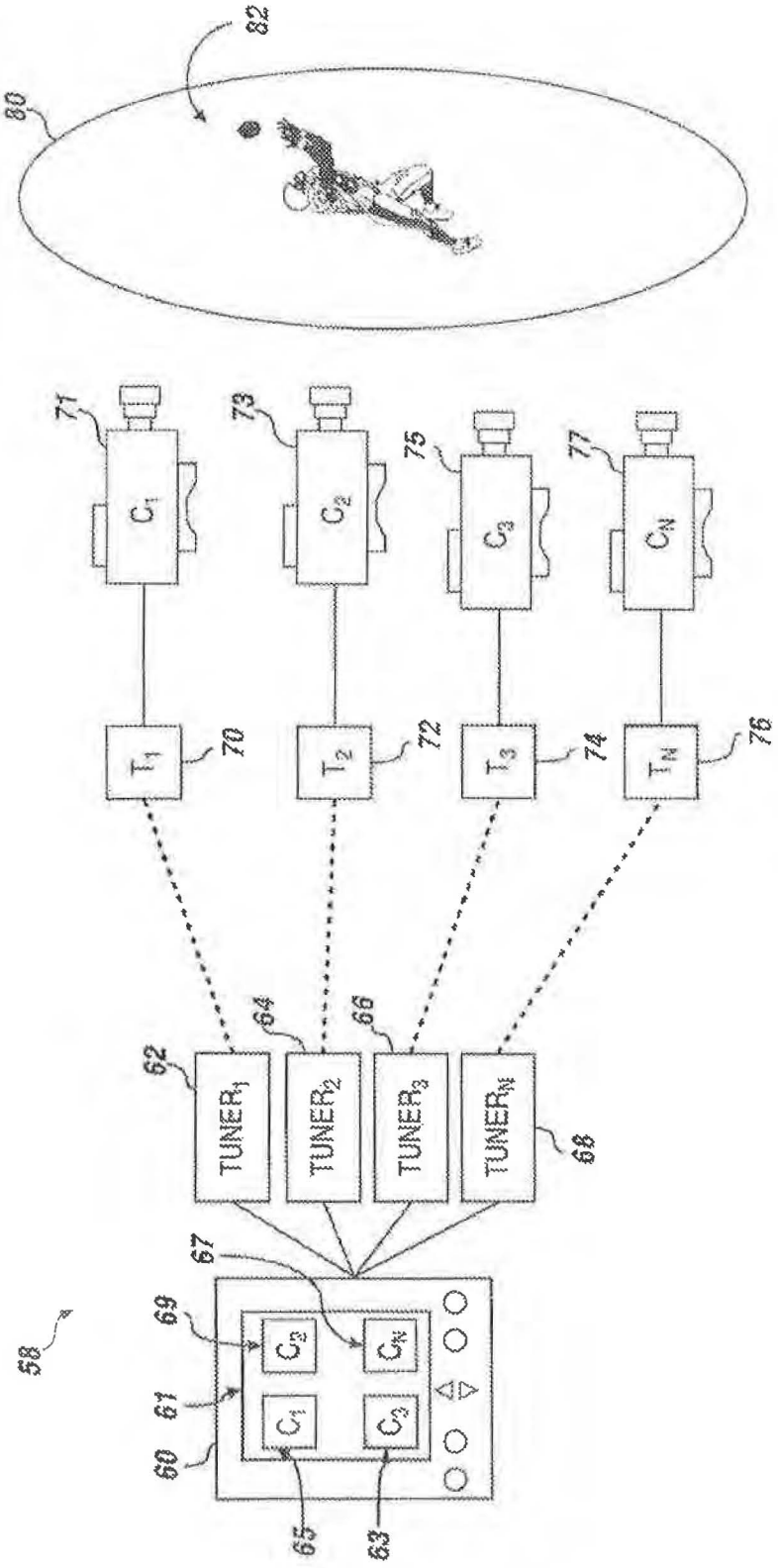

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TUNER1
TUNER2
TUNER3
TUNERN
67
69
61
60
65
63
58

FIG. 4

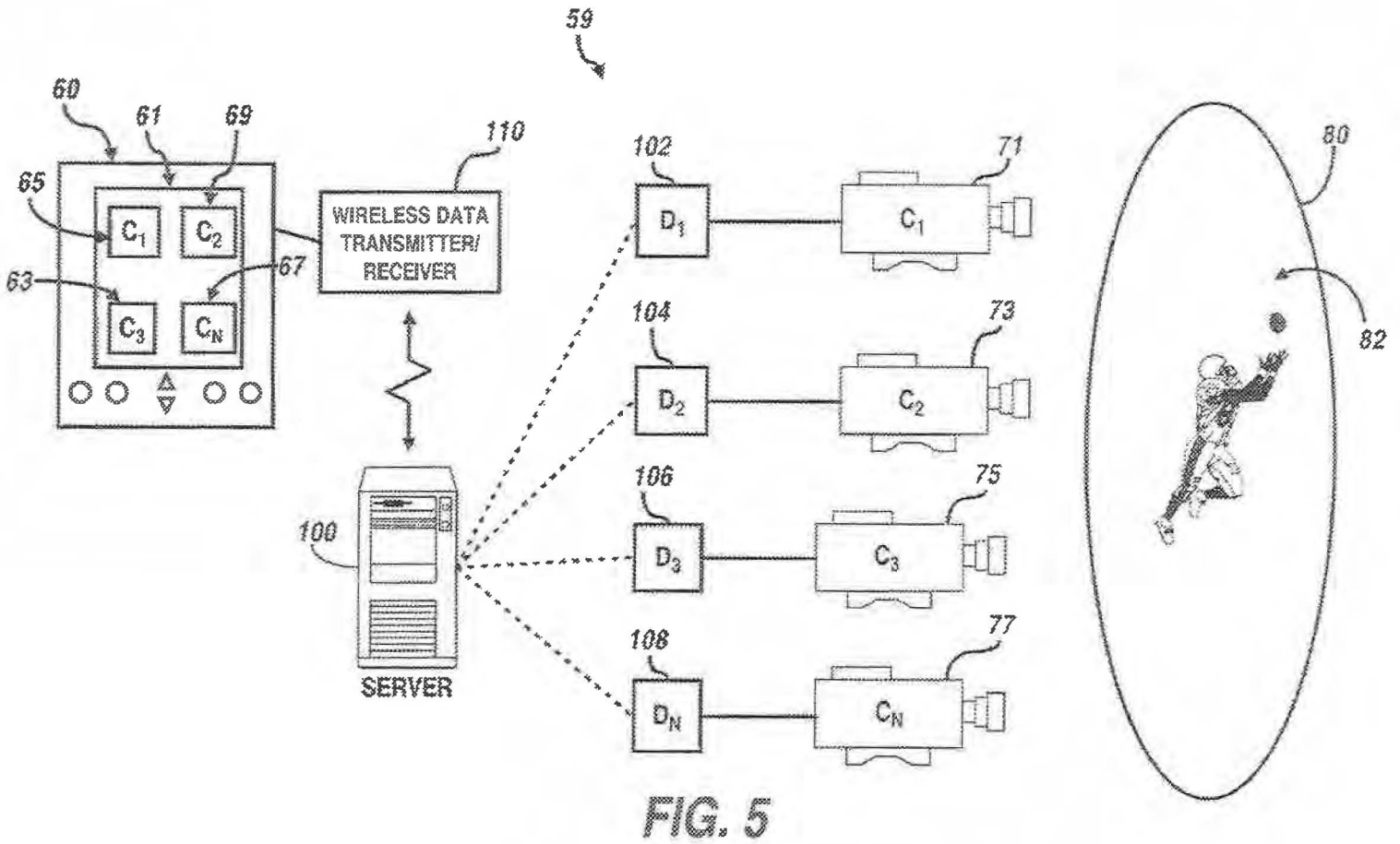

59
60
61
69
65
63
67
110
C1
C2
C3
CN
WIRELESS DATA TRANSMITTER/ RECEIVER
100
SERVER
102
104
106
108
D1
D2
D3
DN
71
73
75
77
80
82

FIG. 5

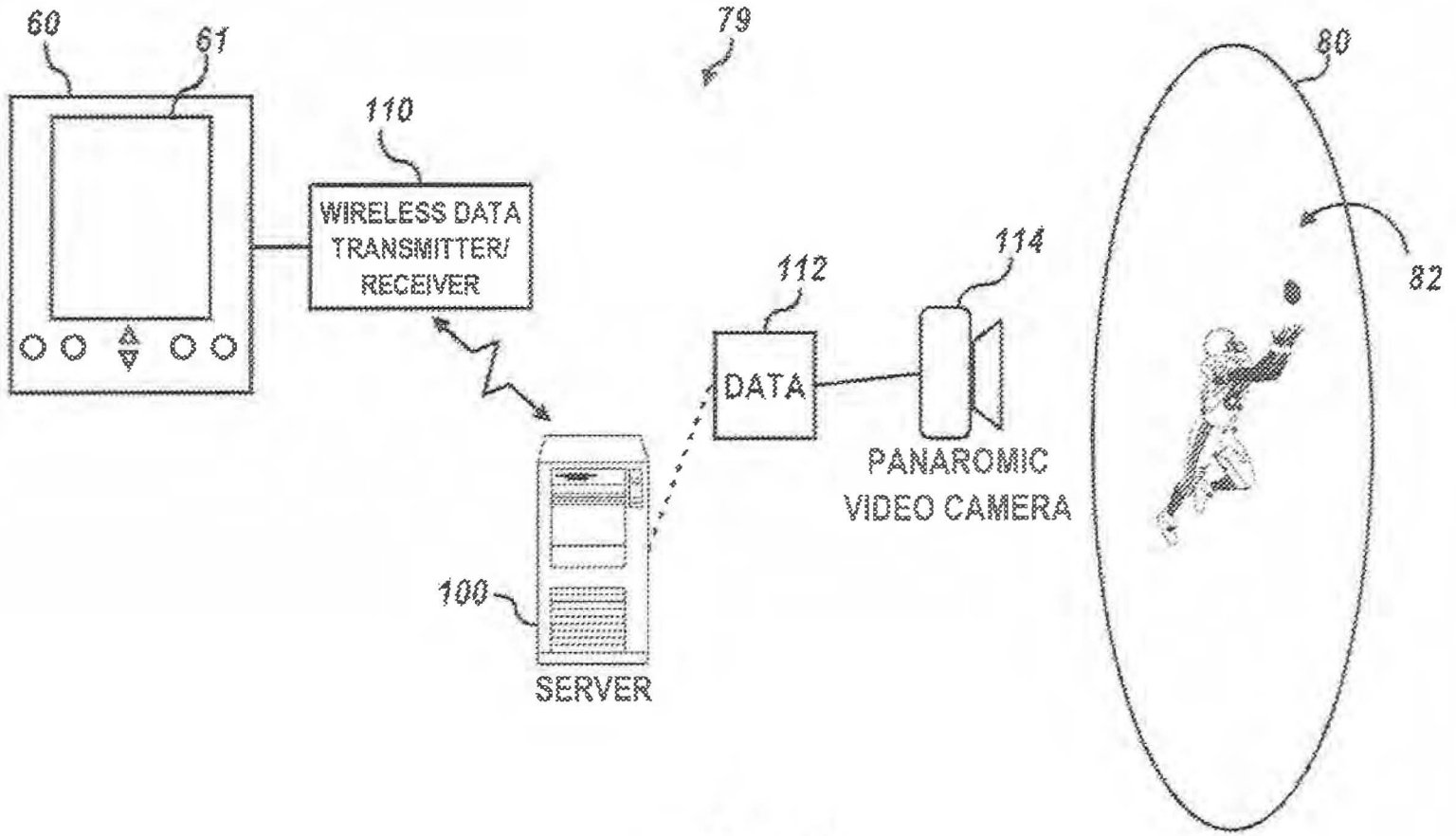

60
61
79
80
110
WIRELESS DATA TRANSMITTER/ RECEIVER
112
114
82
DATA
PANAROMIC VIDEO CAMERA
100
SERVER

FIG. 6

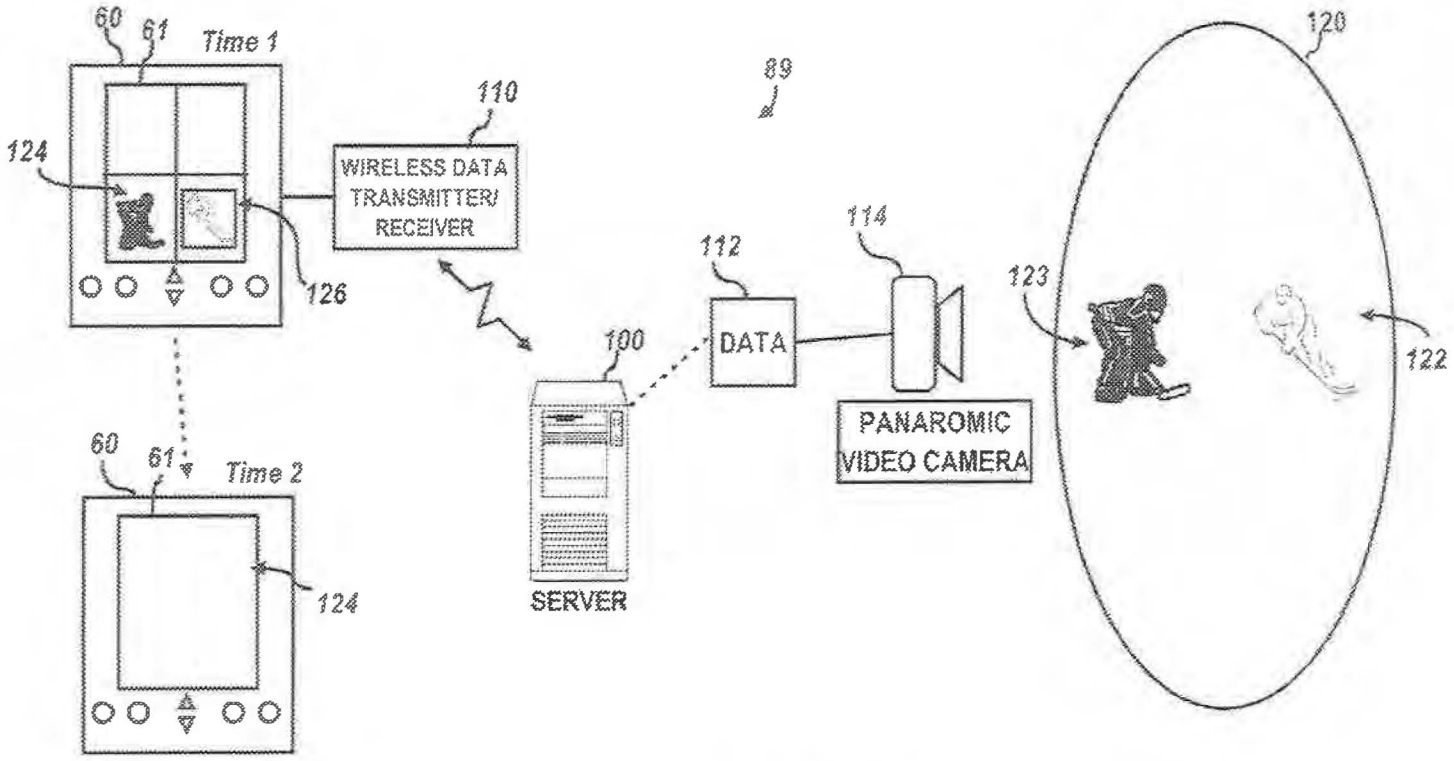

60
61
Time 1
110
89
120
124
WIRELESS DATA TRANSMITTER/ RECEIVER
126
112
114
123
100
DATA
122
PANAROMIC VIDEO CAMERA
60
61
Time 2
124
SERVER

FIG. 7

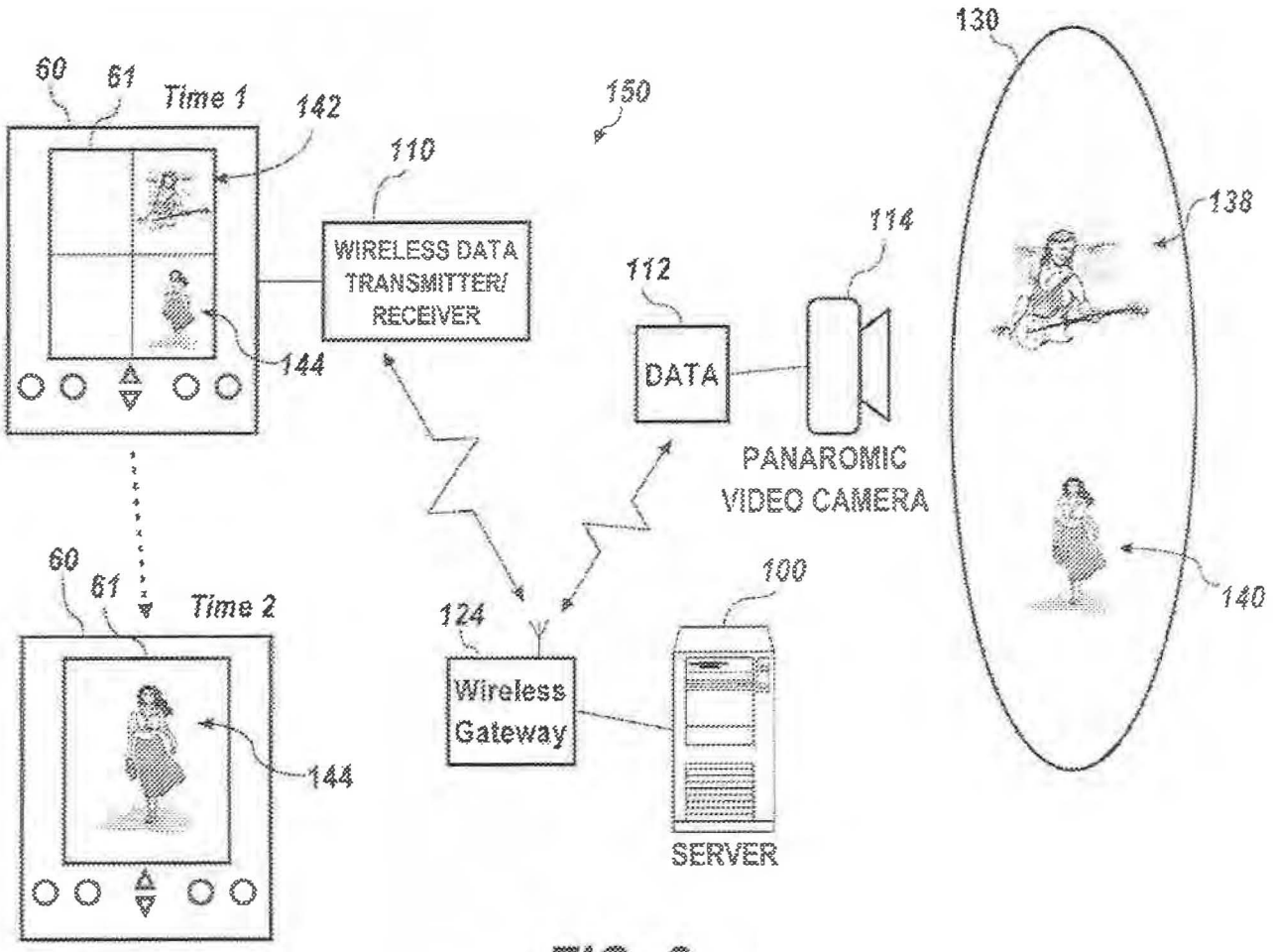

60
61
Time 1
142
110
150
130
138
114
112
WIRELESS DATA TRANSMITTER/ RECEIVER
144
DATA
PANAROMIC VIDEO CAMERA
60
61
Time 2
124
100
Wireless Gateway
144
SERVER
140

FIG. 8

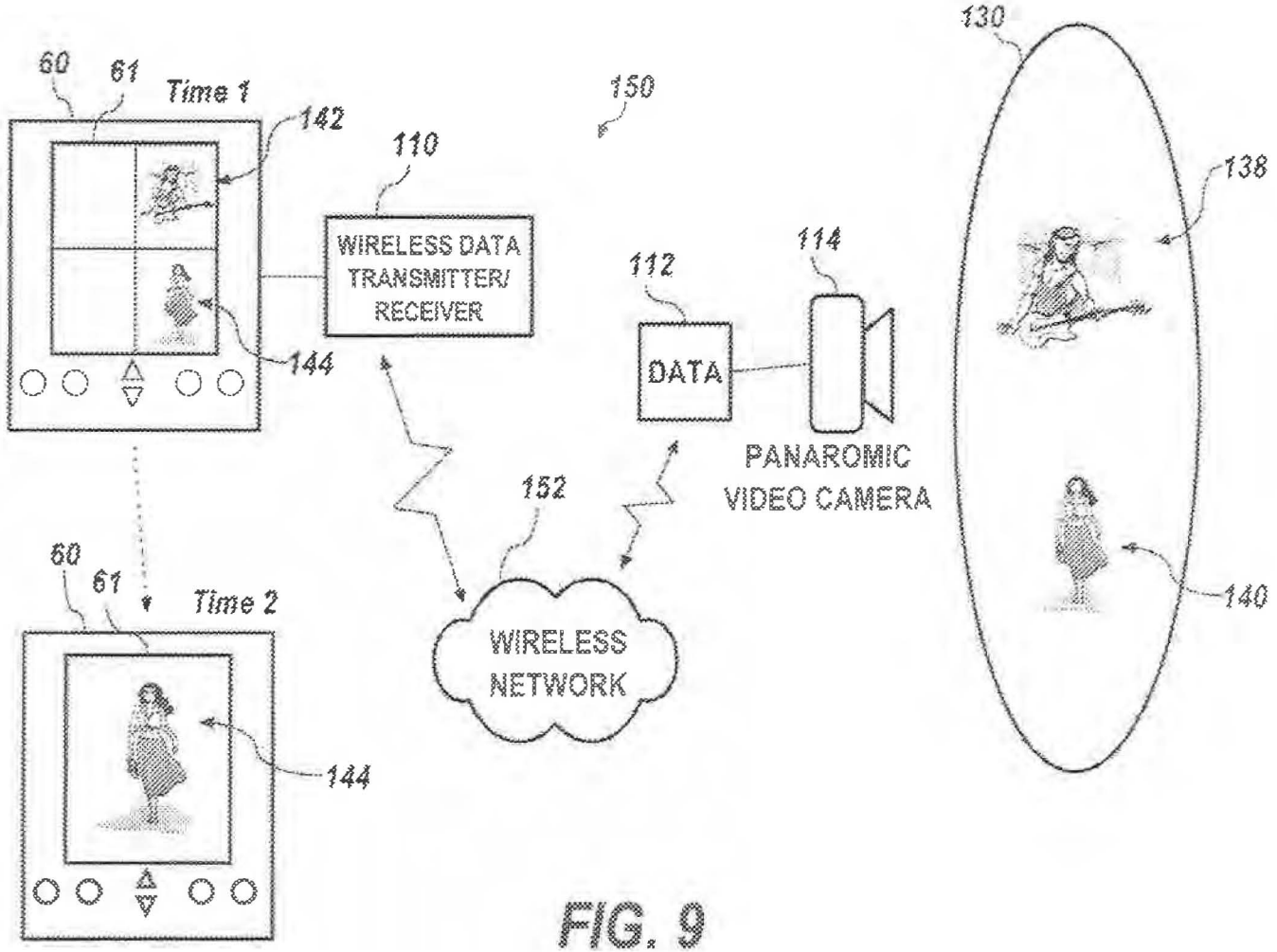

60
61
Time 1
142
110
150
130
138
WIRELESS DATA TRANSMITTER/ RECEIVER
112
114
DATA
144
PANAROMIC VIDEO CAMERA
152
60
61
Time 2
WIRELESS NETWORK
140
144

FIG. 9

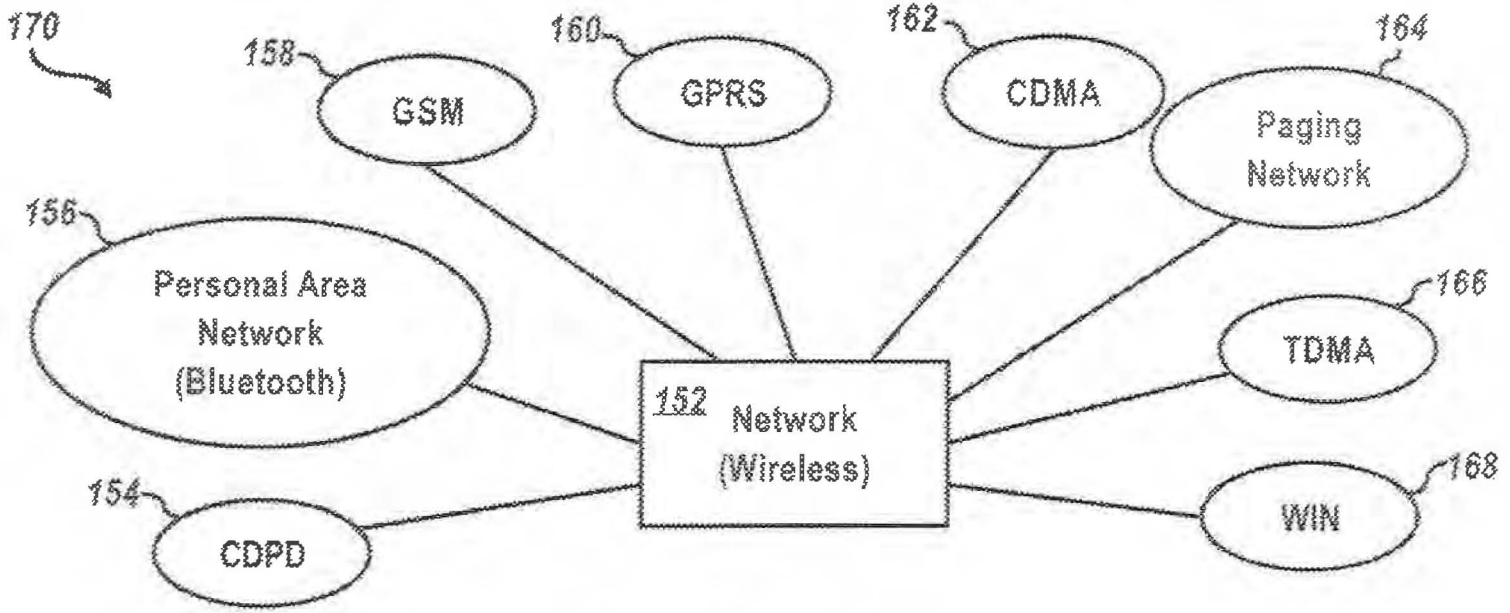

170
158
GSM
160
GPRS
162
CDMA
164
Paging Network
156
Personal Area Network (Bluetooth)
152
Network (Wireless)
166
TDMA
154
CDPD
168
WIN

FIG. 10

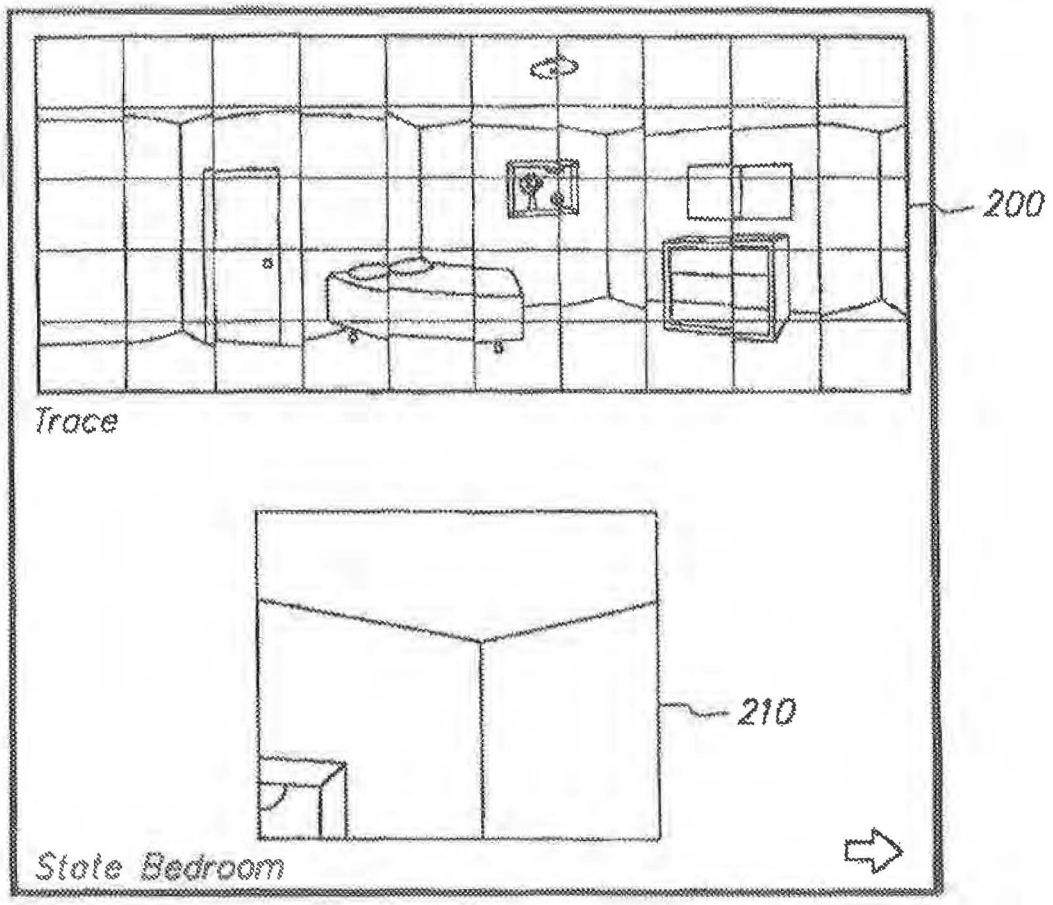


FIG. 11
(Prior Art)

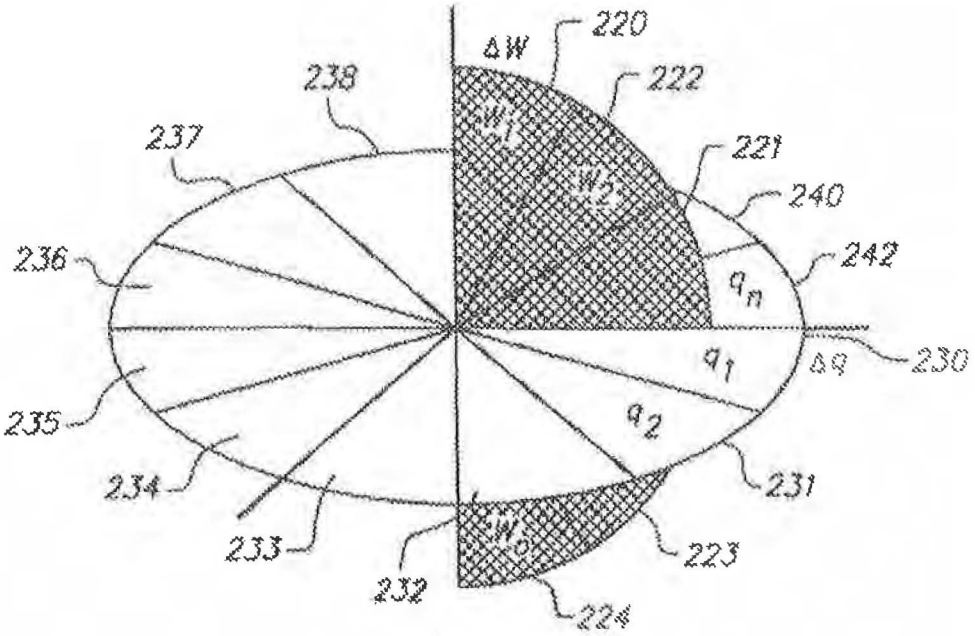


FIG. 12
(Prior Art)

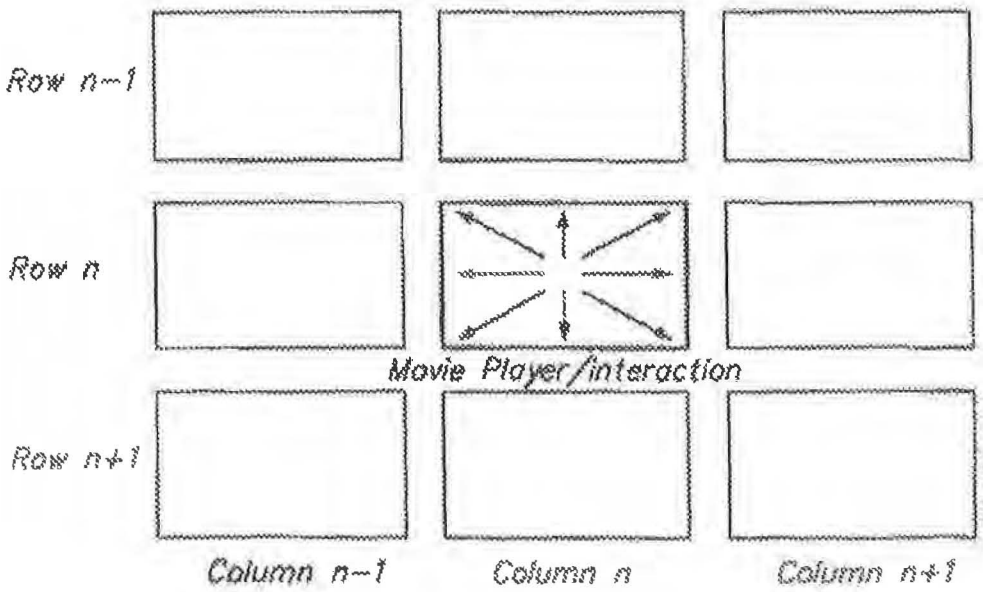


FIG. 13
(Prior Art)

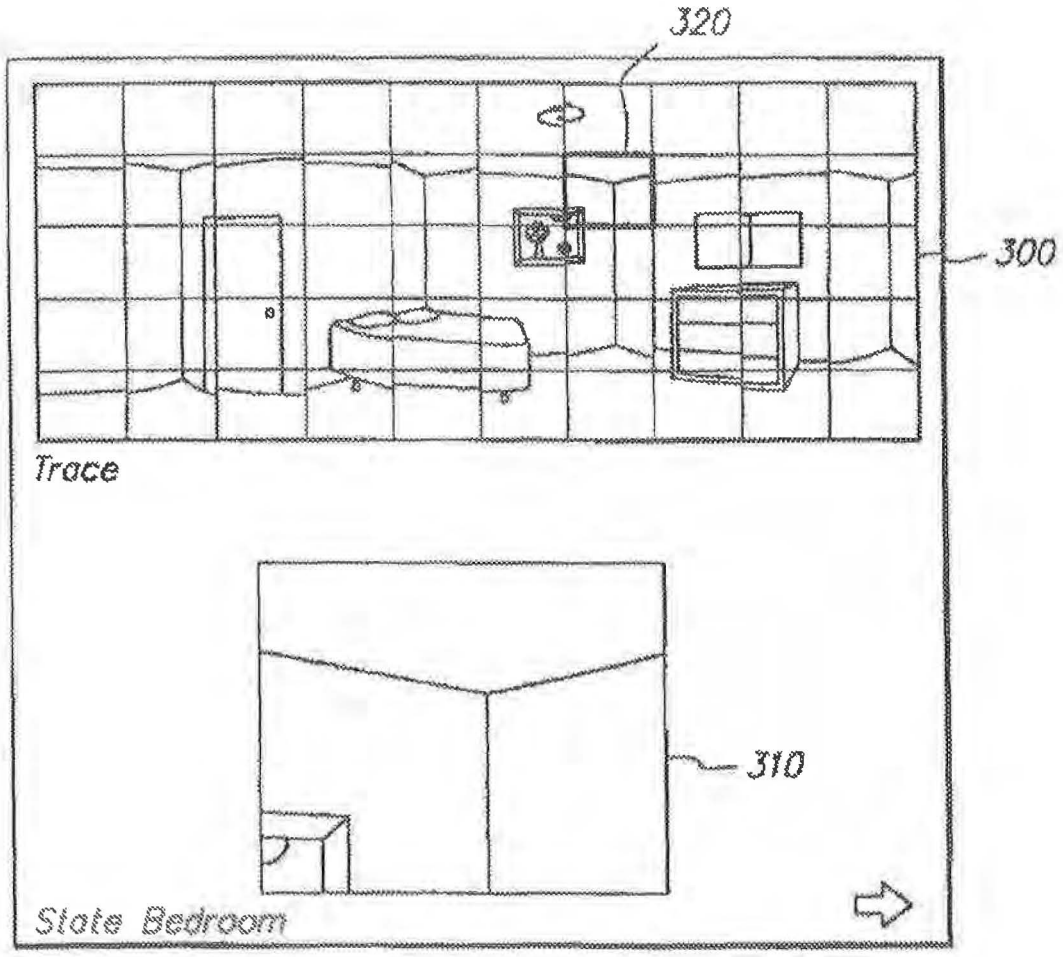


FIG. 14
(Prior Art)

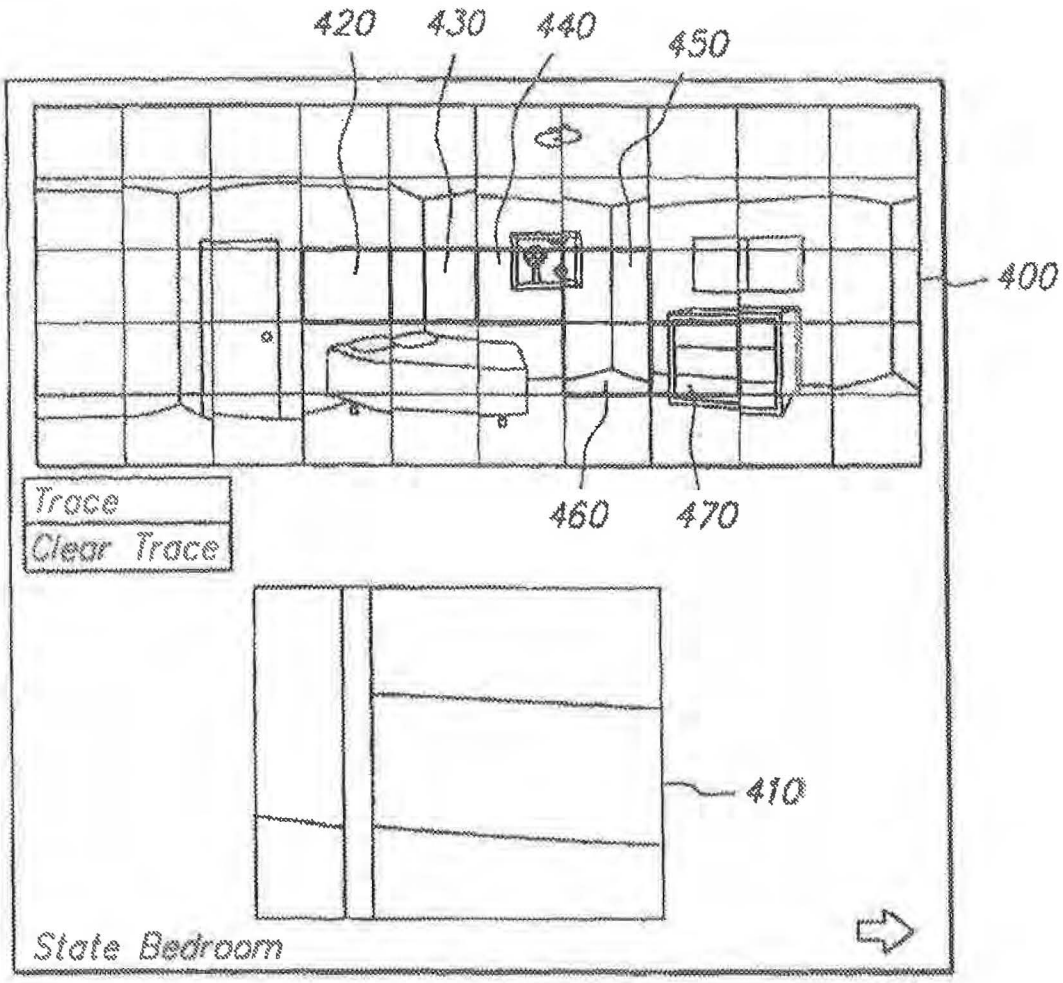


FIG. 15
(Prior Art)

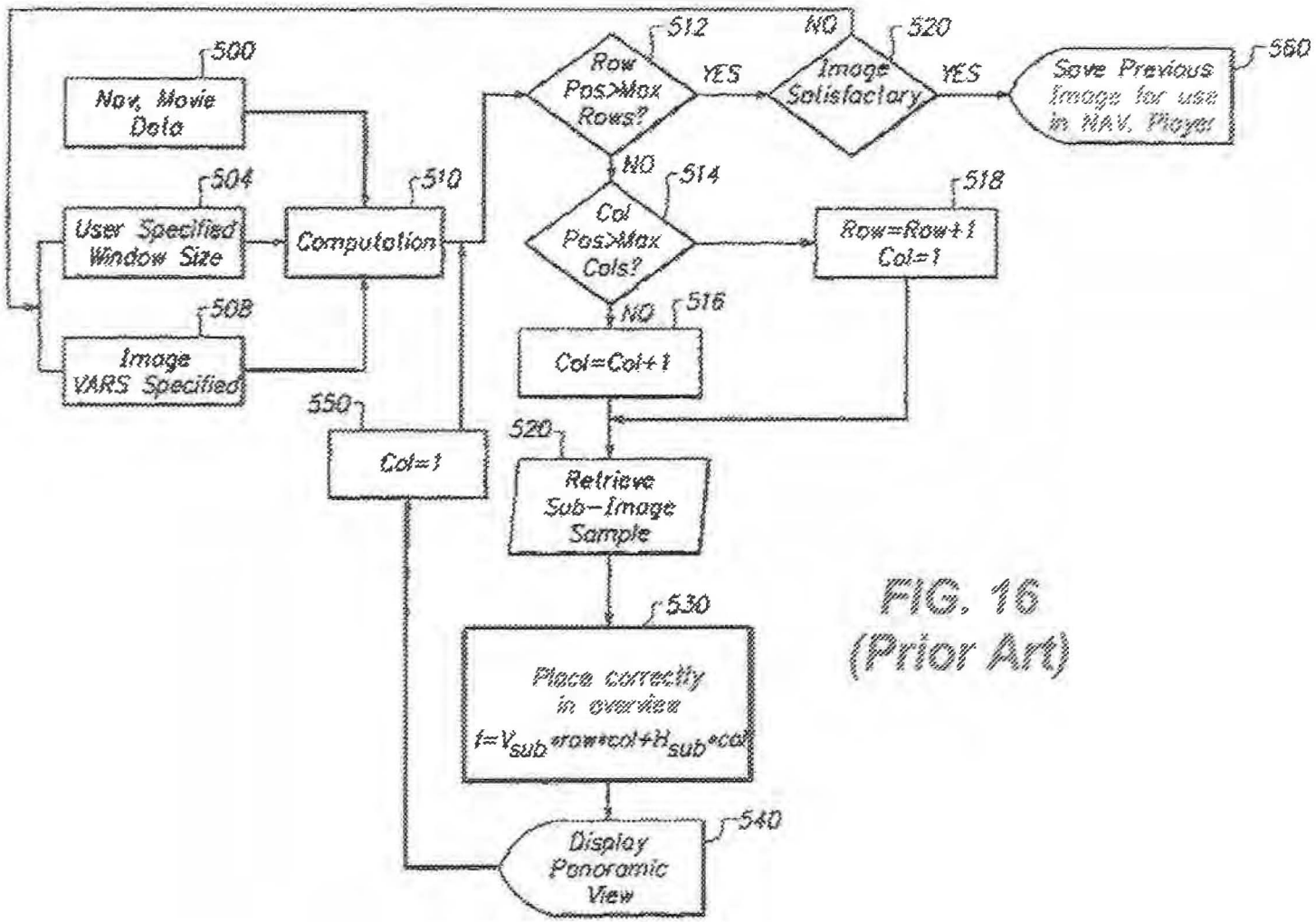


FIG. 16
(Prior Art)

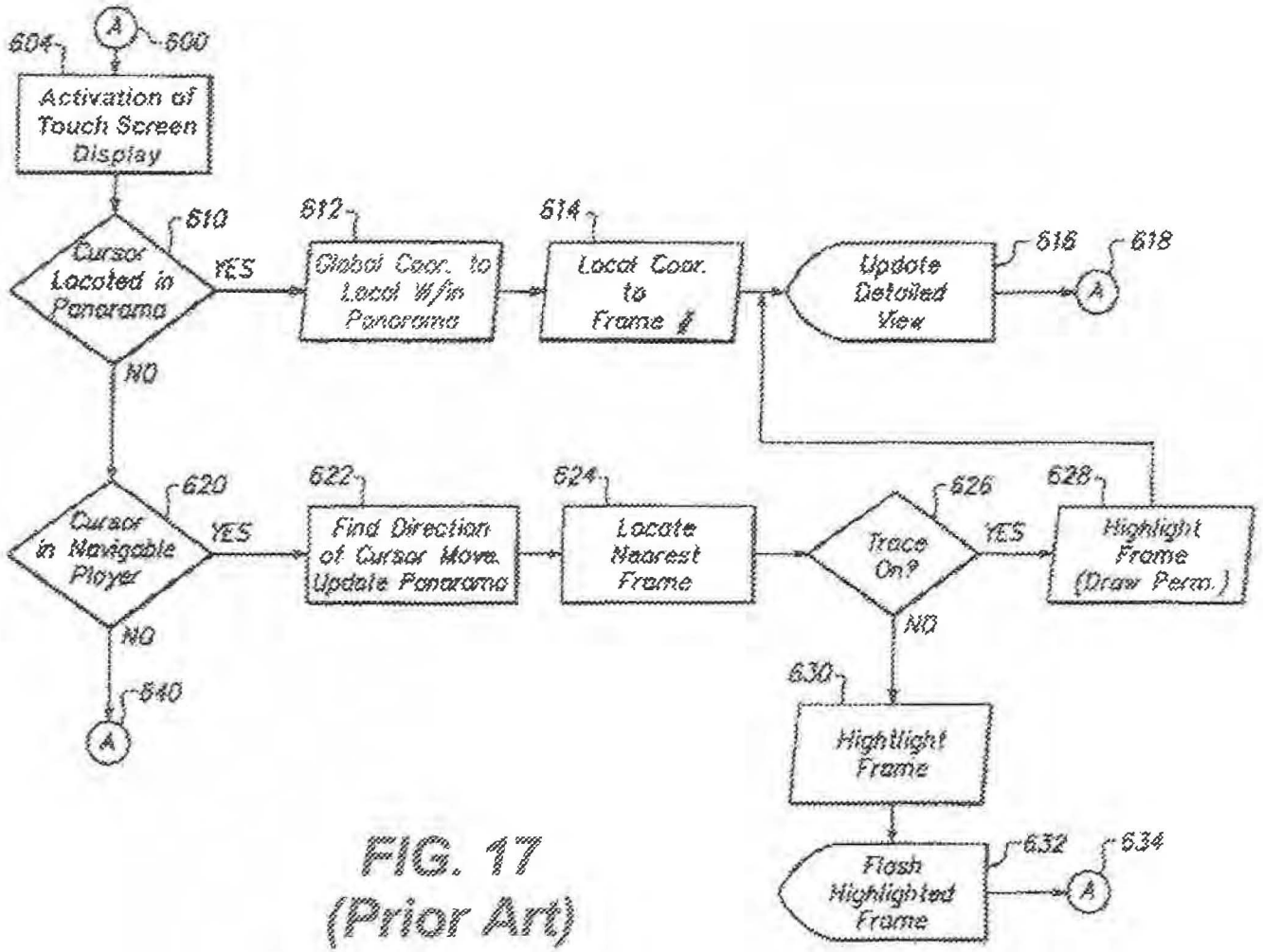


FIG. 17
(Prior Art)

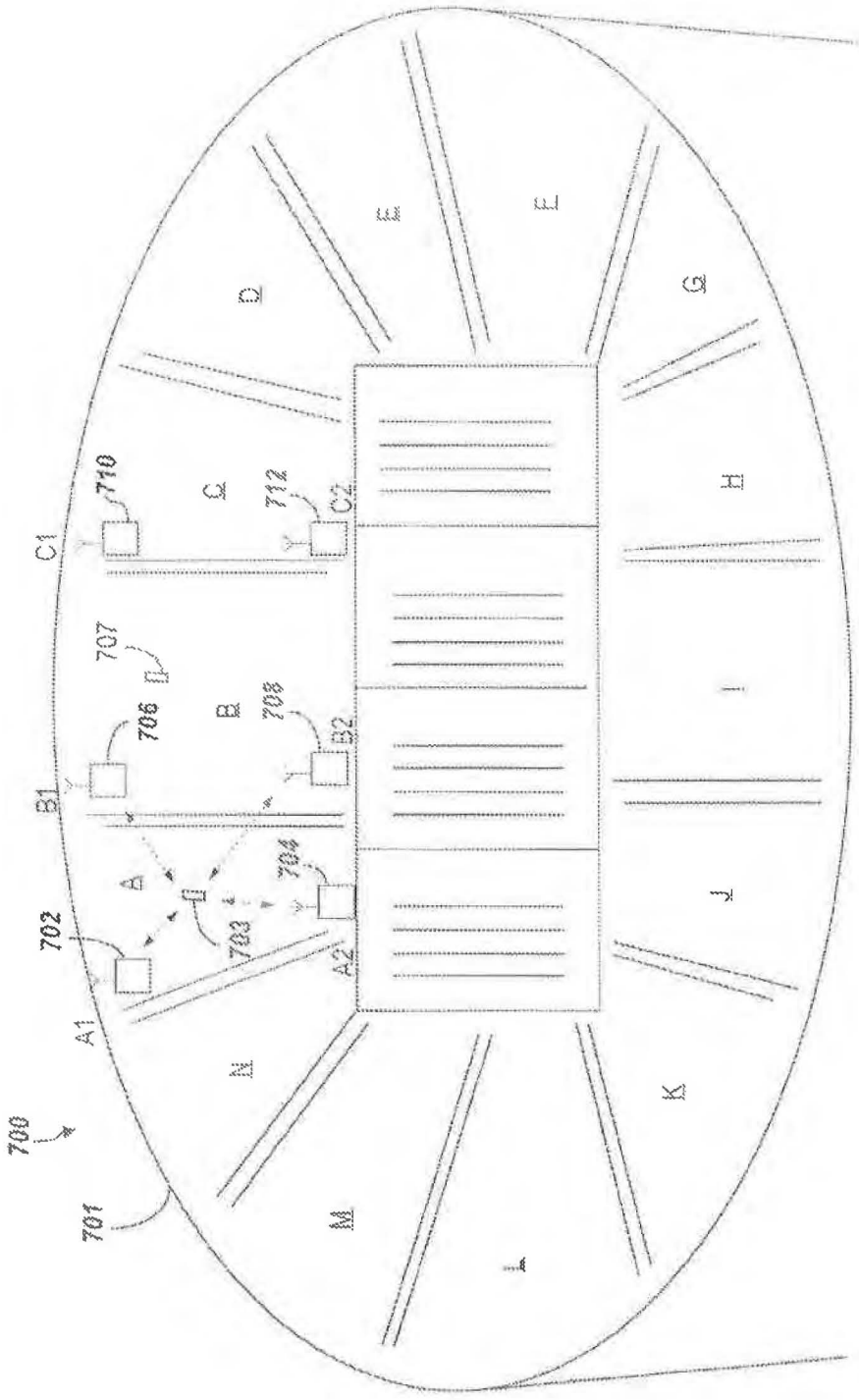

700
701
702
703
704
706
707
708
710
712
A
A1
A2
B
B1
B2
C
C1
C2
D
E
F
G
H
I
J
K
L
M
N

FIG. 18

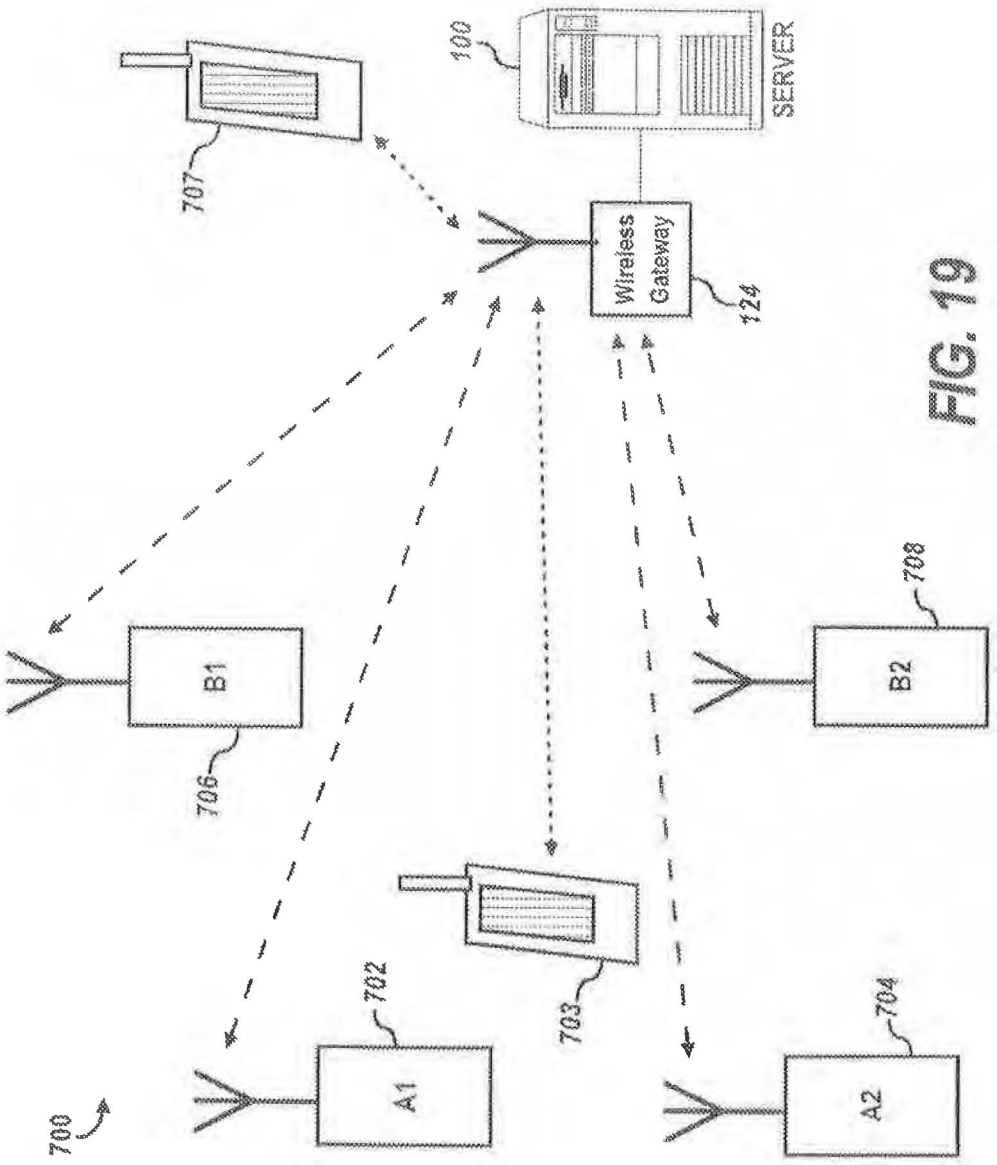

100
SERVER
707
Wireless Gateway
124
B1
706
B2
708
703
A1
702
A2
704
700

FIG. 19

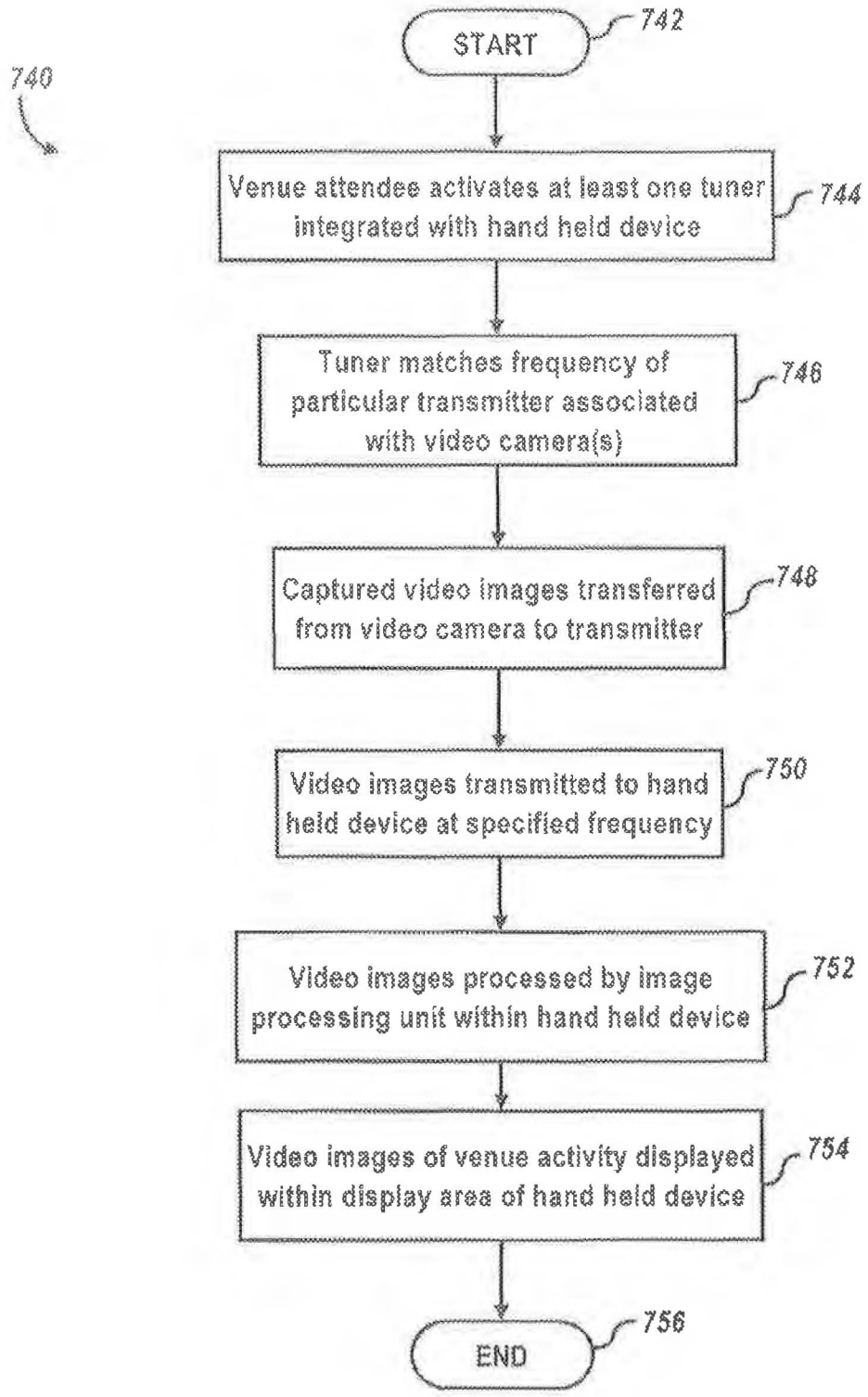

740
START
742
Venue attendee activates at least one tuner integrated with hand held device
744
Tuner matches frequency of particular transmitter associated with video camera(s)
746
Captured video images transferred from video camera to transmitter
748
Video images transmitted to hand held device at specified frequency
750
Video images processed by image processing unit within hand held device
752
Video images of venue activity displayed within display area of hand held device
754
END
756

FIG. 20

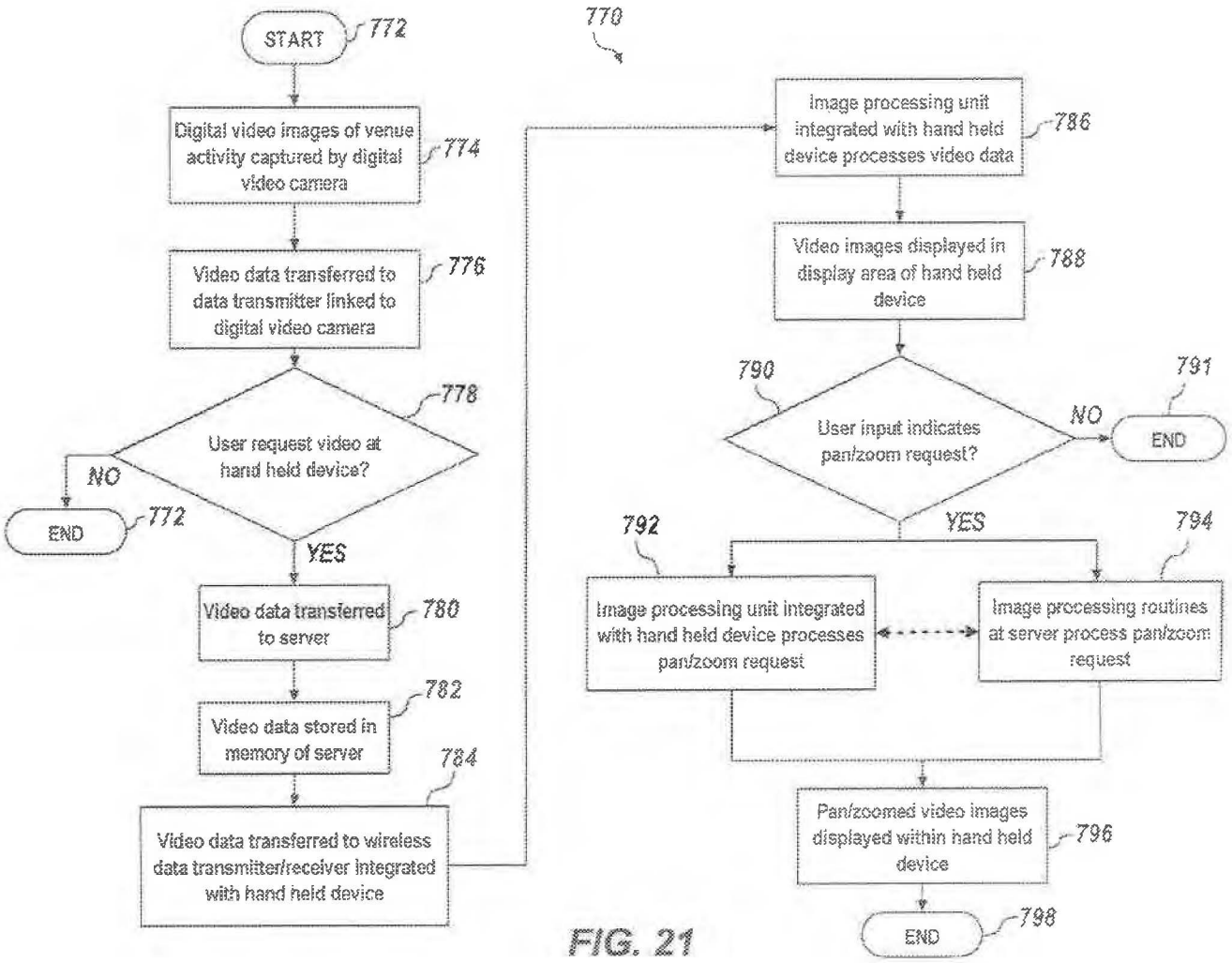

770
START
772
Digital video images of venue activity captured by digital video camera
774
Video data transferred to data transmitter linked to digital video camera
776
User request video at hand held device?
778
NO
END
772
YES
Video data transferred to server
780
Video data stored in memory of server
782
Video data transferred to wireless data transmitter/receiver integrated with hand held device
784
Image processing unit integrated with hand held device processes video data
786
Video images displayed in display area of hand held device
788
User input indicates pan/zoom request?
790
NO
END
791
YES
Image processing unit integrated with hand held device processes pan/zoom request
792
Image processing routines at server process pan/zoom request
794
Pan/zoomed video images displayed within hand held device
796
END
798

FIG. 21

TRANSMITTING SPORTS AND ENTERTAINMENT DATA TO WIRELESS HAND HELD DEVICES OVER A TELECOMMUNICATIONS NETWORK

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 12/329,631 now U.S. Pat. No. 7,826,877, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over A Telecommunications Network," which was filed on Dec. 7, 2008. U.S. patent application Ser. No. 12/329,631 is in turn a continuation of U.S. patent application Ser. No. 11/738,088 entitled "Providing Video of a Venue Activity to a Hand Held Device Through a Cellular Communications Network" which was filed on Apr. 20, 2007 now U.S. Pat. No. 7,620,426. U.S. patent application Ser. No. 11/738,088 is in turn a continuation of U.S. patent application Ser. No. 11/498,415 entitled "Broadcasting Venue Data to a Wireless Hand Held Device," filed on Aug. 2, 2006, which issued on May 20, 2008 as U.S. Pat. No. 7,376,388 and was a continuation of U.S. patent application Ser. No. 09/708,776 entitled "Providing Multiple Perspectives for a Venue Activity Through an Electronic Hand Held Device," which was filed on Nov. 8, 2000 now U.S. Pat. No. 7,149,549 and which claims the benefit of U.S. Provisional Application Ser. No. 60/243,561, which was filed on Oct. 26, 2000. This application therefore traces its priority date to the Oct. 26, 2000 filing date of U.S. Provisional Application Ser. No. 60/243,561.

TECHNICAL FIELD

Embodiments are related to wireless electronic hand held devices, such as Personal Digital Assistants (PDAs), hand held televisions, Smartphones, and cellular and data-enabled wireless telephones. Embodiments are also related to techniques for remotely delivering sports and entertainment data to hand held devices. In addition, Embodiments relates to techniques for providing increased viewing opportunities for audiences within and external to venue environments, such as stadiums and concert arenas. Additionally, embodiments related to wireless video, audio and other data transmission to and from hand held devices.

BACKGROUND OF THE INVENTION

Most modern stadiums and live entertainment facilities or arenas (herein also collectively referred to as "venues"), which feature sporting events and concerts, typically employ large television screens that receive video images and are linked within the stadium to a plurality of television cameras positioned to capture video images at diverse locations within the stadium. The audience at a typical sporting event, for example, can generally view advertisements, instant replays, and other sports related data on the large television screens within the sports stadium itself. Feeds are additionally generally provided from the cameras to announcers in a broadcast booth, replaying certain plays from the event so that the announcers and can make comments about plays, and finally transmitting a telecast to the viewing audience, including some aspects of captured video and data to the stadium audience.

Despite the availability of such large screen television monitors, venue event audience members still lack enhanced viewing options or perspectives within the stadium itself. To compensate for the lack of viewing options, sports and concert promoters often rent binoculars to audience members prior to or during the event. Such binoculars can permit the typical audience member to obtain a somewhat better, but limited, view of the event, such as a football or hockey game, but even these views are often obstructed by other audience members and are tied to only one perspective.

The large television screens placed in the stadium are typically linked to cameras that are either fixed and mobile, the placement of the cameras about the stadium or venue are generally tied to an enterprise system. The movement of the game ball in a football game, for example, along with the players on the field is dynamic and unpredictable, and may not always be caught by the active camera having the best perspective. Thus, during a game, the large television screens typically provide only one view, which can be obstructed further by other players or officials, often destroying a critical angular view.

In addition, such large screens are often utilized to bombard audience members with advertisements, thereby cutting into data such as instant replays at a time when an audience member might otherwise wish to view instant replays, a current play or other event data. The audience members, therefore, essentially view the large screen at the behest of the camera operator and cannot select their own views or camera angles.

Based on the foregoing, the present inventors have found that such problems in venue environments can be solved through the use of hand held devices, such as PDAs, data/video-enabled cellular telephones, and other hand held wireless video-enabled devices. For example, the recent shift in the consumer electronics industry from an emphasis on analog technology to a preference for digital technology is largely based on the fact that the former generally limits the user to a role of a passive recipient of information, while the latter is interactive and allows the user to control what, when, and how he or she receives and manipulates certain information. This shift in focus has resulted in the development and increasingly widespread use of a digital device generically referred to as a "personal digital assistant" (PDA).

These devices are hand held computing devices (i.e., hereinafter referred to as "hand held devices" or "handheld devices") that are becoming increasingly popular for storing and maintaining information. Although PDAs may be connected to a desktop personal computer or other PDAs via infrared, direct wire, or wireless communication links, PDAs and similar hand held devices, can be linked to remote networks, such as the internet, or local wireless resources, through available wireless communications techniques.

The most advanced data- and video-enabled wireless communication devices currently available in the marketplace take the form of a PDA (such as the Palm OS, Handspring OS, and Windows CE compatible hand held computers). Unlike personal computers, which are general-purpose devices geared toward refining and processing information, PDAs are designed to capture, store and display information originating from various sources. Additionally, while a certain level of skill is required to use a personal computer effectively, PDAs are designed with the novice and non-computer user in mind.

A typical PDA includes a microprocessor, memory unit, a display, associated encoder circuitry, and selector buttons. It may optionally contain a clock and infrared emitter and receiver. A graphical user interface permits a user to store, retrieve and manipulate data via an interactive display. A PDA may also include a calendar, datebook, and one or more directories. The calendar shows a month of dates organized as rows and columns in the usual form. The datebook shows one

day at a time and contains alphanumeric text entered in free format (typically, with a time of day and an event and/or name). Each directory contains entries consisting of a name field and a free form alphanumeric text field that can contain company names, addresses, telephone and fax numbers, email addresses, etc.

Entries may be organized alphabetically according to the name field and can be scanned or searched for by specifying a specific sequence of characters in the name field. A menu displayed via the graphical user interface permits a user to choose particular functions and directories. Most PDAs come equipped with a stylus, which is a plastic-tipped pen that a user utilizes to write in, for example, a "graffiti area" of the display and tap particular graphically displayed icons. Each icon is indicative of a particular activity or function. Touch screen interfaces, however, are also increasingly being implemented with PDAs to permit a user to activate software modules in the form of routines and subroutines therein.

Attempts have been made to provide venue-based, interactive entertainment to enhance the fan experience at live events. Such attempts utilize touch-screen technology integrated directly into seats at outdoor or indoor arenas. Such devices, however, due to their integration with the viewer seat, can be easily damaged by audience members. Systems that incorporate such devices are also expensive because they literally require miles of cable.

Some recently constructed arenas, for example, that implement such seat-integrated technology are requiring hundreds of miles of electronic cabling, including audiovisual, broadcast, and multiband lines. Such a plethora of large cables are expensive and require extra space, which often cannot be found in older stadiums, or would require a greater expense to integrate into newly built stadiums. The cost of retrofitting an older stadium with such technology can be staggering. Additionally, many fans who attend games or concerts with such technology integrated directly into the seats may find such a feature distracting.

Another problem faced by venue promoters and arena owners who integrate fixed technology directly into the seat is that such technology can quickly become obsolete. If a new facility is fitted with such electronic/data intensive technology, the technology may become quickly outdated, requiring an expensive update and/or retrofit.

The present inventors thus realize that a solution to these problems lies in the use of wireless hand held devices. By utilizing modern technology integrated with hand held devices, on-demand live action, instant replays from multiple camera angles, and real-time team and venue information may be readily provided to fans without the expense and problems associated with present in-seat integrated technical environments. Additionally, it is anticipated that the deployment of venue-based systems facilitating the use of such devices would be relatively inexpensive, at least in comparison to seat integrated systems. Finally, such systems will provide the venue attendee with increased mobility and freedom of use within and throughout the venue environment.

BRIEF SUMMARY

One aspect of the present invention provides improved methods and systems for delivering venue-based data such as video, audio, advertisements, video replay, statistics and other information to one or more hand held devices.

It is another aspect of the present invention to provide improved methods and systems for delivering venue-based data to hand held device(s) located remote from a venue and/or within the venue itself.

It is still another aspect of the present invention to provide methods and systems for the delivery of sports/entertainment data and related information to hand held devices through a wireless telecommunications network.

The above and other aspects of the invention are achieved as will now be further described. Methods and systems are disclosed for wirelessly providing venue-based data to one or more hand held devices. Venue-based data can be acquired from one or more venues. The venue-based data can be authenticated and wirelessly transmitted to the hand held device(s)through a wireless telecommunications network, in response to authenticating the venue-based data, in order to permit the venue-based data to be accessible via the hand held device(s) at locations remote from the venue(s). The venue-based data can then be accessed via the hand held device(s). In addition, or in lieu of authentication of the venue-base data, the hand held device(s) and/or a user of the hand held device (s) can be authenticated. In response to such an authentication, the venue-based data can be transmitted to the hand held device(s), in order to permit the venue-based data to be accessible via the hand held device(s) at locations remote from the venue(s). That is, the hand held device(s) need not be located at a particular venue, but can be located elsewhere when receiving and accessing the venue-based data. For example, a user may be located at a different venue or at home or in-transit (e.g., commuter train) and access (e.g., view, listen, etc) the venue-based data using his or her hand held device via the wireless telecommunications network.

Venue-based data can include a variety of different data types or s single data type, depending upon design considerations. For example, venue-based data can be video data, audio data, and/or other types of sports and/or entertainment information, such as, video replays, statistics, purchasing, merchandise and concession information, and/or additional product, concession or advertisements. Such data may include information such as, for example, box scores, player matchups, animated playbooks, shot/hit/pitch charts, historical information, and offense-defense statistics. In the context of a concert venue, for example, as opposed to a sporting event, information pertaining to a particular musical group, for example, may be also transferred to the hand held device via the telecommunications network, along with advertising or sponsor information.

For example, a concert may take place at one particular venue and the hand held device may be located at a user's home. The user can utilize his or hand held device to access venue-based data associated with that particular concert, assuming proper authentication. Note that both the video data and other data described above generally comprise types of venue-based data. Venue-based data, as referred to herein, may thus include data and information, such as video, audio, advertisements, promotional information, propaganda, historical information, statistics, event scheduling, and so forth.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of this invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objects, and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

FIG. 1 depicts a block diagram illustrating components of a hand held device, in which embodiments may be implemented;

FIG. **2** illustrates a pictorial representation of a hand held device, which may be utilized to implement an embodiment;

FIG. **3** depicts a pictorial representation of a hand held device adapted for receiving a module, in accordance with an alternative embodiment;

FIG. **4** illustrates a system for providing multiple perspectives through a hand held device of activities at a venue, in accordance with an alternative embodiment;

FIG. **5** depicts a system that provides multiple perspectives of a venue activity through a hand held device adapted to receive and process real time video data, in accordance with a preferred embodiment;

FIG. **6** depicts a system for providing multiple perspectives of activity at a venue through a hand held device adapted to receive and process real time video data, in accordance with a preferred embodiment;

FIG. **7** depicts a system for providing multiple perspectives for activity at a venue at a first time/perspective and a second time/perspective, in accordance with a preferred embodiment;

FIG. **8** illustrates a system for providing multiple perspectives through a hand held device of an activity at a venue, including the use of a wireless gateway, in accordance with a preferred embodiment of the present invention;

FIG. **9** depicts a system for providing multiple perspectives through a hand held device of a venue activity, in association with a wireless network, in accordance with a preferred embodiment;

FIG. **10** illustrates a diagram depicting network attributes of a wireless network that may be utilized in accordance with one or more embodiments;

FIG. **11** depicts a prior art overview display and a detail window;

FIG. **12** illustrates a prior art spherical image space divided into a series of w rows and q columns, with the rows and columns representing individual frames as photographed from a video camera;

FIG. **13** depicts the two-dimensional representation of the spherical image space of FIG. **12** into rows and columns of image frames;

FIG. **14** illustrates a prior art overview display, a detail window and a corresponding area indicia (geometric figure outline;

FIG. **15** depicts a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview image display for subsequent playback, which may be utilized in accordance with embodiments of the present invention;

FIG. **16** is a prior art flowchart providing a logical process for building an overview image, which may be utilized in accordance with embodiments of the present invention;

FIG. **17** illustrates a prior art flowchart illustrative of a logical process for playback interaction, which may be utilized in accordance with embodiments of the present invention;

FIG. **18** depicts a pictorial representation illustrative of a Venue Positioning System (VPS), which can be implemented in accordance with an alternative embodiment;

FIG. **19** illustrates in greater detail the Venue Positioning System (VPS) of FIG. **18**, in accordance with an alternative embodiment;

FIG. **20** depicts a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device, in accordance with an alternative embodiment; and

FIG. **21** illustrates a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras, in accordance with an alternative embodiment.

DETAILED DESCRIPTION

FIG. **1** depicts a schematic diagram illustrating a general hardware configuration of a hand held device **11**, which can be implemented in accordance an embodiment. Those skilled in the art can appreciate, however, that other hardware configurations with less or more hardware and/or modules may be utilized in carrying out the methods and systems (e.g., hand held device **11**) of the present invention, as may be further described herein. CPU **10** of hand held device **11**, can perform as a main controller operating under the control of operating clocks supplied from a clock oscillator. CPU **10** may be configured as a 16-bit microprocessor. External pins of CPU **10** are generally coupled to an internal bus **26** so that it may be interconnected to respective components.

SRAM **24** can be configured as a writeable memory that does not require a refresh operation and can be generally utilized as a working area of CPU **10**. SRAM (Static RAM) is generally a form of semiconductor memory (RAM) based on a logic circuit known as a flip-flop, which retains information as long as there is enough power to run the device. Font ROM **22** can be configured as a read only memory for storing character images (e.g., font) displayable on a display **18**. Examples of types of displays that may be utilized in accordance with display **18** include a TFT active matrix display, an illuminated LCD (Liquid Crystal Display), or other small scale displays being developed.

CPU **10** of the present embodiment drives display **18** utilizing, among other media, font images from Font ROM **22**, and images transmitted as data through wireless unit **17** and processed by image-processing unit **35**. EPROM **20** may be configured as a read only memory that is generally erasable under certain conditions and can be utilized for permanently storing control codes for operating respective hardware components and security data, such as a serial number.

IR controller **14** can be generally configured as a dedicated controller for processing infrared codes transmitted/received by an IR transceiver **16** and for capturing the same as computer data. Wireless unit **17** can be generally configured as a dedicated controller and transceiver for processing wireless data transmitted from and to a wireless communications network.

Port **12** can be connected to CPU **10** and can be temporarily attached, for example, to a docking station to transmit information to and from hand held device **11** to other devices, such as personal computers, retail cash registers, electronic kiosk devices, and so forth. Port **12** can also be configured, for example, to link with a modem, cradle or docking station, which is well known in the art, and can permit network devices, a personal computer or other computing devices to communicate with hand held device **11**.

User controls **32** permit a user to enter data to hand held device **11** and initiate particular processing operations via CPU **10**. A user interface **33** may be linked to user controls **32** to permit a user to access and manipulate hand held device **11** for a particular purpose, such as, for example, viewing images on display **18**. Those skilled in the art will appreciate that user interface **33** may be implemented as a touch screen user interface, as indicated by the dashed lines linking display **18** with user interface **33**. In addition, CPU **10** may cause a sound generator **28** to generate sounds of predetermined frequencies from a speaker **30**. Speaker **30** may be utilized to produce music and other audio information associated with video data transmitted to hand held device **11** form an outside source.

Those skilled in the art can appreciate that additional electronic circuits or the like other than, or in addition to, those illustrated in FIG. **1** may be required to construct hand held device **11**. Such components, however, are not described in the present specification, because many aspects of them are well known in the art. For example, hand held television are available for receiving public television broadcasts, but the basic technology can be modified on such devices so that they may be adapted to (e.g., proper authentication, filters, security codes, or the like) receive venue-based RF transmissions from at least one venue-based RF source (e.g., a wireless camera, or data from a camera transmitted wirelessly through a transmitter). Those skilled in the art can thus appreciate that because of the brevity of the drawings described herein, only a portion of the connections between the illustrated hardware blocks is generally depicted. In addition, those skilled in the art will appreciate that hand held device **11** can be implemented as a specific type of a hand held device, such as a Personal Digital Assistant (PDA), paging device, WAP-enabled mobile phone, and other associated hand held computing devices well known in the art.

Hand held device **11** can be configured to permit images, such as television broadcast images, to be displayed on display **18** for a user to view. Hand held device **35** thus includes an image-processing unit **35** for processing images transmitted as data to hand held device **11** through wireless unit **17**. A tuner unit **34**, implemented as either a single tuner or a plurality of tuners, may be linked through internal bus **26** to CPU **10**. Additionally, a security unit **36** may be utilized to process proper security codes to thereby ensure that data transferred to and from hand held device **11** may be secure and/or permitted. Security unit **36** may be implemented as an optional feature of hand held device **11**. Security unit **36** can also be configured with routines or subroutines that are processed by CPU **10**, and which prevent wireless data from being transmitted/received from hand held device **11** beyond a particular frequency range, outside of a particular geographical area associated with a local wireless network, or absent authorized authorization codes (e.g., decryption).

Hand held device **11** can thus be configured with both wireless and wireline capabilities, depending on the needs and requirements of a manufacturer or customer. Such wireless capabilities include features such as those found in cellular telephone units, in accordance with carrying out embodiments of the present invention. Examples of hand held devices that can be utilized in accordance with the method and system of the present invention include the "Palm Pilot" PDA, manufactured and sold by Palm Computing, the Handspring Visor, the IBM Workpad or other Window CE compatible devices, RIM Blackberry-family paging devices, Motorola paging devices, and the Symbol SPT-family of PDA-type organizer devices. Customized, venue-specific devices (i.e., proprietary, limited use) may be also developed that incorporate hardware and software modules necessary to practice the methods and systems taught herein.

Those skilled in the art can appreciate that although hand held device **11** is generally illustrated in FIG. **1**, hand held device **11** can be implemented as a wireless application protocol (WAP) web-enabled cellular hand held device, such as a PDA, wireless telephone, or pager or a combination thereof. Hand held device **11** can be configured with features of combination cellular telephone/PDA devices. One example of such a device is the Handspring™ palmtop and associated cellular phone attachment, which is manufactured and sold by Handspring Inc. Other such devices include the Palm-Motorola phone, which permits users to access e-mail and store calendars and contact databases. Hand held devices may be also provided in the form of a multi-RF (Radio Frequency) receiver-enabled hand held television viewing device. Regardless of the type of hand held device implemented, it is anticipated that such hand held devices will be adapted to receive and process data via image-processing unit **35** for ultimate display as moving images on display unit **18**, in accordance with the present invention. Image-processing unit **35** may include image-processing routines, subroutines, software modules, and so forth, which perform image-processing operations.

FIG. **2** illustrates a pictorial representation of a hand held device **40**, which may be utilized to implement an embodiment. Those skilled in the art will appreciate that hand held device **40** of FIG. **2** is analogous to hand held device **11** of FIG. **1**. Hand held device **40** includes a display screen **42**, which is generally analogous to display **18** of FIG. **1**. Television images broadcast via radio frequency or digital data may be displayed on display screen **42** for a user to view. User controls **44** permit a user to manipulate images or text displayed on display screen **42**. User controls **44** of FIG. **2** are generally analogous to user controls **32** of FIG. **1**. A touch screen user interface may be further configured on the display screen **42** with hand held device **40** to permit a user to manipulate images/text displayed on display screen **42**.

FIG. **3** depicts a pictorial representation of a hand held device **56** adapted for receiving a module **50**, in accordance with an alternative embodiment. Hand held device **56** of FIG. **3** is generally analogous to hand held device **40** of FIG. **2**, the difference being that hand held device **56** may be adapted to receive a module/cartridge that permits hand held device **56** to function according to specific hardware and/or instructions contained in a memory location within module **50**. Module **50** may also be configured as a smart card, well known in the art. Such a smart card may provide, for example, access codes (e.g., decryption) to enable hand held device **56** to receive venue broadcasts. Note that as utilized herein, the term "module" may refer to a physical module, such as a cartridge. The term "module" may also refer to a software module composed of routines or subroutines that perform a particular function. Those skilled in the art can appreciate the meaning of the term module is based on the context in which the term is utilized. Thus, module **50** may be generally configured as a physical cartridge or smart card. The term "module" as utilized herein may also refer to a software module, depending on the context of the discussion thereof.

To illustrate the use of a physical module, such as module **50**, assume that a user may possess several such physical modules or cartridges. One module, when inserted into hand held device FIG. **3** may instruct hand held device **50** to function as a standard PDA, such as a Palm Pilot device. Another module, when inserted into hand held device FIG. **3**, may instruct hand held device **56** to function as a portable television that receives wireless television data from a local wireless network and/or venue-based (short range) broadcasts.

Those skilled in the art can thus appreciate that hand held device **56** can be adapted to receive and cooperate with module **50**. Additionally, hand held device **56** includes a display screen **52** that is generally analogous to display screen **42** of FIG. **2** and display **18** of FIG. **1**. Hand held device **56** also includes user controls **54** that are generally analogous to user controls **44** of FIG. **2** and user controls **32** of FIG. **1**. Hand held device **56** of FIG. **3** is generally analogous to hand held device **11** of FIG. **1**. Thus, hand held device **56** can also implement touch screen capabilities through a touch screen user interface integrated with display screen **52**.

Assuming module **50** is implemented as a smart card, instead of a cartridge, it is anticipated that similar features can

be implemented in accordance with the smart card to insure that hand held device **56** includes touch screen user interface and video viewing capabilities. Smart cards are generally known in the art as credit-card sized plastic cards with an embedded computer chip. The chip can either be a microprocessor with internal memory or a memory chip with non-programmable logic. The chip connection can be configured via direct physical contact or remotely through a contactless electromagnetic interface.

Smart cards may be generally configured as either a contact or contactless smart card, or a combination thereof. A contact smart card requires insertion into a smart card reader (e.g., contained within hand held device **56**) with a direct connection to, for example, a conductive micromodule on the surface of the card. Such a micromodule may be generally gold plated. Transmission of commands, data, and card status takes place through such physical contact points.

A contactless card requires only close proximity to a reader. Both the reader and the card may be implemented with antenna means providing a contactless link that permits the devices to communicate with one another. Contactless cards can also maintain internal chip power or an electromagnetic signal (e.g., RF tagging technology). Two additional categories of smart codes, well known in the art, which are based on contact and contactless cards are the so-called Combi cards and Hybrid cards.

A Hybrid card generally may be equipped with two chips, each with a respective contact and contactless interface. The two chips are not connected, but for many applications, this Hybrid serves the needs of consumers and card issuers. The Combi card may be generally based on a single chip and can be generally configured with both a contact and contactless interface.

Chips utilized in such smart cards are generally based on microprocessor chips or memory chips. Smart cards based on memory chips depend on the security of the card reader for their processing and can be utilized when low to medium security requirements. A microprocessor chip can add, delete and otherwise manipulate information in its memory. Microprocessor-based memory cards typically contain microprocessor chips with 8, 16, and 32 bit architectures.

FIG. **4** illustrates a system **58** for providing multiple perspectives through a hand held device **60** of activities at a venue **80**, in accordance with an alternative embodiment. For illustrative purposes only, it may be assumed that venue **80** of FIG. **4** is a stadium venue, such as a football stadium. Cameras **71**, **73**, **75**, and **77** are respectively positioned at strategic points about venue **80** to capture the best images of activity taking place within venue **80**. Cameras **71**, **73**, **75**, **77** are respectively linked to transmitters **70**, **72**, **74**, and **76**. Each of these transmitters may be configured as equipment, which feeds a radio signal to an antenna for transmission.

The antenna may be integrated with the transmitter. Transmitters are well known in the art, and include active components, such as a driver, well known in the art. Transmitters also include passive components, such as a TX filter, also well known in the art. These components, when operating together, impress a signal onto a radio frequency carrier of the correct frequency by immediately adjusting its frequency, phase, or amplitude, thereby providing enough gain to the signal to project it to its intended target (e.g., a hand held device located within the venue).

A hand held device **60** may be held by a user at a stadium seat within view of the activity at the venue **80**. Hand held device **60** is generally analogous to hand held device **11** of FIG. **1** and hand held device **40** of FIG. **2**. Hand held device **60** of FIG. **4** may be configured as a hand held device adapted for use with a cartridge/module, such as module **50** of hand held device **56** of FIG. **3**. The cartridge/module may contain the electronics (e.g., tuner, filter, etc.) to allow a hand held device to be adapted for receiving venue-based data. Hand held device **60** includes a display screen **61** (e.g. display **18** of FIG. **1**).

Additionally, display screen **61** of hand held device **60** may be configured with a touch screen user interface displayable and operable on display screen **61**. Those skilled in the art can appreciate that touch screen interfaces are well known in the art and further explanation thereof may be not necessary. Display screen **61** includes a touch screen display area **65** that may be associated with camera **71**. Thus, images captured by camera **71** are transmitted from transmitter **70**, which is linked to camera **71**. Additionally, display screen **61** includes touch screen display areas **69**, **63**, and **67** which are respectively associated with cameras **73**, **75**, and **77**.

Cameras **71**, **73**, **75**, and **77** are respectively labeled C_1, C_2, C_3, and C_N to indicate that a plurality of cameras may be utilized in accordance with system **58** to view activities taking place within venue **80**, such as a football game or concert. Although only four cameras are illustrated in FIG. **4**, those skilled in the art will appreciate that additional or fewer cameras may be also implemented in accordance with system **58**. Touch screen display areas **65**, **69**, **63**, and **67** are also respectively labeled C_1, C_2, C_3, and C_N to illustrate the association between these display areas and cameras **71**, **73**, **75**, and **77**.

Hand held device **60** may be integrated with a plurality of tuners, as illustrated by tuners **62**, **64**, **66**, and **68**. Such tuners can be activated via user controls on hand held device **60** and/or via touch screen icons or areas displayed on display screen **61** that are associated with each tuner. Such icons/areas may be respectively displayed within display areas **65**, **69**, **63** and **67**, or within a separate display area of display screen **61**. A user accesses tuner **62**, for example, to retrieve real-time video images transmitted from transmitter **70** for camera **71**. Likewise, a user can access tuner **64** to retrieve real-time video images transmitted from transmitter **72** for camera **73**.

In addition, a user can access tuner **74** to retrieve real-time video images transmitted from transmitter **74** for camera **75**. Finally, user can access tuner **68** to retrieve real-time video images transmitted from transmitter **76** for camera **77**. In the example depicted in FIG. **4**, a football player **82** is participating in a football game within venue **80**. Cameras **71**, **73**, **75**, and **77** capture moving images (e.g., video data) of the football player **82** from various angles and transmit these images to hand held device **60**.

FIG. **5** depicts a system **59** that provides multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data, in accordance with a preferred embodiment. Note that in FIG. **4** and FIG. **5** analogous parts are indicated by identical reference numerals. Thus, for example, cameras **71**, **73**, **75**, and **77** of FIG. **5** are analogous to cameras **71**, **73**, **75**, and **77** of FIG. **4**. Hand held device **60** of FIG. **5** is also analogous to hand held device **60** of FIG. **4** and includes similar features thereof.

Hand held device **60** of FIG. **5**, however, can be configured to receive wireless real time video data transmitted for cameras **71**, **73**, **75**, and **77** respectively through data transmitters **102**, **104**, **106**, and **108** to server **100** and thereafter to wireless data transmitter/receiver **110**. Note that wireless data transmitter/receiver **110** is analogous to wireless unit **17** of FIG. **1**. Hand held device **60** of FIG. **5** is also analogous to hand held device **11** of FIG. **1**.

Hand held device **60** of FIG. **5** also incorporates a touch screen user interface, as described herein with respect to analogous hand held device **60** of FIG. **4**. The difference between system **58** of FIG. **4** and system **59** of FIG. **5** lies in the inclusion of digital transmitters **102**, **104**, **106**, and **108** which are respectively linked to cameras **71**, **73**, **75**, and **77** of FIG. **5**. In the illustration of FIG. **5**, cameras **71**, **73**, **75**, and **77** may be configured as high definition video cameras which capture real time images of events or activities taking place within venue **80**, such as real time video footage of football player **82**.

A captured image of football player **82** can be transferred from one or more of video cameras **71**, **73**, **75**, and **77** of FIG. **5** and transmitted through a respective digital transmitter, such as digital transmitter **102**, **104**, **106** or **108** and transmitted via wired and/or wireless communications to server **100**. The server **100** then processes the video data received from one or more of the digital transmitters and formats the video data for transmission via wireless means to wireless data transmitter/receiver **100**, which may be integrated with hand held device **100**. Transmitter/receiver **100** can communicate with the various components of hand held device **60**, such as a CPU, image-processing unit, memory units, and so forth.

Those skilled in the art can appreciate that although real time video data may be transmitted to server **100**, captured past video images may also be stored within server **100** and transferred to hand held device **60** for display at display screen **61**. For example, instant replays may be transferred as video data to hand held device **60** upon the request of a user of hand held device **60**. Such instant replay footage can be displayed on display screen **61** for the user to view.

FIG. **6** illustrates a system **79** for providing multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data from at least one wide-angle and/or panoramic video camera **114**, in accordance with a preferred embodiment. In system **79** of FIG. **6**, wide-angle/panoramic (hereinafter referred to as "panoramic") video camera **114** may be configured as a high-definition panoramic video camera that captures images of activities taking place at venue **80**. In the example illustrated in FIG. **6**, panoramic video camera **114** can capture of images of a football game and one or more football players, such as football player **82**.

A data transmitter **112** may be linked to panoramic video camera **114**. Video data captured by panoramic video camera **114** may be transferred to data transmitter **112**, which thereafter transmits the video data to server **100** via a direct link or wireless link, depending on the needs or requirements of the promoters or venue owners. Note that this is also true of the system described in FIG. **6**. Server **100** of FIG. **6** is analogous to server **100** of FIG. **5**. Thus, in the case of FIG. **5**, video data may be transmitted from one or more of data transmitters **102**, **104**, **106**, and **108** via a direct wire/cable link or through wireless transmission means, such as through a wireless network.

Those skilled in the art will appreciate, of course, that hand held device **60** of FIG. **6** is analogous to hand held devices depicted in FIGS. **1-5** herein. In FIGS. **4**, **5**, and **6**, like or analogous parts are identified by identical reference numerals. Thus, images captured by panoramic video camera **114** of activity taking place at venue **80** may be displayed as real time video images or instant replay data on display screen **61** of hand held device **60**.

FIG. **7** depicts a system **89** for providing multiple perspectives for activity at a venue **120** at a first time and/or perspective (Time **1**) and a second time and/or perspective (Time **2**), in accordance with a preferred embodiment. In FIGS. **4**, **5**, **6**, and **7**, like or analogous parts are indicated by identical reference numerals. Thus, in system **89** of FIG. **7**, an event, in this case illustrated as a hockey game, is taking place within venue **120**. Venue **120** may be, for example, a hockey arena. Panoramic video camera **114** may be linked to data transmitter **112**.

As explained previously, data transmitter **112** may be linked to server **100** via a direct link, such as a transmission cable or line, or through wireless communication means, such as through a wireless network. Server **100** can also communicate with hand held device **60** through a wireless network or other wireless communication means by transmitting data through such a network or wireless communications means to wireless data transmitter/receiver **110**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**.

Thus, a video image **124** of a hockey player **122** can be captured as video data by panoramic video camera **114**, along with a video image **126** of a hockey player **123** and displayed within display screen **61** of hand held device **60** as indicated at Time **1**. Video image **124** and **126** can be displayed within a grid-like interface on display screen **61**. Note that in the illustration of FIG. **7**, display screen **61** may be divided into four sections.

When a user touches, for example the area or section of display screen **61** in which video image **124** may be displayed, the entire display area of display screen **61** can be then consumed with a close-up video shot of video image **124**, as indicated at Time **2**, thereby providing the user with a closer view of hockey player **122**. Those skilled in the art can appreciate that the touch screen display area of display screen **61** can be arranged with graphical icons and/or user-controls that perform specific pan and zoom functions. Such icons/user-controls, when activated by a user, permit the user to retrieve panned/zoomed images of events taking place in real time within venue **120**.

Note that although only one panoramic video camera **114** and one data transmitter **112** are illustrated in FIG. **7**, a plurality of panoramic video cameras, servers, and data transmitters may be implemented in accordance with the present invention to capture the best video images, image-processing, and signal capacity to users, whether real time or otherwise, of events taking place at venue **120**.

FIG. **8** illustrates a system **92** for providing multiple perspectives through hand held device **60** of an activity at a venue **130**, including the use of a wireless gateway **124**, in accordance with a preferred embodiment. Those skilled in the art can appreciate that wireless gateway **124** may be configured as an access point for a wireless LAN (Local Area Network). Access points for wireless LAN networks and associated wired and wireless hardware (e.g., servers, routers, gateways, etc.) are well known in the art and may be utilized in accordance with the present invention described herein. Again, note that in FIGS. **4**, **5**, **6**, **7**, and **8**, like or analogous parts are indicated by identical reference numerals. System **92** of FIG. **8** is analogous to system **89** of FIG. **7**, the difference being in the nature of the venue activity. Venue **130** can be, for example, a concert hall or stadium configured with a sound stage.

Gateway **124** can be configured as a communications gateway through which data may enter or exit a communications network, such as wireless network **152** illustrated in FIG. **9** for a large capacity of user hand device **60** users. Wireless network **152** may be configured as a wireless LAN network. Hand held device **60** can be configured to communicate and receive transmissions from such a wireless LAN network based on device identification (e.g., device address). Com-

munication with hand held devices, such as hand held device **60**, however, may also be achieved through RF (Radio Frequency) broadcasts, thereby not requiring two-way communication and authentication between, for example, a wireless LAN network and such hand held devices. A broadcast under such a scenario may also require that such a hand held device or hand held devices possess decryption capabilities or the like in order to be authorized to receive transmissions from the venue.

The remaining elements of FIG. **8** are also analogous to the elements depicted in the previous drawings, with the addition of wireless gateway **124**, which may be linked to server **100** and may be in communication with several wireless data transmitters/receivers **110** and one or more electronic hand held devices, including hand held device **60**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**. One or more panoramic video cameras, such as panoramic video camera **114**, can be positioned at a venue **130** at locations that capture images not only of the events taking place on a concert stage, but also events taking place within the stadium itself.

If an audience member **140**, for example, happens to be walking along a stadium aisle within view of panoramic video camera **114**, the audience member's video image can be displayed as video image **144** within display screen **61** of hand held device **60**, as indicated at Time **1**. Likewise, panoramic video camera **114** captures images of band member **138** whose video image can be displayed as video image **142** within a display area of display screen **61**, as indicated at Time **1**.

Thus, a user of hand held device **60** can view not only the events taking place on a central performing platform of venue **130**, but also other events within the arena itself. The band member **138** may be located on a central performing platform (not shown) of venue **130** when panoramic video camera **114** captures real-time video images of band member **138**. The user may also, for example, wish to see a close-up of audience member **140**. By activating user controls and/or a touch screen interface integrated with display screen **61**, the user can, for example, pan or zoom to view a close-up video shot of audience member **140**, as indicated at Time **2**.

Captured video images are transferred from panoramic video camera **114** as video data through transmitter **112** to server **100** and through wireless gateway **124** to wireless data transmitter/receiver **110**. Although a single server **100** is illustrated in FIG. **8**, those skilled in the art can appreciate that a plurality of servers may be implemented in accordance with the present invention to process captured and transmitted video data. Based on the foregoing, those skilled in the art can appreciate that video data may be simultaneously transferred from server **100** or a plurality or servers to literally thousands of hand held devices located within the range of the wireless network and/or wireless gateways associated with venue **130**.

FIG. **9** illustrates a system **150** for providing multiple perspectives through hand held device **60** of an activity at a venue **130** in association with a wireless network **152**, in accordance with a preferred embodiment. System **150** of FIG. **9** is analogous to system **92** of FIG. **8**, the difference noted in the inclusion of wireless network **152**. Thus, in FIG. **8** and FIG. **9**, like or analogous parts are indicated by identical reference numerals. Video data captured by a camera or cameras, such as panoramic video camera **114**, may be transferred to data transmitter **112**, which transmits the video data to wireless network **152**. Wireless network **152** then retransmits the data, at the request of authorized users of hand held devices, such as hand held device **60**, to wireless data transmitters/receivers, such as transmitter/receiver **110** integrated with hand held device **60**.

Those skilled in the art can appreciate that wireless network **152** may also receive and retransmit other data, in addition to video data. For example, a server or other computer system may be integrated with wireless network **152** to provide team and venue data, which can then be transferred to wireless data transmitter receiver **110** from wireless network **152** and displayed thereafter as team and venue information within display screen **61** of hand held device **60**. Other data that may be transferred to hand held device for display include real-time and historical statistics, purchasing, merchandise and concession information, and additional product or service advertisements.

Such data can include box scores, player matchups, animated playbooks, shot/hit/pitch charts, historical information, and offense-defense statistics. In a concert venue, for example, as opposed to a sporting event, information pertaining to a particular musical group can be also transferred to the hand held device, along with advertising or sponsor information. Note that both the video data and other data described above generally comprise types of venue-based data. Venue-based data, as referred to herein, may include data and information, such as video, audio, advertisements, promotional information, propaganda, historical information, statistics, event scheduling, and so forth, associated with a particular venue and generally not retrievable through public networks.

Such information can be transmitted together with video data received from data transmitter **112**. Such information may be displayed as streaming data within display area **61** of hand held device **60** or simply stored in a database within hand held device **60** for later retrieval by the user. An example of a wireless network that may be utilized to implement wireless network **152** can be Bluetooth, which is described in greater detail herein, and was conceived originally to make up for the shortcomings of infrared technologies (IR). Because IR cannot be utilized to penetrate walls, carry data heavy signals, or operate within devices that are not in line of sight, Bluetooth, which is becoming well-known the art, can be configured as or with wireless network **152**.

FIG. **10** illustrates an entity diagram **170** depicting network attributes of wireless network **152** that may be utilized in accordance with one or more embodiments. Wireless network **152** of FIG. **10** is analogous to wireless network **152** of FIG. **9**. Wireless network **152** as illustrated in FIG. **10** can be configured as a variety of possible wireless networks. Thus, entity diagram **170** illustrates attributes of wireless network **152**, which may or may not be exclusive of one another.

Those skilled in the art can appreciate that a variety of possible wireless communications and networking configurations may be utilized to implement wireless network **152**. Wireless network **152** may be, for example, implemented according to a variety of wireless protocols, including cellular, Bluetooth, and RF or direct IR communications. Wireless network **152** can be implemented as a single network type (e.g., Bluetooth) or a network based on a combination of network types (e.g., GSM, CDMA, etc).

Wireless network **152** may be configured with teachings/aspects of CDPD (Cellular Digital Packet Data) networks well known in the networking arts. CDPD network **154** is illustrated in FIG. **10**. CDPD may be configured as a TCP/IP based technology that supports Point-to-Point (PPP) or Serial Line Internet Protocol (SLIP) wireless connections to mobile devices, such as the hand held devices described and illustrated herein. Cellular service is generally available through-

out the world from major service providers. Data can be transferred utilizing CDPD protocols.

Current restrictions of CDPD are not meant to limit the range or implementation of the method and system described herein, but are described herein for illustrative purposes only. It is anticipated that CDPD will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may preferably be also configured with teachings/aspects of a Personal Area Network **156** or Bluetooth, as described herein. Bluetooth was adopted by a consortium of wireless equipment manufacturers referred to at the Bluetooth Special Interest Group (BSIG), and has emerged as a global standard for low cost wireless data and voice communication. Current specifications for this standard call for a 2.4 GHz ISM frequency band. Bluetooth technology is generally based on a short-range radio transmitter/receiver built into small application specific circuits (ASICS, DSPs) and embedded into support devices, such as the hand held devices described and illustrated herein.

The Bluetooth standard permits up to 100 mw of power, which can increase the range to 100 M. In addition, Bluetooth can support several data channels. Utilizing short data packets and frequency hopping of up to 1600 hops per second, Bluetooth is a wireless technology that can be utilized to enable the implementation of the methods and systems described herein. Current restrictions of Bluetooth are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated Bluetooth will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of GSM network **158**. GSM (Global System for Mobile Communication) and PCS (Personal Communications Systems) networks, both well known in the telecommunications arts, generally operate in the 800 MHz, 900 MHz, and 1900 MHz range. PCS initiates narrowband digital communications in the 900 MHz range for paging, and broadband digital communications in the 1900 MHz band for cellular telephone service. In the United States, PCS 1900 is generally equivalent to GSM 1900. GSM operates in the 900 MHz, 1800-1900 MHz frequency bands, while GSM 1800 is widely utilized throughout Europe and many other parts of the world.

In the United States, GSM 1900 is generally equivalent to PCS 1900, thereby enabling the compatibility of these two types of networks. Current restrictions of GSM and PCS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GSM and PCS will be continually developed, and that aspects of such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also utilize teachings/aspects of GPRS network **160**. GPRS technology, well-known in the telecommunications arts, bridges the gap between current wireless technologies and the so-called "next generation" of wireless technologies referred to frequently as the third-generation or 3G wireless technologies. GPRS is generally implemented as a packet-data transmission network that can provide data transfer rates up to 115 Kbps. GPRS can be implemented with CDMA and TDMA technology and supports X.25 and IP communications protocols, all well known in the telecommunications arts. GPRS also enables features, such as Voice over IP (VoIP) and multimedia services. Current restrictions of GPRS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GPRS will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be implemented utilizing teaching/aspects of a CDMA network **162** or CDMA networks. CDMA (Code Division Multiple Access) is a protocol standard based on IS-95 CDMA, also referred to frequently in the telecommunications arts as CDMA-1. IS-95 CDMA is generally configured as a digital wireless network that defines how a single channel can be segmented into multiple channels utilizing a pseudo-random signal (or code) to identify information associated with each user. Because CDMA networks spread each call over more than 4.4 trillion channels across the entire frequency band, it is much more immune to interference than most other wireless networks and generally can support more users per channel.

Currently, CDMA can support data at speeds up to 14.4 Kbps. Wireless network **152** may also be configured with a form of CDMA technology known as wideband CDMA (W-CDMA). Wideband CDMA may be also referred to as CDMA 2000 in North America. W-CDMA can be utilized to increase transfer rates utilizing multiple 1.25 MHz cellular channels. Current restrictions of CDMA and W-CDMA are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that CDMA and W-CDMA will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may be also implemented utilizing teachings/aspects of paging network **164**. Such paging networks, well known in the telecommunications arts, can be implemented in accordance with the present invention to enable transmission or receipt of data over the TME/X protocol, also well known in the telecommunications arts. Such a protocol enables notification in messaging and two-way data coverage utilizing satellite technology and a network of base stations geographically located throughout a particular geographical region. Paging network **162** can be configured to process enhanced 2-way messaging applications.

Unified messaging solutions can be utilized in accordance with wireless network **152** to permit carriers and Internet service providers to manage customer e-mail, voice messages and fax images and can facilitate delivery of these communications to PDAs, telephony devices, pagers, personal computers and other capable information retrieval devices, wired or wireless.

Current restrictions of such paging networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that such paging networks, including those based on the TME/X protocol, will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of TDMA networks **166**. TDMA (Time Division Multiple Access) is a telecommunications network utilized to separate multiple conversation transmissions over a finite frequency allocation of through-the-air bandwidth. TDMA can be utilized in accordance with the present invention to allocate a discrete amount of frequency bandwidth to each user in a TDMA network to permit many simultaneous conversations or transmission of data. Each user may be assigned a specific timeslot for transmission. A digital cellular communications system that utilizes TDMA typically assigns 10 timeslots for each frequency channel.

A hand held device operating in association with a TDMA network sends bursts or packets of information during each timeslot. Such packets of information are then reassembled by the receiving equipment into the original voice or data/information components. Current restrictions of such TDMA networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that TDMA networks will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of Wireless Intelligent Networks (WINs) **168**. WINs are generally known as the architecture of the wireless switched network that allows carriers to provide enhanced and customized services for mobile telephones. Intelligent wireless networks generally include the use of mobile switching centers (MSCs) having access to network servers and databases such as Home Location Registers (HLRs) and Visiting Location Registers (VLRs), for providing applications and data to networks, service providers and service subscribers (wireless device users).

Local number portability allows wireless subscribers to make and receive calls anywhere—regardless of their local calling area. Roaming subscribers are also able to receive more services, such as call waiting, three-way calling and call forwarding. A HLR is generally a database that contains semi-permanent mobile subscriber (wireless device user) information for wireless carriers' entire subscriber base.

A useful aspect of WINs for the present invention is enabling the maintenance and use of customer profiles within an HLR/VLR-type database. Profile information may be utilized for example with season ticket holders and/or fans of traveling teams or shows. HLR subscriber information as used in WINs includes identity, service subscription information, location information (the identity of the currently serving VLR to enable routing of communications), service restrictions and supplementary services/information. HLRs handle SS7 transactions in cooperation with Mobile Switching Centers and VLR nodes, which request information from the HLR or update the information contained within the HLR. The HLR also initiates transactions with VLRs to complete incoming calls and update subscriber data. Traditional wireless network design is generally based on the utilization of a single HLR for each wireless network, but growth considerations are prompting carriers to consider multiple HLR topologies.

The VLR may be also configured as a database that contains temporary information concerning the mobile subscribers currently located in a given MSC serving area, but whose HLR may be elsewhere. When a mobile subscriber roams away from the HLR location into a remote location, SS7 messages are used to obtain information about the subscriber from the HLR, and to create a temporary record for the subscriber in the VLR.

Signaling System No. 7 (referred to as SS7 or C7) is a global standard for telecommunications. In the past the SS7 standard has defined the procedures and protocol by which network elements in the public switched telephone network (PSTN) exchange information over a digital signaling network to affect wireless and wireline call setup, routing, control, services, enhanced features and secure communications. Such systems and standards may be utilized to implement wireless network **152** in support of venue customers, in accordance with the present invention.

Improved operating systems and protocols allow Graphical User Interfaces (GUIs) to provide an environment that displays user options (e.g., graphical symbols, icons or photographs) on a wireless device's screen. Extensible Markup Language ("XML") is generally a currently available standard that performs as a universal language for data, making documents more interchangeable. XML allows information to be used in a variety of formats for different devices, including PCs, PDAs and web-enabled mobile phones.

XML enables documents to be exchanged even where the documents were created and/or are generally used by different software applications. XML may effectively enable one system to translate what another system sends. As a result of data transfer improvements, wireless device GUIs can be utilized in accordance with a hand held device and wireless network **152**, whether configured as a paging network or another network type, to render images on the hand held device that closely represent the imaging capabilities available on desktop computing devices.

Those skilled in the art can appreciate that the system and logical processes described herein relative to FIGS. **11** to FIG. **17** are not limiting features of the present invention. Rather, FIGS. **11** to FIG. **17** provide examples of image-processing systems and logical processes that can be utilized in accordance with the present invention. Such a system and logical processes represent one possible technique, which may be utilized in accordance with one or more embodiments of the present invention to permit a user of a hand held device to manipulate video images viewable on a display screen of the hand held device.

FIG. **11** thus illustrates a prior art overview display **200** and a detail window **210** that may be utilized with embodiments of the present invention. The overview image display **200** is a view representative of a 360° rotation around a particular point in a space. While a complete rotational view may be utilized in accordance with preferred embodiments of the present invention, one of ordinary skill in the computer arts will readily comprehend that a semi-circular pan (such as used with wide-angle cameras) or other sequence of images could be substituted for the 360 degree rotation without departing from the subject invention. The vantage point is generally where the camera was located as it panned the space. Usually the scene is captured in a spherical fashion as the camera pans around the space in a series of rows as depicted in FIG. **12**. The space is divided into w rows **220-224** and q columns **230-242** with each q representing another single frame as shown in FIG. **12**.

User control over the scene (e.g., rotation, pan, zoom) may be provided by pressing a touch screen display icon or moving a cursor displayed on a display screen of a hand held device, such as the hand held devices described herein. User control over the scene may also be provided by manipulating external user controls integrated with a hand held device (e.g., user controls **44** and **54** of FIG. **2** and FIG. **3**). Movement from a frame in the overview image display to another frame is in one of eight directions as shown in FIG. **13**. The user may interact with the video representation of the space one frame at a time. Each individual frame is an image of one of the pictures taken to capture the space as discussed above. The individual frames may be pieced together.

Interacting with a video one frame at a time results in the ability to present a detailed view of the space, but there are severe limitations. First, the interaction results in a form of tunnel vision. The user can only experience the overview image display as it unfolds a single frame at a time. No provision for viewing an overview or browsing a particular area is provided. Determining where the current location in the image display is, or where past locations were in the overview image display is extremely difficult. Such limita-

tions can be overcome by creating of a motif not dissimilar to the natural feeling a person experiences as one walks into a room.

Another limitation of a simple overview viewer is that there is no random access means. The frames can only be viewed sequentially as the overview image display is unfolded. As adapted for use in accordance with the present invention, this problem has been overcome by providing tools to browse, randomly select and trace selected images associated with any overview image.

FIG. **14** illustrates a prior art overview image **300**, a detail window **310** and a corresponding area indicia, in this case a geometric figure outline **320**. The detail window **310** corresponds to an enlarged image associated with the area bounded by the geometric figure outline **320** in the overview image **300**. As the cursor is moved, the location within the overview image **300** may be highlighted utilizing the geometric figure outline **320** to clearly convey what location the detail window **310** corresponds.

One of ordinary skill in the computer arts will readily comprehend that reverse videoing the area instead of enclosing it with a geometric figure would work equally well. Differentiating the area with color could also be used without departing from the invention. A user can select any position within the overview image, press the cursor selection device's button (for example, user controls in the form of touch screen user interface buttons or icons), and an enlarged image corresponding to the particular area in the overview display is presented in the detail window **310**. Thus, random access of particular frames corresponding to the overview image may be provided.

FIG. **15** illustrates a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview display for subsequent playback. The overview image **400** has a detail window **410** with an enlarged image of the last location selected in the overview image **470**. Each of the other cursor locations traversed in the overview image **420**,**430**,**440**,**450** and **460** are also enclosed by an outline of a geometric figure to present a trace to the user.

Each of the cursor locations may be saved, and because each corresponds to a particular frame of the overview image, the trace of frames can be replayed at a subsequent time to allow another user to review the frames and experience a similar presentation. Locations in the detailed window and the overview image can also be selected to present other images associated with the image area, but not necessarily formed from the original image.

For example, a china teacup may appear as a dot in a china cabinet, but when the dot is selected, a detailed image rendering of the china teacup could appear in the detailed window. Moreover, a closed door appearing in an image could be selected and result in a detailed image of a room located behind the door even if the room was not visible in the previous image. Finally, areas in the detailed window can also be selected to enable further images associated with the detailed window to be revealed. Details of objects within a scene are also dependent on resolution capabilities of a camera. Cameras having appropriate resolution and/or image processing capabilities are preferably used in accordance with certain aspects of the present invention.

The overview image was created as discussed above. To assist one of ordinary skill in the art to make and use the invention, a more detailed discussion of the necessary processing is presented below with reference to FIG. **16** and FIG. **17** herein.

FIG. **16** depicts a prior art flowchart providing a logical process for building an overview image display. Such a logical process may be utilized in accordance with the present invention, but is not a necessary feature of the present invention. Those skilled in the art will appreciate that such a logical process is merely an example of one type of image-processing algorithm that may be utilized in accordance with embodiments of the present invention. For example, such a logical process may be implemented as a routine or subroutine that runs via image-processing unit **35** of FIG. **1** in a hand held device. Those skilled in the art can appreciate that the logical process described with relation to FIGS. **16** and **17** herein are not limiting features of the present invention.

Such logical processes, rather, are merely one of many such processes that may be utilized in accordance with the present invention to permit a user to manipulate video images displayed via a display screen of a hand held device. Navigable movie/video data in the form of images input to the hand held device to form individual images can be thus processed, as illustrated at function block **500**. User specified window size (horizontal dimension and vertical dimension) may be entered, as illustrated at function block **504**.

Image variables can be specified (horizontal sub-sampling rate, vertical sub-sampling rate, horizontal and vertical overlap of individual frame images, and horizontal and vertical clip (the number of pixels are clipped from a particular frame in the x and y plane)), as depicted at function block **508**. Function blocks **500**,**504** and **508** are fed into the computation function block **510** where the individual frames are scaled for each row and column, and the row and column variables are each initialized to one.

Then a nested loop can be invoked to create the overview image. First, as indicated at decision block **512**, a test is performed to determine if the maximum number of rows has been exceeded. If so, then the overview image is tested to determine if its quality is satisfactory at decision block **520**. If the quality is insufficient, the user may be provided with an opportunity to adjust the initial variables, as illustrated at function blocks **504** and **508**. The processing is then repeated. If, however, the image is of sufficient quality, it can be saved and displayed for use, as depicted at block **560**.

If the maximum rows has not been exceeded as detected in decision block **512**, then another test can be performed, as illustrated at decision block **514**, to determine if the column maximum has been exceeded. If so, then the row variable can be incremented and the column variable can be reset to one at function block **518** and control flows to input block **520**. If the column maximum has not been exceeded, then the column variable may be incremented and the sub-image sample frame can be retrieved, as depicted at input block **520**. Then, as illustrated at function block **530**, the frame may be inserted correctly in the overview image.

The frame may be inserted at the location corresponding to (Vsub*row*col)+Hsub*col; where row and col refer to the variables incremented in the nested loop, and Vsub and Hsub are user specified variables corresponding to the horizontal and vertical sub sampling rate. Finally, the incremental overview image can be displayed based on the newly inserted frame as depicted at display block **540**. Thereafter, the column variable can be reset to one and processing can be passed to decision block **512**.

A computer system corresponding to the prior art method and system depicted in FIGS. **11** to **17** may be generally interactive. A user may guess at some set of parameters, build the overview image, and decide if the image is satisfactory. If the image is not satisfactory, then variables can be adjusted and the image is recreated. This process can be repeated until a satisfactory image results, which may be saved with its

associated parameters. The picture and the parameters can be then input to the next set of logic.

Such features may or may not be present with the hand held device itself. For example, images may be transmitted from a transmitter, such as data transmitter **112** of FIG. **7**, and subroutines or routines present within the server itself may utilize predetermined sets of parameters to build the overview image and determine if the image is satisfactory, generally at the request of the hand held device user. A satisfactory image can be then transmitted to the hand held device. Alternatively, image-processing routines present within an image-processing unit integrated with the hand held device may operate in association with routines present within the server to determine if the image is satisfactory, and/or to manipulate the image (e.g., pan, zoom).

FIG. **17** depicts a prior art flowchart illustrative of a logical process for playback interaction. The logical process illustrated in FIG. **17** may be utilized in accordance with a preferred or alternative embodiment, depending of course, upon design considerations and goals. Playback interaction may commence, as illustrated at label **600**, which immediately flows into function block **604** to detect if user controls have been activated at the hand held device. Such user controls may be configured as external user controls on the hand held device itself (e.g., buttons, etc.), or via a touch screen user interface integrated with hand held device display screen.

When a touch screen user input or user control button press is detected, a test can be performed to determine if a cursor is positioned in the overview portion of the display. If so, then the global coordinates can be converted to overview image coordinates local to the overview image as shown in output block **612**. The local coordinates can be subsequently converted into a particular frame number as shown in output block **614**. Then, the overview image is updated by displaying the frame associated with the particular location in the overview image and control flows via label **600** to function block **604** to await the next button press.

If the cursor is not detected in the overview image as illustrated at decision block **610**, then another test may be performed, as indicated at decision block **620**, to determine if the cursor is located in the navigable player (detail window). If not, then control can be passed back via label **600** to function block **604** to await the next user input. However, if the cursor is located in the detail window, then as depicted a function block **622**, the direction of cursor movement may be detected. As depicted at function block **624**, the nearest frame can be located, and as illustrated at decision block **626**, trace mode may be tested.

If trace is on, then a geometric figure can be displayed at the location corresponding to the new cursor location in the overview image. The overview image may be then updated, and control can be passed back to await the next user input via user controls at the hand held device and/or a touch screen user interface integrated with the hand held device. If trace is not on, the particular frame is still highlighted as shown in function block **630**, and the highlight can be flashed on the overview image as illustrated at output block **632**. Thereafter, control may be returned to await the next user input.

Although the aforementioned logical processes describe the use of a cursor as a means for detecting locations in a panorama, those skilled in the art can appreciate that other detection and tracking mechanisms may be utilized, such as, for example, the pressing of a particular area within a touch screen display.

FIG. **18** depicts a pictorial representation illustrative of a Venue Positioning System (VPS) **700** in accordance with an alternative embodiment. FIG. **18** illustrates a stadium venue **701** which is divided according to seats and sections. Stadium venue **701** may be utilized for sports activities, concert activities, political rallies, or other venue activities. Stadium venue **701** is divided, for example, into a variety of seating sections A to N. For purposes of simplifying this discussion, VPS **700** is described in the context of sections A to C only.

A venue positioning system (VPS) device **704** is positioned in section A of stadium venue **701**, as indicated at position A2. A VPS device **702** is located within section A at position A1. In the illustration of FIG. **18**, it is assumed that VPS device **702** is located at the top of a staircase, while VPS device **704** is located at the bottom of the staircase, and therefore at the bottom of section A, near the sports field **711**. A VPS device **706** is located near the top of section B at position B1. A VPS device **708** is located at the bottom of section B at position B2, near sports field **711**. Similarly, in section C, venue positioning devices **710** and **712** are respectively located at positions C1 and C2.

A hand held device **703** may be located at a seat within section A. For purposes of this discussion, and by way of example only, it is assumed that hand held device **703** is being operated by a stadium attendee watching a sporting event or other venue activity taking place on sports field **711**. A hand held device **707** is located within section B. Hand held device **707**, by way of example, may also be operated by a concessionaire or venue employee.

If the user of hand held device **703** desires to order a soda, hot dog, or other product or service offered by venue operators during the venue event, the user merely presses an associated button displayed via a touch screen user interface integrated with the hand held device. Immediately, a signal is transmitted by hand held device **703**, in response to the user input to/through the VPS device, wireless network or wireless gateway as previously described. One or more of VPS devices **702**, **704**, **706**, and **708** may detect the signal. The VPS devices may also operate merely as transponders, in which case hand held devices will be able to determine their approximate location within the venue and then transmit position information through wireless means to, for example, concession personnel.

VPS devices **702**, **704**, **706**, and **708** function in concert with one another to determine the location of hand held device **703** within section A. Triangulation methods, for example, may be used through the hand held device or VPS devices to determine the location of the hand held device within the venue. This information is then transmitted by one or more of such VPS devices either directly to hand held device **707** or initially through a wireless network, including a wireless gateway and associated server, and then to hand held device **707**. The user of hand held device **707** then can directly proceed to the location of hand held device **703** to offer concession services.

Additionally, hand held device **703** can be configured with a venue menu or merchandise list. In response to requesting a particular item from the menu or merchandise list, the request can be transmitted as wireless data from hand held device **703** through the wireless network to hand held device **707** (or directly to a controller (not shown) of hand held device **707**) so that the user (concession employee) of hand held device **707** can respond to the customer request and proceed directly to the location of hand held device **703** used by a customer.

FIG. **19** illustrates in greater detail the VPS **700** of FIG. **18**, in accordance with an alternative embodiment. In FIG. **18** and FIG. **19** like or analogous parts are indicated by identical reference numerals, unless otherwise stated. Additionally wireless gateway **124** and server **100** of FIG. **19** are analogous to the wireless gateway **124** and server **100** illustrated in FIG.

8. Venue positioning units **702**, **704**, **706**, and **708** are located within section A and section B. A wireless gateway **124** is linked to server **100**. Wireless gateway **124** can communicate with hand held device **707** and hand held device **703**.

Wireless gateway **124** can also communicate with VPS devices **702**, **704**, **706**, and **708** if the VPS devices are also operating as data communication devices in addition to providing mere transponder capabilities. When VPS devices **702**, **704**, **706**, and **708** detect the location of hand held device **703** within stadium venue **701**, the location is transmitted to wireless gateway **124** and thereafter to hand held device **703**. It should be appreciated that a hand held device user may also identify his/her location in a venue by entering location information (e.g., seat/section/row) on the hand held device when making a request to a service provider such as a food concession operation. The VPS devices will still be useful to help concession management locate concession employees located within the venue that are in closest proximity to the hand held device user. A wireless gateway **124** and server **100** can be associated with a wireless network implemented in association with stadium venue **701**. Those skilled in the art will appreciate that such a wireless network may be limited geographically to the stadium venue **701** itself and the immediate surrounding area. An example of such a wireless network, as described previously is a Bluetooth based wireless network.

The hand held devices themselves may be proprietary devices owned by promoters or operators of stadium venue **701** and rented to patrons for their use while attending a venue activity. Proprietary devices will generally be manufactured using durable materials (e.g., similar to those materials used on field technician digital multimeters/devices such as the Fluke™ line of electronic devices). Proprietary devices will also be limited in hardware and software modules (i.e., software routines/subroutines) needed for communication with the venue system in order to display venue activities to temporary users.

Hand held devices may also be owned by the patrons themselves which they bring into the stadium venue for their use by permission of the venue promoter or stadium owners in return for the payment of a fee by the patron. In return for the fee, the venue promoter or stadium owner can provide the patron with a temporary code which permits them to access the wireless network associated with the venue itself, such as wireless network **152** described herein. Patron-owned devices may utilize smart card technology to receive authorization codes (e.g., decryption) needed to receive venue—provided video/data. Codes may also be transferred to the patron-owned device via IR or short range RF means. Wireless network **152** described herein may be configured as a proprietary wireless Intranet/Internet providing other data accessible by patrons through their hand held devices.

FIG. **20** depicts a flowchart of operations **740** illustrative of a method for providing multiple venue activities through a hand held device, in accordance with an alternative embodiment. The process is initiated, as depicted at block **742**. As illustrated next at block **744**, a venue attendee may activate at least one hand held tuner integrated with a hand held device, such as the hand held device illustrated in FIG. **4**. At least one tuner may be integrated with the hand held device, although more than one tuner (or other simultaneous signal receiving capability) may be used within a hand held device in support of other embodiments of the invention previously described.

The tuner, or tuners, is/are associated with a transmission frequency/frequencies of a transmitter that may be linked to a particular camera/cameras focusing on a venue activity, or to a wireless gateway or wireless network transmission. To view the images from that particular angle, the user must retrieve the video images from the camera associated with that particular angle. The user may have to adjust a tuner until the right frequency/image is matched, as indicated at block **756**. As illustrated at block **748**, captured video images are transferred from the video camera to the transmitter associated with the camera, or a server in control of the camera(s). Video images are generally transmitted to the hand held device at the specified frequency, in response to a user request at the hand held device, as depicted at block **750**.

An image-processing unit integrated with the hand held device, as illustrated at block **752** may then process transferred video images. An example of such an image-processing unit is image-processing unit **35** of FIG. **1**. As indicated thereafter at block **754**, the video images of the venue activity captured by the video camera can be displayed within a display area of the hand held device, such as display **18** of FIG. **1**. The process can then terminate, as illustrated at block **756**.

FIG. **21** illustrates a flowchart of operations **770** illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras, in accordance with an alternative embodiment. As indicated at block **772**, the process is initiated. As illustrated next at block **774**, video images of a venue activity may be captured by one or more digital video camera.

Such digital video cameras may be panoramic/wide-angle in nature and/or configured as high definition video cameras, well known in the art. The video camera or cameras may be respectively linked to data transmitters, such as data transmitters **102**, **104**, **106**, and/or **108** of FIG. **5** or data transmitter **112** of FIG. **6** to FIG. **9** herein. As depicted next at decision block **778**, if a user does not request a view of the venue activity through the hand held device, the process terminates, as illustrated thereafter at block **779**.

If, as illustrated at decision block **778**, the user does request a view of the venue activity through the hand held device, then as described thereafter at block **780**, video data may be transferred from a data transmitter to a server, such as server **100** of FIG. **5** to FIG. **8** herein. The video data may be stored in a memory location of the server or a plurality of servers, as indicated at block **782**. The video data may be then transferred to a wireless data transmitter/receiver integrated with the hand held device, as indicated at block **784**.

As illustrated thereafter at block **786**, the video data may be processed by an image-processing unit and associated image-processing routines and/or subroutines integrated with the hand held device. When image-processing is complete, the video images may be displayed in a display area of the hand held device. As illustrated next at block **790**, if a user chooses to pan/zoom for a better view of the video images displayed within the hand held device, then two possible operations may follow, either separately or in association with one another.

The image-processing unit integrated with the hand held device may process the user's pan/zoom request, as illustrated at block **792**. Alternatively, image-processing routines and/or subroutines resident at the server or a plurality of servers may process the user's pan/zoom request, following the transmission of the user's request from the hand held device to the server or plurality of servers. Such a request may be transmitted through a wireless gateway linked to the server or servers.

Image-processing may occur at the server or servers if the hand held device is not capable of directly processing the video data and video images thereof due to low memory or slow CPU allocation. Likewise, some image-processing may take place within the hand held device, while video image-

processing requiring faster processing capabilities and increased memory may take place additionally at the server or servers to assist in the final image representation displayed at the hand held device.

When image-processing is complete, the pan/zoomed images can be displayed within a display screen or display area of the hand held device, as illustrated thereafter at block **796**. The process then terminates, as depicted at block **798**. If the user does not request pan/zoom, as indicated at block **790**, the process may then terminate, as described at block **791**.

The embodiments and examples set forth herein are presented in order to best explain the present invention and its practical application and to thereby enable those skilled in the art to make and utilize the invention. However, those skilled in the art will recognize that the foregoing description and examples have been presented for the purpose of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching without departing from the spirit and scope of the following claims.

What is claimed is:

1. A method for wirelessly providing venue-based data to at least one hand held device, said method comprising:

acquiring venue-based data via at least one server, said venue-based data comprising more than one video captured by more than one video camera capturing video within said at least one venue;

authenticating at least one hand held device for receipt of said venue-based data to said at least one hand held device from said at least one server;

wirelessly streaming said venue-based data from said at least one server to said at least one hand held device through a wireless packet based data network, in response to said authenticating said at least one hand held device, in order to permit said venue-based data to be accessible via said at least one hand held device at locations within and remote from said at least one venue; and

accessing said venue-based data via said at least one hand held device for display of said more than one video captured by said more than one video camera capturing said more than one video within said at least one venue.

2. The method of claim **1** wherein authenticating said at least one hand held device comprises authenticating a particular user of said at least one hand held device for the delivery of said venue-based data to said at least one hand held device.

3. The method of claim **1** wherein said venue-based data comprises video replay data.

4. The method of claim **1** wherein said venue-based data comprises audio data.

5. The method of claim **1** wherein said venue-based data comprises at least one of the following types of data: team information and sports statistics.

6. The method of claim **1** wherein said venue-based data comprises promotional information.

7. The method of claim **1** wherein said venue-based data comprises merchandise information.

8. The method of claim **1** wherein said venue-based data comprises advertisements.

9. The method of claim **1** wherein said at least one hand held device comprises a cellular telephone.

10. The method of claim **1** wherein said at least one hand-held device comprises a smartphone having a touchscreen display for said display of said more than one video captured by said more than one video camera capturing said more than one video within said at least one venue.

11. The method of claim **1** wherein said at least one hand held device comprises a laptop computer.

12. A system for wirelessly providing venue-based data to at least one hand held device, said system comprising:

at least one entertainment venue including more than one video camera capturing more than one video of performers engaged in an entertainment activity within said at least one entertainment venue;

at least one server for storing and processing venue-based data;

a data communications network from which said venue-based data is acquirable, said venue-based data comprising audio data and video data, including said more than one video of said performers engaged in said entertainment activity within said at least one entertainment venue;

at least one authentication module for authenticating at least one hand held device for authorized acceptance of said venue-based data to said at least one hand held device; and

at least one transmitter for wirelessly streaming said venue-based data from said at least one server to said at least one hand held device through a wireless packet based data network, in response to authenticating said at least one hand held device via said at least one authentication module, in order to permit said venue-based data to be accessible via said at least one hand held device at locations within and remote to said at least one venue for display of said more than one video captured by said more than one video camera capturing said more than one video within said at least one entertainment venue.

13. The system of claim **12** wherein said at least one hand held device comprises a touchscreen display for said display of said more than one video captured by said more than one video camera capturing video within said at least one venue.

14. The system of claim **12** wherein authenticating said at least one hand held device comprises authenticating a particular user of said at least one hand held device for the delivery of said venue-based data to said at least one hand held device for said display of said more than one video captured by said more than one vide camera capturing video with said at least one entertainment venue.

15. The system of claim **12** wherein said venue-based data further comprises video replay data.

16. The system of claim **13** wherein said venue-based data further comprises at least one of the following types of data: team information and sports statistics.

17. The system of claim **13** wherein said venue-based data further comprises at least one of the following types of data: merchandise information, advertisements, promotional information and concession information.

18. The system of claim **13** wherein said at least one hand held device comprises a cellular telephone.

19. The system of claim **13** wherein said at least one hand-held device comprises a smartphone having a touchscreen display for said display of said more than one video captured by said more than one video camera capturing said more than one video within said at least one entertainment venue.

20. A system for wirelessly providing venue-based data to at least one hand held device, said system comprising:

at least one server;

a processor and a data bus coupled to said processor;

a computer-usable medium embodying computer code, said computer-usable medium being coupled to said

data bus, said computer program code comprising instructions executable by said processor and configured for:

acquiring venue-based data via said at least one server, said venue-based data comprising video captured by more than one video camera capturing more than one video within said at least one venue;

authenticating at least one hand held device for receipt of said venue-based data to said at least one hand held device from said at least one server;

wirelessly streaming said venue-based data from said at least one server to said at least one hand held device through a wireless packet based data network, in response to said authenticating said at least one hand held device, in order to permit said venue-based data to be accessible via said at least one hand held device at locations within and remote from said at least one venue; and

accessing said venue-based data via said at least one hand held device for display of said more than one video captured by said more than one video camera capturing said more than one video within said at least one venue.

* * * * *

US008270895B2

(12) **United States Patent**
Ortiz et al.

(10) **Patent No.: US 8,270,895 B2**
(45) **Date of Patent: *Sep. 18, 2012**

(54) **TRANSMITTING SPORTS AND ENTERTAINMENT DATA TO WIRELESS HAND HELD DEVICES OVER A TELECOMMUNICATIONS NETWORK**

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(73) Assignee: **Front Row Technologies, LLC**, Albuquerque, NM (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/314,385**

(22) Filed: **Dec. 8, 2011**

(65) **Prior Publication Data**

US 2012/0094591 A1 Apr. 19, 2012

Related U.S. Application Data

(63) Continuation of application No. 12/884,810, filed on Sep. 17, 2010, now Pat. No. 8,086,184, and a continuation of application No. 12/884,858, filed on Sep. 17, 2010, now Pat. No. 8,090,321, said application No. 12/884,810 is a continuation of application No. 12/329,631, filed on Dec. 7, 2008, now Pat. No. 7,826,877, said application No. 12/844,858 is a continuation of application No. 12/329,631, which is a continuation of application No. 11/738,088, filed on Apr. 20, 2007, now Pat. No. 7,620,426, which is a continuation of application No. 11/498,415, filed on Aug. 2, 2006, now Pat. No. 7,376,388, which is a continuation of application No. 09/708,776, filed on Nov. 8, 2000, now Pat. No. 7,149,549.

(60) Provisional application No. 60/243,561, filed on Oct. 26, 2000.

(51) **Int. Cl.**

H04H 20/71	(2008.01)
H04H 40/00	(2008.01)
H04B 7/00	(2006.01)
H04B 13/00	(2006.01)

(52) **U.S. Cl.** **455/3.01**; 455/3.06; 455/66.1; 455/899

(58) **Field of Classification Search** 455/899, 455/3.01, 3.06, 180.1, 66.1

See application file for complete search history.

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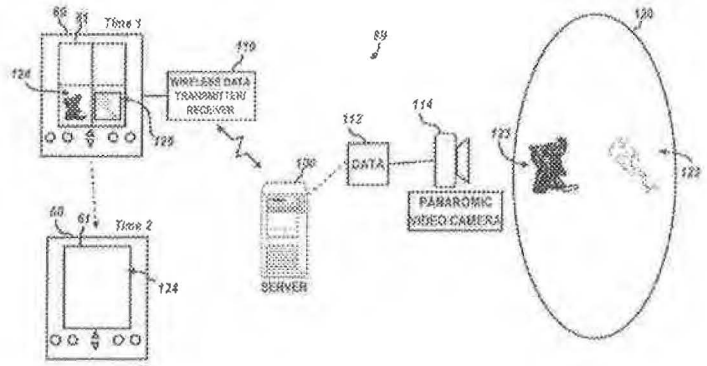
Primary Examiner — Tilahun B Gesesse

(74) *Attorney, Agent, or Firm* — Kermit D. Lopez; Luis M. Ortiz; Ortiz & Lopez, PLLC

(57) **ABSTRACT**

A system, method and/or one or more servers, include a memory (or memories) capable of storing venue-based data comprising video captured from more than one camera located in one or more venues, and one or more processors capable of authenticating one or more remote hand held devices to provide one or more users of the remote hand held device(s) access to the venue-based data. One or more ports is capable of transmitting the venue-based data from the server(s) so that the venue-based data may be received by one or more remote hand held device authorized to receive the venue-based data through one or more wireless data communications networks, in order to permit the venue-based data to be accessible via the remote hand held device(s) by the user(s) of the remote hand held device(s) at locations within or remote from the venue(s).

20 Claims, 19 Drawing Sheets



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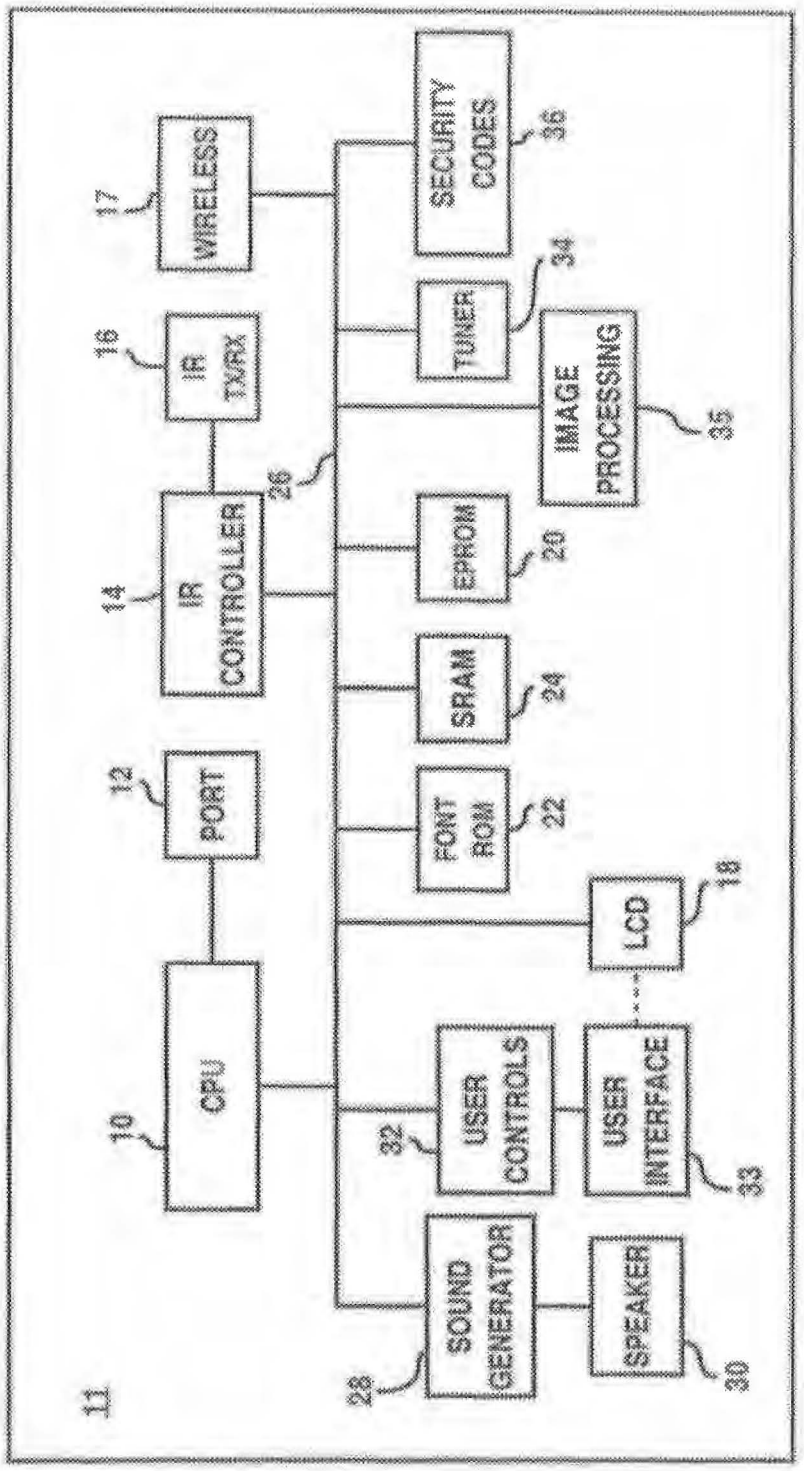


FIG. 1

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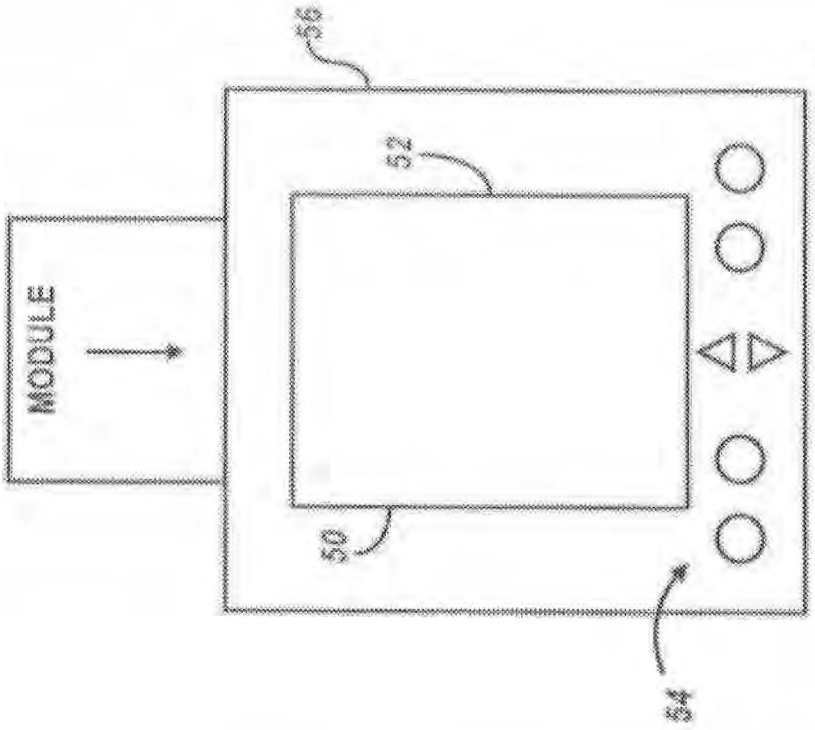


FIG. 3

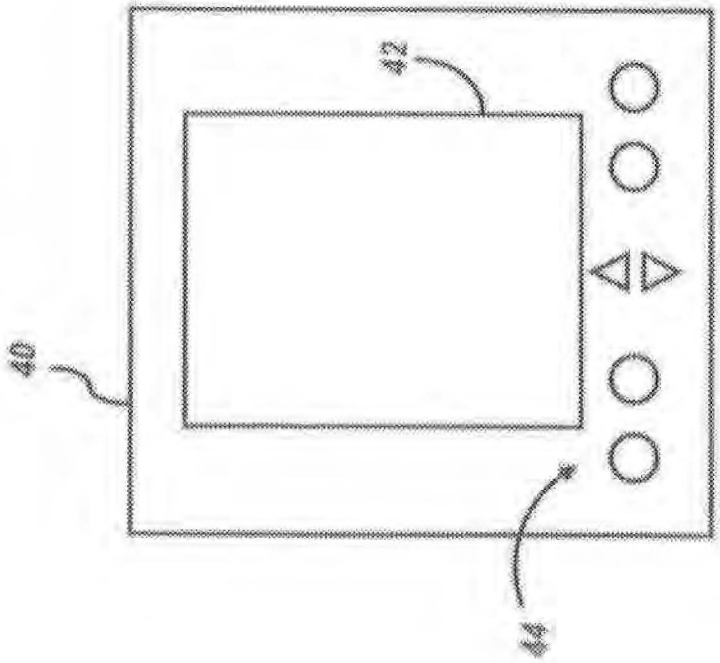


FIG. 2

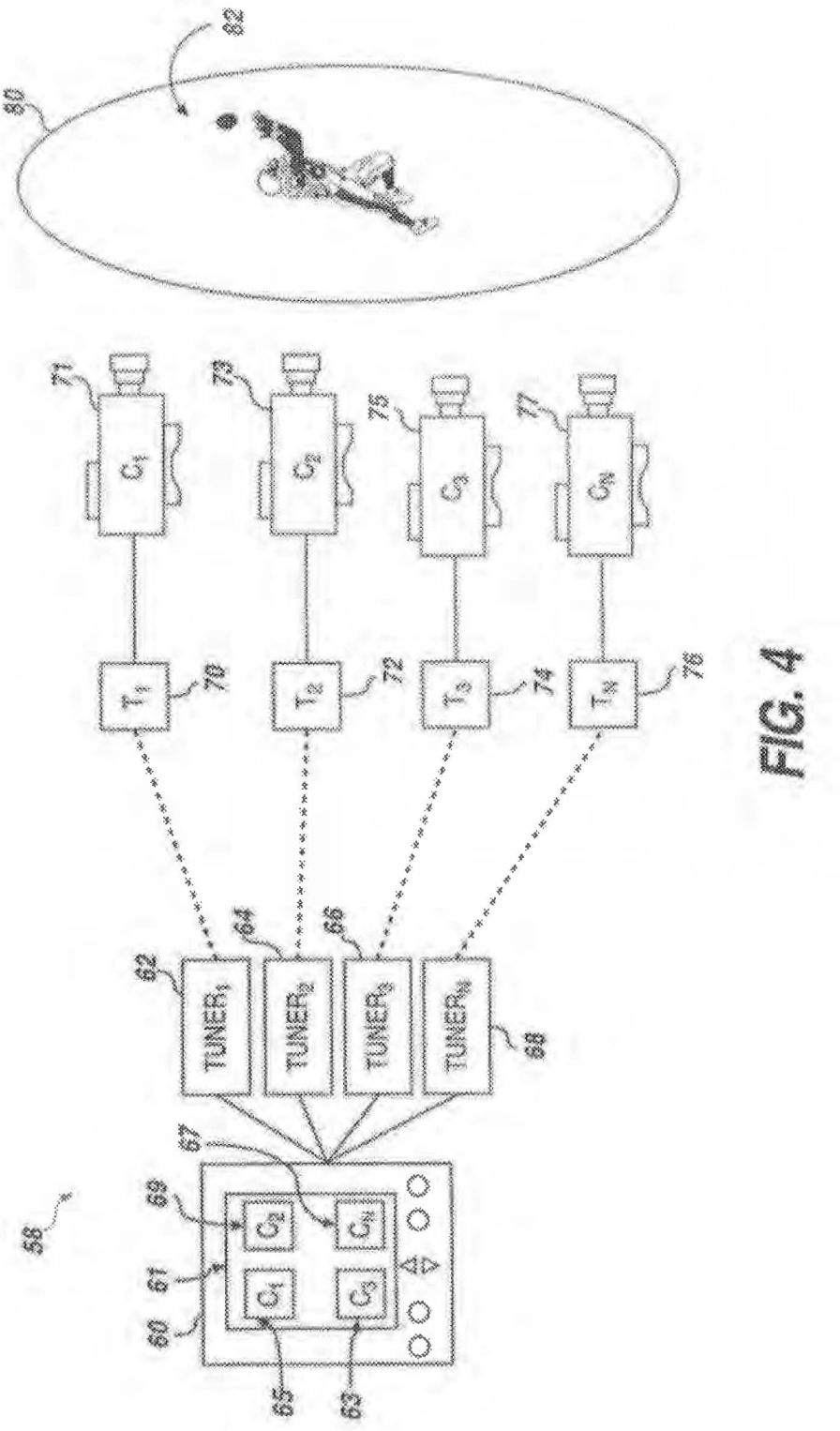


FIG. 4

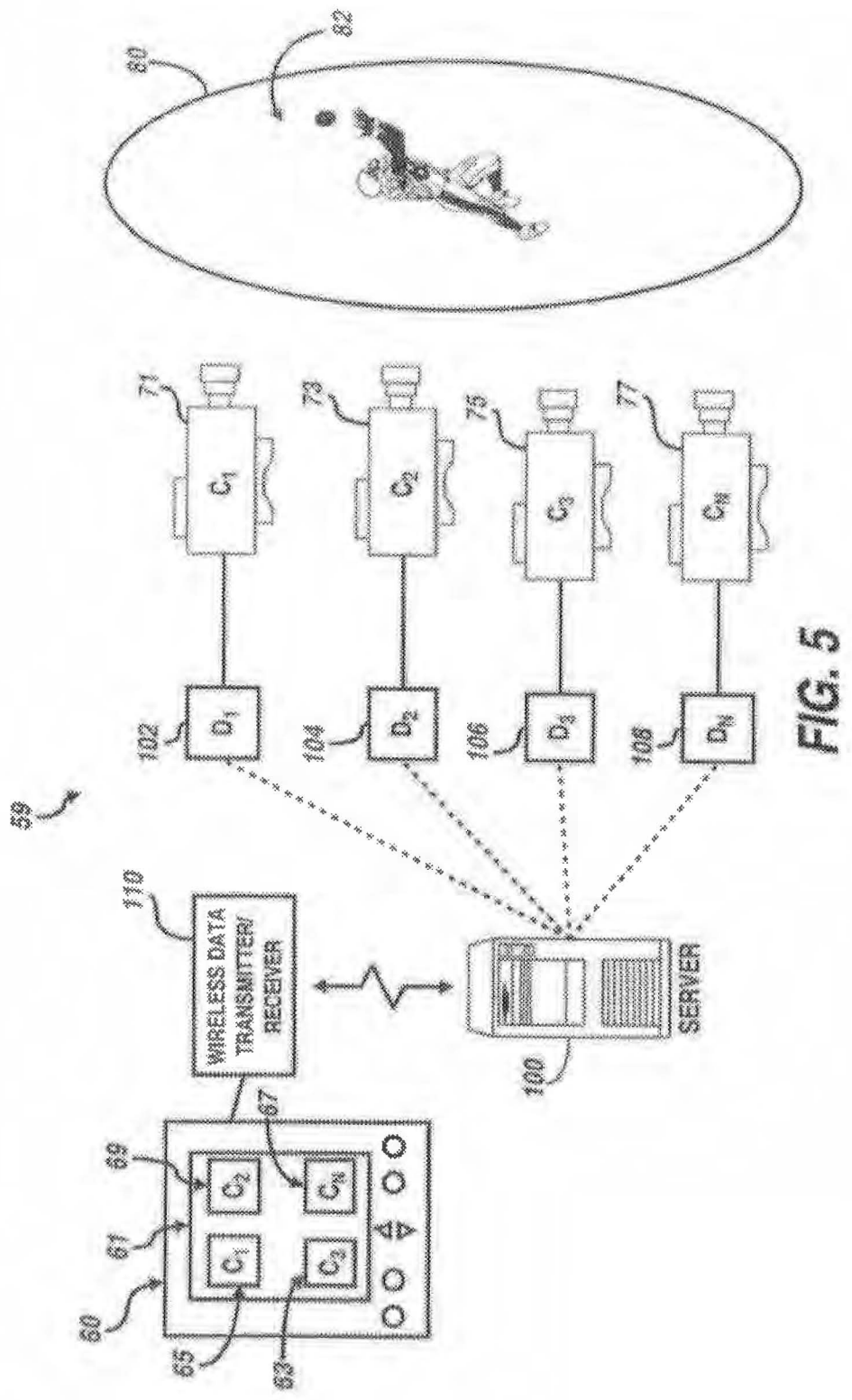

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75
77
C_1
C_2
C_3
C_N
102
104
106
108
D_1
D_2
D_3
D_N
59
110
WIRELESS DATA TRANSMITTER/ RECEIVER
SERVER
100
67
69
67
60
65
63

FIG. 5

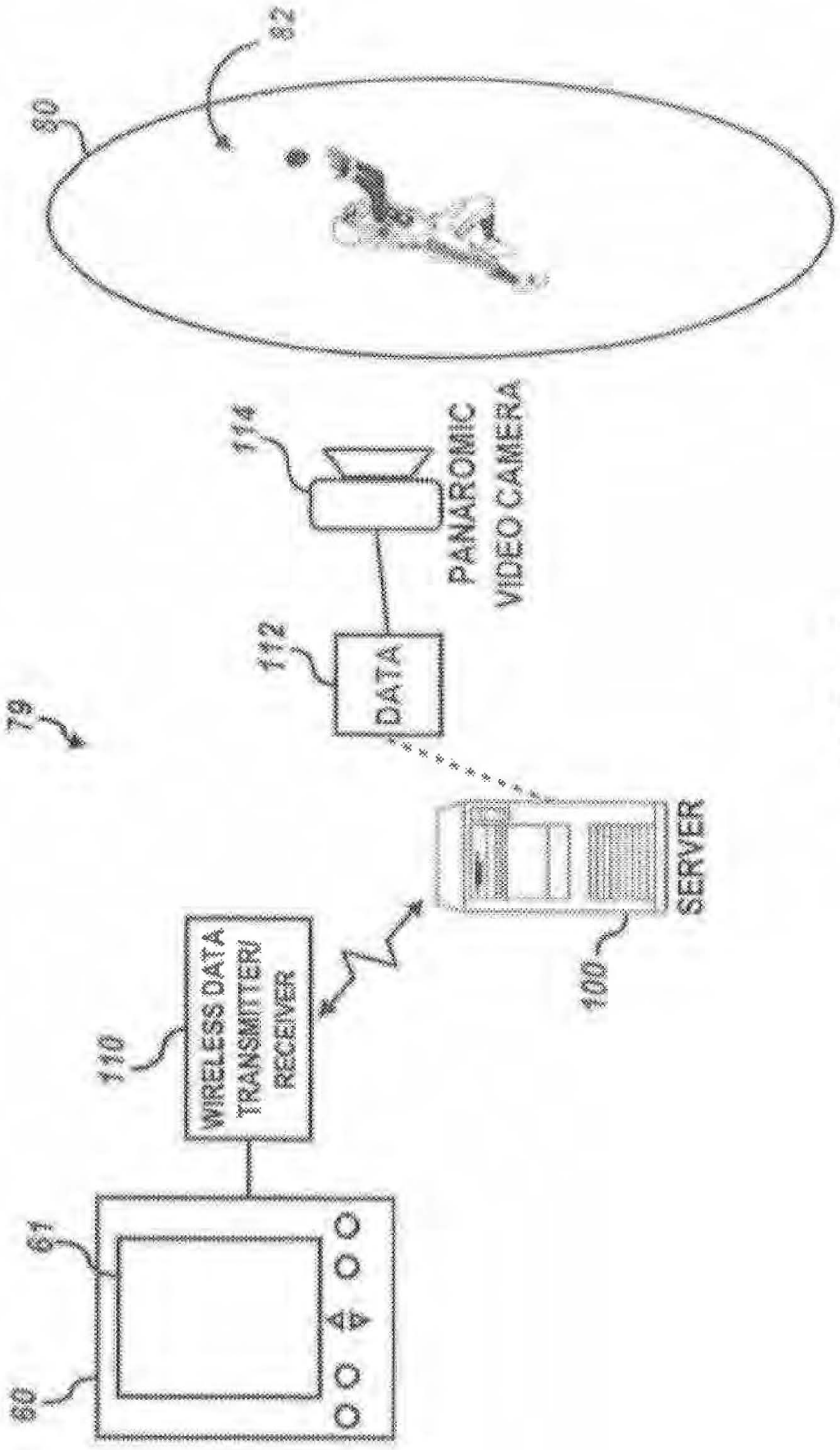

82
80
114
PANAROMIC
VIDEO CAMERA
112
DATA
79
SERVER
100
110
WIRELESS DATA
TRANSMITTER/
RECEIVER
67
60

FIG. 6

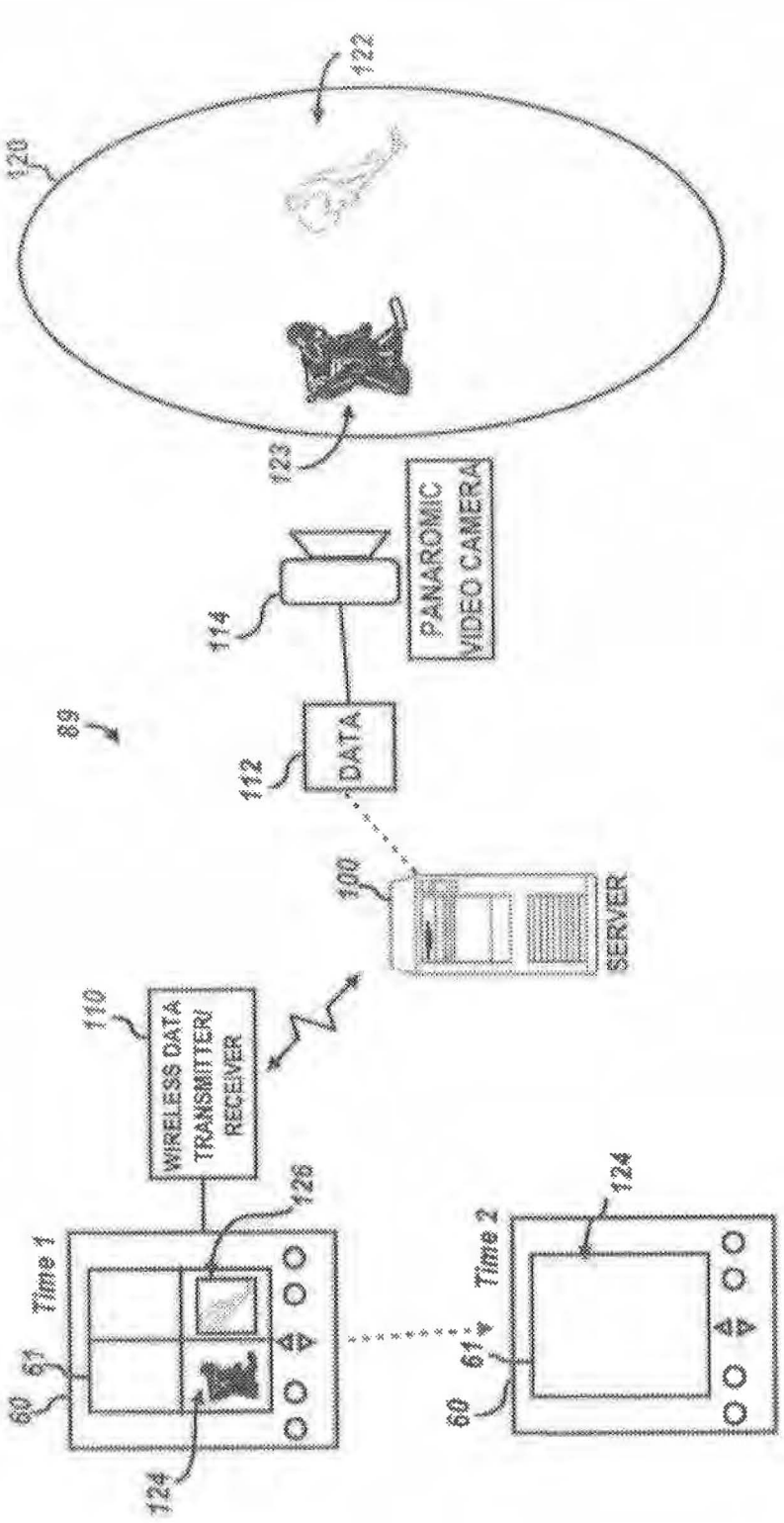


FIG. 7

APPX0767

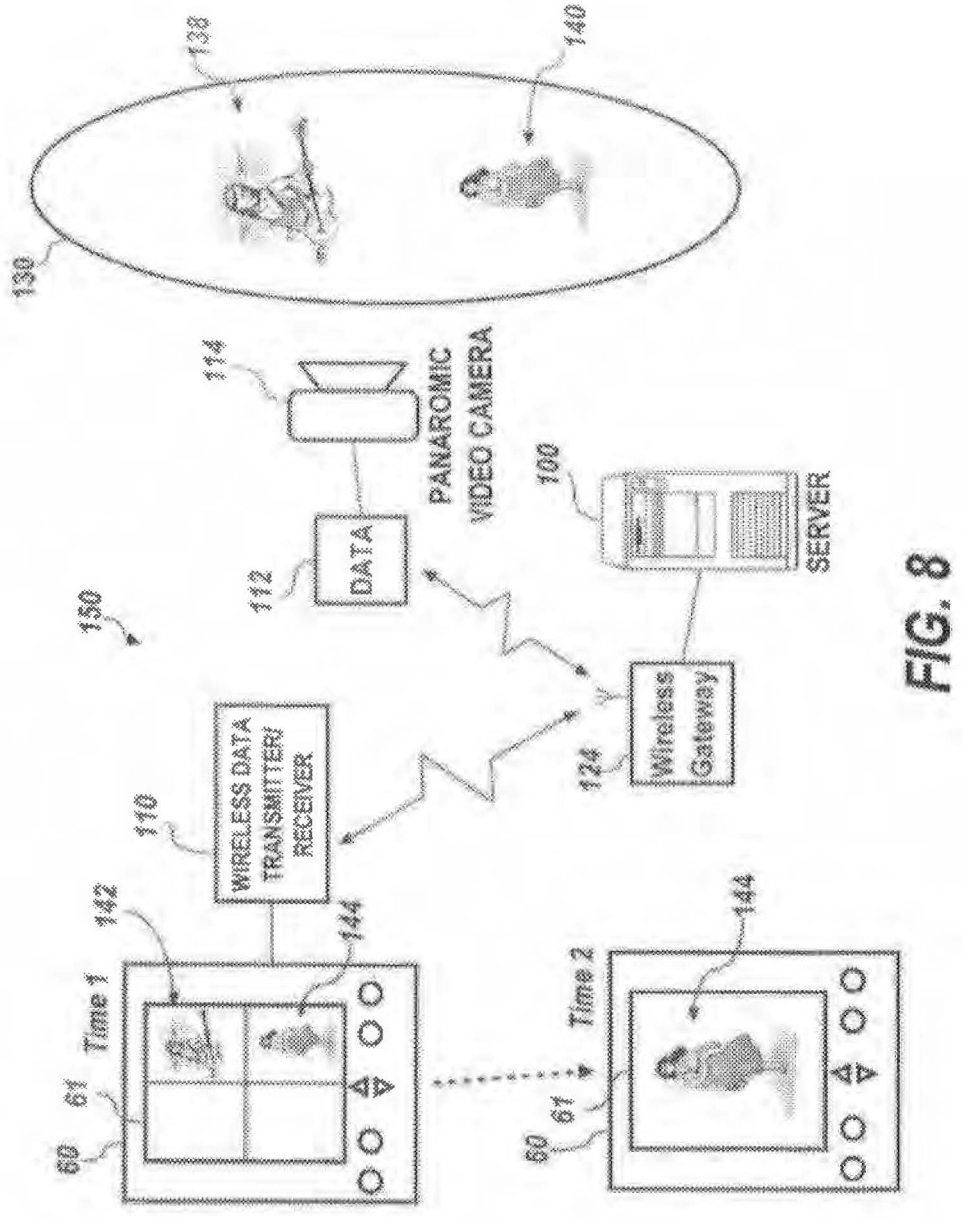


FIG. 8

APPX0768

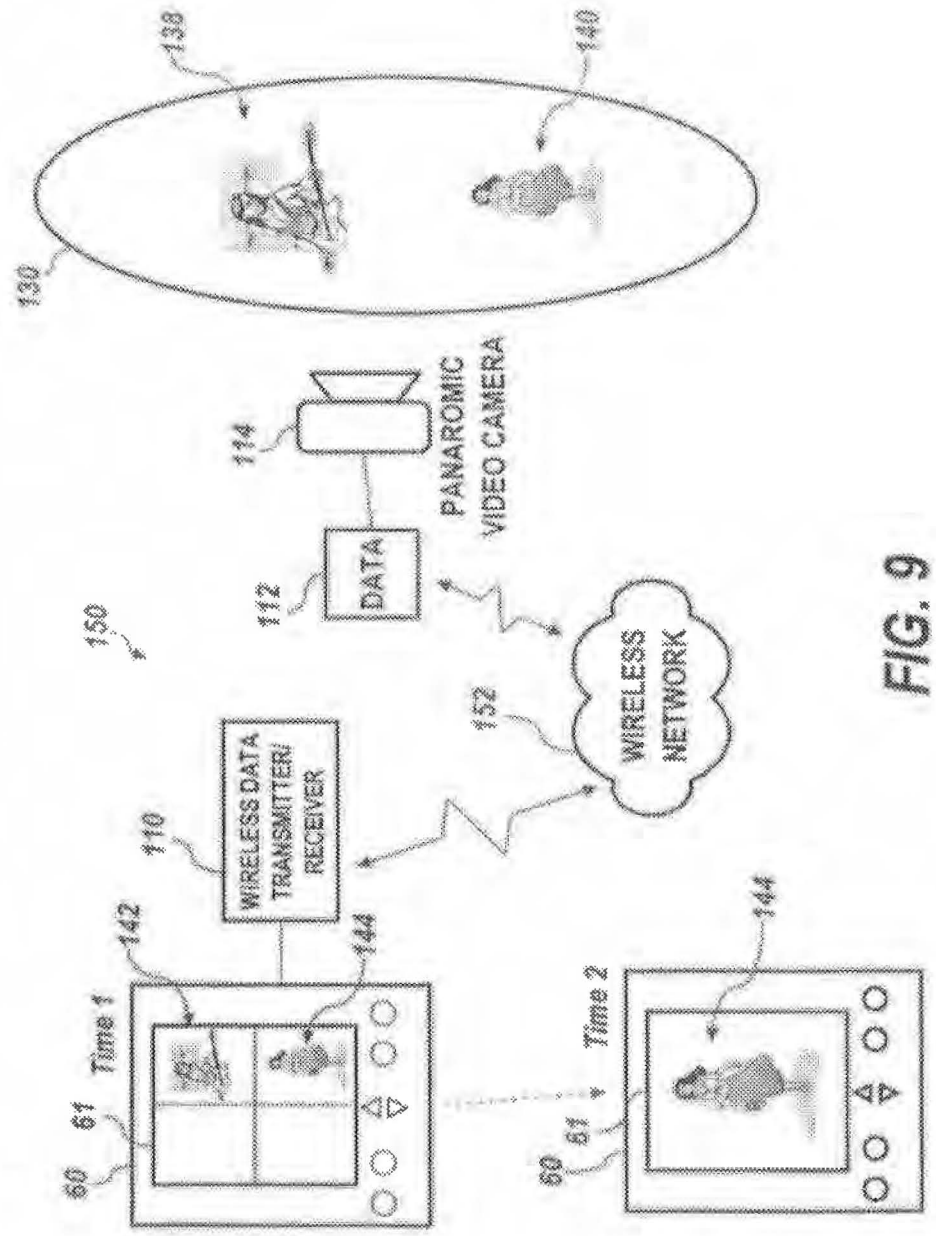


FIG. 9

APPX0769

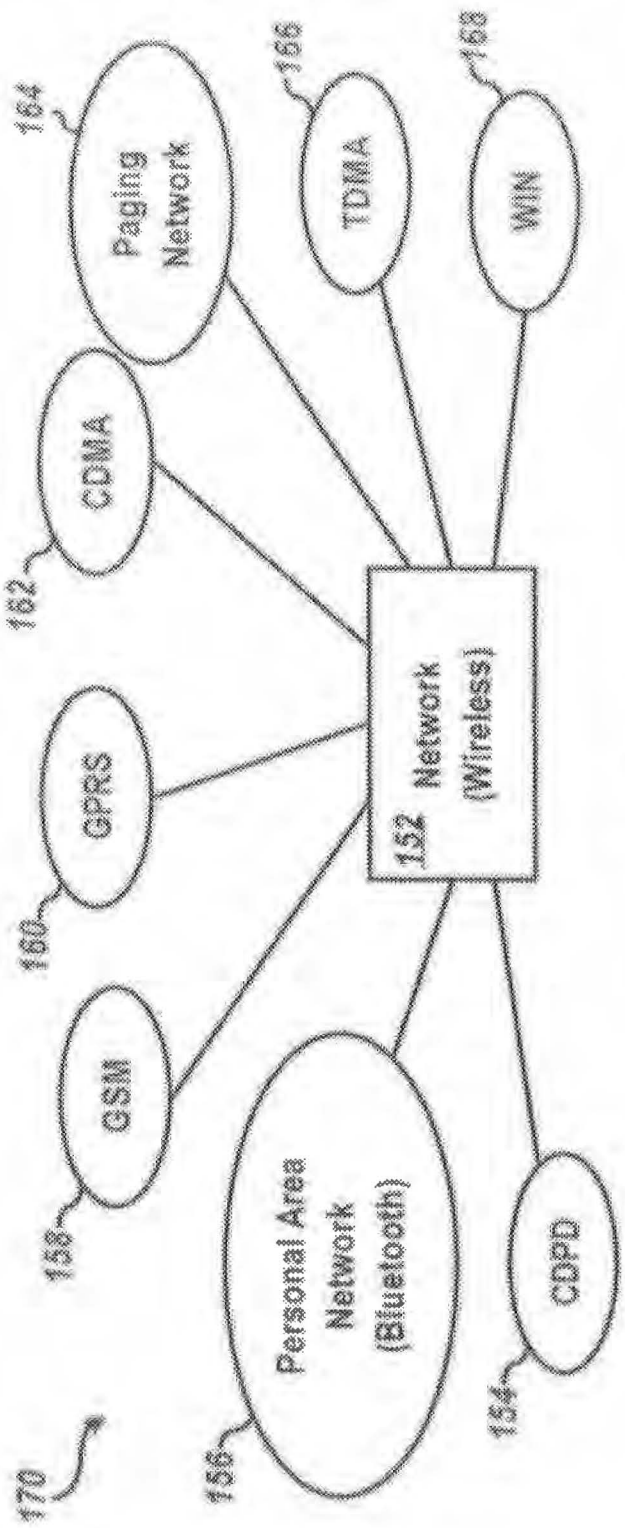

Network (Wireless)
152
Paging Network
164
TDMA
166
WIN
168
CDMA
162
GPRS
160
GSM
158
Personal Area Network (Bluetooth)
156
CDPD
154
170

FIG. 10

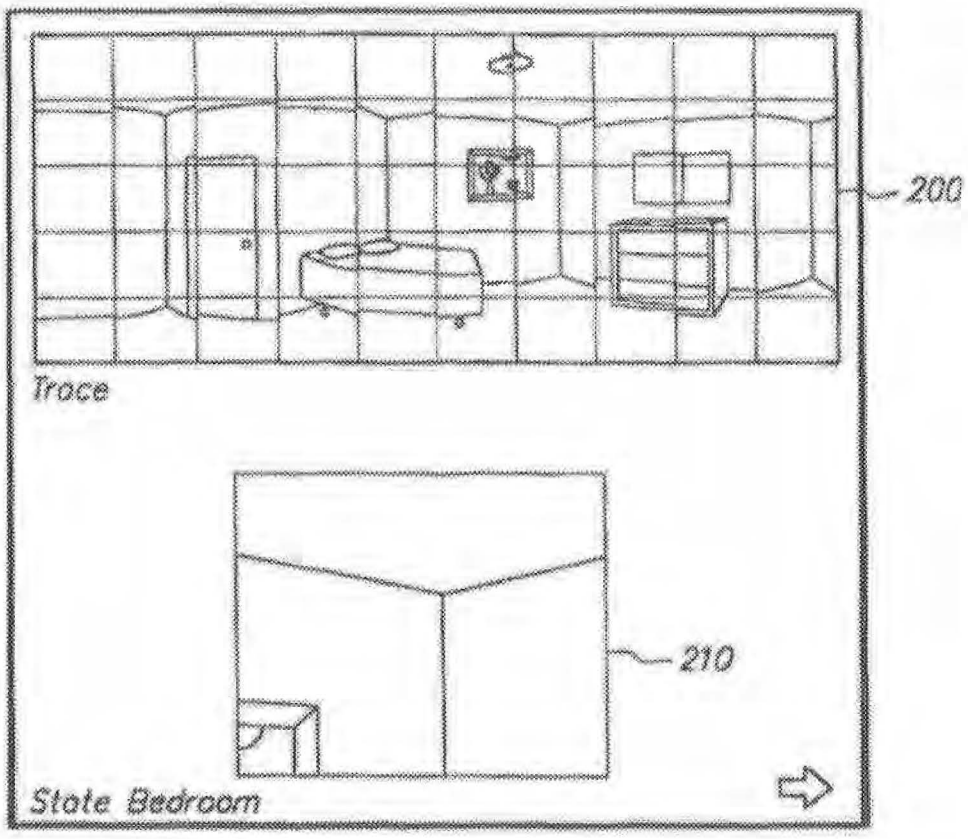


FIG. 11
(Prior Art)

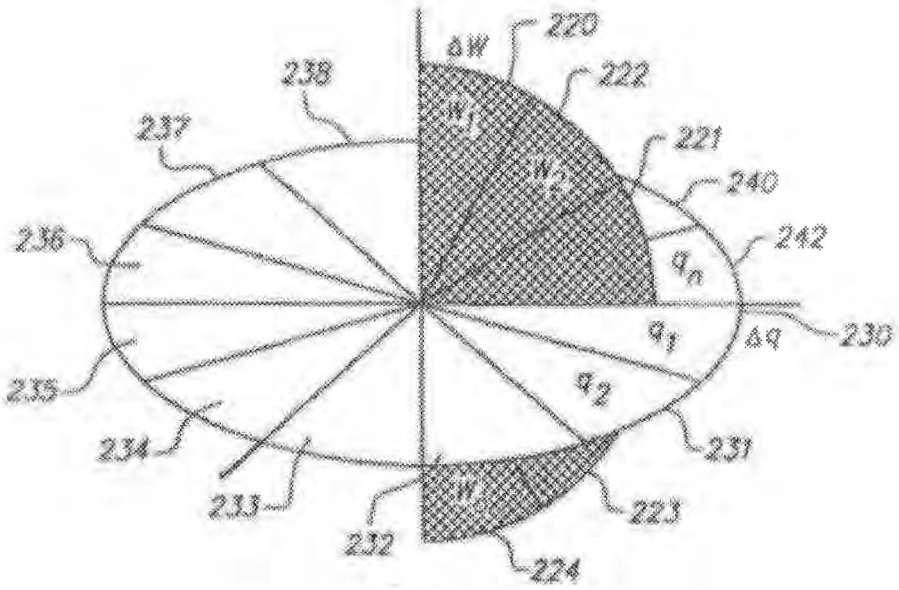


FIG. 12
(Prior Art)

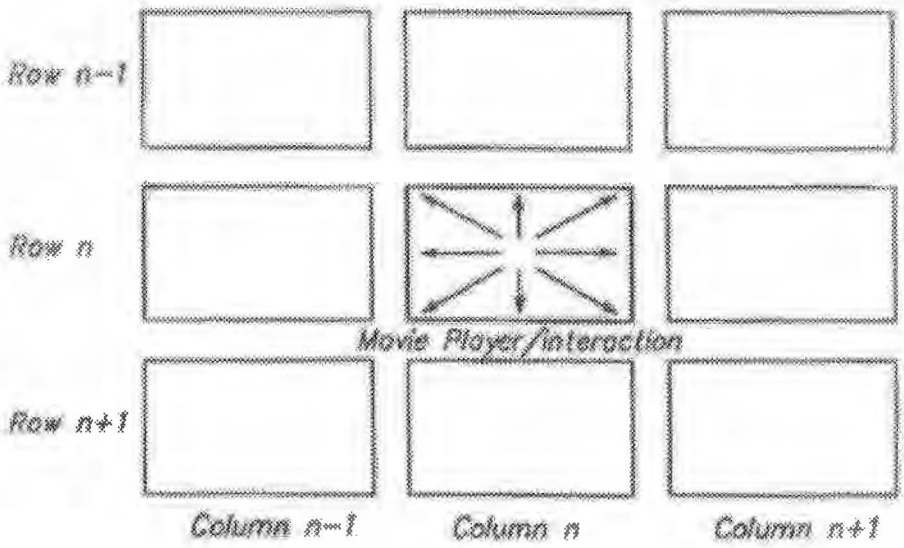


FIG. 13
(Prior Art)

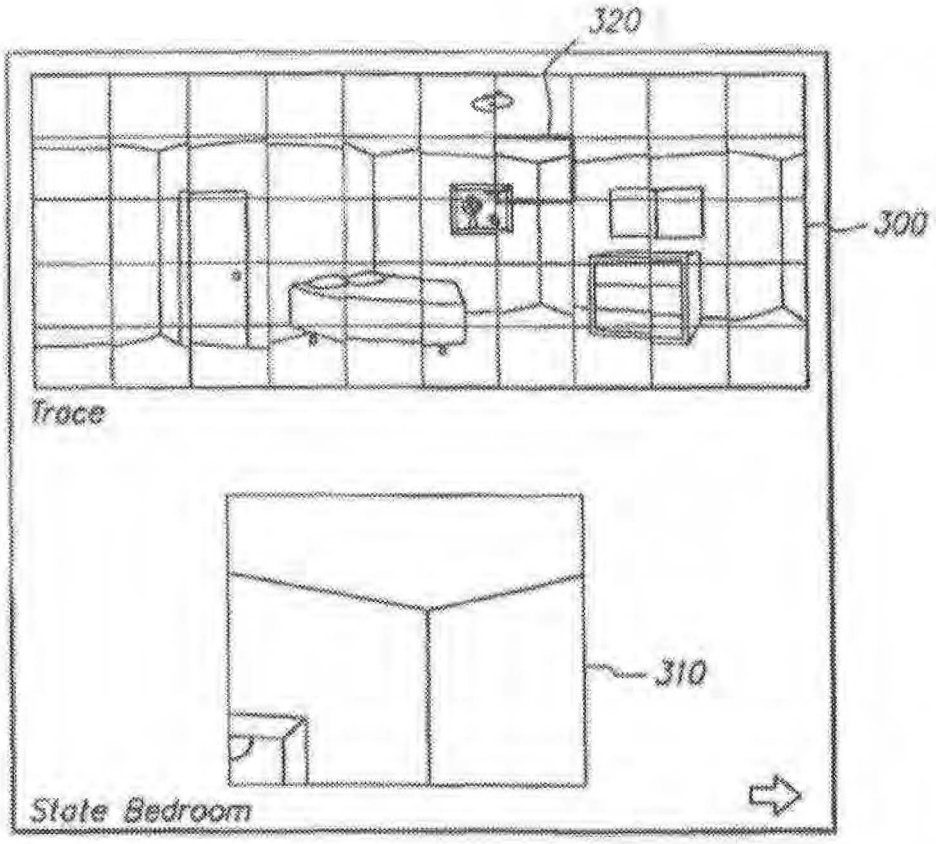


FIG. 14
(Prior Art)

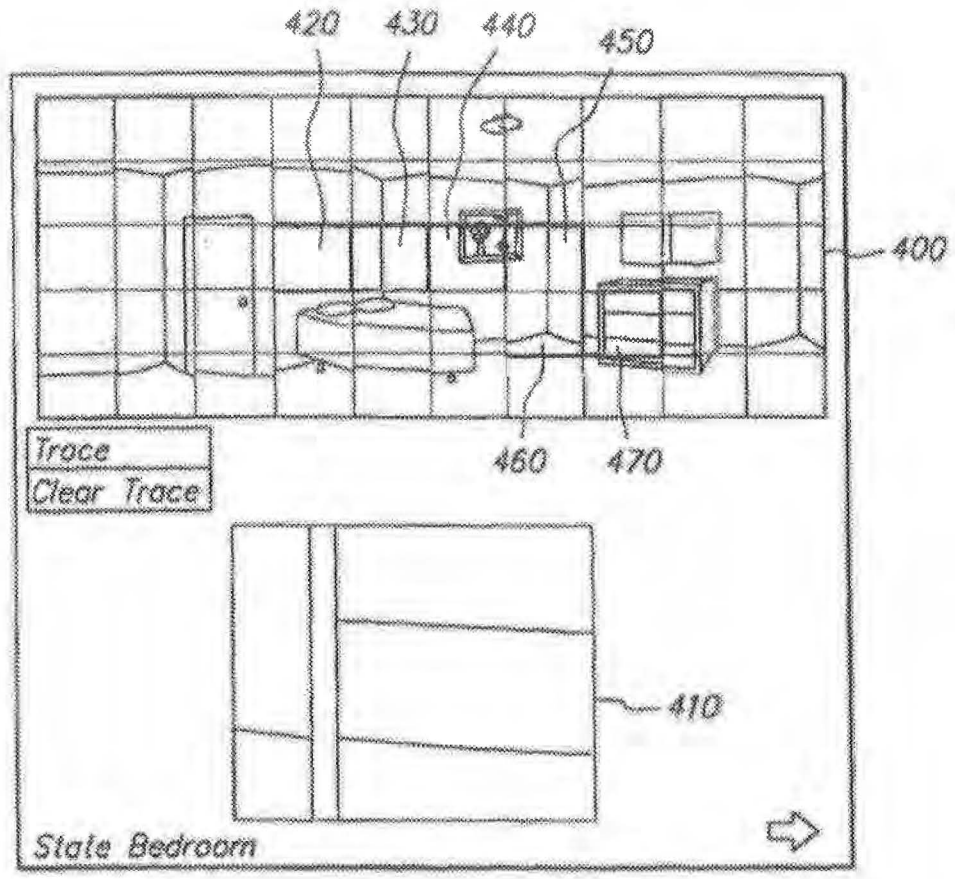


FIG. 15
(Prior Art)

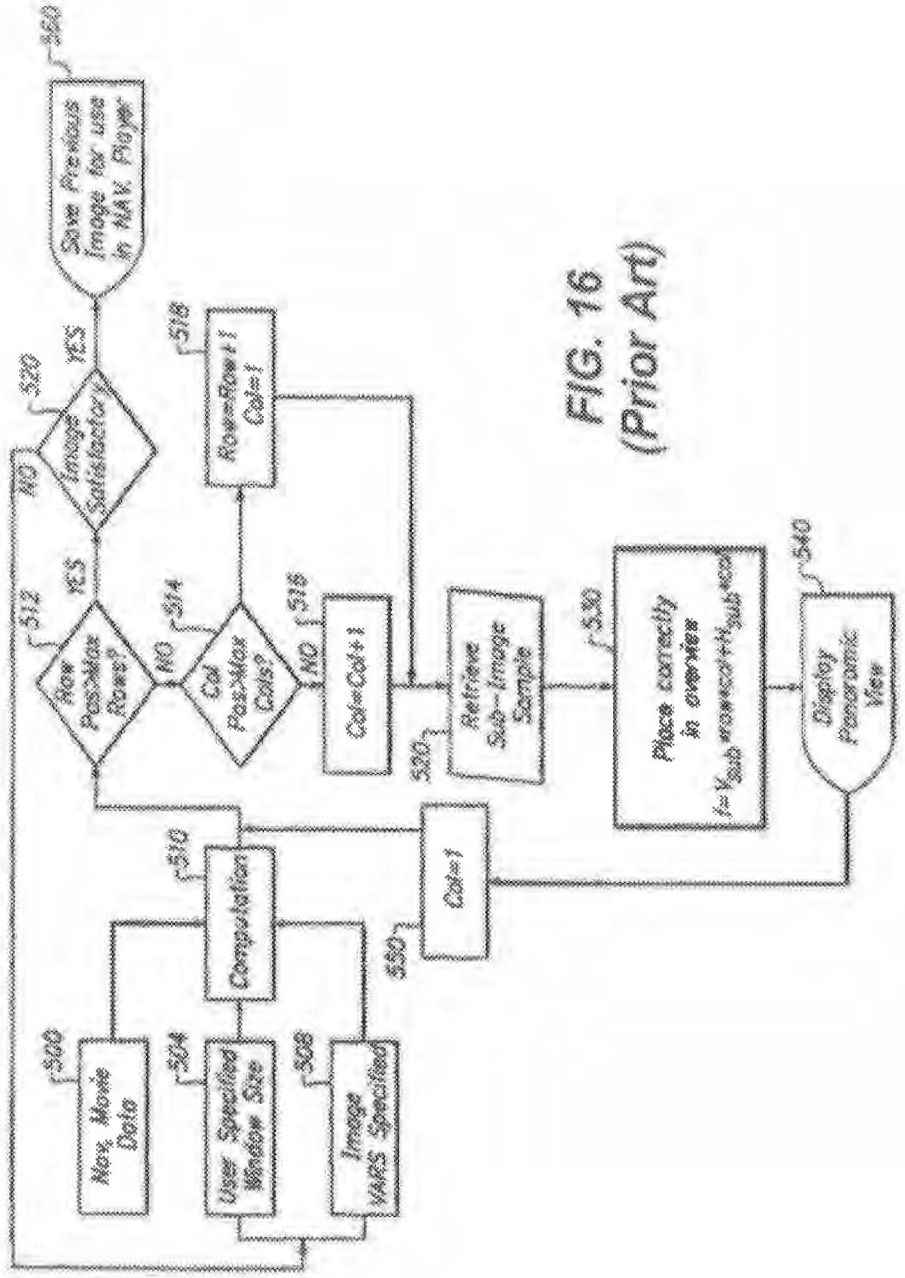


FIG. 16
(Prior Art)

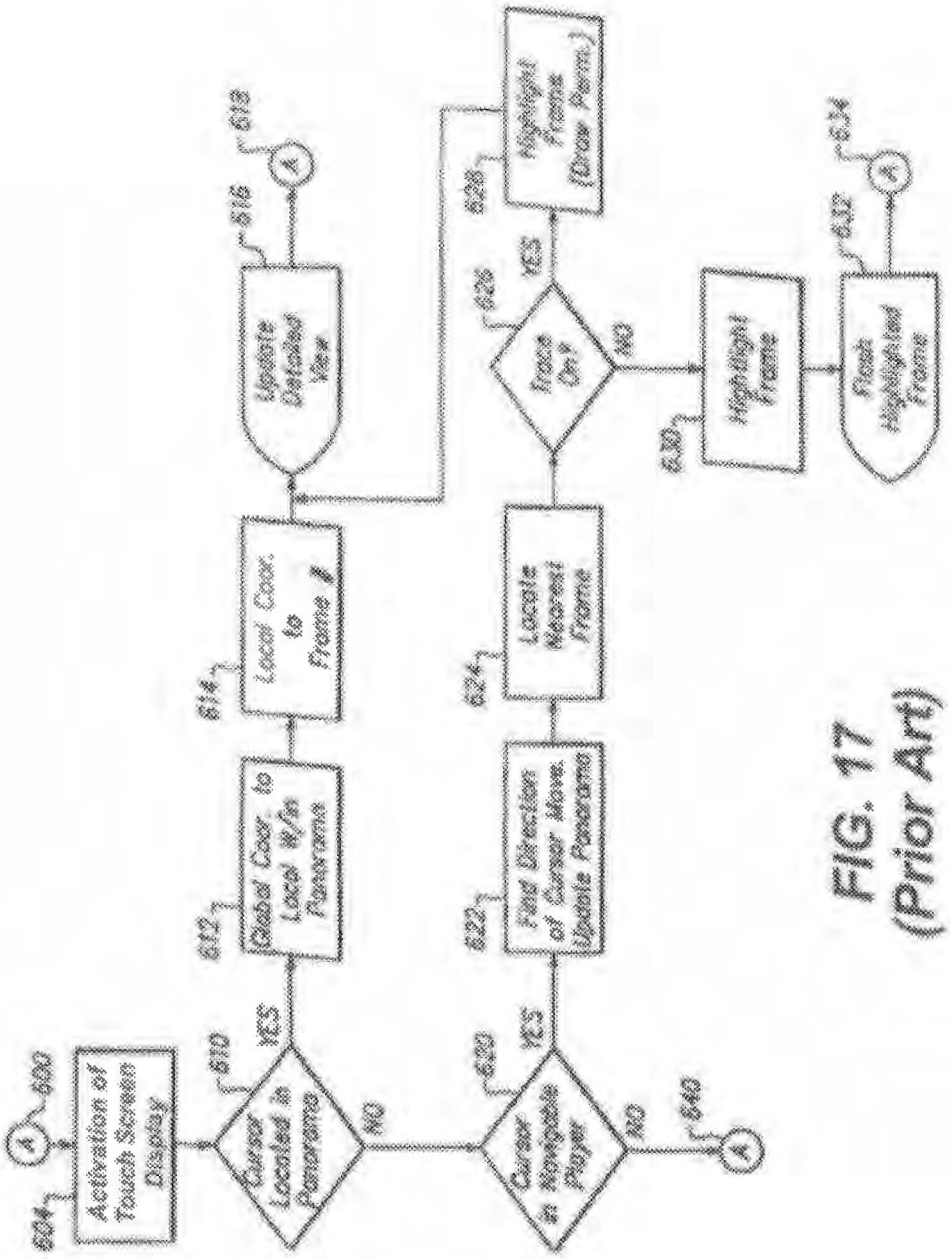


FIG. 17
(Prior Art)

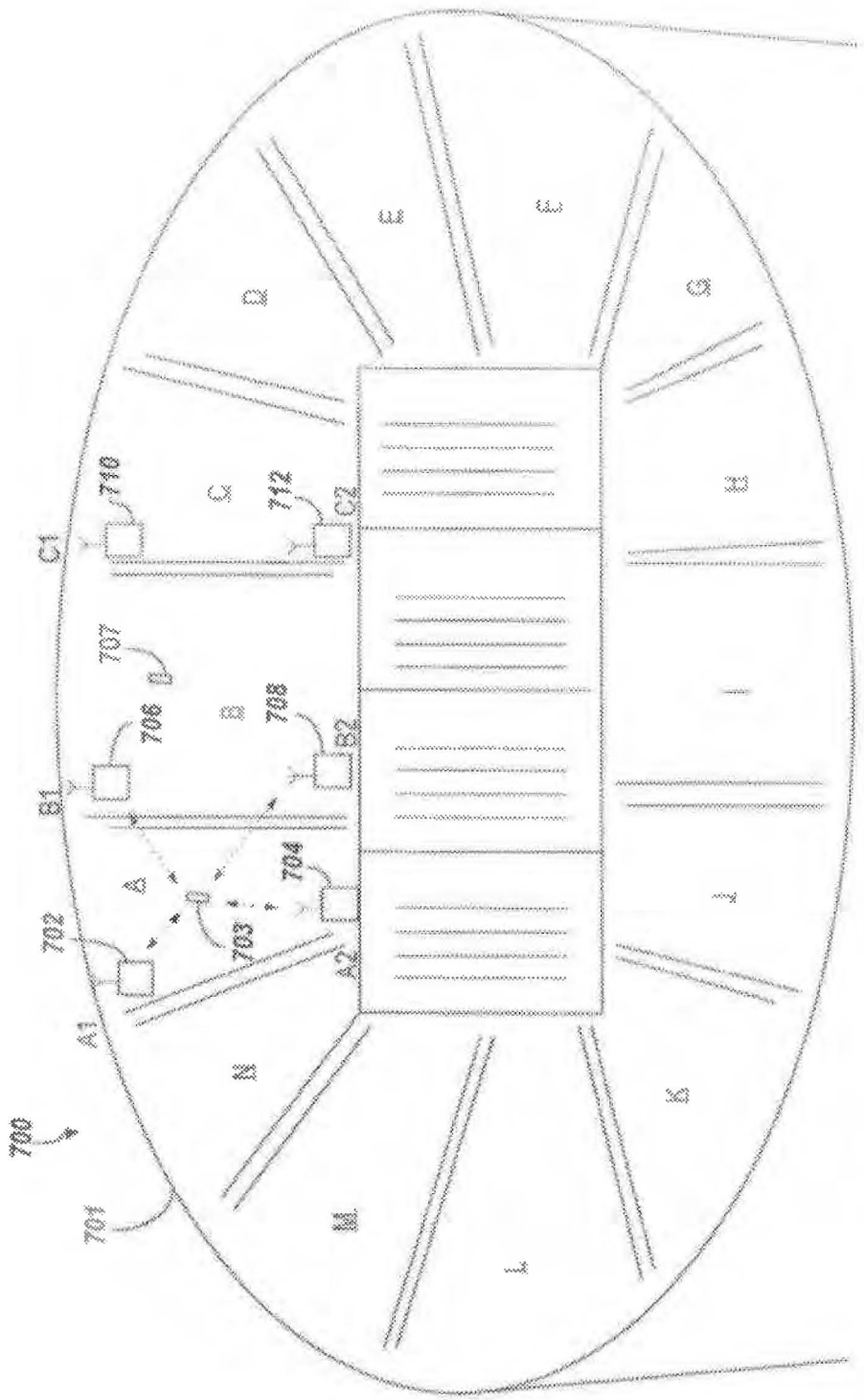

700
701
702
703
704
706
707
708
710
712
A1
A2
B1
B2
C1
C2
A
B
C
D
E
F
G
H
I
J
K
L
M
N

FIG. 18

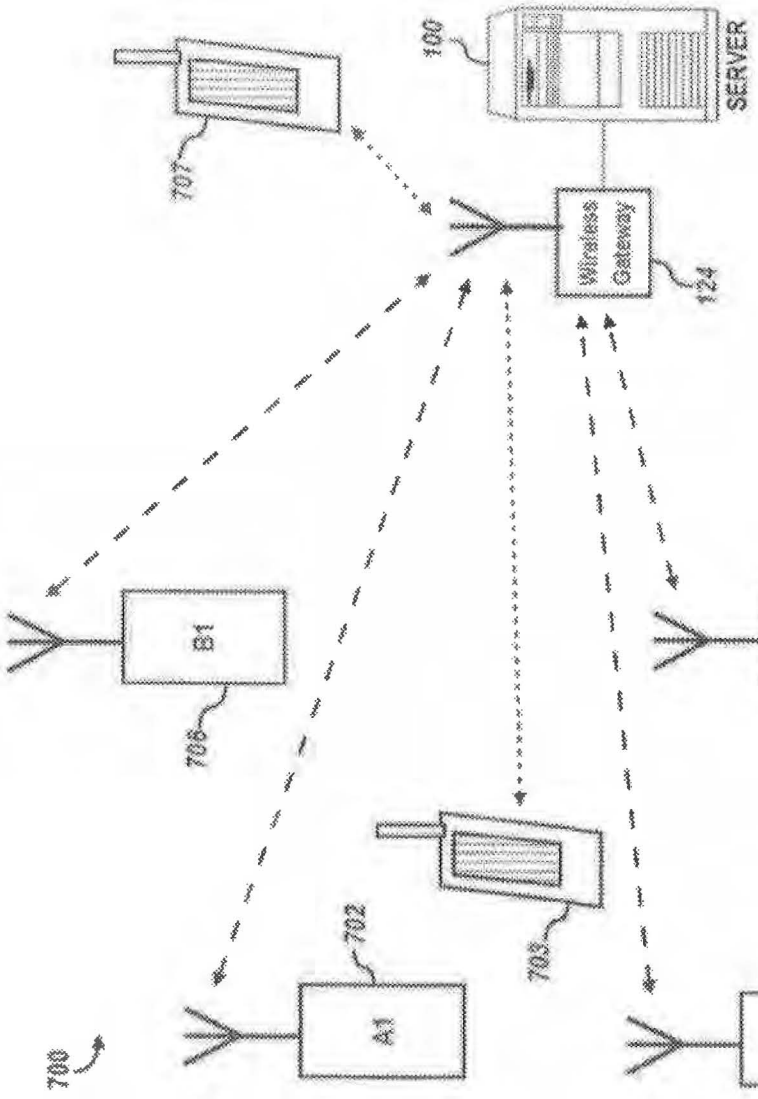

100
SERVER
707
Wireless Gateway
124
B1
706
B2
708
703
702
A1
704
A2
700

FIG. 19

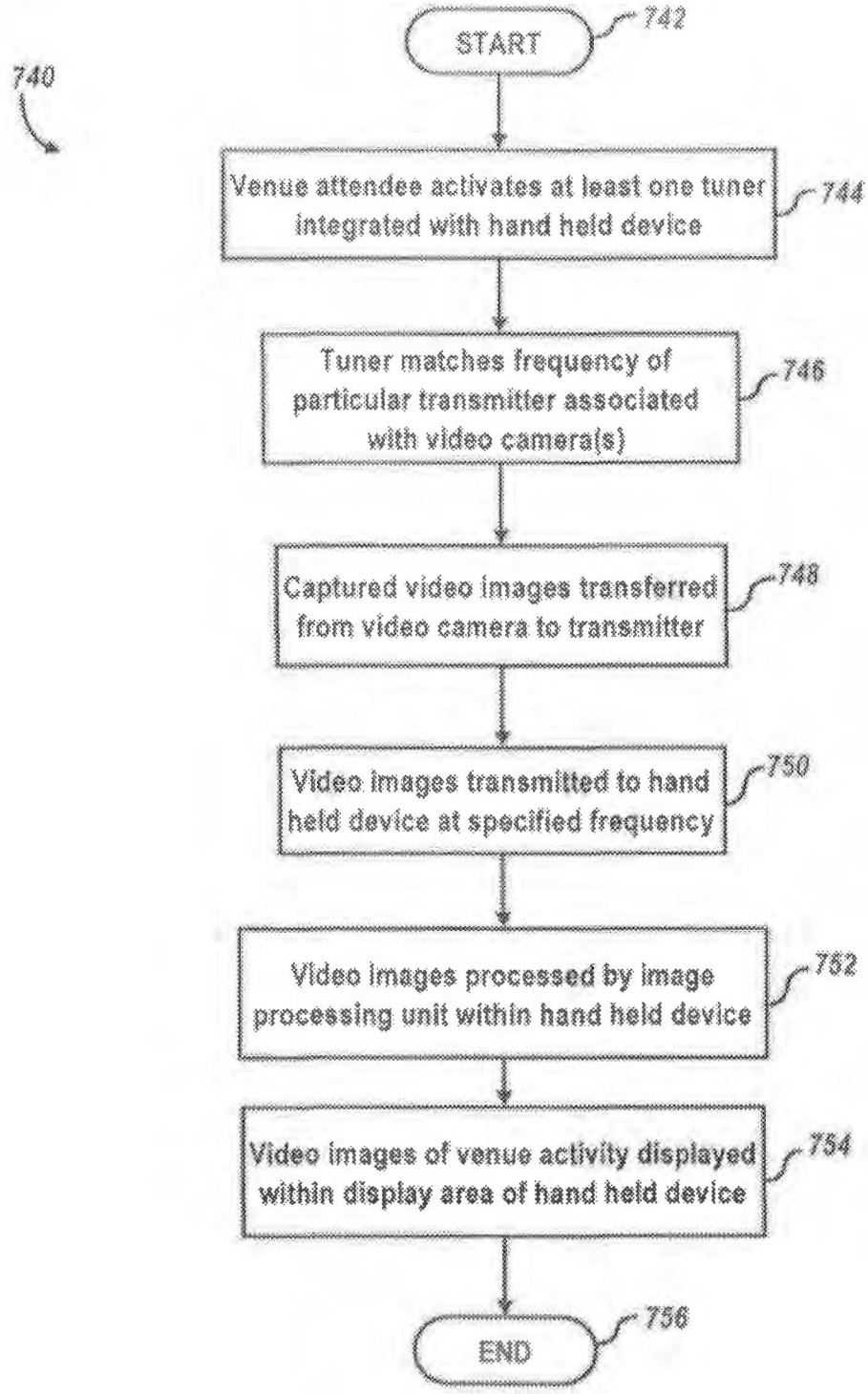

740
START
742
Venue attendee activates at least one tuner integrated with hand held device
744
Tuner matches frequency of particular transmitter associated with video camera(s)
746
Captured video images transferred from video camera to transmitter
748
Video images transmitted to hand held device at specified frequency
750
Video images processed by image processing unit within hand held device
752
Video images of venue activity displayed within display area of hand held device
754
END
756

FIG. 20

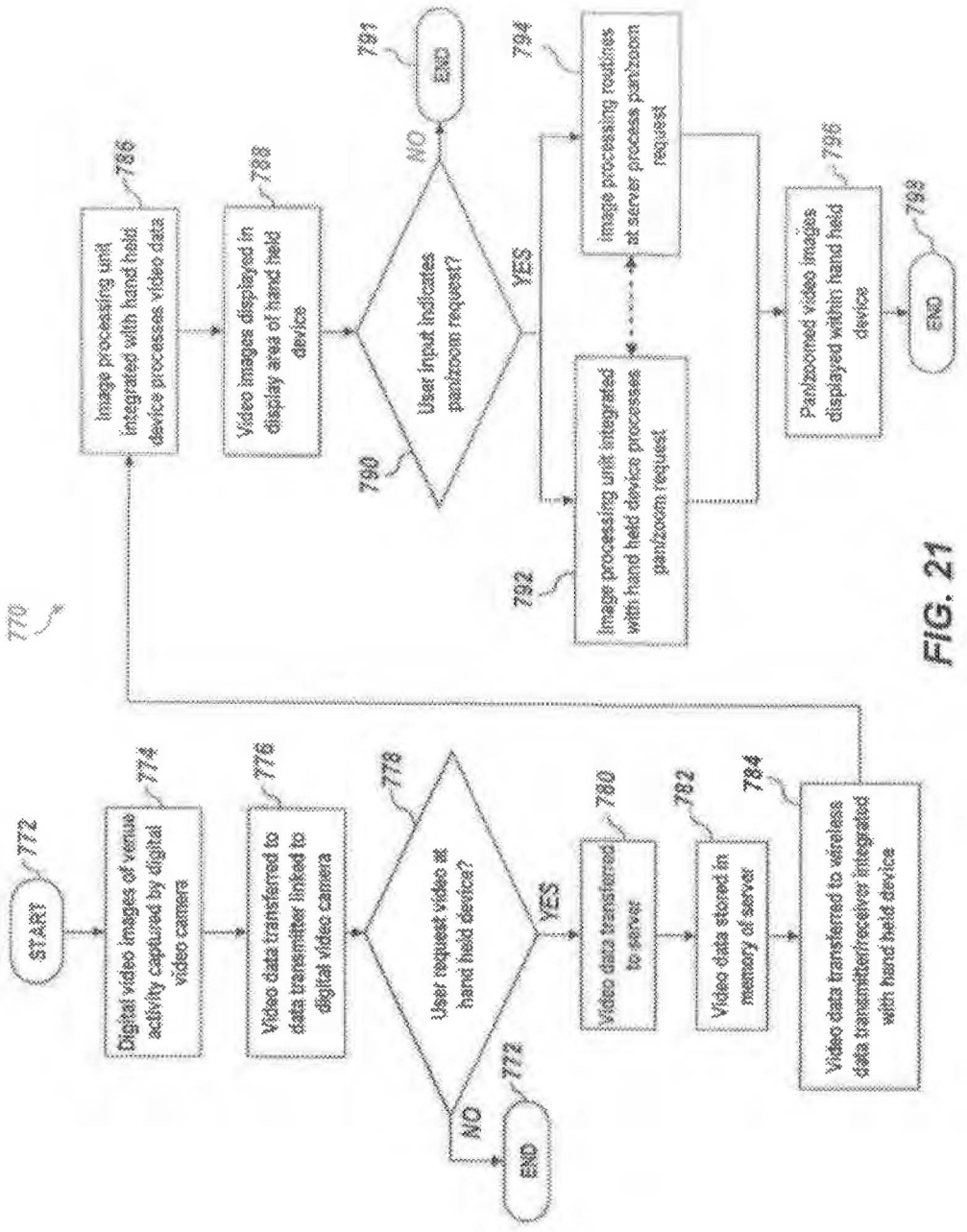

770
772
START
774
Digital video images of venue activity captured by digital video camera
776
Video data transferred to data transmitter linked to digital video camera
778
User request video at hand held device?
YES
NO
777
END
780
Video data transferred to server
782
Video data stored in memory of server
784
Video data transferred to wireless data transmitter/receiver integrated with hand held device
786
Image processing unit integrated with hand held device processes video data
788
Video images displayed in display area of hand held device
790
User input indicates pan/zoom request?
YES
NO
781
END
792
Image processing unit integrated with hand held device processes pan/zoom request
794
Image processing routines at server process pan/zoom request
796
Pan/zoomed video images displayed within hand held device
798
END

FIG. 21

TRANSMITTING SPORTS AND ENTERTAINMENT DATA TO WIRELESS HAND HELD DEVICES OVER A TELECOMMUNICATIONS NETWORK

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 12/884,810, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over a Telecommunications Network," which was filed on Sep. 17, 2010 now U.S. Pat. No. 8,086,184 and is incorporated by reference in its entirety. This application is also a continuation of U.S. patent application Ser. No. 12/884,858, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over a Telecommunications Network," which was filed on Sep. 17, 2010 now U.S. Pat. No. 8,090,321 and is incorporated herein by reference in its entirety. U.S. patent application Ser. No. 12/884,810 and 12/884,858 are continuations of U.S. patent application Ser. No. 12/329,631, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over A Telecommunications Network," which was filed on Dec. 7, 2008 and issued as U.S. Pat. No. 7,826,877. U.S. patent application Ser. No. 12/329,631 was in turn a continuation of U.S. patent application Ser. No. 11/738,088 entitled "Providing Video of a Venue Activity to a Hand Held Device Through a Cellular Communications Network" which was filed on Apr. 20, 2007 now U.S. Pat. No. 7,620,426. U.S. patent application Ser. No. 11/738,088 was in turn a continuation of U.S. patent application Ser. No. 11/498,415 entitled "Broadcasting Venue Data to a Wireless Hand Held Device," filed on Aug. 2, 2006, which issued on May 20, 2008 as U.S. Pat. No. 7,376,388 and was a continuation of U.S. patent application Ser. No. 09/708,776 entitled "Providing Multiple Perspectives for a Venue Activity Through an Electronic Hand Held Device," which was filed on Nov. 8, 2000 now U.S. Pat. No. 7,149,549 and which claims the benefit of U.S. Provisional Application Ser. No. 60/243,561, which was filed on Oct. 26, 2000. This application therefore traces its priority date to and claims the benefit of the Oct. 26, 2000 filing date of U.S. Provisional Application Ser. No. 60/243,561.

TECHNICAL FIELD

Embodiments are related to wireless electronic hand held devices, such as Personal Digital Assistants (PDAs), hand held televisions, Smartphones, and cellular and data-enabled wireless telephones. Embodiments are also related to techniques for remotely delivering sports and entertainment data to hand held devices. In addition, Embodiments relates to techniques for providing increased viewing opportunities for audiences within and external to venue environments, such as stadiums and concert arenas. Additionally, embodiments related to wireless video, audio and other data transmission to and from hand held devices.

BACKGROUND OF THE INVENTION

Most modern stadiums and live entertainment facilities or arenas (herein also collectively referred to as "venues"), which feature sporting events and concerts, typically employ large television screens that receive video images and are linked within the stadium to a plurality of television cameras positioned to capture video images at diverse locations within the stadium. The audience at a typical sporting event, for example, can generally view advertisements, instant replays, and other sports related data on the large television screens within the sports stadium itself. Feeds are additionally generally provided from the cameras to announcers in a broadcast booth, replaying certain plays from the event so that the announcers and can make comments about plays, and finally transmitting a telecast to the viewing audience, including some aspects of captured video and data to the stadium audience.

Despite the availability of such large screen television monitors, venue event audience members still lack enhanced viewing options or perspectives within the stadium itself. To compensate for the lack of viewing options, sports and concert promoters often rent binoculars to audience members prior to or during the event. Such binoculars can permit the typical audience member to obtain a somewhat better, but limited, view of the event, such as a football or hockey game, but even these views are often obstructed by other audience members and are tied to only one perspective.

The large television screens placed in the stadium are typically linked to cameras that are either fixed and mobile, the placement of the cameras about the stadium or venue are generally tied to an enterprise system. The movement of the game ball in a football game, for example, along with the players on the field is dynamic and unpredictable, and may not always be caught by the active camera having the best perspective. Thus, during a game, the large television screens typically provide only one view, which can be obstructed further by other players or officials, often destroying a critical angular view.

In addition, such large screens are often utilized to bombard audience members with advertisements, thereby cutting into data such as instant replays at a time when an audience member might otherwise wish to view instant replays, a current play or other event data. The audience members, therefore, essentially view the large screen at the behest of the camera operator and cannot select their own views or camera angles.

Based on the foregoing, the present inventors have found that such problems in venue environments can be solved through the use of hand held devices, such as PDAs, data/video-enabled cellular telephones, and other hand held wireless video-enabled devices. For example, the recent shift in the consumer electronics industry from an emphasis on analog technology to a preference for digital technology is largely based on the fact that the former generally limits the user to a role of a passive recipient of information, while the latter is interactive and allows the user to control what, when, and how he or she receives and manipulates certain information. This shift in focus has resulted in the development and increasingly widespread use of a digital device generically referred to as a "personal digital assistant" (PDA).

These devices are hand held computing devices (i.e., hereinafter referred to as "hand held devices" or "handheld devices") that are becoming increasingly popular for storing and maintaining information. Although PDAs may be connected to a desktop personal computer or other PDAs via infrared, direct wire, or wireless communication links, PDAs and similar hand held devices, can be linked to remote networks, such as the internet, or local wireless resources, through available wireless communications techniques.

The most advanced data- and video-enabled wireless communication devices currently available in the marketplace take the form of a PDA (such as the Palm OS, Handspring OS, and Windows CE compatible hand held computers). Unlike personal computers, which are general-purpose devices geared toward refining and processing information, PDAs are

designed to capture, store and display information originating from various sources. Additionally, while a certain level of skill is required to use a personal computer effectively, PDAs are designed with the novice and non-computer user in mind.

A typical PDA includes a microprocessor, memory unit, a display, associated encoder circuitry, and selector buttons. It may optionally contain a clock and infrared emitter and receiver. A graphical user interface permits a user to store, retrieve and manipulate data via an interactive display. A PDA may also include a calendar, datebook, and one or more directories. The calendar shows a month of dates organized as rows and columns in the usual form. The datebook shows one day at a time and contains alphanumeric text entered in free format (typically, with a time of day and an event and/or name). Each directory contains entries consisting of a name field and a five form alphanumeric text field that can contain company names, addresses, telephone and fax numbers, email addresses, etc.

Entries may be organized alphabetically according to the name field and can be scanned or searched for by specifying a specific sequence of characters in the name field. A menu displayed via the graphical user interface permits a user to choose particular functions and directories. Most PDAs come equipped with a stylus, which is a plastic-tipped pen that a user utilizes to write in, for example, a "graffiti area" of the display and tap particular graphically displayed icons. Each icon is indicative of a particular activity or function. Touch screen interfaces, however, are also increasingly being implemented with PDAs to permit a user to activate software modules in the form of routines and subroutines therein.

Attempts have been made to provide venue-based, interactive entertainment to enhance the fan experience at live events. Such attempts utilize touch-screen technology integrated directly into seats at outdoor or indoor arenas. Such devices, however, due to their integration with the viewer seat, can be easily damaged by audience members. Systems that incorporate such devices are also expensive because they literally require miles of cable.

Some recently constructed arenas, for example, that implement such seat-integrated technology are requiring hundreds of miles of electronic cabling, including audiovisual, broadcast, and multiband lines. Such a plethora of large cables are expensive and require extra space, which often cannot be found in older stadiums, or would require a greater expense to integrate into newly built stadiums. The cost of retrofitting an older stadium with such technology can be staggering. Additionally, many fans who attend games or concerts with such technology integrated directly into the seats may find such a feature distracting.

Another problem faced by venue promoters and arena owners who integrate fixed technology directly into the seat is that such technology can quickly become obsolete. If a new facility is fitted with such electronic/data intensive technology, the technology may become quickly outdated, requiring an expensive update and/or retrofit.

The present inventors thus realize that a solution to these problems lies in the use of wireless hand held devices. By utilizing modern technology integrated with hand held devices, on-demand live action, instant replays from multiple camera angles, and real-time team and venue information may be readily provided to fans without the expense and problems associated with present in-seat integrated technical environments. Additionally, it is anticipated that the deployment of venue-based systems facilitating the use of such devices would be relatively inexpensive, at least in comparison to seat integrated systems. Finally, such systems will

provide the venue attendee with increased mobility and freedom of use within and throughout the venue environment.

BRIEF SUMMARY

One aspect of the present invention provides improved methods and systems for delivering venue-based data such as video, audio, advertisements, video replay, statistics and other information to one or more hand held devices.

It is another aspect of the present invention to provide improved methods and systems for delivering venue-based data to hand held device(s) located remote from a venue and/or within the venue itself.

It is still another aspect of the present invention to provide methods and systems for the delivery of sports/entertainment data and related information to hand held devices through a wireless telecommunications network.

The above and other aspects of the invention are achieved as will now be further described. Methods and systems are disclosed for wirelessly providing venue-based data to one or more hand held devices. Venue-based data can be acquired from one or more venues. The venue-based data can be authenticated and wirelessly transmitted to the hand held device(s) through wireless telecommunications network, in response to authenticating the venue-based data, in order to permit the venue-based data to be accessible via the hand held device(s) at locations remote from the venue(s). The venue-based data can then be accessed via the hand held device(s). In addition, or in lieu of authentication of the venue-base data, the hand held device(s) and/or a user of the hand held device(s) can be authenticated. In response to such an authentication, the venue-based data can be transmitted to the hand held device(s), in order to permit the venue-based data to be accessible via the hand held device(s) at locations remote from the venue(s). That is, the hand held device(s) need not be located at a particular venue, but can be located elsewhere when receiving and accessing the venue-based data. For example, a user may be located at a different venue or at home or in-transit (e.g., commuter train) and access (e.g., view, listen, etc) the venue-based data using his or her hand held device via the wireless telecommunications network.

Venue-based data can include a variety of different data types or s single data type, depending upon design considerations. For example, venue-based data can be video data, audio data, and/or other types of sports and/or entertainment information, such as, video replays, statistics, purchasing, merchandise and concession information, and/or additional product, concession or advertisements. Such data may include information such as, for example, box scores, player matchups, animated playbooks, shot/hit/pitch charts, historical information, and offense-defense statistics. In the context of a concert venue, for example, as opposed to a sporting event, information pertaining to a particular musical group, for example, may be also transferred to the hand held device via the telecommunications network, along with advertising or sponsor information.

For example, a concert may take place at one particular venue and the hand held device may be located at a user's home. The user can utilize his or hand held device to access venue-based data associated with that particular concert, assuming proper authentication. Note that both the video data and other data described above generally comprise types of venue-based data. Venue-based data, as referred to herein, may thus include data and information, such as video, audio,

advertisements, promotional information, propaganda, historical information, statistics, event scheduling, and so forth.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of this invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objects, and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

FIG. **1** depicts a block diagram illustrating components of a hand held device, in which embodiments may be implemented;

FIG. **2** illustrates a pictorial representation of a hand held device, which may be utilized to implement an embodiment;

FIG. **3** depicts a pictorial representation of a hand held device adapted for receiving a module, in accordance with an alternative embodiment;

FIG. **4** illustrates a system for providing multiple perspectives through a hand held device of activities at a venue, in accordance with an alternative embodiment;

FIG. **5** depicts a system that provides multiple perspectives of a venue activity through a hand held device adapted to receive and process real time video data, in accordance with a preferred embodiment;

FIG. **6** depicts a system for providing multiple perspectives of activity at a venue through a hand held device adapted to receive and process real time video data, in accordance with a preferred embodiment;

FIG. **7** depicts a system for providing multiple perspectives for activity at a venue at a first time/perspective and a second time/perspective, in accordance with a preferred embodiment;

FIG. **8** illustrates a system for providing multiple perspectives through a hand held device of an activity at a venue, including the use of a wireless gateway, in accordance with a preferred embodiment of the present invention;

FIG. **9** depicts a system for providing multiple perspectives through a hand held device of a venue activity, in association with a wireless network, in accordance with a preferred embodiment;

FIG. **10** illustrates a diagram depicting network attributes of a wireless network that may be utilized in accordance with one or more embodiments;

FIG. **11** depicts a prior art overview display and a detail window;

FIG. **12** illustrates a prior art spherical image space divided into a series of w rows and q columns, with the rows and columns representing individual frames as photographed from a video camera;

FIG. **13** depicts the two-dimensional representation of the spherical image space of FIG. **12** into rows and columns of image frames;

FIG. **14** illustrates a prior art overview display, a detail window and a corresponding area indicia (geometric figure outline;

FIG. **15** depicts a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview image display for subsequent playback, which may be utilized in accordance with embodiments of the present invention;

FIG. **16** is a prior art flowchart providing a logical process for building an overview image, which may be utilized in accordance with embodiments of the present invention;

FIG. **17** illustrates a prior art flowchart illustrative of a logical process for playback interaction, which may be utilized in accordance with embodiments of the present invention;

FIG. **18** depicts a pictorial representation illustrative of a Venue Positioning System (VPS), which can be implemented in accordance with an alternative embodiment;

FIG. **19** illustrates in greater detail the Venue Positioning System (VPS) of FIG. **18**, in accordance with an alternative embodiment;

FIG. **20** depicts a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device, in accordance with an alternative embodiment; and

FIG. **21** illustrates a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras, in accordance with an alternative embodiment.

DETAILED DESCRIPTION

FIG. **1** depicts a schematic diagram illustrating a general hardware configuration of a hand held device **11**, which can be implemented in accordance an embodiment. Those skilled in the art can appreciate, however, that other hardware configurations with less or more hardware and/or modules may be utilized in carrying out the methods and systems (e.g., hand held device **11**) of the present invention, as may be further described herein. CPU **10** of hand held device **11**, can perform as a main controller operating under the control of operating clocks supplied from a clock oscillator. CPU **10** may be configured as a 16-bit microprocessor. External pins of CPU **10** are generally coupled to an internal bus **26** so that it may be interconnected to respective components.

SRAM **24** can be configured as a writeable memory that does not require a refresh operation and can be generally utilized as a working area of CPU **10**. SRAM (Static RAM) is generally a form of semiconductor memory (RAM) based on a logic circuit known as a flip-flop, which retains information as long as there is enough power to run the device. Font ROM **22** can be configured as a read only memory for storing character images (e.g., font) displayable on a display **18**. Examples of types of displays that may be utilized in accordance with display **18** include a TFT active matrix display, an illuminated LCD (Liquid Crystal Display), or other small scale displays being developed.

CPU **10** of the present embodiment drives display **18** utilizing, among other media, font images from Font ROM **22**, and images transmitted as data through wireless unit **17** and processed by image-processing unit **35**. EPROM **20** may be configured as a read only memory that is generally erasable under certain conditions and can be utilized for permanently storing control codes for operating respective hardware components and security data, such as a serial number.

IR controller **14** can be generally configured as a dedicated controller for processing infrared codes transmitted/received by an IR transceiver **116** and for capturing the same as computer data. Wireless unit **17** can be generally configured as a dedicated controller and transceiver for processing wireless data transmitted from and to a wireless communications network.

Port **12** can be connected to CPU **10** and can be temporarily attached, for example, to a docking station to transmit information to and from hand held device **11** to other devices, such as personal computers, retail cash registers, electronic kiosk devices, and so forth. Port **12** can also be configured, for example, to link with a modem, cradle or docking station,

which is well known in the art, and can permit network devices, a personal computer or other computing devices to communicate with hand held device **11**.

User controls **32** permit a user to enter data to hand held device **11** and initiate particular processing operations via CPU **10**. A user interface **33** may be linked to user controls **32** to permit a user to access and manipulate hand held device **11** for a particular purpose, such as, for example, viewing images on display **18**. Those skilled in the art will appreciate that user interface **33** may be implemented as a touch screen user interface, as indicated by the dashed lines linking display **18** with user interface **33**. In addition, CPU **10** may cause a sound generator **28** to generate sounds of predetermined frequencies from a speaker **30**. Speaker **30** may be utilized to produce music and other audio information associated with video data transmitted to hand held device **11** form an outside source.

Those skilled in the art can appreciate that additional electronic circuits or the like other than, or in addition to, those illustrated in FIG. **1** may be required to construct hand held device **11**. Such components, however, are not described in the present specification, because many aspects of them are well known in the art. For example, hand held television are available for receiving public television broadcasts, but the basic technology can be modified on such devices so that they may be adapted to (e.g., proper authentication, filters, security codes, or the like) receive venue-based RF transmissions from at least one venue-based RF source (e.g., a wireless camera, or data from a camera transmitted wirelessly through a transmitter). Those skilled in the art can thus appreciate that because of the brevity of the drawings described herein, only a portion of the connections between the illustrated hardware blocks is generally depicted. In addition, those skilled in the art will appreciate that hand held device **11** can be implemented as a specific type of a hand held device, such as a Personal Digital Assistant (PDA), paging device, WAP-enabled mobile phone, and other associated hand held computing devices well known in the art.

Hand held device **11** can be configured to permit images, such as television broadcast images, to be displayed on display **18** for a user to view. Hand held device **35** thus includes an image-processing unit **35** for processing images transmitted as data to hand held device **11** through wireless unit **17**. A tuner unit **34**, implemented as either a single tuner or a plurality of tuners, may be linked through internal bus **26** to CPU **10**. Additionally, a security unit **36** may be utilized to process proper security codes to thereby ensure that data transferred to and from hand held device **11** may be secure and/or permitted. Security unit **36** may be implemented as an optional feature of hand held device **11**. Security unit **36** can also be configured with routines or subroutines that are processed by CPU **10**, and which prevent wireless data from being transmitted/received from hand held device **11** beyond a particular frequency range, outside of a particular geographical area associated with a local wireless network, or absent authorized authorization codes (e.g., decryption).

Hand held device **11** can thus be configured with both wireless and wireline capabilities, depending on the needs and requirements of a manufacturer or customer. Such wireless capabilities include features such as those found in cellular telephone units, in accordance with carrying out embodiments of the present invention. Examples of hand held devices that can be utilized in accordance with the method and system of the present invention include the "Palm Pilot" PDA, manufactured and sold by Palm Computing, the Handspring Visor, the IBM Workpad or other Window CE compatible devices, RIM Blackberry-family paging devices, Motorola paging devices, and the Symbol SPT-family of PDA-type organizer devices. Customized, venue-specific devices (i.e., proprietary, limited use) may be also developed that incorporate hardware and software modules necessary to practice the methods and systems taught herein.

Those skilled in the art can appreciate that although hand held device **11** is generally illustrated in FIG. **1**, hand held device **11** can be implemented as a wireless application protocol (WAP) web-enabled cellular hand held device, such as a PDA, wireless telephone, or pager or a combination thereof. Hand held device **11** can be configured with features of combination cellular telephone/PDA devices. One example of such a device is the Handspring™ palmtop and associated cellular phone attachment, which is manufactured and sold by Handspring Inc. Other such devices include the Palm-Motorola phone, which permits users to access e-mail and store calendars and contact databases. Hand held devices may be also provided in the form of a multi-RF (Radio Frequency) receiver-enabled hand held television viewing device. Regardless of the type of hand held device implemented, it is anticipated that such hand held devices will be adapted to receive and process data via image-processing unit **35** for ultimate display as moving images on display unit **18**, in accordance with the present invention. Image-processing unit **35** may include image-processing routines, subroutines, software modules, and so forth, which perform image-processing operations.

FIG. **2** illustrates a pictorial representation of a hand held device **40**, which may be utilized to implement an embodiment. Those skilled in the art will appreciate that hand held device **40** of FIG. **2** is analogous to hand held device **11** of FIG. **1**. Hand held device **40** includes a display screen **42**, which is generally analogous to display **18** of FIG. **1**. Television images broadcast via radio frequency or digital data may be displayed on display screen **42** for a user to view. User controls **44** permit a user to manipulate images or text displayed on display screen **42**. User controls **44** of FIG. **2** are generally analogous to user controls **32** of FIG. **1**. A touch screen user interface may be further configured on the display screen **42** with hand held device **40** to permit a user to manipulate images/text displayed on display screen **42**.

FIG. **3** depicts a pictorial representation of a hand held device **56** adapted for receiving a module **50**, in accordance with an alternative embodiment. Hand held device **56** of FIG. **3** is generally analogous to hand held device **40** of FIG. **2**, the difference being that hand held device **56** may be adapted to receive a module/cartridge that permits hand held device **56** to function according to specific hardware and/or instructions contained in a memory location within module **50**. Module **50** may also be configured as a smart card, well known in the art. Such a smart card may provide, for example, access codes (e.g., decryption) to enable hand held device **56** to receive venue broadcasts. Note that as utilized herein, the term "module" may refer to a physical module, such as a cartridge. The term "module" may also refer to a software module composed of routines or subroutines that perform a particular function. Those skilled in the art can appreciate the meaning of the term module is based on the context in which the term is utilized. Thus, module **50** may be generally configured as a physical cartridge or smart card. The term "module" as utilized herein may also refer to a software module, depending on the context of the discussion thereof.

To illustrate the use of a physical module, such as module **50**, assume that a user may possess several such physical modules or cartridges. One module, when inserted into hand held device FIG. **3** may instruct hand held device **50** to function as a standard PDA, such as a Palm Pilot device. Another module, when inserted into hand held device FIG. **3**, may

instruct hand held device **56** to function as a portable television that receives wireless television data from a local wireless network and/or venue-based (short range) broadcasts.

Those skilled in the art can thus appreciate that hand held device **56** can be adapted to receive and cooperate with module **50**. Additionally, hand held device **56** includes a display screen **52** that is generally analogous to display screen **42** of FIG. **2** and display **18** of FIG. **1**. Hand held device **56** also includes user controls **54** that are generally analogous to user controls **44** of FIG. **2** and user controls **32** of FIG. **1**. Hand held device **56** of FIG. **3** is generally analogous to hand held device **11** of FIG. **1**. Thus, hand held device **56** can also implement touch screen capabilities through a touch screen user interface integrated with display screen **52**

Assuming module **50** is implemented as a smart card, instead of a cartridge, it is anticipated that similar features can be implemented in accordance wit the smart card to insure that hand held device **56** includes touch screen user interface and video viewing capabilities. Smart cards are generally known in the art as credit-card sized plastic cards with an embedded computer chip. The chip can either be a microprocessor with internal memory or a memory chip with non-programmable logic. The chip connection can be configured via direct physical contact or remotely through a contactless electromagnetic interface.

Smart cards may be generally configured as either a contact or contactless smart card, or a combination thereof. A contact smart card requires insertion into a smart card reader (e.g., contained within hand held device **56**) with a direct connection to, for example, a conductive micromodule on the surface of the card. Such a micromodule may be generally gold plated. Transmission of commands, data, and card status takes place through such physical contact points.

A contactless card requires only close proximity to a reader. Both the reader and the card may be implemented with antenna means providing a contactless link that permits the devices to communicate with one another. Contactless cards can also maintain internal chip power or an electromagnetic signal (e.g., RF tagging technology). Two additional categories of smart codes, well known in the art, which are based on contact and contactless cards are the so-called Combi cards and Hybrid cards.

A Hybrid card generally may be equipped with two chips, each with a respective contact and contactless interface. The two chips are not connected, but for many applications, this Hybrid serves the needs of consumers and card issuers. The Combi card may be generally based on a single chip and can be generally configured with both a contact and contactless interface.

Chips utilized in such smart cards are generally based on microprocessor chips or memory chips. Smart cards based on memory chips depend on the security of the card reader for their processing and can be utilized when low to medium security requirements. A microprocessor chip can add, delete and otherwise manipulate information in its memory. Microprocessor-based memory cards typically contain microprocessor chips with 8, 16, and 32 bit architectures.

FIG. **4** illustrates a system **58** for providing multiple perspectives through a hand held device **60** of activities at a venue **80**, in accordance with an alternative embodiment. For illustrative purposes only, it may be assumed that venue **80** of FIG. **4** is a stadium venue, such as a football stadium. Cameras **71**, **73**, **75**, and **77** are respectively positioned at strategic points about venue **80** to capture the best images of activity taking place within venue **80**. Cameras **71**, **73**, **75**, **77** are respectively linked to transmitters **70**, **72**, **74**, and **76**. Each of these transmitters may be configured as equipment, which feeds a radio signal to an antenna for transmission.

The antenna may be integrated with the transmitter. Transmitters are well known in the art, and include active components, such as a driver, well known in the art. Transmitters also include passive components, such as a TX filter, also well known in the art. These components, when operating together, impress a signal onto a radio frequency carrier of the correct frequency by immediately adjusting its frequency, phase, or amplitude, thereby providing enough gain to the signal to project it to its intended target (e.g., a hand held device located within the venue).

A hand held device **60** may be held by a user at a stadium seat within view of the activity at the venue **80**. Hand held device **60** is generally analogous to hand held device **11** of FIG. **1** and hand held device **40** of FIG. **2**. Hand held device **60** of FIG. **4** may be configured as a hand held device adapted for use with a cartridge/module, such as module **50** of hand held device **56** of FIG. **3**. The cartridge/module may contain the electronics (e.g., tuner, filter, etc.) to allow a hand held device to be adapted for receiving venue-based data. Hand held device **60** includes a display screen **61** (e.g. display **18** of FIG. **1**).

Additionally, display screen **61** of hand held device **60** may be configured with a touch screen user interface displayable and operable on display screen **61**. Those skilled in the art can appreciate that touch screen interfaces are well known in the art and further explanation thereof may be not necessary. Display screen **61** includes a touch screen display area **65** that may be associated with camera **71**. Thus, images captured by camera **71** are transmitted from transmitter **70**, which is linked to camera **71**. Additionally, display screen **61** includes touch screen display areas **69**, **63**, and **67** which are respectively associated with cameras **73**, **75**, and **77**.

Cameras **71**, **73**, **75**, and **77** are respectively labeled C_1, C_2, C_3, and C_N to indicate that a plurality of cameras may be utilized in accordance with system **58** to view activities taking place within venue **80**, such as a football game or concert. Although only four cameras are illustrated in FIG. **4**, those skilled in the art will appreciate that additional or fewer cameras may be also implemented in accordance with system **58**. Touch screen display areas **65**, **69**, **63**, and **67** are also respectively labeled C_1, C_2, C_3, and C_N to illustrate the association between these display areas and cameras **71**, **73**, **75**, and **77**.

Hand held device **60** may be integrated with a plurality of tuners, as illustrated by tuners **62**, **64**, **66**, and **68**. Such tuners can be activated via user controls on hand held device **60** and/or via touch screen icons or areas displayed on display screen **61** that are associated with each tuner. Such icons/areas may be respectively displayed within display areas **65**, **69**, **63** and **67**, or within a separate display area of display screen **61**. A user accesses tuner **62**, for example, to retrieve real-time video images transmitted from transmitter **70** for camera **71**. Likewise, a user can access tuner **64** to retrieve real-time video images transmitted from transmitter **72** for camera **73**.

In addition, a user can access tuner **74** to retrieve real-time video images transmitted from transmitter **74** for camera **75**. Finally, user can access tuner **68** to retrieve real-time video images transmitted from transmitter **76** for camera **77**. In the example depicted in FIG. **4**, a football player **82** is participating in a football game within venue **80**. Cameras **71**, **73**, **75**, and **77** capture moving images (e.g., video data) of the football player **82** from various angles and transmit these images to hand held device **60**.

FIG. **5** depicts a system **59** that provides multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data, in accordance with a preferred embodiment. Note that in FIG. **4** and FIG. **5** analogous parts are indicated by identical reference numerals. Thus, for example, cameras **71**, **73**, **75**, and **77** of FIG. **5** are analogous to cameras **71**, **73**, **75**, and **77** of FIG. **4**. Hand held device **60** of FIG. **5** is also analogous to hand held device **60** of FIG. **4** and includes similar features thereof.

Hand held device **60** of FIG. **5**, however, can be configured to receive wireless real time video data transmitted for cameras **71**. **73**, **75**, and **77** respectively through data transmitters **102**, **104**, **106**, and **108** to server **100** and thereafter to wireless data transmitter/receiver **110**. Note that wireless data transmitter/receiver **110** is analogous to wireless unit **17** of FIG. **1**. Hand held device **60** of FIG. **5** is also analogous to hand held device **11** of FIG. **1**.

Hand held device **60** of FIG. **5** also incorporates a touch screen user interface, as described herein with respect to analogous hand held device **60** of FIG. **4**. The difference between system **58** of FIG. **4** and system **59** of FIG. **5** ties in the inclusion of digital transmitters **102**, **104**, **106**, and **108** which are respectively linked to cameras **71**, **73**, **75**, and **77** of FIG. **5**. In the illustration of FIG. **5**, cameras **71**, **73**, **75**, and **77** may be configured as high definition video cameras which capture real time images of events or activities taking place within venue **80**, such as real time video footage of football player **82**.

A captured image of football player **82** can be transferred from one or more of video cameras **71**, **73**, **75**, and **77** of FIG. **5** and transmitted through a respective digital transmitter, such as digital transmitter **102**, **104**, **106** or **108** and transmitted via wired and/or wireless communications to server **100**. The server **100** then processes the video data received from one or more of the digital transmitters and formats the video data for transmission via wireless means to wireless data transmitter/receiver **100**, which may be integrated with hand held device **100**. Transmitter/receiver **100** can communicate with the various components of hand held device **60**, such as a CPU, image processing unit, memory units, and so forth.

Those skilled in the art can appreciate that although real time video data may be transmitted to server **100**, captured past video images may also be stored within server **100** and transferred to hand held device **60** for display at display screen **61**. For example, instant replays may be transferred as video data to hand held device **60** upon the request of a user of hand held device **60**. Such instant replay footage can be displayed on display screen **61** for the user to view.

FIG. **6** illustrates a system **79** for providing multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data from at least one wide-angle and/or panoramic video camera **114**, in accordance with a preferred embodiment. In system **79** of FIG. **6**, wide-angle/panoramic (hereinafter referred to as "panoramic") video camera **114** may be configured as a high-definition panoramic video camera that captures images of activities taking place at venue **80**. In the example illustrated in FIG. **6**, panoramic video camera **114** can capture of images of a football game and one or more football players, such as football player **82**.

A data transmitter **112** may be linked to panoramic video camera **114**. Video data captured by panoramic video camera **114** may be transferred to data transmitter **112**, which thereafter transmits the video data to server **100** via a direct link or wireless link, depending on the needs or requirements of the promoters or venue owners. Note that this is also true of the system described in FIG. **6**. Server **100** of FIG. **6** is analogous to server **100** of FIG. **5**. Thus, in the case of FIG. **5**, video data may be transmitted from one or more of data transmitters **102**, **104**, **106**, and **108** via a direct wire/cable link or through wireless transmission means, such as through a wireless network.

Those skilled in the art will appreciate, of course, that hand held device **60** of FIG. **6** is analogous to hand held devices depicted in FIGS. **1-5** herein. In FIGS. **4**, **5**, and **6**, like or analogous parts are identified by identical reference numerals. Thus, images captured by panoramic video camera **114** of activity taking place at venue **80** may be displayed as real time video images or instant replay data on display screen **61** of hand held device **60**.

FIG. **7** depicts a system **89** for providing multiple perspectives for activity at a venue **120** at a first time and/or perspective (Time **1**) and a second time and/or perspective (Time **2**), in accordance with a preferred embodiment. In FIGS. **4**, **5**, **6**, and **7**, like or analogous parts are indicated by identical reference numerals. Thus, in system **89** of FIG. **7**, an event, in this case illustrated as a hockey game, is taking place within venue **120**. Venue **120** may be, for example, a hockey arena. Panoramic video camera **114** may be linked to data transmitter **112**.

As explained previously, data transmitter **112** may be linked to server **100** via a direct link, such as a transmission cable or line, or through wireless communication means, such as through a wireless network. Server **100** can also communicate with hand held device **60** through a wireless network or other wireless communication means by transmitting data through such a network or wireless communications means to wireless data transmitter/receiver **110**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**.

Thus, a video image **124** of a hockey player **122** can be captured as video data by panoramic video camera **114**, along with a video image **126** of a hockey player **123** and displayed within display screen **61** of hand held device **60** as indicated at Time **1**. Video image **124** and **126** can be displayed within a grid-like interface on display screen **61**. Note that in the illustration of FIG. **7**, display screen **61** may be divided into four sections.

When a user touches, for example the area or section of display screen **61** in which video image **124** may be displayed, the entire display area of display screen **61** can be then consumed with a close-up video shot of video image **124**, as indicated at Time **2**, thereby providing the user with a closer view of hockey player **122**. Those skilled in the art can appreciate that the touch screen display area of display screen **61** can be arranged with graphical icons and/or user-controls that perform specific pan and zoom functions. Such icons/user-controls, when activated b a user, permit the user to retrieve panned/zoomed images of events taking place in real time within venue **120**.

Note that although only one panoramic video camera **114** and one data transmitter **112** are illustrated in FIG. **7**, a plurality of panoramic video cameras, servers, and data transmitters may be implemented in accordance with the present invention to capture the best video images, image-processing, and signal capacity to users, whether real time or otherwise, of events taking place at venue **120**.

FIG. **8** illustrates a system **92** for providing multiple perspectives through hand held device **60** of an activity at a venue **130**, including the use of a wireless gateway **124**, in accordance with a preferred embodiment. Those skilled in the art can appreciate that wireless gateway **124** may be configured as an access point for a wireless LAN (Local Area Network). Access points for wireless LAN networks and associated

wired and wireless hardware (e.g., servers, routers, gateways, etc.) are well known in the art and may be utilized in accordance with the present invention described herein. Again, note that in FIGS. **4**, **5**, **6**, **7**, and **8**, like or analogous parts are indicated by identical reference numerals. System **92** of FIG. **8** is analogous to system **89** of FIG. **7**, the difference being in the nature of the venue activity. Venue **130** can be, for example, a concert hall or stadium configured with a sound stage.

Gateway **124** can be configured as a communications gateway through which data may enter or exit a communications network, such as wireless network **152** illustrated in FIG. **9** for a large capacity of user hand device **60** users. Wireless network **152** may be configured as a wireless LAN network. Hand held device **60** can be configured to communicate and receive transmissions from such a wireless LAN network based on device identification (e.g., device address). Communication with hand held devices, such as hand held device **60**, however, may also be achieved through RF (Radio Frequency) broadcasts, thereby not requiring two-way communication and authentication between, for example, a wireless LAN network and such hand held devices. A broadcast under such a scenario may also require that such a hand held device or hand held devices possess decryption capabilities or the like in order to be authorized to receive transmissions from the venue.

The remaining elements of FIG. **8** are also analogous to the elements depicted in the previous drawings, with the addition of wireless gateway **124**, which may be linked to server **100** and may be in communication with several wireless data transmitters/receivers **110** and one or more electronic hand held devices, including hand held device **60**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**. One or more panoramic video cameras, such as panoramic video camera **114**, can be positioned at a venue **130** at locations that capture images not only of the events taking place on a concert stage, but also events taking place within the stadium itself.

If an audience member **140**, for example, happens to be walking along a stadium aisle within view of panoramic video camera **114**, the audience member's video image can be displayed as video image **144** within display screen **61** of hand held device **60**, as indicated at Time **1**. Likewise, panoramic video camera **114** captures images of band member **138** whose video image can be displayed as video image **142** within a display area of display screen **61**, as indicated at Time **1**.

Thus, a user of hand held device **60** can view not only the events taking place on a central performing platform of venue **130**, but also other events within the arena itself. The band member **138** may be located on a central performing platform (not shown) of venue **130** when panoramic video camera **114** captures real-time video images of band member **138**. The user may also, for example, wish to see a close-up of audience member **140**. By activating user controls and/or a touch screen interface integrated with display screen **61**, the user can, for example, pan or zoom to view a close-up video shot of audience member **140**, as indicated at Time **2**.

Captured video images are transferred from panoramic video camera **114** as video data through transmitter **112** to server **100** and through wireless gateway **124** to wireless data transmitter/receiver **110**. Although a single server **100** is illustrated in FIG. **8**, those skilled in the art can appreciate that a plurality of servers may be implemented in accordance with the present invention to process captured and transmitted video data. Based on the foregoing, those skilled in the art can appreciate that video data may be simultaneously transferred from server **100** or a plurality or servers to literally thousands of hand held devices located within the range of the wireless network and/or wireless gateways associated with venue **130**.

FIG. **9** illustrates a system **150** for providing multiple perspectives through hand held device **60** of an activity at a venue **130** in association with a wireless network **152**, in accordance with a preferred embodiment. System **150** of FIG. **9** is analogous to system **92** of FIG. **8**, the difference noted in the inclusion of wireless network **152**. Thus, in FIG. **8** and FIG. **9**, like or analogous parts are indicated by identical reference numerals. Video data captured by a camera or cameras, such as panoramic video camera **114**, may be transferred to data transmitter **112**, which transmits the video data to wireless network **152**. Wireless network **152** then retransmits the data, at the request of authorized users of hand held devices, such as hand held device **60**, to wireless data transmitters/receivers, such as transmitter/receiver **110** integrated with hand held device **60**.

Those skilled in the art can appreciate that wireless network **152** may also receive and retransmit other data, in addition to video data. For example, a server or other computer system may be integrated with wireless network **152** to provide team and venue data, which can then be transferred to wireless data transmitter receiver **110** from wireless network **152** and displayed thereafter as team and venue information within display screen **61** of hand held device **60**. Other data that may be transferred to hand held device for display include real-time and historical statistics, purchasing, merchandise and concession information, and additional product or service advertisements.

Such data can include box scores, player matchups, animated play-books, shot/hit/pitch charts, historical information, and offense-defense statistics. In a concert venue, for example, as opposed to a sporting event, information pertaining to a particular musical group can be also transferred to the hand held device, along with advertising or sponsor information. Note that both the video data and other data described above generally comprise types of venue-based data. Venue-based data, as referred to herein, may include data and information, such as video, audio, advertisements, promotional information, propaganda, historical information, statistics, event scheduling, and so forth, associated with a particular venue and generally not retrievable through public networks.

Such information can be transmitted together with video data received from data transmitter **112**. Such information may be displayed as streaming data within display area **61** of hand held device **60** or simply stored in a database within hand held device **60** for later retrieval by the user. An example of a wireless network that may be utilized to implement wireless network **152** is and IEEE 802.11 type wireless network, which is an example of a WLAN (e.g., the WLAN referred to earlier herein). Another example of a wireless network that may be utilized to implement wireless network **152** can be Bluetooth, which is described in greater detail herein, and was conceived originally to make up for the shortcomings of infrared technologies (IR). Because IR cannot be utilized to penetrate walls, carry data heavy signals, or operate within devices that are not in line of sight, Bluetooth, which is becoming well-known the art, can be configured as or with wireless network **152**.

FIG. **10** illustrates an entity diagram **170** depicting network attributes of wireless network **152** that may be utilized in accordance with one or more embodiments. Wireless network **152** of FIG. **10** is analogous to wireless network **1152** of FIG. **9**. Wireless network **152** as illustrated in FIG. **10** can be configured as a variety of possible wireless networks. Thus,

entity diagram **170** illustrates attributes of wireless network **152**, which may or may not be exclusive of one another.

Those skilled in the art can appreciate that a variety of possible wireless communications and networking configurations may be utilized to implement wireless network **152**. Wireless network **152** may be, for example, implemented according to a variety of wireless protocols, including cellular, Bluetooth, and RF or direct IR communications. Wireless network **152** can be implemented as a single network type (e.g., Bluetooth) or a network based on a combination of network types (e.g., GSM, CDMA, etc).

Wireless network **152** may be configured with teachings/aspects of CDPD (Cellular Digital Packet Data) networks well known in the networking arts. CDPD network **154** is illustrated in FIG. **10**. CDPD may be configured as a TCP/IP based technology that supports Point-to-Point (PPP) or Serial Line Internet Protocol (SLIP) wireless connections to mobile devices, such as the hand held devices described and illustrated herein. Cellular service is generally available throughout the world from major service providers. Data can be transferred utilizing CDPD protocols.

Current restrictions of CDPD are not meant to limit the range or implementation of the method and system described herein, but are described herein for illustrative purposes only. It is anticipated that CDPD will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may preferably be also configured with teachings/aspects of a Personal Area Network **156** or Bluetooth, as described herein. Bluetooth was adopted by a consortium of wireless equipment manufacturers referred to at the Bluetooth Special Interest Group (BSIG), and has emerged as a global standard for low cost wireless data and voice communication. Current specifications for this standard call for a 2.4 GHz ISM frequency band. Bluetooth technology is generally based on a short-range radio transmitter/receiver built into small application specific circuits (ASICS, DSPs) and embedded into support devices, such as the hand held devices described and illustrated herein.

The Bluetooth standard permits up to 100 mw of power, which can increase the range to 100 M. In addition, Bluetooth can support several data channels. Utilizing short data packets and frequency hopping of up to 1600 hops per second, Bluetooth is a wireless technology that can be utilized to enable the implementation of the methods and systems described herein. Current restrictions of Bluetooth are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated Bluetooth will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of GSM network **158**. GSM (Global System for Mobile Communication) and PCS (Personal Communications Systems) networks, both well known in the telecommunications arts, generally operate in the 800 MHz, 900 MHz, and 1900 MHz range. PCS initiates narrowband digital communications in the 900 MHz range for paging, and broadband digital communications in the 1900 MHz band for cellular telephone service. In the United States, PCS 1900 is generally equivalent to GSM 1900, GSM operates in the 900 MHz, 1800-1900 MHz frequency bands, while GSM 1800 is widely utilized throughout Europe and many other parts of the world.

In the United States, GSM 1900 is generally equivalent to PCS 1900, thereby enabling the compatibility of these two types of networks. Current restrictions of GSM and PCS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GSM and PCS will be continually developed, and that aspects of such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also utilize teachings/aspects of GPRS network **160**. GPRS technology, well-known in the telecommunications arts, bridges the gap between current wireless technologies and the so-called "next generation" of wireless technologies referred to frequently as the third-generation or 3G wireless technologies. GPRS is generally implemented as a packet-data transmission network that can provide data transfer rates up to 115 Kbps. GPRS can be implemented with CDMA and TDMA technology and supports X.25 and IP communications protocols, all well known in the telecommunications arts. GPRS also enables features, such as Voice over IP (VoIP) and multimedia services. Current restrictions of GPRS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GPRS will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be implemented utilizing teaching/aspects of a CDMA network **162** or CDMA networks. CDMA (Code Division Multiple Access) is a protocol standard based on IS-95 CDMA, also referred to frequently in the telecommunications arts as CDMA-1. IS-95 CDMA is generally configured as a digital wireless network that defines how a single channel can be segmented into multiple channels utilizing a pseudo-random signal (or code) to identify information associated with each user. Because CDMA networks spread each call over more than 4.4 trillion channels across the entire frequency band, it is much more immune to interference than most other wireless networks and generally can support more users per channel.

Currently, CDMA can support data at speeds up to 14.4 Kbps. Wireless network **152** may also be configured with a form of CDMA technology known as wideband CDMA (W-CDMA). Wideband CDMA may be also referred to as CDMA 2000 in North America. W-CDMA can be utilized to increase transfer rates utilizing multiple 1.25 MHz cellular channels. Current restrictions of CDMA and W-CDMA are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that CDMA and W-CDMA will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may be also implemented utilizing teachings/aspects of paging network **164**. Such paging networks, well known in the telecommunications arts, can be implemented in accordance with the present invention to enable transmission or receipt of data over the TME/X protocol, also well known in the telecommunications arts. Such a protocol enables notification in messaging and two-way data coverage utilizing satellite technology and a network of base stations geographically located throughout a particular geographical region. Paging network **162** can be configured to process enhanced 2-way messaging applications.

Unified messaging solutions can be utilized in accordance with wireless network **152** to permit carriers and Internet service providers to manage customer e-mail, voice messages and lax images and can facilitate delivery of these communications to PDAs, telephony devices, pagers, personal computers and other capable information retrieval devices, wired or wireless.

Current restrictions of such paging networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that such paging networks, including those based on the TME/X protocol, will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of TDMA networks **166**. TDMA (Time Division Multiple Access) is a telecommunications network utilized to separate multiple conversation transmissions over a finite frequency allocation of through-the-air bandwidth. TDMA can be utilized in accordance with the present invention to allocate a discrete amount of frequency bandwidth to each user in a TDMA network to permit many simultaneous conversations or transmission of data. Each user may be assigned a specific timeslot for transmission. A digital cellular communications system that utilizes TDMA typically assigns 10 timeslots for each frequency channel.

A hand held device operating in association with a TDMA network sends bursts or packets of information during each timeslot. Such packets of information are then reassembled by the receiving equipment into the original voice or data/information components. Current restrictions of such TDMA networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that TDMA networks will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of Wireless Intelligent Networks (WINs) **168**. WINs are generally known as the architecture of the wireless switched network that allows carriers to provide enhanced and customized services for mobile telephones. Intelligent wireless networks generally include the use of mobile switching centers (MSCs) having access to network servers and databases such as Home Location Registers (HLRs) and Visiting Location Registers (VLRs), for providing applications and data to networks, service providers and service subscribers (wireless device users).

Local number portability allows wireless subscribers to make and receive calls anywhere—regardless of their local calling area. Roaming subscribers are also able to receive more services, such as call waiting, three-way calling and call forwarding. A HLR is generally a database that contains semi-permanent mobile subscriber (wireless device user) information for wireless carriers' entire subscriber base.

A useful aspect of WINs for the present invention is enabling the maintenance and use of customer profiles within an HLR/VLR-type database. Profile information may be utilized for example with season ticket holders and/or fans of traveling teams or shows. HLR subscriber information as used in WINs includes identity, service subscription information, location information (the identity of the currently serving VLR to enable routing of communications), service restrictions and supplementary services/information. HLRs handle SS7 transactions in cooperation with Mobile Switching Centers and VLR nodes, which request information from the HLR or update the information contained within the HLR. The HLR also initiates transactions with VLRs to complete incoming calls and update subscriber data. Traditional wireless network design is generally based on the utilization of a single HLR for each wireless network, but growth considerations are prompting carriers to consider multiple HLR topologies.

The VLR may be also configured as a database that contains temporary information concerning the mobile subscribers currently located in a given MSC serving area, but whose HLR may be elsewhere. When a mobile subscriber roams away from the HLR location into a remote location, SS7 messages are used to obtain information about the subscriber from the HLR, and to create a temporary record for the subscriber in the VLR.

Signaling System No. 7 (referred to as SS7 or C7) is a global standard for telecommunications. In the past the SS7 standard has defined the procedures and protocol by which network elements in the public switched telephone network (PSTN) exchange information over a digital signaling network to affect wireless and wireline call setup, routing, control, services, enhanced features and secure communications. Such systems and standards may be utilized to implement wireless network **152** in support of venue customers, in accordance with the present invention.

Improved operating systems and protocols allow Graphical User Interfaces (GUIs) to provide an environment that displays user options (e.g., graphical symbols, icons or photographs) on a wireless device's screen. Extensible Markup Language ("XML") is generally a currently available standard that performs as a universal language for data, making documents more interchangeable. XML allows information to be used in a variety of formats for different devices, including PCs, PDAs and web-enabled mobile phones.

XML enables documents to be exchanged even where the documents were created and/or are generally used by different software applications. XML may effectively enable one system to translate what another system sends. As a result of data transfer improvements, wireless device GUIs can be utilized in accordance with a hand held device and wireless network **152**, whether configured as a paging network or another network type, to render images on the hand held device that closely represent the imaging capabilities available on desktop computing devices.

Those skilled in the art can appreciate that the system and logical processes described herein relative to FIG. **11** to FIG. **17** are not limiting features of the present invention. Rather, FIG. **11** to FIG. **17** provide examples of image-processing systems and logical processes that can be utilized in accordance with the present invention. Such a system and logical processes represent one possible technique, which may be utilized in accordance with one or more embodiments of the present invention to permit a user of a hand held device to manipulate video images viewable on a display screen of the hand held device.

FIG. **11** thus illustrates a prior art overview display **200** and a detail window **210** that may be utilized with embodiments of the present invention. The overview image display **200** is a view representative of a 360° rotation around a particular point in a space. While a complete rotational view may be utilized in accordance with preferred embodiments of the present invention, one of ordinary skill in the computer arts will readily comprehend that a semi-circular pan (such as used with wide-angle cameras) or other sequence of images could be substituted for the 360 degree rotation without departing from the subject invention. The vantage point is generally where the camera was located as it panned the space. Usually the scene is captured in a spherical fashion as the camera pans around the space in a series of rows as depicted in FIG. **12**. The space is divided into w rows **220-224** and q columns **230-242** with each q representing another single frame as shown in FIG. **12**.

User control over the scene (e.g., rotation, pan, zoom) may be provided by pressing a touch screen display icon or moving a cursor displayed on a display screen of a hand held device, such as the hand held devices described herein. User

control over the scene may also be provided by manipulating external user controls integrated with a hand held device (e.g., user controls **44** and **54** of FIG. **2** and FIG. **3**). Movement from a frame in the overview image display to another frame is in one of eight directions as shown in FIG. **13**. The user may interact with the video representation of the space one frame at a time. Each individual frame is an image of one of the pictures taken to capture the space as discussed above. The individual frames may be pieced together.

Interacting with a video one frame at a time results in the ability to present a detailed view of the space, but there are severe limitations. First, the interaction results in a form of tunnel vision. The user can only experience the overview image display as it unfolds a single frame at a time. No provision for viewing an overview or browsing a particular area is provided. Determining where the current location in the image display is, or where past locations were in the overview image display is extremely difficult. Such limitations can be overcome by creating of a motif not dissimilar to the natural feeling a person experiences as one walks into a room.

Another limitation of a simple overview viewer is that there is no random access means. The frames can only be viewed sequentially as the overview image display is unfolded. As adapted for use in accordance with the present invention, this problem has been overcome by providing tools to browse, randomly select and trace selected images associated with any overview image.

FIG. **14** illustrates a prior art overview image **300**, a detail window **310** and a corresponding area indicia, in this case a geometric figure outline **320**. The detail window **310** corresponds to an enlarged image associated with the area bounded by the geometric figure outline **320** in the overview image **300**. As the cursor is moved, the location within the overview image **300** may be highlighted utilizing the geometric figure outline **320** to clearly convey what location the detail window **310** corresponds.

One of ordinary skill in the computer arts will readily comprehend that reverse videoing the area instead of enclosing it with a geometric figure would work equally well. Differentiating the area with color could also be used without departing from the invention. A user can select any position within the overview image, press the cursor selection device's button (for example, user controls in the form of touch screen user interface buttons or icons), and an enlarged image corresponding to the particular area in the overview display is presented in the detail window **310**. Thus, random access of particular frames corresponding to the overview image may be provided.

FIG. **15** illustrates a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview display for subsequent playback. The overview image **400** has a detail window **410** with an enlarged image of the last location selected in the overview image **470**. Each of the other cursor locations traversed in the overview image **420**, **430**, **440**, **450** and **460** are also enclosed by an outline of a geometric figure to present a trace to the user.

Each of the cursor locations may be saved, and because each corresponds to a particular frame of the overview image, the trace of frames can be replayed at a subsequent time to allow another user to review the frames and experience a similar presentation. Locations in the detailed window and the overview image can also be selected to present other images associated with the image area, but not necessarily formed from the original image.

For example, a china teacup may appear as a dot in a china cabinet, but when the dot is selected, a detailed image rendering of the china teacup could appear in the detailed window. Moreover, a closed door appearing in an image could be selected and result in a detailed image of a room located behind the door even if the room was not visible in the previous image. Finally, areas in the detailed window can also be selected to enable further images associated with the detailed window to be revealed. Details of objects within a scene are also dependent on resolution capabilities of a camera. Cameras having appropriate resolution and/or image processing capabilities are preferably used in accordance with certain aspects of the present invention.

The overview image was created as discussed above. To assist one of ordinary skill in the art to make and use the invention, a more detailed discussion of the necessary processing is presented below with reference to FIG. **16** and FIG. **17** herein.

FIG. **16** depicts a prior art flowchart providing a logical process for building an overview image display. Such a logical process may be utilized in accordance with the present invention, but is not a necessary feature of the present invention. Those skilled in the art will appreciate that such a logical process is merely an example of one type of image-processing algorithm that may be utilized in accordance with embodiments of the present invention. For example, such a logical process may be implemented as a routine or subroutine that runs via image-processing unit **35** of FIG. **1** in a hand held device. Those skilled in the art can appreciate that the logical process described with relation to FIGS. **16** and **17** herein are not limiting features of the present invention.

Such logical processes, rather, are merely one of many such processes that may be utilized in accordance with the present invention to permit a user to manipulate video images displayed via a display screen of a hand held device. Navigable movie/video data in the form of images input to the hand held device to form individual images can be thus processed, as illustrated at function block **500**. User specified window size (horizontal dimension and vertical dimension) may be entered, as illustrated at function block **504**.

Image variables can be specified (horizontal sub-sampling rate, vertical sub-sampling rate, horizontal and vertical overlap of individual frame images, and horizontal and vertical clip (the number of pixels are clipped from a particular frame in the x and y plane)), as depicted at function block **508**. Function blocks **500**,**504** and **508** are fed into the computation function block **510** where the individual frames are scaled for each row and column, and the row and column variables are each initialized to one.

Then a nested loop can be invoked to create the overview image. First, as indicated at decision block **512**, a test is performed to determine if the maximum number of rows has been exceeded. If so, then the overview image is tested to determine if its quality is satisfactory at decision block **520**. If the quality is insufficient, the user may be provided with an opportunity to adjust the initial variables, as illustrated at function blocks **504** and **508**. The processing is then repeated. If however, the image is of sufficient quality, it can be saved and displayed for use, as depicted at block **560**.

If the maximum rows has not been exceeded as detected in decision block **512**, then another test can be performed, as illustrated at decision block **514**, to determine if the column maximum has been exceeded. If so, then the row variable can be incremented and the column variable can be reset to one at function block **518** and control flows to input block **520**. If the column maximum has not been exceeded, then the column variable may be incremented and the sub-image sample frame can be retrieved, as depicted at input block **520**. Then, as

illustrated at function block **530**, the frame may be inserted correctly in the overview image.

The frame may be inserted at the location corresponding to (V sub*row*col)+Hsub*col; where row and col refer to the variables incremented in the nested loop, and Vsub and Hsub are user specified variables corresponding to the horizontal and vertical sub sampling rate. Finally, the incremental overview image can be displayed based on the newly inserted frame as depicted at display block **540**. Thereafter, the column variable can be reset to one and processing can be passed to decision block **512**.

A computer system corresponding to the prior art method and system depicted in FIGS. **11** to **17** may be generally interactive. A user may guess at some set of parameters, build the overview image, and decide if the image is satisfactory. If the image is not satisfactory, then variables can be adjusted and the image is recreated. This process can be repeated until a satisfactory image results, which may be saved with its associated parameters. The picture and the parameters can be then input to the next set of logic.

Such features may or may not be present with the hand held device itself. For example, images may be transmitted from a transmitter, such as data transmitter **112** of FIG. **7**, and subroutines or routines present within the server itself may utilize predetermined sets of parameters to build the overview image and determine if the image is satisfactory, generally at the request of the hand held device user. A satisfactory image can be then transmitted to the hand held device. Alternatively, image-processing routines present within an image-processing unit integrated with the hand held device may operate in association with routines present within the server to determine if the image is satisfactory and/or to manipulate the image (e.g., pan, zoom).

FIG. **17** depicts a prior art flowchart illustrative of a logical process for playback interaction. The logical process illustrated in FIG. **17** may be utilized in accordance with a preferred or alternative embodiment, depending of course, upon design considerations and goals. Playback interaction may commence, as illustrated at label **600**, which immediately flows into function block **604** to detect if user controls have been activated at the hand held device. Such user controls may be configured as external user controls on the hand held device itself (e.g., buttons, etc.), or via a touch screen user interface integrated with hand held device display screen.

When a touch screen user input or user control button press is detected, a test can be performed to determine if a cursor is positioned in the overview portion of the display. If so, then the global coordinates can be converted to overview image coordinates local to the overview image as shown in output block **612**. The local coordinates can be subsequently converted into a particular frame number as shown in output block **614**. Then, the overview image is updated by displaying the frame associated with the particular location in the overview image and control flows via label **600** to function block **604** to await the next button press.

If the cursor is not detected in the overview image as illustrated at decision block **610**, then another test may be performed, as indicated at decision block **620**, to determine if the cursor is located in the navigable player (detail window). If not, then control can be passed back via label **600** to function block **604** to await the next user input. However, if the cursor is located in the detail window, then as depicted a function block **622**, the direction of cursor movement may be detected. As depicted at function block **624**, the nearest frame can be located, and as illustrated at decision block **626**, trace mode may be tested.

If trace is on, then a geometric figure can be displayed at the location corresponding to the new cursor location in the overview image. The overview image may be then updated, and control can be passed back to await the next user input via user controls at the hand held device and/or a touch screen user interface integrated with the hand held device. If trace is not on, the particular frame is still highlighted as shown in function block **630**, and the highlight can be flashed on the overview image as illustrated at output block **632**. Thereafter, control may be returned to await the next user input.

Although the aforementioned logical processes describe the use of a cursor as a means for detecting locations in a panorama, those skilled in the art can appreciate that other detection and tracking mechanisms may be utilized, such as, for example, the pressing of a particular area within a touch screen display.

FIG. **18** depicts a pictorial representation illustrative of a Venue Positioning System (VPS) **700** in accordance with an alternative embodiment. FIG. **18** illustrates a stadium venue **701** which is divided according to seats and sections. Stadium venue **701** may be utilized for sports activities, concert activities, political rallies, or other venue activities. Stadium venue **701** is divided, for example, into a variety of seating sections A to N. For purposes of simplifying this discussion, VPS **700** is described in the context of sections A to C only.

A venue positioning system (VPS) device **704** is positioned in section A of stadium venue **701**, as indicated at position A2. A VPS device **702** is located within section A at position A1. In the illustration of FIG. **18**, it is assumed that VPS device **702** is located at the top of a staircase, while VPS device **704** is located at the bottom of the staircase, and therefore at the bottom of section A, near the sports field **711**. A VPS device **706** is located near the top of section B at position B1. A VPS device **708** is located at the bottom of section B at position B2, near sports field **711**. Similarly, in section C, venue positioning devices **10** and **712** are respectively located at positions C1 and C2.

A hand held device **703** may be located at a seat within section A. For purposes of this discussion, and by way of example only, it is assumed that hand held device **703** is being operated by a stadium attendee watching a sporting event or other venue activity taking place on sports field **711**. A hand held device **707** is located within section B. Hand held device **707**, by way of example, may also be operated by a concessionaire or venue employee.

if the user of hand held device **703** desires to order a soda, hot dog, or other product or service offered by venue operators during the venue event, the user merely presses an associated button displayed via a touch screen user interface integrated with the hand held device. Immediately, a signal is transmitted by hand held device **703**, in response to the user input to/through the VPS device, wireless network or wireless gateway as previously described. One or more of VPS devices **702**, **704**, **706**, and **708** may detect the signal. The VPS devices may also operate merely as transponders, in which case hand held devices will be able to determine their approximate location within the venue and then transmit position information through wireless means to, for example, concession personnel.

VPS devices **702**, **704**, **706**, and **708** function in concert with one another to determine the location of hand held device **703** within section A. Triangulation methods, for example, may be used through the hand held device or VPS devices to determine the location of the hand held device within the venue. This information is then transmitted by one or more of such VPS devices either directly to hand held device **707** or initially through a wireless network, including

a wireless gateway and associated server, and then to hand held device **707**. The user of hand held device **707** then can directly proceed to the location of hand held device **703** to offer concession services.

Additionally, hand held device **703** can be configured with a venue menu or merchandise list. In response to requesting a particular item from the menu or merchandise list, the request can be transmitted as wireless data from hand held device **703** through the wireless network to hand held device **707** (or directly to a controller (not shown) of hand held device **707**) so that the user (concession employee) of hand held device **707** can respond to the customer request and proceed directly to the location of hand held device **703** used by a customer.

FIG. **19** illustrates in greater detail the VPS **700** of FIG. **18**, in accordance with an alternative embodiment. In FIG. **18** and FIG. **19** like or analogous parts are indicated by identical reference numerals, unless otherwise stated. Additionally wireless gateway **124** and server **100** of FIG. **19** are analogous to the wireless gateway **124** and server **100** illustrated in FIG. **8**. Venue positioning units **702**, **704**, **706**, and **708** are located within section A and section B. A wireless gateway **124** is linked to server **100**. Wireless gateway **124** can communicate with hand held device **707** and hand held device **703**.

Wireless gateway **124** can also communicate with VPS devices **702**, **704**, **706**, and **708** if the VPS devices are also operating as data communication devices in addition to providing mere transponder capabilities. When VPS devices **702**, **704**, **706**, and **708** detect the location of hand held device **703** within stadium venue **701**, the location is transmitted to wireless gateway **124** and thereafter to hand held device **703**. It should be appreciated that a hand held device user may also identify his/her location in a venue by entering location information (e.g., seat/section/row) on the hand held device when making a request to a service provider such as a food concession operation. The VPS devices will still be useful to help concession management locate concession employees located within the venue that are in closest proximity to the hand held device user. A wireless gateway **124** and server **100** can be associated with a wireless network implemented in association with stadium venue **701**. Those skilled in the art will appreciate that such a wireless network may be limited geographically to the stadium venue **701** itself and the immediate surrounding area. An example of such a wireless network, as described previously is a Bluetooth based wireless network.

The hand held devices themselves may be proprietary devices owned by promoters or operators of stadium venue **701** and rented to patrons for their use while attending a venue activity. Proprietary devices will generally be manufactured using durable materials (e.g., similar to those materials used on field technician digital millimeters/devices such as the Fluke™ line of electronic devices). Proprietary devices will also be limited in hardware and software modules (i.e., software routines/subroutines) needed for communication with the venue system in order to display venue activities to temporary users.

Hand held devices may also be owned by the patrons themselves which they bring into the stadium venue for their use by permission of the venue promoter or stadium owners in return for the payment of a fee by the patron. In return for the fee, the venue promoter or stadium owner can provide the patron with a temporary code which permits them to access the wireless network associated with the venue itself, such as wireless network **152** described herein. Patron-owned devices may utilize smart card technology to receive authorization codes (e.g., decryption) needed to receive venue—provided video/data. Codes may also be transferred to the patron-owned device via IR or short range RF means. Wireless network **152** described herein may be configured as a proprietary wireless Intranet/Internet providing other data accessible by patrons through their hand held devices.

FIG. **20** depicts a flowchart of operations **740** illustrative of a method for providing multiple venue activities through a hand held device, in accordance with an alternative embodiment. The process is initiated, as depicted at block **742**. As illustrated next at block **744**, a venue attendee may activate at least one hand held tuner integrated with a hand held device, such as the hand held device illustrated in FIG. **4**. At least one tuner may be integrated with the hand held device, although more than one tuner (or other simultaneous signal receiving capability) may be used within a hand held device in support of other embodiments of the invention previously described.

The tuner, or tuners, is/are associated with a transmission frequency/frequencies of a transmitter that may be linked to a particular camera/cameras focusing on a venue activity, or to a wireless gateway or wireless network transmission. To view the images from that particular angle, the user must retrieve the video images from the camera associated with that particular angle. The user may have to adjust a tuner until the right frequency/image is matched, as indicated at block **756**. As illustrated at block **748**, captured video images are transferred from the video camera to the transmitter associated with the camera, or a server in control of the camera(s). Video images are generally transmitted to the hand held device at the specified frequency, in response to a user request at the hand held device, as depicted at block **750**.

An image-processing unit integrated with the hand held device, as illustrated at block **752** may then process transferred video images. An example of such an image-processing unit is image-processing unit **35** of FIG. **1**. As indicated thereafter at block **754**, the video images of the venue activity captured by the video camera can be displayed within a display area of the hand held device, such as display **18** of FIG. **1**. The process can then terminate, as illustrated at block **756**.

FIG. **21** illustrates a flowchart of operations **770** illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras, in accordance with an alternative embodiment. As indicated at block **772**, the process is initiated. As illustrated next at block **774**, video images of a venue activity may be captured by one or more digital video camera.

Such digital video cameras may be panoramic/wide-angle in nature and/or configured as high definition video cameras, well known in the art. The video camera or cameras may be respectively linked to data transmitters, such as data transmitters **102**, **104**, **106**, and/or **108** of FIG. **5** or data transmitter **112** of FIG. **6** to FIG. **9** herein. As depicted next at decision block **778**, if a user does not request a view of the venue activity through the hand held device, the process terminates, as illustrated thereafter at block **779**.

If, as illustrated at decision block **778**, the user does request a view of the venue activity through the hand held device, then as described thereafter at block **780**, video data may be transferred from a data transmitter to a server, such as server **100** of FIG. **5** to FIG. **8** herein. The video data may be stored in a memory location of the server or a plurality of servers, as indicated at block **782**. The video data may be then transferred to a wireless data transmitter/receiver integrated with the hand held device, as indicated at block **784**.

As illustrated thereafter at block **786**, the video data may be processed by an image-processing unit and associated image-processing routines and/or subroutines integrated with the hand held device. When image-processing is complete, the video images may be displayed in a display area of the hand

held device. As illustrated next at block **790**, if a user chooses to pan/zoom for a better view of the video images displayed within the hand held device, then two possible operations may follow, either separately or in association with one another.

The image-processing unit integrated with the hand held device may process the user's pan/zoom request, as illustrated at block **792**. Alternatively, image-processing routines and/or subroutines resident at the server or a plurality of servers may process the user's pan/zoom request, following the transmission of the user's request from the hand held device to the server or plurality of servers. Such a request may be transmitted through a wireless gateway linked to the server or servers.

Image-processing may occur at the server or servers if the hand held device is not capable of directly processing the video data and video images thereof due to low memory or slow CPU allocation. Likewise, some image-processing may take place within the hand held device, while video image-processing requiring faster processing capabilities and increased memory may take place additionally at the server or servers to assist in the final image representation displayed at the hand held device.

When image-processing is complete, the pan/zoomed images can be displayed within a display screen or display area of the hand held device, as illustrated thereafter at block **796**. The process then terminates, as depicted at block **798**. If the user does not request pan/zoom, as indicated at block **790**, the process may then terminate, as described at block **791**.

The embodiments and examples set forth herein are presented in order to best explain the present invention and its practical application and to thereby enable those skilled in the art to make and utilize the invention. However, those skilled in the art will recognize that the foregoing description and examples have been presented for the purpose of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching without departing from the spirit and scope of the following claims.

What is claimed is:

1. At least one server, comprising:

memory capable of storing entertainment venue-based data comprising video captured of live entertainment occurring in front of a live audience from more than one camera located in at least one entertainment venue;

at least one processor capable of authenticating via a security code at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data;

at least one processor processing the venue-based data including video captured from the more than one camera into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by said at least one remote hand held device; and

at least one port capable of streaming said venue-based data as streamed data from said at least one server so that said entertainment venue-based data may be wirelessly received as said streamed data by at least one remote hand held device authorized to receive said entertainment venue-based data through at least one wireless data communications network, in order to permit said entertainment venue-based data to be accessible wirelessly as said streamed data via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one venue for viewing via said at least one remote hand held device, said video captured from said more than one camera located at said at least one entertainment venue.

2. The at least one server of claim **1** wherein said at least one wireless data communications network comprises a cellular telecommunications network.

3. The at least one server of claim **1** wherein said at least one wireless data communications network comprises an 802.11 wireless network.

4. The at least one server of claim **1** wherein said at least one remote hand held device comprises a Smartphone.

5. The at least one server of claim **1** wherein said at least one remote hand held device comprises a tablet computing device.

6. The at least one server of claim **1** wherein said at least one remote hand held device comprises a touchscreen display for the display of said entertainment venue-based data comprising video captured from more than one camera located in said at least one entertainment venue.

7. The at least one server of claim **6** wherein said at least one hand held device comprises at least one of the following: a Smartphone and a tablet computing device.

8. At least one server, comprising:

memory capable of storing entertainment venue-based data that comprises video captured of live entertainment occurring in front of a live audience from more than one camera located in at least one entertainment venue;

at least one processor capable of authenticating via a security code at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data;

at least one processor processing the venue-based data including video captured from the more than one camera into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by said at least one remote hand held device; and

at least one port capable of streaming said entertainment venue-based data as streamed data from said at least one server so that said entertainment venue-based data may be wirelessly streamed to at least one remote hand held device authorized to receive said entertainment venue-based data through at least one wireless data communications network, in order to permit said entertainment venue-based data to be accessible wirelessly as said streamed data via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one entertainment venue for viewing via said at least one remote hand held device, said video captured from said more than one camera located at said at least one entertainment venue.

9. The at least one server of claim **8** wherein said at least one wireless data communications network comprises a cellular telecommunications network.

10. The at least one server of claim **8** wherein said at least one wireless data communications network comprises an 802.11 wireless network.

11. The at least one server of claim **8** wherein said at least one remote hand held device comprises a Smartphone.

12. The at least one server of claim **8** wherein said at least one remote hand held device comprises a tablet computing device.

13. The at least one server of claim **8** wherein said at least one remote hand held device comprises a touchscreen display for the display of said entertainment venue-based data comprising video captured from more than one camera located in said at least one entertainment venue.

14. The at least one server of claim **13** wherein said at least one hand held device comprises at least one of the following: a Smartphone and a tablet computing device.

15. A system, comprising:

memory capable of storing entertainment venue-based data comprising video captured of live entertainment occurring in front of a live audience from more than one camera located in at least one entertainment venue;

at least one processor capable of authenticating via a security code at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data;

at least one processor processing the venue-based data including video captured from the more than one camera into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by said at least one remote hand held device; and

at least one port capable of streaming said entertainment venue-based data as streamed data from said at least one server so that said entertainment venue-based data may be wirelessly received as said streamed data by and/or streamed to at least one remote hand held device authorized to receive said entertainment venue-based data through at least one wireless data communications network, in order to permit said entertainment venue-based data to be accessible wirelessly as said streamed data via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one entertainment venue for viewing via said at least one remote hand held device, said video captured from said more than one camera located at said at least one entertainment venue.

16. The at least one server of claim **15** wherein said at least one wireless data communications network comprises a cellular telecommunications network.

17. The at least one server of claim **15** wherein said at least one wireless data communications network comprises an 802.11 wireless network.

18. The at least one server of claim **15** wherein said at least one remote hand held device comprises a touchscreen display for the display of said entertainment venue-based data comprising video captured from more than one camera located in said at least one entertainment venue.

19. The at least one server of claim **18** wherein said at least one hand held device comprises at least one of a Smartphone or a tablet computing device.

20. The at least one server of claim **15** wherein said at least one hand held device comprises at least one of a Smartphone or a tablet computing device.

* * * * *

US007812856B2

(12) **United States Patent**
Ortiz et al.

(10) **Patent No.: US 7,812,856 B2**
(45) **Date of Patent: *Oct. 12, 2010**

(54) **PROVIDING MULTIPLE PERSPECTIVES OF A VENUE ACTIVITY TO ELECTRONIC WIRELESS HAND HELD DEVICES**

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(73) Assignee: **Front Row Technologies, LLC.** Albuquerque, NM (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 887 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **09/902,348**

(22) Filed: **Jul. 10, 2001**

(65) **Prior Publication Data**

US 2002/0063799 A1 May 30, 2002

Related U.S. Application Data

(60) Provisional application No. 60/243,561, filed on Oct. 26, 2000.

(51) **Int. Cl.**
H04N 7/18 (2006.01)

(52) **U.S. Cl.** **348/159**

(58) **Field of Classification Search** 248/157, 248/158, 159

See application file for complete search history.

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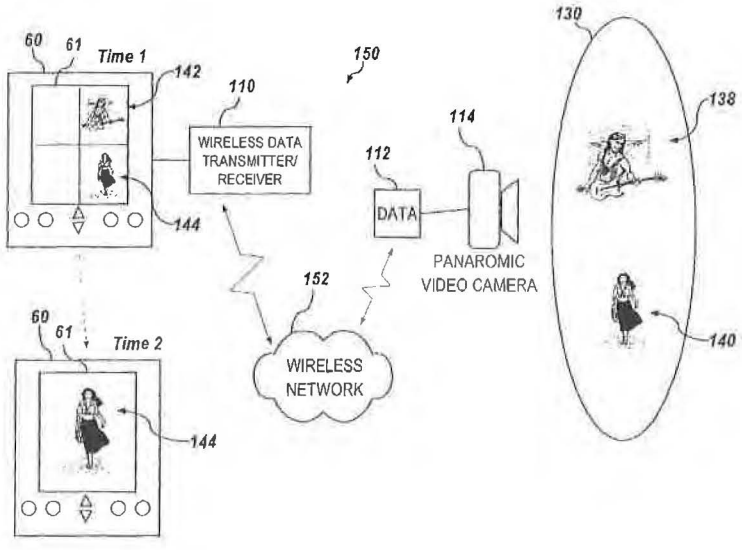
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Primary Examiner—Nhon T Diep
(74) *Attorney, Agent, or Firm*—Kermit D. Lopez; Luis M. Ortiz; Ortiz & Lopez, PLLC

(57) **ABSTRACT**

Methods and systems for providing multiple perspectives of a venue activity to electronic hand held devices are disclosed. A system for providing venue-based data to venue-based wireless hand held device can include at least one processor for processing data captured by at least one venue-based video camera for transmission to remote wireless hand held devices and at least one transmitter for wirelessly transmitting the data to a the remote wireless hand held devices. Wireless hand held devices include a display screen for displaying received venue video data. A method for transmitting venue-based data to hand held devices includes steps of capturing video images from at least one perspective of a venue-based activity using at least one video camera, processing the video images into venue-based data formatted for transmission and use by at least one hand held device and transmitting the venue-based data to at least one hand held device. Hand held devices receive venue-based data, process the data for display on a display screen associated with hand held devices, and display processed data on the display screen, thereby enabling users of the hand held devices to view at least one perspective of venue-based data through the hand held devices.

20 Claims, 18 Drawing Sheets



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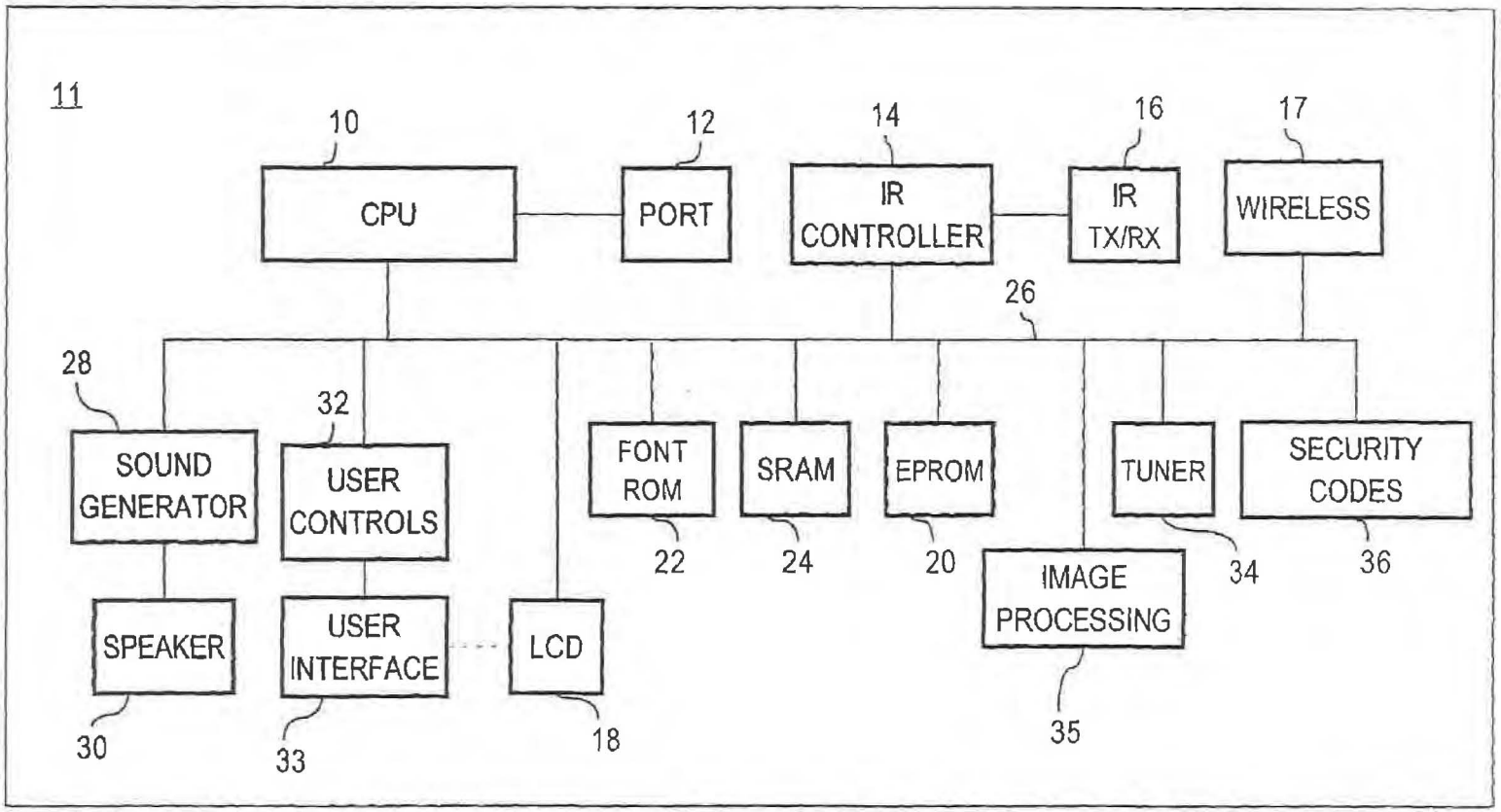

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CPU
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PORT
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IR CONTROLLER
16
IR TX/RX
17
WIRELESS
26
28
SOUND GENERATOR
32
USER CONTROLS
FONT ROM
SRAM
EPROM
TUNER
SECURITY CODES
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24
20
34
36
IMAGE PROCESSING
SPEAKER
USER INTERFACE
LCD
30
33
18
35

FIG. 1

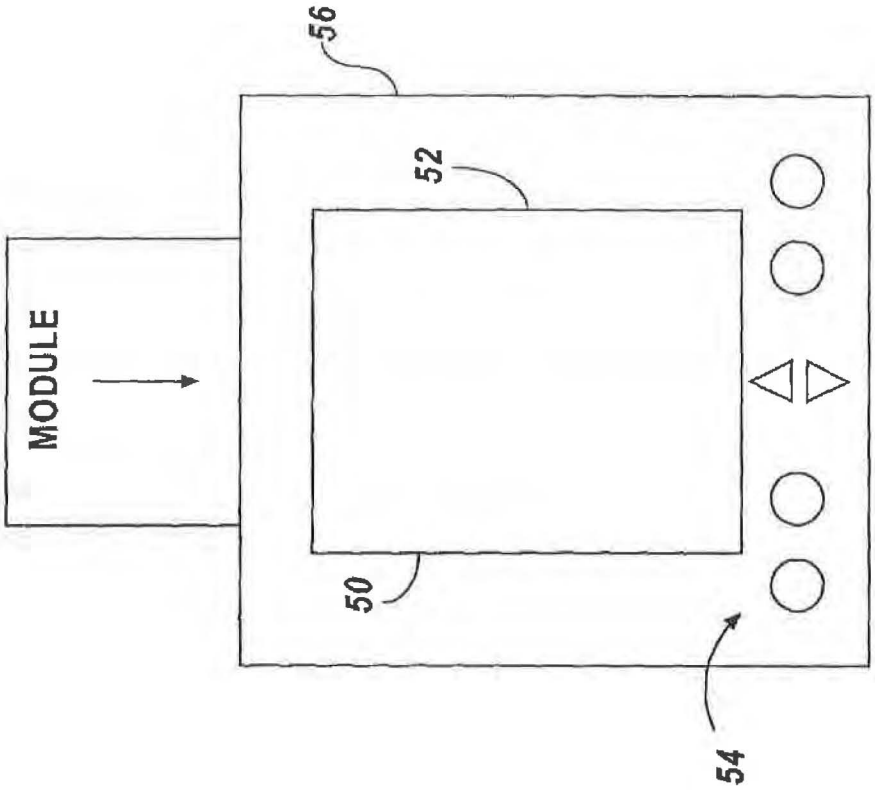


FIG. 3

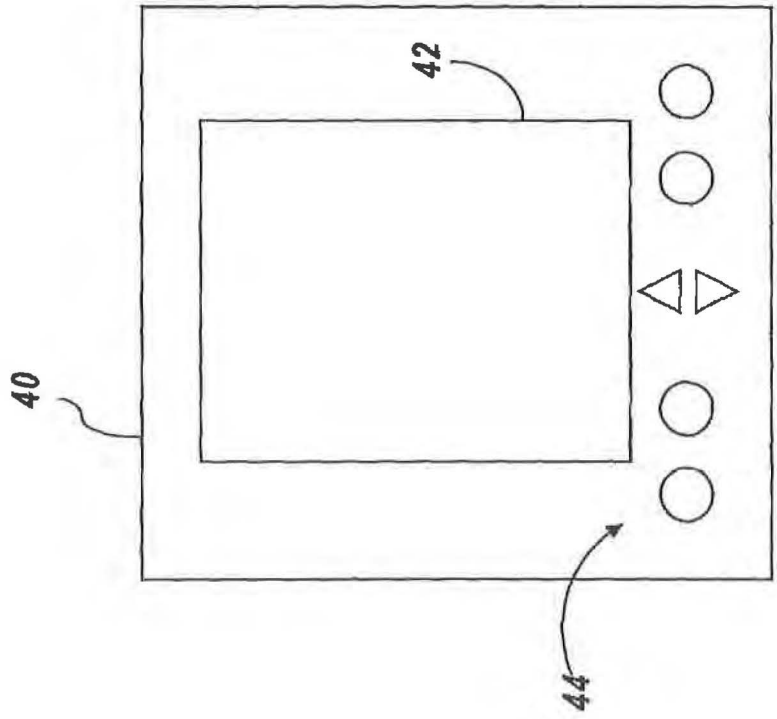


FIG. 2

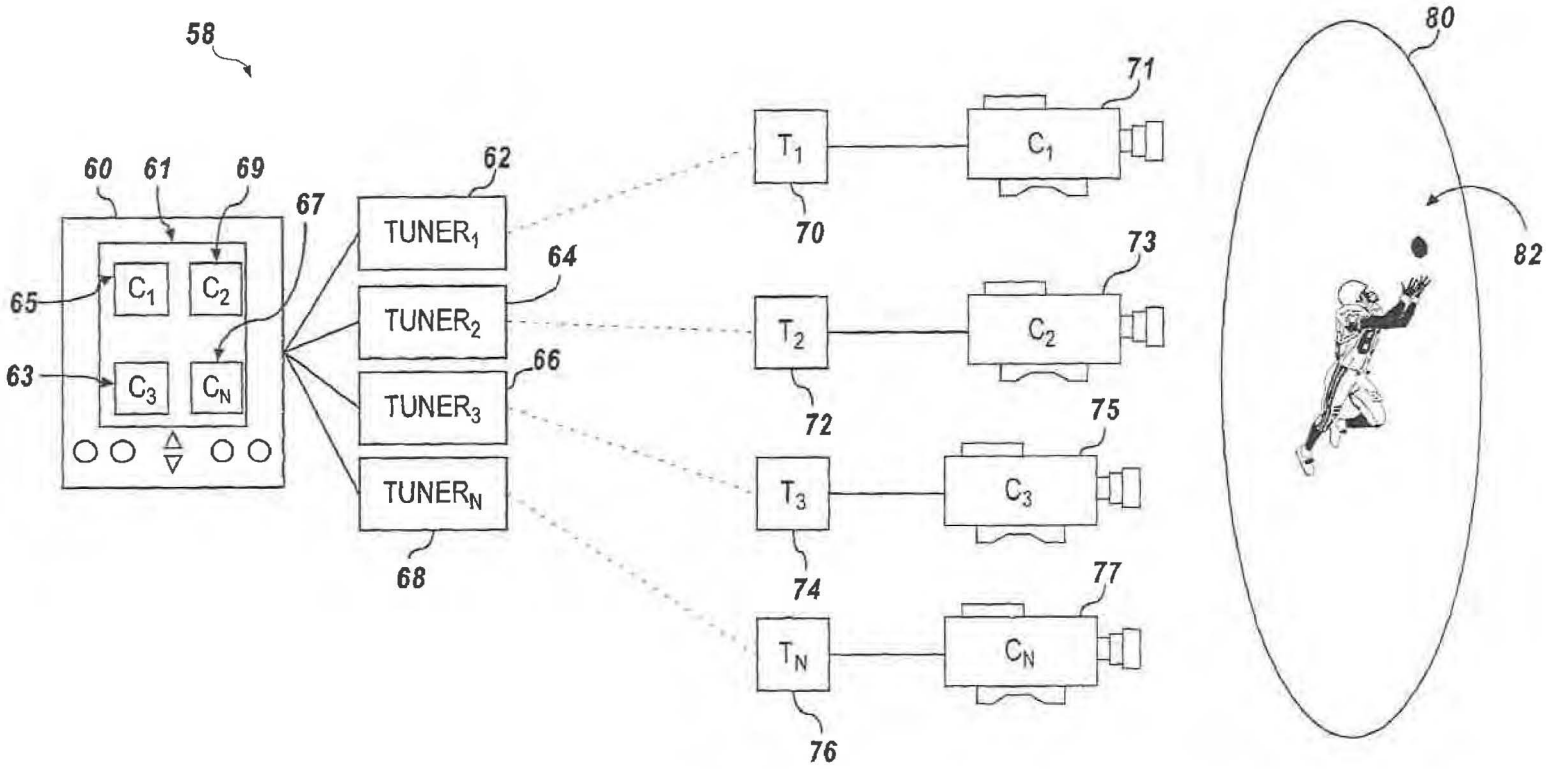

58
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69
67
62
65
63
C1
C2
C3
CN
TUNER1
TUNER2
TUNER3
TUNERN
64
66
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T1
T2
T3
TN
70
72
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76
71
73
75
77
80
82

FIG. 4

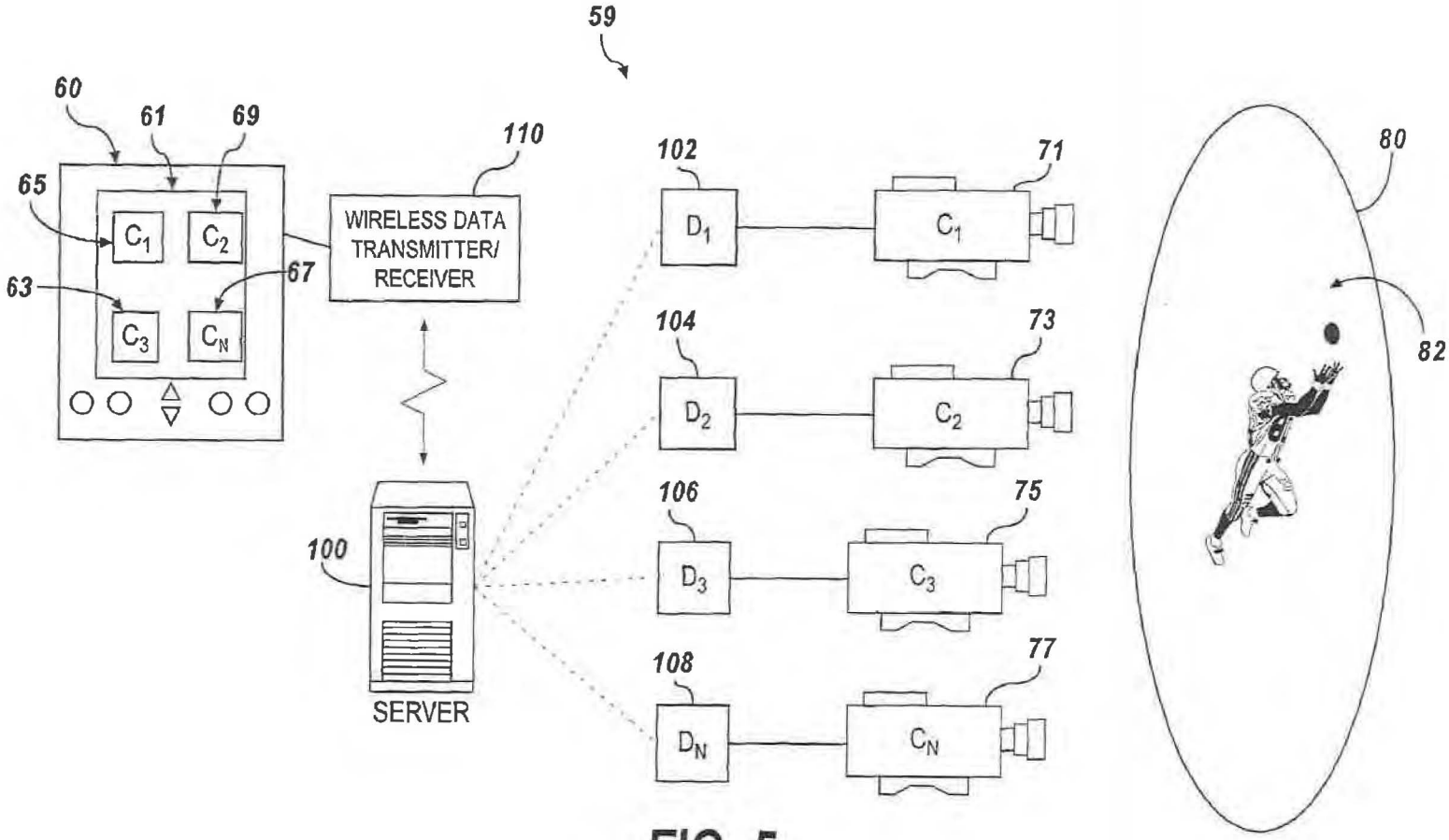

59
60
61
69
65
63
67
110
C1
C2
C3
CN
WIRELESS DATA TRANSMITTER/ RECEIVER
100
SERVER
102
D1
71
C1
104
D2
73
C2
106
D3
75
C3
108
DN
77
CN
80
82

FIG. 5

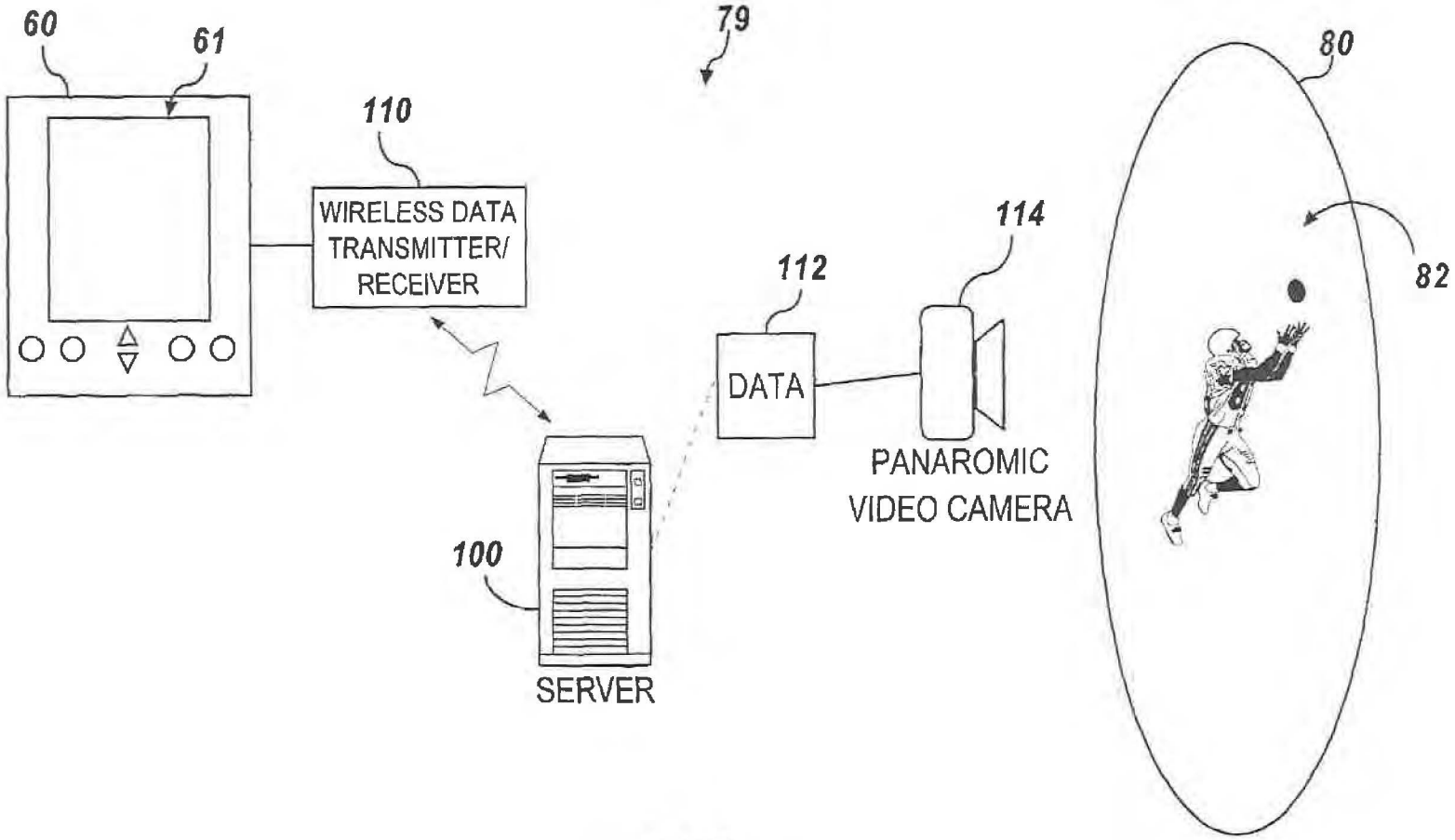

60
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80
110
WIRELESS DATA TRANSMITTER/ RECEIVER
114
112
82
DATA
PANAROMIC VIDEO CAMERA
100
SERVER

FIG. 6

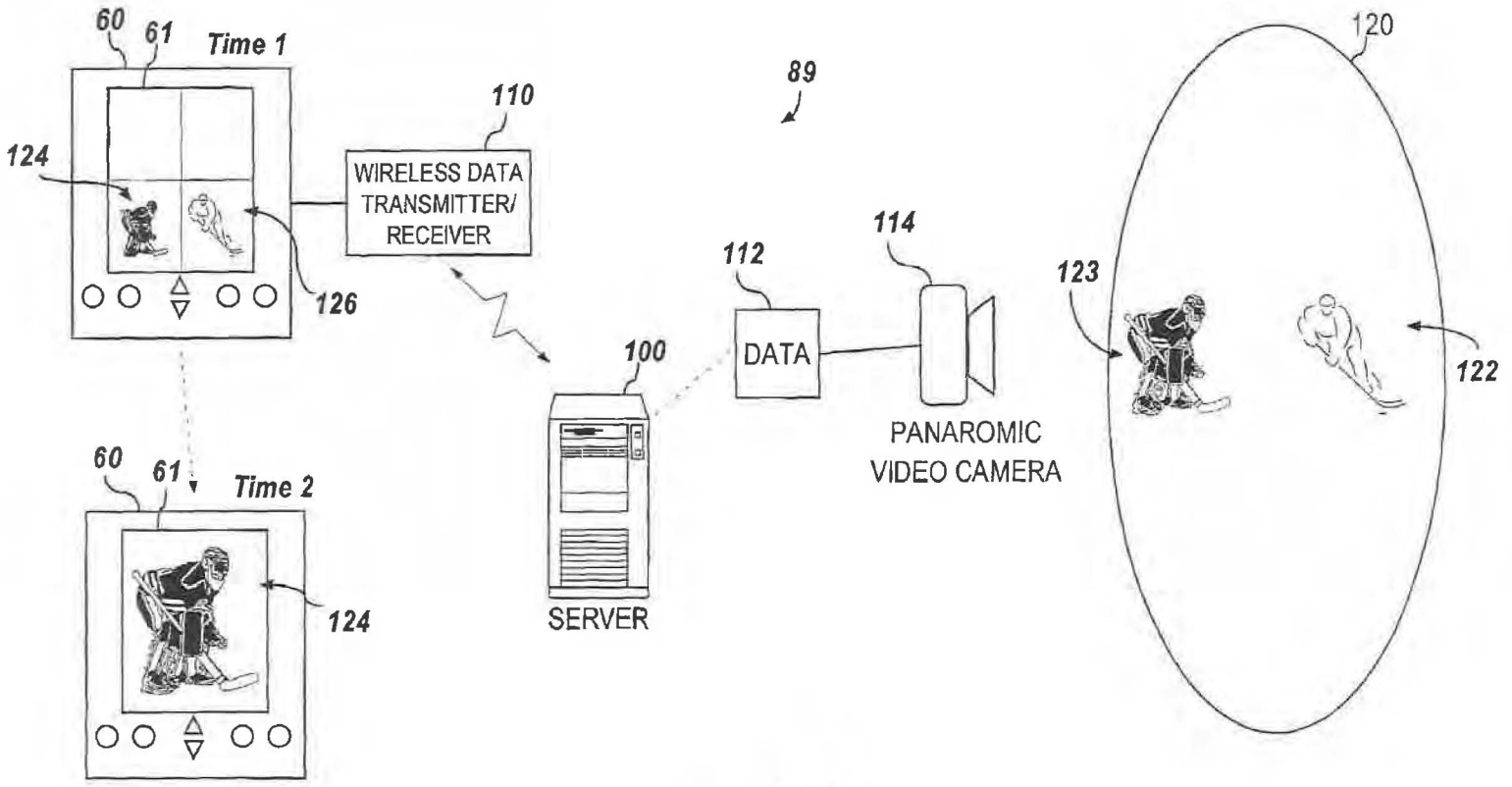

60
61
Time 1
124
110
WIRELESS DATA TRANSMITTER/ RECEIVER
126
89
120
112
114
123
DATA
PANAROMIC VIDEO CAMERA
122
100
SERVER
60
61
Time 2
124

FIG. 7

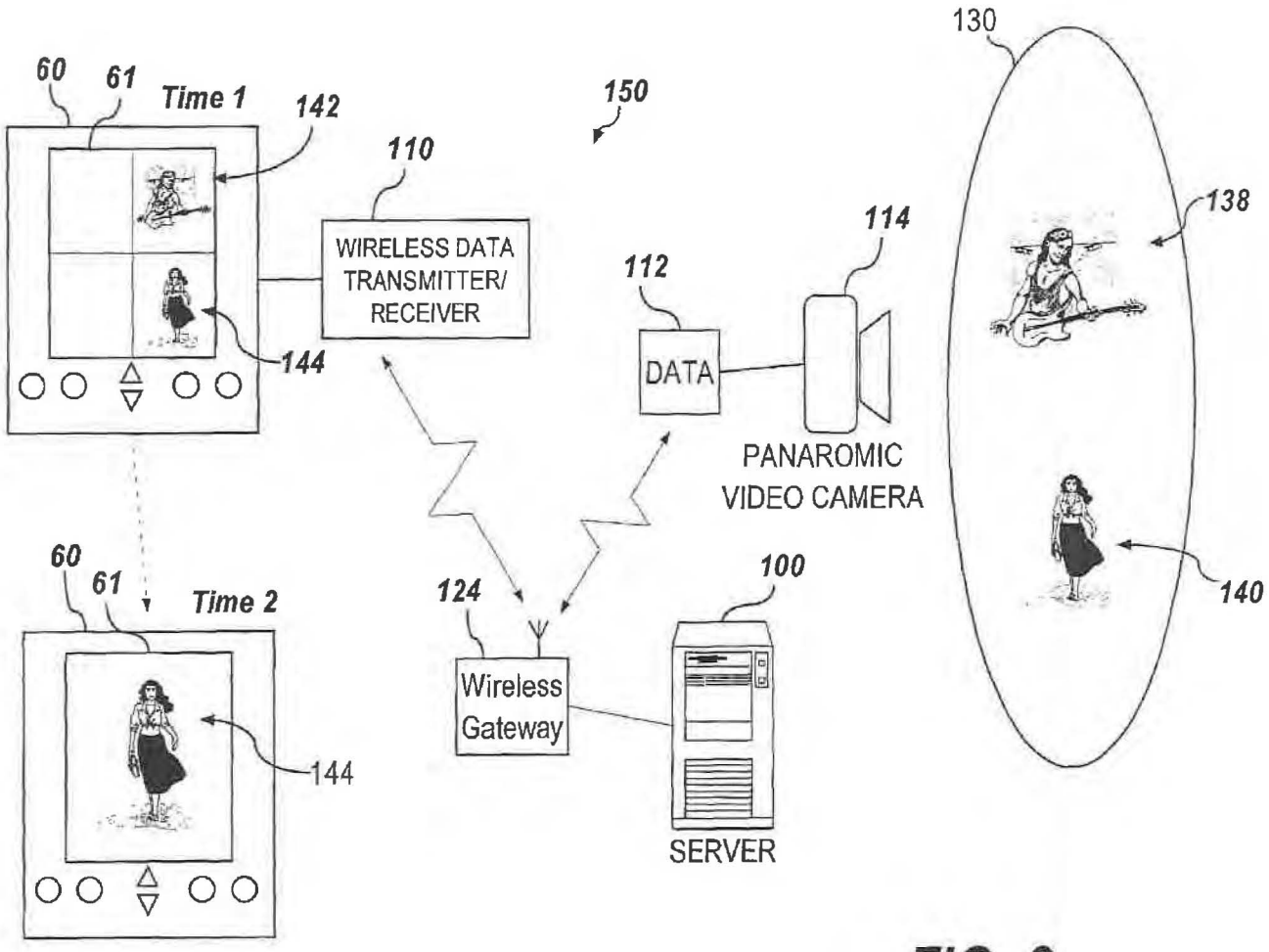

60
61
Time 1
142
110
150
130
138
114
112
WIRELESS DATA TRANSMITTER/ RECEIVER
144
DATA
PANAROMIC VIDEO CAMERA
60
61
Time 2
124
100
Wireless Gateway
144
SERVER
140

FIG. 8

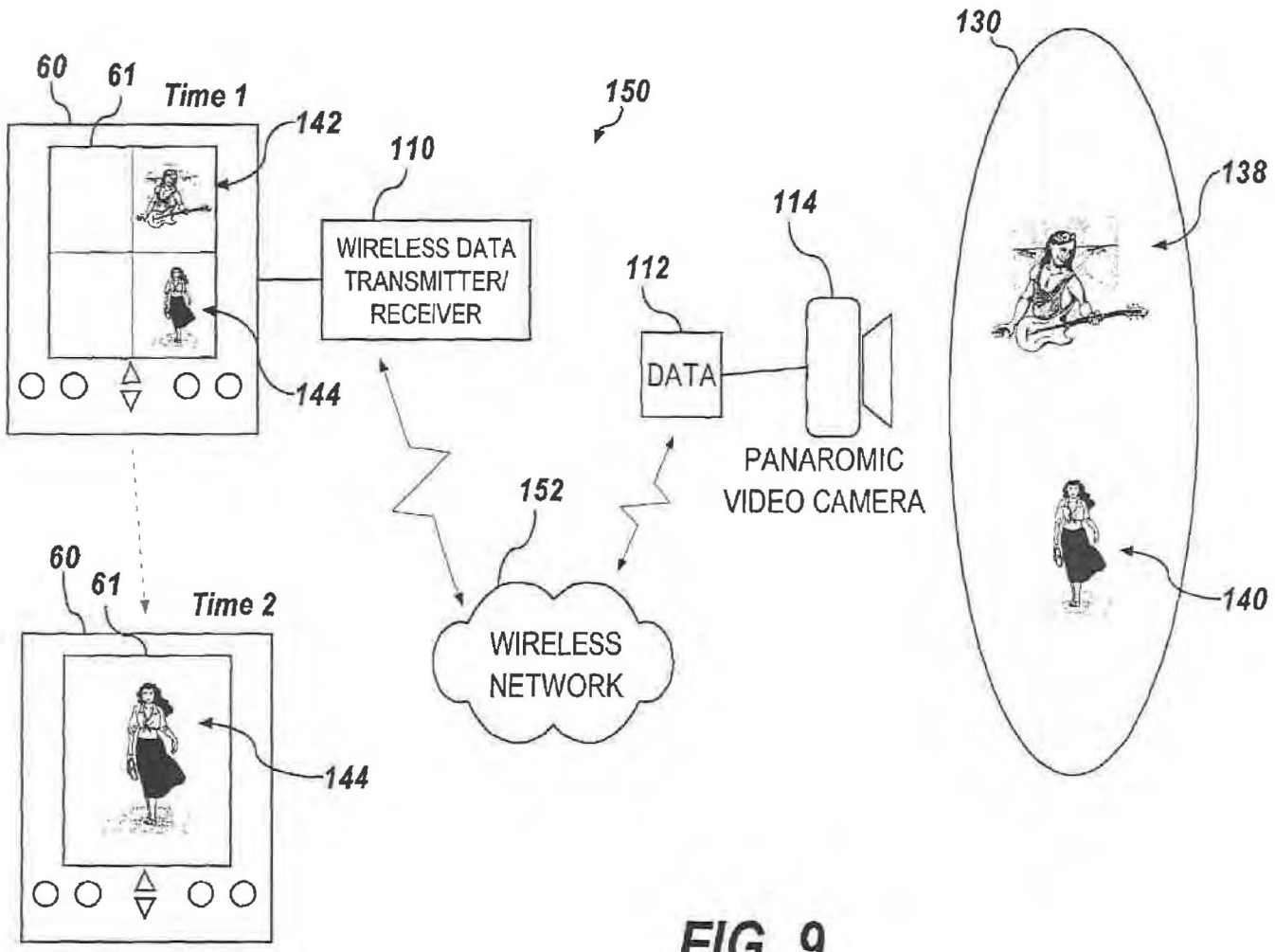

60
61
Time 1
142
110
150
130
138
114
112
WIRELESS DATA TRANSMITTER/ RECEIVER
DATA
144
PANAROMIC VIDEO CAMERA
152
60
61
Time 2
WIRELESS NETWORK
140
144

FIG. 9

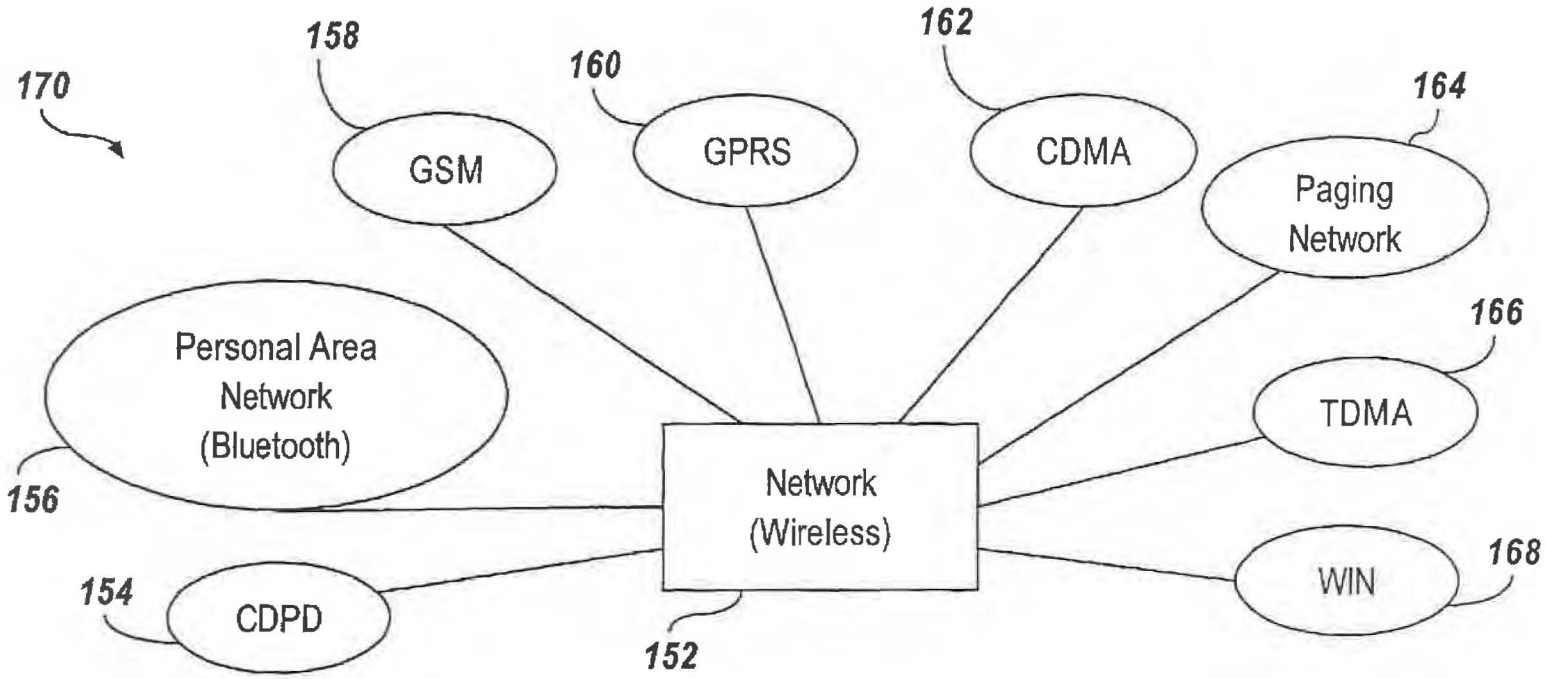

170
158
GSM
160
GPRS
162
CDMA
164
Paging Network
166
TDMA
168
WIN
Personal Area Network (Bluetooth)
156
154
CDPD
Network (Wireless)
152

FIG. 10

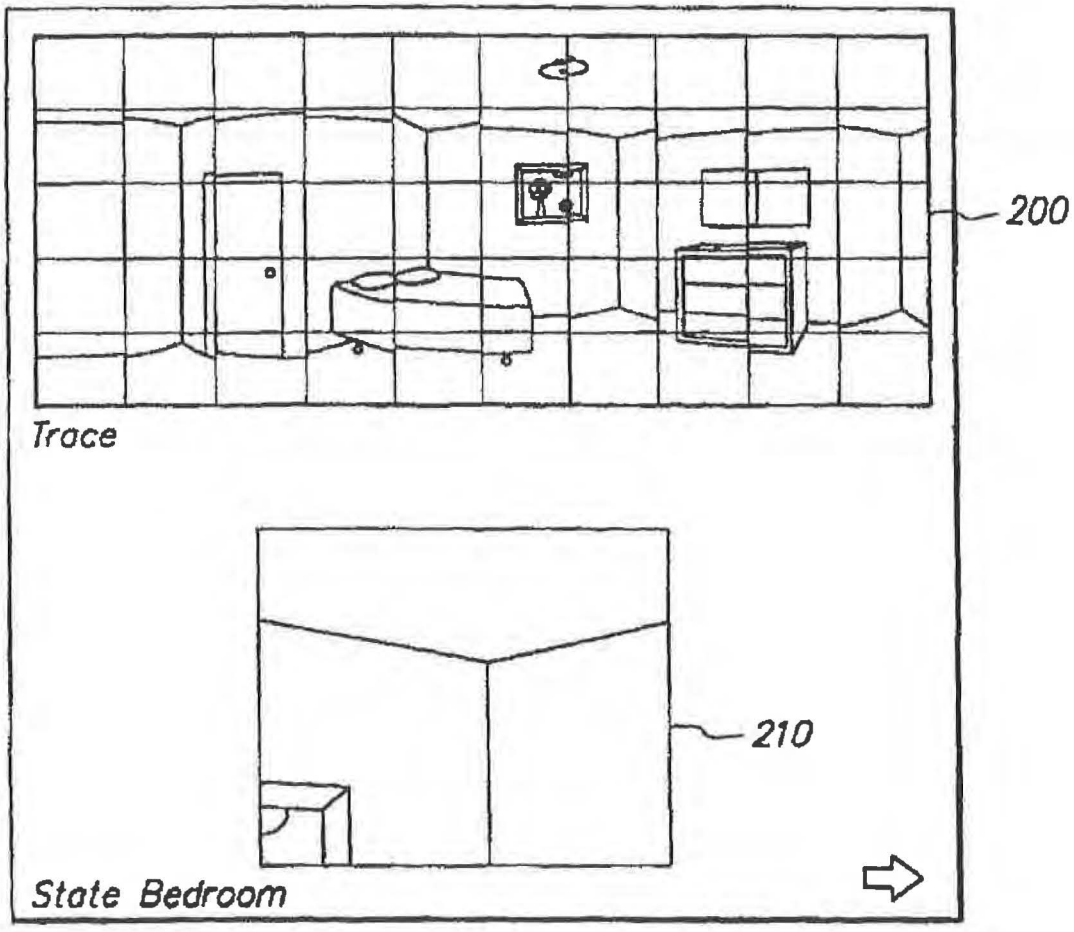


FIG. 11
(Prior Art)

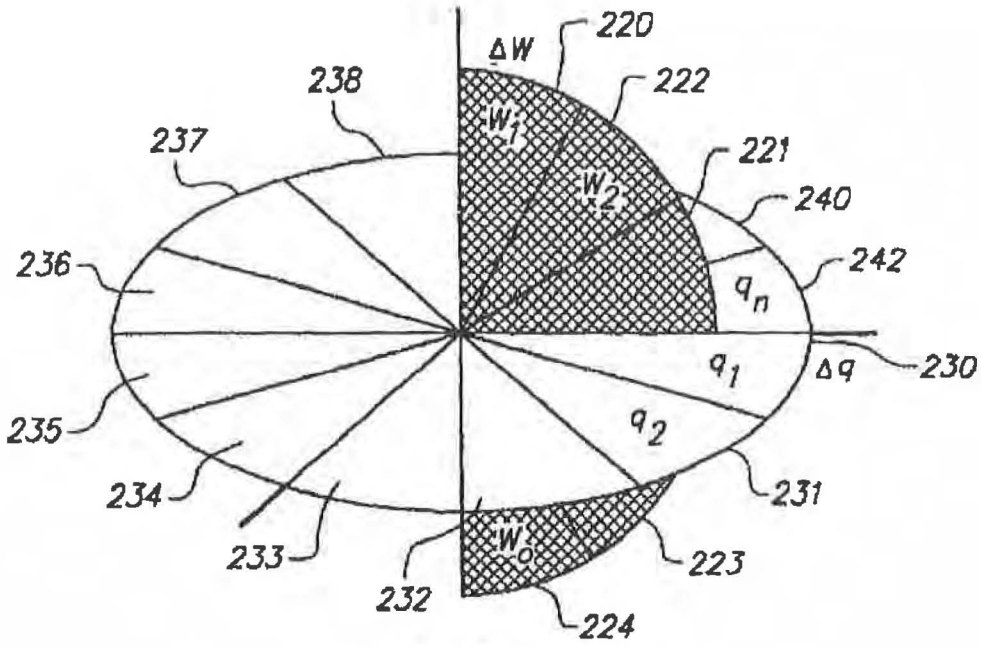


FIG. 12
(Prior Art)

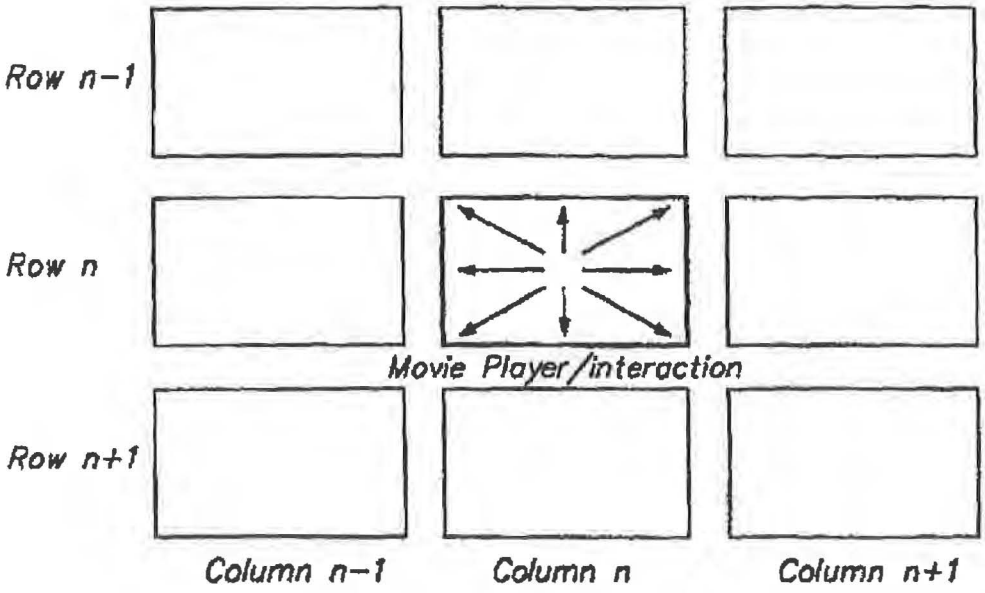


FIG. 13
(Prior Art)

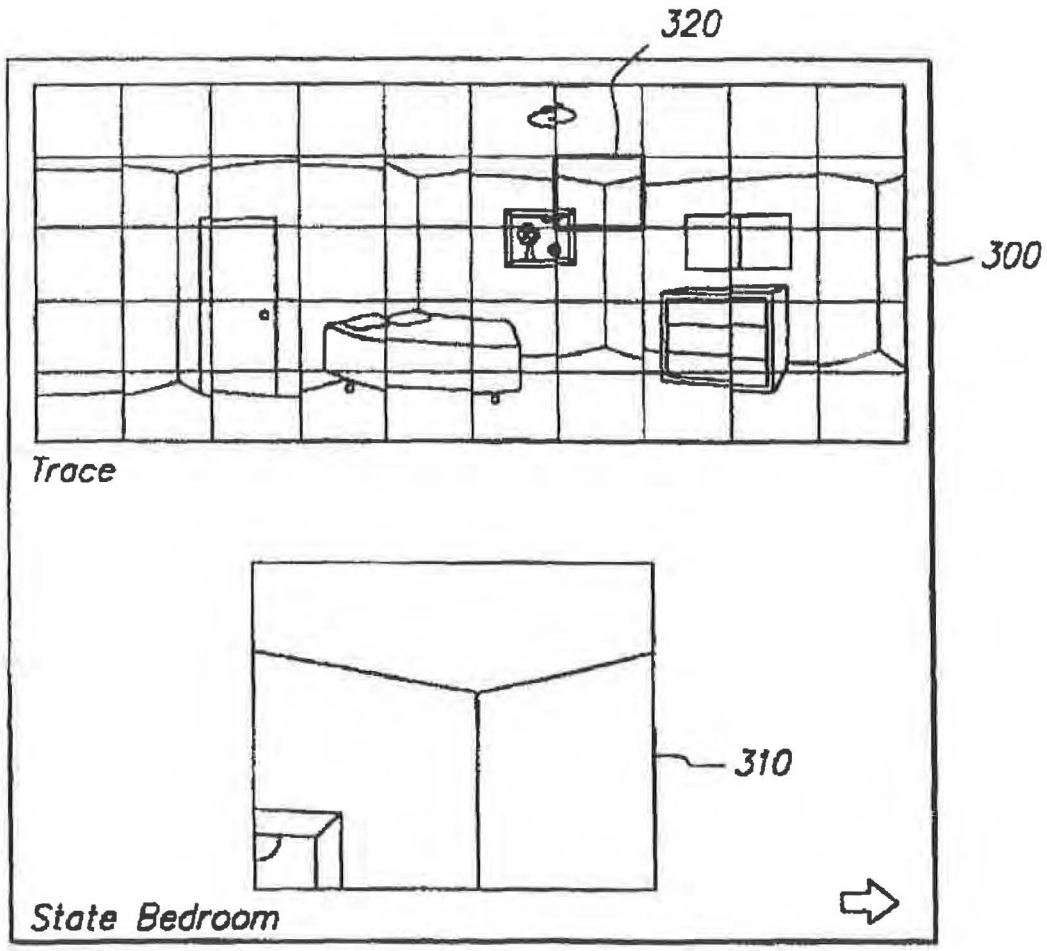


FIG. 14
(Prior Art)

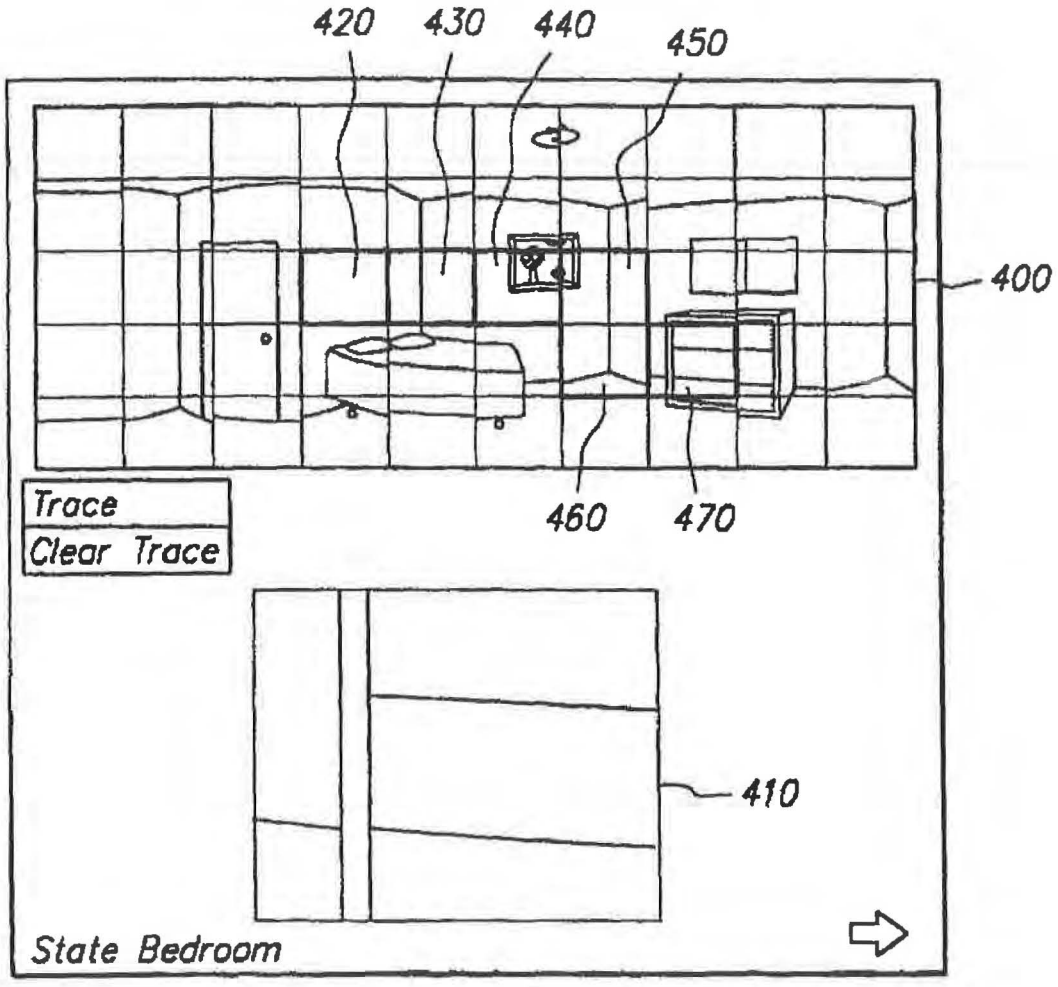


FIG. 15
(Prior Art)

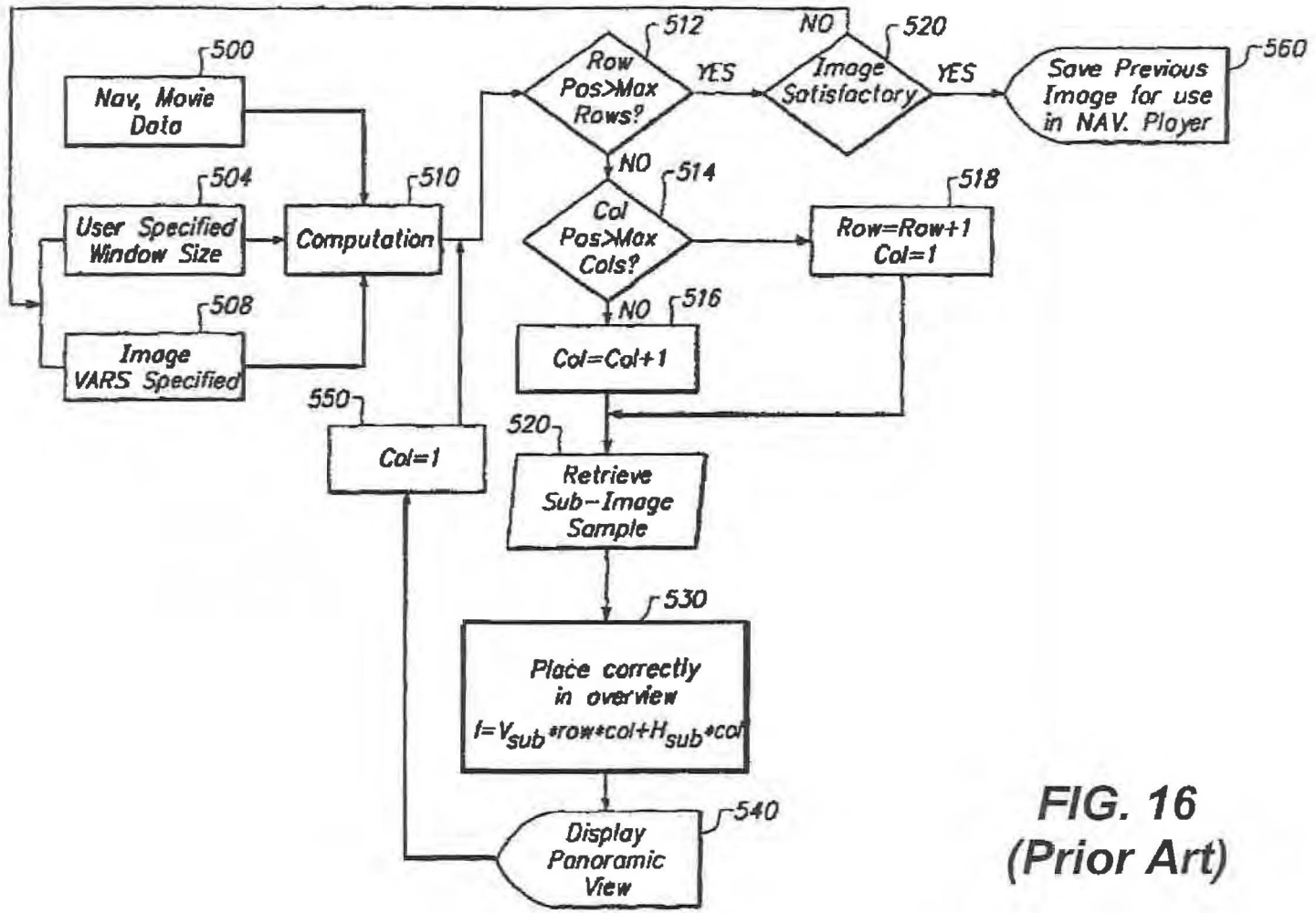


FIG. 16
(Prior Art)

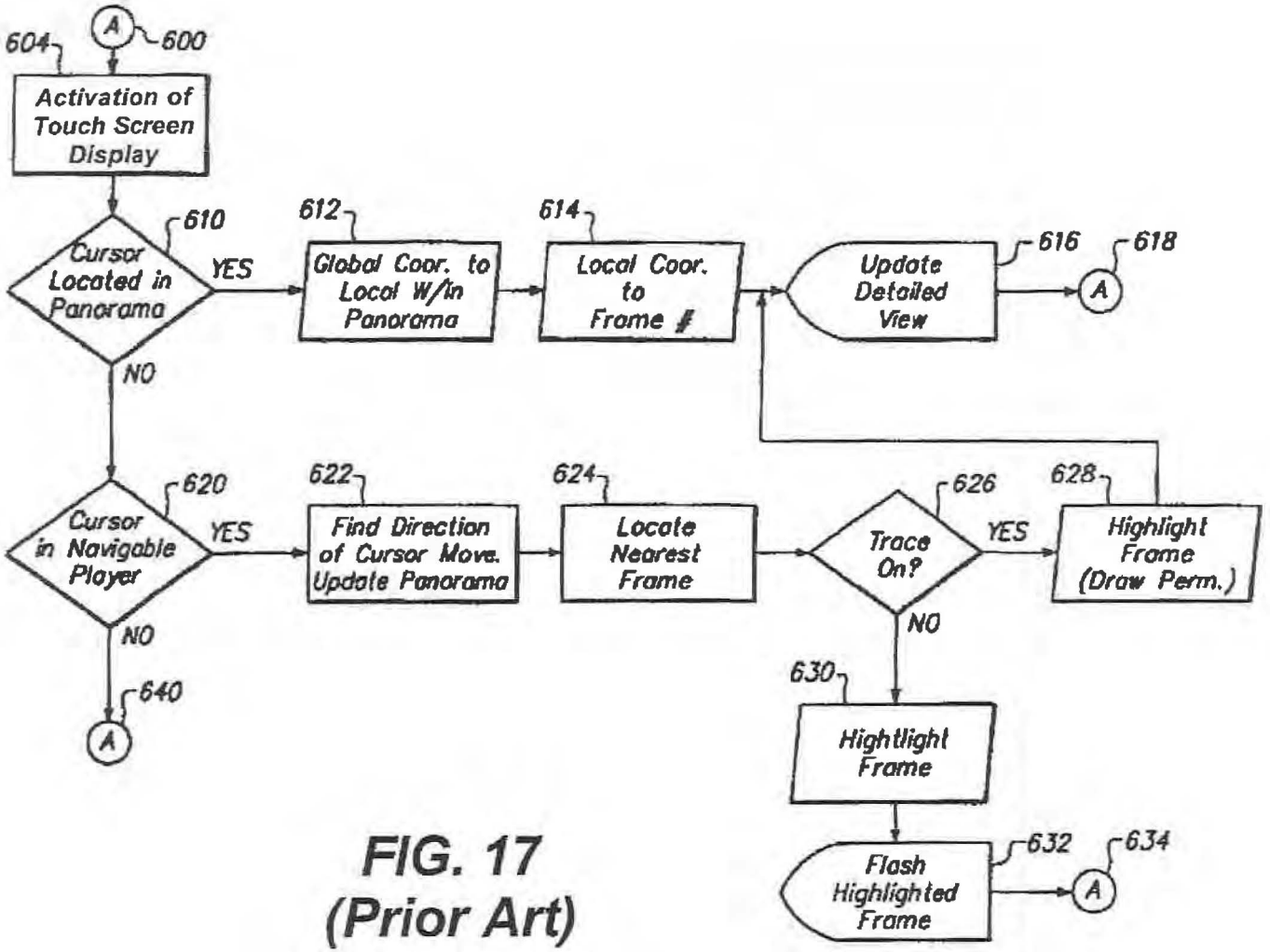


FIG. 17
(Prior Art)

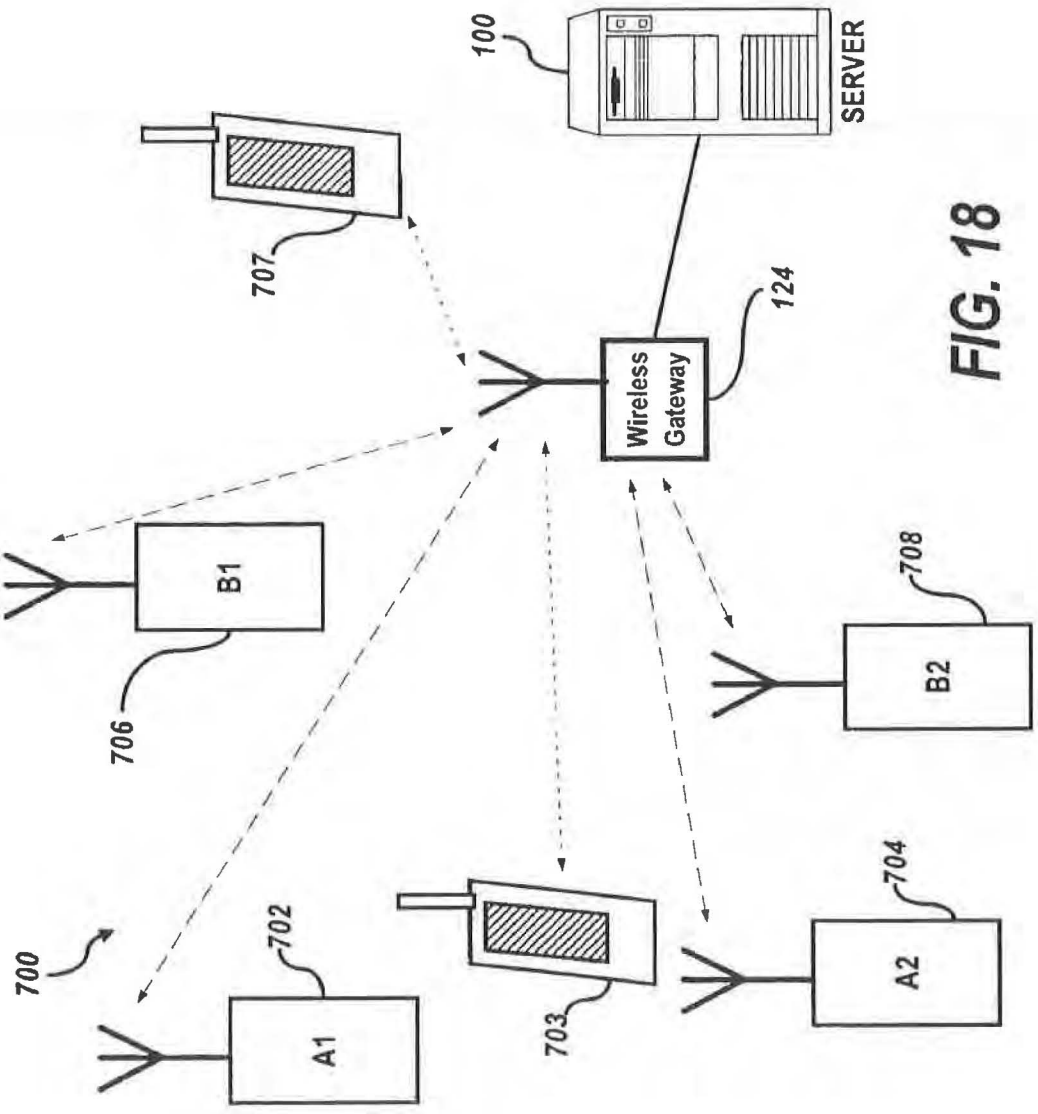

100
SERVER
707
124
Wireless Gateway
B1
706
B2
708
700
A1
702
703
A2
704

FIG. 18

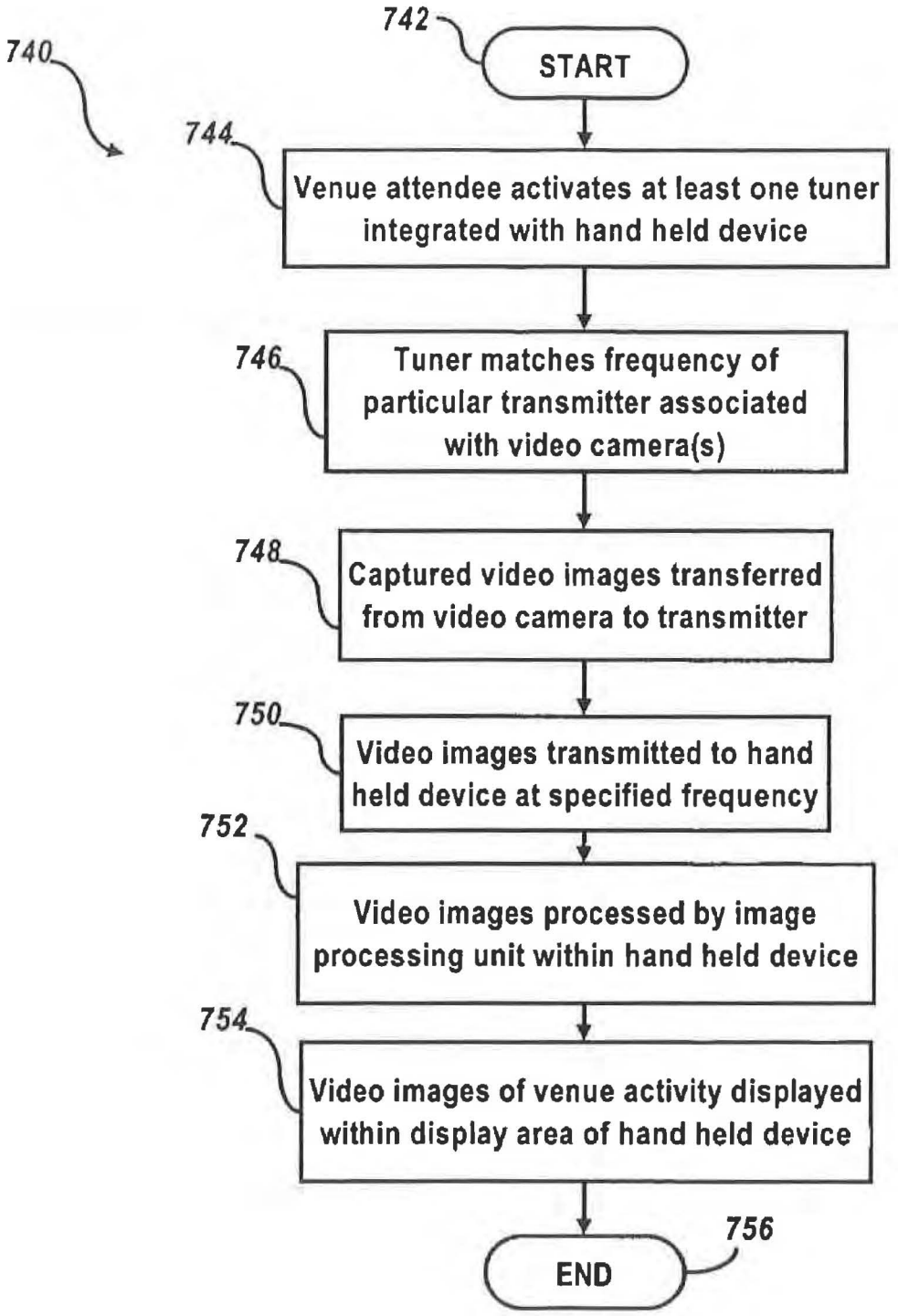

740
742
START
744
Venue attendee activates at least one tuner integrated with hand held device
746
Tuner matches frequency of particular transmitter associated with video camera(s)
748
Captured video images transferred from video camera to transmitter
750
Video images transmitted to hand held device at specified frequency
752
Video images processed by image processing unit within hand held device
754
Video images of venue activity displayed within display area of hand held device
756
END

FIG. 19

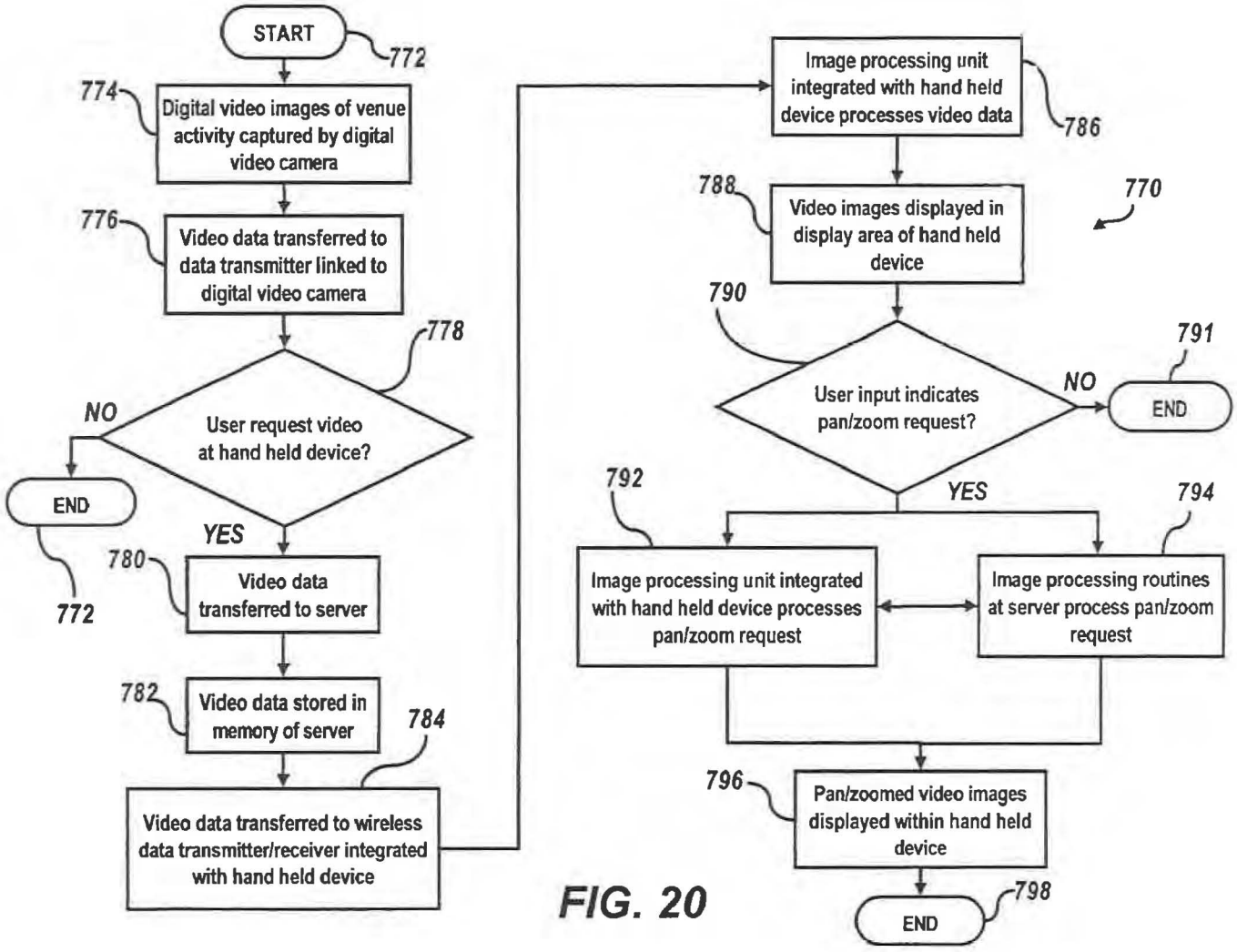

START
772
774
Digital video images of venue activity captured by digital video camera
776
Video data transferred to data transmitter linked to digital video camera
778
User request video at hand held device?
NO
END
772
YES
780
Video data transferred to server
782
Video data stored in memory of server
784
Video data transferred to wireless data transmitter/receiver integrated with hand held device
Image processing unit integrated with hand held device processes video data
786
770
788
Video images displayed in display area of hand held device
790
User input indicates pan/zoom request?
NO
791
END
YES
792
Image processing unit integrated with hand held device processes pan/zoom request
794
Image processing routines at server process pan/zoom request
796
Pan/zoomed video images displayed within hand held device
END
798

FIG. 20

PROVIDING MULTIPLE PERSPECTIVES OF A VENUE ACTIVITY TO ELECTRONIC WIRELESS HAND HELD DEVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application Ser. No. 60/243,561, filed Oct 26, 2000 by Luis M. Ortiz and Kermit D Lopez, for "Providing Multiple Perspectives for a Venue Activity through an Electronic Hand Held Device."

BACKGROUND OF THE INVENTION

1 Technical Field of the Invention

The present invention is related to wireless electronic hand held devices, such as Personal Digital Assistants (PDAs), hand held televisions, and data-enabled wireless telephones. The present invention also relates to techniques for remotely delivering video-related data to hand held devices. In addition, the present invention relates to techniques for providing increased viewing opportunities for audiences in venue environments, such as stadiums and concert arenas. Additionally, the present invention relates to wireless video data transmission to hand held devices.

2. Description of the Related Art

Most modern stadiums and live entertainment facilities or arenas (herein also collectively referred to as "venues"), which feature sporting events and concerts, typically employ large television screens that receive video images and are linked within the stadium to a plurality of television cameras positioned to capture video images at diverse locations within the stadium. The audience at a typical sporting event, for example, can generally view advertisements, instant replays, and other sports related data on the large television screens within the sports stadium itself. Feeds are additionally generally provided from the cameras to announcers in a broadcast booth, replaying certain plays from the event so that announcers can make comments about plays, and finally transmitting a telecast to the viewing audience, including some aspects of captured video and data to the stadium audience.

Despite the availability of such large screen television monitors, venue event audience members still lack enhanced viewing options or perspectives within the venue itself. To compensate for the lack of viewing options, sports and concert promoters often rent binoculars to audience members prior to or during the event. Such binoculars can permit the typical audience member to obtain a somewhat better, but limited, view of the event, such as a football or hockey game, but even these views are often obstructed by other audience members and are tied to only one perspective.

The large television screens placed in a venue such as a stadium are typically linked to cameras that are fixed or mobile. Placement of cameras about the stadium is generally tied to an enterprise system. The movement of the game ball in a football game, for example, along with the players on the field is dynamic and unpredictable, and may not always be caught by the active camera having the best perspective. Thus, during a game, the large television screens typically provide only one view, which can be further obstructed by other players or officials, often destroying a critical angular view.

In addition, such large screens are often utilized to bombard audience members with information, such as advertisements, thereby cutting into venue activity video that venue audience members might otherwise wish to view such as instant replays, a current play or other event data. The audience members, therefore, essentially view the large screen at the behest of the camera operator or director and cannot select their own views or camera angles

Based on the foregoing, the present inventors have found that such limitations in venue environments can be solved through the use of hand held devices, such as PDAs, hand held televisions, data/video-enabled cellular telephones, and other hand held wireless video-enabled devices For example, the recent shift in the consumer electronics industry from an emphasis on analog technology to a preference for digital technology is largely based on the fact that the former generally limits the user to a role of a passive recipient of information, while the latter is interactive and allows the user to control what, when, and how he or she receives and manipulates certain information. This shift in focus has resulted in the development and increasingly widespread use of a digital device generically referred to as a "personal digital assistant" (PDA).

Hand held computing devices (i e., hereinafter referred to as "hand held devices" or "handheld devices") are becoming increasingly popular for storing and maintaining information. Although PDAs may be connected to a desktop personal computer or other PDAs via infrared, direct wire, or wireless communication links, PDAs and similar hand held devices, can be linked to remote networks, such as the Internet, or local wireless resources, such as RF broadcasts, through available wireless communications techniques

The most advanced data- and video-enabled wireless communication devices currently available in the marketplace take the form of a PDA (e.g., Palm Pilot™, Handspring Visor™, and Windows CE compatible hand held computers, such as the iPAQ™). Unlike personal computers, which are general-purpose devices geared toward refining and processing information, PDAs are designed to capture, store and display information originating from various sources. Additionally, while a certain level of skill is required to use a personal computer effectively, PDAs are designed with the novice and non-computer user in mind.

Attempts have been made to provide venue-based, interactive entertainment to enhance the fan experience at live events. Such attempts utilize touch-screen technology integrated directly into seats at outdoor or indoor arenas. Audience members, however, due to their integration with the viewer seat, can easily damage such devices. Systems that incorporate such devices are also expensive because they literally require miles of cable.

Some recently constructed arenas, for example, that implement such seat-integrated technology are requiring hundreds of miles of electronic cabling, including audiovisual, broadcast, and multiband lines. Such a plethora of large cables are expensive and require extra space, which often cannot be found in older stadiums, or would require a greater expense to integrate into newly built stadiums. The cost of retrofitting an older stadium with such technology can be staggering. Additionally, many fans that attend games or concerts with such technology integrated directly into the seats may find such a feature distracting.

Another problem faced by venue promoters and arena owners who integrate fixed technology directly into the seat is that such technology can quickly become obsolete. If a new facility is fitted with such electronic/hardware intensive technology, the technology may become quickly outdated, requiring an expensive update and/or retrofit.

The present inventors thus realize that a solution to these problems lies in the use of wireless hand held devices. By utilizing modern technology integrated with hand held devices, on-demand live action, multiple camera angles,

instant replays, and real-time team and venue information may each be readily provided to fans without the expense and problems associated with present in-seat integrated technical environments. Additionally, it is anticipated that the deployment of venue-based systems facilitating the use of such devices would be relatively inexpensive, at least in comparison to seat-integrated systems. Finally, such systems will provide the venue attendee with increased mobility and freedom of use within and throughout the venue environment.

SUMMARY OF THE INVENTION

One aspect of the present invention provides improved methods and systems for delivering venue-related data to a hand held device.

It is another aspect of the present invention to provide improved methods and systems for delivering real time video provided at an entertainment venue to a hand held device.

It is still another aspect of the present invention to provide methods and systems for providing multiple perspectives from a venue activity for viewing through a hand held device.

It is yet another aspect of the present invention to provide hand held devices and associated methods that provide on-demand video action and instant replays from multiple camera angles focused on an entertainment venue activity.

It is still another aspect of the present invention to provide hand held devices and associated methods that provide on-demand video action and instant replays from one or more cameras focused on a venue activity.

The above and other aspects of the invention are achieved as will now be further described.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of this invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objects, and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

FIG. **1** depicts a block diagram illustrating components of a hand held device in which preferred embodiments of the present invention may be implemented;

FIG. **2** illustrates a pictorial representation of a hand held device, which may be utilized to implement preferred embodiments of the present invention;

FIG. **3** depicts a pictorial representation of a hand held device adapted for receiving a module in accordance with preferred embodiments of the present invention;

FIG. **4** illustrates a system for providing multiple perspectives through a hand held device of activities at a venue in accordance with preferred embodiments of the present invention;

FIG. **5** depicts a system that provides multiple perspectives of a venue activity through a hand held device adapted to receive and process real time video data in accordance with preferred embodiments of the present invention;

FIG. **6** depicts a system for providing multiple perspectives of activity at a venue through a hand held device adapted to receive and process real time video data in accordance with preferred embodiments of the present invention;

FIG. **7** depicts a system for providing multiple perspectives for activity at a venue at a first time/perspective and a second time/perspective in accordance with preferred embodiments of the present invention;

FIG. **8** illustrates a system for providing multiple perspectives through a hand held device of an activity at a venue including the use of a wireless gateway in accordance with a preferred embodiment of the present invention;

FIG. **9** depicts a system for providing multiple perspectives through a hand held device of a venue activity, in association with a wireless network in accordance with preferred embodiments of the present invention;

FIG. **10** illustrates a diagram depicting network attributes of a wireless network that may be utilized in accordance with preferred embodiments of the present invention;

FIG. **11** depicts a prior art overview display and a detail window;

FIG. **12** illustrates a prior art spherical image space divided into a series of w rows and q columns, with the rows and columns representing individual frames as photographed from a video camera;

FIG. **13** depicts the two-dimensional representation of the spherical image space of FIG. **12** into rows and columns of image frames;

FIG. **14** illustrates a prior art overview display, a detail window and a corresponding area indicia (geometric figure outline);

FIG. **15** depicts a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview image display for subsequent playback, which may be utilized in accordance with embodiments of the present invention;

FIG. **16** is a prior art flowchart providing a logical process for building an overview image, which may be utilized in accordance with embodiments of the present invention;

FIG. **17** illustrates a prior art flowchart illustrative of a logical process for playback interaction, which may be utilized in accordance with embodiments of the present invention;

FIG. **18** depicts a pictorial representation illustrative of a Venue Positioning System (VPS) in accordance with preferred embodiments of the present invention;

FIG. **19** depicts a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device in accordance with preferred embodiments of the present invention; and

FIG. **20** illustrates a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras in accordance with preferred embodiments of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

FIG. **1** depicts a schematic diagram illustrating a general hardware configuration of a hand held device **11** in accordance with an embodiment of the present invention. Those skilled in the art can appreciate, however, that other hardware configurations with less or more hardware and/or modules may be utilized in carrying out the methods and systems (e.g., hand held device **11**) of the present invention as further described herein. CPU **10** of hand held device **11** performs as a main controller operating under the control of operating clocks supplied from a clock oscillator. CPU **10** may be configured, for example, as a 16-bit microprocessor. External pins of CPU **10** are generally coupled to an internal bus **26** so that it may be interconnected to respective components.

A SRAM **24** can be configured as a writeable memory that does not require a refresh operation and can be generally utilized as a working area of CPU **10**. SRAM (Static RAM) is

generally a form of semiconductor memory (RAM) based on a logic circuit known as a flip-flop, which retains information as long as there is enough power to run the device. Font ROM **22** can be configured as a read only memory for storing character images (e.g., font) displayable on a display **18**. Examples of types of displays that may be utilized in accordance with display **18** include a TFT active matrix display, an illuminated LCD (Liquid Crystal Display), or other small-scale displays being developed.

CPU **10** of the present embodiment drives display **18** utilizing, among other media, font images from Font ROM **22**, and images transmitted as data through wireless unit **17** and processed by image-processing module **35**. A EPROM **20** may be configured as a read only memory that is generally erasable under certain conditions and can be utilized for permanently storing control codes for operating respective hardware components and security data, such as a serial number.

An IR controller **14** can generally be configured as a dedicated controller for processing infrared codes transmitted/received by an IR transceiver **16** and for capturing the same as computer data. Wireless unit **17** can generally be configured as a dedicated controller and transceiver for processing wireless data transmitted from and to a wireless communications network. Note that wireless unit **17** can be implemented as a separate module or cartridge, such as illustrated in FIG. **3**. Wireless unit **17** can thus comprise a wireless module.

Port **12** can be connected to CPU **10** and can be temporarily attached, for example, to a docking station to transmit information to and from hand held device **11** to other devices such as personal computers, retail cash registers, electronic kiosk devices, and so forth. Port **12** can also be configured, for example, to link with a modem, cradle or docking station, which are well known in the art, that permit network devices, a personal computer or other computing devices to communicate with hand held device **11**.

User controls **32** permit a user to enter data to hand held device **11** and initiate particular processing operations via CPU **10**. A user interface **33** may be linked to user controls **32** to permit a user to access and manipulate hand held device **11** for a particular purpose, such as, for example, viewing images on display **18**. Those skilled in the art will appreciate that user interface **33** may be implemented as a touch screen user interface, as indicated by the dashed lines linking display **18** with user interface **33**. In addition, CPU **10** may cause a sound generator **28** to generate sounds of predetermined frequencies from a speaker **30**. Speaker **30** may be utilized to produce music and other audio information associated with video data transmitted to hand held device **11** form an outside source.

Those skilled in the art can appreciate that additional electronic circuits or the like other than, or in addition to, those illustrated in FIG. **1** may be used to construct hand held device **11**. Such components, however, are not described in the present specification, because many aspects of them are well known in the art. For example, hand held televisions are available for receiving public television broadcasts, but the basic technology can be modified on such devices so that they may be adapted to (e.g., proper authentication, filters, security codes, or the like) receive venue-based RF transmissions from at least one venue-based RF source (e.g., a wireless camera, or data from a camera transmitted wirelessly through at least one transmitter). Those skilled in the art can thus appreciate that because of the brevity of the drawings described herein, only a portion of the connections between the illustrated hardware blocks is generally depicted. In addition, those skilled in the art will appreciate that hand held device **11** can be implemented as a specific type of a hand held device, such as a Personal Digital Assistant (PDA), paging device, WAP-enabled mobile phone, and other associated hand held computing devices well known in the art.

Given the teaching of various embodiments of the present invention, it should be appreciated that a hand held device **11** can be configured to permit images, similar to television broadcast images, to be displayed on display **18** for a user to view. Hand held device **35** thus includes an image-processing unit **35** for processing images transmitted as data to hand held device **11** through wireless unit **17**. A tuner unit **34**, implemented as either a single tuner or a plurality of tuners, may be linked through internal bus **26** to CPU **10**. Additionally, a security unit **36** may be utilized to process proper security codes to thereby ensure that data transferred to and from hand held device **11** may be secure and/or permitted. Broadcast security prevents general receipt of venue images without proprietary hardware and/or signals.

Security unit **36** may be implemented as an optional feature of hand held device **11**. Security unit **36** can also be configured with software, e.g., algorithm routines or subroutines, that are processed by CPU **10**, and which prevent wireless data from being transmitted/received from hand held device **11** beyond a particular frequency range, outside of a particular geographical area associated with a local wireless network, or absent authorization codes (e.g., decryption, encryption, coding, decoding, and so forth). Note that security unit **36** can be implemented as a separate security module, such as, for example, a smart card, or cartridge. An example of a module, which may be implemented in accordance with the methods and systems of the present invention, is illustrated in FIG. **3**. A security module of this type may be utilized for securing data transmitted from or to a hand held device such as, for example, hand held device **11**.

Hand held device **11** can thus be configured with both wireless and wireline capabilities, depending on the needs and requirements of a manufacturer or customer. Such wireless capabilities include features such as those found in cellular telephone units, in accordance with carrying out embodiments of the present invention. Current examples of hand held devices that can be utilized in accordance with the methods and systems of the present invention include the "PalmPilot™" PDA, manufactured and sold by Palm Computing, the Handspring Visor™, Window CE™ compatible devices, RIM™ Blackberry-family paging devices, Motorola paging devices, hand held portable televisions, and the Symbol™ SPT-family of PDA-type organizer devices. Such hand held devices are mentioned herein for illustrative purposes only and are not considered limiting features of the present invention. Hand held devices which may also be implemented in accordance with the methods and systems of the present invention include hand held devices, such as cellular telephones having viewable display screens for the display of data transmitted through wireless networks. Customized, venue-specific devices (i.e., proprietary, limited use) may be also developed in accordance with the methods and systems of the present invention that incorporate hardware and software modules necessary to practice the methods and systems taught herein.

Those skilled in the art can appreciate that although hand held device **11** is generally illustrated in FIG. **1**, hand held device **11** can be implemented as a wireless application protocol (WAP) web-enabled cellular hand held device, such as a PDA, wireless telephone, or pager or a combination thereof. Hand held device **11** can also be configured with features of combination cellular telephone/PDA devices. One recent example of such a device is the Handspring™ PDA and associated cellular phone attachment module, which is manufactured and sold by Handspring™ Inc. Other such devices

include the Palm-Motorola phone, which permits users to access e-mail and store calendars and contact databases. Hand held devices may also be provided in the form of a multi-RF (Radio Frequency) receiver-enabled hand held television-viewing device, such as those manufactured by Sony™ and Casio™. Regardless of the type of hand held device implemented, it is anticipated that such hand held devices will be adapted to receive and process data via image-processing unit **35** for ultimate display as moving images on display unit **18**, in accordance with the present invention. Image-processing unit **35** may include image-processing routines, subroutines, software modules, and so forth, to perform image-processing operations.

FIG. **2** illustrates a pictorial representation of a hand held device **40** that may be utilized to implement preferred embodiments of the present invention. Hand held device **40** includes a display screen **42**, which is generally analogous to display **18** of FIG. **1**. Television images broadcast via radio frequency or digital data may be displayed on display screen **42** for a user to view. User controls **44** can permit a user to select and/or manipulate images or text displayed on display screen **42**. User controls **44** of FIG. **2** are generally analogous to user controls **32** of FIG. **1**. A touch screen user interface may be further configured on the display screen **42** with hand held device **40** to permit a user to manipulate images/text displayed on display screen **42**.

FIG. **3** depicts a pictorial representation of a hand held device **56** adapted for receiving a module **50**, in accordance with preferred embodiments of the present invention. Although hand held device **56** of FIG. **3** is generally analogous to hand held device **40** of FIG. **2**, the difference being that hand held device **56** may be adapted to receive a module/cartridge that permits hand held device **56** to function according to specific hardware, codes and/or instructions contained in a memory location (e.g., a computer chip or magnetic strip) within module **50**. Module **50** can be configured as a smart card, well known in the art. Such a smart card may provide, for example, access codes (e.g., decryption) to enable hand held device **56** to receive venue broadcasts. Note that as utilized herein, the term "module" may refer to a physical module, such as a cartridge. The term "module" may also refer to a software module composed of routines or subroutines that perform a particular function. Those skilled in the art can appreciate the meaning of the term module is based on the context in which the term is utilized and environment being described. Thus, module **50** as illustrated can be generally configured as a physical cartridge or smart card. The term "module" as utilized herein may also refer to a software module, depending on the context of the discussion thereof.

To illustrate the use of a physical module, such as module **50**, assume that a user may possess several such physical modules or cartridges. One module, when inserted into hand held device FIG. **3** may instruct hand held device **50** to function as a standard PDA, such as a Palm Pilot device. Another module, when inserted into hand held device FIG. **3**, may instruct hand held device **56** to function as a portable television that receives wireless television broadcasts and/or data from a local wireless broadcast network and/or venue-based (e.g., short range) broadcasts. Such a module can also incorporate decryption capabilities to receive controlled/secured broadcasts at venues.

Those skilled in the art can thus appreciate that hand held device **56** can be adapted to receive and cooperate with module **50**. Additionally, hand held device **56** includes a display screen **52** that is generally analogous to display screen **42** of FIG. **2** and display **18** of FIG. **1**. Hand held device **56** also includes user controls **54** that are generally analogous to user controls **44** of FIG. **2** and user controls **32** of FIG. **1**. Hand held device **56** of FIG. **3** is generally analogous to hand held device **11** of FIG. **1**. Thus, hand held device **56** can also implement touch screen capabilities through a touch screen user interface integrated with display screen **52**.

Assuming module **50** is implemented as a smart card instead of a cartridge to provide receiver and/or securing capabilities (e.g., encryption, decryption, coding, decoding, etc.), it is anticipated that similar features can be implemented in accordance with a smart card to insure that hand held device **56** includes touch screen user interface and video viewing capabilities. Smart cards are generally known in the art as credit card sized plastic cards with an embedded computer chip. The chip can either be a microprocessor with internal memory or a memory chip with non-programmable logic. The chip connection can be configured via direct physical contact or remotely through a contactless electromagnetic interface.

Smart cards may be generally configured as either a contact or contactless smart card, or a combination thereof. A contact smart card requires insertion into a smart card reader (e.g., contained within hand held device **56**) with a direct connection to, for example, a conductive micromodule on the surface of the card. Such a micromodule may be generally gold plated. Transmission of commands, data, and card status takes place through such physical contact points.

A contactless card requires only close proximity to a reader. Both the reader and the card may be implemented with antenna means providing a contactless link that permits the devices to communicate with one another. Contactless cards can also maintain internal chip power or an electromagnetic signal (e.g., RF tagging technology). Two additional categories of smart codes, well known in the art, which are based on contact and contactless cards are the so-called Combi cards and Hybrid cards.

A Hybrid card generally may be equipped with two chips, each with a respective contact and contactless interface. The two chips are not connected, but for many applications, this Hybrid serves the needs of consumers and card issuers. The Combi card may be generally based on a single chip and can be generally configured with both a contact and contactless interface.

Chips utilized in such smart cards are generally based on microprocessor chips or memory chips. Smart cards based on memory chips depend on the security of the card reader for their processing and can be utilized when low to medium security requirements. A microprocessor chip can add, delete and otherwise manipulate information in its memory. Microprocessor-based memory cards typically contain microprocessor chips with 8, 16, and 32 bit architectures.

FIG. **4** illustrates a system **58** for providing multiple perspectives through a hand held device **60** of activities at a venue **80**, in accordance with preferred embodiments of the present invention. For illustrative purposes only, it may be assumed that venue **80** of FIG. **4** is a stadium venue, such as a football stadium. Cameras **71**, **73**, **75**, and **77** are respectively positioned at strategic points about venue **80** to capture the best images of activity taking place within venue **80**. Cameras **71**, **73**, **75**, **77** are respectively linked to transmitters **70**, **72**, **74**, and **76**. Each of these transmitters may be configured as equipment, which feeds a radio signal to an antenna for transmission. The equipment may also provide for the securing transmission of signals and associated data. For example, such equipment can rely on the encryption of signals. These signals, if encrypted, can be decrypted by authorized hand held receivers.

The antenna may be integrated with the transmitter. Transmitters are well known in the art, and include active components, such as a driver, well known in the art. Transmitters also include passive components, such as a TX filter, also well known in the art. These components, when operating together, impress a signal onto a radio frequency carrier of the correct frequency by immediately adjusting its frequency, phase, or amplitude, thereby providing enough gain to the signal to project it to its intended target (e.g., a hand held device located within the venue).

A hand held device **60** may be held by a user at a stadium seat within view of the activity at the venue **80**. Hand held device **60** is generally analogous to hand held device **11** of FIG. **1** and hand held device **40** of FIG. **2**. Hand held device **60** of FIG. **4** may be configured as a hand held device (e.g., PDA, portable television, etc.) adapted for use with a cartridge/module, such as module **50** of hand held device **56** of FIG. **3**. The cartridge/module may contain the electronics (e.g., tuner(s), filter(s), security codes, encryption/decryption codes, etc.) to allow a hand held device to be adapted for receiving venue-based data. Hand held device **60** includes a display screen **61** (e.g. display **18** of FIG. **1**).

Additionally, display screen **61** of hand held device **60** may be configured with a touch screen user interface displayable and operable on display screen **61**. Those skilled in the art can appreciate that touch screen interfaces are well known in the PDA art and further explanation thereof should not be necessary. Display screen **61** can include a touch screen display area **65** that may be associated with camera **71**. Thus, images captured by camera **71** are transmitted from transmitter **70**, which is linked to camera **71**. Additionally, display screen **61** includes touch screen display areas **69**, **63**, and **67**, which are respectively associated with cameras **73**, **75**, and **77**.

Cameras **71**, **73**, **75**, and **77** are respectively labeled C_1, C_2, C_3, and C_N to indicated that a plurality of cameras may be utilized in accordance with system **58** to view activities taking place within venue **80**, such as a football game or concert. Although only four cameras are illustrated in FIG. **4**, those skilled in the art will appreciate that additional or fewer cameras may be also implemented in accordance with system **58**. Touch screen display areas **65**, **69**, **63**, and **67** are also respectively labeled C_1, C_2, C_3, and C_N to illustrate the association between these display areas and cameras **71**, **73**, **75**, and **77** where touch screen technology is utilized.

Hand held device **60** can be integrated with one or more plurality of tuners, as illustrated by tuners **62**, **64**, **66**, and **68**. Such tuners can be activated via user controls on hand held device **60** and/or via touch screen icons or areas displayed on display screen **61** that are associated with each tuner. Such icons/areas may be respectively displayed within display areas **65**, **69**, **63** and **67**, or within a separate display area of display screen **61** (e.g., picture-within-picture capabilities found on large television sets). A user accesses tuner **62**, for example, to retrieve real-time video images transmitted from transmitter **70** for camera **71**. Likewise, a user can access tuner **64** to retrieve real-time video images transmitted from transmitter **72** for camera **73**.

In addition, a user can access tuner **74** to retrieve real-time video images transmitted from transmitter **74** for camera **75**. Finally, user can access tuner **68** to retrieve real-time video images transmitted from transmitter **76** for camera **77**. In the example depicted in FIG. **4**, a football player **82** is participating in a football game within venue **80**. Cameras **71**, **73**, **75**, and **77** capture moving images (e.g., video data) of the football player **82** from various angles and transmit these images to hand held device **60**.

FIG. **5** depicts a system **59** that provides multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data in accordance with preferred embodiments of the present invention. Note that in FIG. **4** and FIG. **5** analogous parts are indicated by identical reference numerals. Thus, for example, cameras **71**, **73**, **75**, and **77** of FIG. **5** are analogous to cameras **71**, **73**, **75**, and **77** of FIG. **4**. Hand held device **60** of FIG. **5** is also analogous to hand held device **60** of FIG. **4** and includes similar features thereof.

Hand held device **60** of FIG. **5**, however, can be configured to receive wireless real time video data transmitted for cameras **71**, **73**, **75**, and **77** respectively through data transmitters **102**, **104**, **106**, and **108** to server **100** and thereafter to wireless data transmitter/receiver **110**. Note that wireless data transmitter/receiver **110** is analogous to wireless unit **17** of FIG. **1**. Hand held device **60** of FIG. **5** is also analogous to hand held device **11** of FIG. **1**.

Hand held device **60** of FIG. **5** can also incorporate a touch screen user interface, as described herein with respect to analogous hand held device **60** of FIG. **4**. The difference between system **58** of FIG. **4** and system **59** of FIG. **5** lies in the inclusion of digital transmitters **102**, **104**, **106**, and **108** which are respectively linked to cameras **71**, **73**, **75**, and **77** of FIG. **5**. In the illustration of FIG. **5**, cameras **71**, **73**, **75**, and **77** may be configured as high definition video cameras which capture real time images of events or activities taking place within venue **80**, such as real time video footage of football player **82**.

A captured image of football player **82**, for example, can be transferred from one or more of video cameras **71**, **73**, **75**, and **77** of FIG. **5** and transmitted through a respective digital transmitter, such as digital transmitter **102**, **104**, **106** or **108** and transmitted via wired and/or wireless communications to server **100**. The server **100** then processes the video data received from one or more of the digital transmitters and formats the video data for transmission via wireless means to wireless data transmitter/receiver **100**, which may be integrated with hand held device **100**. Transmitter/receiver **100** can communicate with the various components of hand held device **60**, such as a CPU, image-processing unit, memory units, and so forth.

Those skilled in the art can appreciate that although real time video data may be transmitted to server **100**, captured past video images may also be stored within server **100** and transferred to hand held device **60** for display at display screen **61**. For example, instant replays may be transferred as video data to hand held device **60** upon the request of a user of hand held device **60**. Such instant replay footage can be displayed on display screen **61** for the user to view.

FIG. **6** illustrates a system **79** for providing multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data from at least one wide-angle and/or panoramic video camera **114**, in accordance with preferred embodiments of the present invention. In system **79** of FIG. **6**, wide-angle/panoramic (hereinafter referred to as "panoramic") video camera **114** may be configured as a high-definition panoramic video camera that captures images of activities taking place at venue **80**. In the example illustrated in FIG. **6**, panoramic video camera **114** can capture of images of a football game and one or more football players, such as illustrated football player **82**.

A data transmitter **112** may be linked to panoramic video camera **114**. Video data captured by panoramic video camera **114** may be transferred to data transmitter **112**, which thereafter transmits the video data to server **100** via a direct link or wireless link, depending on the needs or requirements of the

promoters or venue owners. Note that this is also true of the system described in FIG. **6**. Server **100** of FIG. **6** is analogous to server **100** of FIG. **5**. Thus. in the case of FIG. **5**, video data may be transmitted from one or more of data transmitters **102**, **104**, **106**, and **108** via a direct wire/cable link or through wireless transmission means, such as through a wireless network.

Those skilled in the art will appreciate, of course, that hand held device **60** of FIG. **6** is analogous to hand held devices depicted in FIGS. **1-5** herein. In FIGS. **4**, **5**, and **6**, like or analogous parts are identified by identical reference numerals. Thus, images captured by panoramic video camera **114** of activity taking place at venue **80** may be displayed as real time video images or instant replay data on display screen **61** of hand held device **60**.

FIG. **7** depicts a system **89** for providing multiple perspectives for activity at a venue **120** at a first time and/or perspective (Time **1**) and a second time and/or perspective (Time **2**), in accordance with preferred embodiments of the present invention. In FIGS. **4**, **5**, **6**, and **7**, like or analogous parts are indicated by identical reference numerals. Thus, in system **89** of FIG. **7**, an event, in this case illustrated as a hockey game, is taking place within venue **120**. Venue **120** may be, for example, a hockey arena. Panoramic video camera **114** may be linked to data transmitter **112**.

As explained previously, data transmitter **112** may be linked to server **100** via a direct link, such as a transmission cable or line, or through wireless communication means, such as through a wireless network. Server **100** can also communicate with hand held device **60** through a wireless network or other wireless communication means by transmitting data through such a network or wireless communications means to wireless data transmitter/receiver **110**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**.

Thus, a video image **124** of a hockey player **122** can be captured as video data by panoramic video camera **114**, along with a video image **126** of a hockey player **123** and displayed within display screen **61** of hand held device **60** as indicated at Time **1**. Video image **124** and **126** can be displayed within a grid-like interface on display screen **61**. Note that in the illustration of FIG. **7**, display screen **61** may be divided into four sections.

When a user touches, for example the area or section of display screen **61** in which video image **124** may be displayed, the entire display area of display screen **61** can then be consumed with a close-up video shot of video image **124**, as indicated at Time **2**, thereby providing the user with a closer view of hockey player **122**. Those skilled in the art can appreciate that the touch screen display area of display screen **61** can be arranged with graphical icons and/or user-controls that perform specific pan and zoom functions. Such icons/user-controls, when activated by a user, permit the user to retrieve panned/zoomed images of events taking place in real time within venue **120**.

Note that although only one panoramic video camera **114** and one data transmitter **112** are illustrated in FIG. **7**, a plurality of panoramic video cameras, servers, and data transmitters may be implemented in accordance with the present invention to capture the best video images, image-processing, and signal capacity to users, whether real time or otherwise, of events taking place at venue **120**.

FIG. **8** illustrates a system **92** for providing multiple perspectives through hand held device **60** of an activity at a venue **130**, including the use of a wireless gateway **124**, in accordance with a preferred embodiment of the present invention. Those skilled in the art can appreciate that wireless gateway **124** may be configured as an access point for a wireless LAN (Local Area Network). Access points for wireless LAN networks and associated wired and wireless hardware (e.g., servers, routers, gateways, etc.) are well known in the art and may be utilized in accordance with the present invention described herein. Again, note that in FIGS. **4**, **5**, **6**, **7**, and **8**, like or analogous parts are indicated by identical reference numerals. System **92** of FIG. **8** is analogous to system **89** of FIG. **7**, the difference being in the nature of the venue activity. Venue **130** can be, for example, a concert hall or stadium configured with a sound stage.

Gateway **124** can be configured as a communications gateway through which data may enter or exit a communications network, such as wireless network **152** illustrated in FIG. **9** for a large capacity of user hand device **60** users. Wireless network **152** may be configured as a wireless LAN network. Hand held device **60** can be configured to communicate and receive transmissions from such a wireless LAN network based on device identification (e.g., device address). Communication with hand held devices, such as hand held device **60**, however, may also be. achieved through RF (Radio Frequency) broadcasts, thereby not requiring two-way communication and authentication between, for example, a wireless LAN network and such hand held devices. A broadcast under such a scenario may also require that such a hand held device or hand held devices possess decryption capabilities or the like in order to be authorized to receive transmissions from the venue.

The remaining elements of FIG. **8** are also analogous to the elements depicted in the previous drawings, with the addition of wireless gateway **124**, which may be linked to server **100** and may be in communication with several wireless data transmitters/receivers **110** and one or more electronic hand held devices, including hand held device **60**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**. One or more panoramic video cameras, such as panoramic video camera **114**, can be positioned at a venue **130** at locations that capture images not only of the events taking place on a concert stage, but also events taking place within the stadium itself.

If an audience member **140**, for example, happens to be walking along a stadium aisle within view of panoramic video camera **114**, the audience member's video image can be displayed as video image **144** within display screen **61** of hand held device **60**, as indicated at Time **1**. Likewise, panoramic video camera **114** captures images of band member **138** whose video image can be displayed as video image **142** within a display area of display screen **61**, as indicated at Time **1**.

Thus, a user of hand held device **60** can view not only the events taking place on a central performing platform of venue **130**, but also other events within the arena itself. The band member **138** may be located on a central performing platform (not shown) of venue **130** when panoramic video camera **114** captures real-time video images of band member **138**. The user may also, for example, wish to see a close-up of audience member **140**. By activating user controls and/or a touch screen interface integrated with display screen **61**, the user can, for example, pan or zoom to view a close-up video shot of audience member **140**, as indicated at Time **2**.

Captured video images are transferred from panoramic video camera **114** as video data through transmitter **112** to server **100** and through wireless gateway **124** to wireless data transmitter/receiver **110**. Although a single server **100** is illustrated in FIG. **8**, those skilled in the art can appreciate that a plurality of servers and/or wireless gateways can be implemented in accordance with the methods and systems of the

present invention to process and deliver captured and transmitted video data. Based on the foregoing, those skilled in the art can appreciate that video data may be simultaneously transferred from server **100** or a plurality or servers to literally thousands of hand held devices located within the range of the wireless network and/or wireless gateways associated with venue **130**.

FIG. **9** illustrates a system **150** for providing multiple perspectives through hand held device **60** of an activity at a venue **130** in association with a wireless network **152**, in accordance with preferred embodiments of the present invention. System **150** of FIG. **9** is analogous to system **92** of FIG. **8**, the difference noted in the inclusion of wireless network **152**. Thus, in FIG. **8** and FIG. **9**, like or analogous parts are indicated by identical reference numerals. Video data captured by a camera or cameras, such as panoramic video camera **114**, may be transferred to data transmitter **112**, which transmits the video data to wireless network **152**. Wireless network **152** then retransmits the data, at the request of authorized users of hand held devices, such as hand held device **60**, to wireless data transmitters/receivers, such as transmitter/receiver **110** integrated with hand held device **60**.

Those skilled in the art can appreciate that wireless network **152** may also receive and retransmit other data, in addition to video data. For example, a server or other computer system may be integrated with wireless network **152** to provide team and venue data, which can then be transferred to wireless data transmitter receiver **110** from wireless network **152** and displayed thereafter as team and venue information within display screen **61** of hand held device **60**. Other data that may be transferred to hand held device for display include real-time and historical statistics, purchasing, merchandise and concession information, and additional product or service advertisements.

Such data can include box scores, player information and matchups, animated playbooks, shot/hit/pitch charts, historical information, and offense-defense statistics. In a concert venue, for example, as opposed to a sporting event, information pertaining to a particular musical group can be also transferred to the hand held device, along with advertising or sponsor information. Note that both the video data and other data described above generally comprise types of venue-based data. Venue-based data, as referred to herein, may include data and information, such as video, audio, advertisements, promotional information, propaganda, historical information, statistics, event scheduling, and so forth, associated with a particular venue and/or its advertisers/sponsors generally not retrievable through public networks.

Such information can be transmitted together with video data received from data transmitter **112**. Such information may be displayed as streaming data within display area **61** of hand held device **60** or simply stored in a database within hand held device **60** for later retrieval by the user.

One example of a wireless network that may be utilized to implement wireless network **152** can be Bluetooth, which is described in greater detail herein, and was conceived originally to make up for the shortcomings of infrared technologies (IR). Because IR cannot be utilized to penetrate walls, carry data heavy signals, or operate within devices that are not in line of sight, Bluetooth, which is becoming well known the art, can be configured as or with wireless network **152**.

FIG. **10** illustrates an entity diagram **170** depicting network attributes of wireless network **152** that may be utilized in accordance with preferred embodiments of the present invention. A wireless network **152** as illustrated in FIG. **10** can be configured as a variety of possible wireless networks. Thus, entity diagram **170** illustrates attributes of wireless network **152**, which may or may not be exclusive of one another.

Those skilled in the art can appreciate that a variety of possible wireless communications and networking configurations may be utilized to implement wireless network **152**. Wireless network **152** may be, for example, implemented according to a variety of wireless protocols, including cellular, Bluetooth, and 802.11 RF or direct IR communications. Wireless network **152** can be implemented as a single network type or a network based on a combination of network types (e.g., Bluetooth, CDMA, etc).

Wireless network **152** may be configured with teachings/aspects of CDPD (Cellular Digital Packet Data) networks well known in the networking arts. CDPD network **154** is illustrated in FIG. **10**. CDPD may be configured as a TCP/IP based technology that supports Point-to-Point (PPP) or Serial Line Internet Protocol (SLIP) wireless connections to mobile devices, such as the hand held devices described and illustrated herein. Mobility and/or cellular service are generally available throughout the world from major service providers. Data can be transferred utilizing CDPD protocols.

Current restrictions of CDPD are not meant to limit the range or implementation of the method and system described herein, but are described herein for illustrative purposes only. It is anticipated that CDPD will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may preferably be also configured with teachings/aspects of a Personal Area Network **156** or Bluetooth, as described herein. Bluetooth was adopted by a consortium of wireless equipment manufacturers referred to at the Bluetooth Special Interest Group (BSIG), and has emerged as a global standard for low cost wireless data and voice communication. Current specifications for this standard call for a 2.4 GHz ISM frequency band. Bluetooth technology is generally based on a short-range radio transmitter/receiver built into small application specific circuits (ASICS, DSPs) and embedded into support devices, such as the hand held devices described and illustrated herein.

The Bluetooth standard permits up to 100 mw of power, which can increase the range to 100 M. In addition, Bluetooth can support several data channels. Utilizing short data packets and frequency hopping of up to 1600 hops per second, Bluetooth is a wireless technology that can be utilized to enable the implementation of the methods and systems described herein. Current restrictions of Bluetooth are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated Bluetooth will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of GSM network **158**. GSM (Global System for Mobile Communication) and PCS (Personal Communications Systems) networks, both well known in the telecommunications arts, generally operate in the 800 MHz, 900 MHz, and 1900 MHz range. PCS initiates narrowband digital communications in the 900 MHz range for paging, and broadband digital communications in the 1900 MHz band for cellular telephone service. In the United States, PCS 1900 is generally equivalent to GSM 1900. GSM operates in the 900 MHz, 1800-1900 MHz frequency bands, while GSM 1800 is widely utilized throughout Europe and many other parts of the world.

In the United States, GSM 1900 is generally equivalent to PCS 1900, thereby enabling the compatibility of these two types of networks. Current restrictions of GSM and PCS are

not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GSM and PCS will be continually developed, and that aspects of such new developments can be implemented in accordance with the present invention

Wireless network **152** may also utilize teachings/aspects of GPRS network **160**. GPRS technology, well-known in the telecommunications arts, bridges the gap between current wireless technologies and the so-called "next generation" of wireless technologies referred to frequently as the third-generation or 3G wireless technologies. GPRS is generally implemented as a packet-data transmission network that can provide data transfer rates up to 115 Kbps. GPRS can be implemented with CDMA and TDMA technology and supports X.25 and IP communications protocols, all well known in the telecommunications arts. GPRS also enables features, such as Voice over IP (VoIP) and multimedia services. Current restrictions of GPRS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GPRS will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be implemented utilizing teaching/aspects of a CDMA network **162** or CDMA networks. CDMA (Code Division Multiple Access) is a protocol standard based on IS-95 CDMA, also referred to frequently in the telecommunications arts as CDMA-1. IS-95 CDMA is generally configured as a digital wireless network that defines how a single channel can be segmented into multiple channels utilizing a pseudo-random signal (or code) to identify information associated with each user. Because CDMA networks spread each call over more than 4.4 trillion channels across the entire frequency band, it is much more immune to interference than most other wireless networks and generally can support more users per channel.

Currently, CDMA can support data at speeds up to 14.4 Kbps. Wireless network **152** may also be configured with a form of CDMA technology known as wideband CDMA (W-CDMA). Wideband CDMA may be also referred to as CDMA 2000 in North America. W-CDMA can be utilized to increase transfer rates utilizing multiple 1.25 MHz cellular channels. Current restrictions of CDMA and W-CDMA are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that CDMA and W-CDMA will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may be also implemented utilizing teachings/aspects of paging network **164**. Such paging networks, well known in the telecommunications arts, can be implemented in accordance with the present invention to enable transmission or receipt of data over the TME/X protocol, also well known in the telecommunications arts. Such a protocol enables notification in messaging and two-way data coverage utilizing satellite technology and a network of base stations geographically located throughout a particular geographical region. Paging network **162** can be configured to process enhanced 2-way messaging applications.

Unified messaging solutions can be utilized in accordance with wireless network **152** to permit carriers and Internet service providers to manage customer e-mail, voice messages and fax images and can facilitate delivery of these communications to PDAs, telephony devices, pagers, personal computers and other capable information retrieval devices, wired or wireless.

Current restrictions of such paging networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that such paging networks, including those based on the TME/X protocol, will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of TDMA networks **166**. TDMA (Time Division Multiple Access) is a telecommunications network utilized to separate multiple conversation transmissions over a finite frequency allocation of through-the-air bandwidth. TDMA can be utilized in accordance with the present invention to allocate a discrete amount of frequency bandwidth to each user in a TDMA network to permit many simultaneous conversations or transmission of data. Each user may be assigned a specific timeslot for transmission. A digital cellular communications system that utilizes TDMA typically assigns 10 timeslots for each frequency channel.

A hand held device operating in association with a TDMA network sends bursts or packets of information during each timeslot. Such packets of information are then reassembled by the receiving equipment into the original voice or data/information components. Current restrictions of such TDMA networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that TDMA networks will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of Wireless Intelligent Networks (WINs) **168**. WINs are generally known as the architecture of the wireless switched network that allows carriers to provide enhanced and customized services for mobile telephones. Intelligent wireless networks generally include the use of mobile switching centers (MSCs) having access to network servers and databases such as Home Location Registers (HLRs) and Visiting Location Registers (VLRs), for providing applications and data to networks, service providers and service subscribers (wireless device users).

Local number portability allows wireless subscribers to make and receive calls anywhere—regardless of their local calling area. Roaming subscribers are also able to receive more services, such as call waiting, three-way calling and call forwarding. A HLR is generally a database that contains semipermanent mobile subscriber (wireless device user) information for wireless carriers' entire subscriber base.

A useful aspect of WINs for the present invention is enabling the maintenance and use of customer profiles within an HLR/VLR-type database. Profile information may be utilized for example with season ticket holders and/or fans of traveling teams or shows. HLR subscriber information as used in WINs includes identity, service subscription information, location information (the identity of the currently serving VLR to enable routing of communications), service restrictions and supplementary services/information. HLRs handle SS7 transactions in cooperation with Mobile Switching Centers and VLR nodes, which request information from the HLR or update the information contained within the HLR. The HLR also initiates transactions with VLRs to complete incoming calls and update subscriber data. Traditional wireless network design is generally based on the utilization of a single HLR for each wireless network, but growth considerations are prompting carriers to consider multiple HLR topologies.

The VLR may also be configured as a database that contains temporary information concerning the mobile subscrib-

ers currently located in a given MSC serving area, but whose HLR may be elsewhere. When a mobile subscriber roams away from the HLR location into a remote location, SS7 messages are used to obtain information about the subscriber from the HLR and to create a temporary record for the subscriber in the VLR.

Signaling System No. 7 (referred to as SS7 or C7) is a global standard for telecommunications. In the past the SS7 standard has defined the procedures and protocol by which network elements in the public switched telephone network (PSTN) exchange information over a digital signaling network to effect wireless and wireline call setup, routing, control, services, enhanced features and secure communications. Such systems and standards may be utilized to implement wireless network **152** in support of venue customers, in accordance with the present invention.

Improved operating systems and protocols allow Graphical User Interfaces (GUIs) to provide an environment that displays user options (e.g., graphical symbols, icons or photographs) on a wireless device's screen. Extensible Markup Language ("XML") is generally a currently available standard that performs as a universal language for data, making documents more interchangeable. XML allows information to be used in a variety of formats for different devices, including PCs, PDAs and web-enabled mobile phones.

XML enables documents to be exchanged even where the documents were created and/or are generally used by different software applications. XML may effectively enable one system to translate what another systems sends. As a result of data transfer improvements, wireless device GUIs can be utilized in accordance with a hand held device and wireless network **152**, whether configured as a paging network or another network type, to render images on the hand held device that closely represent the imaging capabilities available on desktop computing devices.

Those skilled in the art can appreciate that the system and logical processes described herein relative to FIG. **11** to FIG. **17** are not limiting features of the present invention. Rather, FIG. **11** to FIG. **17** provide examples of image-processing systems and logical processes that can be utilized in accordance with the present invention. Such a system and logical processes represent one possible technique, which may be utilized in accordance with one or more embodiments of the present invention to permit a user of a hand held device to manipulate video images viewable on a display screen of the hand held device.

FIG. **11** thus illustrates a prior art overview display **200** and a detail window **210** that may be utilized with embodiments of the present invention. The overview image display **200** is a view representative of a 360° rotation around a particular point in a space. While a complete rotational view may be utilized in accordance with preferred embodiments of the present invention, one of ordinary skill in the computer arts will readily comprehend that a semi-circular pan (such as used with wide-angle cameras) or other sequence of images could be substituted for the 360 degree rotation without departing from the subject invention. The vantage point is generally where the camera was located as it panned the space. Usually the scene is captured in a spherical fashion as the camera pans around the space in a series of rows as depicted in FIG. **12**. The space is divided into w rows **220-224** and q columns **230-242** with each q representing another single frame as shown in FIG. **12**.

User control over the scene (e.g., rotation, pan, zoom) may be provided by pressing a touch screen display icon or moving a cursor displayed on a display screen of a hand held device, such as the hand held devices described herein. User control over the scene may also be provided by manipulating external user controls integrated with a hand held device (e.g., user controls **44** and **54** of FIG. **2** and FIG. **3**). Movement from a frame in the overview image display to another frame is in one of eight directions as shown in FIG. **13**. The user may interact with the video representation of the space one frame at a time. Each individual frame is an image of one of the pictures taken to capture the space as discussed above. The individual frames may be pieced together.

Interacting with a video one frame at a time results in the ability to present a detailed view of the space. The user can experience the overview image display as it unfolds a single frame at a time. In a venue application, a user may chose to view different sections of a larger area by browsing to a particular area are provided. The area chosen may be at a high resolution allowing for the user to zoom in and out of the section.

Another limitation of a simple overview viewer is that there is no random access means. The frames can only be viewed sequentially as the overview image display is unfolded. As adapted for use in accordance with the present invention, this problem has been overcome by providing tools to browse, randomly select and trace selected images associated with any overview image.

FIG. **14** illustrates a prior art overview image **300**, a detail window **310** and a corresponding area indicia, in this case a geometric figure outline **320**. The detail window **310** corresponds to an enlarged image associated with the area bounded by the geometric figure outline **320** in the overview image **300**. As the cursor is moved, the location within the overview image **300** may be highlighted utilizing the geometric figure outline **320** to clearly convey what location the detail window **310** corresponds to.

One of ordinary skill in the computer arts will readily comprehend that reverse videoing the area instead of enclosing it with a geometric figure would work equally well. Differentiating the area with color could also be used without departing from the invention. A user can select any position within the overview image, press the cursor selection device's button (for example, user controls in the form of touch screen user interface buttons or icons), and an enlarged image corresponding to the particular area in the overview display is presented in the detail window **310**. Thus, random access of particular frames corresponding to the overview image may be provided.

FIG. **15** illustrates a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview display for subsequent playback. The overview image **400** has a detail window **410** with an enlarged image of the last location selected in the overview image **470**. Each of the other cursor locations traversed in the overview image **420**, **430**, **440**, **450** and **460** are also enclosed by an outline of a geometric figure to present a trace to the user.

Each of the cursor locations may be saved, and because each corresponds to a particular frame of the overview image, the trace of frames can be replayed at a subsequent time to allow another user to review the frames and experience a similar presentation. Locations in the detailed window and the overview image can also be selected to present other images associated with the image area, but not necessarily formed from the original image.

For example, a china teacup may appear as a dot in a china cabinet, but when the dot is selected, a detailed image rendering of the china teacup could appear in the detailed window. Moreover, a closed door appearing in an image could be selected and result in a detailed image of a room located behind the door even if the room was not visible in the

previous image. Finally, areas in the detailed window can also be selected to enable further images associated with the detailed window to be revealed. Details of objects within a scene are also dependent on resolution capabilities of a camera. Cameras having appropriate resolution and/or image processing capabilities are preferably used in accordance with certain aspects of the present invention.

The overview image was created as discussed above. To assist one of ordinary skill in the art to make and use the invention, a more detailed discussion of the necessary processing is presented below with reference to FIG. **16** and FIG **17** herein.

FIG. **16** depicts a prior art flowchart providing a logical process for building an overview image display. Such a logical process may be utilized in accordance with the present invention, but is not a necessary feature of the present invention. Those skilled in the art will appreciate that such a logical process can merely an example of one type of image-processing algorithm that may be utilized in accordance with embodiments of the present invention. For example, such a logical process may be implemented as a routine or subroutine that runs via image-processing unit **35** of FIG. **1** in a hand held device. Those skilled in the art can appreciate that the logical process described with relation to FIGS. **16** and **17** herein are not limiting features of the present invention.

Such logical processes, rather, are merely one of many such processes that may be utilized in accordance with the present invention to permit a user to manipulate video images displayed via a display screen of a hand held device. Navigable movie/video data in the form of images input to the hand held device to form individual images can be thus processed, as illustrated at function block **500**. User specified window size (horizontal dimension and vertical dimension) may be entered, as illustrated at function block **504**.

Image variables can be specified (horizontal sub-sampling rate, vertical sub-sampling rate, horizontal and vertical overlap of individual frame images, and horizontal and vertical clip (the number of pixels are clipped from a particular frame in the x and y plane)), as depicted at function block **508**. Function blocks **500**, **504** and **508** are fed into the computation function block **510** where the individual frames are scaled for each row and column, and the row and column variables are each initialized to one.

Then a nested loop can be invoked to create the overview image. First, as indicated at decision block **512**, a test is performed to determine if the maximum number of rows has been exceeded. If so, then the overview image is tested to determine if its quality is satisfactory at decision block **520**. If the quality is insufficient, the user may be provided with an opportunity to adjust the initial variables, as illustrated at function blocks **504** and **508**. The processing is then repeated. If, however, the image is of sufficient quality, it can be saved and displayed for use, as depicted at block **560**.

If the maximum rows has not been exceeded as detected in decision block **512**, then another test can be performed, as illustrated at decision block **514**, to determine if the column maximum has been exceeded. If so, then the row variable can be incremented and the column variable can be reset to one at function block **518** and control flows to input block **520**. If the column maximum has not been exceeded, then the column variable may be incremented and the sub-image sample frame can be retrieved, as depicted at input block **520**. Then, as illustrated at function block **530**, the frame may be inserted correctly in the overview image.

The frame may be inserted at the location corresponding to (Vsub*row*col)+Hsub*col; where row and col refer to the variables incremented in the nested loop, and Vsub and Hsub are user specified variables corresponding to the horizontal and vertical sub sampling rate. Finally, the incremental overview image can be displayed based on the newly inserted frame as depicted at display block **540**. Thereafter, the column variable can be reset to one and processing can be passed to decision block **512**.

A computer system corresponding to the prior art method and system depicted in FIGS. **11** to **17** may be generally interactive. A user may guess at some set of parameters, build the overview image, and decide if the image is satisfactory. If the image is not satisfactory, then variables can be adjusted and the image is recreated. This process can be repeated until a satisfactory image results, which may be saved with its associated parameters. The picture and the parameters can be then input to the next set of logic.

Such features may or may not be present with the hand held device itself. For example, images may be transmitted from a transmitter, such as data transmitter **112** of FIG. **7**, and subroutines or routines present within the server itself may utilize predetermined sets of parameters to build the overview image and determine if the image is satisfactory, generally at the request of the hand held device user. A satisfactory image can be then transmitted to the hand held device. Alternatively, image-processing routines present within an image-processing unit integrated with the hand held device may operate in association with routines present within the server to determine if the image is satisfactory, and/or to manipulate the image (e.g., pan, zoom).

FIG. **17** depicts a prior art flowchart illustrative of a logical process for playback interaction. The logical process illustrated in FIG. **17** may be utilized in accordance with preferred embodiments of the present invention. Playback interaction may commence, as illustrated at label **600**, which immediately flows into function block **604** to detect if user controls have been activated at the hand held device. Such user controls may be configured as external user controls on the hand held device itself (e.g., buttons, etc.), or via a touch screen user interface integrated with hand held device display screen.

When a touch screen user input or user control button press is detected, a test can be performed to determine if a cursor is positioned in the overview portion of the display. If so, then the global coordinates can be converted to overview image coordinates local to the overview image as shown in output block **612**. The local coordinates can be subsequently converted into a particular frame number as shown in output block **614**. Then, the overview image is updated by displaying the frame associated with the particular location in the overview image and control flows via label **600** to function block **604** to await the next button press.

If the cursor is not detected in the overview image as illustrated at decision block **610**, then another test may be performed, as indicated at decision block **620**, to determine if the cursor is located in the navigable player (detail window). If not, then control can be passed back via label **600** to function block **604** to await the next user input. However, if the cursor is located in the detail window, then as depicted a function block **622**, the direction of cursor movement may be detected. As depicted at function block **624**, the nearest frame can be located, and as illustrated at decision block **626**, trace mode may be tested.

If trace is on, then a geometric figure can be displayed at the location corresponding to the new cursor location in the overview image. The overview image may be then updated, and control can be passed back to await the next user input via user controls at the hand held device and/or a touch screen user interface integrated with the hand held device. If trace is not

on, the particular frame is still highlighted as shown in function block **630**, and the highlight can be flashed on the overview image as illustrated at output block **632**. Thereafter, control may be returned to await the next user input.

Although the aforementioned logical processes describe the use of a cursor as a means for detecting locations in a panorama, those skilled in the art can appreciate that other detection and tracking mechanisms may be utilized, such as, for example, the pressing of a particular area within a touch screen display.

FIG. **19** depicts a pictorial representation illustrative of a Venue Positioning System (VPS) **700** in accordance with preferred embodiments of the present invention. Stadium venue may be utilized for sports activities, concert activities, political rallies, or other venue activities. Such a stadium venue can be divided, for example, into a variety of seating sections A to N. For purposes of simplifying this discussion, VPS **700** is described in the context of sections A to C only.

A venue positioning system (VPS) device **704** is positioned in section A of stadium venue **701**, as indicated at position A**2**. A VPS device **702** is located within section A at position A**1**. In the illustration of FIG. **19**, it is assumed that VPS device **702** is located at the top of a staircase, while VPS device **704** is located at the bottom of the staircase, and therefore at the bottom of section A, near the sports field **711**. A VPS device **706** is located near the top of section B at position B**1**. A VPS device **708** is located at the bottom of section B at position B**2**, near sports field. Similarly, in section C, other venue-positioning devices can be respectively located at positions C**1** and C**2**.

A hand held device **703** may be located at a seat within section A. For purposes of this discussion, and by way of example only, it is assumed that hand held device **703** is being operated by a stadium attendee watching a sporting event or other venue activity taking place on the sports field. A hand held device **707** is located within section B. Hand held device **707**, by way of example, may also be operated by a concessionaire or venue employee.

If the user of hand held device **703** desires to order a soda, hot dog, or other product or service offered by venue operators during the venue event, the user merely presses an associated button displayed via a touch screen user interface integrated with the hand held device. A signal is transmitted by hand held device **703**, in response to the user input to/through the VPS device, wireless network or wireless gateway as previously described. One or more of VPS devices **702**, **704**, **706**, and **708** may detect the signal. The VPS devices may also operate merely as transponders, in which case hand held devices will be able to determine their approximate location within the venue and then transmit position information through wireless means to, for example, concession personnel.

VPS devices **702**, **704**, **706**, and **708** function in concert with one another to determine the location of hand held device **703** within section A. Triangulation methods, for example, may be used through the hand held device or VPS devices to determine the location of the hand held device within the venue. This information is then transmitted by one or more of such VPS devices either directly to hand held device **707** or initially through a wireless network, including a wireless gateway and associated server, and then to hand held device **707**. The user of hand held device **707** then can directly proceed to the location of hand held device **703** to offer concession services.

Additionally, hand held device **703** can be configured with a venue menu or merchandise list. In response to requesting a particular item from the menu or merchandise list, the request can be transmitted as wireless data from hand held device **703** through the wireless network to hand held device **707** (or directly to a controller (not shown) of hand held device **707**) so that the user (concession employee) of hand held device **707** can respond to the customer request and proceed directly to the location of hand held device **703** used by a customer.

Additionally wireless gateway **124** and server **100** of FIG. **19** are analogous to the wireless gateway **124** and server **100** illustrated in FIG. **8**. Venue positioning units **702**, **704**, **706**, and **708** are located within section A and section B. A wireless gateway **124** is linked to server **100**. Wireless gateway **124** can communicate with hand held device **707** and hand held device **703**.

Wireless gateway **124** can also communicate with VPS devices **702**, **704**, **706**, and **708** if the VPS devices are also operating as data communication devices in addition to providing mere transponder capabilities. When VPS devices **702**, **704**, **706**, and **708** detect the location of hand held device **703** within the stadium venue, the location is transmitted to wireless gateway **124** and thereafter to hand held device **703**. It should be appreciated that a hand held device user may also identify his/her location in a venue by entering location information (e.g., seat/section/row) on the hand held device when making a request to a service provider such as a food concession operation. The VPS devices will still be useful to help concession management locate concession employees located within the venue that are in closest proximity to the hand held device user. A wireless gateway **124** and server **100** can be associated with a wireless network implemented in association with the stadium venue. Those skilled in the art will appreciate that such a wireless network may be limited geographically to the stadium venue itself and the immediate surrounding area. An example of such a wireless network, as described previously is a Bluetooth based wireless network.

The hand held devices themselves may be proprietary devices owned by promoters or operators of stadium venue **701** and rented to patrons for their use while attending a venue activity. Proprietary devices will generally be manufactured using durable materials (e.g., similar to those materials used on field technician digital multimeters/devices such as the Fluke™ line of electronic devices). Proprietary devices will also be limited in hardware and software modules (i.e., software routines/subroutines) needed for communication with the venue system in order to display venue activities to temporary users.

Hand held devices may also be owned by the patrons themselves that they bring into the stadium venue for their use by permission of the venue promoter or stadium owners in return for the payment of a fee by the patron. In return for the fee, the venue promoter or stadium owner can provide the patron with a temporary code, which permits them to access, the wireless transmissions network and associated with the venue itself, such as wireless network **152** described herein. Patron-owned devices may utilize modules (e.g., smart card technology to receive authorization (e.g., frequency or codes) needed to receive venue-provided video/data. Authorization may also be transferred to the patron-owned device via IR or short-range RF means. Wireless network **152** described herein may be configured as a proprietary wireless Intranet/Internet providing other data accessible by patrons through their hand held devices.

FIG. **19** depicts a flowchart of operations **740** illustrative of a method for providing multiple venue activities through a hand held device, in accordance with preferred embodiments of the present invention. The process is initiated, as depicted at block **742**. As illustrated next at block **744**, a venue attendee may activate at least one hand held tuner integrated with a

hand held device, such as the hand held device illustrated in FIG. **4**. At least one tuner may be integrated with the hand held device, although more than one tuner (or other simultaneous signal receiving capability) may be used within a hand held device in support of other embodiments of the invention previously described.

The tuner, or tuners, is/are associated with a transmission frequency/frequencies of a transmitter that may be linked to a particular camera/cameras focusing on a venue activity, or to a wireless gateway or wireless network transmission. To view images from a particular angle, the user can retrieve the video images from the camera associated with that particular perspective. The user may have to adjust a tuner until the right frequency/image is matched, as indicated at block **756**. As illustrated at block **748**, captured video images are transferred from the video camera to the transmitter associated with the camera, or a server in control of the camera(s). Video images are thus generally transmitted to the hand held device at the specified frequency, either in response to a user request at the hand held device, as depicted at block **750** or as a broadcast.

An image-processing unit integrated with the hand held device, as illustrated at block **752** may process transferred video images. An example of such an image-processing unit is image-processing unit **35** of FIG. **1**. As indicated thereafter at block **754**, the video images of the venue activity captured by the video camera can be displayed within a display area of the hand held device, such as display **18** of FIG. **1**. The process can then terminate, as illustrated at block **756** when the user no longer desires to view the perspective.

FIG. **20** illustrates a flowchart of operations **770** illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras, in accordance with preferred embodiments of the present invention. When a user of a hand held device can interact with the venue system, as indicated at block **772**, the process is initiated. As illustrated next at block **774**, video images of a venue activity may be captured by one or more digital video cameras.

Such digital video cameras may be panoramic/wide-angle in nature and/or configured as high definition/resolution video cameras, well known in the art. The video camera or cameras may be respectively linked to data transmitters, such as data transmitters **102**, **104**, **106**, and/or **108** of FIG. **5** or data transmitter **112** of FIG. **6** to FIG. **9** herein. As depicted next at decision block **778**, if a user does not request a view of the venue activity through the hand held device, the process terminates (i.e., with respect to that use), as illustrated thereafter at block **779**.

If, as illustrated at decision block **778**, the user can request a view of the venue activity through the hand held device, then as described thereafter at block **780**, video data may be transferred from a data transmitter to a server, such as server **100** of FIG. **5** to FIG. **8** herein. The video data may be stored in a memory location of the server or a plurality of servers, as indicated at block **782**. The video data may be then transferred to a wireless data transmitter/receiver integrated with the hand held device, as indicated at block **784**.

As illustrated thereafter at block **786**, the video data may be processed by an image-processing unit and associated image-processing routines and/or subroutines integrated with the hand held device. When image processing is complete, the video images may be displayed in a display area of the hand held device. As illustrated next at block **790**, if a user chooses to pan/zoom for a better view of the video images displayed within the hand held device, then two possible operations may follow, either separately or in association with one another.

The image-processing unit integrated with the hand held device may process a user's pan/zoom request, as illustrated at block **792**. Alternatively, image-processing routines and/or subroutines resident at the server or a plurality of servers may process the user's pan/zoom request, following the transmission of the user's request from the hand held device to the server or plurality of servers. Such a request may be transmitted through a wireless gateway linked to the server or servers.

Image processing may occur at the server or servers if the hand held device is not capable of directly processing the video data and video images thereof due to low memory or slow CPU allocation. Likewise, some image-processing may take place within the hand held device, while video image-processing requiring faster processing capabilities and increased memory may take place additionally at the server or servers to assist in the final image representation displayed at the hand held device.

When image processing is complete, the pan/zoomed images can be displayed within a display screen or display area of the hand held device, as illustrated thereafter at block **796**. The process then terminates, as depicted at block **798**. If the user does not request pan/zoom, as indicated at block **790**, the process may then terminate, as described at block **791**.

The embodiments and examples set forth herein are presented in order to best explain the present invention and its practical application and to thereby enable those skilled in the art to make and utilize the invention. However, those skilled in the art will recognize that the foregoing description and examples have been presented for the purpose of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching without departing from the spirit and scope of the following claims.

The invention claimed is:

1. A method for providing venue-based data to hand held devices, said method comprising the steps of:

capturing video images from more than one perspective of a venue-based activity using more than one video camera located at a sports and entertainment venue;

providing said video images to a server to process said more than one video perspective captured by more than one video camera into venue-based data formatted for wireless transmission via wireless data networks to more than one hand held device, each of said more than one hand held device further comprising at least one of a personal digital assistant and a smart phone, said more than one hand held device including at least one 802.11 wireless module for access to a wireless local area network and a cellular communications module for communication with a wireless cellular communications network, said more than one hand held device further comprising a touch-sensitive display screen to simultaneously and singularly display said venue-based data and to accept user input via said touch-sensitive display screen; and

retrieving said venue-based data from said server and wirelessly transmitting said venue-based data to at least one hand held device located at said sports and entertainment venue over said wireless local area network and also wirelessly transmitting said venue-based data to at least one hand held device located outside of said sports and entertainment venue over said wireless cellular communications network.

2. The method of claim 1 further comprising the step of:

providing said at least one hand held device as a hand held device adapted for use with a software module that contains access codes that permit said at least one hand held device located at said sports and entertainment venue to receive venue-based data over said local wireless network and display said venue-based data.

3. The method of claim 1 further comprising the steps of:

receiving said venue-based data at said least one hand held device from at least one of said wireless local area network or said wireless cellular communications network;

processing said data to provide more than one video perspective for simultaneous display on said touch-sensitive display screen associated with said at least one hand held device, in response to receiving said data at said at least one hand held device; and

simultaneously displaying more than one video perspective on said touch-sensitive display screen, thereby enabling a user of said at least one hand held device to view more than one video perspective at a time through said at least one hand held device.

4. The method of claim 3 wherein the step of displaying said processed data including more than one video perspective on said touch-sensitive display screen, further comprises the step of:

displaying said processed data on said touch-sensitive display screen, in response to user input through a user interface associated with said touch sensitive display screen; and

displaying a single video perspective on said touch-sensitive display screen following a user selection of the single video perspective at said user interface.

5. The method of claim 1 wherein said at least one video camera is adapted to provide high-resolution wide-angle video data.

6. The method of claim 1, wherein said wirelessly transmitting said venue-based data to at least one hand held device located outside of said sports and entertainment venue over a wireless cellular communications network further comprises providing said venue-based data from said server to said at least one hand held device located at or outside of said sports and entertainment venue through said wireless cellular communications network, wherein said wireless cellular communications network comprises a CDMA wireless communications network.

7. The method of claim 1 further comprising the step of:

transmitting said venue-based data from said at least one venue-based data source to said at least one hand held device located at said sports and entertainment venue through more than one wireless gateway associated with said a wireless local area network also located at said sports and entertainment venue.

8. The method of claim 7 further comprising the step of:

transferring said data through a wireless gateway associated with said wireless local area network.

9. The method of claim 1 further comprising the step of:

processing said data for display on said touch-sensitive display screen associated with said at least one hand held device utilizing at least one image-processing module.

10. The method of claim 1 wherein said venue-based data further comprises at least one of team data, venue information, statistics, merchandise information, concession information, advertisements, scores, charts, promotional information, propaganda, and scheduling, instant video replays.

11. The method of claim 1 wherein said venue-based data further comprises instant replay video data.

12. The method of claim 1 wherein said venue-based data further comprises promotional information.

13. The method of claim 1 wherein said venue-based data further comprises venue and team information.

14. A method for wirelessly transmitting venue-based data to hand held devices located within and outside of a sports and entertainment venue, said method comprising the steps of:

capturing video images from more than one perspective of a venue-based activity using more than one video camera located at a sports and entertainment venue;

providing said video images to a server to process said more than one video perspective captured by more than one video camera into venue-based data formatted for wireless transmission via wireless data networks to more than one hand held device, each of said more than one hand held device further comprising at least one of a personal digital assistant and a smart phone, said more than one hand held device including at least one 802.11 wireless module for access to a wireless local area network and a cellular communications module for communication with a wireless cellular communications network, said more than one hand held device further comprising a touch-sensitive display screen to simultaneously and singularly display said venue-based data and to accept user input via said touch-sensitive display screen;

wirelessly transmitting venue-based data including video captured from multiple perspective by cameras located at said a sports and entertainment venue to at least one hand held device among said more than one hand held device located at said sports and entertainment venue over said wireless local area network from said server;

wirelessly transmitting said venue-based data to at least one hand held device among said more than one hand held device located at or outside of said sports and entertainment venue over said wireless a cellular communications network; and

processing said venue-based data received by said more than one hand held device to provide processed data including more than one video perspective for display on said touch-sensitive display screen associated with said more than one hand held device; and

displaying at least one video perspective processed as data on said touch-sensitive display screen of said more than one hand held device.

15. A method for displaying a particular perspective of a venue-based activity at least one authorized hand held device having a display screen, said method comprising the steps of:

simultaneously capturing a plurality of video perspectives of a venue-based activity utilizing more than one camera located at a sports and entertainment venue;

processing said plurality of video perspectives at a server into encrypted video data packet for display on a touch-sensitive display screen associated with said at least one authorized hand held device provided in the form of at least a smart phone or personal digital assistance, said at least one hand held device further comprising at least one 802.11 wireless module for access to a wireless local area network and a cellular communications module for communication with a wireless cellular communications network;

wirelessly transmitting said encrypted video packet over an 802.11 wireless local area network to said at least one authorized hand held device said plurality of video perspectives of a venue-based activity from said server;

processing said plurality of video perspectives at said at least one authorized hand held device into decrypted

video data packet for display on said touch-sensitive display screen associated with said at least one authorized hand held device; and

displaying a particular video perspective on said touch-sensitive display screen, in response to a user selection of said particular video perspective from among said plurality of video perspectives.

16. An entertainment venue multimedia system configured with a data processing system and wireless infrastructure for providing venue-based data to authorized hand held devices located within and outside of an entertainment venue via data communication networks including cellular communications and local wireless networking capabilities, said multimedia system comprising:

more than one venue-based camera capturing a different video perspective within an entertainment venue;

a server receiving and processing more than one video perspective received from said more than one venue-based camera;

wireless data communication networks including a wireless local area network and a wireless cellular communications network in communication with said server, said wireless data communication networks accessing and transmitting said more than one video perspective from said server to more than one hand held device; and

at least one hand held device in secure communications with said server, said at least one hand held device each further comprising at least one of a personal digital assistant and a smart phone and said more than one hand held device including at least one 802.11 wireless module for access to a wireless local area network and a cellular communications module for communication with a wireless cellular communications network, said more than one hand held device further comprising a touch-sensitive display screen to display venue-based data including simultaneously and singularly displaying video perspectives from said more than one venue-based camera and to accept user input via said touch-sensitive display screen;

wherein said system wirelessly transmits venue-based data including video from said more than one venue-based camera from said server to said at least one hand held device located in said entertainment venue over a wireless local area network and said system is also wirelessly transmits said venue-based data including video from said more than one venue-based camera from said server to hand held devices located outside of said sports and entertainment venue over a wireless cellular communications network.

17. The system of claim **16**, said at least one personal digital assistant including cellular communications and local wireless networking capabilities further comprising a removable module that contains at least one of electronics or access codes that permit said at least one authorized personal digital assistant including cellular communications and local wireless networking capabilities to receive said video perspectives transmitted by said server.

18. The system of claim **17** wherein said removable module comprises a smart card.

19. The system of claim **17** wherein said module comprises a removable cartridge that provides decryption codes to enable said at least one authorized personal digital assistant including cellular communications and local wireless networking capabilities to receive video perspectives from said server, if said video perspectives are encrypted.

20. The system of claim **17** wherein said removable module further comprises a plurality of tuners integrated with said at least one authorized personal digital assistant including cellular communications and local wireless networking capabilities, wherein said plurality of tuners are activated by at least one authorized personal digital assistant including cellular communications and local wireless networking capabilities to receive video perspectives transmitted from said server for display at said touch-sensitive display screen associated with the at least one authorized personal digital assistant including cellular communications and local wireless networking capabilities.

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US008401460B2

(12) **United States Patent**
Ortiz et al.

(10) **Patent No.: US 8,401,460 B2**
(45) **Date of Patent: *Mar. 19, 2013**

(54) **TRANSMITTING SPORTS AND ENTERTAINMENT DATA TO WIRELESS HAND HELD DEVICES OVER A TELECOMMUNICATIONS NETWORK**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/307,276**

(22) Filed: **Nov. 30, 2011**

(65) **Prior Publication Data**

US 2012/0072945 A1 Mar. 22, 2012

Related U.S. Application Data

(63) Continuation of application No. 12/884,810, filed on Sep. 17, 2010, now Pat. No. 8,086,184, which is a continuation of application No. 12/329,631, filed on Dec. 7, 2008, now Pat. No. 7,826,877, which is a continuation of application No. 11/738,088, filed on

(Continued)

(51) **Int. Cl.**

H04H 20/71	(2008.01)
H04H 40/00	(2008.01)
H04B 1/18	(2006.01)
H04B 7/00	(2006.01)
H04B 13/00	(2006.01)

(52) **U.S. Cl.** **455/3.01**; 455/3.06; 455/180.1; 455/66.1; 455/899

(58) **Field of Classification Search** 455/3.01, 455/3.06, 66.1, 899, 180.1

See application file for complete search history.

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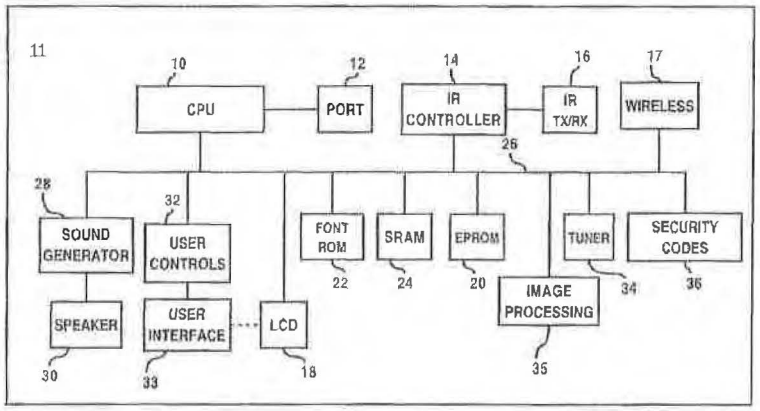
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(57) **ABSTRACT**

A method and system for wirelessly providing venue-based data to one or more wireless hand held devices. Venue-based data can be acquired from one or more venues. The venue-based data can be authenticated and wirelessly transmitted to one or more hand held devices through one or more wireless telecommunications networks, in response to authenticating the venue-based data and/or the hand held device(s) and/or a user of the hand held device(s), in order to permit the venue-based data to be accessible via one or more hand held devices at locations remote from the venue(s).

20 Claims, 19 Drawing Sheets



Related U.S. Application Data

Apr. 20, 2007, now Pat. No. 7,620,426, which is a continuation of application No. 11/498,415, filed on Aug. 2, 2006, now Pat. No. 7,376,388, which is a continuation of application No. 09/708,776, filed on Nov. 8, 2000, now Pat. No. 7,149,549, application No. 13/307,276, which is a continuation of application No. 12/884,858, filed on Sep. 17, 2010, now Pat. No. 8,090,321.

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D426,527	S		6/2000	Sakaguchi
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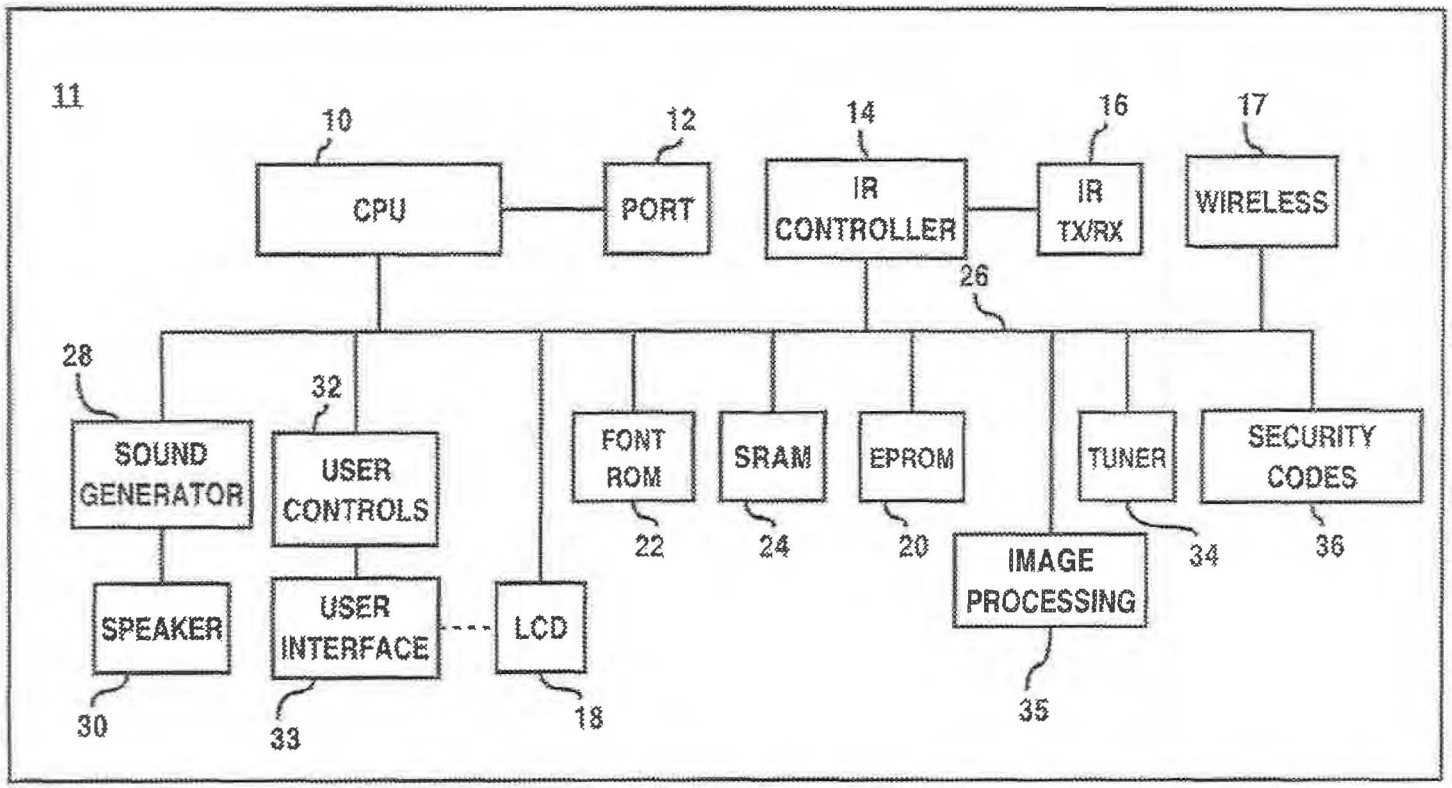

11
10
CPU
12
PORT
14
IR CONTROLLER
16
IR TX/RX
17
WIRELESS
26
28
SOUND GENERATOR
32
USER CONTROLS
FONT ROM
22
SRAM
24
EPROM
20
TUNER
34
SECURITY CODES
36
IMAGE PROCESSING
35
SPEAKER
30
USER INTERFACE
33
LCD
18

FIG. 1

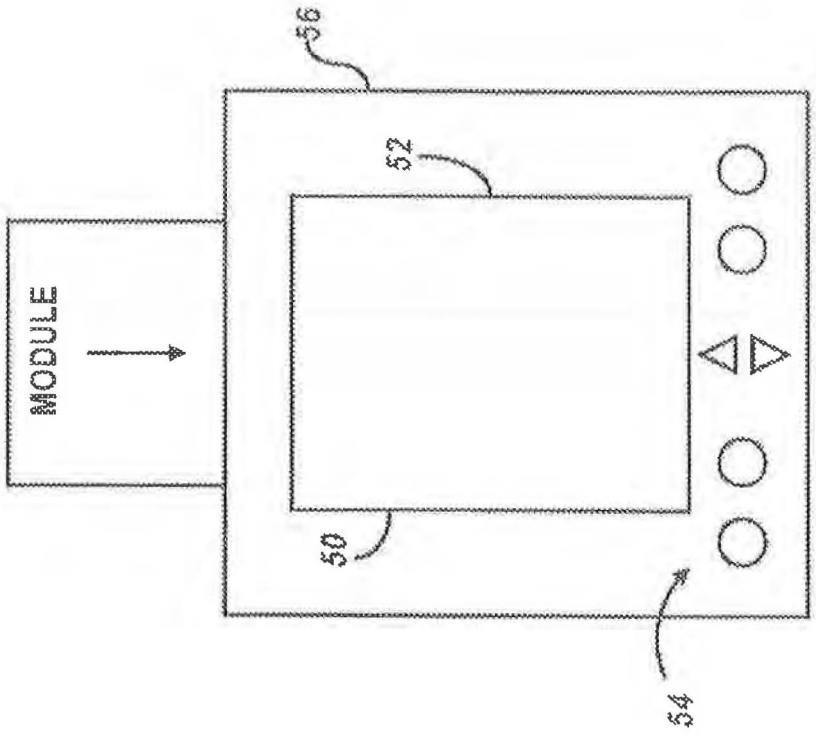


FIG. 3

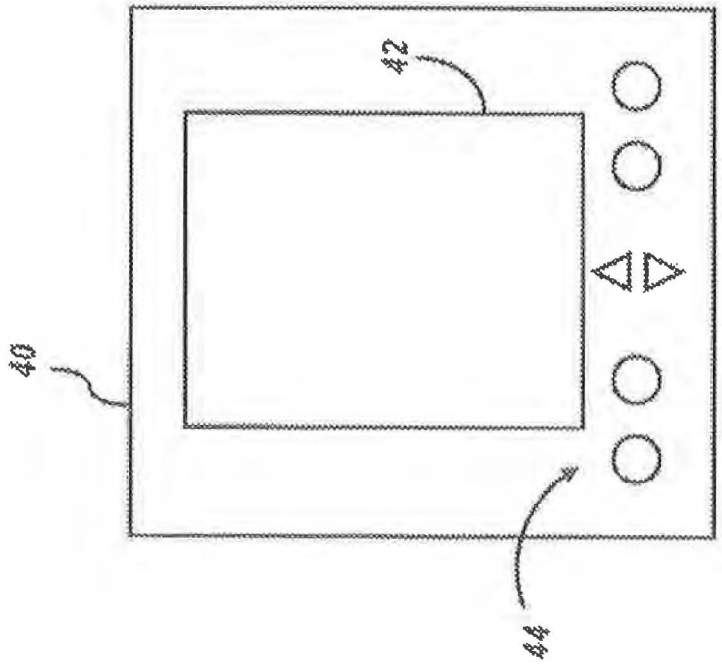


FIG. 2

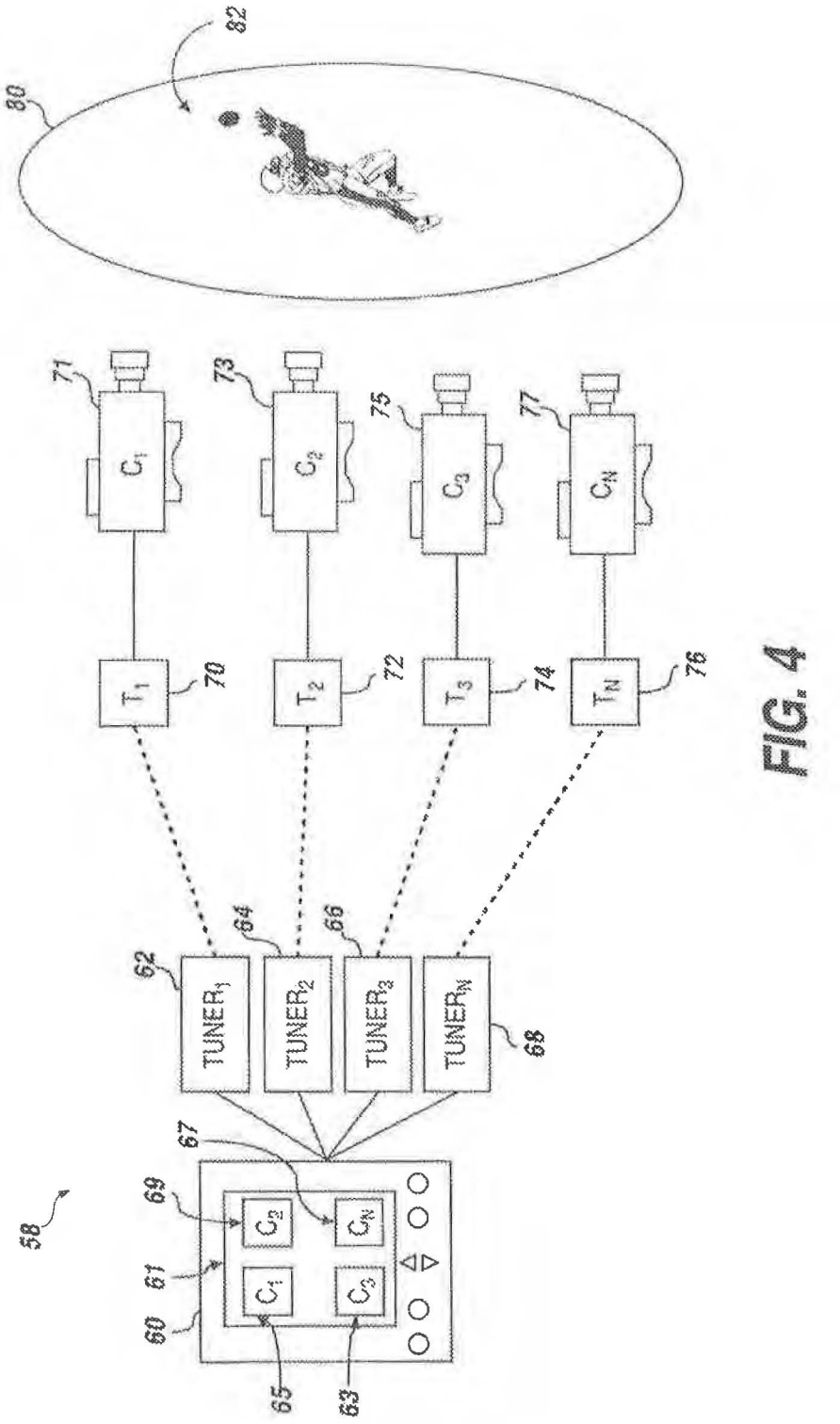

82
80
71
73
75
77
C1
C2
C3
CN
T1
T2
T3
TN
70
72
74
76
62
64
66
68
TUNER1
TUNER2
TUNER3
TUNERN
67
69
61
60
65
63
58

FIG. 4

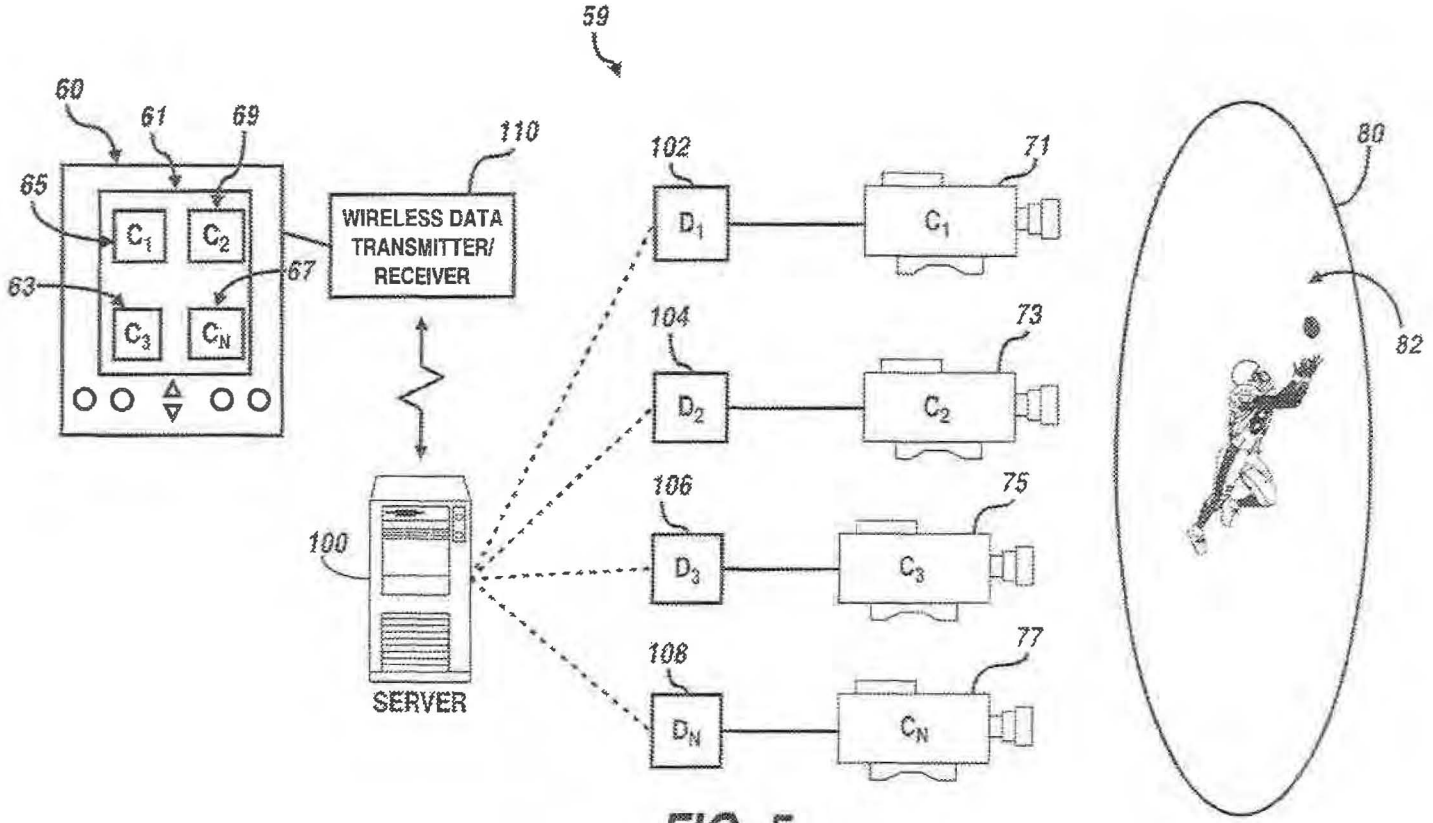

59
60
61
69
110
65
63
67
C_1
C_2
C_3
C_N
WIRELESS DATA TRANSMITTER/ RECEIVER
100
SERVER
102
104
106
108
D_1
D_2
D_3
D_N
71
73
75
77
80
82

FIG. 5

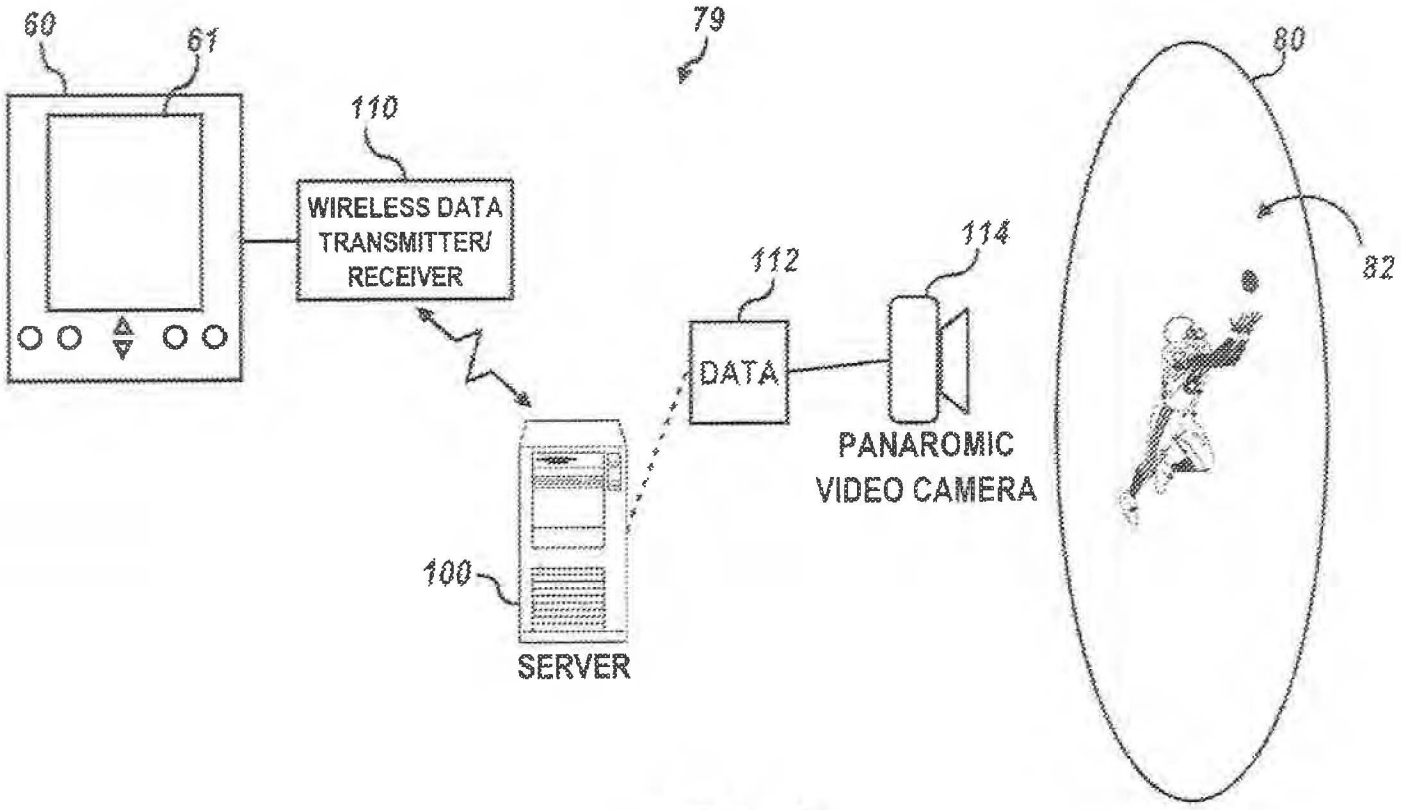

60
61
79
80
110
WIRELESS DATA TRANSMITTER/ RECEIVER
112
114
82
DATA
PANAROMIC VIDEO CAMERA
100
SERVER

FIG. 6

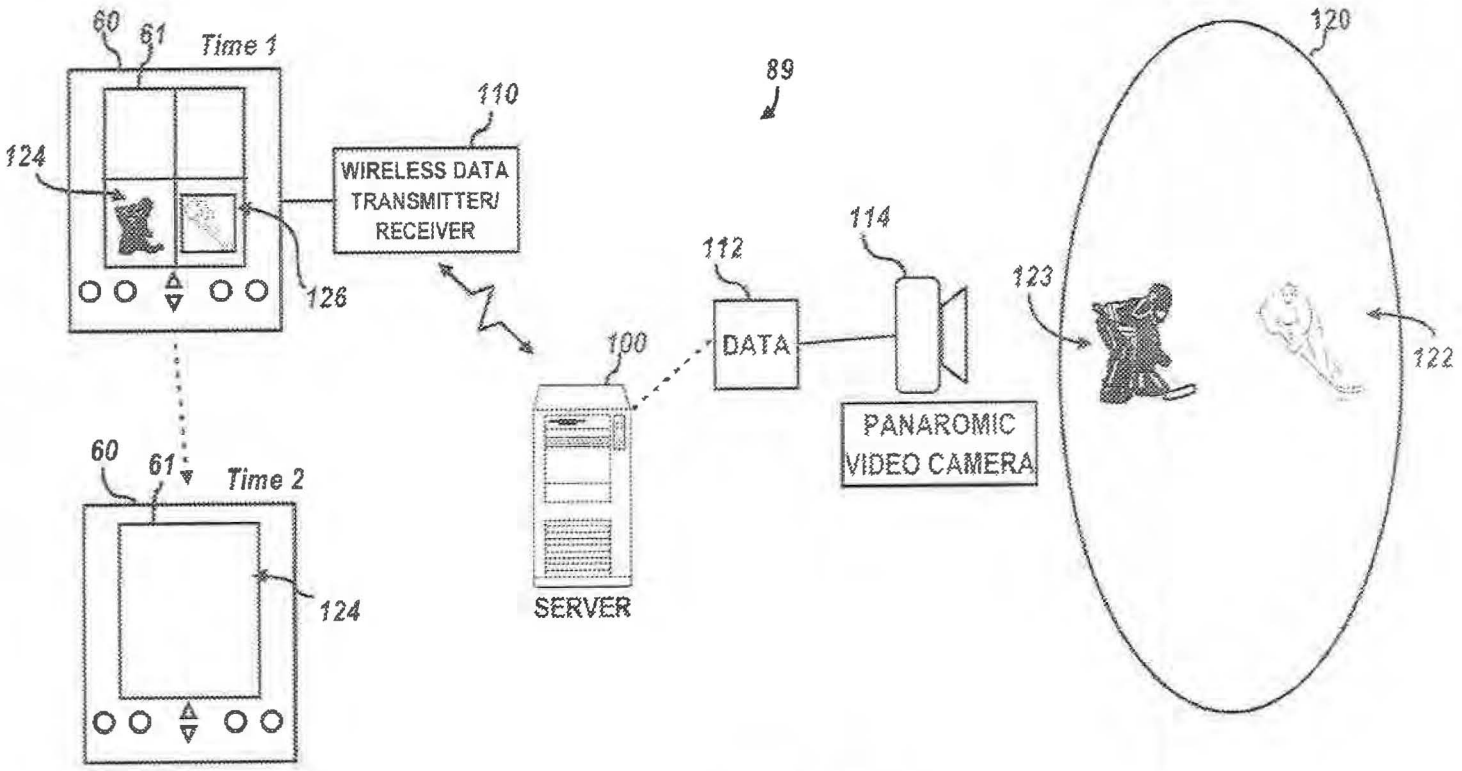

60
61
Time 1
124
110
WIRELESS DATA TRANSMITTER/ RECEIVER
126
89
120
114
112
123
100
DATA
PANAROMIC VIDEO CAMERA
122
60
61
Time 2
124
SERVER

FIG. 7

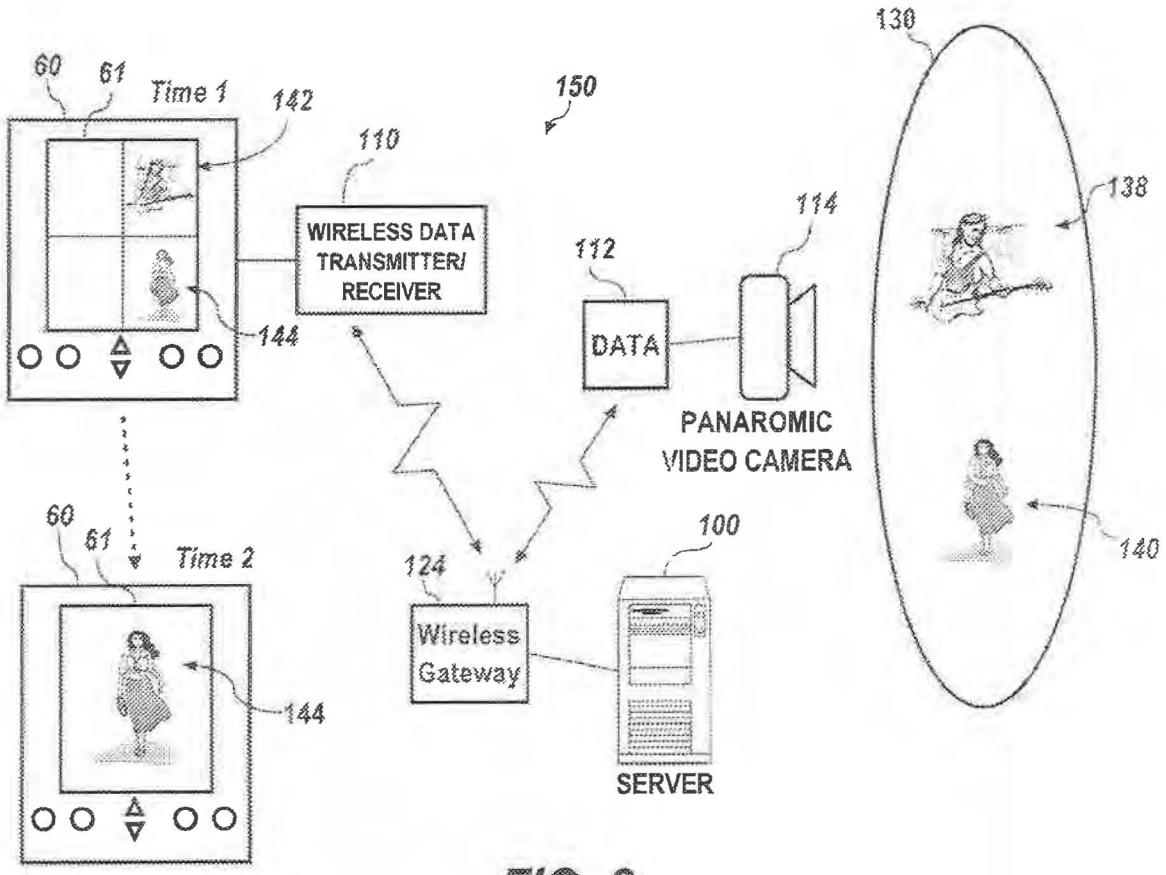

60
61
Time 1
142
110
150
130
138
WIRELESS DATA TRANSMITTER/ RECEIVER
114
112
144
DATA
PANAROMIC VIDEO CAMERA
60
61
Time 2
100
124
140
Wireless Gateway
144
SERVER

FIG. 8

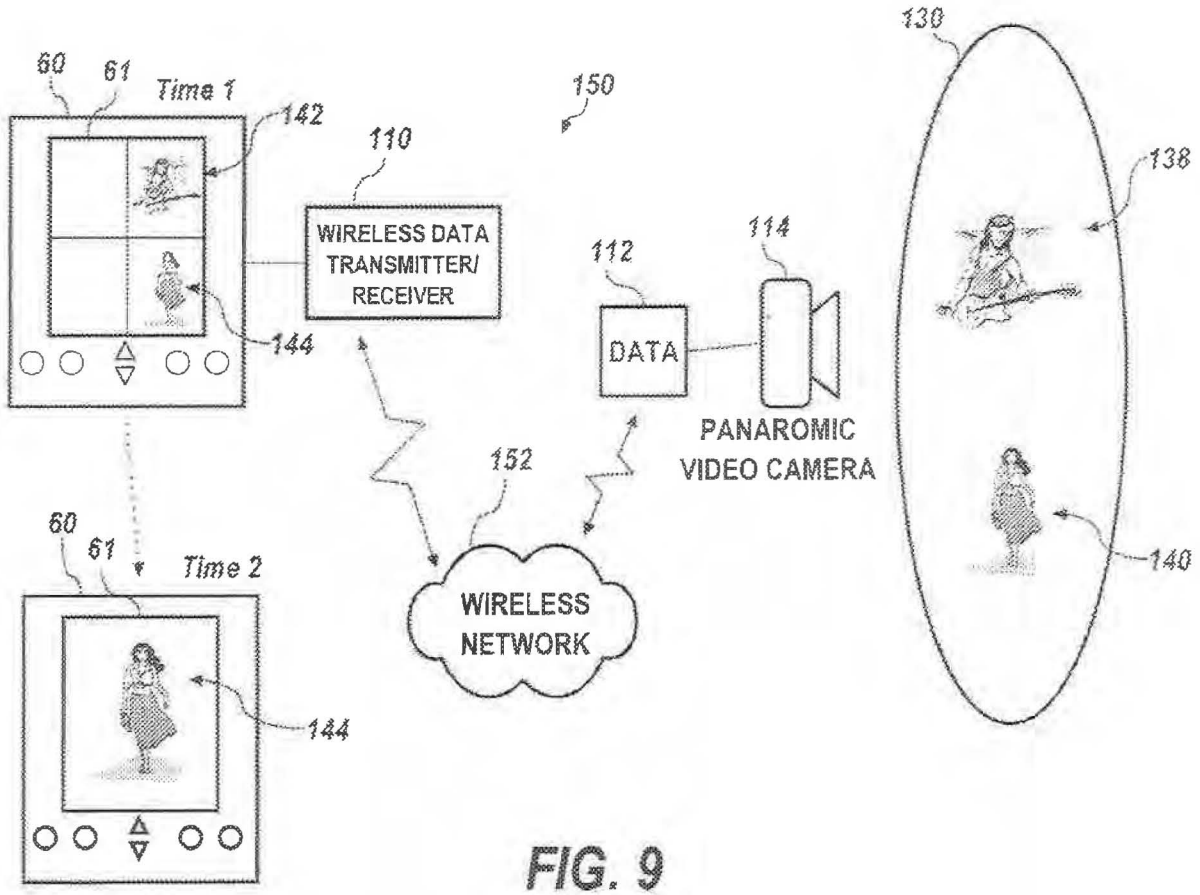

60
61
Time 1
142
110
150
130
138
WIRELESS DATA TRANSMITTER/ RECEIVER
112
114
DATA
144
PANAROMIC VIDEO CAMERA
152
60
61
Time 2
WIRELESS NETWORK
140
144

FIG. 9

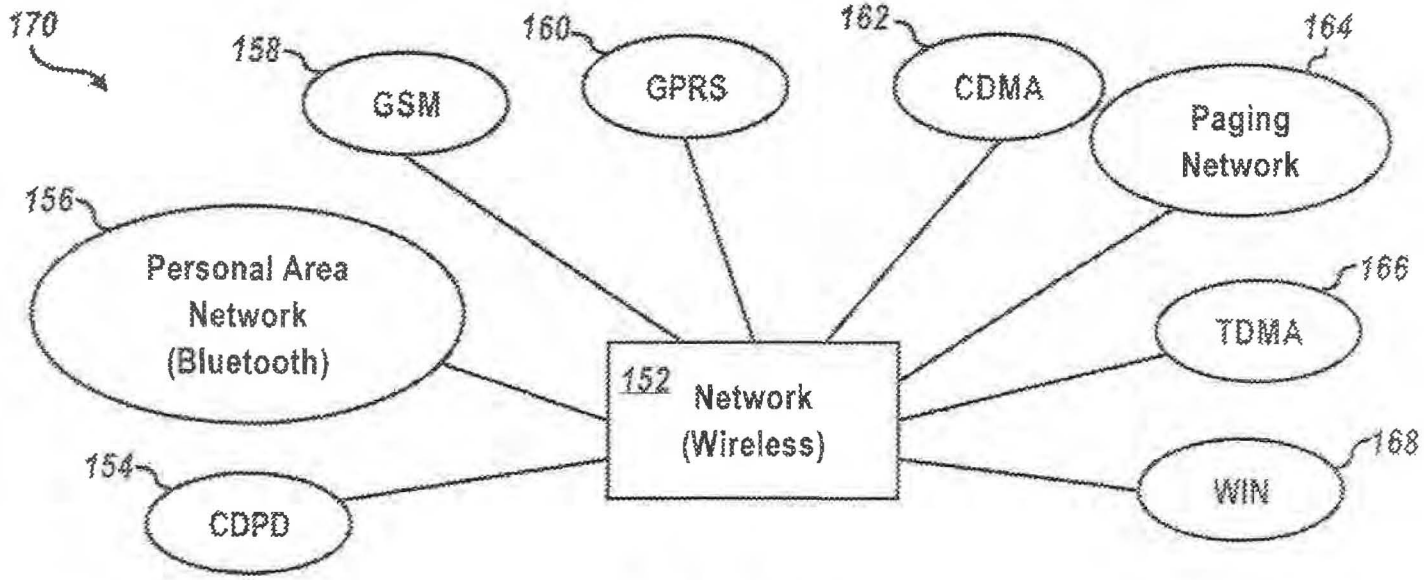

170
158
GSM
160
GPRS
162
CDMA
164
Paging Network
156
Personal Area Network (Bluetooth)
166
TDMA
152
Network (Wireless)
154
CDPD
168
WIN

FIG. 10

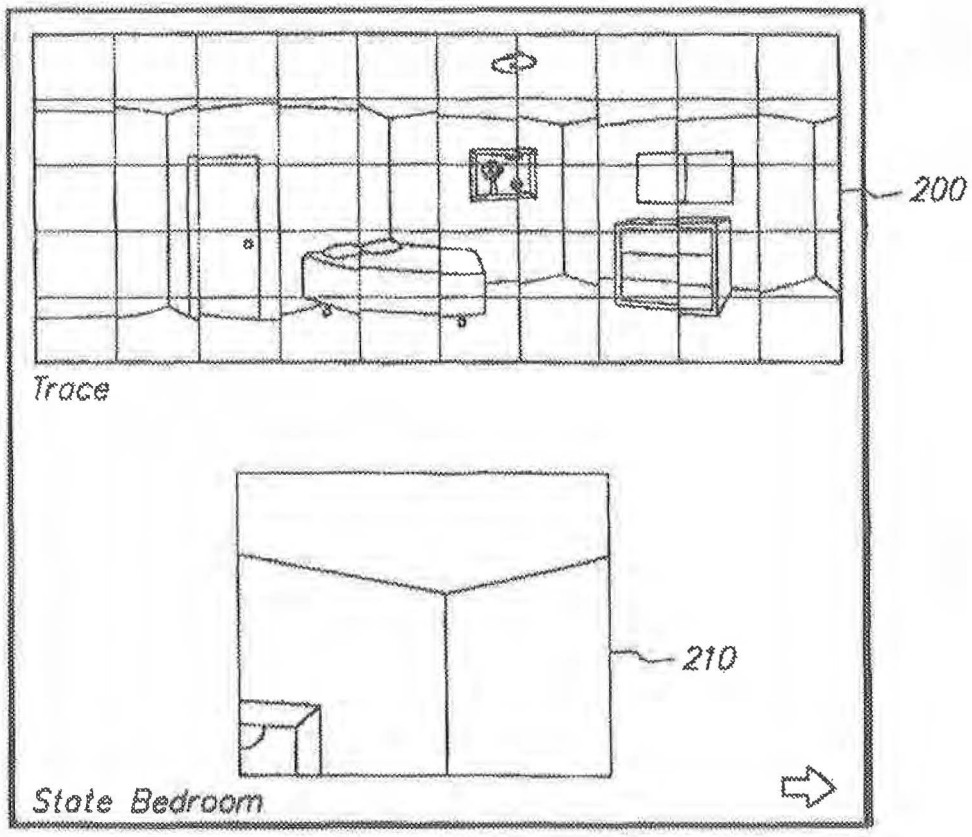


FIG. 11
(Prior Art)

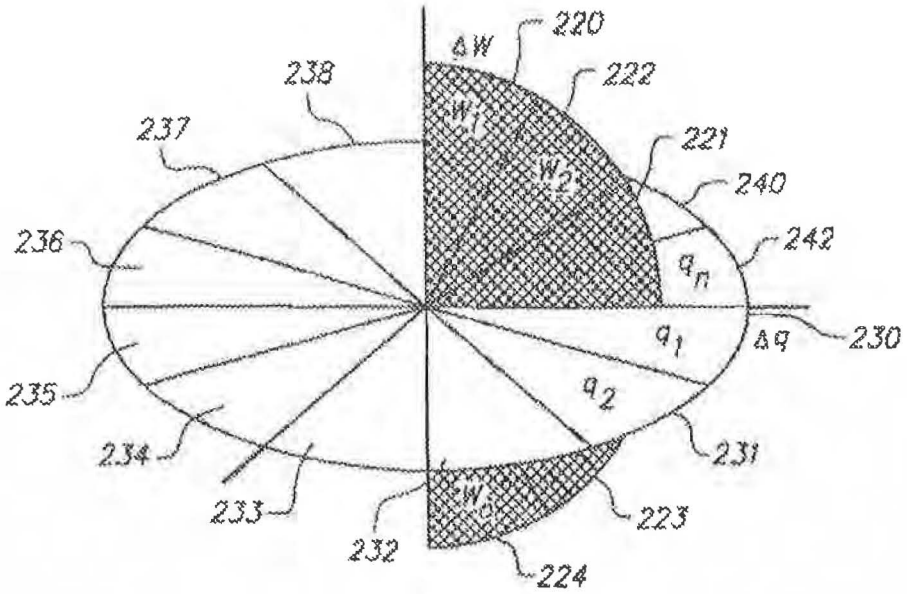


FIG. 12
(Prior Art)

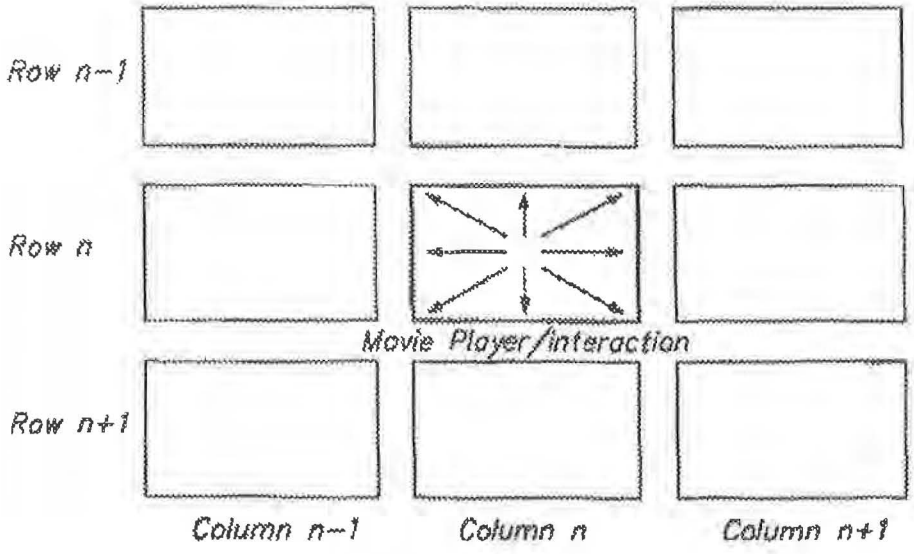


FIG. 13
(Prior Art)

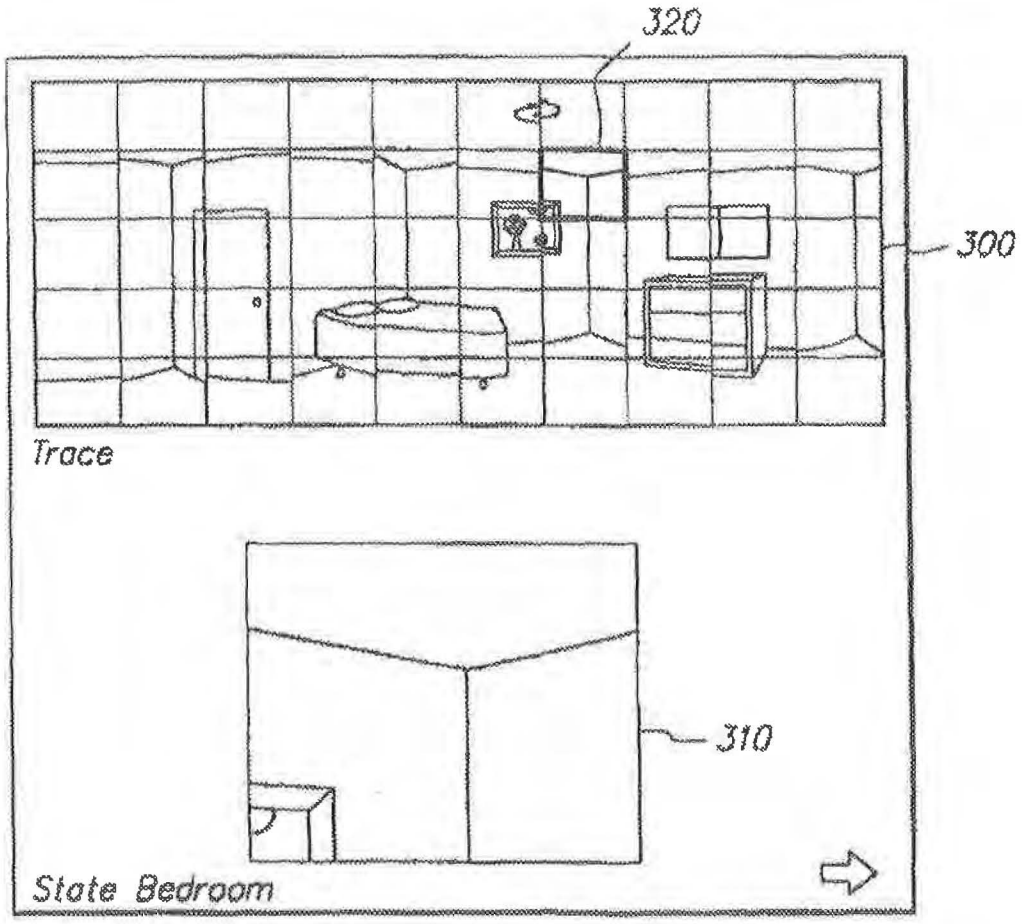


FIG. 14
(Prior Art)

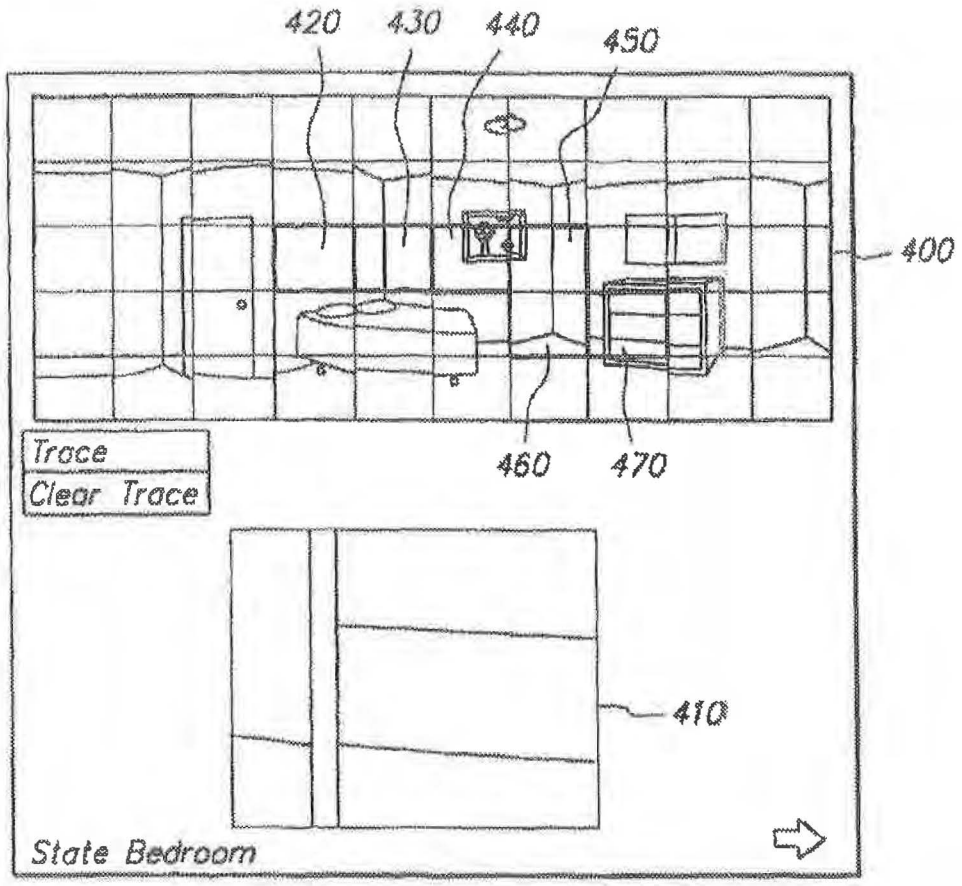


FIG. 15
(Prior Art)

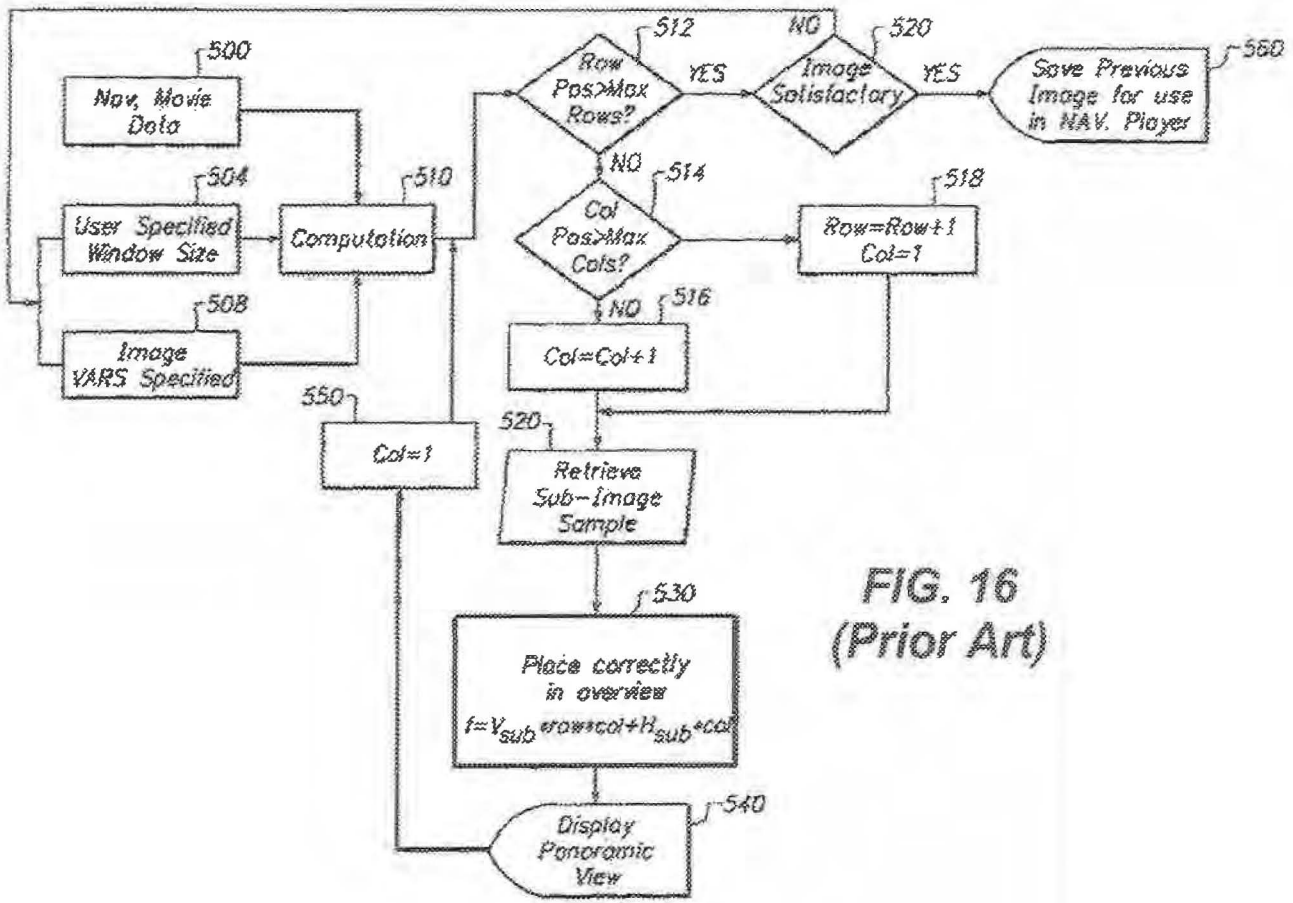


FIG. 16
(Prior Art)

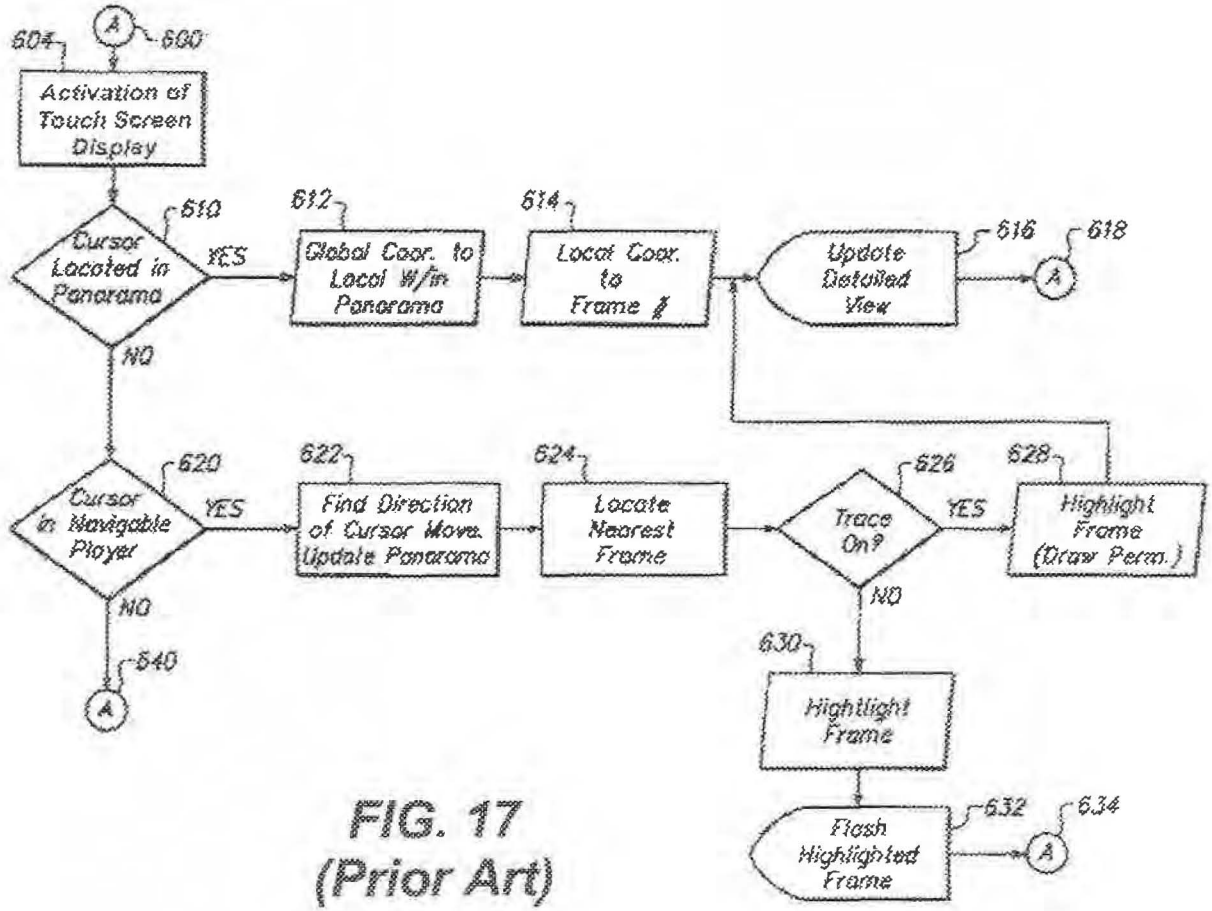


FIG. 17
(Prior Art)

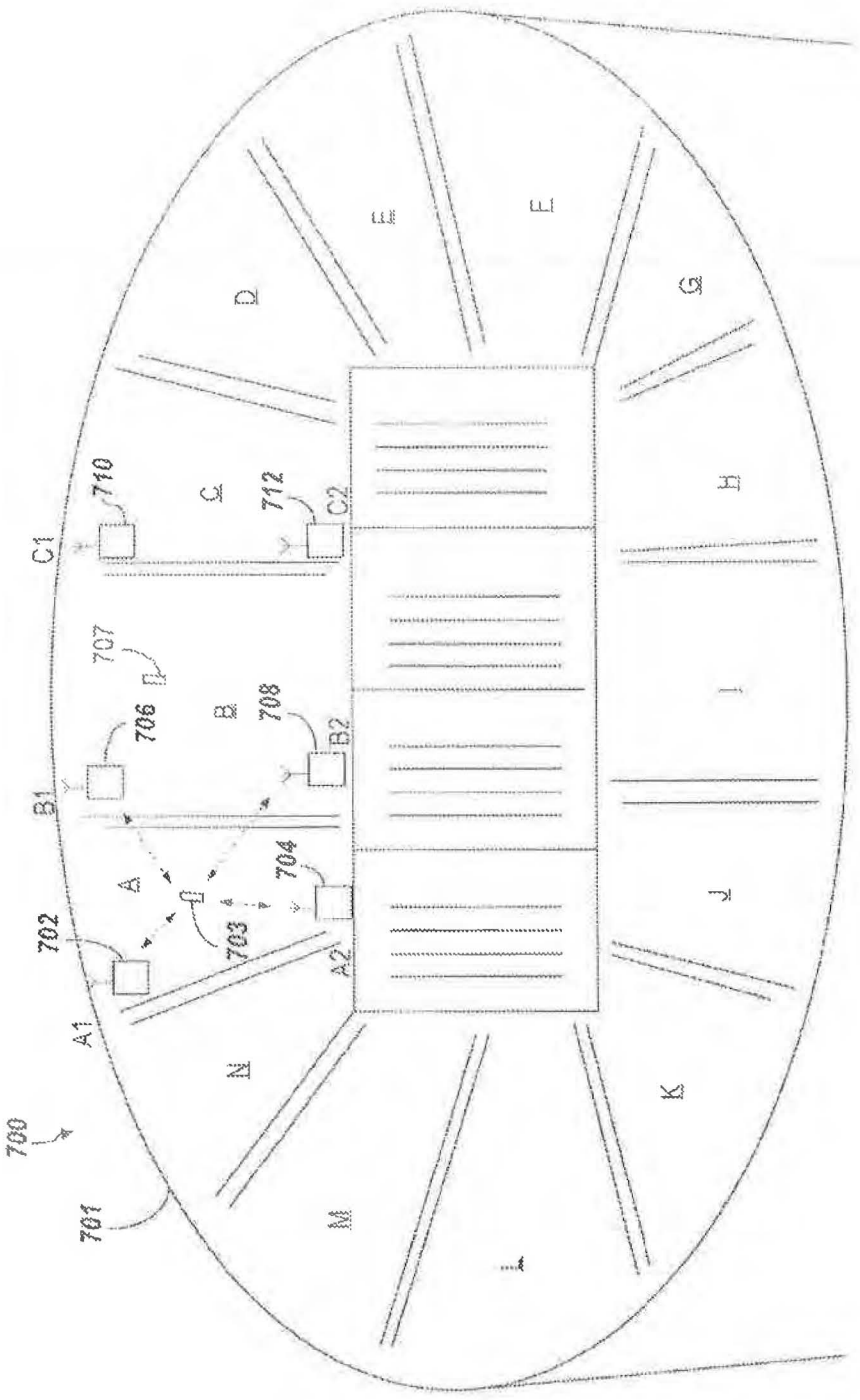

700
701
702
703
704
706
707
708
710
712
A
A1
A2
B
B1
B2
C
C1
C2
D
E
E1
G
H
I
J
K
L
M
N
O
P

FIG. 18

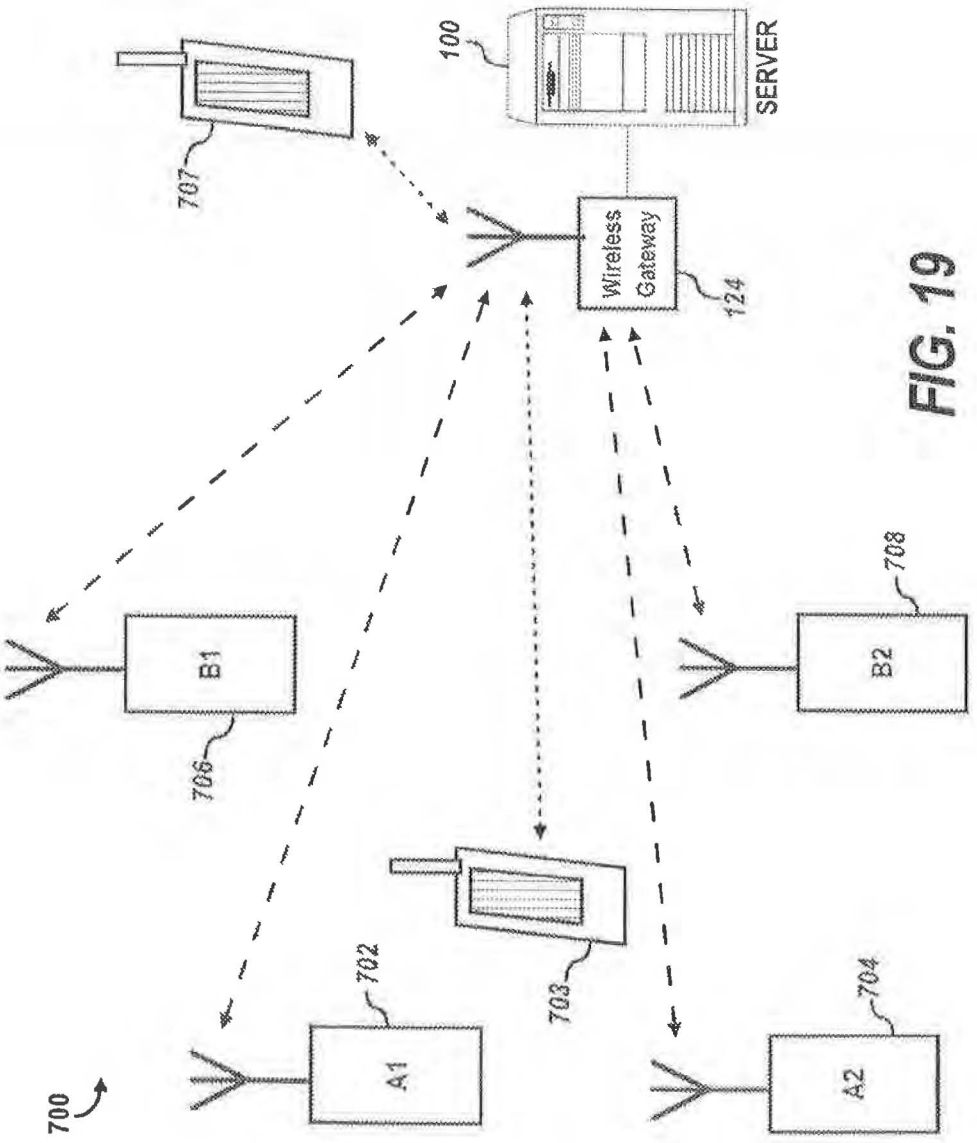

100
SERVER
707
Wireless Gateway
124
B1
706
B2
708
703
702
A1
704
A2
700

FIG. 19

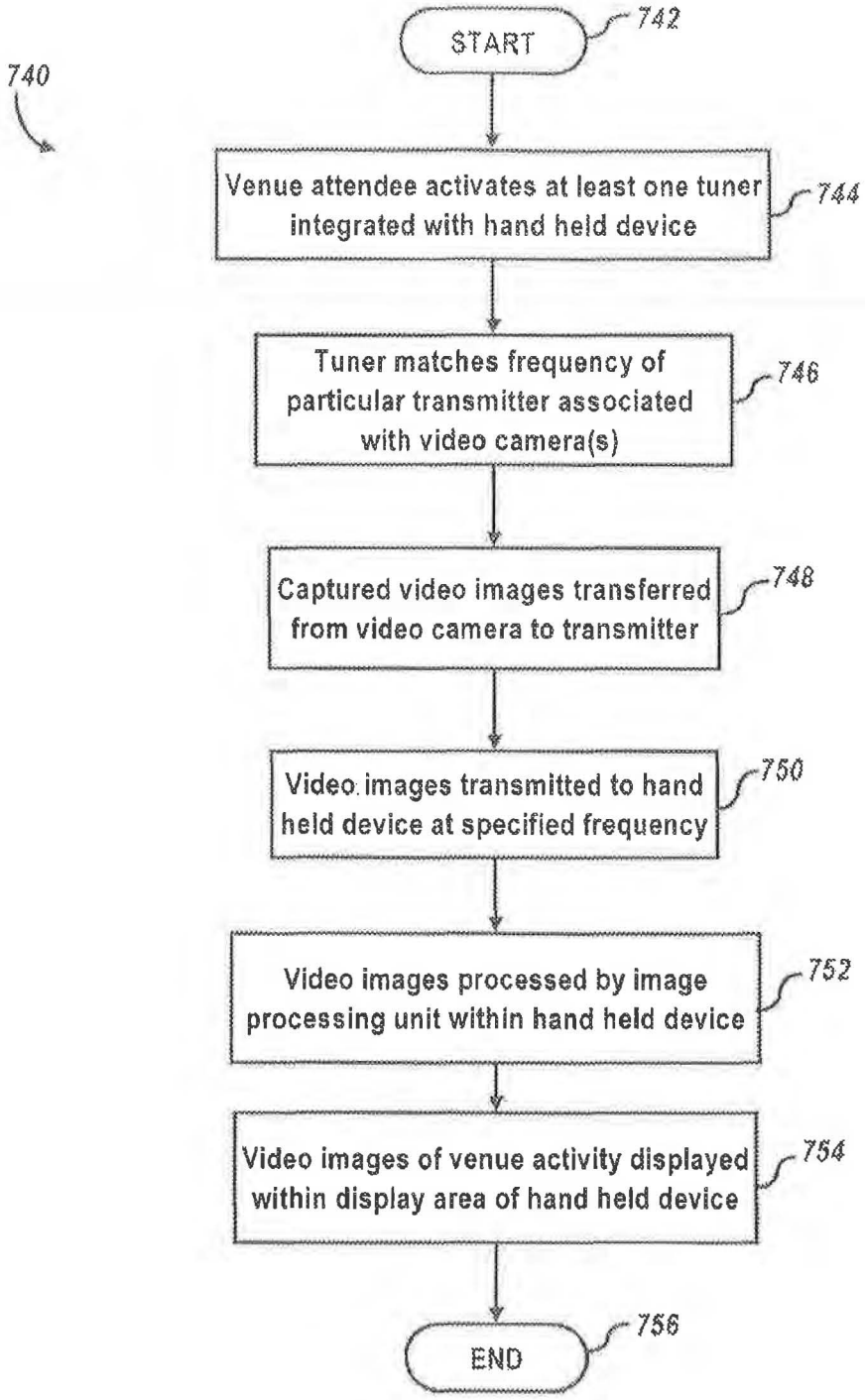

740
START
742
Venue attendee activates at least one tuner integrated with hand held device
744
Tuner matches frequency of particular transmitter associated with video camera(s)
746
Captured video images transferred from video camera to transmitter
748
Video images transmitted to hand held device at specified frequency
750
Video images processed by image processing unit within hand held device
752
Video images of venue activity displayed within display area of hand held device
754
END
756

FIG. 20

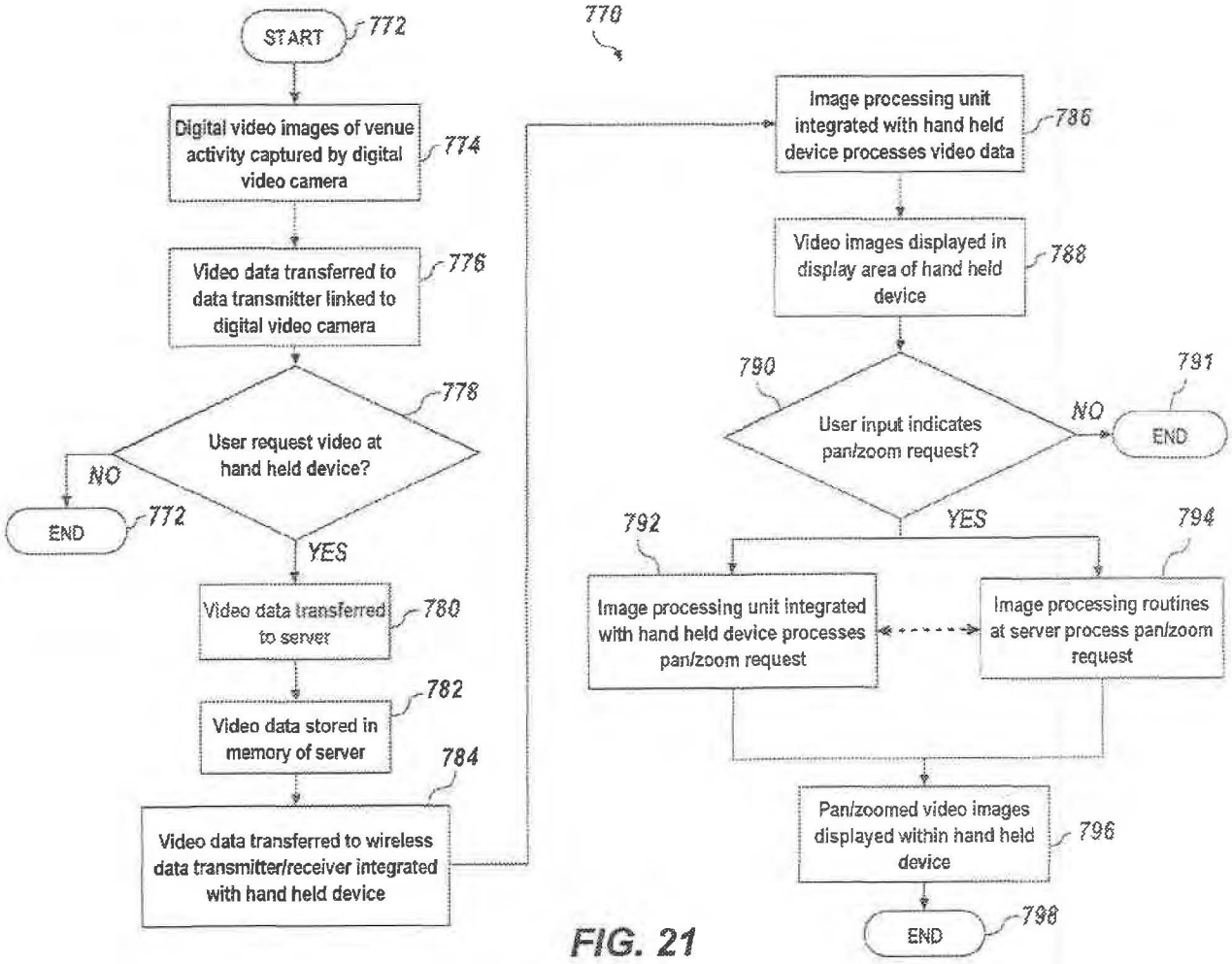

START
772
Digital video images of venue activity captured by digital video camera
774
Video data transferred to data transmitter linked to digital video camera
776
User request video at hand held device?
778
NO
END
772
YES
Video data transferred to server
780
Video data stored in memory of server
782
Video data transferred to wireless data transmitter/receiver integrated with hand held device
784
770
Image processing unit integrated with hand held device processes video data
786
Video images displayed in display area of hand held device
788
User input indicates pan/zoom request?
790
NO
END
791
YES
Image processing unit integrated with hand held device processes pan/zoom request
792
Image processing routines at server process pan/zoom request
794
Pan/zoomed video images displayed within hand held device
796
END
798

FIG. 21

TRANSMITTING SPORTS AND ENTERTAINMENT DATA TO WIRELESS HAND HELD DEVICES OVER A TELECOMMUNICATIONS NETWORK

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 12/884,810, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over a Telecommunications Network," which was filed on Sep. 17, 2010, now U.S. Pat. No. 8,086,184 and is incorporated by reference in its entirety. This application is also a continuation of U.S. patent application Ser. No. 12/884,858, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over a Telecommunications Network," which was filed on Sep. 17, 2010, now U.S. Pat. No. 8,090,321 and is incorporated herein by reference in its entirety. U.S. patent application Ser. Nos. 12/884,810 and 12/884,858 are continuations of U.S. patent application Ser. No. 12/329,631, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over A Telecommunications Network," which was filed on Dec. 7, 2008 and issued as U.S Pat. No. 7,826,877.

U.S. patent application Ser. No. 12/329,631 was in turn a continuation of U.S. patent application Ser. No. 11/738,088 entitled "Providing Video of a Venue Activity to a Hand Held Device Through a Cellular Communications Network" which was filed on Apr. 20, 2007, now U.S. Pat. No. 7,620,426. U.S. patent application Ser. No. 11/738,088 was in turn a continuation of U.S. patent application Ser. No. 11/498,415 entitled "Broadcasting Venue Data to a Wireless Hand Held Device," filed on Aug. 2, 2006, which issued on May 20, 2008 as U.S. Pat. No. 7,376,388 and was a continuation of U.S. patent application Ser. No. 09/708,776 entitled "Providing Multiple Perspectives for a Venue Activity Through an Electronic Hand Held Device," which was filed on Nov. 8, 2000, now U.S. Pat. No. 7,149,549, and which claims the benefit of U.S. Provisional Application Ser. No. 60/243,561, which was filed on Oct. 26, 2000. This application therefore traces its priority date to and claims the benefit of the Oct. 26, 2000 filing date of U.S. Provisional Application Ser. No. 60/243,561.

TECHNICAL FIELD

Embodiments are related to wireless electronic hand held devices, such as Personal Digital Assistants (PDAs), hand held televisions, Smartphones, and cellular and data-enabled wireless telephones. Embodiments are also related to techniques for remotely delivering sports and entertainment data to hand held devices. In addition, Embodiments relates to techniques for providing increased viewing opportunities for audiences within and external to venue environments, such as stadiums and concert arenas. Additionally, embodiments related to wireless video, audio and other data transmission to and from hand held devices.

BACKGROUND OF THE INVENTION

Most modern stadiums and live entertainment facilities or arenas (herein also collectively referred to as "venues"), which feature sporting events and concerts, typically employ large television screens that receive video images and are linked within the stadium to a plurality of television cameras positioned to capture video images at diverse locations within the stadium. The audience at a typical sporting event, for example, can generally view advertisements, instant replays, and other sports related data on the large television screens within the sports stadium itself. Feeds are additionally generally provided from the cameras to announcers in a broadcast booth, replaying certain plays from the event so that the announcers and can make comments about plays, and finally transmitting a telecast to the viewing audience, including some aspects of captured video and data to the stadium audience.

Despite the availability of such large screen television monitors, venue event audience members still lack enhanced viewing options or perspectives within the stadium itself. To compensate for the lack of viewing options, sports and concert promoters often rent binoculars to audience members prior to or during the event. Such binoculars can permit the typical audience member to obtain a somewhat better, but limited, view of the event, such as a football or hockey game, but even these views are often obstructed by other audience members and are tied to only one perspective.

The large television screens placed in the stadium are typically linked to cameras that are either fixed and mobile, the placement of the cameras about the stadium or venue are generally tied to an enterprise system. The movement of the game ball in a football game, for example, along with the players on the field is dynamic and unpredictable, and may not always be caught by the active camera having the best perspective. Thus, during a game, the large television screens typically provide only one view, which can be obstructed further by other players or officials, often destroying a critical angular view.

In addition, such large screens are often utilized to bombard audience members with advertisements, thereby cutting into data such as instant replays at a time when an audience member might otherwise wish to view instant replays, a current play or other event data. The audience members, therefore, essentially view the large screen at the behest of the camera operator and cannot select their own views or camera angles.

Based on the foregoing, the present inventors have found that such problems in venue environments can be solved through the use of hand held devices, such as PDAs, data/video-enabled cellular telephones, and other hand held wireless video-enabled devices. For example, the recent shift in the consumer electronics industry from an emphasis on analog technology to a preference for digital technology is largely based on the act that the former generally limits the user to a role of a passive recipient of information, while the latter is interactive and allows the user to control what, when, and how he or she receives and manipulates certain information. This shift in focus has resulted in the development and increasingly widespread use of a digital device generically referred to as a "personal digital assistant" (PDA).

These devices are hand held computing devices (i.e., hereinafter referred to as "hand held devices" or "handheld devices") that are becoming increasingly popular for storing and maintaining information. Although PDAs may be connected to a desktop personal computer or other PDAs via infrared, direct wire, or wireless communication links, PDAs and similar hand held devices, can be linked to remote networks, such as the internet, or local wireless resources, through available wireless communications techniques.

The most advanced data- and video-enabled wireless communication devices currently available in the marketplace take the form of a PDA (such as the Palm OS, Handspring OS, and Windows CE compatible hand held computers). Unlike personal computers, which are general-purpose devices

geared toward refining and processing information, PDAs are designed to capture, store and display information originating from various sources. Additionally, while a certain level of skill is required to use a personal computer effectively, PDAs are designed with the novice and non-computer user in mind.

A typical PDA includes a microprocessor, memory unit, a display, associated encoder circuitry, and selector buttons. It may optionally contain a clock and infrared emitter and receiver. A graphical user interface permits a user to store, retrieve and manipulate data via an interactive display. A PDA may also include a calendar, datebook, and one or more directories. The calendar shows a month of dates organized as rows and columns in the usual form. The datebook shows one day at a time and contains alphanumeric text entered in free format (typically, with a time of day and an event and/or name). Each directory contains entries consisting of a name field and a five form alphanumeric text field that can contain company names, addresses, telephone and fax numbers, email addresses, etc.

Entries may be organized alphabetically according to the name field and can be scanned or searched for by specifying a specific sequence of characters in the name field. A menu displayed via the graphical user interface permits a user to choose particular functions and directories. Most PDAs come equipped with a stylus, which is a plastic-tipped pen that a user utilizes to write in, for example, a "graffiti area" of the display and tap particular graphically displayed icons. Each icon is indicative of a particular activity or function. Touch screen interfaces, however, are also increasingly being implemented with PDAs to permit a user to activate software modules in the form of routines and subroutines therein.

Attempts have been made to provide venue-based, interactive entertainment to enhance the fan experience at live events. Such attempts utilize touch-screen technology integrated directly into seats at outdoor or indoor arenas. Such devices, however, due to their integration with the viewer seat, can be easily damaged by audience members. Systems that incorporate such devices are also expensive because they literally require miles of cable.

Some recently constructed arenas, for example, that implement such seat-integrated technology are requiring hundreds of miles of electronic cabling, including audiovisual, broadcast, and multiband lines. Such a plethora of large cables are expensive and require extra space, which often cannot be found in older stadiums, or would require a greater expense to integrate into newly built stadiums. The cost of retrofitting an older stadium with such technology can be staggering. Additionally, many fans who attend games or concerts with such technology integrated directly into the seats may find such a feature distracting.

Another problem faced by venue promoters and arena owners who integrate fixed technology directly into the seat is that such technology can quickly become obsolete. If a new facility is fitted with such electronic/data intensive technology, the technology may become quickly outdated, requiring an expensive update and/or retrofit.

The present inventors thus realize that a solution to these problems lies in the use of wireless hand held devices. By utilizing modern technology integrated with hand held devices, on-demand live action, instant replays from multiple camera angles, and real-time team and venue information may be readily provided to fans without the expense and problems associated with present in-seat integrated technical environments. Additionally, it is anticipated that the deployment of venue-based systems facilitating the use of such devices would be relatively inexpensive, at least in comparison to seat integrated systems. Finally, such systems will provide the venue attendee with increased mobility and freedom of use within and throughout the venue environment.

BRIEF SUMMARY

One aspect of the present invention provides improved methods and systems for delivering venue-based data such as video, audio, advertisements, video replay, statistics and other information to one or more hand held devices.

It is another aspect of the present invention to provide improved methods and systems for delivering venue-based data to hand held device(s) located remote from a venue and/or within the venue itself.

It is still another aspect of the present invention to provide methods and systems for the delivery of sports/entertainment data and related information to hand held devices through a wireless telecommunications network.

The above and other aspects of the invention are achieved as will now be further described. Methods and systems are disclosed for wirelessly providing venue-based data to one or more hand held devices. Venue-based data can be acquired from one or more venues. The venue-based data can be authenticated and wirelessly transmitted to the hand held device(s) through wireless telecommunications network, in response to authenticating the venue-based data, in order to permit the venue-based data to be accessible via the hand held device(s) at locations remote from the venue(s). The venue-based data can then be accessed via the hand held device(s). In addition, or in lieu of authentication of the venue-base data, the hand held device(s) and/or a user of the hand held device(s) can be authenticated. In response to such an authentication, the venue-based data can be transmitted to the hand held device(s), in order to permit the venue-based data to be accessible via the hand held device(s) at locations remote from the venue(s). That is, the hand held device(s) need not be located at a particular venue, but can be located elsewhere when receiving and accessing the venue-based data. For example, a user may be located at a different venue or at home or in-transit (e.g., commuter train) and access (e.g., view, listen, etc) the venue-based data using his or her hand held device via the wireless telecommunications network.

Venue-based data can include a variety of different data types or s single data type, depending upon design considerations. For example, venue-based data can be video data, audio data, and/or other types of sports and/or entertainment information, such as, video replays, statistics, purchasing, merchandise and concession information, and/or additional product, concession or advertisements. Such data may include information such as, for example, box scores, player matchups, animated playbooks, shot/hit/pitch charts, historical information, and offense-defense statistics. In the context of a concert venue, for example, as opposed to a sporting event, information pertaining to a particular musical group, for example, may be also transferred to the hand held device via the telecommunications network, along with advertising or sponsor information.

For example, a concert may take place at one particular venue and the hand held device may be located at a user's home. The user can utilize his or hand held device to access venue-based data associated with that particular concert, assuming proper authentication. Note that both the video data and other data described above generally comprise types of venue-based data. Venue-based data, as referred to herein, may thus include data and information, such as video, audio,

advertisements, promotional information, propaganda, historical information, statistics, event scheduling, and so forth.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of this invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objects, and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

FIG. **1** depicts a block diagram illustrating components of a hand held device, in which embodiments may be implemented;

FIG. **2** illustrates a pictorial representation of a hand held device, which may be utilized to implement an embodiment;

FIG. **3** depicts a pictorial representation of a hand held device adapted for receiving a module, in accordance with an alternative embodiment;

FIG. **4** illustrates a system for providing multiple perspectives through a hand held device of activities at a venue, in accordance with an alternative embodiment;

FIG. **5** depicts a system that provides multiple perspectives of a venue activity through a hand held device adapted to receive and process real time video data, in accordance with a preferred embodiment;

FIG. **6** depicts a system for providing multiple perspectives of activity at a venue through a hand held device adapted to receive and process real time video data, in accordance with a preferred embodiment;

FIG. **7** depicts a system for providing multiple perspectives for activity at a venue at a first time/perspective and a second time/perspective, in accordance with a preferred embodiment;

FIG. **8** illustrates a system for providing multiple perspectives through a hand held device of an activity at a venue, including the use of a wireless gateway, in accordance with a preferred embodiment of the present invention;

FIG. **9** depicts a system for providing multiple perspectives through a hand held device of a venue activity, in association with a wireless network, in accordance with a preferred embodiment;

FIG. **10** illustrates a diagram depicting network attributes of a wireless network that may be utilized in accordance with one or more embodiments;

FIG. **11** depicts a prior art overview display and a detail window;

FIG. **12** illustrates a prior art spherical image space divided into a series of w rows and q columns, with the rows and columns representing individual frames as photographed from a video camera;

FIG. **13** depicts the two-dimensional representation of the spherical image space of FIG. **12** into rows and columns of image frames;

FIG. **14** illustrates a prior art overview display, a detail window and a corresponding area indicia (geometric figure outline;

FIG. **15** depicts a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview image display for subsequent playback, which may be utilized in accordance with embodiments of the present invention;

FIG. **16** is a prior art flowchart providing a logical process for building an overview image, which may be utilized in accordance with embodiments of the present invention;

FIG. **17** illustrates a prior art flowchart illustrative of a logical process for playback interaction, which may be utilized in accordance with embodiments of the present invention;

FIG. **18** depicts a pictorial representation illustrative of a Venue Positioning System (VPS), which can be implemented in accordance with an alternative embodiment;

FIG. **19** illustrates in greater detail the Venue Positioning System (VPS) of FIG. **18**, in accordance with an alternative embodiment;

FIG. **20** depicts a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device, in accordance with an alternative embodiment; and

FIG. **21** illustrates a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras, in accordance with an alternative embodiment.

DETAILED DESCRIPTION

FIG. **1** depicts a schematic diagram illustrating a general hardware configuration of a hand held device **11**, which can be implemented in accordance an embodiment. Those skilled in the art can appreciate, however, that other hardware configurations with less or more hardware and/or modules may be utilized in carrying out the methods and systems (e.g., hand held device **11**) of the present invention, as may be further described herein. CPU **10** of hand held device **11**, can perform as a main controller operating under the control of operating clocks supplied from a clock oscillator. CPU **10** may be configured as a 16-bit microprocessor. External pins of CPU **10** are generally coupled to an internal bus **26** so that it may be interconnected to respective components.

SRAM **24** can be configured as a writeable memory that does not require a refresh operation and can be generally utilized as a working area of CPU **10**. SRAM (Static RAM) is generally a form of semiconductor memory (RAM) based on a logic circuit known as a flip-flop, which retains information as long as there is enough power to run the device. Font ROM **22** can be configured as a read only memory for storing character images (e.g., font) displayable on a display **18**. Examples of types of displays that may be utilized in accordance with display **18** include a TFT active matrix display, an illuminated LCD (Liquid Crystal Display), or other small scale displays being developed.

CPU **10** of the present embodiment drives display **18** utilizing, among other media, font images from Font ROM **22**, and images transmitted as data through wireless unit **17** and processed by image-processing unit **35**. EPROM **20** may be configured as a read only memory that is generally erasable under certain conditions and can be utilized for permanently storing control codes for operating respective hardware components and security data, such as a serial number.

IR controller **14** can be generally configured as a dedicated controller for processing infrared codes transmitted/received by an IR transceiver **116** and for capturing the same as computer data. Wireless unit **17** can be generally configured as a dedicated controller and transceiver for processing wireless data transmitted from and to a wireless communications network.

Port **12** can be connected to CPU **10** and can be temporarily attached, for example, to a docking station to transmit information to and from hand held device **11** to other devices, such as personal computers, retail cash registers, electronic kiosk devices, and so forth. Port **12** can also be configured, for example, to link with a modem, cradle or docking station,

which is well known in the art, and can permit network devices, a personal computer or other computing devices to communicate with hand held device **11**.

User controls **32** permit a user to enter data to hand held device **11** and initiate particular processing operations via CPU **10**. A user interface **33** may be linked to user controls **32** to permit a user to access and manipulate hand held device **11** for a particular purpose, such as, for example, viewing images on display **18**. Those skilled in the art will appreciate that user interface **33** may be implemented as a touch screen user interface, as indicated by the dashed lines linking display **18** with user interface **33**. In addition, CPU **10** may cause a sound generator **28** to generate sounds of predetermined frequencies from a speaker **30**. Speaker **30** may be utilized to produce music and other audio information associated with video data transmitted to hand held device **11** form an outside source.

Those skilled in the art can appreciate that additional electronic circuits or the like other than, or in addition to, those illustrated in FIG. **1** may be required to construct hand held device **11**. Such components, however, are not described in the present specification, because many aspects of them are well known in the art. For example, hand held television are available for receiving public television broadcasts, but the basic technology can be modified on such devices so that they may be adapted to (e.g., proper authentication, filters, security codes, or the like) receive venue-based RF transmissions from at least one venue-based RF source (e.g., a wireless camera, or data from a camera transmitted wirelessly through a transmitter). Those skilled in the art can thus appreciate that because of the brevity of the drawings described herein, only a portion of the connections between the illustrated hardware blocks is generally depicted. In addition, those skilled in the art will appreciate that hand held device **11** can be implemented as a specific type of a hand held device, such as a Personal Digital Assistant (PDA), paging device, WAP-enabled mobile phone, and other associated hand held computing devices well known in the art.

Hand held device **11** can be configured to permit images, such as television broadcast images, to be displayed on display **18** for a user to view. Hand held device **35** thus includes an image-processing unit **35** for processing images transmitted as data to hand held device **11** through wireless unit **17**. A tuner unit **34**, implemented as either a single tuner or a plurality of tuners, may be linked through internal bus **26** to CPU **10**. Additionally, a security unit **36** may be utilized to process proper security codes to thereby ensure that data transferred to and from hand held device **11** may be secure and/or permitted. Security unit **36** may be implemented as an optional feature of hand held device **11**. Security unit **36** can also be configured with routines or subroutines that are processed by CPU **10**, and which prevent wireless data from being transmitted/received from hand held device **11** beyond a particular frequency range, outside of a particular geographical area associated with a local wireless network, or absent authorized authorization codes (e.g., decryption).

Hand held device **11** can thus be configured with both wireless and wireline capabilities, depending on the needs and requirements of a manufacturer or customer. Such wireless capabilities include features such as those found in cellular telephone units, in accordance with carrying out embodiments of the present invention. Examples of hand held devices that can be utilized in accordance with the method and system of the present invention include the "Palm Pilot" PDA, manufactured and sold by Palm Computing, the Handspring Visor, the IBM Workpad or other Window CE compatible devices, RIM Blackberry-family paging devices, Motorola paging devices, and the Symbol SPT-family of PDA-type organizer devices. Customized, venue-specific devices (i.e., proprietary, limited use) may be also developed that incorporate hardware and software modules necessary to practice the methods and systems taught herein.

Those skilled in the art can appreciate that although hand held device **11** is generally illustrated in FIG. **1**, hand held device **11** can be implemented as a wireless application protocol (WAP) web-enabled cellular hand held device, such as a PDA, wireless telephone, or pager or a combination thereof. Hand held device **11** can be configured with features of combination cellular telephone/PDA devices. One example of such a device is the Handspring™ palmtop and associated cellular phone attachment, which is manufactured and sold by Handspring Inc. Other such devices include the Palm-Motorola phone, which permits users to access e-mail and store calendars and contact databases. Hand held devices may be also provided in the form of a multi-RF (Radio Frequency) receiver-enabled hand held television viewing device. Regardless of the type of hand held device implemented, it is anticipated that such hand held devices will be adapted to receive and process data via image-processing unit **35** for ultimate display as moving images on display unit **18**, in accordance with the present invention. Image-processing unit **35** may include image-processing routines, subroutines, software modules, and so forth, which perform image-processing operations.

FIG. **2** illustrates a pictorial representation of a hand held device **40**, which may be utilized to implement an embodiment. Those skilled in the art will appreciate that hand held device **40** of FIG. **2** is analogous to hand held device **11** of FIG. **1**. Hand held device **40** includes a display screen **42**, which is generally analogous to display **18** of FIG. **1**. Television images broadcast via radio frequency or digital data may be displayed on display screen **42** for a user to view. User controls **44** permit a user to manipulate images or text displayed on display screen **42**. User controls **44** of FIG. **2** are generally analogous to user controls **32** of FIG. **1**. A touch screen user interface may be further configured on the display screen **42** with hand held device **40** to permit a user to manipulate images/text displayed on display screen **42**.

FIG. **3** depicts a pictorial representation of a hand held device **56** adapted for receiving a module **50**, in accordance with an alternative embodiment. Hand held device **56** of FIG. **3** is generally analogous to hand held device **40** of FIG. **2**, the difference being that hand held device **56** may be adapted to receive a module/cartridge that permits hand held device **56** to function according to specific hardware and/or instructions contained in a memory location within module **50**. Module **50** may also be configured as a smart card, well known in the art. Such a smart card may provide, for example, access codes (e.g., decryption) to enable hand held device **56** to receive venue broadcasts. Note that as utilized herein, the term "module" may refer to a physical module, such as a cartridge. The term "module" may also refer to a software module composed of routines or subroutines that perform a particular function. Those skilled in the art can appreciate the meaning of the term module is based on the context in which the term is utilized. Thus, module **50** may be generally configured as a physical cartridge or smart card. The term "module" as utilized herein may also refer to a software module, depending on the context of the discussion thereof.

To illustrate the use of a physical module, such as module **50**, assume that a user may possess several such physical modules or cartridges. One module, when inserted into hand held device FIG. **3** may instruct hand held device **50** to function as a standard PDA, such as a Palm Pilot device. Another module, when inserted into hand held device FIG. **3**, may

instruct hand held device **56** to function as a portable television that receives wireless television data from a local wireless network and/or venue-based (short range) broadcasts.

Those skilled in the art can thus appreciate that hand held device **56** can be adapted to receive and cooperate with module **50**. Additionally, hand held device **56** includes a display screen **52** that is generally analogous to display screen **42** of FIG. **2** and display **18** of FIG. **1**. Hand held device **56** also includes user controls **54** that are generally analogous to user controls **44** of FIG. **2** and user controls **32** of FIG. **1**. Hand held device **56** of FIG. **3** is generally analogous to hand held device **11** of FIG. **1**. Thus, hand held device **56** can also implement touch screen capabilities through a touch screen user interface integrated with display screen **52**

Assuming module **50** is implemented as a smart card, instead of a cartridge, it is anticipated that similar features can be implemented in accordance with the smart card to insure that hand held device **56** includes touch screen user interface and video viewing capabilities. Smart cards are generally known in the art as credit-card sized plastic cards with an embedded computer chip. The chip can either be a microprocessor with internal memory or a memory chip with non-programmable logic. The chip connection can be configured via direct physical contact or remotely through a contactless electromagnetic interface.

Smart cards may be generally configured as either a contact or contactless smart card, or a combination thereof. A contact smart card requires insertion into a smart card reader (e.g., contained within hand held device **56**) with a direct connection to, for example, a conductive micromodule on the surface of the card. Such a micromodule may be generally gold plated. Transmission of commands, data, and card status takes place through such physical contact points.

A contactless card requires only close proximity to a reader. Both the reader and the card may be implemented with antenna means providing a contactless link that permits the devices to communicate with one another. Contactless cards can also maintain internal chip power or an electromagnetic signal (e.g., RF tagging technology). Two additional categories of smart codes, well known in the art, which are based on contact and contactless cards are the so-called Combi cards and Hybrid cards.

A Hybrid card generally may be equipped with two chips, each with a respective contact and contactless interface. The two chips are not connected, but for many applications, this Hybrid serves the needs of consumers and card issuers. The Combi card may be generally based on a single chip and can be generally configured with both a contact and contactless interface.

Chips utilized in such smart cards are generally based on microprocessor chips or memory chips. Smart cards based on memory chips depend on the security of the card reader for their processing and can be utilized when low to medium security requirements. A microprocessor chip can add, delete and otherwise manipulate information in its memory. Microprocessor-based memory cards typically contain microprocessor chips with 8, 16, and 32 bit architectures.

FIG. **4** illustrates a system **58** for providing multiple perspectives through a hand held device **60** of activities at a venue **80**, in accordance with an alternative embodiment. For illustrative purposes only, it may be assumed that venue **80** of FIG. **4** is a stadium venue, such as a football stadium. Cameras **71**, **73**, **75**, and **77** are respectively positioned at strategic points about venue **80** to capture the best images of activity taking place within venue **80**. Cameras **71**, **73**, **75**, **77** are respectively linked to transmitters **70**, **72**, **74**, and **76**. Each of these transmitters may be configured as equipment, which feeds a radio signal to an antenna for transmission.

The antenna may be integrated with the transmitter. Transmitters are well known in the art, and include active components, such as a driver, well known in the art. Transmitters also include passive components, such as a TX filter, also well known in the art. These components, when operating together, impress a signal onto a radio frequency carrier of the correct frequency by immediately adjusting its frequency, phase, or amplitude, thereby providing enough gain to the signal to project it to its intended target (e.g., a hand held device located within the venue).

A hand held device **60** may be held by a user at a stadium seat within view of the activity at the venue **80**. Hand held device **60** is generally analogous to hand held device **11** of FIG. **1** and hand held device **40** of FIG. **2**. Hand held device **60** of FIG. **4** may be configured as a hand held device adapted for use with a cartridge/module, such as module **50** of hand held device **56** of FIG. **3**. The cartridge/module may contain the electronics (e.g., tuner, filter, etc.) to allow a hand held device to be adapted for receiving venue-based data. Hand held device **60** includes a display screen **61** (e.g. display **18** of FIG. **1**).

Additionally, display screen **61** of hand held device **60** may be configured with a touch screen user interface displayable and operable on display screen **61**. Those skilled in the art can appreciate that touch screen interfaces are well known in the art and further explanation thereof may be not necessary. Display screen **61** includes a touch screen display area **65** that may be associated with camera **71**. Thus, images captured by camera **71** are transmitted from transmitter **70**, which is linked to camera **71**. Additionally, display screen **61** includes touch screen display areas **69**, **63**, and **67** which are respectively associated with cameras **73**, **75**, and **77**.

Cameras **71**, **73**, **75**, and **77** are respectively labeled C_1, C_2, C_3, and C_N to indicate that a plurality of cameras may be utilized in accordance with system **58** to view activities taking place within venue **80**, such as a football game or concert. Although only four cameras are illustrated in FIG. **4**, those skilled in the art will appreciate that additional or fewer cameras may be also implemented in accordance with system **58**. Touch screen display areas **65**, **69**, **63**, and **67** are also respectively labeled C_1, C_2, C_3, and C_N to illustrate the association between these display areas and cameras **71**, **73**, **75**, and **77**.

Hand held device **60** may be integrated with a plurality of tuners, as illustrated by tuners **62**, **64**, **66**, and **68**. Such tuners can be activated via user controls on hand held device **60** and/or via touch screen icons or areas displayed on display screen **61** that are associated with each tuner. Such icons/areas may be respectively displayed within display areas **65**, **69**, **63** and **67**, or within a separate display area of display screen **61**. A user accesses tuner **62**, for example, to retrieve real-time video images transmitted from transmitter **70** for camera **71**. Likewise, a user can access tuner **64** to retrieve real-time video images transmitted from transmitter **72** for camera **73**.

In addition, a user can access tuner **74** to retrieve real-time video images transmitted from transmitter **74** for camera **75**. Finally, user can access tuner **68** to retrieve real-time video images transmitted from transmitter **76** for camera **77**. In the example depicted in FIG. **4**, a football player **82** is participating in a football game within venue **80**. Cameras **71**, **73**, **75**, and **77** capture moving images (e.g., video data) of the football player **82** from various angles and transmit these images to hand held device **60**.

FIG. **5** depicts a system **59** that provides multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data, in accordance with a preferred embodiment. Note that in FIG. **4** and FIG. **5** analogous parts are indicated by identical reference numerals. Thus, for example, cameras **71**, **73**, **75**, and **77** of FIG. **5** are analogous to cameras **71**, **73**, **75**, and **77** of FIG. **4**. Hand held device **60** of FIG. **5** is also analogous to hand held device **60** of FIG. **4** and includes similar features thereof.

Hand held device **60** of FIG. **5**, however, can be configured to receive wireless real time video data transmitted for cameras **71**, **73**, **75**, and **77** respectively through data transmitters **102**, **104**, **106**, and **108** to server **100** and thereafter to wireless data transmitter/receiver **110**. Note that wireless data transmitter/receiver **110** is analogous to wireless unit **17** of FIG. **1**. Hand held device **60** of FIG. **5** is also analogous to hand held device **11** of FIG. **1**.

Hand held device **60** of FIG. **5** also incorporates a touch screen user interface, as described herein with respect to analogous hand held device **60** of FIG. **4**. The difference between system **58** of FIG. **4** and system **59** of FIG. **5** ties in the inclusion of digital transmitters **102**, **104**, **106**, and **108** which are respectively linked to cameras **71**, **73**, **75**, and **77** of FIG. **5**. In the illustration of FIG. **5**, cameras **71**, **73**, **75**, and **77** may be configured as high definition video cameras which capture real time images of events or activities taking place within venue **80**, such as real time video footage of football player **82**.

A captured image of football player **82** can be transferred from one or more of video cameras **71**, **73**, **75**, and **77** of FIG. **5** and transmitted through a respective digital transmitter, such as digital transmitter **102**, **104**, **106** or **108** and transmitted via wired and/or wireless communications to server **100**. The server **100** then processes the video data received from one or more of the digital transmitters and formats the video data for transmission via wireless means to wireless data transmitter/receiver **100**, which may be integrated with hand held device **100**. Transmitter/receiver **100** can communicate with the various components of hand held device **60**, such as a CPU, image processing unit, memory units, and so forth.

Those skilled in the art can appreciate that although real time video data may be transmitted to server **100**, captured past video images may also be stored within server **100** and transferred to hand held device **60** for display at display screen **61**. For example, instant replays may be transferred as video data to hand held device **60** upon the request of a user of hand held device **60**. Such instant replay footage can be displayed on display screen **61** for the user to view.

FIG. **6** illustrates a system **79** for providing multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data from at least one wide-angle and/or panoramic video camera **114**, in accordance with a preferred embodiment. In system **79** of FIG. **6**, wide-angle/panoramic (hereinafter referred to as "panoramic") video camera **114** may be configured as a high-definition panoramic video camera that captures images of activities taking place at venue **80**. In the example illustrated in FIG. **6**, panoramic video camera **114** can capture of images of a football game and one or more football players, such as football player **82**.

A data transmitter **112** may be linked to panoramic video camera **114**. Video data captured by panoramic video camera **114** may be transferred to data transmitter **112**, which thereafter transmits the video data to server **100** via a direct link or wireless link, depending on the needs or requirements of the promoters or venue owners. Note that this is also true of the system described in FIG. **6**. Server **100** of FIG. **6** is analogous to server **100** of FIG. **5**. Thus, in the case of FIG. **5**, video data may be transmitted from one or more of data transmitters **102**, **104**, **106**, and **108** via a direct wire/cable link or through wireless transmission means, such as through a wireless network.

Those skilled in the art will appreciate, of course, that hand held device **60** of FIG. **6** is analogous to hand held devices depicted in FIGS. **1-5** herein. In FIGS. **4**, **5**, and **6**, like or analogous parts are identified by identical reference numerals. Thus, images captured by panoramic video camera **114** of activity taking place at venue **80** may be displayed as real time video images or instant replay data on display screen **61** of hand held device **60**.

FIG. **7** depicts a system **89** for providing multiple perspectives for activity at a venue **120** at a first time and/or perspective (Time **1**) and a second time and/or perspective (Time **2**), in accordance with a preferred embodiment. In FIGS. **4**, **5**, **6**, and **7**, like or analogous parts are indicated by identical reference numerals. Thus, in system **89** of FIG. **7**, an event, in this case illustrated as a hockey game, is taking place within venue **120**. Venue **120** may be, for example, a hockey arena. Panoramic video camera **114** may be linked to data transmitter **112**.

As explained previously, data transmitter **112** may be linked to server **100** via a direct link, such as a transmission cable or line, or through wireless communication means, such as through a wireless network. Server **100** can also communicate with hand held device **60** through a wireless network or other wireless communication means by transmitting data through such a network or wireless communications means to wireless data transmitter/receiver **110**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**.

Thus, a video image **124** of a hockey player **122** can be captured as video data by panoramic video camera **114**, along with a video image **126** of a hockey player **123** and displayed within display screen **61** of hand held device **60** as indicated at Time **1**. Video image **124** and **126** can be displayed within a grid-like interface on display screen **61**. Note that in the illustration of FIG. **7**, display screen **61** may be divided into four sections.

When a user touches, for example the area or section of display screen **61** in which video image **124** may be displayed, the entire display area of display screen **61** can be then consumed with a close-up video shot of video image **124**, as indicated at Time **2**, thereby providing the user with a closer view of hockey player **122**. Those skilled in the art can appreciate that the touch screen display area of display screen **61** can be arranged with graphical icons and/or user-controls that perform specific pan and zoom functions. Such icons/user-controls, when activated b a user, permit the user to retrieve panned/zoomed images of events taking place in real time within venue **120**.

Note that although only one panoramic video camera **114** and one data transmitter **112** are illustrated in FIG. **7**, a plurality of panoramic video cameras, servers, and data transmitters may be implemented in accordance with the present invention to capture the best video images, image-processing, and signal capacity to users, whether real time or otherwise, of events taking place at venue **120**.

FIG. **8** illustrates a system **92** for providing multiple perspectives through hand held device **60** of an activity at a venue **130**, including the use of a wireless gateway **124**, in accordance with a preferred embodiment. Those skilled in the art can appreciate that wireless gateway **124** may be configured as an access point for a wireless LAN (Local Area Network). Access points for wireless LAN networks and associated

wired and wireless hardware (e.g., servers, routers, gateways, etc.) are well known in the art and may be utilized in accordance with the present invention described herein. Again, note that in FIGS. **4**, **5**, **6**, **7**, and **8**, like or analogous parts are indicated by identical reference numerals. System **92** of FIG. **8** is analogous to system **89** of FIG. **7**, the difference being in the nature of the venue activity. Venue **130** can be, for example, a concert hall or stadium configured with a sound stage.

Gateway **124** can be configured as a communications gateway through which data may enter or exit a communications network, such as wireless network **152** illustrated in FIG. **9** for a large capacity of user hand device **60** users. Wireless network **152** may be configured as a wireless LAN network. Hand held device **60** can be configured to communicate and receive transmissions from such a wireless LAN network based on device identification (e.g., device address). Communication with hand held devices, such as hand held device **60**, however, may also be achieved through RF (Radio Frequency) broadcasts, thereby not requiring two-way communication and authentication between, for example, a wireless LAN network and such hand held devices. A broadcast under such a scenario may also require that such a hand held device or hand held devices possess decryption capabilities or the like in order to be authorized to receive transmissions from the venue.

The remaining elements of FIG. **8** are also analogous to the elements depicted in the previous drawings, with the addition of wireless gateway **124**, which may be linked to server **100** and may be in communication with several wireless data transmitters/receivers **110** and one or more electronic hand held devices, including hand held device **60**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**. One or more panoramic video cameras, such as panoramic video camera **114**, can be positioned at a venue **130** at locations that capture images not only of the events taking place on a concert stage, but also events taking place within the stadium itself.

If an audience member **140**, for example, happens to be walking along a stadium aisle within view of panoramic video camera **114**, the audience member's video image can be displayed as video image **144** within display screen **61** of hand held device **60**, as indicated at Time **1**. Likewise, panoramic video camera **114** captures images of band member **138** whose video image can be displayed as video image **142** within a display area of display screen **61**, as indicated at Time **1**.

Thus, a user of hand held device **60** can view not only the events taking place on a central performing platform of venue **130**, but also other events within the arena itself. The band member **138** may be located on a central performing platform (not shown) of venue **130** when panoramic video camera **114** captures real-time video images of band member **138**. The user may also, for example, wish to see a close-up of audience member **140**. By activating user controls and/or a touch screen interface integrated with display screen **61**, the user can, for example, pan or zoom to view a close-up video shot of audience member **140**, as indicated at Time **2**.

Captured video images are transferred from panoramic video camera **114** as video data through transmitter **112** to server **100** and through wireless gateway **124** to wireless data transmitter/receiver **110**. Although a single server **100** is illustrated in FIG. **8**, those skilled in the art can appreciate that a plurality of servers may be implemented in accordance with the present invention to process captured and transmitted video data. Based on the foregoing, those skilled in the art can appreciate that video data may be simultaneously transferred from server **100** or a plurality or servers to literally thousands of hand held devices located within the range of the wireless network and/or wireless gateways associated with venue **130**.

FIG. **9** illustrates a system **150** for providing multiple perspectives through hand held device **60** of an activity at a venue **130** in association with a wireless network **152**, in accordance with a preferred embodiment. System **150** of FIG. **9** is analogous to system **92** of FIG. **8**, the difference noted in the inclusion of wireless network **152**. Thus, in FIG. **8** and FIG. **9**, like or analogous parts are indicated by identical reference numerals. Video data captured by a camera or cameras, such as panoramic video camera **114**, may be transferred to data transmitter **112**, which transmits the video data to wireless network **152**. Wireless network **152** then retransmits the data, at the request of authorized users of hand held devices, such as hand held device **60**, to wireless data transmitters/receivers, such as transmitter/receiver **110** integrated with hand held device **60**.

Those skilled in the art can appreciate that wireless network **152** may also receive and retransmit other data, in addition to video data. For example, a server or other computer system may be integrated with wireless network **152** to provide team and venue data, which can then be transferred to wireless data transmitter receiver **110** from wireless network **152** and displayed thereafter as team and venue information within display screen **61** of hand held device **60**. Other data that may be transferred to hand held device for display include real-time and historical statistics, purchasing, merchandise and concession information, and additional product or service advertisements.

Such data can include box scores, player matchups, animated play-books, shot/hit/pitch charts, historical information, and offense-defense statistics. In a concert venue, for example, as opposed to a sporting event, information pertaining to a particular musical group can be also transferred to the hand held device, along with advertising or sponsor information. Note that both the video data and other data described above generally comprise types of venue-based data. Venue-based data, as referred to herein, may include data and information, such as video, audio, advertisements, promotional information, propaganda, historical information, statistics, event scheduling, and so forth, associated with a particular venue and generally not retrievable through public networks.

Such information can be transmitted together with video data received from data transmitter **112**. Such information may be displayed as streaming data within display area **61** of hand held device **60** or simply stored in a database within hand held device **60** for later retrieval by the user. An example of a wireless network that may be utilized to implement wireless network **152** can be Bluetooth, which is described in greater detail herein, and was conceived originally to make up for the shortcomings of infrared technologies (IR). Because IR cannot be utilized to penetrate walls, carry data heavy signals, or operate within devices that are not in line of sight, Bluetooth, which is becoming well-known the art, can be configured as or with wireless network **152**.

FIG. **10** illustrates an entity diagram **170** depicting network attributes of wireless network **152** that may be utilized in accordance with one or more embodiments. Wireless network **152** of FIG. **10** is analogous to wireless network **152** of FIG. **9**. Wireless network **152** as illustrated in FIG. **10** can be configured as a variety of possible wireless networks. Thus, entity diagram **170** illustrates attributes of wireless network **152**, which may or may not be exclusive of one another.

Those skilled in the art can appreciate that a variety of possible wireless communications and networking configurations may be utilized to implement wireless network **152**.

Wireless network **152** may be, for example, implemented according to a variety of wireless protocols, including cellular, Bluetooth, and RF or direct IR communications. Wireless network **152** can be implemented as a single network type (e.g., Bluetooth) or a network based on a combination of network types (e.g., GSM, CDMA, etc).

Wireless network **152** may be configured with teachings/aspects of CDPD (Cellular Digital Packet Data) networks well known in the networking arts. CDPD network **154** is illustrated in FIG. **10**. CDPD may be configured as a TCP/IP based technology that supports Point-to-Point (PPP) or Serial Line Internet Protocol (SLIP) wireless connections to mobile devices, such as the hand held devices described and illustrated herein. Cellular service is generally available throughout the world from major service providers. Data can be transferred utilizing CDPD protocols.

Current restrictions of CDPD are not meant to limit the range or implementation of the method and system described herein, but are described herein for illustrative purposes only. It is anticipated that CDPD will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may preferably be also configured with teachings/aspects of a Personal Area Network **156** or Bluetooth, as described herein, Bluetooth was adopted by a consortium of wireless equipment manufacturers referred to at the Bluetooth Special Interest Group (BSIG), and has emerged as a global standard for low cost wireless data and voice communication. Current specifications for this standard call for a 2.4 GHz ISM frequency band. Bluetooth technology is generally based on a short-range radio transmitter/receiver built into small application specific circuits (ASICS, DSPs) and embedded into support devices, such as the hand held devices described and illustrated herein.

The Bluetooth standard permits up to 100 mw of power, which can increase the range to 100 M. In addition, Bluetooth can support several data channels. Utilizing short data packets and frequency hopping of up to 1600 hops per second, Bluetooth is a wireless technology that can be utilized to enable the implementation of the methods and systems described herein. Current restrictions of Bluetooth are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated Bluetooth will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of GSM network **158**. GSM (Global System for Mobile Communication) and PCS (Personal Communications Systems) networks, both well known in the telecommunications arts, generally operate in the 800 MHz, 900 MHz, and 1900 MHz range. PCS initiates narrowband digital communications in the 900 MHz range for paging, and broadband digital communications in the 1900 MHz band for cellular telephone service. In the United States, PCS 1900 is generally equivalent to GSM 1900, GSM operates in the 900 MHz, 1800-1900 MHz frequency bands, while GSM 1800 is widely utilized throughout Europe and many other parts of the world.

In the United States, GSM 1900 is generally equivalent to PCS 1900, thereby enabling the compatibility of these two types of networks. Current restrictions of GSM and PCS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GSM and PCS will be continually developed, and that aspects of such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also utilize teachings/aspects of GPRS network **160**. GPRS technology, well-known in the telecommunications arts, bridges the gap between current wireless technologies and the so-called "next generation" of wireless technologies referred to frequently as the third-generation or 3G wireless technologies. GPRS is generally implemented as a packet-data transmission network that can provide data transfer rates up to 115 Kbps. GPRS can be implemented with CDMA and TDMA technology and supports X.25 and IP communications protocols, all well known in the telecommunications arts. GPRS also enables features, such as Voice over IP (VoIP) and multimedia services. Current restrictions of GPRS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GPRS will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be implemented utilizing teaching/aspects of a CDMA network **162** or CDMA networks. CDMA (Code Division Multiple Access) is a protocol standard based on IS-95 CDMA, also referred to frequently in the telecommunications arts as CDMA-1. IS-95 CDMA is generally configured as a digital wireless network that defines how a single channel can be segmented into multiple channels utilizing a pseudo-random signal (or code) to identify information associated with each user. Because CDMA networks spread each call over more than 4.4 trillion channels across the entire frequency band, it is much more immune to interference than most other wireless networks and generally can support more users per channel.

Currently, CDMA can support data at speeds up to 14.4 Kbps. Wireless network **152** may also be configured with a form of CDMA technology known as wideband CDMA (W-CDMA). Wideband CDMA may be also referred to as CDMA 2000 in North America. W-CDMA can be utilized to increase transfer rates utilizing multiple 1.25 MHz cellular channels. Current restrictions of CDMA and W-CDMA are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that CDMA and W-CDMA will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may be also implemented utilizing teachings/aspects of paging network **164**. Such paging networks, well known in the telecommunications arts, can be implemented in accordance with the present invention to enable transmission or receipt of data over the TME/X protocol, also well known in the telecommunications arts. Such a protocol enables notification in messaging and two-way data coverage utilizing satellite technology and a network of base stations geographically located throughout a particular geographical region. Paging network **162** can be configured to process enhanced 2-way messaging applications.

Unified messaging solutions can be utilized in accordance with wireless network **152** to permit carriers and Internet service providers to manage customer e-mail, voice messages and lax images and can facilitate delivery of these communications to PDAs, telephony devices, pagers, personal computers and other capable information retrieval devices, wired or wireless.

Current restrictions of such paging networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that such paging networks, including those based on the TME/X protocol, will be continually developed and

that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of TDMA networks **166**. TDMA (Time Division Multiple Access) is a telecommunications network utilized to separate multiple conversation transmissions over a finite frequency allocation of through-the-air bandwidth. TDMA can be utilized in accordance with the present invention to allocate a discrete amount of frequency bandwidth to each user in a TDMA network to permit many simultaneous conversations or transmission of data. Each user may be assigned a specific timeslot for transmission. A digital cellular communications system that utilizes TDMA typically assigns 10 timeslots for each frequency channel.

A hand held device operating in association with a TDMA network sends bursts or packets of information during each timeslot. Such packets of information are then reassembled by the receiving equipment into the original voice or data/information components. Current restrictions of such TDMA networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that TDMA networks will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of Wireless Intelligent Networks (WINs) **168**. WINs are generally known as the architecture of the wireless switched network that allows carriers to provide enhanced and customized services for mobile telephones. Intelligent wireless networks generally include the use of mobile switching centers (MSCs) having access to network servers and databases such as Home Location Registers (HLRs) and Visiting Location Registers (VLRs), for providing applications and data to networks, service providers and service subscribers (wireless device users).

Local number portability allows wireless subscribers to make and receive calls anywhere—regardless of their local calling area. Roaming subscribers are also able to receive more services, such as call waiting, three-way calling and call forwarding. A HLR is generally a database that contains semi-permanent mobile subscriber (wireless device user) information for wireless carriers' entire subscriber base.

A useful aspect of WINs for the present invention is enabling the maintenance and use of customer profiles within an HLR/VLR-type database. Profile information may be utilized for example with season ticket holders and/or fans of traveling teams or shows. HLR subscriber information as used in WINs includes identity, service subscription information, location information (the identity of the currently serving VLR to enable routing of communications), service restrictions and supplementary services/information. HLRs handle SS7 transactions in cooperation with Mobile Switching Centers and VLR nodes, which request information from the HLR or update the information contained within the HLR. The HLR also initiates transactions with VLRs to complete incoming calls and update subscriber data. Traditional wireless network design is generally based on the utilization of a single HLR for each wireless network, but growth considerations are prompting carriers to consider multiple HLR topologies.

The VLR may be also configured as a database that contains temporary information concerning the mobile subscribers currently located in a given MSC serving area, but whose HLR may be elsewhere. When a mobile subscriber roams away from the HLR location into a remote location, SS7 messages are used to obtain information about the subscriber from the HLR, and to create a temporary record for the subscriber in the VLR.

Signaling System No. 7 (referred to as SS7 or C7) is a global standard for telecommunications. In the past the SS7 standard has defined the procedures and protocol by which network elements in the public switched telephone network (PSTN) exchange information over a digital signaling network to affect wireless and wireline call setup, routing, control, services, enhanced features and secure communications. Such systems and standards may be utilized to implement wireless network **152** in support of venue customers, in accordance with the present invention.

Improved operating systems and protocols allow Graphical User Interfaces (GUIs) to provide an environment that displays user options (e.g., graphical symbols, icons or photographs) on a wireless device's screen. Extensible Markup Language ("XML") is generally a currently available standard that performs as a universal language for data, making documents more interchangeable. XML allows information to be used in a variety of formats for different devices, including PCs, PDAs and web-enabled mobile phones.

XML enables documents to be exchanged even where the documents were created and/or are generally used by different software applications. XML may effectively enable one system to translate what another system sends. As a result of data transfer improvements, wireless device GUIs can be utilized in accordance with a hand held device and wireless network **152**, whether configured as a paging network or another network type, to render images on the hand held device that closely represent the imaging capabilities available on desktop computing devices.

Those skilled in the art can appreciate that the system and logical processes described herein relative to FIG. **11** to FIG. **17** are not limiting features of the present invention. Rather, FIG. **11** to FIG. **17** provide examples of image-processing systems and logical processes that can be utilized in accordance with the present invention. Such a system and logical processes represent one possible technique, which may be utilized in accordance with one or more embodiments of the present invention to permit a user of a hand held device to manipulate video images viewable on a display screen of the hand held device.

FIG. **11** thus illustrates a prior art overview display **200** and a detail window **210** that may be utilized with embodiments of the present invention. The overview image display **200** is a view representative of a 360° rotation around a particular point in a space. While a complete rotational view may be utilized in accordance with preferred embodiments of the present invention, one of ordinary skill in the computer arts will readily comprehend that a semi-circular pan (such as used with wide-angle cameras) or other sequence of images could be substituted for the 360 degree rotation without departing from the subject invention. The vantage point is generally where the camera was located as it panned the space. Usually the scene is captured in a spherical fashion as the camera pans around the space in a series of rows as depicted in FIG. **12**. The space is divided into w rows **220-224** and q columns **230-242** with each q representing another single frame as shown in FIG. **12**.

User control over the scene (e.g., rotation, pan, zoom) may be provided by pressing a touch screen display icon or moving a cursor displayed on a display screen of a hand held device, such as the hand held devices described herein. User control over the scene may also be provided by manipulating external user controls integrated with a hand held device (e.g., user controls **44** and **54** of FIG. **2** and FIG. **3**). Movement from

a frame in the overview image display to another frame is in one of eight directions as shown in FIG. **13**. The user may interact with the video representation of the space one frame at a time. Each individual frame is an image of one of the pictures taken to capture the space as discussed above. The individual frames may be pieced together.

Interacting with a video one frame at a time results in the ability to present a detailed view of the space, but there are severe limitations. First, the interaction results in a form of tunnel vision. The user can only experience the overview image display as it unfolds a single frame at a time. No provision for viewing an overview or browsing a particular area is provided. Determining where the current location in the image display is, or where past locations were in the overview image display is extremely difficult. Such limitations can be overcome by creating of a motif not dissimilar to the natural feeling a person experiences as one walks into a room.

Another limitation of a simple overview viewer is that there is no random access means. The frames can only be viewed sequentially as the overview image display is unfolded. As adapted for use in accordance with the present invention, this problem has been overcome by providing tools to browse, randomly select and trace selected images associated with any overview image.

FIG. **14** illustrates a prior art overview image **300**, a detail window **310** and a corresponding area indicia, in this case a geometric figure outline **320**. The detail window **310** corresponds to an enlarged image associated with the area bounded by the geometric figure outline **320** in the overview image **300**. As the cursor is moved, the location within the overview image **300** may be highlighted utilizing the geometric figure outline **320** to clearly convey what location the detail window **310** corresponds.

One of ordinary skill in the computer arts will readily comprehend that reverse videoing the area instead of enclosing it with a geometric figure would work equally well. Differentiating the area with color could also be used without departing from the invention. A user can select any position within the overview image, press the cursor selection device's button (for example, user controls in the form of touch screen user interface buttons or icons), and an enlarged image corresponding to the particular area in the overview display is presented in the detail window **310**. Thus, random access of particular frames corresponding to the overview image may be provided.

FIG. **15** illustrates a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview display for subsequent playback. The overview image **400** has a detail window **410** with an enlarged image of the last location selected in the overview image **470**. Each of the other cursor locations traversed in the overview image **420**,**430**,**440**,**450** and **460** are also enclosed by an outline of a geometric figure to present a trace to the user.

Each of the cursor locations may be saved, and because each corresponds to a particular frame of the overview image, the trace of frames can be replayed at a subsequent time to allow another user to review the frames and experience a similar presentation. Locations in the detailed window and the overview image can also be selected to present other images associated with the image area, but not necessarily formed from the original image.

For example, a china teacup may appear as a dot in a china cabinet, but when the dot is selected, a detailed image rendering of the china teacup could appear in the detailed window. Moreover, a closed door appearing in an image could be selected and result in a detailed image of a room located behind the door even if the room was not visible in the previous image. Finally, areas in the detailed window can also be selected to enable further images associated with the detailed window to be revealed. Details of objects within a scene are also dependent on resolution capabilities of a camera. Cameras having appropriate resolution and/or image processing capabilities are preferably used in accordance with certain aspects of the present invention.

The overview image was created as discussed above. To assist one of ordinary skill in the art to make and use the invention, a more detailed discussion of the necessary processing is presented below with reference to FIG. **16** and FIG. **17** herein.

FIG. **16** depicts a prior art flowchart providing a logical process for building an overview image display. Such a logical process may be utilized in accordance with the present invention, but is not a necessary feature of the present invention. Those skilled in the art will appreciate that such a logical process is merely an example of one type of image-processing algorithm that may be utilized in accordance with embodiments of the present invention. For example, such a logical process may be implemented as a routine or subroutine that runs via image-processing unit **35** of FIG. **1** in a hand held device. Those skilled in the art can appreciate that the logical process described with relation to FIGS. **16** and **17** herein are not limiting features of the present invention.

Such logical processes, rather, are merely one of many such processes that may be utilized in accordance with the present invention to permit a user to manipulate video images displayed via a display screen of a hand held device. Navigable movie/video data in the form of images input to the hand held device to form individual images can be thus processed, as illustrated at function block **500**. User specified window size (horizontal dimension and vertical dimension) may be entered, as illustrated at function block **504**.

Image variables can be specified (horizontal sub-sampling rate, vertical sub-sampling rate, horizontal and vertical overlap of individual frame images, and horizontal and vertical clip (the number of pixels are clipped from a particular frame in the x and y plane)), as depicted at function block **508**. Function blocks **500**,**504** and **508** are fed into the computation function block **510** where the individual frames are scaled for each row and column, and the row and column variables are each initialized to one.

Then a nested loop can be invoked to create the overview image. First, as indicated at decision block **512**, a test is performed to determine if the maximum number of rows has been exceeded. If so, then the overview image is tested to determine if its quality is satisfactory at decision block **520**. If the quality is insufficient, the user may be provided with an opportunity to adjust the initial variables, as illustrated at function blocks **504** and **508**. The processing is then repeated. If however, the image is of sufficient quality, it can be saved and displayed for use, as depicted at block **560**.

If the maximum rows has not been exceeded as detected in decision block **512**, then another test can be performed, as illustrated at decision block **514**, to determine if the column maximum has been exceeded. If so, then the row variable can be incremented and the column variable can be reset to one at function block **518** and control flows to input block **520**. If the column maximum has not been exceeded, then the column variable may be incremented and the sub-image sample frame can be retrieved, as depicted at input block **520**. Then, as illustrated at function block **530**, the frame may be inserted correctly in the overview image.

The frame may be inserted at the location corresponding to (Vsub*row*col)+Hsub*col; where row and col refer to the

variables incremented in the nested loop, and Vsub and Hsub are user specified variables corresponding to the horizontal and vertical sub sampling rate. Finally, the incremental overview image can be displayed based on the newly inserted frame as depicted at display block **540**. Thereafter, the column variable can be reset to one and processing can be passed to decision block **512**.

A computer system corresponding to the prior art method and system depicted in FIG. **11** to **17** may be generally interactive. A user may guess at some set of parameters, build the overview image, and decide if the image is satisfactory. If the image is not satisfactory, then variables can be adjusted and the image is recreated. This process can be repeated until a satisfactory image results, which may be saved with its associated parameters. The picture and the parameters can be then input to the next set of logic.

Such features may or may not be present with the hand held device itself. For example, images may be transmitted from a transmitter, such as data transmitter **112** of FIG. **7**, and subroutines or routines present within the server itself may utilize predetermined sets of parameters to build the overview image and determine if the image is satisfactory, generally at the request of the hand held device user. A satisfactory image can be then transmitted to the hand held device. Alternatively, image-processing routines present within an image-processing unit integrated with the hand held device may operate in association with routines present within the server to determine if the image is satisfactory, and/or to manipulate the image (e.g., pan, zoom).

FIG. **17** depicts a prior art flowchart illustrative of a logical process for playback interaction. The logical process illustrated in FIG. **17** may be utilized in accordance with a preferred or alternative embodiment, depending of course, upon design considerations and goals. Playback interaction may commence, as illustrated at label **600**, which immediately flows into function block **604** to detect if user controls have been activated at the hand held device. Such user controls may be configured as external user controls on the hand held device itself (e.g., buttons, etc.), or via a touch screen user interface integrated with hand held device display screen.

When a touch screen user input or user control button press is detected, a test can be performed to determine if a cursor is positioned in the overview portion of the display. If so, then the global coordinates can be converted to overview image coordinates local to the overview image as shown in output block **612**. The local coordinates can be subsequently converted into a particular frame number as shown in output block **614**. Then, the overview image is updated by displaying the frame associated with the particular location in the overview image and control flows via label **600** to function block **604** to await the next button press.

If the cursor is not detected in the overview image as illustrated at decision block **610**, then another test may be performed, as indicated at decision block **620**, to determine if the cursor is located in the navigable player (detail window). If not, then control can be passed back via label **600** to function block **604** to await the next user input. However, if the cursor is located in the detail window, then as depicted a function block **622**, the direction of cursor movement may be detected. As depicted at function block **624**, the nearest frame can be located, and as illustrated at decision block **626**, trace mode may be tested.

If trace is on, then a geometric figure can be displayed at the location corresponding to the new cursor location in the overview image. The overview image may be then updated, and control can be passed back to await the next user input via user controls at the hand held device and/or a touch screen user interface integrated with the hand held device. If trace is not on, the particular frame is still highlighted as shown in function block **630**, and the highlight can be flashed on the overview image as illustrated at output block **632**. Thereafter, control may be returned to await the next user input.

Although the aforementioned logical processes describe the use of a cursor as a means for detecting locations in a panorama, those skilled in the art can appreciate that other detection and tracking mechanisms may be utilized, such as, for example, the pressing of a particular area within a touch screen display.

FIG. **18** depicts a pictorial representation illustrative of a Venue Positioning System (VPS) **700** in accordance with an alternative embodiment. FIG. **18** illustrates a stadium venue **701** which is divided according to seats and sections. Stadium venue **701** may be utilized for sports activities, concert activities, political rallies, or other venue activities. Stadium venue **701** is divided, for example, into a variety of seating sections A to N. For purposes of simplifying this discussion, VPS **700** is described in the context of sections A to C only.

A venue positioning system (VPS) device **704** is positioned in section A of stadium venue **701**, as indicated at position A2. A VPS device **702** is located within section A at position A1. In the illustration of FIG. **18**, it is assumed that VPS device **702** is located at the top of a staircase, while VPS device **704** is located at the bottom of the staircase, and therefore at the bottom of section A, near the sports field **711**. A VPS device **706** is located near the top of section B at position B1. A VPS device **708** is located at the bottom of section B at position B2, near sports field **711**. Similarly, in section C, venue positioning devices **10** and **712** are respectively located at positions C1 and C2.

A hand held device **703** may be located at a seat within section A. For purposes of this discussion, and by way of example only, it is assumed that hand held device **703** is being operated by a stadium attendee watching a sporting event or other venue activity taking place on sports field **711**. A hand held device **707** is located within section B. Hand held device **707**, by way of example, may also be operated by a concessionaire or venue employee.

If the user of hand held device **703** desires to order a soda, hot dog, or other product or service offered by venue operators during the venue event, the user merely presses an associated button displayed via a touch screen user interface integrated with the hand held device. Immediately, a signal is transmitted by hand held device **703**, in response to the user input to/through the VPS device, wireless network or wireless gateway as previously described. One or more of VPS devices **702**, **704**, **706**, and **708** may detect the signal. The VPS devices may also operate merely as transponders, in which case hand held devices will be able to determine their approximate location within the venue and then transmit position information through wireless means to, for example, concession personnel.

VPS devices **702**, **704**, **706**, and **708** function in concert with one another to determine the location of hand held device **703** within section A. Triangulation methods, for example, may be used through the hand held device or VPS devices to determine the location of the hand held device within the venue. This information is then transmitted by one or more of such VPS devices either directly to hand held device **707** or initially through a wireless network, including a wireless gateway and associated server, and then to hand held device **707**. The user of hand held device **707** then can directly proceed to the location of hand held device **703** to offer concession services.

Additionally, hand held device **703** can be configured with a venue menu or merchandise list. In response to requesting a particular item from the menu or merchandise list, the request can be transmitted as wireless data from hand held device **703** through the wireless network to hand held device **707** (or directly to a controller (not shown) of hand held device **707**) so that the user (concession employee) of hand held device **707** can respond to the customer request and proceed directly to the location of hand held device **703** used by a customer.

FIG. **19** illustrates in greater detail the VPS **700** of FIG. **18**, in accordance with an alternative embodiment. In FIG. **18** and FIG. **19** like or analogous parts are indicated by identical reference numerals, unless otherwise stated. Additionally wireless gateway **124** and server **100** of FIG. **19** are analogous to the wireless gateway **124** and server **100** illustrated in FIG. **8**. Venue positioning units **702**, **704**, **706**, and **708** are located within section A and section B. A wireless gateway **124** is linked to server **100**. Wireless gateway **124** can communicate with hand held device **707** and hand held device **703**.

Wireless gateway **124** can also communicate with VPS devices **702**, **704**, **706**, and **708** if the VPS devices are also operating as data communication devices in addition to providing mere transponder capabilities. When VPS devices **702**, **704**, **706**, and **708** detect the location of hand held device **703** within stadium venue **701**, the location is transmitted to wireless gateway **124** and thereafter to hand held device **703**. It should be appreciated that a hand held device user may also identify his/her location in a venue by entering location information (e.g., seat/section/row) on the hand held device when making a request to a service provider such as a food concession operation. The VPS devices will still be useful to help concession management locate concession employees located within the venue that are in closest proximity to the hand held device user. A wireless gateway **124** and server **100** can be associated with a wireless network implemented in association with stadium venue **701**. Those skilled in the art will appreciate that such a wireless network may be limited geographically to the stadium venue **701** itself and the immediate surrounding area. An example of such a wireless network, as described previously is a Bluetooth based wireless network.

The hand held devices themselves may be proprietary devices owned by promoters or operators of stadium venue **701** and rented to patrons for their use while attending a venue activity. Proprietary devices will generally be manufactured using durable materials (e.g., similar to those materials used on field technician digital millimeters/devices such as the Fluke™ line of electronic devices). Proprietary devices will also be limited in hardware and software modules (i.e., software routines/subroutines) needed for communication with the venue system in order to display venue activities to temporary users.

Hand held devices may also be owned by the patrons themselves which they bring into the stadium venue for their use by permission of the venue promoter or stadium owners in return for the payment of a fee by the patron. In return for the fee, the venue promoter or stadium owner can provide the patron with a temporary code which permits them to access the wireless network associated with the venue itself, such as wireless network **152** described herein. Patron-owned devices may utilize smart card technology to receive authorization codes (e.g., decryption) needed to receive venue—provided video/data. Codes may also be transferred to the patron-owned device via IR or short range RF means. Wireless network **152** described herein may be configured as a proprietary wireless Intranet/Internet providing other data accessible by patrons through their hand held devices.

FIG. **20** depicts a flowchart of operations **740** illustrative of a method for providing multiple venue activities through a hand held device, in accordance with an alternative embodiment. The process is initiated, as depicted at block **742**. As illustrated next at block **744**, a venue attendee may activate at least one hand held tuner integrated with a hand held device, such as the hand held device illustrated in FIG. **4**. At least one tuner may be integrated with the hand held device, although more than one tuner (or other simultaneous signal receiving capability) may be used within a hand held device in support of other embodiments of the invention previously described.

The tuner, or tuners, is/are associated with a transmission frequency/frequencies of a transmitter that may be linked to a particular camera/cameras focusing on a venue activity, or to a wireless gateway or wireless network transmission. To view the images from that particular angle, the user must retrieve the video images from the camera associated with that particular angle. The user may have to adjust a tuner until the right frequency/image is matched, as indicated at block **756**. As illustrated at block **748**, captured video images are transferred from the video camera to the transmitter associated with the camera, or a server in control of the camera(s). Video images are generally transmitted to the hand held device at the specified frequency, in response to a user request at the hand held device, as depicted at block **750**.

An image-processing unit integrated with the hand held device, as illustrated at block **752** may then process transferred video images. An example of such an image-processing unit is image-processing unit **35** of FIG. **1**. As indicated thereafter at block **754**, the video images of the venue activity captured by the video camera can be displayed within a display area of the hand held device, such as display **18** of FIG. **1**. The process can then terminate, as illustrated at block **756**.

FIG. **21** illustrates a flowchart of operations **770** illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras, in accordance with an alternative embodiment. As indicated at block **772**, the process is initiated. As illustrated next at block **774**, video images of a venue activity may be captured by one or more digital video camera.

Such digital video cameras may be panoramic/wide-angle in nature and/or configured as high definition video cameras, well known in the art. The video camera or cameras may be respectively linked to data transmitters, such as data transmitters **102**, **104**, **106**, and/or **108** of FIG. **5** or data transmitter **112** of FIG. **6** to FIG. **9** herein. As depicted next at decision block **778**, if a user does not request a view of the venue activity through the hand held device, the process terminates, as illustrated thereafter at block **779**.

If, as illustrated at decision block **778**, the user does request a view of the venue activity through the hand held device, then as described thereafter at block **780**, video data may be transferred from a data transmitter to a server, such as server **100** of FIG. **5** to FIG. **8** herein. The video data may be stored in a memory location of the server or a plurality of servers, as indicated at block **782**. The video data may be then transferred to a wireless data transmitter/receiver integrated with the hand held device, as indicated at block **784**.

As illustrated thereafter at block **786**, the video data may be processed by an image-processing unit and associated image-processing routines and/or subroutines integrated with the hand held device. When image-processing is complete, the video images may be displayed in a display area of the hand held device. As illustrated next at block **790**, if a user chooses to pan/zoom for a better view of the video images displayed

within the hand held device, then two possible operations may follow, either separately or in association with one another.

The image-processing unit integrated with the hand held device may process the user's pan/zoom request, as illustrated at block **792**. Alternatively, image-processing routines and/or subroutines resident at the server or a plurality of servers may process the user's pan/zoom request. following the transmission of the user's request from the hand held device to the server or plurality of servers. Such a request may be transmitted through a wireless gateway linked to the server or servers.

Image-processing may occur at the server or servers if the hand held device is not capable of directly processing the video data and video images thereof due to low memory or slow CPU allocation. Likewise, some image-processing may take place within the hand held device, while video image-processing requiring faster processing capabilities and increased memory may take place additionally at the server or servers to assist in the final image representation displayed at the hand held device.

When image-processing is complete, the pan/zoomed images can be displayed within a display screen or display area of the hand held device, as illustrated thereafter at block **796**. The process then terminates, as depicted at block **798**. If the user does not request pan/zoom, as indicated at block **790**, the process may then terminate, as described at block **791**.

The embodiments and examples set forth herein are presented in order to best explain the present invention and its practical application and to thereby enable those skilled in the art to make and utilize the invention. However, those skilled in the art will recognize that the foregoing description and examples have been presented for the purpose of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching without departing from the spirit and scope of the following claims.

What is claimed is:

1. At least one server that includes a computer-readable medium tangibly embodying computer-executable instructions, said computer-executable instructions comprising instructions for:

acquiring entertainment venue-based data that comprises video of live entertainment occurring in front of a live audience captured from more than one camera located in at least one entertainment venue;

processing said entertainment venue-based data including video of live entertainment occurring in front of a live audience captured from the more than one camera located in at least one entertainment venue into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by at least one remote hand held device;

authenticating at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data; and

transmitting said entertainment venue-based data after processing from said at least one server so that said entertainment venue-based data may be received and further process for viewing by at least one remote hand held device authorized to receive said venue-based data through at least one wireless data communications network, in response to said authenticating of said at least one remote hand held device to wirelessly access said entertainment venue-based data, in order to permit said entertainment venue-based data to be accessible via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one entertainment venue for viewing via said at least one remote hand held device.

2. The at least one server of claim **1**, wherein said at least one remote hand held device comprises a touchscreen display for display of said video captured from said more than one camera located at said at least one entertainment venue.

3. The at least one server of claim **1** wherein said at least one remote hand held device comprises a Smartphone.

4. The at least one server of claim **1** wherein said at least one remote hand held device comprises a portable computing device having a touchscreen display for display of said video captured from said more than one camera located at said at least one entertainment venue.

5. The at least one server of claim **1** wherein said at least one wireless data communications network comprises a cellular communications network.

6. The at least one server of claim **1** wherein said at least one wireless data communications network an 802.11 data communications network.

7. The at least one server of claim **1** wherein said at least one entertainment venue comprises a sports venue.

8. The at least one server of claim **2** wherein said at least one remote hand held device comprises a portable computing device having a touchscreen display for display of said video captured from said more than one camera located at said at least one entertainment venue.

9. The at least one server of claim **8** wherein said at least one entertainment venue comprises a sports venue.

10. At least one server that includes a computer-readable medium tangibly embodying computer-executable instructions, said computer-executable instructions comprising instructions for:

acquiring entertainment venue-based data that comprises video of live entertainment occurring in front of a live audience captured from more than one camera located in at least one entertainment venue;

processing said entertainment venue-based data including video of live entertainment occurring in front of a live audience captured from the more than one camera located in at least one entertainment venue into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by at least one remote hand held device;

authenticating at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data; and

transmitting said entertainment venue-based data after processing from said at least one server so that said entertainment venue-based data may be streamed to at least one remote hand held device authorized to receive said venue-based data through at least one wireless data communications network, in response to said authenticating of said at least one remote hand held device to wirelessly access said entertainment venue-based data, in order to permit said entertainment venue-based data to be accessible via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one entertainment venue for further processing and viewing via said at least one remote hand held device.

11. The at least one server of claim **10**, wherein said at least one remote hand held device comprises a touchscreen display

for display of said video captured from said more than one camera located at said at least one entertainment venue.

12. The at least one server of claim **10** wherein said at least one remote hand held device comprises a Smartphone.

13. At least one server, comprising:

memory capable of storing entertainment venue-based data that comprises video of live entertainment occurring in front of a live audience captured from more than one camera located in at least one entertainment venue;

at least one processor capable of processing said entertainment venue-based data including video of live entertainment occurring in front of a live audience captured from the more than one camera located in at least one entertainment venue into a format suitable for streaming over wireless data networks as streamed data that is capable of further processing for viewing by at least one remote hand held device, and of authenticating at least one remote hand held device to provide at least one user of said at least one remote hand held device wireless access to said entertainment venue-based data; and

at least one port capable of transmitting said entertainment venue-based data, after its processing into a format suitable for streaming over wireless data networks as streamed data, from said at least one server so that said venue-based data may be received by or streamed to at least one remote hand held device authorized to receive said venue-based data through at least one wireless data communications network, in response to said authenticating of said at least one remote hand held device to wirelessly access said entertainment venue-based data, in order to permit said entertainment venue-based data to be accessible via said at least one remote hand held device by said at least one user of said at least one remote hand held device at locations within or remote from said at least one entertainment venue for further processing and viewing via said at least one remote hand held device.

14. The at least one server of claim **13** wherein said entertainment venue-based data further comprises video replay data.

15. The at least one server of claim **13** wherein said entertainment venue-based data further comprises audio data.

16. The at least one server of claim **13** wherein said entertainment venue-based data further comprises audio and video data.

17. The at least one server of claim **13** wherein said at least one remote hand held device comprises a touchscreen display for display of said video captured from said more than one camera located at said at least one entertainment venue.

18. The at least one server of claim **13** wherein said at least one remote hand held device comprises a Smartphone.

19. The at least one server of claim **13** wherein said at least one remote hand held device comprises a portable computing device having a touchscreen display for display of said video captured from said more than one camera located at said at least one entertainment venue.

20. The at least one server of claim **13** wherein said at least one entertainment venue comprises a sports venue.

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(12) **United States Patent**
Ortiz et al.

(10) **Patent No.: US 8,583,027 B2**
(45) **Date of Patent: *Nov. 12, 2013**

(54) **METHODS AND SYSTEMS FOR AUTHORIZING COMPUTING DEVICES FOR RECEIPT OF VENUE-BASED DATA BASED ON THE LOCATION OF A USER**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/403,231**

(22) Filed: **Feb. 23, 2012**

(65) **Prior Publication Data**

US 2012/0156983 A1 Jun. 21, 2012

Related U.S. Application Data

(63) Continuation of application No. 13/314,385, filed on Dec. 8, 2011, now Pat. No. 8,270,895, which is a continuation of application No. 12/884,810, filed on Sep. 17, 2010, now Pat. No. 8,086,184, which is a continuation of application No. 12/884,858, filed on Sep. 17, 2010, now Pat. No. 8,090,321, and a continuation of application No. 12/329,631, filed on Dec. 7, 2008, now Pat. No. 7,826,877, said application No. 12/884,858 is a continuation of application No. 11/738,088, filed on Apr. 20, 2007, now Pat. No. 7,620,426, which is a continuation of application No.

(Continued)

(51) **Int. Cl.**

H04H 20/71	(2008.01)
H04H 40/00	(2008.01)
H04B 13/00	(2006.01)
H04W 24/00	(2009.01)

(52) **U.S. Cl.**

USPC **455/3.01**; 455/3.06; 455/899; 455/456.1

(58) **Field of Classification Search**

USPC 455/3.01, 66.1, 3.06, 899

See application file for complete search history.

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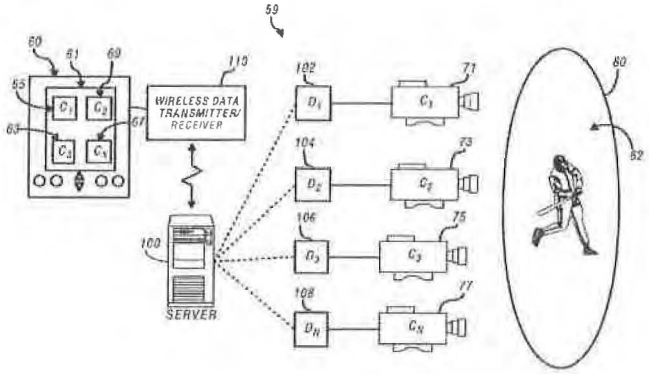
Primary Examiner — Tilahun B Gesesse

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(57) **ABSTRACT**

Methods and systems for authorizing access by a user of at least one service associated with an event at a venue based on a location of the user as determined by assets of a data communications network (e.g., Internet protocol based networks, computer network, telecommunications network, wireless network, Internet, etc). A location of at least one user can be determined based on communications of at least one computing device utilized by the at least one user with the data communications network supporting data communications of the at least one computing device. The at least one computing device can be authorized to receive the at least one service based on the location as determined by the data communications network and/or a server. The data communications network can further comprise at least one of a server, a gateway, a home location register and a visiting location register.

18 Claims, 19 Drawing Sheets



Related U.S. Application Data

11/498,415, filed on Aug. 2, 2006, now Pat. No. 7,376,388, which is a continuation of application No. 09/708,776, filed on Nov. 8, 2000, now Pat. No. 7,149,549, application No. 13/403,231, which is a continuation of application No. 13/364,793, filed on Feb. 2, 2012.

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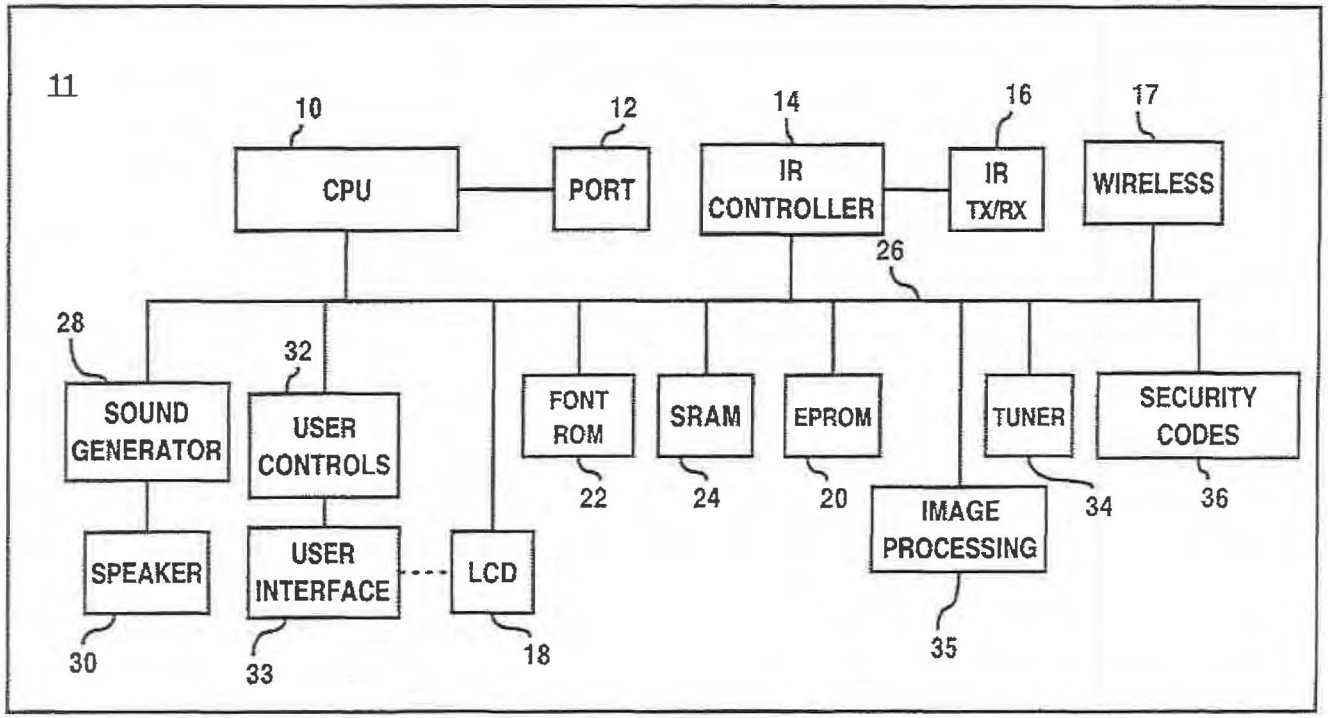

11
10
CPU
12
PORT
14
IR CONTROLLER
16
IR TX/RX
17
WIRELESS
26
28
SOUND GENERATOR
32
USER CONTROLS
FONT ROM
22
SRAM
24
EPROM
20
TUNER
34
SECURITY CODES
36
IMAGE PROCESSING
35
SPEAKER
30
USER INTERFACE
33
LCD
18

FIG. 1

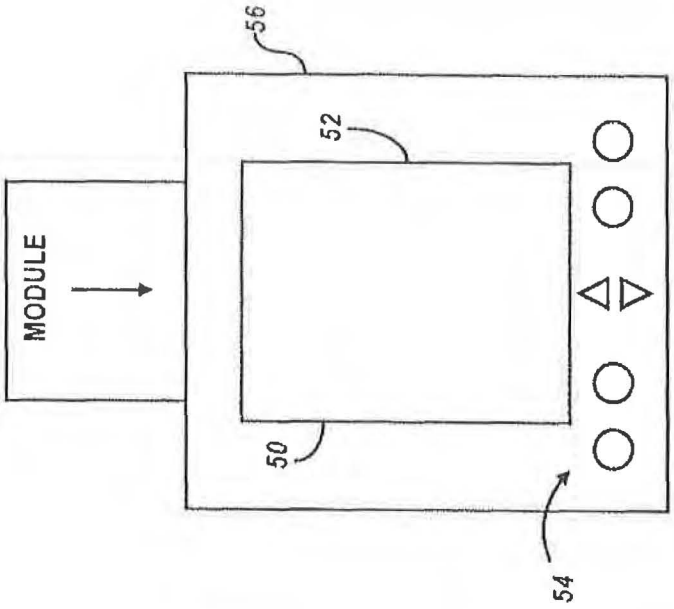


FIG. 3

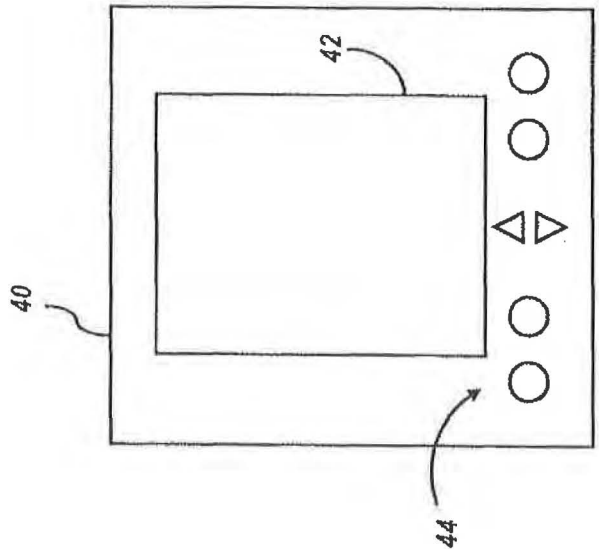


FIG. 2

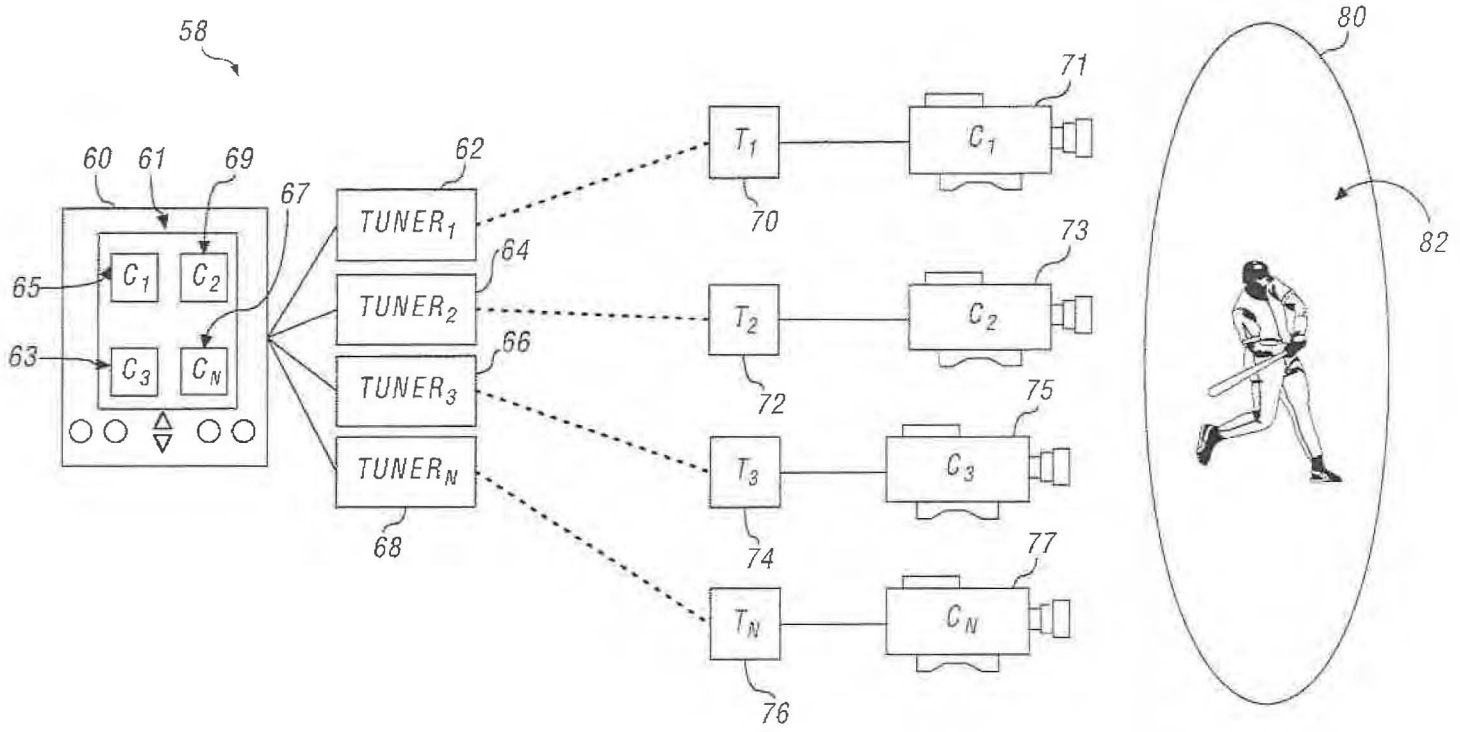

58
60
61
69
67
62
65
63
C_1
C_2
C_3
C_N
$TUNER_1$
$TUNER_2$
$TUNER_3$
$TUNER_N$
64
66
68
T_1
T_2
T_3
T_N
70
72
74
76
71
73
75
77
80
82

FIG. 4

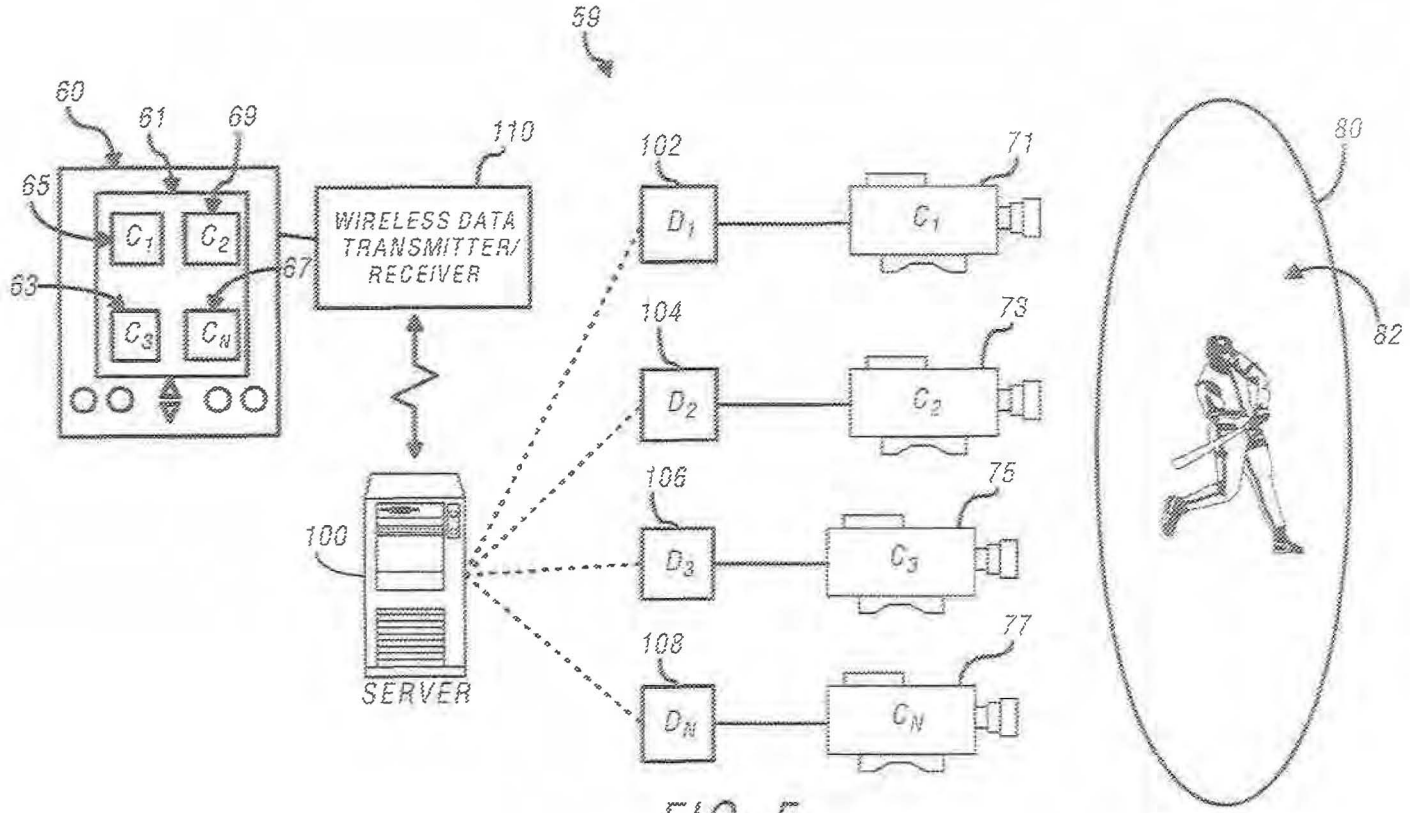

59
60
61
69
110
65
63
67
C_1
C_2
C_3
C_N
WIRELESS DATA TRANSMITTER/ RECEIVER
100
SERVER
102
104
106
108
D_1
D_2
D_3
D_N
71
73
75
77
C_1
C_2
C_3
C_N
80
82

FIG. 5

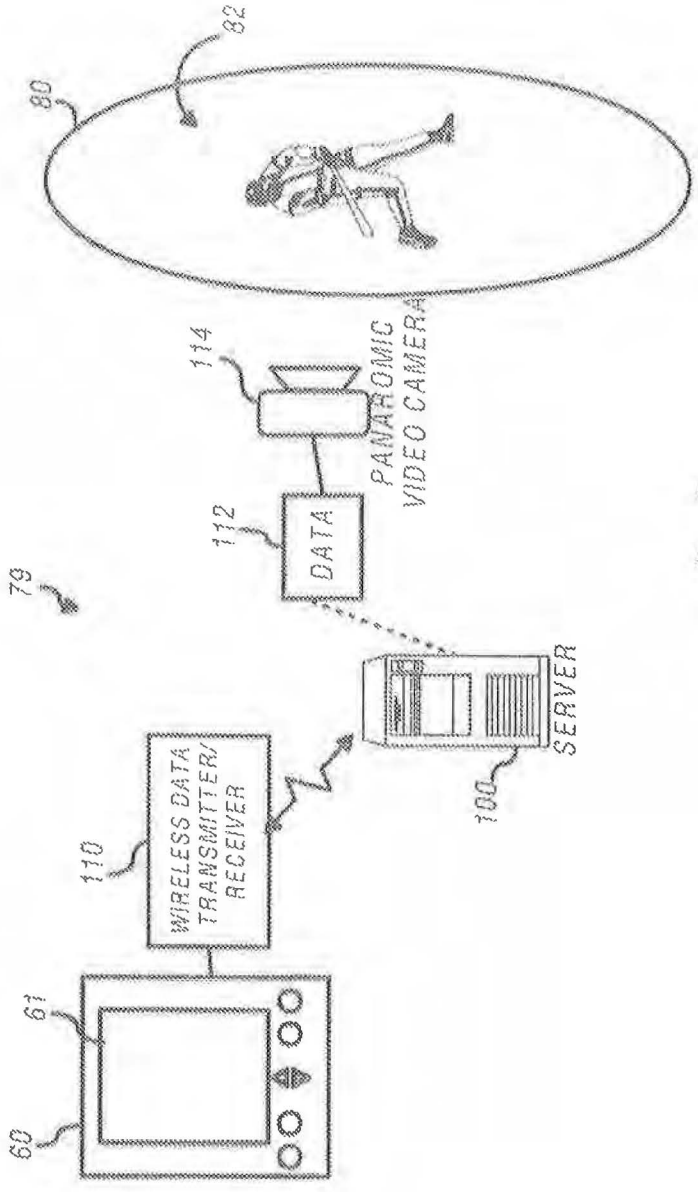

82
80
114
PANAROMIC VIDEO CAMERA
112
DATA
79
SERVER
100
110
WIRELESS DATA TRANSMITTER/ RECEIVER
61
60

FIG. 6

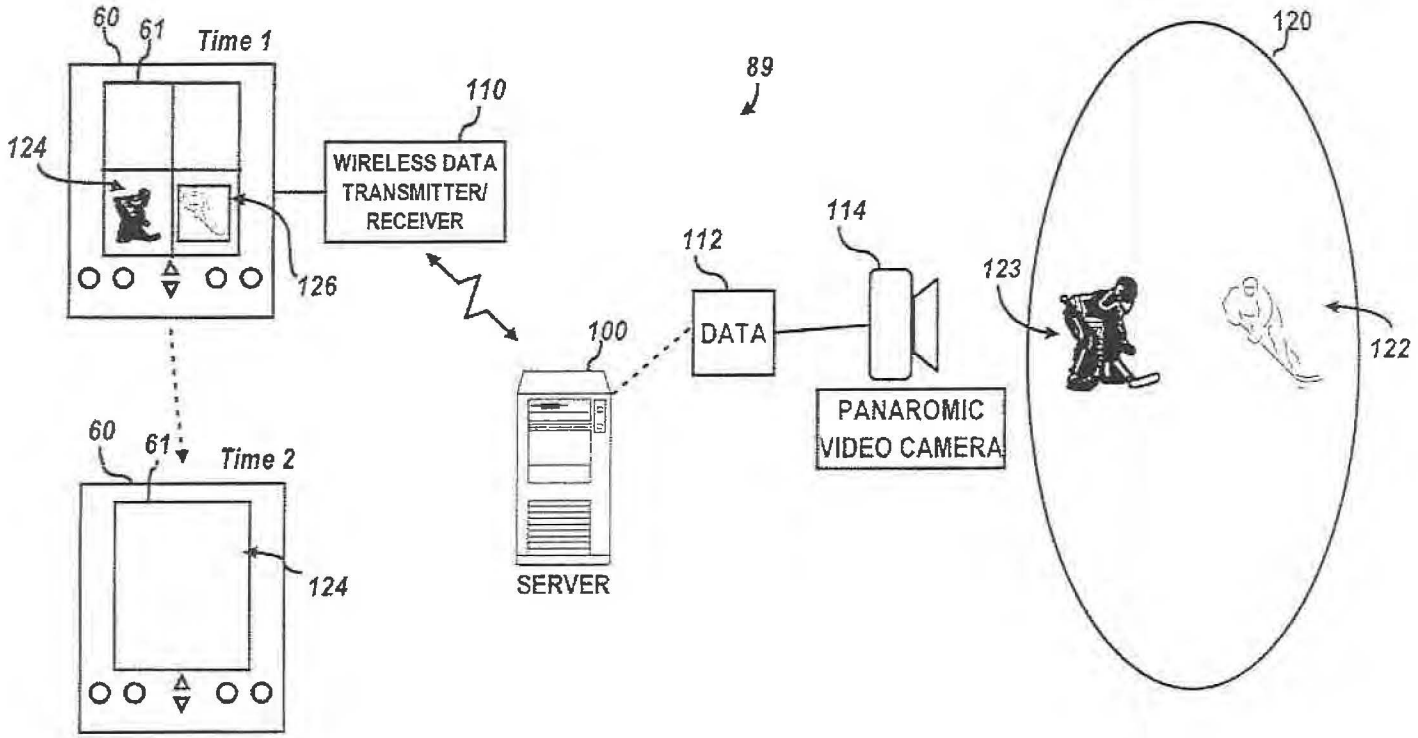

60
61
Time 1
124
110
WIRELESS DATA TRANSMITTER/ RECEIVER
126
89
120
112
114
123
DATA
PANAROMIC VIDEO CAMERA
122
100
SERVER
60
61
Time 2
124

FIG. 7

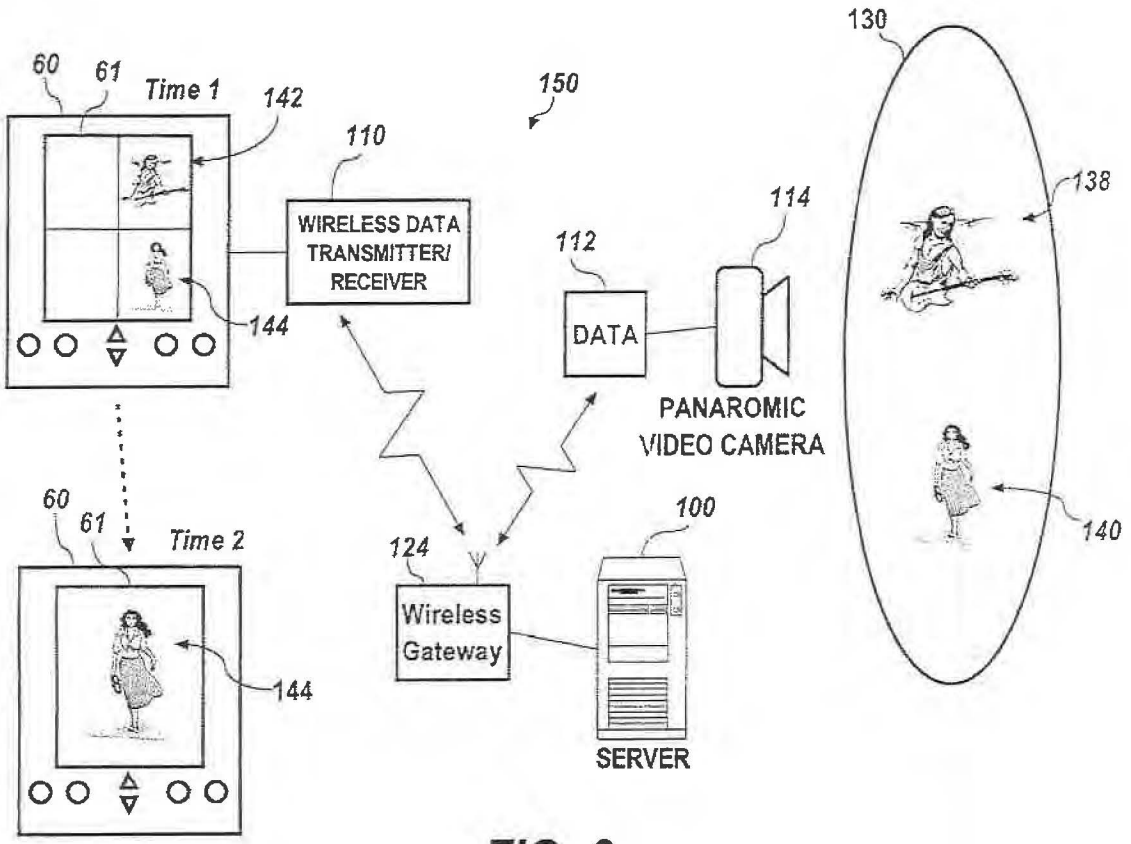

60
61
Time 1
142
110
150
130
138
WIRELESS DATA TRANSMITTER/ RECEIVER
144
112
114
DATA
PANAROMIC VIDEO CAMERA
60
61
Time 2
100
124
Wireless Gateway
144
140
SERVER

FIG. 8

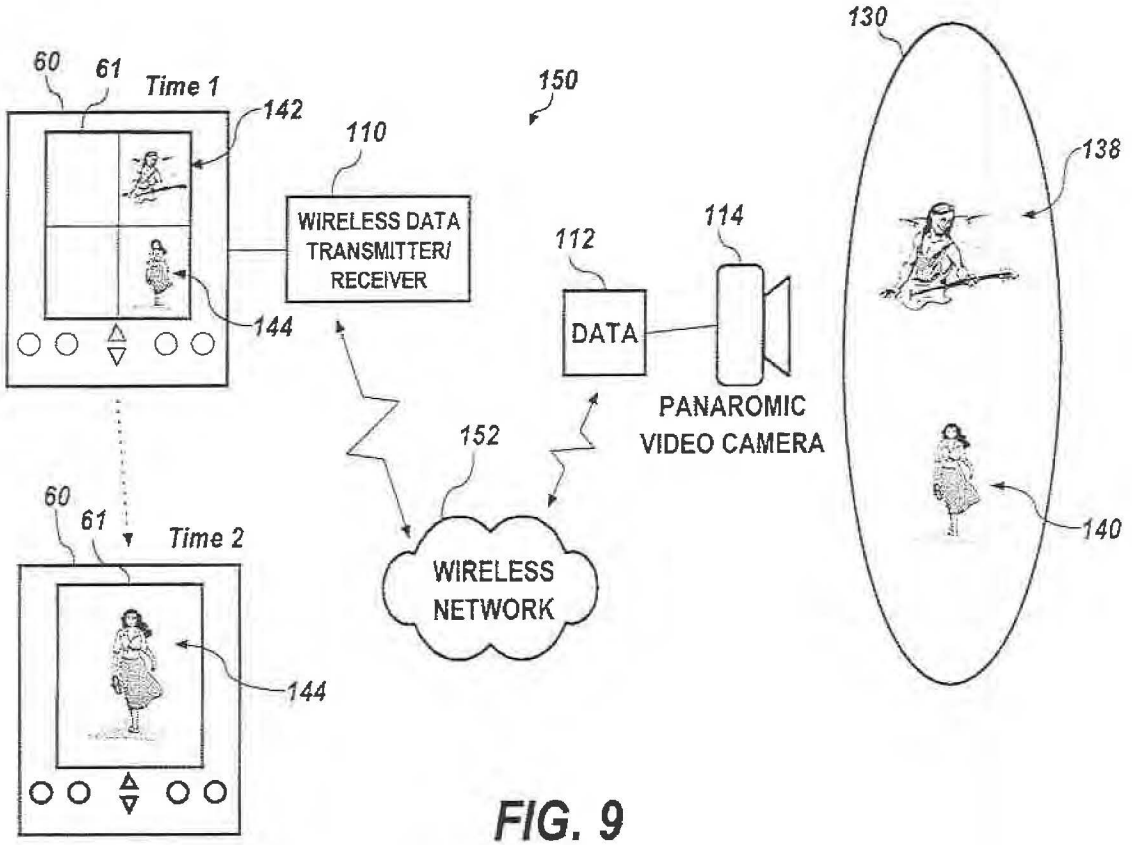

60
61
Time 1
142
110
150
130
138
WIRELESS DATA TRANSMITTER/ RECEIVER
144
112
114
DATA
PANAROMIC VIDEO CAMERA
152
60
61
Time 2
WIRELESS NETWORK
140
144

FIG. 9

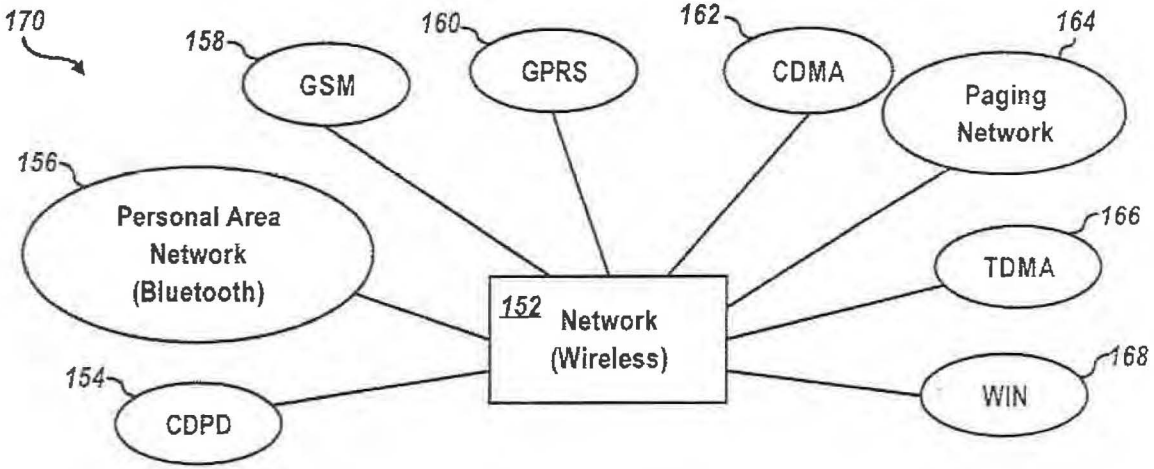

170
158
GSM
160
GPRS
162
CDMA
164
Paging Network
156
Personal Area Network (Bluetooth)
152 Network (Wireless)
166
TDMA
154
CDPD
168
WIN

FIG. 10

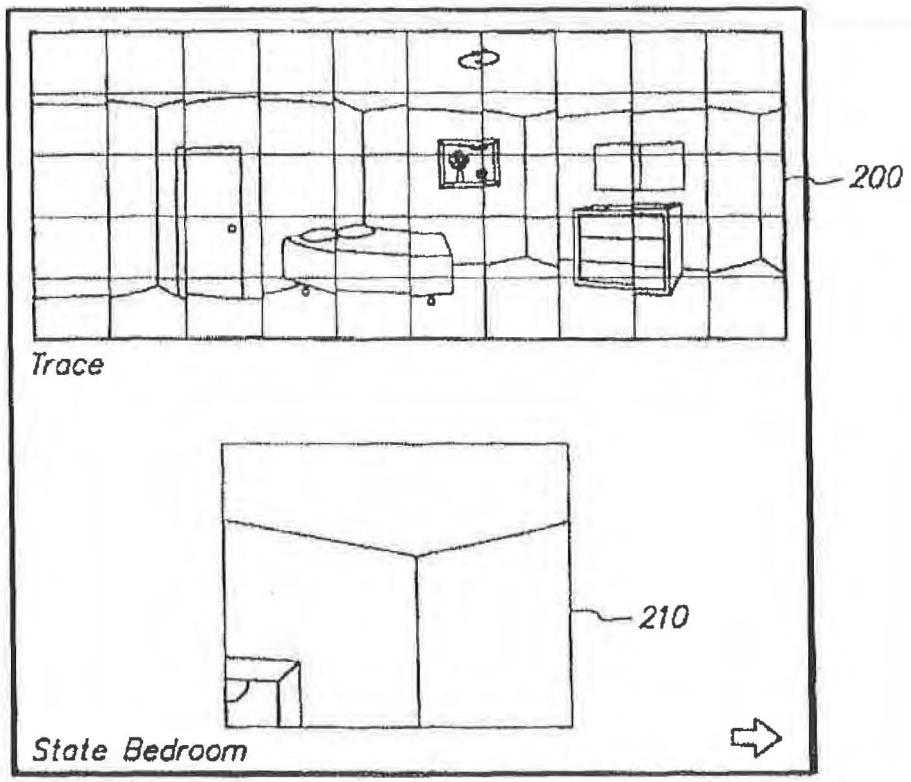


FIG. 11
(Prior Art)

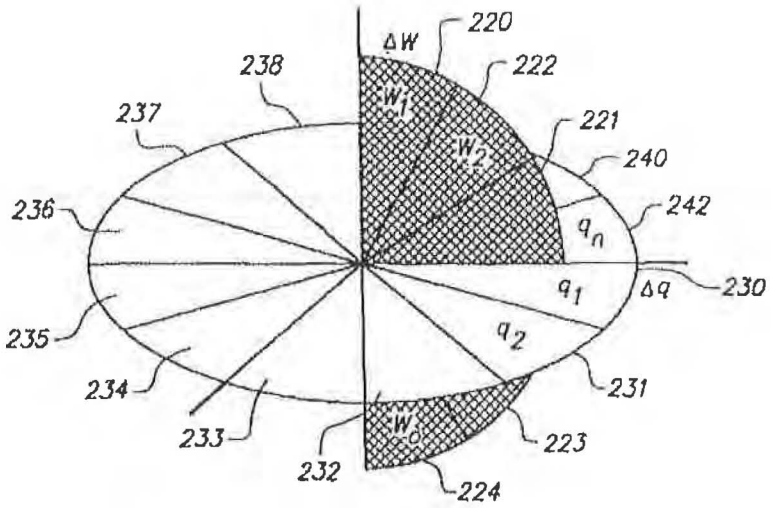


FIG. 12
(Prior Art)

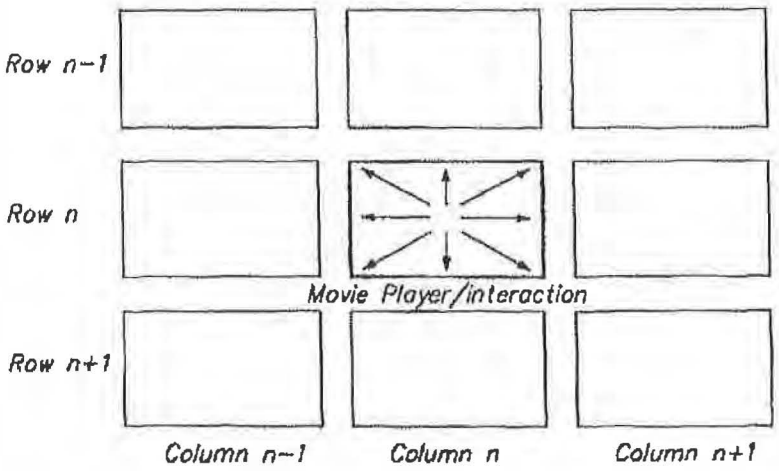


FIG. 13
(Prior Art)

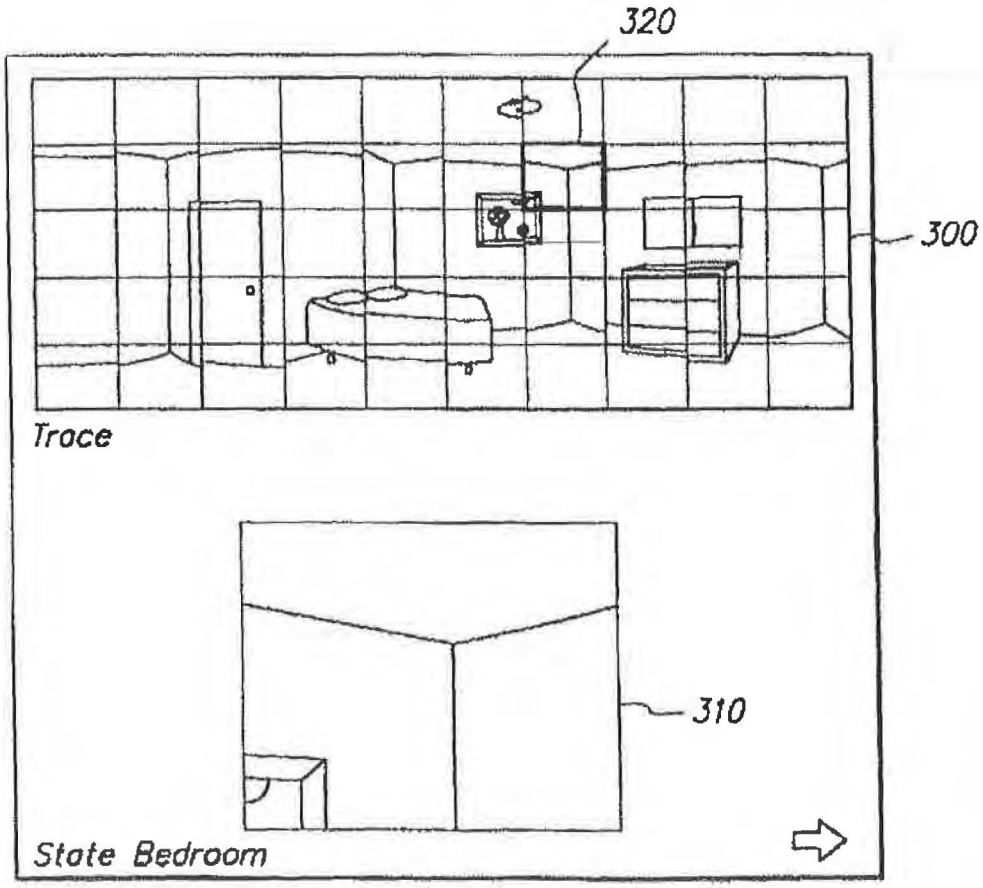


FIG. 14
(Prior Art)

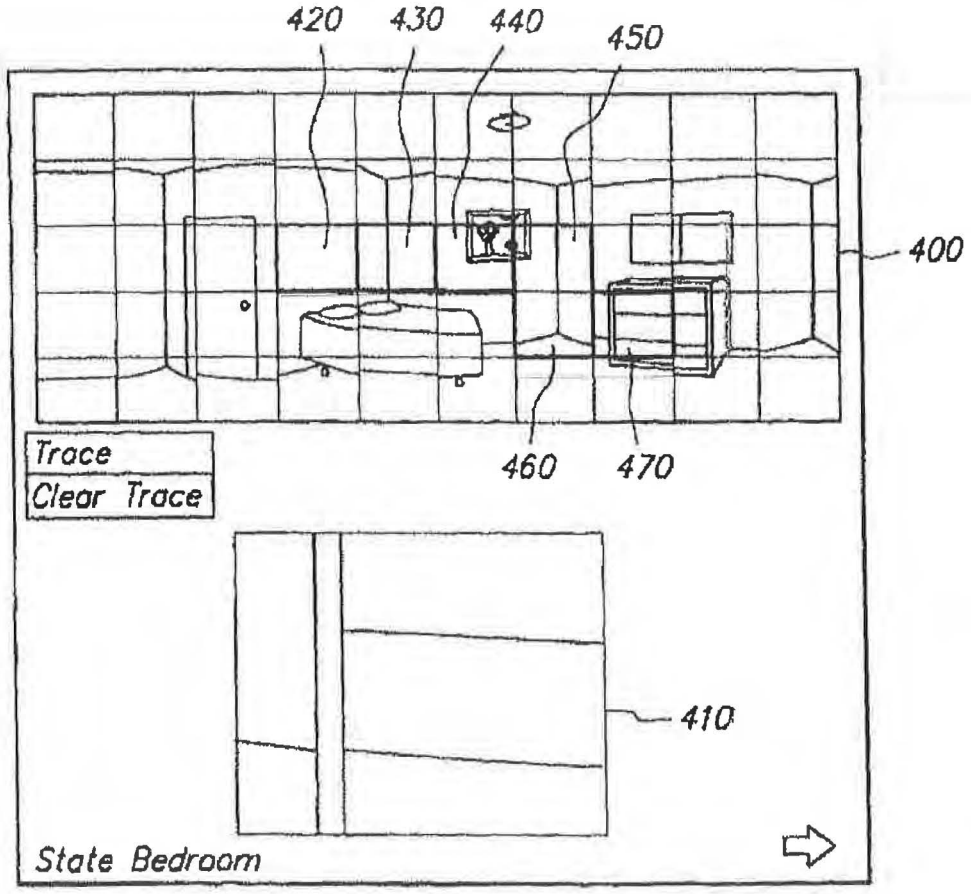


FIG. 15
(Prior Art)

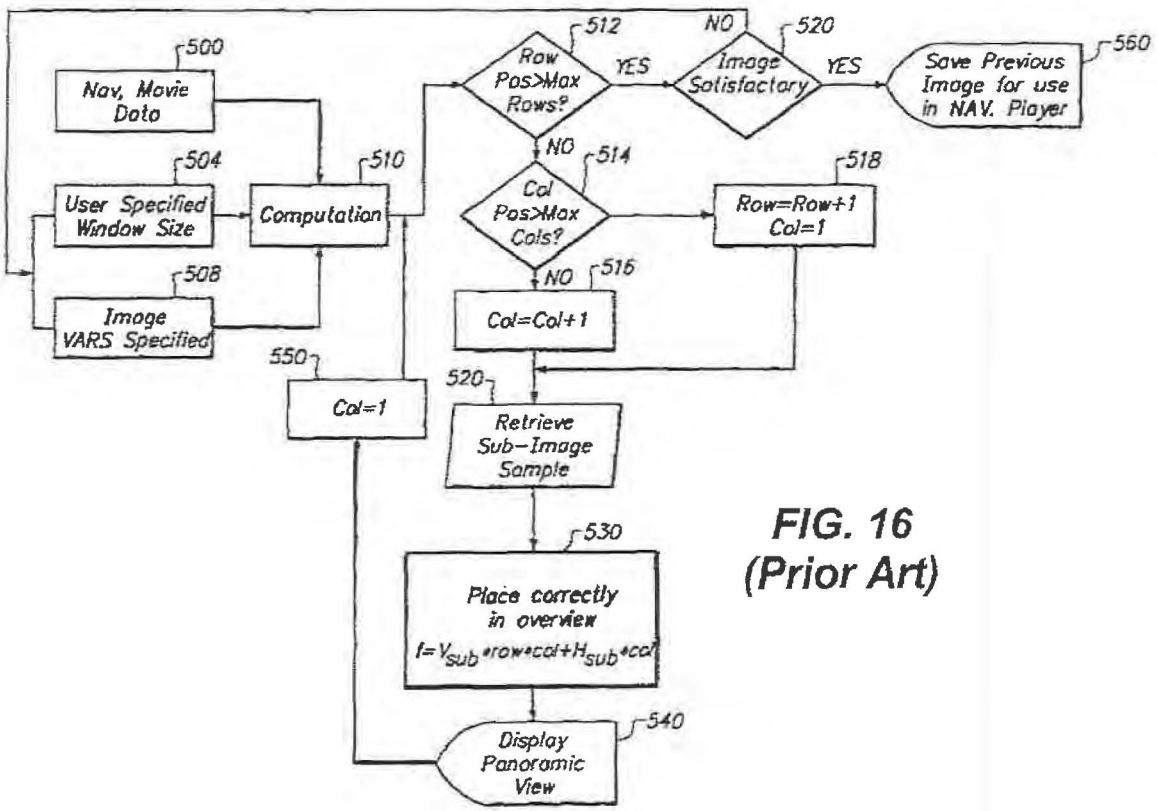


FIG. 16
(Prior Art)

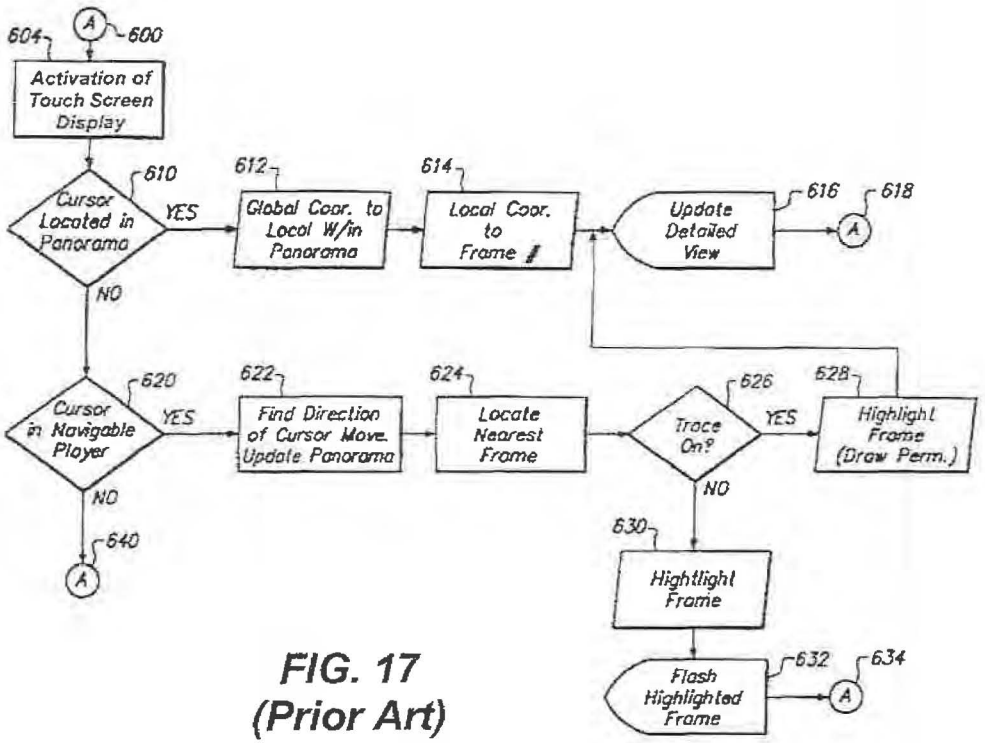


FIG. 17
(Prior Art)

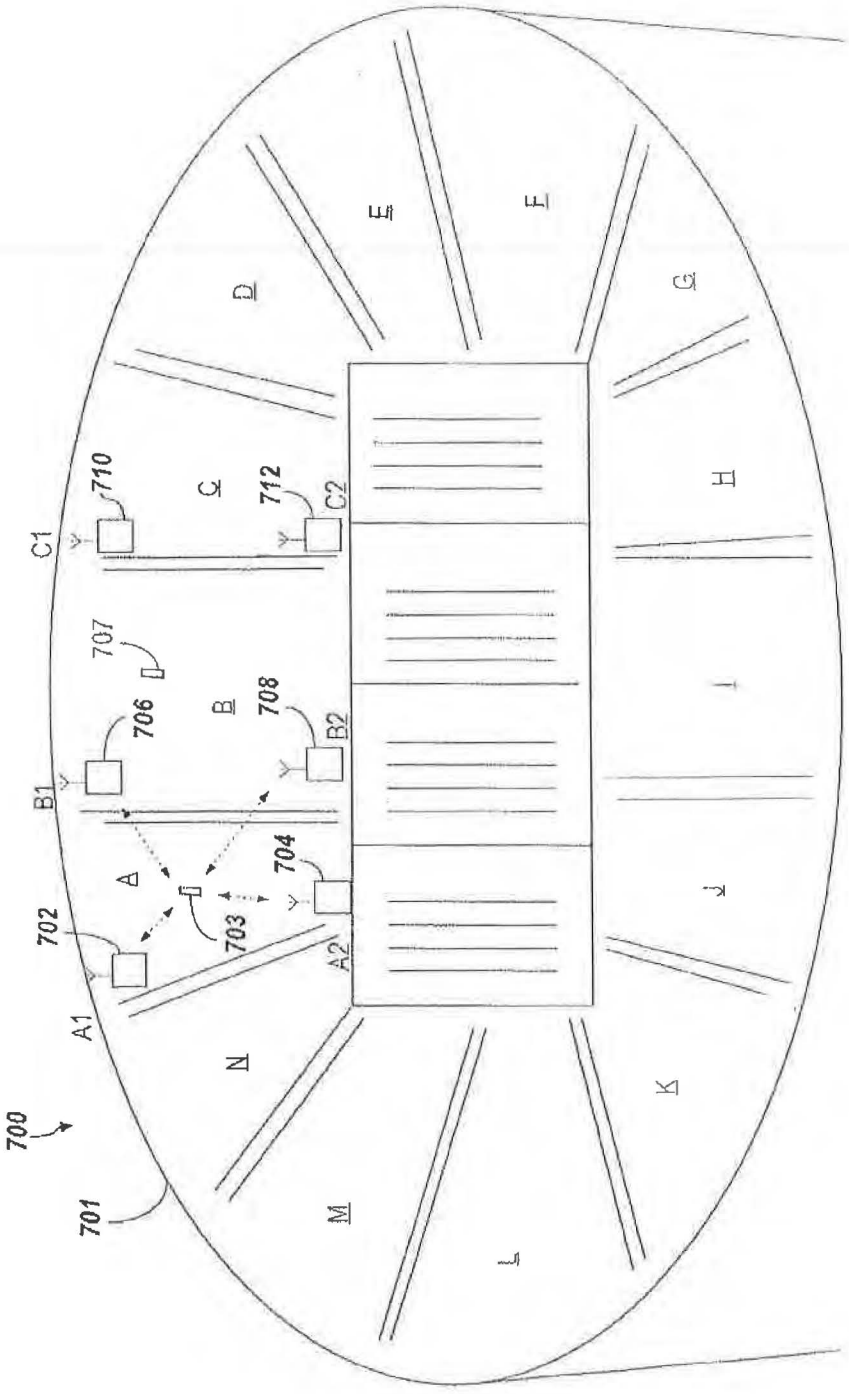

700
701
702
703
704
706
707
708
710
712
A
A1
A2
B
B1
B2
C
C1
C2
D
E
F
G
H
I
J
K
L
M
N

FIG. 18

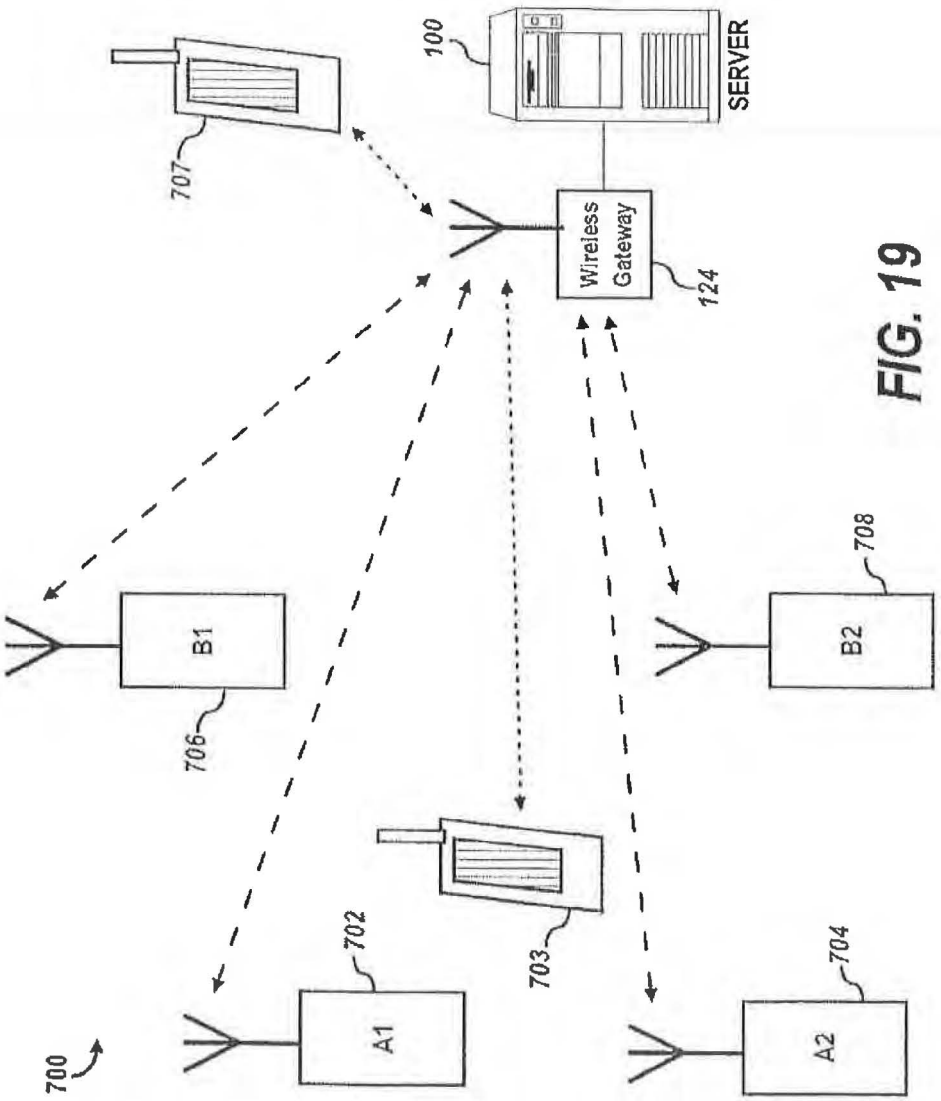

100
SERVER
707
Wireless Gateway
124
B1
706
B2
708
703
702
A1
704
A2
700

FIG. 19

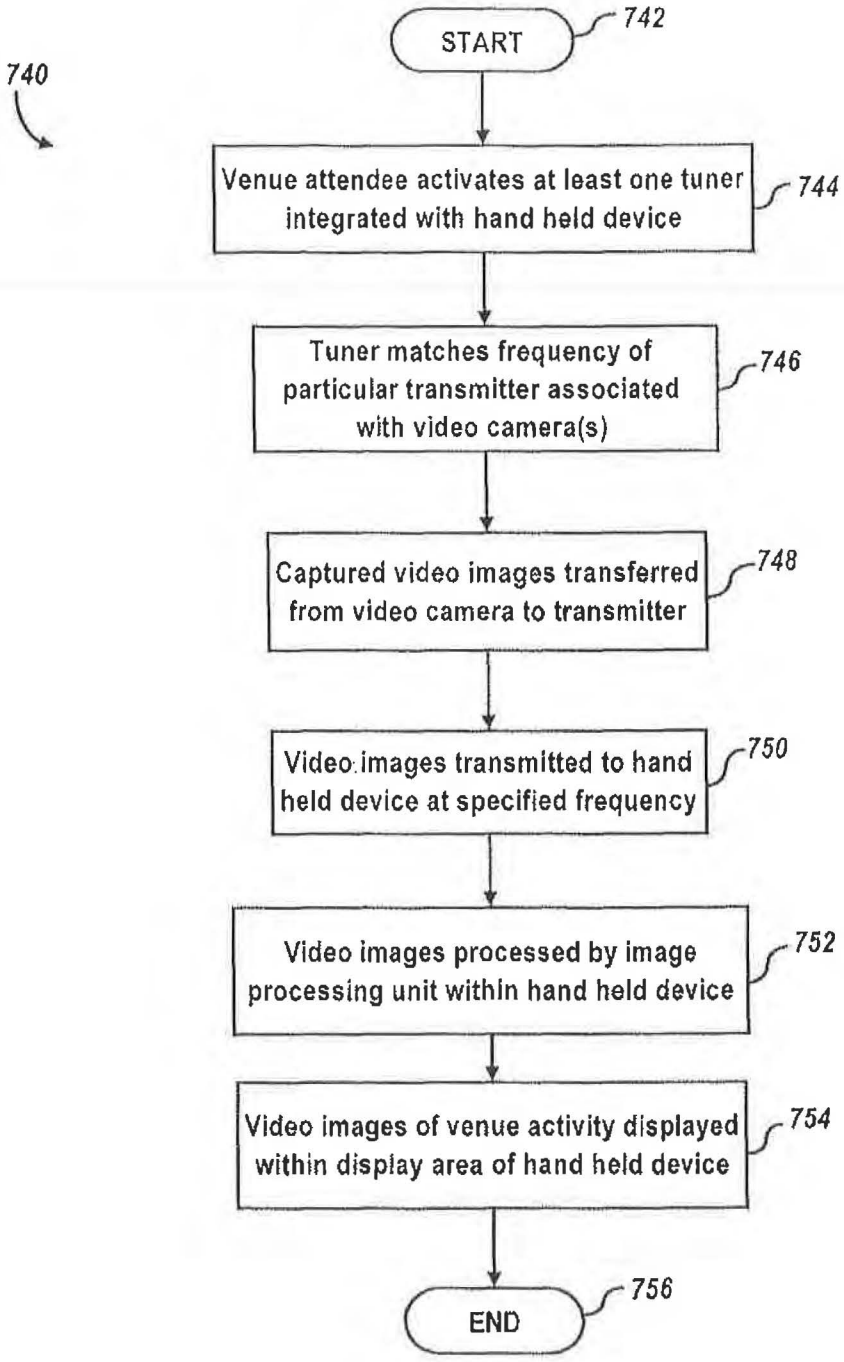

740
START
742
Venue attendee activates at least one tuner integrated with hand held device
744
Tuner matches frequency of particular transmitter associated with video camera(s)
746
Captured video images transferred from video camera to transmitter
748
Video images transmitted to hand held device at specified frequency
750
Video images processed by image processing unit within hand held device
752
Video images of venue activity displayed within display area of hand held device
754
END
756

FIG. 20

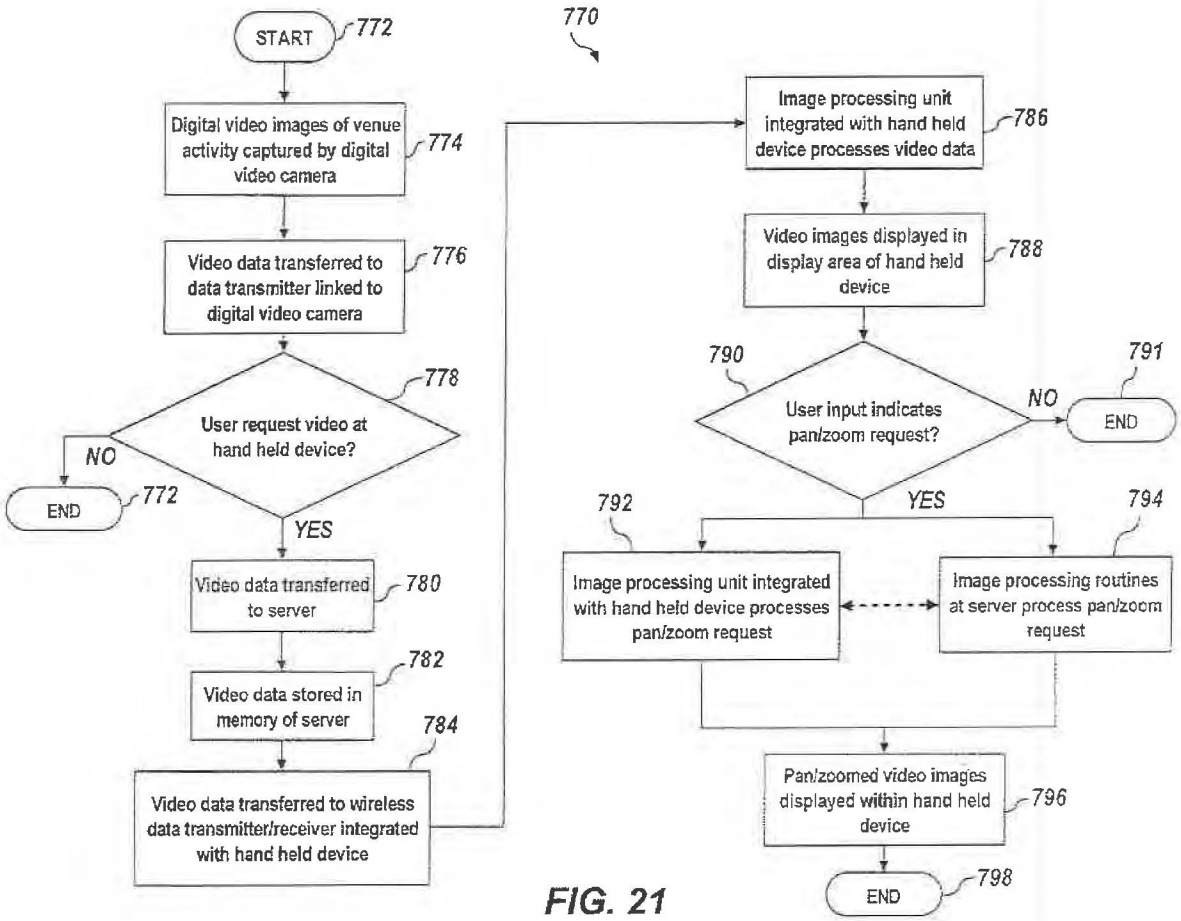

770
START
772
Digital video images of venue activity captured by digital video camera
774
Video data transferred to data transmitter linked to digital video camera
776
User request video at hand held device?
778
NO
END
772
YES
Video data transferred to server
780
Video data stored in memory of server
782
Video data transferred to wireless data transmitter/receiver integrated with hand held device
784
Image processing unit integrated with hand held device processes video data
786
Video images displayed in display area of hand held device
788
User input indicates pan/zoom request?
790
NO
END
791
YES
Image processing unit integrated with hand held device processes pan/zoom request
792
Image processing routines at server process pan/zoom request
794
Pan/zoomed video images displayed within hand held device
796
END
798

FIG. 21

METHODS AND SYSTEMS FOR AUTHORIZING COMPUTING DEVICES FOR RECEIPT OF VENUE-BASED DATA BASED ON THE LOCATION OF A USER

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 13/314,385, which was filed on Dec. 8, 2011 now U.S. Pat. No. 8,270,895, and which in turn is a continuation of U.S. patent application Ser. No. 12/884,810, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over a Telecommunications Network," which was filed on Sep. 17, 2010 now U.S. Pat. No. 8,086,184 and is incorporated by reference in its entirety.

U.S. patent application Ser. No. 12/884,810 is also a continuation of U.S. patent application Ser. No. 12/884,858, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over a Telecommunications Network," which was filed on Sep. 17, 2010 now U.S. Pat. No. 8,090,321 and is incorporated herein by reference in its entirety. U.S. patent application Ser. Nos. 12/884,810 and 12/884,858 are continuations of U.S. patent application Ser. No. 12/329,631, entitled "Transmitting Sports and Entertainment Data to Wireless Hand Held Devices Over A Telecommunications Network," which was filed on Dec. 7, 2008 and issued as U.S. Pat. No. 7,826,877.

U.S. patent application Ser. No. 12/329,631 was in turn a continuation of U.S. patent application Ser. No. 11/738,088 entitled "Providing Video of a Venue Activity to a Hand Held Device Through a Cellular Communications Network" which was filed on Apr. 20, 2007 now U.S. Pat. No. 7,620,426. U.S. patent application Ser. No. 11/738,088 was in turn a continuation of U.S. patent application Ser. No. 11/498,415 entitled "Broadcasting Venue Data to a Wireless Hand Held Device," filed on Aug. 2, 2006, which issued on May 20, 2008 as U.S. Pat. No. 7,376,388 and was a continuation of U.S. patent application Ser. No. 09/708,776 entitled "Providing Multiple Perspectives for a Venue Activity Through an Electronic Hand Held Device," which was filed on Nov. 8, 2000 now U.S. Pat. No. 7,149,549 and which claims the benefit of U.S. Provisional Application Ser. No. 60/243,561, which was filed on Oct. 26, 2000. This application therefore traces its priority date to and claims the benefit of the Oct. 26, 2000 filing date of U.S. Provisional Application Ser. No. 60/243,561.

This patent application is also a continuation of U.S. patent application Ser. No. 13/364,793, which filed on Feb. 2, 2012 and claims priority to U.S. patent application Ser. No. 09/887,492, entitled "Systems, Methods and Apparatuses for Brokering Data Between Wireless Devices and Data Rendering Devices," which was filed on Jun. 22, 2001, and which is incorporated herein by reference in its entirety, and which claims priority as a continuation to U.S. Provisional Patent Application Ser. No. 60/214,339, entitled "Systems, Methods and Apparatuses for Brokering Data Between Wireless Devices and Data Rendering Devices," which was filed on Jun. 27, 2000. This application therefore also traces its priority date to and claims the benefit of the Jun. 27, 2000 filing date of U.S. Provisional Patent Application Ser. No. 60/214,339, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

Embodiments are related to wireless electronic hand held devices, such as Personal Digital Assistants (PDAs), hand held televisions, Smartphones, and cellular and data-enabled wireless telephones. Embodiments are also related to techniques for remotely delivering sports and entertainment data to hand held devices. In addition, Embodiments relates to techniques for providing increased viewing opportunities for audiences within and external to venue environments, such as stadiums and concert arenas. Additionally, embodiments related to wireless video, audio and other data transmission to and from hand held devices.

BACKGROUND OF THE INVENTION

Most modern stadiums and live entertainment facilities or arenas (herein also collectively referred to as "venues"), which feature sporting events and concerts, typically employ large television screens that receive video images and are linked within the stadium to a plurality of television cameras positioned to capture video images at diverse locations within the stadium. The audience at a typical sporting event, for example, can generally view advertisements, instant replays, and other sports related data on the large television screens within the sports stadium itself. Feeds are additionally generally provided from the cameras to announcers in a broadcast booth, replaying certain plays from the event so that the announcers and can make comments about plays, and finally transmitting a telecast to the viewing audience, including some aspects of captured video and data to the stadium audience.

Despite the availability of such large screen television monitors, venue event audience members still lack enhanced viewing options or perspectives within the stadium itself. To compensate for the lack of viewing options, sports and concert promoters often rent binoculars to audience members prior to or during the event. Such binoculars can permit the typical audience member to obtain a somewhat better, but limited, view of the event, such as a baseball, a basketball, a football or a hockey game, but even these views are often obstructed by other audience members and are tied to only one perspective.

The large television screens placed in the stadium are typically linked to cameras that are either fixed and mobile, the placement of the cameras about the stadium or venue are generally tied to an enterprise system. The movement of the game ball in a baseball or football game, for example, along with the players on the field is dynamic and unpredictable, and may not always be caught by the active camera having the best perspective. Thus, during a game, the large television screens typically provide only one view, which can be obstructed further by other players or officials, often destroying a critical angular view.

In addition, such large screens are often utilized to bombard audience members with advertisements, thereby cutting into data such as instant replays at a time when an audience member might otherwise wish to view instant replays, a current play or other event data. The audience members, therefore, essentially view the large screen at the behest of the camera operator and cannot select their own views or camera angles.

Based on the foregoing, the present inventors have found that such problems in venue environments can be solved through the use of hand held devices, such as PDAs, data/video-enabled cellular telephones, and other hand held wireless video-enabled devices. For example, the recent shift in the consumer electronics industry from an emphasis on analog technology to a preference for digital technology is largely based on the fact that the former generally limits the user to a role of a passive recipient of information, while the

latter is interactive and allows the user to control what, when, and how he or she receives and manipulates certain formation. This shift in focus has resulted in the development and increasingly widespread use of a digital device generically referred to as a "personal digital assistant" (PDA).

These devices are hand held computing devices (i.e., hereinafter referred to as "hand held devices" or "handheld devices") that are becoming increasingly popular for storing and maintaining information. Although PDAs may be connected to a desktop personal computer or other PDAs via infrared, direct wire, or wireless communication links, PDAs and similar hand held devices, can be linked to remote networks, such as the internet, or local wireless resources, through available wireless communications techniques.

The most advanced data- and video-enabled wireless communication devices currently available in the marketplace take the form of a PDA (such as the Palm OS, Handspring OS, and Windows CE compatible hand held computers). Unlike personal computers, which are general-purpose devices geared toward refining and processing information, PDAs are designed to capture, store and display information originating from various sources. Additionally, while a certain level of skill is required to use a personal computer effectively, PDAs are designed with the novice and non-computer user in mind.

A typical PDA includes a microprocessor, memory unit, a display, associated encoder circuitry, and selector buttons. It may optionally contain a clock and infrared emitter and receiver. A graphical user interface permits a user to store, retrieve and manipulate data via an interactive display. A PDA may also include a calendar, datebook, and one or more directories. The calendar shows a month of dates organized as rows and columns in the usual form. The datebook shows one day at a time and contains alphanumeric text entered in free format (typically, with a time of day and an event and/or name). Each directory contains entries consisting of a name field and a free form alphanumeric text field that can contain company names, addresses, telephone and fax numbers, email addresses, etc.

Entries may be organized alphabetically according to the name field and can be scanned or searched for by specifying a specific sequence of characters in the name field. A menu displayed via the graphical user interface permits a user to choose particular functions and directories. Most PDAs come equipped with a stylus, which is a plastic-tipped pen that a user utilizes to write in, for example, a "graffiti area" of the display and tap particular graphically displayed icons. Each icon is indicative of a particular activity or function. Touch screen interfaces, however, are also increasingly being implemented with PDAs to permit a user to activate software modules in the form of routines and subroutines therein.

Attempts have been made to provide venue-based, interactive entertainment to enhance the fan experience at live events. Such attempts utilize touch-screen technology integrated directly into seats at outdoor or indoor arenas. Such devices, however, due to their integration with the viewer seat, can be easily damaged by audience members. Systems that incorporate such devices are also expensive because they literally require miles of cable.

Some recently constructed arenas, for example, that implement such seat-integrated technology are requiring hundreds of miles of electronic cabling, including audiovisual, broadcast, and multiband lines. Such a plethora of large cables are expensive and require extra space, which often cannot be found in older stadiums, or would require a greater expense to integrate into newly built stadiums. The cost of retrofitting an older stadium with such technology can be staggering. Additionally, many fans who attend games or concerts with such technology integrated directly into the seats may find such a feature distracting.

Another problem faced by venue promoters and arena owners who integrate fixed technology directly into the seat is that such technology can quickly become obsolete. If a new facility is fitted with such electronic/data intensive technology, the technology may become quickly outdated, requiring an expensive update and/or retrofit.

The present inventors thus realize that a solution to these problems lies in the use of wireless hand held devices. By utilizing modern technology integrated with hand held devices, on-demand live action, instant replays from multiple camera angles, and real-time team and venue information may be readily provided to fans without the expense and problems associated with present in-seat integrated technical environments. Additionally, it is anticipated that the deployment of venue-based systems facilitating the use of such devices would be relatively inexpensive, at least in comparison to seat integrated systems. Finally, such systems will provide the venue attendee with increased mobility and freedom of use within and throughout the venue environment.

BRIEF SUMMARY

It is one aspect of the disclosed embodiments to provide methods, systems and servers for authorizing computer devices for receiving venue-based data based on the location of the user.

It is another aspect of the disclosed embodiments to provide methods, systems and servers for delivering venue-based data such as video, audio, advertisements, video replay, statistics and other information to one or more computing devices.

It is another aspect of the disclosed embodiments to provide improved methods, systems and servers for delivering venue-based data to hand held computing device(s) located remote from a venue and/or within the venue itself.

It is still another aspect of the disclosed embodiments to provide methods and systems for the delivery and authorization of sports/entertainment data and related information to computing devices through a data communications network.

The above and other aspects of the invention are achieved as will now be further described. Methods, systems and servers are disclosed for authorizing access by a user of at least one service associated with an event at a venue based on a location of the user as determined by assets of a data communications network (e.g., Internet protocol based networks, computer network, telecommunications network, wireless network, Internet, etc). A location of at least one user can be determined based on communications of at least one computing device utilized by the at least one user with the data communications network supporting data communications of the at least one computing device. The at least one computing device can be authorized to receive the at least one service based on the location as determined by the data communications network. The data communications network can further comprise at least one of a server, a gateway, a home location register and a visiting location register. In some embodiments, the at least one user can be, for example, a subscriber. In other embodiments, the subscriber information associated with the subscriber can be stored in a memory (e.g., a database), and the subscriber information can be utilized to authorize the at least one service for the user. The at least one service can comprise, for example, at least one of video data, statistical information, concession information and advertisements. In some embodiments, authorizing the at

least one computing device can further comprise preventing the at least one computing device from receiving the at least one service beyond or within a particular geographical area based on the location determined by the data communications network. In other embodiments, authorizing the at least one computing device can further comprise preventing the at least one computing device from receiving the at least one service absent at least one authorization code.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of this invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objects, and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

FIG. **1** depicts a block diagram illustrating components of a hand held device, in which embodiments may be implemented;

FIG. **2** illustrates a pictorial representation of a hand held device, which may be utilized to implement an embodiment;

FIG. **3** depicts a pictorial representation of a hand held device adapted for receiving a module, in accordance with an alternative embodiment;

FIG. **4** illustrates a system for providing multiple perspectives through a hand held device of activities at a venue, in accordance with an alternative embodiment;

FIG. **5** depicts a system that provides multiple perspectives of a venue activity through a hand held device adapted to receive and process real time video data, in accordance with a preferred embodiment;

FIG. **6** depicts a system for providing multiple perspectives of activity at a venue through a hand held device adapted to receive and process real time video data, in accordance with a preferred embodiment;

FIG. **7** depicts a system for providing multiple perspectives for activity at a venue at a first time/perspective and a second time/perspective, in accordance with a preferred embodiment;

FIG. **8** illustrates a system for providing multiple perspectives through a hand held device of an activity at a venue, including the use of a wireless gateway, in accordance with a preferred embodiment of the present invention;

FIG. **9** depicts a system for providing multiple perspectives through a hand held device of a venue activity, in association with a wireless network, in accordance with a preferred embodiment;

FIG. **10** illustrates a diagram depicting network attributes of a wireless network that may be utilized in accordance with one or more embodiments;

FIG. **11** depicts a prior art overview display and a detail window;

FIG. **12** illustrates a prior art spherical image space divided into a series of w rows and q columns, with the rows and columns representing individual frames as photographed from a video camera;

FIG. **13** depicts the two-dimensional representation of the spherical image space of FIG. **12** into rows and columns of image frames;

FIG. **14** illustrates a prior art overview display, a detail window and a corresponding area indicia (geometric figure outline;

FIG **15** depicts a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview image display for subsequent playback, which may be utilized in accordance with embodiments of the present invention;

FIG. **16** is a prior art flowchart providing a logical process for building an overview image, which may be utilized in accordance with embodiments of the present invention;

FIG. **17** illustrates a prior art flowchart illustrative of a logical process for playback interaction, which may be utilized in accordance with embodiments of the present invention;

FIG. **18** depicts a pictorial representation illustrative of a Venue Positioning System (VPS), which can be implemented in accordance with an alternative embodiment;

FIG. **19** illustrates in greater detail the Venue Positioning System (VPS) of FIG. **18**, in accordance with an alternative embodiment;

FIG. **20** depicts a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device, in accordance with an alternative embodiment; and

FIG. **21** illustrates a flowchart of operations illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras, in accordance with an alternative embodiment.

DETAILED DESCRIPTION

FIG. **1** depicts a schematic diagram illustrating a general hardware configuration of a hand held device **11**, which can be implemented in accordance an embodiment. Those skilled in the art can appreciate, however, that other hardware configurations with less or more hardware and/or modules may be utilized in carrying out the methods and systems (e.g., hand held device **11**) of the present invention, as may be further described herein. CPU **10** of hand held device **11**, can perform as a main controller operating under the control of operating clocks supplied from a clock oscillator. CPU **10** may be configured as a 16-bit microprocessor. External pins of CPU **10** are generally coupled to an internal bus **26** so that it may be interconnected to respective components.

SRAM **24** can be configured as a writeable memory that does not require a refresh operation and can be generally utilized as a working area of CPU **10**. SRAM (Static RAM) is generally a form of semiconductor memory (RAM) based on a logic circuit known as a flip-flop, which retains information as long as there is enough power to run the device. Font ROM **22** can be configured as a read only memory for storing character images (e.g., font) displayable on a display **18**. Examples of types of displays that may be utilized in accordance with display **18** include a TFT active matrix display, an illuminated LCD (Liquid Crystal Display), or other small scale displays being developed.

CPU **10** of the present embodiment drives display **18** utilizing, among other media, font images from Font ROM **22**, and images transmitted as data through wireless unit **17** and processed by image-processing unit **35**. EPROM **20** may be configured as a read only memory that is generally erasable under certain conditions and can be utilized for permanently storing control codes for operating respective hardware components and security data, such as a serial number.

IR controller **14** can be generally configured as a dedicated controller fir processing infrared codes transmitted/received by an IR transceiver **16** and for capturing the same as computer data. Wireless unit **17** can be generally configured as a dedicated controller and transceiver for processing wireless data transmitted from and to a wireless communications network.

Port **12** can be connected to CPU **10** and can be temporarily attached, for example, to a docking station to transmit information to and from hand held device **11** to other devices, such as personal computers, retail cash registers, electronic kiosk devices, and so forth. Port **12** can also be configured, for example, to link with a modem, cradle or docking station, which is well known in the art, and can permit network devices, a personal computer or other computing devices to communicate with hand held device **11**.

User controls **32** permit a user to enter data to hand held device **11** and initiate particular processing operations via CPU **10**. A user interface **33** may be linked to user controls **32** to permit a user to access and manipulate hand held device **11** for a particular purpose, such as, for example, viewing images on display **18**. Those skilled in the art will appreciate that user interface **33** may be implemented as a touch screen user interface, as indicated by the dashed lines linking display **18** with user interface **33**. In addition, CPU **10** may cause a sound generator **28** to generate sounds of predetermined frequencies from a speaker **30**. Speaker **30** may be utilized to produce music and other audio information associated with video data transmitted to hand held device **11** form an outside source.

Those skilled in the art can appreciate that additional electronic circuits or the like other than, or in addition to, those illustrated in FIG. **1** may be required to construct hand held device **11**. Such components, however, are not described in the present specification, because many aspects of them are well known in the art. For example, hand held television are available for receiving public television broadcasts, but the basic technology can be modified on such devices so that they may be adapted to (e.g., proper authentication, filters, security codes, or the like) receive venue-based RF transmissions from at least one venue-based RF source (e.g., a wireless camera, or data from a camera transmitted wirelessly through a transmitter). Those skilled in the art can thus appreciate that because of the brevity of the drawings described herein, only a portion of the connections between the illustrated hardware blocks is generally depicted. In addition, those skilled in the art will appreciate that hand held device **11** can be implemented as a specific type of a hand held device, such as a Personal Digital Assistant (PDA), paging device, WAP-enabled mobile phone, and other associated hand held computing devices well known in the art.

Hand held device **11** can be configured to permit images, such as television broadcast images, to be displayed on display **18** for a user to view. Hand held device **35** thus includes an image-processing unit **35** for processing images transmitted as data to hand held device **11** through wireless unit **17**. A tuner unit **34**, implemented as either a single tuner or a plurality of tuners, may be linked through internal bus **26** to CPU **10**. Additionally, a security unit **36** may be utilized to process proper security codes to thereby ensure that data transferred to and from hand held device **11** may be secure and/or permitted. Security unit **36** may be implemented as an optional feature of hand held device **11**. Security unit **36** can also be configured with routines or subroutines that are processed by CPU **10**, and which prevent wireless data from being transmitted/received from hand held device **11** beyond a particular frequency range, outside of a particular geographical area associated with a local wireless network, or absent authorized authorization codes (e.g., decryption).

Hand held device **11** can thus be configured with both wireless and wireline capabilities, depending on the needs and requirements of a manufacturer or customer. Such wireless capabilities include features such as those found in cellular telephone units, in accordance with carrying out embodiments of the present invention. Examples of hand held devices that can be utilized in accordance with the method and system of the present invention include the "Palm Pilot" PDA, manufactured and sold by Palm Computing, the Handspring Visor, the IBM Workpad or other Window CE compatible devices, RIM Blackberry-family paging devices, Motorola paging devices, and the Symbol SPT-family of PDA-type organizer devices. Customized, venue-specific devices (i.e., proprietary, limited use) may be also developed that incorporate hardware and software modules necessary to practice the methods and systems taught herein.

Those skilled in the art can appreciate that although hand held device **11** is generally illustrated in FIG. **1**, hand held device **11** can be implemented as a wireless application protocol (WAP) web-enabled cellular hand held device, such as a PDA, wireless telephone, or pager or a combination thereof. Hand held device **11** can be configured with features of combination cellular telephone/PDA devices. One example of such a device is the Handspring™ palmtop and associated cellular phone attachment, which is manufactured and sold by Handspring Inc. Other such devices include the Palm-Motorola phone, which permits users to access e-mail and store calendars and contact databases. Hand held devices may be also provided in the form of a multi-RF (Radio Frequency) receiver-enabled hand held television viewing device. Regardless of the type of hand held device implemented, it is anticipated that such hand held devices will be adapted to receive and process data via image-processing unit **35** for ultimate display as moving images on display unit **18**, in accordance with the present invention. Image-processing unit **35** may include image-processing routines, subroutines, software modules, and so forth, which perform image-processing operations.

FIG. **2** illustrates a pictorial representation of a hand held device **40**, which may be utilized to implement an embodiment. Those skilled in the art will appreciate that hand held device **40** of FIG. **2** is analogous to hand held device **11** of FIG. **1**. Hand held device **40** includes a display screen **42**, which is generally analogous to display **18** of FIG. **1**. Television images broadcast via radio frequency or digital data may be displayed on display screen **42** for a user to view. User controls **44** permit a user to manipulate images or text displayed on display screen **42**. User controls **44** of FIG. **2** are generally analogous to user controls **32** of FIG. **1**. A touch screen user interface may be further configured on the display screen **42** with hand held device **40** to permit a user to manipulate images/text displayed on display screen **42**.

FIG. **3** depicts a pictorial representation of a hand held device **56** adapted for receiving a module **50**, in accordance with an alternative embodiment. Hand held device **56** of FIG. **3** is generally analogous to hand held device **40** of FIG. **2**, the difference being that hand held device **56** may be adapted to receive a module/cartridge that permits hand held device **56** to function according to specific hardware and/or instructions contained in a memory location within module **50**. Module **50** may also be configured as a smart card, well known in the art. Such a smart card may provide, for example, access codes (e.g., decryption) to enable hand held device **56** to receive venue broadcasts. Note that as utilized herein, the term "module" may refer to a physical module, such as a cartridge. The term "module" may also refer to a software module composed of routines or subroutines that perform a particular function. Those skilled in the art can appreciate the meaning of the term module is based on the context in which the term is utilized. Thus, module **50** may be generally configured as a physical cartridge or smart card. The term "module" as utilized herein may also refer to a software module, depending on the context of the discussion thereof.

To illustrate the use of a physical module, such as module **50**, assume that a user may possess several such physical modules or cartridges. One module, when inserted into hand held device FIG. **3** may instruct hand held device **50** to function as a standard PDA, such as a Palm Pilot device. Another module, when inserted into hand held device FIG. **3**, may instruct hand held device **56** to function as a portable television that receives wireless television data from a local wireless network and/or venue-based (short range) broadcasts.

Those skilled in the art can thus appreciate that hand held device **56** can be adapted to receive and cooperate with module **50**. Additionally, hand held device **56** includes a display screen **52** that is generally analogous to display screen **42** of FIG. **2** and display **18** of FIG. **1**. Hand held device **56** also includes user controls **54** that are generally analogous to user controls **44** of FIG. **2** and user controls **32** of FIG. **1**. Hand held device **56** of FIG. **3** is generally analogous to hand held device **11** of FIG. **1**. Thus, hand held device **56** can also implement touch screen capabilities through a touch screen user interface integrated with display screen **52**

Assuming module **50** is implemented as a smart card, instead of a cartridge, it is anticipated that similar features can be implemented in accordance with the smart card to insure that hand held device **56** includes touch screen user interface and video viewing capabilities. Smart cards are generally known in the art as credit-card sized plastic cards with an embedded computer chip. The chip can either be a microprocessor with internal memory or a memory chip with non-programmable logic. The chip connection can be configured via direct physical contact or remotely through a contactless electromagnetic interface.

Smart cards may be generally configured as either a contact or contactless smart card, or a combination thereof. A contact smart card requires insertion into a smart card reader (e.g., contained within hand held device **56**) with a direct connection to, for example, a conductive micromodule on the surface of the card. Such a micromodule may be generally gold plated. Transmission of commands, data, and card status takes place through such physical contact points.

A contactless card requires only close proximity to a reader. Both the reader and the card may be implemented with antenna means providing a contactless link that permits the devices to communicate with one another. Contactless cards can also maintain internal chip power or an electromagnetic signal (e.g., RF tagging technology). Two additional categories of smart codes, well known in the art, which are based on contact and contactless cards are the so-called Combi cards and Hybrid cards.

A Hybrid card generally may be equipped with two chips, each with a respective contact and contactless interface. The two chips are not connected, but for many applications, this Hybrid serves the needs of consumers and card issuers. The Combi card may be generally based on a single chip and can be generally configured with both a contact and contactless interface.

Chips utilized in such smart cards are generally based on microprocessor chips or memory chips. Smart cards based on memory chips depend on the security of the card reader for their processing and can be utilized when low to medium security requirements. A microprocessor chip can add, delete and otherwise manipulate information in its memory. Microprocessor-based memory cards typically contain microprocessor chips with 8, 16, and 32 bit architectures.

FIG. **4** illustrates a system **58** for providing multiple perspectives through a hand held device **60** of activities at a venue **80**, in accordance with an alternative embodiment. For illustrative purposes only, it may be assumed that venue **80** of FIG. **4** is a stadium venue, such as a baseball stadium. Cameras **71**, **73**, **75**, and **77** are respectively positioned at strategic points about venue **80** to capture the best images of activity taking place within venue **80**. Cameras **71**, **73**, **75**, **77** are respectively linked to transmitters **70**, **72**, **74**, and **76**. Each of these transmitters may be configured as equipment, which feeds a radio signal to an antenna for transmission.

The antenna may be integrated with the transmitter. Transmitters are well known in the art, and include active components, such as a driver, well known in the art. Transmitters also include passive components, such as a TX filter, also well known in the art. These components, when operating together, impress a signal onto a radio frequency carrier of the correct frequency by immediately adjusting its frequency, phase, or amplitude, thereby providing enough gain to the signal to project it to its intended target (e.g., a hand held device located within the venue).

A hand held device **60** may be held by a user at a stadium seat within view of the activity at the venue **80**. Hand held device **60** is generally analogous to hand held device **11** of FIG. **1** and hand held device **40** of FIG. **2**. Hand held device **60** of FIG. **4** may be configured as a hand held device adapted for use with a cartridge/module, such as module **50** of hand held device **56** of FIG. **3**. The cartridge/module may contain the electronics (e.g., tuner, filter, etc.) to allow a hand held device to be adapted for receiving venue-based data. Hand held device **60** includes a display screen **61** (e.g. display **18** of FIG. **1**).

Additionally, display screen **61** of hand held device **60** may be configured with a touch screen user interface displayable and operable on display screen **61**. Those skilled in the art can appreciate that touch screen interfaces are well known in the art and further explanation thereof may be not necessary. Display screen **61** includes a touch screen display area **65** that may be associated with camera **71**. Thus, images captured by camera **71** are transmitted from transmitter **70**, which is linked to camera **71**. Additionally, display screen **61** includes touch screen display areas **69**, **63**, and **67** which are respectively associated with cameras **73**, **75**, and **77**.

Cameras **71**, **73**, **75**, and **77** are respectively labeled C_1, C_2, C_3, and C_N to indicate that a plurality of cameras may be utilized in accordance with system **58** to view activities taking place within venue **80**, such as a baseball game or concert. Although only four cameras are illustrated in FIG. **4**, those skilled in the art will appreciate that additional or fewer cameras may be also implemented in accordance with system **58**. Touch screen display areas **65**, **69**, **63**, and **67** are also respectively labeled C_1, C_2, C_3, and C_N to illustrate the association between these display areas and cameras **71**, **73**, **75**, and **77**.

Hand held device **60** may be integrated with a plurality of tuners, as illustrated by tuners **62**, **64**, **66**, and **68**. Such tuners can be activated via user controls on hand held device **60** and/or via touch screen icons or areas displayed on display screen **61** that are associated with each tuner. Such icons/areas may be respectively displayed within display areas **65**, **69**, **63** and **67**, or within a separate display area of display screen **61**. A user accesses tuner **62**, for example, to retrieve real-time video images transmitted from transmitter **70** for camera **71**. Likewise, a user can access tuner **64** to retrieve real-time video images transmitted from transmitter **72** for camera **73**.

In addition, a user can access tuner **74** to retrieve real-time video images transmitted from transmitter **74** for camera **75**. Finally, user can access tuner **68** to retrieve real-time video images transmitted from transmitter **76** for camera **77**. In the example depicted in FIG. **4**, a baseball player **82** is partici-

pating in a baseball game within venue **80**. Cameras **71**, **73**, **75**, and **77** capture moving images (e.g., video data) of the baseball player **82** from various angles and transmit these images to hand held device **60**.

FIG. **5** depicts a system **59** that provides multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data, in accordance with a preferred embodiment. Note that in FIG. **4** and FIG. **5** analogous parts are indicated by identical reference numerals. Thus, for example, cameras **71**, **73**, **75**, and **77** of FIG. **5** are analogous to cameras **71**, **73**, **75**, and **77** of FIG. **4**. Hand held device **60** of FIG. **5** is also analogous to hand held device **60** of FIG. **4** and includes similar features thereof.

Hand held device **60** of FIG. **5**, however, can be configured to receive wireless real time video data transmitted for cameras **71**, **73**, **75**, and **77** respectively through data transmitters **102**, **104**, **106**, and **108** to server **100** and thereafter to wireless data transmitter/receiver **110**. Note that wireless data transmitter/receiver **110** is analogous to wireless unit **17** of FIG. **1**. Hand held device **60** of FIG. **5** is also analogous to hand held device **11** of FIG. **1**.

Hand held device **60** of FIG. **5** also incorporates a touch screen user interface, as described herein with respect to analogous hand held device **60** of FIG. **4**. The difference between system **58** of FIG. **4** and system **59** of FIG. **5** lies in the inclusion of digital transmitters **102**, **104**, **106**, and **108** which are respectively linked to cameras **71**, **73**, **75**, and **77** of FIG. **5**. In the illustration of FIG. **5**, cameras **71**, **73**, **75**, and **77** may be configured as high definition video cameras which capture real time images of events or activities taking place within venue **80**, such as real time video footage of baseball player **82**.

A captured image of baseball player **82** can be transferred from one or more of video cameras **71**, **73**, **75**, and **77** of FIG. **5** and transmitted through a respective digital transmitter, such as digital transmitter **102**, **104**, **106** or **108** and transmitted via wired and/or wireless communications to server **100**. The server **100** then processes the video data received from one or more of the digital transmitters and formats the video data for transmission via wireless means to wireless data transmitter/receiver **100**, which may be integrated with hand held device **100**. Transmitter/receiver **100** can communicate with the various components of hand held device **60**, such as a CPU, image processing unit, memory units, and so forth.

Those skilled in the art can appreciate that although real time video data may be transmitted to server **100**, captured past video images may also be stored within server **100** and transferred to hand held device **60** for display at display screen **61**. For example, instant replays may be transferred as video data to hand held device **60** upon the request of a user of hand held device **60**. Such instant replay footage can be displayed on display screen **61** for the user to view.

FIG. **6** illustrates a system **79** for providing multiple perspectives of activity at a venue **80** through a hand held device **60** adapted to receive and process real time video data from at least one wide-angle and/or panoramic video camera **114**, in accordance with a preferred embodiment. In system **79** of FIG. **6**, wide-angle/panoramic (hereinafter referred to as "panoramic") video camera **114** may be configured as a high-definition panoramic video camera that captures images of activities taking place at venue **80**. In the example illustrated in FIG. **6**, panoramic video camera **114** can capture of images of a baseball game and one or more baseball players, such as baseball player **82**.

A data transmitter **112** may be linked to panoramic video camera **114**. Video data captured by panoramic video camera **114** may be transferred to data transmitter **112**, which thereafter transmits the video data to server **100** via a direct link or wireless link, depending on the needs or requirements of the promoters or venue owners. Note that this is also true of the system described in FIG. **6**. Server **100** of FIG. **6** is analogous to server **100** of FIG. **5**. Thus, in the case of FIG. **5**, video data may be transmitted from one or more of data transmitters **102**, **104**, **106**, and **108** via a direct wire/cable link or through wireless transmission means, such as through a wireless network.

Those skilled in the art will appreciate, of course, that hand held device **60** of FIG. **6** is analogous to hand held devices depicted in FIGS. **1-5** herein. In FIGS. **4**, **5**, and **6**, like or analogous parts are identified by identical reference numerals. Thus, images captured by panoramic video camera **114** of activity taking place at venue **80** may be displayed as real time video images or instant replay data on display screen **61** of hand held device **60**.

FIG. **7** depicts a system **89** for providing multiple perspectives for activity at a venue **120** at a first time and/or perspective (Time **1**) and a second time and/or perspective (Time **2**), in accordance with a preferred embodiment. In FIGS. **4**, **5**, **6**, and **7**, like or analogous parts are indicated by identical reference numerals. Thus, in system **89** of FIG. **7**, an event, in this case illustrated as a hockey game, is taking place within venue **120**. Venue **120** may be, for example, a hockey arena. Panoramic video camera **114** may be linked to data transmitter **112**.

As explained previously, data transmitter **112** may be linked to server **100** via a direct link, such as a transmission cable or line, or through wireless communication means, such as through a wireless network. Server **100** can also communicate with hand held device **60** through a wireless network or other wireless communication means by transmitting data through such a network or wireless communications means to wireless data transmitter/receiver **110**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**.

Thus, a video image **124** of a hockey player **122** can be captured as video data by panoramic video camera **114**, along with a video image **126** of a hockey player **123** and displayed within display screen **61** of hand held device **60** as indicated at Time **1**. Video image **124** and **126** can be displayed within a grid-like interface on display screen **61**. Note that in the illustration of FIG. **7**, display screen **61** may be divided into four sections.

When a user touches, for example the area or section of display screen **61** in which video image **124** may be displayed, the entire display area of display screen **61** can be then consumed with a close-up video shot of video image **124**, as indicated at Time **2**, thereby providing the user with a closer view of hockey player **122**. Those skilled in the art can appreciate that the touch screen display area of display screen **61** can be arranged with graphical icons and/or user-controls that perform specific pan and zoom functions. Such icons/user-controls, when activated by a user, permit the user to retrieve panned/zoomed images of events taking place in real time within venue **120**.

Note that although only one panoramic video camera **114** and one data transmitter **112** are illustrated in FIG. **7**, a plurality of panoramic video cameras, servers, and data transmitters may be implemented in accordance with the present invention to capture the best video images, image-processing, and signal capacity to users, whether real time or otherwise, of events taking place at venue **120**.

FIG. **8** illustrates a system **92** for providing multiple perspectives through hand held device **60** of an activity at a venue **130**, including the use of a wireless gateway **124**, in accor-

dance with a preferred embodiment. Those skilled in the art can appreciate that wireless gateway **124** may be configured as an access point for a wireless LAN (Local Area Network). Access points for wireless LAN networks and associated wired and wireless hardware (e.g., servers, routers, gateways, etc.) are well known in the art and may be utilized in accordance with the present invention described herein. Again, note that in FIGS. **4**, **5**, **6**, **7**, and **8**, like or analogous parts are indicated by identical reference numerals. System **92** of FIG. **8** is analogous to system **89** of FIG. **7**, the difference being in the nature of the venue activity. Venue **130** can be, for example, a concert hall or stadium configured with a sound stage.

Gateway **124** can be configured as a communications gateway through which data may enter or exit a communications network, such as wireless network **152** illustrated in FIG. **9** for a large capacity of user hand device **60** users. Wireless network **152** may be configured as a wireless LAN network. Hand held device **60** can be configured to communicate and receive transmissions from such a wireless LAN network based on device identification (e.g., device address). Communication with hand held devices, such as hand held device **60**, however, may also be achieved through RF (Radio Frequency) broadcasts, thereby not requiring two-way communication and authentication between, for example, a wireless LAN network and such hand held devices. A broadcast under such a scenario may also require that such a hand held device or hand held devices possess decryption capabilities or the like in order to be authorized to receive transmissions from the venue.

The remaining elements of FIG. **8** are also analogous to the elements depicted in the previous drawings, with the addition of wireless gateway **124**, which may be linked to server **100** and may be in communication with several wireless data transmitters/receivers **110** and one or more electronic hand held devices, including hand held device **60**. Wireless data transmitter/receiver **110**, as explained previously, may be integrated with hand held device **60**. One or more panoramic video cameras, such as panoramic video camera **114**, can be positioned at a venue **130** at locations that capture images not only of the events taking place on a concert stage, but also events taking place within the stadium itself.

If an audience member **140**, for example, happens to be walking along a stadium aisle within view of panoramic video camera **114**, the audience member's video image can be displayed as video image **144** within display screen **61** of hand held device **60**, as indicated at Time **1**. Likewise, panoramic video camera **114** captures images of band member **138** whose video image can be displayed as video image **142** within a display area of display screen **61**, as indicated at Time **1**.

Thus, a user of hand held device **60** can view not only the events taking place on a central performing platform of venue **130**, but also other events within the arena itself. The band member **138** may be located on a central performing platform (not shown) of venue **130** when panoramic video camera **114** captures real-time video images of band member **138**. The user may also, for example, wish to see a close-up of audience member **140**. By activating user controls and/or a touch screen interface integrated with display screen **61**, the user can, for example, pan or zoom to view a close-up video shot of audience member **140**, as indicated at Time **2**.

Captured video images are transferred from panoramic video camera **114** as video data through transmitter **112** to server **100** and through wireless gateway **124** to wireless data transmitter/receiver **110**. Although a single server **100** is illustrated in FIG. **8**, those skilled in the art can appreciate that a plurality of servers may be implemented in accordance with the present invention to process captured and transmitted video data. Based on the foregoing, those skilled in the art can appreciate that video data may be simultaneously transferred from server **100** or a plurality or servers to literally thousands of hand held devices located within the range of the wireless network and/or wireless gateways associated with venue **130**.

FIG. **9** illustrates a system **150** for providing multiple perspectives through hand held device **60** of an activity at a venue **130** in association with a wireless network **152**, in accordance with a preferred embodiment. System **150** of FIG. **9** is analogous to system **92** of FIG. **8**, the difference noted in the inclusion of wireless network **152**. Thus, in FIG. **8** and FIG. **9**, like or analogous parts are indicated by identical reference numerals. Video data captured by a camera or cameras, such as panoramic video camera **114**, may be transferred to data transmitter **112**, which transmits the video data to wireless network **152**. Wireless network **152** then retransmits the data, at the request of authorized users of hand held devices, such as hand held device **60**, to wireless data transmitters/receivers, such as transmitter/receiver **110** integrated with hand held device **60**.

Those skilled in the art can appreciate that wireless network **152** may also receive and retransmit other data, in addition to video data. For example, a server or other computer system may be integrated with wireless network **152** to provide team and venue data, which can then be transferred to wireless data transmitter receiver **110** from wireless network **152** and displayed thereafter as team and venue information within display screen **61** of hand held device **60**. Other data that may be transferred to hand held device for display include real-time and historical statistics, purchasing, merchandise and concession information, and additional product or service advertisements.

Such data can include box scores, player matchups, animated play-books, shot/hit/pitch charts, historical information, and offense-defense statistics. In a concert venue, for example, as opposed to a sporting event, information pertaining to a particular musical group can be also transferred to the hand held device, along with advertising or sponsor information. Note that both the video data and other data described above generally comprise types of venue-based data. Venue-based data, as referred to herein, may include data and information, such as video, audio, advertisements, promotional information, propaganda, historical information, statistics, event scheduling, and so forth, associated with a particular venue and generally not retrievable through public networks.

Such information can be transmitted together with video data received from data transmitter **112**. Such information may be displayed as streaming data within display area **61** of hand held device **60** or simply stored in a database within hand held device **60** for later retrieval by the user. An example of a wireless network that may be utilized to implement wireless network **152** can be Bluetooth, which is described in greater detail herein, and was conceived originally to make up for the shortcomings of infrared technologies (IR). Because IR cannot be utilized to penetrate walls, carry data heavy signals, or operate within devices that are not in line of sight, Bluetooth, which is becoming well-known the art, can be configured as or with wireless network **152**.

FIG. **10** illustrates an entity diagram **170** depicting network attributes of wireless network **152** that may be utilized in accordance with one or more embodiments. Wireless network **152** of FIG. **10** is analogous to wireless network **152** of FIG. **9**. Wireless network **152** as illustrated in FIG. **10** can be configured as a variety of possible wireless networks. Thus,

entity diagram **170** illustrates attributes of wireless network **152**, which may or may not be exclusive of one another.

Those skilled in the art can appreciate that a variety of possible wireless communications and networking configurations may be utilized to implement wireless network **152**. Wireless network **152** may be, for example, implemented according to a variety of wireless protocols, including cellular, Bluetooth, and RF or direct IR communications. Wireless network **152** can be implemented as a single network type (e.g., Bluetooth) or a network based on a combination of network types (e.g., GSM, CDMA, etc).

Wireless network **152** may be configured with teachings/aspects of CDPD (Cellular Digital Packet Data) networks well known in the networking arts. CDPD network **154** is illustrated in FIG. **10**. CDPD may be configured as a TCP/IP based technology that supports Point-to-Point (PPP) or Serial Line Internet Protocol (SLIP) wireless connections to mobile devices, such as the hand held devices described and illustrated herein. Cellular service is generally available throughout the world from major service providers. Data can be transferred utilizing CDPD protocols.

Current restrictions of CDPD are not meant to limit the range or implementation of the method and system described herein, but are described herein for illustrative purposes only. It is anticipated that CDPD will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may preferably be also configured with teachings/aspects of a Personal Area Network **156** or Bluetooth, as described herein. Bluetooth was adopted by a consortium of wireless equipment manufacturers referred to at the Bluetooth Special Interest Group (BSIG), and has emerged as a global standard for low cost wireless data and voice communication. Current specifications for this standard call for a 2.4 GHz ISM frequency band. Bluetooth technology is generally based on a short-range radio transmitter/receiver built into small application specific circuits (ASICS, DSPs) and embedded into support devices, such as the hand held devices described and illustrated herein.

The Bluetooth standard permits up to 100 mw of power, which can increase the range to 100 M. In addition, Bluetooth can support several data channels. Utilizing short data packets and frequency hopping of up to 1600 hops per second, Bluetooth is a wireless technology that can be utilized to enable the implementation of the methods and systems described herein. Current restrictions of Bluetooth are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated Bluetooth will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of GSM network **158**. GSM (Global System for Mobile Communication) and PCS (Personal Communications Systems) networks, both well known in the telecommunications arts, generally operate in the 800 MHz, 900 MHz, and 1900 MHz range. PCS initiates narrowband digital communications in the 900 MHz range for paging, and broadband digital communications in the 1900 MHz band for cellular telephone service. In the United States, PCS 1900 is generally equivalent to GSM 1900, GSM operates in the 900 MHz, 1800-1900 MHz frequency bands, while GSM 1800 is widely utilized throughout Europe and many other parts of the world.

In the United States, GSM 1900 is generally equivalent to PCS 1900, thereby enabling the compatibility of these two types of networks. Current restrictions of GSM and PCS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GSM and PCS will be continually developed, and that aspects of such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also utilize teachings/aspects of GPRS network **160**. GPRS technology, well-known in the telecommunications arts, bridges the gap between current wireless technologies and the so-called "next generation" of wireless technologies referred to frequently as the third-generation or 3G wireless technologies. GPRS is generally implemented as a packet-data transmission network that can provide data transfer rates up to 115 Kbps. GPRS can be implemented with CDMA and TDMA technology and supports X.25 and IP communications protocols, all well known in the telecommunications arts. GPRS also enables features, such as Voice over IP (VoIP) and multimedia services. Current restrictions of GPRS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GPRS will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be implemented utilizing teaching/aspects of a CDMA network **162** or CDMA networks. CDMA (Code Division Multiple Access) is a protocol standard based on IS-95 CDMA, also referred to frequently in the telecommunications arts as CDMA-1. IS-95 CDMA is generally configured as a digital wireless network that defines how a single channel can be segmented into multiple channels utilizing a pseudo-random signal (or code) to identify information associated with each user. Because CDMA networks spread each call over more than 4.4 trillion channels across the entire frequency band, it is much more immune to interference than most other wireless networks and generally can support more users per channel.

Currently, CDMA can support data at speeds up to 14.4 Kbps. Wireless network **152** may also be configured with a form of CDMA technology known as wideband CDMA (W-CDMA). Wideband CDMA may be also referred to as CDMA 2000 in North America. W-CDMA can be utilized to increase transfer rates utilizing multiple 1.25 MHz cellular channels. Current restrictions of CDMA and W-CDMA are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that CDMA and W-CDMA will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may be also implemented utilizing teachings/aspects of paging network **164**. Such paging networks, well known in the telecommunications arts, can be implemented in accordance with the present invention to enable transmission or receipt of data over the TME/X protocol, also well known in the telecommunications arts. Such a protocol enables notification in messaging and two-way data coverage utilizing satellite technology and a network of base stations geographically located throughout a particular geographical region. Paging network **162** can be configured to process enhanced 2-way messaging applications.

Unified messaging solutions can be utilized in accordance with wireless network **152** to permit carriers and Internet service providers to manage customer e-mail, voice messages and fax images and can facilitate delivery of these communications to PDAs, telephony devices, pagers, personal computers and other capable information retrieval devices, wired or wireless.

Current restrictions of such paging networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that such paging networks, including those based on the TME/X protocol, will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of TDMA networks **166**. TDMA (Time Division Multiple Access) is a telecommunications network utilized to separate multiple conversation transmissions over a finite frequency allocation of through-the-air bandwidth. TDMA can be utilized in accordance with the present invention to allocate a discrete amount of frequency bandwidth to each user in a TDMA network to permit many simultaneous conversations or transmission of data. Each user may be assigned a specific timeslot for transmission. A digital cellular communications system that utilizes TDMA typically assigns 10 timeslots for each frequency channel.

A hand held device operating in association with a TDMA network sends bursts or packets of information during each timeslot. Such packets of information are then reassembled by the receiving equipment into the original voice or data/information components. Current restrictions of such TDMA networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that TDMA networks will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network **152** may also be configured utilizing teachings/aspects of Wireless intelligent Networks (WINs) **168**. WINs are generally known as the architecture of the wireless switched network that allows carriers to provide enhanced and customized services for mobile telephones. Intelligent wireless networks generally include the use of mobile switching centers (MSCs) having access to network servers and databases such as Home Location Registers (HLRs) and Visiting Location Registers (VLRs), for providing applications and data to networks, service providers and service subscribers (wireless device users).

Local number portability allows wireless subscribers to make and receive calls anywhere—regardless of their local calling area. Roaming subscribers are also able to receive more services, such as call waiting, three-way calling and call forwarding. A HLR is generally a database that contains semi-permanent mobile subscriber (wireless device user) information for wireless carriers' entire subscriber base.

A useful aspect of WINs for the present invention is enabling the maintenance and use of customer profiles within an HLR/VLR-type database. Profile information may be utilized for example with season ticket holders and/or fans of traveling teams or shows. HLR subscriber information as used in WINs includes identity, service subscription information, location information (the identity of the currently serving VLR to enable routing of communications), service restrictions and supplementary services/information. HLRs handle SS7 transactions in cooperation with Mobile Switching Centers and VLR nodes, which request information from the HLR or update the information contained within the HLR. The HLR also initiates transactions with VLRs to complete incoming calls and update subscriber data. Traditional wireless network design is generally based on the utilization of a single HLR for each wireless network, but growth considerations are prompting carriers to consider multiple HLR topologies.

The VLR may be also configured as a database that contains temporary information concerning the mobile subscribers currently located in a given MSC serving area, but whose HLR may be elsewhere. When a mobile subscriber roams away from the HLR location into a remote location, SS7 messages are used to obtain information about the subscriber from the HLR, and to create a temporary record for the subscriber in the VLR.

Signaling System No. 7 (referred to as SS7 or C7) is a global standard for telecommunications. In the past the SS7 standard has defined the procedures and protocol by which network elements in the public switched telephone network (PSTN) exchange information over a digital signaling network to affect wireless and wireline call setup, routing, control, services, enhanced features and secure communications. Such systems and standards may be utilized to implement wireless network **152** in support of venue customers, in accordance with the present invention.

Improved operating systems and protocols allow Graphical User Interfaces (GUIs) to provide an environment that displays user options (e.g., graphical symbols, icons or photographs) on a wireless device's screen. Extensible Markup Language ("XML") is generally a currently available standard that performs as a universal language for data, making documents more interchangeable. XML allows information to be used in a variety of formats for different devices, including PCs, PDAs and web-enabled mobile phones.

XML enables documents to be exchanged even where the documents were created and/or are generally used by different software applications. XML may effectively enable one system to translate what another system sends. As a result of data transfer improvements, wireless device GUIs can be utilized in accordance with a hand held device and wireless network **152**, whether configured as a paging network or another network type, to render images on the hand held device that closely represent the imaging capabilities available on desktop computing devices.

Those skilled in the art can appreciate that the system and logical processes described herein relative to FIG. **11** to FIG. **17** are not limiting features of the present invention. Rather, FIG. **11** to FIG. **17** provide examples of image-processing systems and logical processes that can be utilized in accordance with the present invention. Such a system and logical processes represent one possible technique, which may be utilized in accordance with one or more embodiments of the present invention to permit a user of a hand held device to manipulate video images viewable on a display screen of the hand held device.

FIG. **11** thus illustrates a prior art overview display **200** and a detail window **210** that may be utilized with embodiments of the present invention. The overview image display **200** is a view representative of a 360° rotation around a particular point in a space. While a complete rotational view may be utilized in accordance with preferred embodiments of the present invention, one of ordinary skill in the computer arts will readily comprehend that a send-circular pan (such as used with wide-angle cameras) or other sequence of images could be substituted for the 360 degree rotation without departing from the subject invention. The vantage point is generally where the camera was located as it panned the space. Usually the scene is captured in a spherical fashion as the camera pans around the space in a series of rows as depicted in FIG. **12**. The space is divided into w rows **220-224** and q columns **230-242** with each q representing another single frame as shown in FIG. **12**.

User control over the scene (e.g., rotation, pan, zoom) may be provided by pressing a touch screen display icon or moving a cursor displayed on a display screen of a hand held device, such as the hand held devices described herein. User

control over the scene may also be provided by manipulating external user controls integrated with a hand held device (e.g., user controls **44** and **54** of FIG. **2** and FIG. **3**). Movement from a frame in the overview image display to another frame is in one of eight directions as shown in FIG. **13**. The user may interact with the video representation of the space one frame at a time. Each individual frame is an image of one of the pictures taken to capture the space as discussed above. The individual frames may be pieced together.

Interacting with a video one frame at a time results in the ability to present a detailed view of the space, but there are severe limitations. First, the interaction results in a form of tunnel vision. The user can only experience the overview image display as it unfolds a single frame at a time. No provision for viewing an overview or browsing a particular area is provided. Determining where the current location in the image display is, or where past locations were in the overview image display is extremely difficult. Such limitations can be overcome by creating of a motif not dissimilar to the natural feeling a person experiences as one walks into a room.

Another limitation of a simple overview viewer is that there is no random access means. The frames can only be viewed sequentially as the overview image display is unfolded. As adapted for use in accordance with the present invention, this problem has been overcome by providing tools to browse, randomly select and trace selected images associated with any overview image.

FIG. **14** illustrates a prior art overview image **300**, a detail window **310** and a corresponding area indicia, in this case a geometric figure outline **320**. The detail window **310** corresponds to an enlarged image associated with the area bounded by the geometric figure outline **320** in the overview image **300**. As the cursor is moved, the location within the overview image **300** may be highlighted utilizing the geometric figure outline **320** to clearly convey what location the detail window **310** corresponds.

One of ordinary skill in the computer arts will readily comprehend that reverse videoing the area instead of enclosing it with a geometric figure would work equally well. Differentiating the area with color could also be used without departing from the invention. A user can select any position within the overview image, press the cursor selection device's button (for example, user controls in the form of touch screen user interface buttons or icons), and an enlarged image corresponding to the particular area in the overview display is presented in the detail window **310**. Thus, random access of particular frames corresponding to the overview image may be provided.

FIG. **15** illustrates a prior art series of saved geometric figure outlines corresponding to user selections in tracing through an overview display for subsequent playback. The overview image **400** has a detail window **410** with an enlarged image of the last location selected in the overview image **470**. Each of the other cursor locations traversed in the overview image **420**,**430**,**440**,**450** and **460** are also enclosed by an outline of a geometric figure to present a trace to the user.

Each of the cursor locations may be saved, and because each corresponds to a particular frame of the overview image, the trace of frames can be replayed at a subsequent time to allow another user to review the frames and experience a similar presentation. Locations in the detailed window and the overview image can also be selected to present other images associated with the image area, but not necessarily formed from the original image.

For example, a china teacup may appear as a dot in a china cabinet, but when the dot is selected, a detailed image rendering of the china teacup could appear in the detailed window. Moreover, a closed door appearing in an image could be selected and result in a detailed image of a room located behind the door even if the room was not visible in the previous image. Finally, areas in the detailed window can also be selected to enable further images associated with the detailed window to be revealed. Details of objects within a scene are also dependent on resolution capabilities of a camera. Cameras having appropriate resolution and/or image processing capabilities are preferably used in accordance with certain aspects of the present invention.

The overview image was created as discussed above. To assist one of ordinary skill in the art to make and use the invention, a more detailed discussion of the necessary processing is presented below with reference to FIG. **16** and FIG. **17** herein.

FIG. **16** depicts a prior art flowchart providing a logical process for building an overview image display. Such a logical process may be utilized in accordance with the present invention, but is not a necessary feature of the present invention. Those skilled in the art will appreciate that such a logical process is merely an example of one type of image-processing algorithm that may be utilized in accordance with embodiments of the present invention. For example, such a logical process may be implemented as a routine or subroutine that runs via image-processing unit **35** of FIG. **1** in a hand held device. Those skilled in the art can appreciate that the logical process described with relation to FIGS. **16** and **17** herein are not limiting features of the present invention.

Such logical processes, rather, are merely one of many such processes that may be utilized in accordance with the present invention to permit a user to manipulate video images displayed via a display screen of a hand held device. Navigable movie/video data in the form of images input to the hand held device to form individual images can be thus processed, as illustrated at function block **500**. User specified window size (horizontal dimension and vertical dimension) may be entered, as illustrated at function block **504**.

Image variables can be specified (horizontal sub-sampling rate, vertical sub-sampling rate, horizontal and vertical overlap of individual frame images, and horizontal and vertical clip (the number of pixels are clipped from a particular frame in the x and y plane)), as depicted at function block **508**. Function blocks **500**,**504** and **508** are fed into the computation function block **510** where the individual frames are scaled for each row and column, and the row and column variables are each initialized to one.

Then a nested loop can be invoked to create the overview image. First, as indicated at decision block **512**, a test is performed to determine if the maximum number of rows has been exceeded. If so, then the overview image is tested to determine if its quality is satisfactory at decision block **520**. If the quality is insufficient, the user may be provided with an opportunity to adjust the initial variables, as illustrated at function blocks **504** and **508**. The processing is then repeated. If however, the image is of sufficient quality, it can be saved and displayed for use, as depicted at block **560**.

If the maximum rows has not been exceeded as detected in decision block **512**, then another test can be performed, as illustrated at decision block **514**, to determine if the column maximum has been exceeded. If so, then the row variable can be incremented and the column variable can be reset to one at function block **518** and control flows to input block **520**. If the column maximum has not been exceeded, then the column variable may be incremented and the sub-image sample frame can be retrieved, as depicted at input block **520**. Then, as

illustrated at function block **530**, the frame may be inserted correctly in the overview image.

The frame may be inserted at the location corresponding to (Vsub*row*col)+Hsub*col: where row and col refer to the variables incremented in the nested loop, and Vsub and Hsub are user specified variables corresponding to the horizontal and vertical sub sampling rate. Finally, the incremental overview image can be displayed based on the newly inserted frame as depicted at display block **540**. Thereafter, the column variable can be reset to one and processing can be passed to decision block **512**.

A computer system corresponding to the prior art method and system depicted in FIG. **11** to **17** may be generally interactive. A user may guess at some set of parameters, build the overview image, and decide if the image is satisfactory. If the image is not satisfactory, then variables can be adjusted and the image is recreated. This process can be repeated until a satisfactory image results, which may be saved with its associated parameters. The picture and the parameters can be then input to the next set of logic.

Such features may or may not be present with the hand held device itself. For example, images may be transmitted from a transmitter, such as data transmitter **112** of FIG. **7**, and subroutines or routines present within the server itself may utilize predetermined sets of parameters to build the overview image and determine if the image is satisfactory, generally at the request of the hand held device user. A satisfactory image can be then transmitted to the hand held device. Alternatively, image-processing routines present within an image-processing unit integrated with the hand held device may operate in association with routines present within the server to determine if the image is satisfactory, and/or to manipulate the image (e.g., pan, zoom).

FIG. **17** depicts a prior art flowchart illustrative of a logical process for playback interaction. The logical process illustrated in FIG. **17** may be utilized in accordance with a preferred or alternative embodiment, depending of course, upon design considerations and goals. Playback interaction may commence, as illustrated at label **600**, which immediately flows into function block **604** to detect if user controls have been activated at the hand held device. Such user controls may be configured as external user controls on the hand held device itself (e.g., buttons, etc.), or via a touch screen user interface integrated with hand held device display screen.

When a touch screen user input or user control button press is detected, a test can be performed to determine if a cursor is positioned in the overview portion of the display. If so, then the global coordinates can be converted to overview image coordinates local to the overview image as shown in output block **612**. The local coordinates can be subsequently converted into a particular frame number as shown in output block **614**. Then, the overview image is updated by displaying the frame associated with the particular location in the overview image and control flows via label **600** to function block **604** to await the next button press.

If the cursor is not detected in the overview image as illustrated at decision block **610**, then another test may be performed, as indicated at decision block **620**, to determine if the cursor is located in the navigable player (detail window). If not, then control can be passed back via label **600** to function block **604** to await the next user input. However, if the cursor is located in the detail window, then as depicted a function block **622**, the direction of cursor movement may be detected. As depicted at function block **624**, the nearest frame can be located, and as illustrated at decision block **626**, trace mode may be tested.

If trace is on, then a geometric figure can be displayed at the location corresponding to the new cursor location in the overview image. The overview image may be then updated, and control can be passed back to await the next user input via user controls at the hand held device and/or a touch screen user interface integrated with the hand held device. If trace is not on, the particular frame is still highlighted as shown in function block **630**, and the highlight can be flashed on the overview image as illustrated at output block **632**. Thereafter, control may be returned to await the next user input.

Although the aforementioned logical processes describe the use of a cursor as a means for detecting locations in a panorama, those skilled in the art can appreciate that other detection and tracking mechanisms may be utilized, such as, for example, the pressing of a particular area within a touch screen display.

FIG. **18** depicts a pictorial representation illustrative of a Venue Positioning System (VPS) **700** in accordance with an alternative embodiment. FIG. **18** illustrates a stadium venue **701** which is divided according to seats and sections. Stadium venue **701** may be utilized for sports activities, concert activities, political rallies, or other venue activities. Stadium venue **701** is divided, for example, into a variety of seating sections A to N. For purposes of simplifying this discussion, VPS **700** is described in the context of sections A to C only.

A venue positioning system (VPS) device **704** is positioned in section A of stadium venue **701**, as indicated at position A2. A VPS device **702** is located within section A at position A1. In the illustration of FIG. **18**, it is assumed that VPS device **702** is located at the top of a staircase, while VPS device **704** is located at the bottom of the staircase, and therefore at the bottom of section A near the sports field **711**. A VPS device **706** is located near the top of section B at position B1. A VPS device **708** is located at the bottom of section B at position B2, near sports field **711**. Similarly, in section C, venue positioning devices **710** and **712** are respectively located at positions C1 and C2.

A hand held device **703** may be located at a seat within section A. For purposes of this discussion, and by way of example only, it is assumed that hand held device **703** is being operated by a stadium attendee watching a sporting event or other venue activity taking place on sports field **711**. A hand held device **707** is located within section B. Hand held device **707**, by way of example, may also be operated by a concessionaire or venue employee.

If the user of hand held device **703** desires to order a soda, hot dog, or other product or service offered by venue operators during the venue event, the user merely presses an associated button displayed via a touch screen user interface integrated with the hand held device. Immediately, a signal is transmitted by hand held device **703**, in response to the user input to/through the VPS device, wireless network or wireless gateway as previously described. One or more of VPS devices **702**, **704**, **706**, and **708** may detect the signal. The VPS devices may also operate merely as transponders, in which case hand held devices will be able to determine their approximate location within the venue and then transmit position information through wireless means to, for example, concession personnel.

VPS devices **702**, **704**, **706**, and **708** function in concert with one another to determine the location of hand held device **703** within section A. Triangulation methods, for example, may be used through the hand held device or VPS devices to determine the location of the hand held device within the venue. This information is then transmitted by one or more of such VPS devices either directly to hand held device **707** or initially through a wireless network, including

a wireless gateway and associated server, and then to hand held device **707**. The user of hand held device **707** then can directly proceed to the location of hand held device **703** to offer concession services.

Additionally, hand held device **703** can be configured with a venue menu or merchandise list. In response to requesting a particular item from the menu or merchandise list, the request can be transmitted as wireless data from hand held device **703** through the wireless network to hand held device **707** (or directly to a controller (not shown) of hand held device **707**) so that the user (concession employee) of hand held device **707** can respond to the customer request and proceed directly to the location of hand held device **703** used by a customer.

FIG. **19** illustrates in greater detail the VPS **700** of FIG. **18**, in accordance with an alternative embodiment. In FIG. **18** and FIG. **19** like or analogous parts are indicated by identical reference numerals, unless otherwise stated. Additionally wireless gateway **124** and server **100** of FIG. **19** are analogous to the wireless gateway **124** and server **100** illustrated in FIG. **8**. Venue positioning units **702**, **704**, **706**, and **708** are located within section A and section B. A wireless gateway **124** is linked to server **100**. Wireless gateway **124** can communicate with hand held device **707** and hand held device **703**.

Wireless gateway **124** can also communicate with VPS devices **702**, **704**, **706**, and **708** if the VPS devices are also operating as data communication devices in addition to providing mere transponder capabilities. When VPS devices **702**, **704**, **706**, and **708** detect the location of hand held device **703** within stadium venue **701**, the location is transmitted to wireless gateway **124** and thereafter to hand held device **703**. It should be appreciated that a hand held device user may also identify his/her location in a venue by entering location information (e.g., seat/section/row) on the hand held device when making a request to a service provider such as a food concession operation. The VPS devices will still be useful to help concession management locate concession employees located within the venue that are in closest proximity to the hand held device user. A wireless gateway **124** and server **100** can be associated with a wireless network implemented in association with stadium venue **701**. Those skilled in the art will appreciate that such a wireless network may be limited geographically to the stadium venue **701** itself and the immediate surrounding area. An example of such a wireless network, as described previously is a Bluetooth based wireless network.

The hand held devices themselves may be proprietary devices owned by promoters or operators of stadium venue **701** and rented to patrons for their use while attending a venue activity. Proprietary devices will generally be manufactured using durable materials (e.g., similar to those materials used on field technician digital millimeters/devices such as the Fluke™ line of electronic devices). Proprietary devices will also be limited in hardware and software modules (i.e., software routines/subroutines) needed for communication with the venue system in order to display venue activities to temporary users.

Hand held devices may also be owned by the patrons themselves which they bring into the stadium venue for their use by permission of the venue promoter or stadium owners in return for the payment of a fee by the patron. In return for the fee, the venue promoter or stadium owner can provide the patron with a temporary code which permits them to access the wireless network associated with the venue itself, such as wireless network **152** described herein. Patron-owned devices may utilize smart card technology to receive authorization codes (e.g., decryption) needed to receive venue—provided video/data. Codes may also be transferred to the patron-owned device via IR or short range RF means. Wireless network **152** described herein may be configured as a proprietary wireless Intranet/Internet providing other data accessible by patrons through their hand held devices.

FIG. **20** depicts a flowchart of operations **740** illustrative of a method for providing multiple venue activities through a hand held device, in accordance with an alternative embodiment. The process is initiated, as depicted at block **742**. As illustrated next at block **744**, a venue attendee may activate at least one hand held tuner integrated with a hand held device, such as the hand held device illustrated in FIG. **4**. At least one tuner may be integrated with the hand held device, although more than one tuner (or other simultaneous signal receiving capability) may be used within a hand held device in support of other embodiments of the invention previously described.

The tuner, or tuners, is/are associated with a transmission frequency/frequencies of a transmitter that may be linked to a particular camera/cameras focusing on a venue activity, or to a wireless gateway or wireless network transmission. To view the images from that particular angle, the user must retrieve the video images from the camera associated with that particular angle. The user may have to adjust a tuner until the right frequency/image is matched, as indicated at block **756**. As illustrated at block **748**, captured video images are transferred from the video camera to the transmitter associated with the camera, or a server in control of the camera(s). Video images are generally transmitted to the hand held device at the specified frequency, in response to a user request at the hand held device, as depicted at block **750**.

An image-processing unit integrated with the hand held device, as illustrated at block **752** may then process transferred video images. An example of such an image-processing unit is image-processing unit **35** of FIG. **1**. As indicated thereafter at block **754**, the video images of the venue activity captured by the video camera can be displayed within a display area of the hand held device, such as display **18** of FIG. **1**. The process can then terminate, as illustrated at block **756**.

FIG. **21** illustrates a flowchart of operations **770** illustrative of a method for providing multiple venue activities through a hand held device from one or more digital video cameras, in accordance with an alternative embodiment. As indicated at block **772**, the process is initiated. As illustrated next at block **774**, video images of a venue activity may be captured by one or more digital video camera.

Such digital video cameras may be panoramic/wide-angle in nature and/or configured as high definition video cameras, well known in the art. The video camera or cameras may be respectively linked to data transmitters, such as data transmitters **102**, **104**, **106**, and/or **108** of FIG. **5** or data transmitter **112** of FIG. **6** to FIG. **9** herein. As depicted next at decision block **778**, if a user does not request a view of the venue activity through the hand held device, the process terminates, as illustrated thereafter at block **779**.

If, as illustrated at decision block **778**, the user does request a view of the venue activity through the hand held device, then as described thereafter at block **780**, video data may be transferred from a data transmitter to a server, such as server **100** of FIG. **5** to FIG. **8** herein. The video data may be stored in a memory location of the server or a plurality of servers, as indicated at block **782**. The video data may be then transferred to a wireless data transmitter/receiver integrated with the hand held device, as indicated at block **784**.

As illustrated thereafter at block **786**, the video data may be processed by an image-processing unit and associated image-processing routines and/or subroutines integrated with the hand held device. When image-processing is complete, the video images may be displayed in a display area of the hand

held device. As illustrated next at block **790**, if a user chooses to pan/zoom for a better view of the video images displayed within the hand held device, then two possible operations may follow, either separately or in association with one another.

The image-processing unit integrated with the hand held device may process the user's pan/zoom request, as illustrated at block **792**. Alternatively, image-processing routines and/or subroutines resident at the server or a plurality of servers may process the user's pan/zoom request, following the transmission of the user's request from the hand held device to the server or plurality of servers. Such a request may be transmitted through a wireless gateway linked to the server or servers.

Image-processing may occur at the server or servers if the hand held device is not capable of directly processing the video data and video images thereof due to low memory or slow CPU allocation. Likewise, some image-processing may take place within the hand held device, while video image-processing requiring faster processing capabilities and increased memory may take place additionally at the server or servers to assist in the final image representation displayed at the hand held device.

When image-processing is complete, the pan/zoomed images can be displayed within a display screen or display area of the hand held device, as illustrated thereafter at block **796**. The process then terminates, as depicted at block **798**. If the user does not request pan/zoom, as indicated at block **790**, the process may then terminate, as described at block **791**.

Based on the foregoing, it can be appreciated that methods, systems and servers are disclosed for authorizing access by a user of at least one service associated with an event at a venue based on a location of the user as determined by assets of a data communications network (e.g., Internet protocol based networks, computer network, telecommunications network, wireless network, Internet, etc). A location of at least one user can be determined based on communications of at least one computing device utilized by the at least one user with the data communications network supporting data communications of the at least one computing device. The at least one computing device can be authorized to receive the at least one service based on the location as determined by the data communications network. The data communications network can further comprise at least one of a server, a gateway, a home location register and a visiting location register. In some embodiments, the at least one user can be, for example, a subscriber. In other embodiments, the subscriber information associated with the subscriber can be stored in a memory (e.g., a database), and the subscriber information can be utilized to authorize the at least one service for the user. The at least one service can comprise, for example, at least one of video data, statistical information, concession information and advertisements. In some embodiments, authorizing the at least one computing device can further comprise preventing the at least one computing device from receiving the at least one service beyond or within a particular geographical area based on the location determined by the data communications network. In other embodiments, authorizing the at least one computing device can further comprise preventing the at least one computing device from receiving the at least one service absent at least one authorization code.

The embodiments and examples set forth herein are presented in order to best explain the present invention and its practical application and to thereby enable those skilled in the art to make and utilize the invention. However, those skilled in the art will recognize that the foregoing description and examples have been presented for the purpose of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching without departing from the spirit and scope of the following claims.

What is claimed is:

1. A method for authorizing access by a user of at least one service associated with an event at a venue based on a location of said user as determined by information derived from communication between a computing device in the form of a wireless handheld device carried and utilized by said user and assets of a data communications network, said method comprising:

determining a location of at least one user based on communications of at least one computing device comprised of a wireless handheld device utilized by said at least one user with said data communications network supporting data communications of said at least one computing device;

authorizing said at least one computing device to receive said at least one service based on said location as determined by said data communications network, wherein said at least one service includes streaming video accessed from a server wherein streaming video captured by at least one video camera operating within at least one entertainment venue is processed for delivery to subscribers of the at least one service and wherein said authorizing said at least one computing device further comprising preventing said at least one computing device from receiving said at least one service beyond or within a particular geographic area based on said location determination by said data communication network.

2. The method of claim **1** wherein said data communications network further comprises at least one of a server, a gateway, a home location register and a visiting location register.

3. The method of claim **1** wherein said at least one user comprises a subscriber.

4. The method of claim **3** further comprising:

storing subscriber information associated with said subscriber in a database; and

utilizing said subscriber information to authorize said at least one service for said user.

5. The method of claim **1** wherein said at least one service comprises providing at least one of video replay data, statistical information, concession information and advertisements to said at least one computing device authorized to receive said at least one service.

6. The method of claim **1** wherein said authorizing said at least one computing device further comprises preventing said at least one computing device from receiving said at least one service absent at least one authorization code.

7. A system for authorizing access by a user of at least one service associated with an event at a venue based on a location of said user as determined by information derived from communication between a computing device in the form of a wireless handheld device carried and utilized by said user and assets of a data communications network, said system comprising:

a processor;

a data bus coupled to said processor; and

a computer-usable medium embodying computer code, said computer-usable medium being coupled to said data bus, said computer program code comprising

instructions executable by said processor and configured for:

determining a location of at least one user based on communications of at least one computing device comprising a wireless handheld device utilized by said at least one user with said data communications network supporting data communications of said at least one computing device; and

authorizing said at least one computing device to receive said at least one service based on said location as determined by said data communications network, wherein said at least one service includes streaming video accessed from a server wherein streaming video captured by at least one video camera operating within at least one entertainment venue is processed for delivery to subscribers of the at least one service and wherein said instructions for authorizing said at least one computing device further comprising instructions for preventing said at least one computing device from receiving said at least one service beyond or within a particular geographic area based on said location determination by said data communication network.

8. The system of claim **7** wherein said data communications network further comprises at least one of a server, a gateway, a home location register and a visiting location register.

9. The system of claim **7** wherein said at least one user comprises a subscriber.

10. The system of claim **9** wherein said instructions are further configured for:

storing subscriber information associated with said subscriber in a database; and

utilizing said subscriber information to authorize said at least one service for said user.

11. The system of claim **7** wherein said at least one service comprises providing at least one of video replay data, statistical information, concession information and advertisements to said at least one computing device authorized to receive said at least one service.

12. The system of claim **7** wherein said instructions for authorizing said at least one computing device further comprise instructions for preventing said at least one computing device from receiving said at least one service absent at least one authorization code.

13. At least one server for authorizing access by a user of at least one service associated with an event at a venue based on a location of said user as determined by information derived from communication between a computing device in the form of a wireless handheld device carried and utilized by said user and assets of a data communications network, said at least one server comprising:

at least one processor capable of determining a location of at least one user based on communications of at least one computing device comprising a wireless handheld device utilized by said at least one user with said data communications network supporting data communications of said at least one computing device; and

at least one processor capable of authorizing said at least one computing device to receive said at least one service based on said location as determined by said data communications network, wherein said at least one service includes streaming video accessed from a server wherein streaming video captured by at least one video camera operating within at least one entertainment venue is processed for delivery to subscribers of the at least one service and wherein said authorizing said at least one computing device further comprising preventing said at least one computing device from receiving said at least one service beyond or within a particular geographic area based on said location determination by said data communication network.

14. The at least one server of claim **13** wherein said data communications network further comprises at least one of a server, a gateway, a home location register and a visiting location register.

15. The at least one server of claim **13** wherein said at least one user comprises a subscriber.

16. The at least one server of claim **15** further comprising:

at least one memory capable of storing subscriber information associated with said subscriber in a database; and

at least one processor capable of utilizing said subscriber information to authorize said at least one service for said user.

17. The at least one server of claim **13** The method of claim **1** wherein said at least one service comprises providing at least one of video replay data, statistical information, concession information and advertisements to said at least one computing device authorized to receive said at least one service.

18. The at least one server of claim **13** wherein said authorizing said at least one computing device further comprises preventing said at least one computing device from receiving said at least one service absent at least one authorization code.

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