Ruffin B. Cordell (Admission pro hac vice pending/cordell@fr.com)
Michael J. McKeon (Admission pro hac vice pending/mckeon@fr.com)
Brian R. Nester (Admission pro hac vice pending/nester@fr.com)
FISH & RICHARDSON P.C.
1425 K Street, N.W., 11th Floor
Washington, D.C. 20005
Telephone: (202) 783-5070
Facsimile: (202) 783-2331

Juanita R. Brooks (SBN 75934)
Christopher S, Marchese (SBN 170239)
FISH & RICHARDSON P.C.
12390 El Camino Real
San Diego, CA 92130
Telephone: (858) 678-5070
Facsimile: (858) 678-5099

Attorneys for Plaintiff
LG Electronics, Inc.

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FEB 20 2009
CLERK, U.S. DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
BY DEPUTY

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF CALIFORNIA

LG ELECTRONICS, INC.,

Plaintiff,

v.

EASTMAN KODAK COMPANY,

Defendant.

Case No.

'09 CV 0344 JAH RBB

**COMPLAINT FOR PATENT INFRINGEMENT**

**DEMAND FOR JURY TRIAL**

Plaintiff LG Electronics, Inc. (hereinafter Plaintiff or "LGE") hereby files this complaint against Defendant Eastman Kodak Company (hereinafter Defendant or "Kodak"), and alleges as follows:

## PARTIES

1. Plaintiff LGE is a Korean corporation with its principal place of business located at LG Twin Towers, 20, Yeouido-dong, Yeongdeungpo-gu, Seoul 150-721, Korea.

2. On information and belief, Defendant Kodak is a New York corporation with its principal place of business located at 343 State Street, Rochester, New York 14650.

ORIGINAL

## JURISDICTION AND VENUE

3. This Court has subject matter jurisdiction over the cause of this action pleaded herein under 28 U.S.C. §§ 1331 and 1338(a) because the action concerns a federal question arising under the patent laws of the United States, including 35 U.S.C. § 271.

4. Venue is proper in this judicial district under 28 U.S.C. §§ 1391(b), (c) and 1400(b) because, among other reasons, Kodak is subject to personal jurisdiction in this judicial district, has committed acts of infringement in this judicial district, and has a regular and established place of business in this judicial district.

5. Upon information and belief, Kodak has placed infringing products into the stream of commerce by shipping those products into this judicial district or knowing that such products would be shipped into this judicial district.

## FIRST CLAIM FOR RELIEF
## INFRINGEMENT OF U.S. PATENT NO. 6,885,407

6. The allegations of paragraphs 1-5 are incorporated herein by reference.

7. LGE is the owner by assignment of all right, title, and interest in and to United States Patent No. 6,885,407 entitled "Apparatus For Displaying Guide Line For Picture Adjustment In Monitor" (hereinafter "the '407 patent"), which was duly and legally issued on April 26, 2005. A true and correct copy of the '407 patent is attached to this Complaint as Exhibit 1.

8. Kodak has infringed and continues to infringe directly and/or indirectly, literally and/or under the doctrine of equivalents, one or more claims of the '407 patent under 35 U.S.C. § 271, by making, using, offering to sell, or selling within the United States, including in this judicial district, or importing into the United States, digital cameras including the Kodak EasyShare Z1015 IS and Kodak EasyShare Z1012 IS.

9. On information and belief, LGE alleges that Kodak's infringement was and/or is willful.

10. As a result of Kodak's unlawful infringement of the '407 patent, LGE has suffered, and will continue to suffer, irreparable harm and damages.

11. Kodak's past and continued acts of infringement have injured and damaged LGE, and will continue to cause irreparable injury to LGE unless and until enjoined by this Court.

## SECOND CLAIM FOR RELIEF
## INFRINGEMENT OF U.S. PATENT NO. 5,077,612

12. The allegations of paragraphs 1-5 are incorporated herein by reference.

13. LGE is the owner by assignment of all right, title, and interest in and to United States Patent No. 5,077,612 entitled "Portable Electronic Picture Recording Device With Nonvolatile Electronic Memory" (hereinafter "the '612 patent"), which was duly and legally issued on December 31, 1991. A true and correct copy of the '612 patent is attached to this Complaint as Exhibit 2.

14. Kodak has infringed and continues to infringe directly and/or indirectly, literally and/or under the doctrine of equivalents, one or more claims of the '612 patent under 35 U.S.C. § 271, by making, using, offering to sell, or selling within the United States, including in this judicial district, or importing into the United States, digital cameras including the Kodak EasyShare V1073.

15. On information and belief, LGE alleges that Kodak's infringement was and/or is willful.

16. As a result of Kodak's unlawful infringement of the '612 patent, LGE has suffered, and will continue to suffer, irreparable harm and damages.

17. Kodak's past and continued acts of infringement have injured and damaged LGE, and will continue to cause irreparable injury to LGE unless and until enjoined by this Court.

## PRAYER FOR RELIEF

WHEREFORE, LGE prays that this Court enters judgment and provides relief as follows:

(a) That Kodak has infringed the '407 patent and the '612 patent;

(b) That Kodak, and its officers, agents, servants, employees, and those in active concert or participation with them directly or indirectly, be enjoined from infringing the '407 patent and the '612 patent;

(c) That Kodak be ordered to account for and pay to LGE the damages resulting from Kodak's infringement of the '407 patent and the '612 patent, together with interest and costs, and all other damages permitted by 35 U.S.C. § 284, including enhanced damages up to three times the amount of damages found or measured;

(d) That Kodak has willfully infringed the '407 patent and the '612 patent;

(e) That this action be adjudged an exceptional case and LGE be awarded its attorneys' fees, expenses and costs in this action pursuant to 35 U.S.C. § 285; and

(f) That LGE be awarded such other equitable or legal relief as this Court deems just and proper under the circumstances.

**DEMAND FOR JURY TRIAL**

Pursuant to Federal Rule of Civil Procedure 38, Plaintiff LGE demands a jury trial on all issues so triable.

Dated: February 20, 2009

FISH & RICHARDSON P.C.

By: _____
Christopher S, Marchese (SBN 170239)

Attorneys for Plaintiff
LG Electronics, Inc.

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EXHIBIT 1

US006885407B1

(12) **United States Patent**
**Lee**

(10) **Patent No.: US 6,885,407 B1**
(45) **Date of Patent: Apr. 26, 2005**

(54) **APPARATUS FOR DISPLAYING GUIDE LINE FOR PICTURE ADJUSTMENT IN MONITOR**

(75) Inventor: **Jun Hyeong Lee**, Daegu Metropolitan (KR)

(73) Assignee: **LG Electronics Inc.**, Seoul (KR)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 525 days.

(21) Appl. No.: **09/678,838**

(22) Filed: **Oct. 4, 2000**

(30) **Foreign Application Priority Data**

Oct. 4, 1999 (KR) ..... 1999-42545

(51) **Int. Cl.**[7] ..... **H04N 5/50**
(52) **U.S. Cl.** ..... **348/569**; 348/589
(58) **Field of Search** ..... 348/569, 570, 348/589; 345/634, 636, 629

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*Primary Examiner*—Michael H. Lee
(74) *Attorney, Agent, or Firm*—Fleshner & Kim, LLP

(57) **ABSTRACT**

Disclosed is an apparatus for displaying a guide line for picture adjustment in a monitor. The apparatus includes a control section for recognizing a command for executing a picture adjustment mode from a user, and outputting commands for generating an OSD and a guideline, respectively, a guideline information providing section for receiving the command for generating the guideline from the control section, and outputting information related to forming the guideline, an image signal generator for receiving information related to forming the guideline from the guideline information providing section, and outputting an image signal to construct a picture including the guideline corresponding to the information related to the guideline, an OSD generating section for receiving the command for generating the OSD from the control section, and outputting an OSD image signal to adjust a picture, an image amplifying section for combining the image signal including the guideline outputted from the image signal generator with the OSD image signal outputted from the OSD generating section, and a display section for displaying an output of the image amplifying section on a display screen.

**53 Claims, 4 Drawing Sheets**

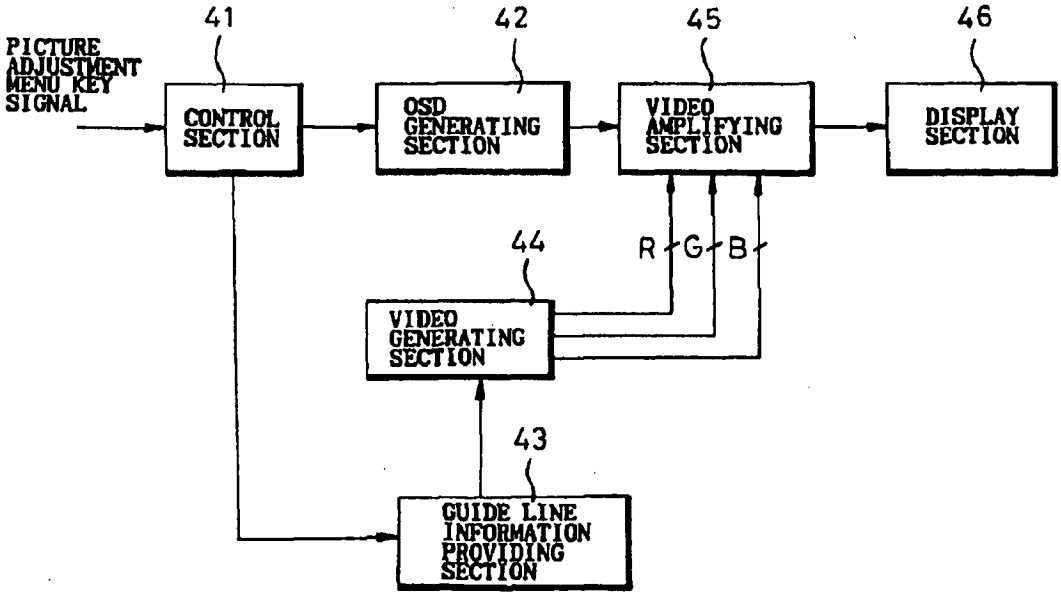


FIG. 1
(Related Art)

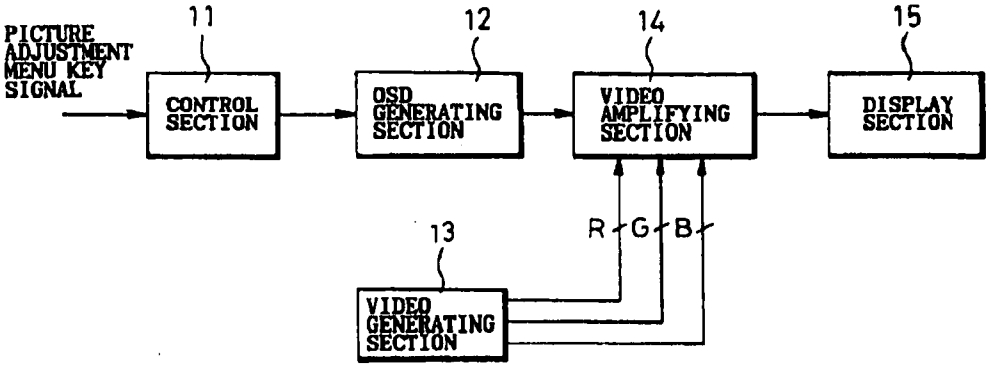



FIG. 2
(Related Art)

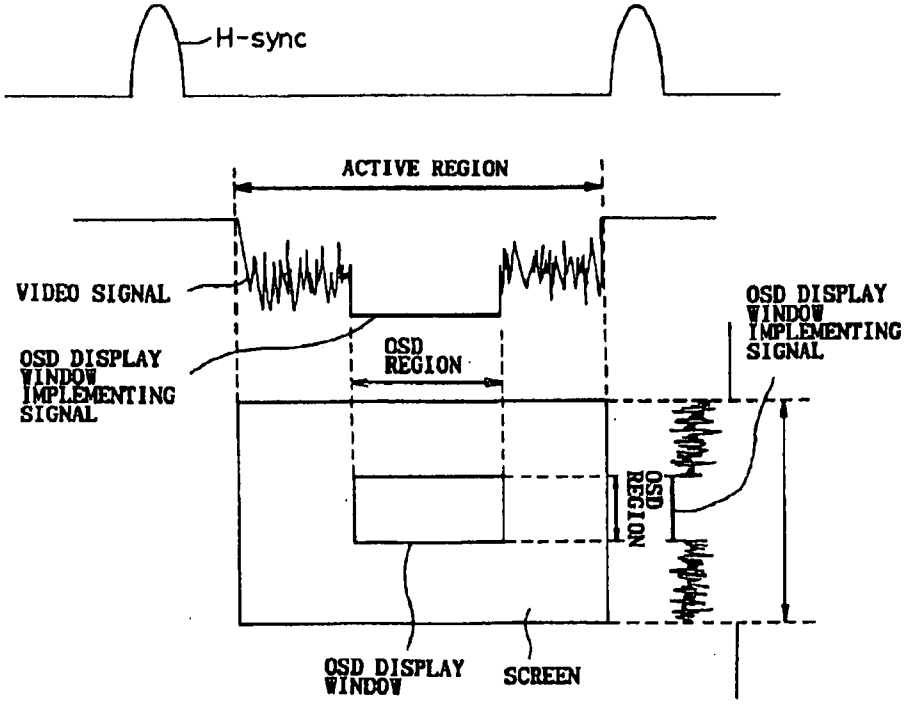


FIG. 3
(Related Art)

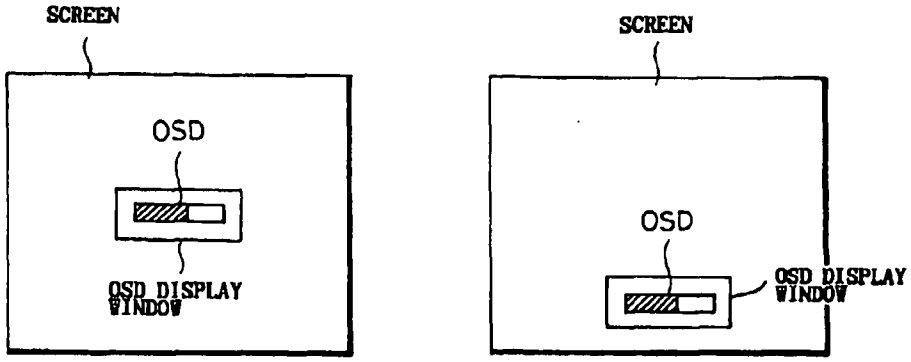



FIG. 4

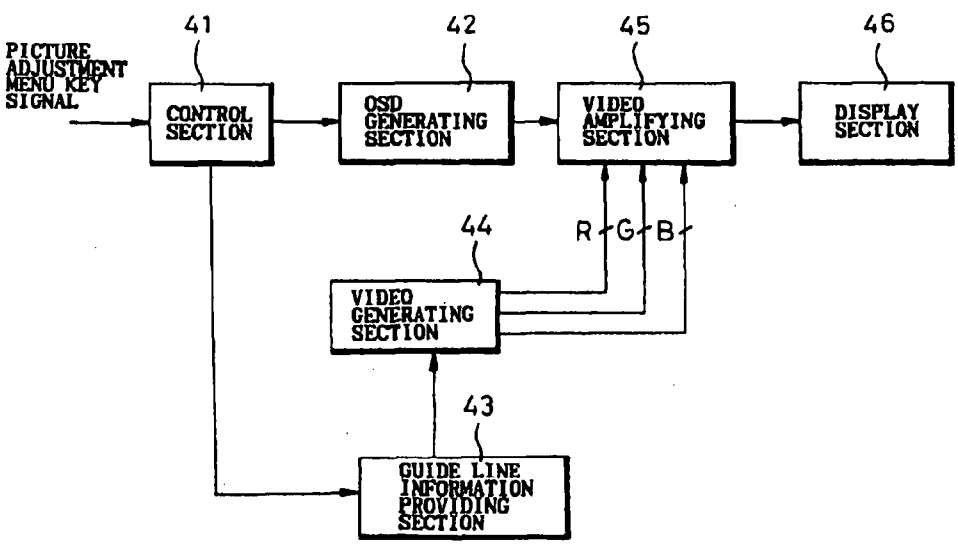


FIG. 5

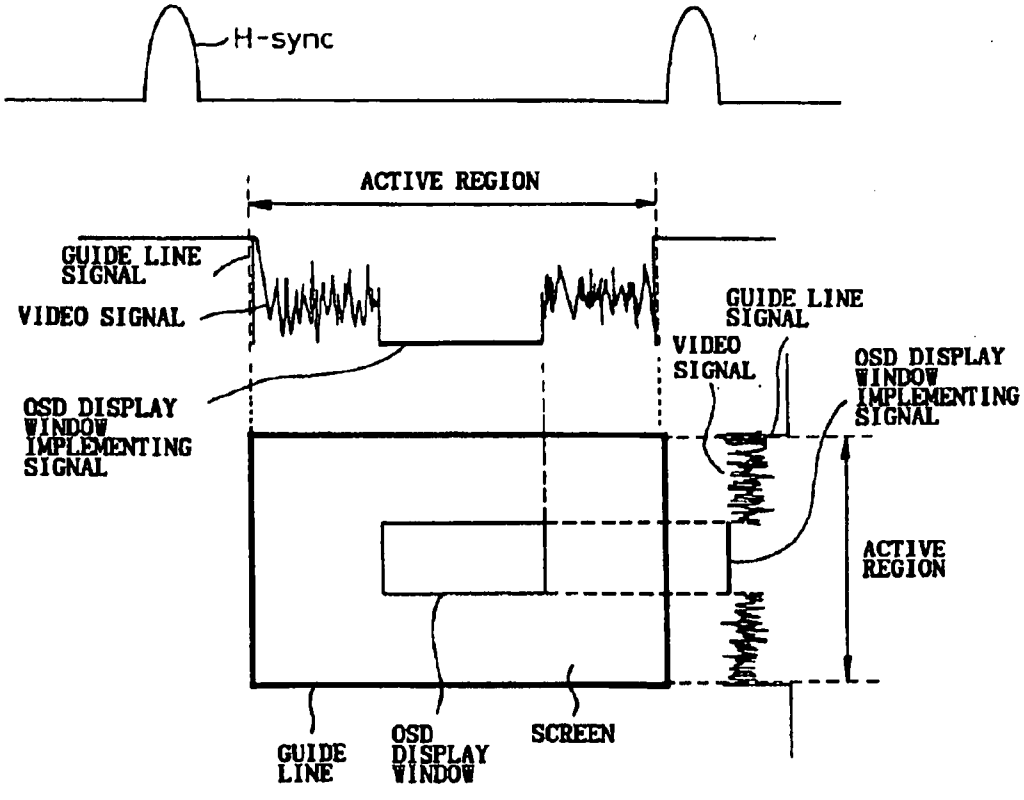

H-sync
ACTIVE REGION
GUIDE LINE SIGNAL
VIDEO SIGNAL
OSD DISPLAY WINDOW IMPLEMENTING SIGNAL
GUIDE LINE SIGNAL
VIDEO SIGNAL
OSD DISPLAY WINDOW IMPLEMENTING SIGNAL
ACTIVE REGION
GUIDE LINE
OSD DISPLAY WINDOW
SCREEN

FIG. 6

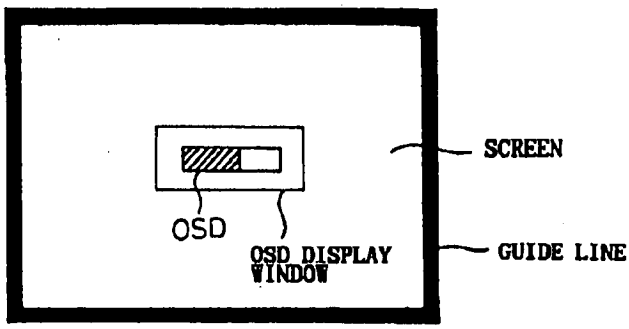



FIG. 7

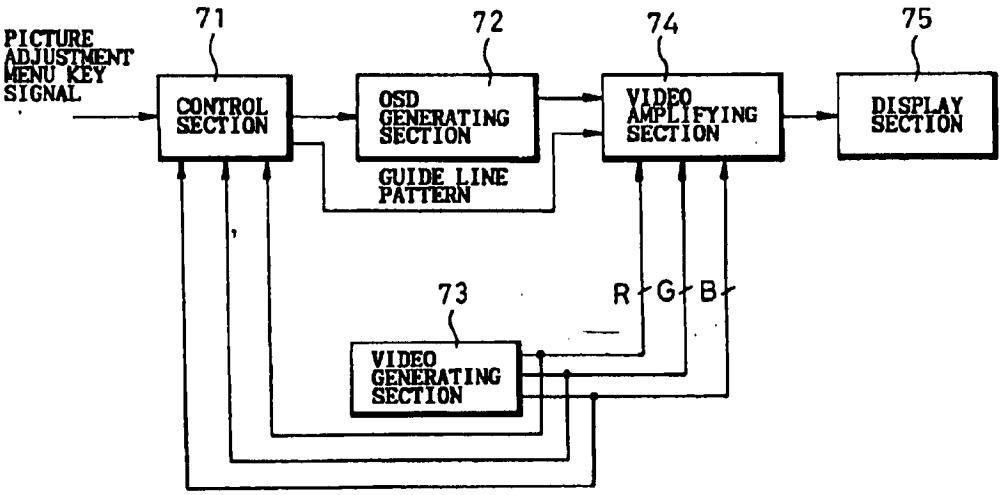
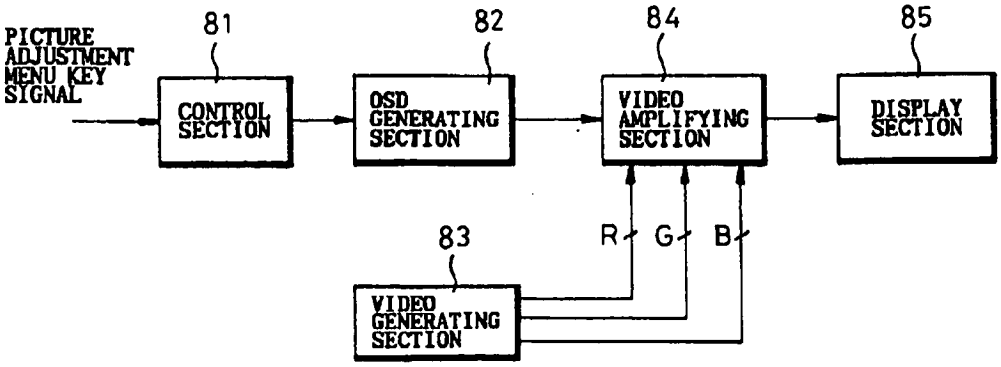



FIG. 8



# APPARATUS FOR DISPLAYING GUIDE LINE FOR PICTURE ADJUSTMENT IN MONITOR

## BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an apparatus for displaying guide line for picture adjustment in a monitor, and more particularly to an apparatus for displaying guide line for picture adjustment in a monitor, which displays a guideline around a periphery of the screen when adjusting the picture, thereby enabling a user to confirm the adjusted result.

2. Description of the Related Art

In general, if a user selects a picture adjustment mode, the on-screen display (OSD) device displays patterns, which are used for displaying specified items for adjusting the picture such as size, position, pin cushion, on the screen.

The user can confirm the varying state of an adjustment value set by himself/herself by means of a numerical value or a bar appearing within the OSD of the picture to display the state of adjustment.

FIG. **1** shows the conventional OSD device for a monitor comprising a control section **11**, an OSD generating section **12**, an image generator **13**, an image amplifier **14** and a display section **15**.

The control section **11** is mounted inside of a monitor and outputs a control signal so that the OSD for a picture adjustment mode can be displayed at a predetermined position of the picture in accordance with an input of a picture adjustment menu key by a user. Thus, the control section **11** exchanges data with a system in a main body of a PC. The OSD generating section **12** generates the corresponding OSD in accordance with a control signal from the control section **11**. The image generator **13** is mounted on the main body of the PC, and outputs image signals R, G, B to construct a picture corresponding to the control signal from the system in the main body of the PC. The image amplifier **14** combines the OSD image outputted from the OSD generating section **12** with the image signals outputted from the image signal generator **13** to amplify the combined signals. The display section **15** displays an output of the image amplifier on the screen.

The operation of the conventional OSD displaying device for a monitor will now be explained in further detail.

If the user first inputs a picture adjustment menu key through a key input section of the monitor, the control section **11** of the monitor recognizes the input.

The control section **11** locates the position for displaying the OSD in accordance with the horizontal and vertical synchronous signals inputted from the system in the main body of the PC, and outputs a command for generating the OSD to the OSD generating section **12** so that the OSD for picture adjustment mode can be embodied at the corresponding position.

Subsequently, the OSD generating section **12** generates image signals to construct the corresponding OSD in accordance with the control signal outputted from the control section **11** to the image amplifying section **14**.

Meanwhile, the image signal generator **13** outputs the image signals R, G, B to the image amplifying section **14**, as shown in FIG. **2**.

The image amplifying section **14** then combines an output from the OSD generating section **12** with an output from the image signal generator **13**, and amplifies the combined outputs to a predetermined level so as to output the amplified image signal to the display section **15**.



As shown in FIG. **3**, the display section **15** displays the signals outputted from the image amplifying section **14** at a predetermined position of an OSD display window such as in the middle or at a lower portion of the screen undergoing a series of signal processing.

At this time, the user can confirm the picture adjustment result in the picture adjustment mode in accordance with the adjusted value by means of the numerical value or a bar displayed by OSD.

In the picture adjustment mode of a monitor according to the conventional technology, the user can confirm the actual picture adjustment result by using the OSD. However, the actual picture is not clearly distinguished from the entire region of the picture. Thus, the picture adjustment result cannot be easily viewed on the picture, thereby posing a problem of failing to perform a picture adjustment as desired by the user.

## SUMMARY OF THE INVENTION

To solve at least the problems and disadvantages of the related ar an object of the present invention is to provide an apparatus for displaying a guide line for picture adjustment in a monitor, which enables a user to easily adjust the picture and view the result thereof.

Additional advantages, objects, and features of the invention will be set forth in part in the following description and will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objects and advantages of the invention may be realized and attained as particularly pointed out in the appended claims.

To achieve the objects and in accordance with the purposes of the invention, as embodied and broadly described herein according to an aspect of the present invention, there is provided an apparatus for displaying a guide line for picture adjustment in a monitor, comprising a control section for recognizing a command for executing a picture adjustment mode from a user, and outputting commands for generating an OSD and a guideline, respectively; a guideline information providing section for receiving the command for generating the guideline from the control section, and outputting information related to forming the guideline; an image signal generator for receiving information related to forming the guideline from the guideline information providing section, and outputting an image signal to construct a picture including the guideline corresponding to the information related to the guideline; an OSD generator section for receiving the command for generating the OSD from the control section, and outputting an OSD image signal to adjust a picture; an image amplifying section for combining the image signal including the guideline outputted from the image signal generator with the OSD image signal outputted from the OSD generating section; and a display section for displaying an output of the image amplifying section on a display screen.

Here, the information related to forming the guideline preferably includes at least one kind of information between thickness and color of the guideline.

According to another aspect of the present invention, there is provided an apparatus for displaying a guide line for picture adjustment in a monitor, comprising an image signal generator for outputting an image signal to construct a picture; a control section for recognizing a command for executing a picture adjustment mode from a user, identifying

a command for generating an OSD for picture adjustment, and beginning and ending positions of an active region of the image signal, and outputting a guideline pattern signal for generating a guideline; an OSD generating section for receiving the command for generating the OSD from the control section, and outputting an OSD image signal; an image amplifying section for combining the image signal outputted from the image signal generator, the guideline pattern signal outputted from the control section, and the OSD image signal outputted from the OSD generating section, and amplifying the combined signal; and a display section for displaying an output of the image amplifying section on a display screen.

Here, the control section preferably includes an active region detector for detecting the beginning and ending positions of the active region of the image signals outputted from the image signal generator, and a guideline pattern generator for generating a guideline at the beginning and ending positions of the detected active region.

Also, the active region detector is preferably a high-speed detective IC used for auto-sizing.

According to still another aspect of the present invention, there is provided an apparatus for displaying a guide line for picture adjustment in a monitor, comprising an image signal generator for generating an image signal to construct a picture; a control section for recognizing a command for executing a picture adjustment mode from a user, and identifying a position of generating a guideline in accordance with inputted horizontal/vertical synchronous signals, and outputting a command for generating an OSD signal and the guideline signal for picture adjustment at the corresponding position; an OSD generating section for receiving the command for generating the OSD signal and the guideline signal from the control section, and outputting the OSD signal and the guideline signal; an image amplifying section for combining the OSD signal, the guideline signal outputted from the OSD generating section, and the image signal outputted from the image signal generator, and amplifying the combined signal; and a display section for displaying an output of the image amplifying section on a display screen.

## BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in detail with reference to the accompanying drawings, in which:

FIG. **1** is a block diagram showing a construction of the conventional device of displaying an OSD for a monitor.

FIG. **2** is a diagram showing an image signal waveform for embodying an OSD display window in FIG. **1**.

FIG. **3** is a block diagram showing an OSD display picture according to the conventional technology.

FIG. **4** is a block diagram showing a construction of a device of displaying a picture adjustment guideline for a monitor according to a first embodiment of the present invention.

FIG. **5** is a diagram showing an image signal waveform for embodying a picture adjustment guideline in FIG. **4**.

FIG. **6** is a block diagram showing a picture adjustment guideline according to the present invention.

FIG. **7** is a block diagram showing a construction of a device of displaying a picture adjustment guideline for a monitor according to a second embodiment of the present invention.

FIG. **8** is a block diagram showing a construction of a device of displaying a picture adjustment guideline for a monitor according to a third embodiment of the present invention.



## DETAILED DESCRIPTION OF THE INVENTION

Preferred embodiments of the present invention will be described hereinafter with reference to the accompanying drawings.

FIG. **4** is a block diagram showing a construction of an apparatus for displaying a guide line for picture adjustment in a monitor according to a first embodiment of the present invention. FIG. **5** is a diagram showing an image signal waveform for embodying a picture adjustment guideline in FIG. **4**. FIG. **6** is a block diagram showing a picture adjustment guideline according to the present invention. FIG. **7** is a block diagram showing a construction of an apparatus for displaying guide line for picture adjustment in a monitor according to a second embodiment of the present invention. FIG. **8** is a block diagram showing a construction of an apparatus for displaying guide line for picture adjustment in a monitor according to a third embodiment of the present invention.

Embodiment 1

As shown in FIG. **4**, the first embodiment of an apparatus for displaying a guide line for picture adjustment in a monitor according to the present invention includes an OSD generating section **42** for generating predetermined OSD image signals in accordance with a control signal outputted from a control section **41** inside of the monitor, an image signal generator **44** for generating image signals R, G, B to construct a picture including a picture adjustment guideline, a guideline information providing section **43** for transferring information related to forming a corresponding guideline to the image signal generator **44** in accordance with a command for generating a guideline outputted from the control section **41**, an image amplifying section **45** for combining an OSD image outputted from the OSD generating section **42** with the image signals including the guideline outputted from the image signal generator **44**, and amplifying the combined signals, a display section **46** for displaying an output from the image amplifying section **45** on the picture, and a control section **41** for outputting a command for generating the OSD to the OSD generating section by recognizing a command for implementing a picture adjustment mode from a user, and transferring a command for generating a guideline to the guideline information providing section **43**.

An operation of the apparatus for displaying a guide line for picture adjustment according to a first embodiment of the present invention constructed above will now be described in further detail.

The user first inputs a picture adjustment menu key through a key input section of the monitor. The control section **41** of the monitor subsequently recognizes the input.

The control section **41** locates a position to display an OSD in accordance with horizontal and vertical synchronous signals pre-inputted from a system in a main body of a PC. The control section **41** also transfers a command for generating an OSD to the OSD generating section **42** so that an OSD of the picture adjustment mode can be displayed at the corresponding position. At the same time, the control section **41** also transfers a command for generating a guideline to the guideline information providing section **43**.

Subsequently, the OSD generating section **42** outputs image signals for constructing the corresponding OSD in accordance with the control signal transferred from the control section **41** to the image amplifying section **45**. The guideline information providing section **43** recognizes the command for generating the guideline from the control section **41**, and transfers the information related to the

guideline such as thickness and color of the guideline to the image signal generator **44**.

Accordingly, as shown in FIG. **5**, the image signal generator **44** generates image signals, including a guideline signal, image signal and OSD display window embodiment signal in the active region, and outputs the same to the image amplifying section **45**.

The image amplifying section **45** combines an output of the OSD generating section **42** with an output of the image signal generator **44**, and amplifies the combined signals to a predetermined level so as to be outputted to the display section **46**.

As shown in FIG. **6**, the display section **46** undergoes a series of signal processing with an output of the image amplifying section **45**, and displays the guideline and the OSD around the periphery of the picture so that the user can easily recognize the picture adjustment result.

Embodiment 2

As shown in FIG. **7**, the second embodiment of the apparatus for displaying a guide line for picture adjustment in a monitor according to the present invention comprises: an OSD generating section **72** for generating a predetermined OSD in accordances with the control signal outputted from the control section **71** of the monitor; an image signal generator **73** for generating image signals R, G, B to construct a picture; a control section **71** for outputting a command for generating an OSD to the OSD generating section **72** by recognizing a command for implementing a picture adjustment mode from the user, and detecting an active region of the image signals R, G, B outputted from the image signal generator **73** by means of an active region detector inside of the monitor so as to generate a guideline image at the corresponding position by means of a pattern generator inside of the monitor; an image amplifying section **74** for combining the OSD image signal outputted from the OSD generating section **72** and the image signals outputted from the image signal generator **73** with the guideline pattern signs outputted from the control section **71**, and amplifies the combined signals; and a display section **75** for displaying an output from the image amplifying section **74** on the picture.

Here, a high-speed detection IC is employed for the active region detector mainly used for auto-sizing.

An operation of the apparatus for displaying guide line for picture adjustment according to the present invention constructed above will now be described herein below.

The user first inputs a picture adjustment menu key through a key input section of the monitor. The control section **71** subsequently recognizes the input.

The control section **71** then outputs a command for generating an OSD to the OSD generating section **72** so that the OSD for a picture adjustment mode can be displayed at the corresponding position. At the same time, the active region detector inside of the monitor **71**, e.g., the high-speed detective IC, detects the beginning and ending positions of the active region of the image signals R, G, B supplied from the image signal generator **73**. The pattern generator inside of the control section **71** outputs the signal for generating guideline patterns at the corresponding position to the image amplifying section **74**.

At this stage, the high speed detective IC detects the image signals R, G, B and synchronous signals from the image signal generator **73**, and transfers the information on the exact beginning and ending positions of the active region to the control section **71** upon request of an OSD by the user.

The OSD generating section **72** then outputs the image signal to construct the corresponding OSD to the image amplifying section **74** in accordance with the control signal from the control section **71**. The image signal generator **73** outputs the image signals.

Subsequently, the image signal amplifying section **74** combines an output from the OSD generating section **72** and an output from the image signal generator **73** with the guideline pattern signals aud from the control section **71**, and amplifies the combined signals so as to be outputted to the display section **75**.

As shown in FIG. **6**, the display section **75** displays the guideline and the OSD around the periphery of the picture so that the user can easily recognize the picture adjustment result.

Embodiment 3

As shown in FIG. **8**, the third embodiment of the apparatus for displaying a guide line for picture adjustment in a monitor according to the present invention comprises: an OSD generating section **82** for generating an OSD and picture adjustment guideline image signals in accordance with the control signal outputted from the control section **81**; an image signal generator **83** for generating image signals R, G, B to construct a picture; a control section **81** for outputting a command for generating the OSD and the guideline to the OSD generating section **82** by recognizing a command for implementing a picture adjustment mode from the user; an image amplifying section **84** for combining the OSD and the guideline image signal outputted from the OSD generating section **82** with the image signals outputted from the image signal generator **83**; and a display section **85** for displaying an output of the image amplifying section **84** on the picture.

An operation of the apparatus for displaying a guide line for picture adjustment according to the present invention as constructed above will now be described herein below.

The user first inputs a picture adjustment menu key through a key input section of the monitor. The control section **81** subsequently recognizes the input.

The control section **81** then outputs a command for generating an OSD and a guideline to the OSD generating section **82** so that the OSD for a picture adjustment mode and the guideline can be displayed at the corresponding position.

The control section **81** can detect information on the beginning and ending positions of the active region in accordance with the horizontal and vertical synchronous signals transferred from a PC system. Thus, the control section **81** outputs the command for generating the OSD and the guideline to the OSD generating section **82** by means of the information on the corresponding position.

The OSD generating section **82** then outputs the image sia to display the corresponding OSD and the guideline to the image amplifying ion **84** in accordance with the control signal from the control section **81**. The image signal generator **83** outputs the image signals.

The image signal amplifying section **84** combines the OSD and the guideline image signal outputted from the OSD generating section **82** with the image signals of the image signal generator **83**, and amplifies the combined signals to a predetermined level so as to be outputted to the display section **85**.

As shown in FIG. **6**, the display section **85** undergoes a series of signal processing based on an output of the image amplifying section **84**, and displays the guideline and the OSD around the periphery of the picture so that the user can easily recognize the picture adjustment result.

As described above, the Embodiment 1 and the Embodiment 3 provide a guideline for clearly lining the boundary of

the picture in a picture adjusting mode, e.g., when adjusting the size of the picture. Thus, the adjusted result clearly appears on the picture.

The result of the picture adjustment may be highlighted by embodying the guideline with a color contrasted with the picture such as a red color.

The apparatus for displaying guide line for picture adjustment in a monitor according to the present invention embodies a guideline around the periphery of the picture in a picture adjustment mode for clearly lining the boundary of the picture. Therefore, the present invention carries effects of enhancing a user convenience as well as a reliability of the product.

The foregoing embodiments are merely exemplary and are not to be construed as limiting the present invention. The present teachings can be readily applied to other types of devices. The description of the present invention is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art.

What is claimed is:

1. An apparatus for displaying a guide line for picture adjustment in a monitor; comprising:

a control section for recognizing a command for executing a picture adjustment mode from a user, and outputting commands for generating an OSD and a guideline, respectively;

a guideline information providing section for receiving the command for generating the guideline from the control section, and outputting information related to forming the guideline;

an image signal generator for receiving information related to forming the guideline from the guideline information providing section, and outputting an image signal to construct a picture including the guideline corresponding to the information related to the guideline;

an OSD generating section for receiving the command for generating the OSD from the control section, and outputting an OSD image signal to adjust a picture;

an image amplifying section for combining the image signal including the guideline outputted from the image signal generator with the OSD image signal outputted from the OSD generating section; and

a display section for displaying an output of the image amplifying section on a display screen.

2. The apparatus of claim 1, wherein the information related to the guideline includes at least one of the information on thickness and color of the guideline.

3. An apparatus for displaying a guide line for picture adjustment in a monitor, comprising

an image signal generator for outputting an image signal to construct a picture;

a control section for recognizing a command for executing a picture adjustment mode from a user, identifying a command for generating an OSD for picture adjustment, and beginning and ending positions of an active region of the image signal, and outputting a guideline pattern signal for generating a guideline;

an OSD generating section for receiving the command for generating the OSD from the control section, and outputting an OSD image signal;

an image amplifying section for combining the image signal outputted from the image signal generator, the guideline pattern signal outputted from the control section, and the OSD image signal outputted from the OSD generating section, and amplifying the combined signal; and

a display section for displaying an output of the image amplifying section on a display screen.

4. The apparatus of claim 3, wherein the control section includes an active region detector for detecting beginning and ending positions of the active region from the image signal outputted from the image signal generator, and a guideline pattern generator for generating a guideline at the beginning and ending positions of the active region detected by the active region detector.

5. The apparatus of claim 4, wherein the active region detector is a high-speed detection IC used for auto-sizing.

6. An apparatus for displaying a guide line for picture adjustment in a monitor, comprising:

an image signal generator for generating an image signal to construct a picture;

a control section for recognizing a command for executing a picture adjustment mode from a user, and identifying a position of generating a guideline in accordance with inputted horizontal/vertical synchronous signals, and outputting a command for generating an OSD signal and the guideline signal for picture adjustment at the corresponding position;

an OSD generating section for receiving the command for generating the OSD signal and the guideline signal from the control section, and outputting the OSD signal and the guideline signal;

an image amplifying section for combining the OSD signal, the guideline signal outputted from the OSD generating section, and the image signal outputted from the image signal generator, and amplifying the combined signal; and

a display section for displaying an output of the image amplifying section on a display screen.

7. The apparatus of claim 1, further comprising:

an active region detector which detects beginning and ending positions of an active region including the OSD, wherein the image signal generator generates the guideline at the beginning and ending positions of the active region detected by the active region detector.

8. The apparatus of claim 7, wherein the active region detector is a high-speed detection IC used for auto-sizing.

9. The apparatus of claim 6, wherein the control section includes an active region detector which detects the position of generating the guideline, said position corresponding to beginning and ending positions of an active region of the OSD as detected by the active region detector based on the horizontal/vertical synchronous signals.

10. The apparatus of claim 9, wherein the active region detector is a high-speed detection IC used for auto-sizing.

11. An apparatus for a display device, comprising:

an OSD generator to generate an on-screen display (OSD) on a display device; and

a guideline generator to generate a guideline substantially surrounding the OSD on the display screen, wherein the OSD provides a statistical indication of a screen parameter adjustment and the guideline provide a visual indication of a result of the screen parameter adjustment.

12. The apparatus of claim 11, wherein said statistical indication includes at least one of a numerical value and a graph.

13. The apparatus of claim 11, wherein the guideline has a rectangular or square shape.

14. The apparatus of claim 11, wherein the guideline generator generates the guideline along a periphery of the screen.

15. An apparatus for a display device, comprising:

an OSD generator to generate an on-screen display (OSD) on a display device;

a guideline generator to generate a guideline substantially surrounding the OSD on the display screen; and

a controller which generates a first signal for input into the OSD generator to designate a location of the OSD on the screen, and generates a second signal for input into the guideline generator to command generation of the guideline.

16. The apparatus of claim 15, wherein the controller generates the first signal based on horizontal and vertical synchronous signals generated for the display device.

17. The apparatus of claim 15, wherein the guideline generator includes:

a guideline information providing section which generates information indicative of at least one a thickness and color of the guideline in response to the second signal generated by the controller; and

an image signal generator which generates an image signal for generating the guideline based on the information generated by the guideline information providing section.

18. An apparatus for a display device, comprising:

an OSD generator to generate an on-screen display (OSD) on a display device;

a guideline generator to generate a guideline substantially surrounding the OSD on the display screen;

a controller which inputs a signal designating a screen location of the OSD into the OSD generator; and

an active region detector which detects a position of an active region on the screen which includes the screen location of the OSD.

19. The apparatus of claim 18, wherein the active region detector is included within a high-speed detection integrated circuit (IC) which performs an auto-sizing function.

20. The apparatus of claim 18, wherein the controller includes the active region detector and the guideline generator, and wherein the guideline generator generates the guideline at a boundary of the active region position detected by the active region detector.

21. The apparatus of claim 18, wherein the active region detector detects the position of the active region based on horizontal and vertical synchronous signals generated for the display.

22. The apparatus of claim 21, wherein the active region detector detects beginning and ending positions of the active region based on the horizontal and vertical synchronous signals.

23. The apparatus of claim 22, wherein the guideline generator generates the guideline at the beginning and ending positions of the active region.

24. An apparatus for a display device, comprising:

an OSD generator to generate an on-screen display (OSD) on a display device;

a guideline generator to generate a guideline substantially surrounding the OSD on the display screen; and

a controller which generates a first signal for input into the OSD generator designating a screen location of the OSD and a second signal for input into the guideline generator designating a screen location of the guideline relative to the OSD screen location.

25. The apparatus of claim 24, wherein the controller generates the first and second signals based on horizontal and vertical synchronous signals generated for the display device.

26. A method, comprising:

generating an on-screen display (OSD); and

generating an indicator on the screen, wherein a screen parameter adjustment shown on the OSD is reflected as a corresponding change in the indicator, and wherein the indicator at least substantially surrounds the OSD on the screen.

27. The method of claim 26, wherein the OSD provides a statistical indication of the screen parameter adjustment, said statistical indication including at least one of a numerical value and a graph.

28. The method of claim 27, wherein the graph is a bar graph.

29. The method of claim 26, wherein the indicator is a guideline spaced a predetermined distance from the OSD on a screen.

30. The method of claim 26, wherein the indicator has a rectangular or square shape.

31. A method, comprising:

generating an on-screen display (OSD); and

generating an indicator on the screen, wherein a screen parameter adjustment shown on the OSD is reflected as a corresponding change in the indicator, and wherein the indicator is provided along a periphery of the screen.

32. A method, comprising:

generating an on-screen display (OSD);

generating an indicator on the screen, wherein a screen parameter adjustment shown on the OSD is reflected as a corresponding change in the indicator; and

detecting an active region on the screen which includes the OSD, wherein the indicator is provided at a boundary of the active region.

33. The method of claim 32, wherein the active region is detected based on horizontal and vertical synchronization signals for the display.

34. The method of claim 32, wherein the indicator is generated at beginning and ending positions of the active region.

35. The method of claim 32, wherein the detecting is provided in a high-speed detection integrated circuit (IC) which performs an auto-sizing function.

36. The method of claim 26, further comprising:

receiving a signal indicative of the screen parameter adjustment from a user operating a control menu of the display.

37. The method of claim 26, wherein indicator is generated to be distinguishable from other information on the screen.

38. The method of claim 37, wherein the indicator is displayed in a predetermined color.

39. The method of claim 26, wherein the screen parameter being adjusted is one of position, size, brightness, pin cushion, shape, and color.

40. A method, comprising:

receiving a signal for adjusting a screen parameter;

generating an on-screen display (OSD) to provide a statistical indication of the screen parameter adjustment in response to said signal; and

generating an indicator on the display to provide a visual indication of a result of the screen parameter

adjustment, wherein the indicator at least substantially surrounds the OSD on the screen.

**41**. The method of claim **40**, wherein the statistical indication provided by the OSD includes at least one of a numerical value and a graph.

**42**. The method of claim **41**, wherein the graph is a bar graph.

**43**. The method of claim **40**, wherein the indicator is a guideline spaced a predetermined distance from the OSD on the screen.

**44**. The method of claim **40**, wherein the indicator has a rectangular or square shape.

**45**. A display processor, comprising:

means for receiving a signal for adjusting a screen parameter;

means for generating an on-screen display (OSD) to provide a statistical indication of the screen parameter adjustment in response to said signal;

means for generating an indicator on the display to provide a visual indication of a result of the screen parameter adjustment; and

means for displaying the indicator along a periphery of the screen.

**46**. A method, comprising:

receiving a signal for adjusting a screen parameter;

generating an on-screen display (OSD) to provide a statistical indication of the screen parameter adjustment in response to said signal;

generating an indicator on the display to provide a visual indication of a result of the screen parameter adjustment; and

detecting an active region on the screen which includes the OSD, wherein the indicator is provided at a boundary of the active region.

**47**. The method of claim **46**, wherein the active region is detected based on horizontal and vertical synchronization signals for the display.

**48**. The method of claim **46**, wherein the indicator is generated at beginning and ending positions of the active region.

**49**. The method of claim **46**, wherein the detecting is provided in a high-speed detection integrated circuit (IC) which performs an auto-sizing function.

**50**. The method of claim **40**, wherein the screen parameter adjustment signal is generated by a control menu function of the display activated by a user.

**51**. The method of claim **40**, wherein the indicator is generated to be distinguishable from other information on the screen.

**52**. The method of claim **51**, wherein the indicator is displayed in a predetermined color.

**53**. The method of claim **50**, wherein said screen parameter adjustment signal designates a change in one of a picture position, size, brightness, pin cushion, shape, and color.

* * * * *

# United States Patent [19]

**Megrgardt et al.**

[11] **Patent Number: 5,077,612**

[45] **Date of Patent: Dec. 31, 1991**


[54] **PORTABLE ELECTRONIC PICTURE RECORDING DEVICE WITH NONVOLATILE ELECTRONIC MEMORY**


[75] Inventors: **Soenke Megrgardt**, March; **Ljubomir Micic**, Freiburg, both of Fed. Rep. of Germany

[73] Assignee: **Deutsche ITT Industries GmbH**, Freilburg, Fed. Rep. of Germany



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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.**[5] ..... **H04N 5/30**

[52] **U.S. Cl.** ..... **358/209**; 358/909; 358/310

[58] **Field of Search** ..... 358/310, 346, 339, 909, 358/182, 209, 346, 339; 365/112, 154; 371/24, 21.1, 40.1



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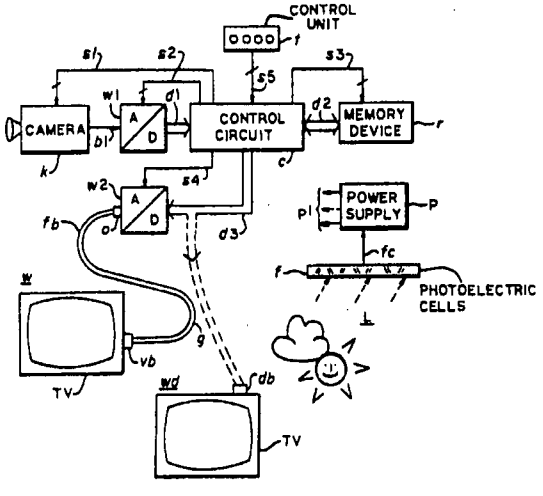
*Primary Examiner*—James J. Groody
*Assistant Examiner*—Tuan Ho
*Attorney, Agent, or Firm*—Thomas L. Peterson



[57] **ABSTRACT**

A portable electronic picture recording device includes a camera, an A/D converter for converting the analog picture signal to digital picture data, a signal processing and control circuit for compressing the digital picture data for storage and for restoring the data on playback and for processing the picture signal frames in single-picture, multi-picture, and scene shooting (sequence) modes, an electronic memory having erasable, programmable, nonvolatile memory cells, and a D/A converter for converting restored digital picture data into analog output signals. The electronic memory has EEPROM cells formed at a high packing density with VLSI technology, so that the picture recording device can have camcorder-like functions without a moving storage medium and with comparatively low power consumption.


**7 Claims, 2 Drawing Sheets**



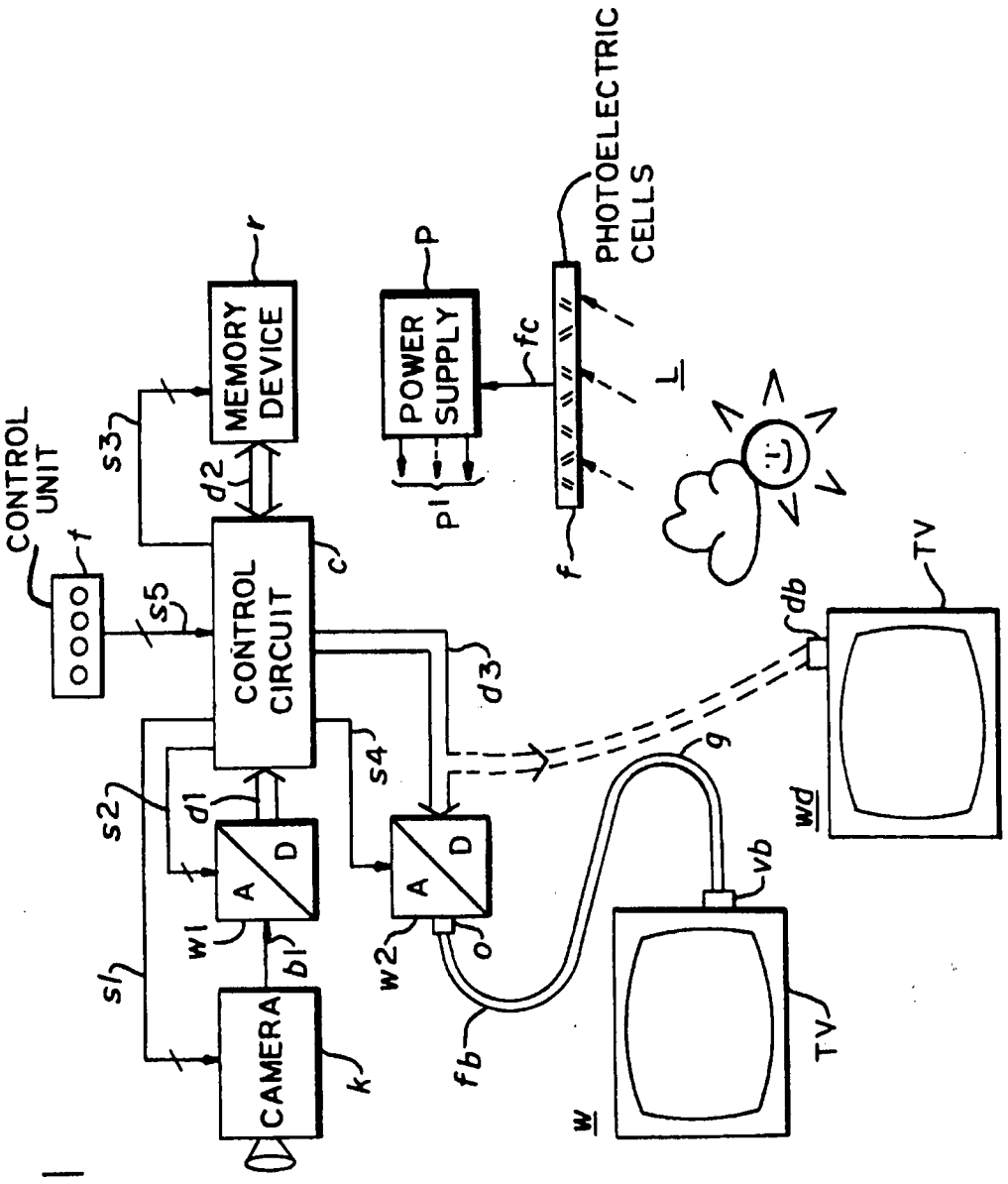

CONTROL UNIT
t
0000
s5
CONTROL CIRCUIT
c
MEMORY DEVICE
r
s3
d2
POWER SUPPLY
P
P1
fc
PHOTOELECTRIC CELLS
L
f
d3
s4
s2
d1
A
D
w1
b1
s1
CAMERA
k
w2
o
fb
g
db
TV
wd
vb
TV
w

FIG. 1

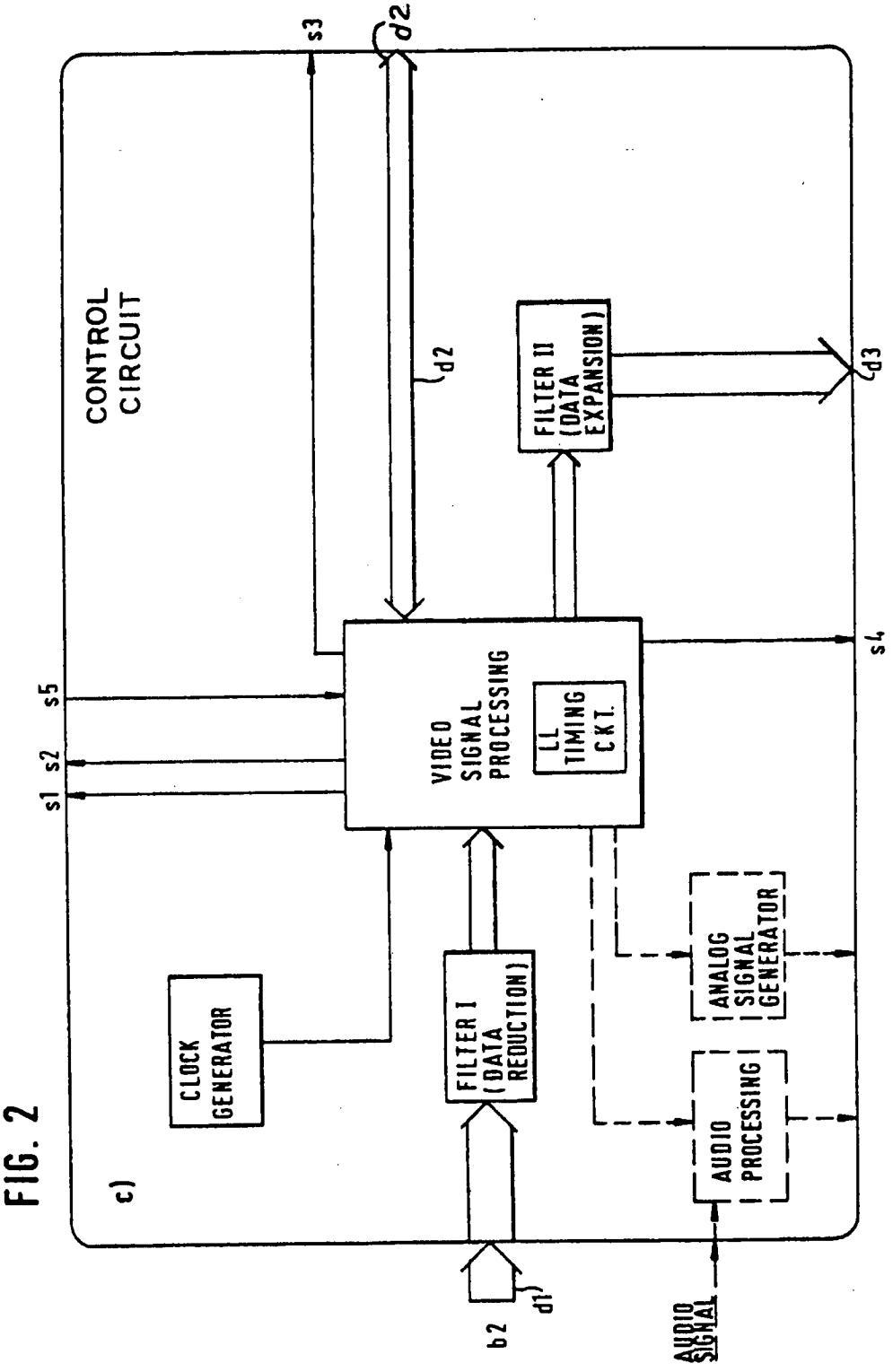

CONTROL CIRCUIT
s3
d2
d2
FILTER II (DATA EXPANSION)
d3
s4
s5
s1 s2
VIDEO SIGNAL PROCESSING
LL TIMING CKT.
CLOCK GENERATOR
FILTER I (DATA REDUCTION)
ANALOG SIGNAL GENERATOR
AUDIO PROCESSING
b2
d1
AUDIO SIGNAL
c)

FIG. 2

# PORTABLE ELECTRONIC PICTURE RECORDING DEVICE WITH NONVOLATILE ELECTRONIC MEMORY

## FIELD OF THE INVENTION

The present invention relates to a portable electronic picture recording device which uses electronic storage means for storing the pictures.

## BACKGROUND OF THE INVENTION

Picture recording devices in which the storage device is a video cassette holding a magnetic tap wound on a spool are classified under the term "camera recorder" or the abbreviated name "camcorder". For recording and playback, besides the purely electronic signal-processing circuitry, a costly, bulky, and failure-prone tape transport mechanism is necessary for moving the tape at as constant a speed as possible. The power consumption of this mechanism requires a relatively large energy store in the form of one or more batteries if the device is to be independent of a power line over a prolonged period of time. If all necessary functional parts, such as the camera, power supply with batteries and charger, signal-processing circuits, video cassette and tape transport mechanism, etc., are contained in a single housing, the device becomes relatively heavy and unwieldy.

Much handier are "still video cameras", which are equipped with an electronic picture recording device in which a CCD (charge coupled device) chip converts the picture element-by-element into electronic signals which are then stored in a frame of a small magnetic disk instead of the magnetic tape of the camcorder. This device makes it possible to store in the range of 25 individual frames, but also to record a rapid sequence of frames or scenes. However, it suffers from the drawback that the disk does require a drive mechanism. Examples of conventional camcorders and still video cameras are described, for example, in the publication "Funkschau", No. 22, 1986, pages 40 to 42.

Electronic picture recording devices are finding increasing use because the picture and associated sound can be immediately reproduced via a conventional television receiver, and because the electronic storage medium can be erased and reused any number of times, which is impossible with the light-sensitive film commonly used in conventional picture recording devices.

Electronic still cameras under development are described in the article "Electronic Camera", in the British Journal of Photography, No. 19, May 1984, pages 486–487, as published in London. It is proposed that such a camera include an objective lens coupled to a CCD transducer having separate arrays for respective primary colors. An A/D converter converts the CCD signals into digital pulses which are processed then stored in an erasable IC memory having storage sites for a number of individual picture frames. The picture frames can be extracted via a D/A converter for display on a TV screen or passed to a printer for hard copy pictures. However, such an electronic still camera is only adapted to shooting individual still pictures.

Another electronic video apparatus is adapted for decision of the arrival order of contestants in races, such as horse races, bicycle races, auto races, or the like, as disclosed in European Patent Application No. 86/304,610, of Yamaguchi Cinema Corporation, published as Publication No. 0,207,675 on Jan. 7, 1987. This video apparatus is set in a fixed position and a line sensor scans successive image lines as the arriving objects move in front of the line sensor. The line image data is converted via an A/D converter and stored in successive frames in a random access memory (RAM). The image data can be retrieved from memory and converted to television signals for replay in still or scroll modes. However, such a device has limited utility and requires a constant power supply to maintain the image data in RAM.



## SUMMARY OF THE INVENTION

It is, therefore, a primary object of the invention to provide a portable electronic picture recording device which requires no moving parts to store pictures and whose energy consumption is reduced to a minimum. It is a further object that such a device have the capability of reproducing a scene in a moving sequence as in camcorders, as well as single pictures as in still video cameras.

In accordance with the invention, a portable electronic picture recording device comprises a camera which generates an analog picture signal for individual or successive frames of images, an analog-to-digital converter for converting the analog picture signal to digital picture data, a signal processing an control circuit having means for compressing the digital picture data for storage in an electronic memory and for retrieving and expanding the data into television signals for display on a television receiver, respectively, wherein said signal processing and control circuit further includes means for processing data for picture signal frames in a plurality of modes, including single-picture, multi-picture, and scene shooting (sequence) modes, an electronic memory having a very large plurality of erasable, programmable, nonvolatile memory cells for storing digital picture data for a plurality of picture signal frames without the need for constant power supply, a digital-to-analog converter for converting restored digital picture data into analog output signals, and a power supply for supplying power to said signal processing and control circuit without the need for constantly supplying power to said electronic memory to maintain the data stored therein.

A fundamental ideal of the invention is to replace the moving storage medium of camcorders by fixed, programmable solid-state memories with nonvolatile memory cells, whose density on chips continues to increase as a result of technological development. In the preferred embodiment, the electronic memory is composed of electrically erasable programmable read-only memory (EEPROM) cells which can be formed at high densities on a chip using very largescale integration (VLSI) technology and do not require constant power supply to maintain stored data. The picture signal to be stored is digitized and fed to the signal processing and control circuit which writes the data into the memory and reads them out again for playback. For picture reproduction via a television receiver, a standard composite color signal must be generated. To this end, the blanking and synchronizing signals associated with the picture data read from the memory are added to the picture data either as digital signals before or as analog signals after the digital-to-analog conversion at the output end.

The above objects and the further features and advantages of the invention are described in detail below in conjunction with the drawings, of which:

## BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a schematic diagram of a portable electronic video device in accordance with the invention connected to a television receiver for an output display; and

FIG. 2 is a schematic diagram of the signal processing and control circuit for the portable electronic video device shown in FIG. 1.

## DETAILED DESCRIPTION OF THE FIGURES

Referring to FIG. 1, an image input is provided by a camera k which generates an analog picture signal bl in the usual manner, i.e., by line scanning. The analog picture signal bl is digitized by means of the analog-to-digital (A/D) converter wl and fed as the digital picture signal b2 to the signal processing and control circuit c. The latter performs a central control function of controlling, via a built-in clock generator unit and suitable control signals, all essential functions of the picture recording and reproducing device and even any simultaneous sound recording that may be made. First and second control signals sl, s2 are generated to control, for example, the camera k and the digitization process in the A/D converter wl, respectively.

As illustrated in FIG. 2, the signal-processing and control circuit c includes circuits for processing the digital picture signal b2 applied over the first data line d1, e.g., a first filter circuit for reducing the data to be stored such as by setting defined threshold signal levels, or by various data compression techniques as is well known. Correspondingly, a second filter circuit is provided for expansion of the stored data to restore the data by the inverse step from its compression technique. Complementary data compression and expansion permit optimum utilization of the capacity of the memory device r. The latter is connected to the signal-processing and control circuit c via the bidirectional second data line d2 and is controlled by third control signals s3 from this circuit c. The data compression and expansion techniques may further incorporate a data reduction circuit with a differential pulse code modulator for video signals. See U.S. Pat. No. 4,748,503 entitled DATA REDUCTION CIRCUIT WITH A DIFFERENTIAL PULSE CODE MODULATOR FOR VIDEO SIGNALS by Peter Pirsch issued on May 31, 1988. That patent describes a data reduction circuits that employs a differential pulse code modulator for input video signals where the timecritical loop includes a loop subtractor (s2), a quantizer (q)- and a -loop delay element (v3), so that differential pulse code modulation can be performed at higher clock rates than with conventional architectures. With 2 μm CMOS or N-channel MOS technology, for example, clock rates of 17 to 20 MHz are possible. The circuit includes a limiter circuit which applies the input video signals to the loop subtractor minuend input after processing the same. The output of the delay element in the loop is applied to inputs of a first adder, a vertical predictor and a constant multiplier, the multiplier receives a weighting factor equal to the square of a given weighting factor with the output of the multiplier applied to the subtrahend input of a first subtractor whose output is coupled to the input of the loop subtractor via a delay element. The output of the vertical predictor is applied respectively to the inputs of another constant multiplier, another delay element and the subtrahend input of another subtractor. The outputs of these units are applied to enable input video signals as processed to be applied to the minuend input of the first subtractor to thereby reduce the circuitry needed in the time critical loop. The techniques and structures employed in U.S. Pat. No. 4,748,503 can be used herein.

Depending on the internal organization of the memory device r, data is written in serially or as blocks with block addresses or as individual data units with associated addresses. Block transfer is particularly advantageous, since each block then corresponds to at least one complete picture line. The memory device r has a large plurality of programmable solid-state nonvolatile memory cells, for which a high packing density on chips can be obtained as a result of current technological development. Preferably, the memory device r is composed of electrically erasable programmable read-only memory (EEPROM) cells formed using VLSI technology which do not require a constant power supply in order to maintain stored data.

The data read from the memory device r is transferred via the signal-processing and control circuit c to the digital-to-analog (D/A) converter w2. This is done over the third data line d3 after the data from the memory device r has been suitably conditioned in the processing unit of the signal-processing and control circuit c. For example, blanking and synchronizing signals are digitally added to the stored picture data, so that a standard (PAL, NTSC, or SECAM color-television standard) composite color signal fb is available at the output of the D/A converter w2. The output of the latter is applied over a cable g connected to the output jack o to the input of a reproducing or display device w, e.g., a commercially available television receiver TV, which is fed with the output from the picture recording device according to the invention via the antenna or video input jack vb.

If a display device wd has an input jack db for digital picture signals, the D/A converter w2 is unnecessary, and the third data line d3 can be connected directly to this input jack db. In FIG. I this is indicated by dashed lines from the° third data line d3 connected to the display device wd, which is a television. The D/A converter w2 is controlled by fourth control signals s4, which are also generated by the processing unit of the signal-processing and control circuit c.

In certain circumstances, it may be simpler to add the blanking and synchronizing signals to the stored picture signals as analog signals, i.e. only after the digital-to-analog conversion. This is not shown in the drawings, since the additive mixing of the different analog signals with the standard composite color signal fb would then be performed by analog circuits like in conventional camcorders. In this (analog) case, the blanking and synchronizing signals are generated in the signal-processing and control circuit c by a suitable analog signal generator (dashed lines in FIG. 2) triggered by a line-locked timing circuit. In the digital case, they are derived from corresponding data sequences which are stored in a (ROM) memory and are also called up by the line-locked timing circuit.

The signal-processing and control circuit c is fed with fifth control signals s5 from the control unit t, which has buttons for operator selection of single-picture, multipicture or scene shooting (picture sequence), playback and other modes. These fifth control signals s5 initiate the corresponding functions which are coordinated

together in the picture recording device. Thus, the advantages of camcorderlike functions can be obtained in a more portable and handy apparatus which has an electronic memory that obviates the need for moving storage medium mechanisms and has very low power requirements.

FIG. 1 also shows the power supply p which feeds the picture recording device via supply lines pl. Besides the usual devices (not shown), such as main external line connection, transformer, rectifier, regulated DC voltage stage, batteries, etc., the power supply p can contain a generating device which uses photoelectrically-generated charging current fc from photoelectric transducer cells f to charge or trickle-charge the batteries. The photoelectric transducer cells f can be mounted at an advantageous point of the housing of the picture recording device, so that they are exposed to the ambient light L as fully as possible.

One implementation of a signal processing circuit similar to the signal-processing and control circuit c is described, as an example, in the data sheet of ITT Semiconductors entitled "VMC 2260 Video Memory Controller", Edition 1988/8, order No. 6251-248-7E. Shown therein is a, monolithic integrated circuit signal processor for storing one complete television picture in associated dynamic random access memories to implement a flicker free TV display. It includes signal processing circuits which serve, inter alia, to reduce the data of the digitized picture signals in order to minimize the memory capacity required for storage and playback. Other types of integrated filter circuits can also be used to serve the data reduction and complementary expansion functions. The necessary control signals are governed by means of an externally applied clock signal. It is also possible to record individual "snapshots" of up to nine different television-signal sources.

In the picture recording device according to the invention, storage of the picture data in the memory device r would be disadvantageous despite the high packing density attainable, because the memory function would have to be continuously "refreshed" which involves a continuous supply of electrical power. Thus, the invention provides for the combination of data reduction and expansion circuits and erasable, programmable nonvolatile memory cells. The nonvolatile memory cells are more advantageous for the implementation of the memory device r, because once they are written the power supply does not have to be maintained constantly on to maintain storage of the data, however the cells must be made easily erasable so that they can be rewritten. Such memory cells are commercially available, for example, in the form of electrically erasable and electrically programmable read-only memory (EEPROM) cells which can be implemented to a high packing density using very large scale integration (VSLI) technology. For example, each video frame of average quality may require a storage capacity from between 3 Mbits to 15 Mbits. It is understood that memory capacity continues to expand and larger capacity memories continue to become available.

The nonvolatile memory cells in the memory device r may also be nonvolatile ferroelectric memory cells as are disclosed, for example, in U.S. Pat. No. 4,713,157 issued to McMillan et al. With such memory cells, VLSI mass memories can be formed with a packing density comparable to that of conventional dynamic memories.

The specific embodiments of the invention described herein are intended to be illustrative only, and many other variations and modifications may be made thereto in accordance with the principles of the invention. All such embodiments and variations and modifications thereof are considered to be within the scope of the invention, as defined in the following claims.

We claim:

1. A portable electronic picture recording device comprising:

a camera which generates an analog picture signal for at least one frame of images;

an analog-to-digital (A/D) converter for converting the analog picture signal too digital picture data;

a signal processing and control circuit having means for compressing the digital picture data for storage in an electronic memory and for retrieving and expanding the digital picture data into television signals for display on a television receiver, respectively, wherein said signal processing and control circuit further includes means for processing data for picture signal frames in a plurality of modes, including single-picture, and scene shooting (sequence) modes and wherein said signal processing and control circuit further includes a first filter for reducing said digital picture data for storage and a second filter for data expansion upon playback;

said electronic memory having a very large plurality of erasable, programmable, nonvolatile memory cells for storing digital picture data for a plurality of picture signal frames without the need for constant power supply;

a digital-to-analog (D/aA) converter for converting restored digital picture data into analog output signals; and

a power supply for supplying power to said signal processing and control circuit without the need for constantly supplying power to said electronic memory to maintain the data stored therein.

2. A portable electronic picture recording device according to claim 1, wherein said nonvolatile memory cells are electrically erasable and electrically programmable read only memory (EEPROM) cells.

3. A portable electronic picture recording device according to claim 1, wherein said nonvolatile memory cells are ferroelectric memory cells.

4. A portable electronic picture recording device according to claim 1, wherein said power supply includes batteries which are recharged by photoelectric transducer cells.

5. A portable electronic picture recording device according to claim 1, wherein the output of said D/A converter is a standard composite color signal.

6. A portable electronic picture recording device according to claim 1, wherein the input of said D/A converter is tapped as a digital signal ahead of said D/A converter and fed to a digital input connection of a reproducing device.

7. A portable electronic picture recording device according to claim 1, further comprising means for storing and reproducing associated sound signals..

* * * * *

**ATTACHMENT TO CIVIL COVER SHEET**

*LG Electronics, Inc. v. Eastman Kodak Company*

**VIII. RELATED CASE(S) IF ANY:**

1. *In the Matter of CERTAIN ELECTRONIC DEVICES HAVING IMAGE CAPTURE OR DISPLAY FUNCTIONALITY AND COMPONENTS THEREOF*, 337-TA-___ (case number not yet assigned) (U.S. International Trade Commission Feb 20, 2009).

2. *LG Electronics, Inc. v. Eastman Kodak Company*, Case No. ____ (case number not yet assigned) (S.D. Cal. filed February 20, 2009).

JS 44 (Rev. 12/07)

# CIVIL COVER SHEET

The JS 44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM.)

**I. (a) PLAINTIFFS**

LG ELECTRONICS, INC.

**(b)** County of Residence of First Listed Plaintiff Seoul, Korea
(EXCEPT IN U.S. PLAINTIFF CASES)

**(c)** Attorney's (Firm Name, Address, and Telephone Number)

Christopher S. Marchese, Fish & Richardson P.C., 12390 El Camino Real, San Diego, CA 92130 (858) 678-5070

**DEFENDANTS**

EASTMAN KODAK COMPANY

09 FEB 20 PM 3:39

County of Residence of First Listed Defendant Monroe County
(IN U.S. PLAINTIFF CASES ONLY)

NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE LAND INVOLVED.

Attorneys (If Known)

09 CV 0344 JAH RBB

DEPUTY

**II. BASIS OF JURISDICTION** (Place an "X" in One Box Only)

- ☐ 1 U.S. Government Plaintiff
- ☒ 3 Federal Question (U.S. Government Not a Party)
- ☐ 2 U.S. Government Defendant
- ☐ 4 Diversity (Indicate Citizenship of Parties in Item III)

**III. CITIZENSHIP OF PRINCIPAL PARTIES** (Place an "X" in One Box for Plaintiff and One Box for Defendant)
(For Diversity Cases Only)

| | PTF | DEF | | PTF | DEF |
|---|---|---|---|---|---|
| Citizen of This State | ☐ 1 | ☐ 1 | Incorporated *or* Principal Place of Business In This State | ☐ 4 | ☐ 4 |
| Citizen of Another State | ☐ 2 | ☐ 2 | Incorporated *and* Principal Place of Business In Another State | ☐ 5 | ☐ 5 |
| Citizen or Subject of a Foreign Country | ☐ 3 | ☐ 3 | Foreign Nation | ☐ 6 | ☐ 6 |

**IV. NATURE OF SUIT** (Place an "X" in One Box Only)

**CONTRACT**
- ☐ 110 Insurance
- ☐ 120 Marine
- ☐ 130 Miller Act
- ☐ 140 Negotiable Instrument
- ☐ 150 Recovery of Overpayment & Enforcement of Judgment
- ☐ 151 Medicare Act
- ☐ 152 Recovery of Defaulted Student Loans (Excl. Veterans)
- ☐ 153 Recovery of Overpayment of Veteran's Benefits
- ☐ 160 Stockholders' Suits
- ☐ 190 Other Contract
- ☐ 195 Contract Product Liability
- ☐ 196 Franchise

**REAL PROPERTY**
- ☐ 210 Land Condemnation
- ☐ 220 Foreclosure
- ☐ 230 Rent Lease & Ejectment
- ☐ 240 Torts to Land
- ☐ 245 Tort Product Liability
- ☐ 290 All Other Real Property

**TORTS**

PERSONAL INJURY
- ☐ 310 Airplane
- ☐ 315 Airplane Product Liability
- ☐ 320 Assault, Libel & Slander
- ☐ 330 Federal Employers' Liability
- ☐ 340 Marine
- ☐ 345 Marine Product Liability
- ☐ 350 Motor Vehicle
- ☐ 355 Motor Vehicle Product Liability
- ☐ 360 Other Personal Injury

PERSONAL INJURY
- ☐ 362 Personal Injury - Med. Malpractice
- ☐ 365 Personal Injury - Product Liability
- ☐ 368 Asbestos Personal Injury Product Liability

PERSONAL PROPERTY
- ☐ 370 Other Fraud
- ☐ 371 Truth in Lending
- ☐ 380 Other Personal Property Damage
- ☐ 385 Property Damage Product Liability

**CIVIL RIGHTS**
- ☐ 441 Voting
- ☐ 442 Employment
- ☐ 443 Housing/ Accommodations
- ☐ 444 Welfare
- ☐ 445 Amer. w/Disabilities - Employment
- ☐ 446 Amer. w/Disabilities - Other
- ☐ 440 Other Civil Rights

**PRISONER PETITIONS**
- ☐ 510 Motions to Vacate Sentence

Habeas Corpus:
- ☐ 530 General
- ☐ 535 Death Penalty
- ☐ 540 Mandamus & Other
- ☐ 550 Civil Rights
- ☐ 555 Prison Condition

**FORFEITURE/PENALTY**
- ☐ 610 Agriculture
- ☐ 620 Other Food & Drug
- ☐ 625 Drug Related Seizure of Property 21 USC 881
- ☐ 630 Liquor Laws
- ☐ 640 R.R. & Truck
- ☐ 650 Airline Regs.
- ☐ 660 Occupational Safety/Health
- ☐ 690 Other

**LABOR**
- ☐ 710 Fair Labor Standards Act
- ☐ 720 Labor/Mgmt. Relations
- ☐ 730 Labor/Mgmt.Reporting & Disclosure Act
- ☐ 740 Railway Labor Act
- ☐ 790 Other Labor Litigation
- ☐ 791 Empl. Ret. Inc. Security Act

**IMMIGRATION**
- ☐ 462 Naturalization Application
- ☐ 463 Habeas Corpus - Alien Detainee
- ☐ 465 Other Immigration Actions

**BANKRUPTCY**
- ☐ 422 Appeal 28 USC 158
- ☐ 423 Withdrawal 28 USC 157

**PROPERTY RIGHTS**
- ☐ 820 Copyrights
- ☒ 830 Patent
- ☐ 840 Trademark

**SOCIAL SECURITY**
- ☐ 861 HIA (1395ff)
- ☐ 862 Black Lung (923)
- ☐ 863 DIWC/DIWW (405(g))
- ☐ 864 SSID Title XVI
- ☐ 865 RSI (405(g))

**FEDERAL TAX SUITS**
- ☐ 870 Taxes (U.S. Plaintiff or Defendant)
- ☐ 871 IRS—Third Party 26 USC 7609

**OTHER STATUTES**
- ☐ 400 State Reapportionment
- ☐ 410 Antitrust
- ☐ 430 Banks and Banking
- ☐ 450 Commerce
- ☐ 460 Deportation
- ☐ 470 Racketeer Influenced and Corrupt Organizations
- ☐ 480 Consumer Credit
- ☐ 490 Cable/Sat TV
- ☐ 810 Selective Service
- ☐ 850 Securities/Commodities/ Exchange
- ☐ 875 Customer Challenge 12 USC 3410
- ☐ 890 Other Statutory Actions
- ☐ 891 Agricultural Acts
- ☐ 892 Economic Stabilization Act
- ☐ 893 Environmental Matters
- ☐ 894 Energy Allocation Act
- ☐ 895 Freedom of Information Act
- ☐ 900Appeal of Fee Determination Under Equal Access to Justice
- ☐ 950 Constitutionality of State Statutes

**V. ORIGIN** (Place an "X" in One Box Only)

☒ 1 Original Proceeding ☐ 2 Removed from State Court ☐ 3 Remanded from Appellate Court ☐ 4 Reinstated or Reopened ☐ 5 Transferred from another district (specify) ☐ 6 Multidistrict Litigation ☐ 7 Appeal to District Judge from Magistrate Judgment

**VI. CAUSE OF ACTION**

Cite the U.S. Civil Statute under which you are filing (**Do not cite jurisdictional statutes unless diversity**): Title 35, United States Code 35:145 jer

Brief description of cause: patent infringement

**VII. REQUESTED IN COMPLAINT:** ☐ CHECK IF THIS IS A **CLASS ACTION** UNDER F.R.C.P. 23 **DEMAND $**

CHECK YES only if demanded in complaint:
**JURY DEMAND:** ☒ Yes ☐ No

**VIII. RELATED CASE(S) IF ANY** (See instructions): JUDGE PLEASE SEE ATTACHED DOCKET NUMBER

DATE 02/20/2009

SIGNATURE OF ATTORNEY OF RECORD

**FOR OFFICE USE ONLY**

RECEIPT # 160311 AMOUNT $350 APPLYING IFP JUDGE MAG. JUDGE

AHC 2/20/09

ORIGINAL

**UNITED STATES**
**DISTRICT COURT**
SOUTHERN DISTRICT OF CALIFORNIA
SAN DIEGO DIVISION

**# 160311 - TC**
*** * C O P Y * ***
**February 20, 2009**
**15:39:20**

**Civ Fil Non-Pris**
USAO #.: 09CV0344
Judge..: JOHN A HOUSTON
Amount.: $350.00 CK
Check#.: 6135

**Total-> $350.00**

**FROM: LG VS EASTMAN KODAK**