IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

INTERMEC TECHNOLOGIES CORP., a Delaware corporation,	)	
Plaintiff,	)	C. A. No. 07-272-SLR
v.	)	**JURY TRIAL DEMANDED**
PALM, INC., a Delaware corporation,	)	
Defendant.	)	

DEFENDANT PALM, INC.'S FIRST AMENDED ANSWER, DEFENSES, COUNTERCLAIMS, AND JURY DEMAND

Defendant Palm, Inc. ("Palm") answers the Complaint for Patent Infringement of Intermec Technologies Corp. ("Intermec") as follows:

JURISDICTION AND VENUE

1. Palm admits that this action arises under the Patent Laws of the United States, 35 U.S.C. § 101 et seq., and that there is subject matter jurisdiction under 28 U.S.C. § 1338(a).

2. Palm admits that venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391 and 1400(b).

THE PARTIES

3. Palm lacks information and belief as to Intermec's incorporation and principal place of business and denies the allegations in paragraph 3 upon that basis.

4. Palm admits the allegations in paragraph 4.

ASSERTED PATENTS

5. Palm admits that United States Patent No. 5,349,678 ("the '678 patent") is entitled "Versatile RF Data Capture System," and was issued by the United States Patent and Trademark Office on September 20, 1994. Palm admits that what purports to be a copy of the '678 patent is attached to Intermec's Complaint. With respect to the remainder of the allegations of paragraph 5, Palm lacks sufficient information on which to form a belief as to the truth of the allegations, and on that basis denies each and every such allegation.

6. Palm admits that United States Patent No. 5,568,645 ("the '645 patent") is entitled "Versatile RF Data Capture System," and was issued by the United States Patent and Trademark Office on October 22, 1996. Palm admits that what purports to be a copy of the '645 patent is attached to Intermec's Complaint. With respect to the remainder of the allegations of paragraph 6, Palm lacks sufficient information on which to form a belief as to the truth of the allegations, and on that basis denies each and every such allegation.

7. Palm admits that United States Patent No. 5,987,499 ("the '499 patent") is entitled "Versatile RF Data Capture System," and was issued by the United States Patent and Trademark Office on November 16, 1999. Palm admits that what purports to be a copy of the '499 patent is attached to Intermec's Complaint. With respect to the remainder of the allegations of paragraph 7, Palm lacks sufficient information on which to form a belief as to the truth of the allegations, and on that basis denies each and every such allegation.

8. Palm admits that United States Patent No. 5,468,947 ("the '947 patent") is entitled "Pocket Size Data Capture Unit With Processor and Shell Modules," and was issued by the United States Patent and Trademark Office on November 21, 1995. Palm admits that what

purports to be a copy of the '947 patent is attached to Intermec's Complaint. With respect to the remainder of the allegations of paragraph 8, Palm lacks sufficient information on which to form a belief as to the truth of the allegations, and on that basis denies each and every allegation.

9. Palm admits that United States Patent No. 5,892,971 ("the '971 patent") is entitled "Portable Data Processing Device Having An Indicia Reader And A Multi-Tasking Operating System Capable Of Executing Battery Monitoring Instructions While Concurrently Executing Application Programs," and was issued by the United States Patent and Trademark Office on April 6, 1999. Palm admits that what purports to be a copy of the '971 patent is attached to Intermec's Complaint. With respect to the remainder of the allegations of paragraph 9, Palm lacks sufficient information on which to form a belief as to the truth of the allegations, and on that basis denies each and every allegation.

10. Palm admits that it sells the Palm Treo 700w, Treo 700wx Treo 750 products. Palm denies that its products infringe the patents-in-suit, and on that basis denies all remaining allegations in paragraph 10.

FIRST CLAIM FOR RELIEF

11. Palm lacks information upon which to form a belief as to the truth of the allegations in paragraph 11, and on that basis denies each and every allegation in paragraph 11.

12. Palm denies that it has been and is infringing, inducing the infringement of, and/or contributing to the infringement of the '678 patent, and on that basis denies the allegations in paragraph 12.

13. Palm denies that it has caused Intermec any injury or damages, and further denies that Intermec is entitled to recover from Palm any damages or compensation, and on that basis denies the allegations in paragraph 13.

14. Palm denies that it has been and is willfully and deliberately infringing the '678 patent, and further denies that Intermec is entitled to any damages from Palm, and on that basis denies the allegations in paragraph 14.

15. Palm denies that it has caused Intermec irreparable injury and on that basis denies the allegations in paragraph 15.

SECOND CLAIM FOR RELIEF

16. Palm lacks information upon which to form a belief as to the truth of the allegations in paragraph 16, and on that basis denies each and every allegation in paragraph 16.

17. Palm denies that it has been and is infringing, inducing the infringement of, and/or contributing to the infringement of the '645 patent, and on that basis denies the allegations in paragraph 17.

18. Palm denies that it has caused Intermec any injury or damages, and further denies that Intermec is entitled to recover from Palm any damages or compensation, and on that basis denies the allegations in paragraph 18.

19. Palm denies that it has been and is willfully and deliberately infringing the '645 patent, and further denies that Intermec is entitled to any damages from Palm, and on that basis denies the allegations in paragraph 19.

20. Palm denies that it has caused Intermec irreparable injury and on that basis denies the allegations in paragraph 20.

THIRD CLAIM FOR RELIEF

21. Palm lacks information upon which to form a belief as to the truth of the allegations in paragraph 21, and on that basis denies each and every allegation in paragraph 21.

22. Palm denies that it has been and is infringing, inducing the infringement of, and/or contributing to the infringement of the '499 patent, and on that basis denies the allegations in paragraph 22.

23. Palm denies that it has caused Intermec any injury or damages, and further denies that Intermec is entitled to recover from Palm any damages or compensation, and on that basis denies the allegations in paragraph 23.

24. Palm denies that it has been and is willfully and deliberately infringing the '499 patent, and further denies that Intermec is entitled to any damages from Palm, and on that basis denies the allegations in paragraph 24.

25. Palm denies that it has caused Intermec irreparable injury and on that basis denies the allegations in paragraph 25.

FOURTH CLAIM FOR RELIEF

26. Palm lacks information upon which to form a belief as to the truth of the allegations in paragraph 26, and on that basis denies each and every allegation in paragraph 26.

27. Palm denies that it has been and is infringing, inducing the infringement of, and/or contributing to the infringement of the '947 patent, and on that basis denies the allegations in paragraph 27.

28. Palm denies that it has caused Intermec any injury or damages, and further denies that Intermec is entitled to recover from Palm any damages or compensation, and on that basis denies the allegations in paragraph 28.

29. Palm denies that it has been and is willfully and deliberately infringing the '947 patent, and further denies that Intermec is entitled to any damages from Palm, and on that basis denies the allegations in paragraph 29.

30. Palm denies that it has caused Intermec irreparable injury and on that basis denies the allegations in paragraph 30.

FIFTH CLAIM FOR RELIEF

31. Palm lacks information upon which to form a belief as to the truth of the allegations in paragraph 31, and on that basis denies each and every allegation in paragraph 31.

32. Palm denies that it has been and is infringing, inducing the infringement of, and/or contributing to the infringement of the '971 patent, and on that basis denies the allegations in paragraph 32.

33. Palm denies that it has caused Intermec any injury or damages, and further denies that Intermec is entitled to recover from Palm any damages or compensation, and on that basis denies the allegations in paragraph 33.

34. Palm denies that it has been and is willfully and deliberately infringing the '971 patent, and further denies that Intermec is entitled to any damages from Palm, and on that basis denies the allegations in paragraph 34.

35. Palm denies that it has caused Intermec irreparable injury and on that basis denies the allegations in paragraph 35.

DEFENSES

FIRST DEFENSE

36. Intermec's Complaint fails to state facts sufficient to state a cause of action and fails to state any claim upon which relief may be granted.

SECOND DEFENSE

37. One or more claims of U.S. Patent Nos. 5,349,678, 5,568,645, 5,987,499, 5,468,947, and 5,892,971 allegedly infringed by Palm are invalid for failure to comply with one or more of the requirements of 35 U.S.C. §§ 101, 102, 103, and 112.

THIRD DEFENSE

38. Defendant Palm's making, use or sale of its products, and the use of such products by Palm's customers, do not infringe any of the claims of U.S. Patent Nos. 5,349,678, 5,568,645, 5,987,499, 5,468,947, and 5,892,971 being asserted against Palm. Palm has not actively induced infringement of any claims of the patents being asserted against Palm, and Palm has not contributed to the infringement of any claims of the patents being asserted against Palm.

FOURTH DEFENSE

39. Prosecution history estoppel bars Intermec from proving infringement of the asserted claims under the doctrine of equivalents. Intermec is estopped from construing the

asserted claims of U.S. Patent Nos. 5,349,678, 5,568,645, 5,987,499, 5,468,947, and 5,892,971 in such a way as may cover Palm's activities by reason of statements made to the United States Patent and Trademark office during the prosecution of the applications that issued as the '678 patent, the '645 patent, the '499 patent, the '947 patent, and the '971 patent.

FIFTH DEFENSE

40. All claims of the '678 patent are void, invalid, and unenforceable by virtue of the failure of the patentee to act with the degree of candor and good faith required of persons who prepare or prosecute a patent application before the United States Patent and Trademark Office ("PTO"), including the failure to disclose material prior art and information known to the patentee and/or persons having substantial responsibility for the prosecution of the '678 patent.

41. On August 21, 1991, named inventors of the '678 patent and their agents associated with the prosecution of the application that resulted in the '678 patent – Michael D. Morris, Gregory Beggs, Richard Cederoth, James Dowdall, Robert Fieseler, Raymond Gable, Herbert Hart III, John Held Jr., John Leaheey, Van Lund, Timothy Malloy, Sidney Neuman, Arthur Olson, Jr., Donald Peterson, Philip Petti, Robert Ryan, Noel Smith, William Wesley, George Wheeler, and Fred Williams, among others (collectively the "'678 patentees") – filed U.S. Patent application no. 748,150 (the "'150 application") with the PTO and/or prosecuted the '150 application thereafter until it issued as the '678 patent.

42. At the time of the '150 application's filing on August 21, 1991, and during the prosecution of the '150 application, each of the '678 patentees had a continuing duty of candor and good faith to disclose to the PTO all information known to that individual that is material to patentability, pursuant to United States patent laws and regulation, including 37 C.F.R. §1.56.

43. Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the '678 patentees were required to file at least one Information Disclosure Statement ("IDS") with the PTO during the prosecution of the '150 application setting forth all patents, publications, applications, or other information known to be material to patentablility for consideration by the PTO.

44. One or more of the '678 patentees were also named inventors or agents associated with the prosecution of U.S. Patent application 06/904,496 (the "'496 application"), which was filed on September 15, 1986, almost 5 years prior to the filing of the '150 application. The '496 application was issued as U.S. Patent No. 4,972,463 (the "'463 patent") on November 20, 1990, less than a year prior to the filing of the '150 application.

45. One or more of the '678 patentees were also named inventors or agents associated with the prosecution of U.S. Patent application no. 07/486,521 (the "'521 application"), which was filed on June 26, 1992, less than a year after the '150 application was filed. The '521 application was issued as U.S. Patent No. 5,239,662 (the "'662 patent") on August 24, 1993, prior to the issuance of the '150 application as the '678 patent.

U.S. Patent No. 4,972,463

46. The '463 patent, entitled "In-Store Multiple Device Communications Unit And Centralized Data System Utilizing Same," identifies Arvin D. Danielson and Michael D. Morris as inventors. The '463 patent shares a common inventor with the '678 patent, Michael D. Morris.

47. The '463 patent discloses several of the elements of the claims of the '678 patent, including a data communications system consisting of a plurality of client data collection terminals, a server station with a mass memory means, communication means for

interconnecting the server station with the client terminals, and the server station operating on data in a second format style different from the first format style of the data terminal, as claimed in claim 1 of the '678 patent.

48. The '463 patent is material to patentability because there is a substantial likelihood that a reasonable examiner would have considered this preexisting, prior art information important in deciding whether to allow the '678 patent to issue. This is true because the specification of the '463 patent disclosed certain features of claim 1 and other claims in the '678 patent that were not disclosed in any other reference before the examiner who granted the '678 patent. For example, the claims of the '678 patent disclose in a terminal a "means operating on data formatted in a first style," and they disclose in a server a "means operating on data formatted in a second style different from said first style." ('678 patent col. 15:9-10, 15:17-18, claim 1) (hereinafter the "two data format feature"). This includes "translat[ing] the format" of data from a format used by the terminal to a format used by the server and vice versa. ('678 patent, col. 14:16-17, 14:31-32, claim 7).

49. In the Notice of Allowability for the '678 patent, the examiner emphasized that the prior art did not disclose the "two data format feature" by stating that "the prior art, either individually or in combination, does not teach a data capture system comprising portable data collection terminals with a first control means operating on data formatted in a first style and a server station with a second control means operating on data formatted in a second style." (Notice of Allowability mailed 9/23/93 at 2). The examiner had before him prior art that showed portable data collection terminals, but he did not have before him prior art that disclosed the "two data format feature."

50. The '463 patent discloses the "two data format" feature. For example, terminals that collect data ('463 patent col. 3:28-36, 3:18-19) operate on data using communication protocols specific to, for example, an A.T.M. network, a credit/debit network, or a point of sale network. (col. 3:21, 3:30, 3:32). The data is then transmitted to a server (col. 5:15-22), where an interface may "convert the device [i.e., terminal] protocols to a standard high level communications architecture, e.g., SDLC/SNA" (col. 5:43-46, col. 5:54-58). This process also takes place in reverse, when data received by the server in the SDLC/SNA format is converted into a format recognized by the terminal by adding any "needed control characters" before transmission to the terminal. (col. 6:14-24). The two different data "protocols" in the '463 patent qualify as two different "formats" of data, since each refers to a structure for the data that allows it to be processed by devices that comply with the given protocol (e.g., SDLC/SNA used at the server, or the proprietary communication protocol used at the given terminal).

51. The '678 patentees did not submit the '463 patent to the examiner through an IDS or otherwise in the '150 application, even though the '463 patent had been published before the '150 application was filed and shared an inventor and prosecuting agents with the '150 application.

52. The '678 patentees were aware of the Reason of Allowance stated by the examiner on September 22, 1993, and prosecution of the '150 application remained open three months later – as demonstrated by the post-issuance Amendment filed by the '678 patentees on December 23, 1993. The applicants were aware of the '463 patent at the time the Notice of Allowability was transmitted to them by the examiner. They nonetheless failed to disclose the '463 patent to the examiner, notwithstanding the fact that it disclosed the "two data format feature" that the examiner cited as missing from the art before him.

53. On information and belief, the '678 patentees, including Michael D. Morris, an inventor on both the '463 and '678 patents, were aware of the materiality of the '463 patent to the '150 patent application at the time the '150 application was filed and during its prosecution.

54. On information and belief, the '678 patentees' intent to mislead the PTO can be inferred by, among other things, the overwhelming materiality of the '463 patent to the '150 application, Mr. Morris's role as an inventor on both the '678 and the '463 patents, and the '678 patentees' awareness of the examiner's statements regarding the materiality of the "two data format feature."

U.S. Patent No. 5,239,662

55. U.S. Patent No. 5,239,662, entitled "System Including Multiple Device Communications Controller Which Coverts Data Received From Two Different Customer Transaction Devices Each Using Different Communications Protocols Into A Single Communications Protocol" identifies Arvin D. Danielson, Joseph J. Kubler, Dennis A. Durbin, Michael D. Morris, and Keith K. Cargin, Jr as inventors. It issued from U.S. Patent application no. 905,900, filed on June 26, 1992. The '900 application was a continuation of U.S. Patent application 486,521, filed on February 28, 1990, abandoned, which was a divisional of the '496 application. The '662 patent shares a common inventor with the '678 patent, Michael D. Morris.

56. The '662 patent discloses several of the elements of the claims of the '678 patent, including a data communications system consisting of a plurality of client data collection terminals, a server station with a mass memory means, communication means for interconnecting the server station with the client terminals, and the server station operating on

data in a second format style different from the first format style of the data terminal, as claimed in claim 1 of the '678 patent.

57. The '662 patent is material to patentability because there is a substantial likelihood that a reasonable examiner would have considered this preexisting, prior art information important in deciding whether to allow the '678 patent to issue. This is true because the specification of the '662 patent disclosed certain features of claim 1 and other claims in the '678 patent that were not disclosed in any other reference before the examiner who granted the '678 patent. For example, the claims of the '678 patent disclose in a terminal a "means operating on data formatted in a first style," and they disclose in a server a "means operating on data formatted in a second style different from said first style." ('678 patent col. 15:9-10, 15:17-18, claim 1) (hereinafter the "two data format feature"). This includes "translat[ing] the format" of data from a format used by the terminal to a format used by the server and vice versa. ('678 patent, col. 14:16-17, 14:31-32, claim 7).

58. In the Notice of Allowability for the '678 patent, the examiner emphasized that the prior art did not disclose the "two data format feature" by stating that "the prior art, either individually or in combination, does not teach a data capture system comprising portable data collection terminals with a first control means operating on data formatted in a first style and a server station with a second control means operating on data formatted in a second style." (Notice of Allowability mailed 9/23/93 at 2). The examiner had before him prior art that showed portable data collection terminals, but he did not have before him prior art that disclosed the "two data format feature."

59. The '662 patent discloses the "two data format" feature. For example, terminals that collect data ('662 patent col. 2:64-68, 2:54-55) operate on data using communication protocols specific to, for example, an A.T.M. network, a credit/debit network, or a point of sale network. (col. 2:57, 2:66, 3:2). The data is then transmitted to a server (col. 4:61-68), where an interface may "convert the device [i.e., terminal] protocols to a standard high level communications architecture, e.g., SDLC/SNA" (col. 5:13-16, col. 5:24-28). This process also takes place in reverse, when data received by the server in the SDLC/SNA format is converted into a format recognized by the terminal by adding any "needed control characters" before transmission to the terminal (col. 5:52-62). The two different data "protocols" in the '662 patent qualify as two different "formats" of data, since each refers to a structure for the data that allows it to be processed by devices that comply with the given protocol (e.g., SDLC/SNA used at the server, or the proprietary communication protocol used at the given terminal).

60. The '678 patentees did not submit the '662 patent to the examiner through an IDS or otherwise in the '150 application, even though the '662 patent had been issued merely one month prior to the date on which the examiner issued his Notice of Allowability on the '150 application, and despite the fact that the '662 patent shared an inventor and prosecuting agents with the '150 application.

61. The '678 patentees were aware of the Reason of Allowance stated by the examiner on September 22, 1993, and prosecution of the '150 application remained open three months later – as demonstrated by the post-issuance Amendment filed by the '678 patentees on December 23, 1993. The applicants were aware of the '662 patent at the time the Notice of Allowability was transmitted to them by the examiner. They nonetheless failed to disclose the

'662 patent to the examiner notwithstanding the fact that it disclosed the "two data format feature" that the examiner cited as missing from the art before him.

62. On information and belief, the '678 patentees, including Michael D. Morris, an inventor on both the '662 and '678 patents, were aware of the materiality of the '662 patent to the '150 patent application at the time the '150 application was filed and during its prosecution.

63. On information and belief, the '678 patentees' intent to mislead the PTO can be inferred by, among other things, the overwhelming materiality of the '662 patent to the '150 application, plus Mr. Morris's role as an inventor on both the '678 and the '662 patents, and the '678 patentees' awareness of the examiner's statements regarding the materiality of the "two data format feature."

SIXTH DEFENSE

64. The '645 and '499 patents are unenforceable based on the doctrine of infectious unenforceability.

65. On information and belief, the '645 and '499 patents have an immediate and necessary relation to the '678 patent. The '645 and '499 patents claim on their face that they are related to the '678 patent, and the '645 and '499 patents make claims of priority to the '678 patent. The '645 patent is a continuation of the '678 patent, and the '499 is a continuation of the '645 patent. The '645 and '499 patents are based on the same specification as the '678 patent, and large portions of the description of the invention are the same in both patents. Thus, the specification and claims of the '678 patent provide the foundation upon which the '645 and '499 patents are built.

66. On information and belief, Intermec's failure to disclose known material prior art to the PTO during prosecution of the '678 patent also renders unenforceable the '645 and '499 patents.

67. An immediate and necessary relationship exists between Intermec's conduct in the prosecution of the '678 patent and the prosecution of the '645 and '499 patents. Under the doctrine of infectious unenforceability, a patent which relates to, or is dependent upon, a patent procured through fraud and misrepresentation during prosecution in the PTO is likewise tainted in the same manner as the patent with respect to which the fraud occurred. Therefore, the '645 and '499 patents are unenforceable by reason of the doctrine of infectious unenforceability.

SEVENTH DEFENSE

68. Intermec's claims are barred by the equitable doctrines of laches, estoppel, waiver, implied license, and/or unclean hands.

EIGHTH DEFENSE

69. Defendant Palm reserves the right to amend its answer to assert further defenses based on future discovery in the lawsuit.

COUNTERCLAIMS

Pursuant to Federal Rule of Civil Procedure 13, Palm, Inc. hereby asserts the following counterclaims against Intermec Technologies Corp. and avers as follows:

NATURE AND BASIS OF ACTION

1. This is an action arising under the United States Patent Act, 35 U.S.C. § 1 *et seq.*

PARTIES

2. Counterclaim Defendant Intermec is, on information and belief, a corporation incorporated under the laws of the State of Delaware and has its principle place of business at 6001 36th Avenue West, Everett, WA 98803.

3. Counterclaimant Palm is a corporation organized and existing under the laws of Delaware, having a place of business at 950 West Maude Avenue, Sunnyvale, CA 94085.

JURISDICTION AND VENUE

4. This is an action for declaratory judgment of non-infringement and invalidity of U.S. Patent No. 5,349,678 ("the '678 patent"), U.S. Patent No. 5,568,645, ("the '645 patent), U.S. Patent No. 5,987,499 ("the '499 patent), U.S. Patent No. 5,468,947 ("the '947 patent), and U.S. Patent No. 5,892,971 ("the '971 patent). This is also an action for infringement of U.S. Patent No. 6,831,568 ("the '568 patent") (Ex. A hereto), U.S. Patent No. 7,093,764 ("the '764 patent") (Ex. B hereto), and U.S. Patent No. 7,096,049 ("the '049 patent") (Ex. C hereto). This Court has subject matter jurisdiction over these claims pursuant to 28 U.S.C. §§ 1331, 1338(a), 2201, and 2202.

5. Venue is proper in this district under 28 U.S.C. §§ 1391(b) and (c).

GENERAL ALLEGATIONS

6. On May 18, 2007, Intermec filed suit against Palm, claiming infringement of the '678, '645, '499, '947 and '971 patents.

7. A justiciable controversy exists between Intermec and Palm concerning the infringement and validity of the '678, '645, '499, '947 and '971 patents.

FIRST COUNTERCLAIM

(NONINFRINGEMENT OF THE INTERMEC PATENTS-IN-SUIT)

8. Palm incorporates paragraphs 1-7 as if fully set forth herein.

9. Palm has not and is not now infringing, contributorily infringing, or inducing infringement of the claims of the '678 patent asserted by the plaintiff in this litigation ("the asserted '678 claims").

10. Palm is entitled to a declaratory judgment that Palm does not infringe the asserted '678 claims.

11. Palm has not and is not now infringing, contributorily infringing, or inducing infringement of the claims of the '645 patent asserted by the plaintiff in this litigation ("the asserted '645 claims").

12. Palm is entitled to a declaratory judgment that Palm does not infringe the asserted '645 claims.

13. Palm has not and is not now infringing, contributorily infringing, or inducing infringement of the claims of the '499 patent asserted by the plaintiff in this litigation ("the asserted '499 claims").

14. Palm is entitled to a declaratory judgment that Palm does not infringe the asserted '499 claims.

15. Palm has not and is not now infringing, contributorily infringing, or inducing infringement of the claims of the '947 patent asserted by the plaintiff in this litigation ("the asserted '947 claims").

16. Palm is entitled to a declaratory judgment that Palm does not infringe the asserted '947 claims.

17. Palm has not and is not now infringing, contributorily infringing, or inducing infringement of the claims of the '971 patent asserted by the plaintiff in this litigation ("the asserted '971 claims").

18. Palm is entitled to a declaratory judgment that Palm does not infringe the asserted '971 claims.

SECOND COUNTERCLAIM

(INVALIDITY OF THE INTERMEC PATENTS IN SUIT)

19. Palm incorporates paragraphs 1-18 as if fully set forth herein.

20. One or more claims of the '678 patent are invalid for failure to comply with one or more of the conditions and requirements of patentability set forth in the patent statutes, including 35 U.S.C. §§ 101, 102, 103 and/or 112.

21. Palm is entitled to declaratory judgment that one or more claims of the '678 patent are invalid.

22. One or more claims of the '645 patent are invalid for failure to comply with one or more of the conditions and requirements of patentability set forth in the patent statutes, including 35 U.S.C. §§ 101, 102, 103 and/or 112.

23. Palm is entitled to declaratory judgment that one or more claims of the '645 patent are invalid.

24. One or more claims of the '499 patent are invalid for failure to comply with one or more of the conditions and requirements of patentability set forth in the patent statutes, including 35 U.S.C. §§ 101, 102, 103 and/or 112.

25. Palm is entitled to declaratory judgment that one or more claims of the '499 patent are invalid.

26. One or more claims of the '947 patent are invalid for failure to comply with one or more of the conditions and requirements of patentability set forth in the patent statutes, including 35 U.S.C. §§ 101, 102, 103 and/or 112.

27. Palm is entitled to declaratory judgment that one or more claims of the '947 patent are invalid.

28. One or more claims of the '971 patent are invalid for failure to comply with one or more of the conditions and requirements of patentability set forth in the patent statutes, including 35 U.S.C. §§ 101, 102, 103 and/or 112.

29. Palm is entitled to declaratory judgment that one or more claims of the '971 patent are invalid.

THIRD COUNTERCLAIM
(INFRINGEMENT OF U.S. PATENT NO. 6,831,568)

30. Palm incorporates paragraphs 1-29 as if fully set forth herein.

31. On December 14, 2004, the United States Patent and Trademark Office duly and legally issued United States Patent No. 6,831,568 (the "'568 Patent") to PalmOne, Inc. for an

invention entitled "Method and apparatus for visual silent alarm indicator." A true and correct copy of the '568 patent is attached hereto as Exhibit A.

32. Palm, Inc. is the sole holder of the entire right, title, and interest in the '568 Patent.

33. On information and belief, Intermec has been and is infringing, literally and/or under the doctrine of equivalents, contributing to the infringement of, and/or actively inducing the infringement of one or more claims of the '568 patent by making, using, offering for sale, selling, causing to be sold, and/or importing one or more products, including, without limitation the CN3 Mobile Computer (the "Accused Products").

34. By reason of Intermec's infringement of the '568 patent, Palm has suffered, is suffering, and will continue to suffer injury to its business and property rights, for which it is entitled to damages in an amount to be proven at trial.

35. By reason of Intermec's infringement of the '568 patent, Palm has suffered, is suffering, and will continue to suffer irreparable harm unless such acts are enjoined by the Court.

FOURTH COUNTERCLAIM
(INFRINGEMENT OF U.S. PATENT NO. 7,093,764)

36. Palm realleges and incorporates by reference Paragraphs 1-35 of this Counterclaim as if fully set forth herein.

37. On August 22, 2006, the United States Patent and Trademark Office duly and legally issued United States Patent No. 7,093,764 (the "'764 Patent") to Palm, Inc. for an

invention entitled "Integrated SIM holder with backcase and rotating door." A true and correct copy of the '764 patent is attached hereto as Exhibit B.

38. Palm, Inc. is the sole holder of the entire right, title, and interest in the '764 Patent.

39. On information and belief, Intermec has been and is infringing, literally and/or under the doctrine of equivalents, contributing to the infringement of, and/or actively inducing the infringement of one or more claims of the '764 patent by making, using, offering for sale, selling, causing to be sold, and/or importing one or more products, including, without limitation the CN3 Mobile Computer (the "Accused Products").

40. By reason of Intermec's infringement of the '764 patent, Palm has suffered, is suffering, and will continue to suffer injury to its business and property rights, for which it is entitled to damages in an amount to be proven at trial.

41. By reason of Intermec's infringement of the '764 patent, Palm has suffered, is suffering, and will continue to suffer irreparable harm unless such acts are enjoined by the Court.

FIFTH COUNTERCLAIM
(INFRINGEMENT OF U.S. PATENT NO. 7,096,049)

42. Palm realleges and incorporates by reference Paragraphs 1-41 of this Counterclaim as if fully set forth herein.

43. On August 22, 2006 the United States Patent and Trademark Office duly and legally issued United States Patent No. 7,096,049 (the "'049 Patent") to Palm, Inc. for an

invention entitled "Wireless transaction enabled handheld computer system and method." A true and correct copy of the '049 patent is attached hereto as Exhibit C.

44. Palm, Inc. is the sole holder of the entire right, title, and interest in the '049 Patent.

45. On information and belief, Intermec has been and is infringing, literally and/or under the doctrine of equivalents, contributing to the infringement of, and/or actively inducing the infringement of one or more claims of the '049 patent by making, using, offering for sale, selling, causing to be sold, and/or importing one or more products, including, without limitation the CN3 Mobile Computer (the "Accused Products").

46. By reason of Intermec's infringement of the '049 patent, Palm has suffered, is suffering, and will continue to suffer injury to its business and property rights, for which it is entitled to damages in an amount to be proven at trial.

47. By reason of Intermec's infringement of the '049 patent, Palm has suffered, is suffering, and will continue to suffer irreparable harm unless such acts are enjoined by the Court.

REQUEST FOR RELIEF

WHEREFORE, Palm prays for judgment that:

A. Intermec's Complaint is dismissed in its entirety with prejudice;

B. Intermec is not entitled to the relief prayed for in its Complaint, or to any relief whatsoever;

C. U.S. Patent No. 5,349,678 is invalid and void against Palm;

D. U.S. Patent No. 5,349,678 has never been, and is not now, infringed by Palm or by any other person using Palm's products in this judicial district or anywhere in the United States;

E. U.S. Patent No. 5,349,678 is unenforceable against Palm;

F. U.S. Patent No. 5,568,645 is invalid and void against Palm;

G. U.S. Patent No. 5,568,645 has never been, and is not now, infringed by Palm or by any other person using Palm's products in this judicial district or anywhere in the United States;

H. U.S. Patent No. 5,568,645 is unenforceable against Palm;

I. U.S. Patent No. 5,987,499 is invalid and void against Palm;

J. U.S. Patent No. 5,987,499 has never been, and is not now, infringed by Palm or by any other person using Palm's products in this judicial district or anywhere in the United States;

K. U.S. Patent No. 5,987,499 is unenforceable against Palm;

L. U.S. Patent No. 5,468,947 is invalid and void against Palm;

M. U.S. Patent No. 5,468,947 has never been, and is not now, infringed by Palm or by any other person using Palm's products in this judicial district or anywhere in the United States;

N. U.S. Patent No. 5,892,971 is invalid and void against Palm;

O. U.S. Patent No. 5,892,971 has never been, and is not now, infringed by Palm or by any other person using Palm's products in this judicial district or anywhere in the United States;

P. No damages or royalties are due or owing by Palm for any of the acts alleged by Intermec in its Complaint; and

Q. Intermec has been and is infringing, directly or indirectly, one or more claims of the '568 Patent;

R. Intermec has been and is infringing, directly or indirectly, one or more claims of the '764 Patent;

S. Intermec has been and is infringing, directly or indirectly, one or more claims of the '049 Patent;

T. Intermec, and all persons acting in concert or participation with Intermec, are permanently enjoined, pursuant to 35 U.S.C. § 283, from any further acts of infringement, contributory infringement, or inducement of infringement of the '568, '764, and '049 Patents;

U. An accounting for damages resulting from Intermec's infringement of the '568, '764, and '049 Patents shall be made;

V. Palm is awarded, pursuant to 35 U.S.C. § 284, damages adequate to compensate Palm for Intermec's infringement of the '568, '764, and '049 Patents, but in no event less than a reasonable royalty, together with pre-judgment and post-judgment interest;

W. This case is an exceptional case pursuant to 35 U.S.C. § 285, and Palm is accordingly awarded its reasonable attorneys' fees incurred in this action;

X. Palm is awarded its costs (including expert fees), disbursements, and reasonable attorneys' fees pursuant to 35 U.S.C. § 285; and

Y. Palm is awarded such other relief as the Court may deem appropriate, just and proper under the circumstances.

DEMAND FOR JURY TRIAL

In accordance with Fed. R. Civ. P. 38(b), Palm demands a trial by jury on all issues so triable.

OF COUNSEL:

Robert T. Haslam
Nitin Subhedar
Jaideep Venkatesan
HELLER EHRMAN LLP
275 Middlefield Road
Menlo Park, California 94025
Tel: (650) 324-7000

Robert D. Fram
Michael M. Markman
Robert J. Williams
HELLER EHRMAN LLP
333 Bush Street
San Francisco, CA 94104-2878
Tel: (415) 772-6000

Dated: July 20, 2007
808188 / 31950

POTTER ANDERSON & CORROON LLP

By: */s/ David E. Moore*
Richard L. Horwitz (#2246)
David E. Moore (#3983)
Hercules Plaza, 6th Floor
1313 North Market Street
Wilmington, DE 19801
Tel: (302) 984-6000
rhorwitz@potteranderson.com
dmoore@potteranderson.com

Attorneys for Defendant Palm, Inc.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

CERTIFICATE OF SERVICE

I, David E. Moore, hereby certify that on July 20, 2007, the attached document was electronically filed with the Clerk of the Court using CM/ECF which will send notification to the registered attorney(s) of record that the document has been filed and is available for viewing and downloading.

I further certify that on July 20, 2007, I have Electronically Mailed the documents to the following person(s):

Jack B. Blumenfeld
Rodger D. Smith, II
Morris, Nichols, Arsht & Tunnell LLP
1201 N. Market Street
Wilmington, DE 19899
JBlumenfeld@MNAT.com
rdsefiling@mnat.com

Carson P. Veach
Leland W. Hutchinson, Jr.
Jacob D. Koering
Freeborn & Peters LLP
311 South Wacker Drive, Suite 3000
Chicago, IL 60606
cveach@freebornpeters.com
lhutchinson@freebornpeters.com
jkoering@freebornpeters.com

By: */s/ David E. Moore*
Richard L. Horwitz
David E. Moore
Hercules Plaza, 6th Floor
1313 N. Market Street
Wilmington, Delaware 19899-0951
Tel: (302) 984-6000
rhorwitz@potteranderson.com
dmoore@potteranderson.com

EXHIBIT A

US006831568B1

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

(10) **Patent No.: US 6,831,568 B1**
(45) **Date of Patent: Dec. 14, 2004**

(54) **METHOD AND APPARATUS FOR VISUAL SILENT ALARM INDICATOR**

(75) Inventors: **Michael Cortopassi**, Arlington Heights, IL (US); **Eric Fuhs**, Crystal Lake, IL (US); **Wayne Hile**, Round Lake Park, IL (US); **Thomas Robinson**, Crystal Lake, IL (US); **Edward Endejan**, Gurnee, IL (US)

(73) Assignee: **palmOne, Inc.**, Milpitas, CA (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.: **09/607,894**

(22) Filed: **Jun. 30, 2000**

(51) **Int. Cl.**[7] **G08B 5/00**
(52) **U.S. Cl.** **340/815.4**; 340/815.46; 340/573.1; 340/309.16; 361/681; 345/1.1
(58) **Field of Search** 340/815.4, 815.45, 340/825.36, 571, 573.1, 568.1, 309.16; 345/117, 961, 1.1, 618; 362/26; 361/681, 683; 348/43

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,088,056	A *	2/1992	McIntosh et al.	340/309.15
5,210,532	A *	5/1993	Knoedler et al.	340/825.69
5,546,078	A *	8/1996	Motohashi et al.	340/825.44
5,570,025	A *	10/1996	Lauritsen et al.	324/433
5,760,690	A *	6/1998	French	340/571
5,796,575	A *	8/1998	Podwalny et al.	361/681
5,861,815	A *	1/1999	Wernig	340/815.75
5,877,695	A *	3/1999	Kubes	340/815.4
6,144,363	A *	11/2000	Alloul	345/117
6,268,789	B1 *	7/2001	Diamant	340/5.74
6,310,634	B1 *	10/2001	Bodnar et al.	345/854

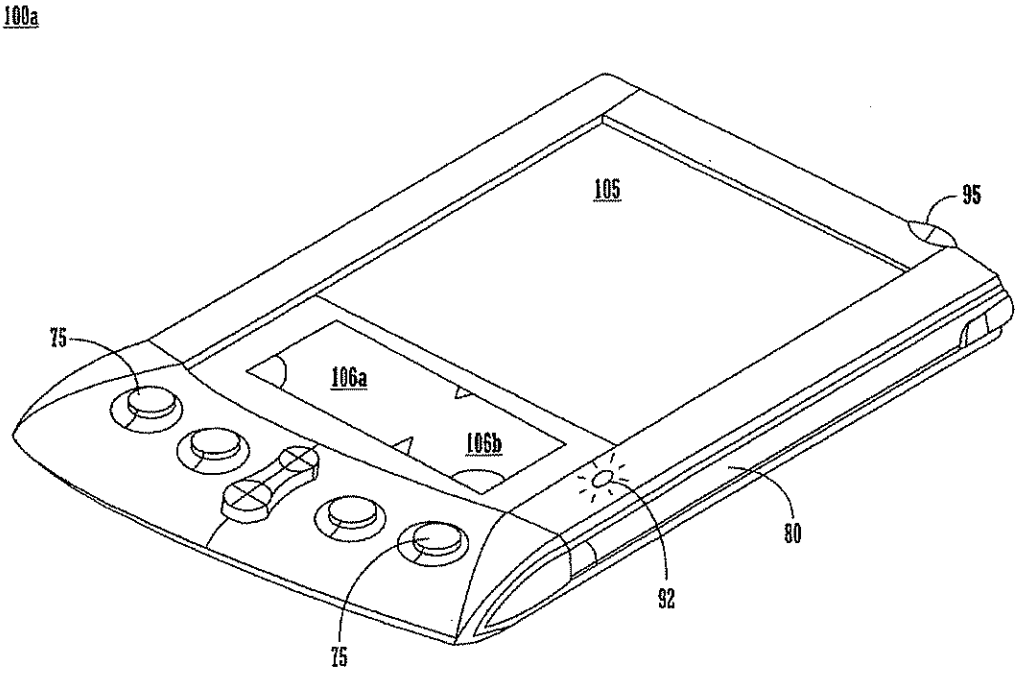
* cited by examiner

Primary Examiner—Ahn V. La
(74) *Attorney, Agent, or Firm*—Wagner, Murabito, & Hao LLP

(57) **ABSTRACT**

An apparatus and method thereof wherein a portable computer system or personal digital assistant generates a visual signal in response to an occurrence of a programmed event. For example, the portable computer system can use a light emitting diode to visually signal an alarm at a specified time. The visual signal can be varied in order to indicate the type of event associated with the alarm. In one implementation, the visual signal blinks at a particular rate depending on the type of event. In another implementation, the visual signal blinks a prescribed number of times or according to a particular pattern depending on the type of event. When enabled, the visual signal is generated in lieu of an audible signal, thus providing to the user a silent alarm that does not disturb other people in proximity, such as in a meeting, a theater, or some other gathering.

15 Claims, 9 Drawing Sheets



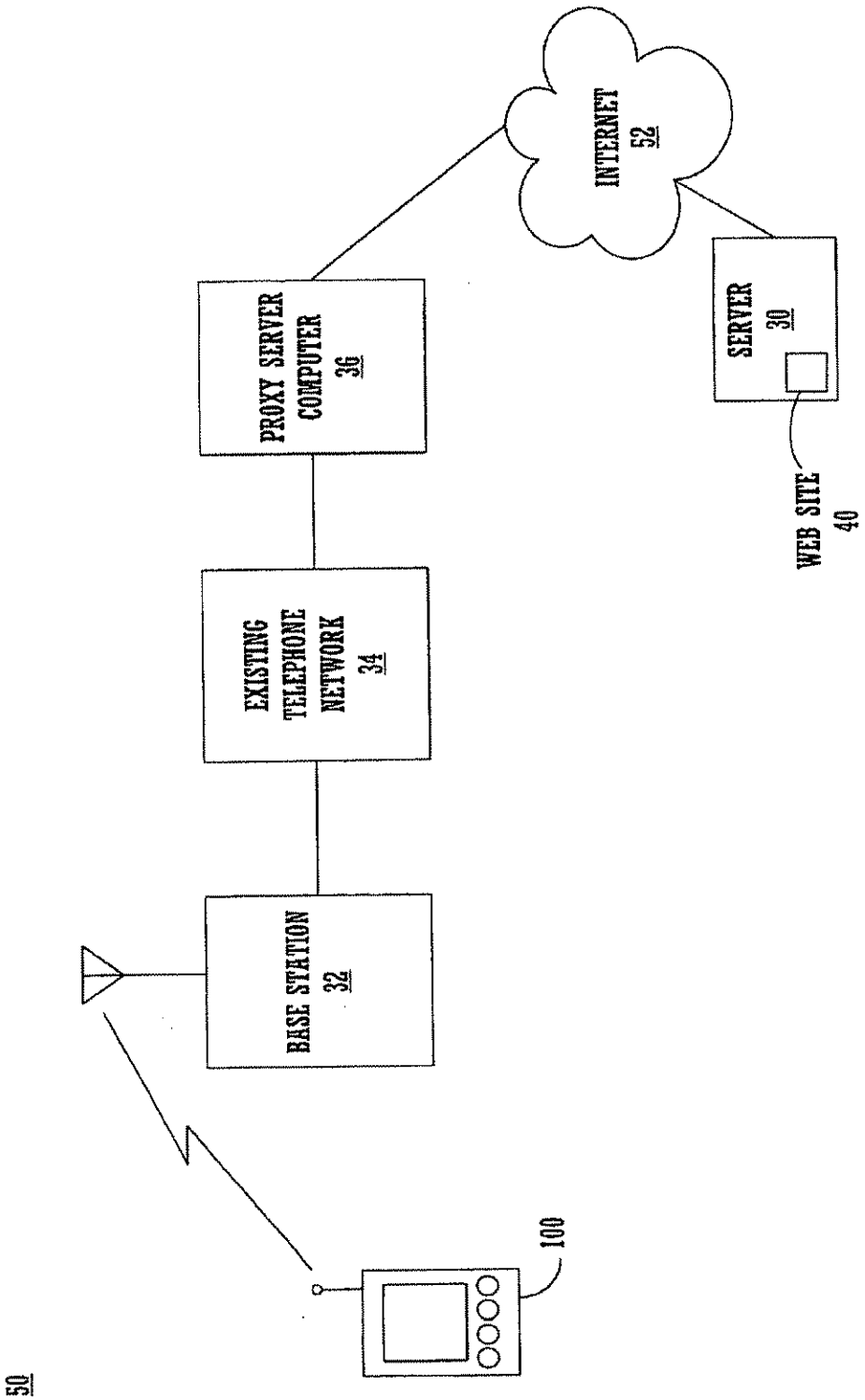

INTERNET
52
PROXY SERVER COMPUTER
36
SERVER
30
WEB SITE
40
EXISTING TELEPHONE NETWORK
34
BASE STATION
32
100
50

FIGURE 1A

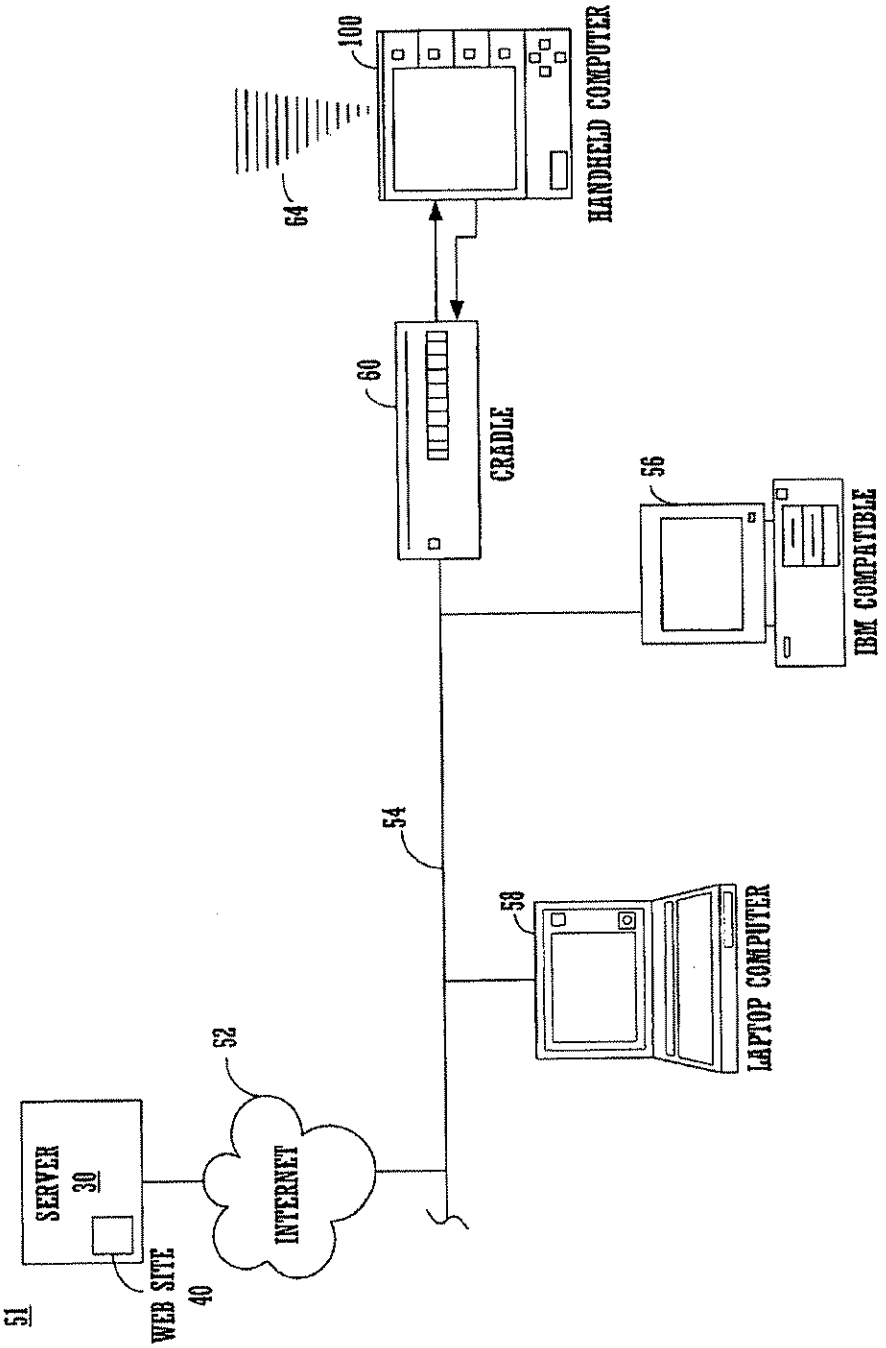

100
HANDHELD COMPUTER
64
60
CRADLE
56
IBM COMPATIBLE
54
58
LAPTOP COMPUTER
52
INTERNET
SERVER
30
WEB SITE
40
51

FIGURE 1B

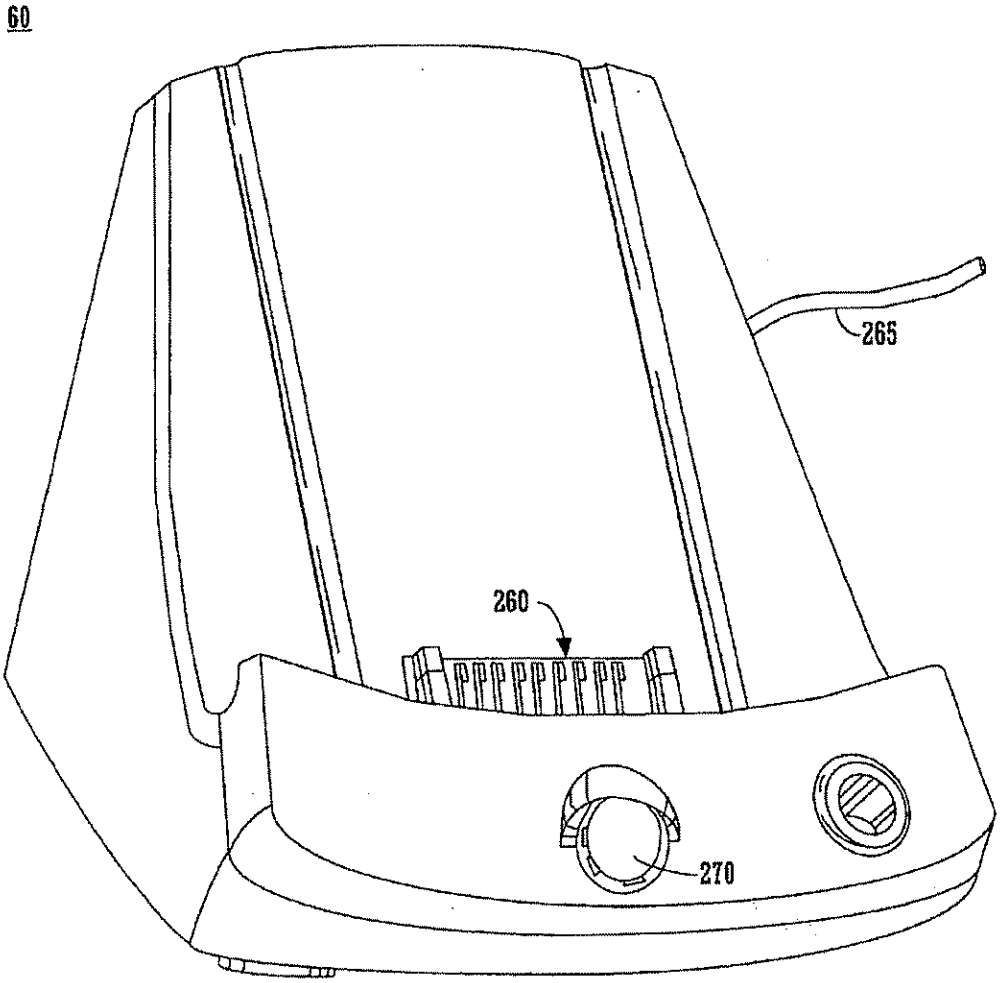


FIGURE 1C

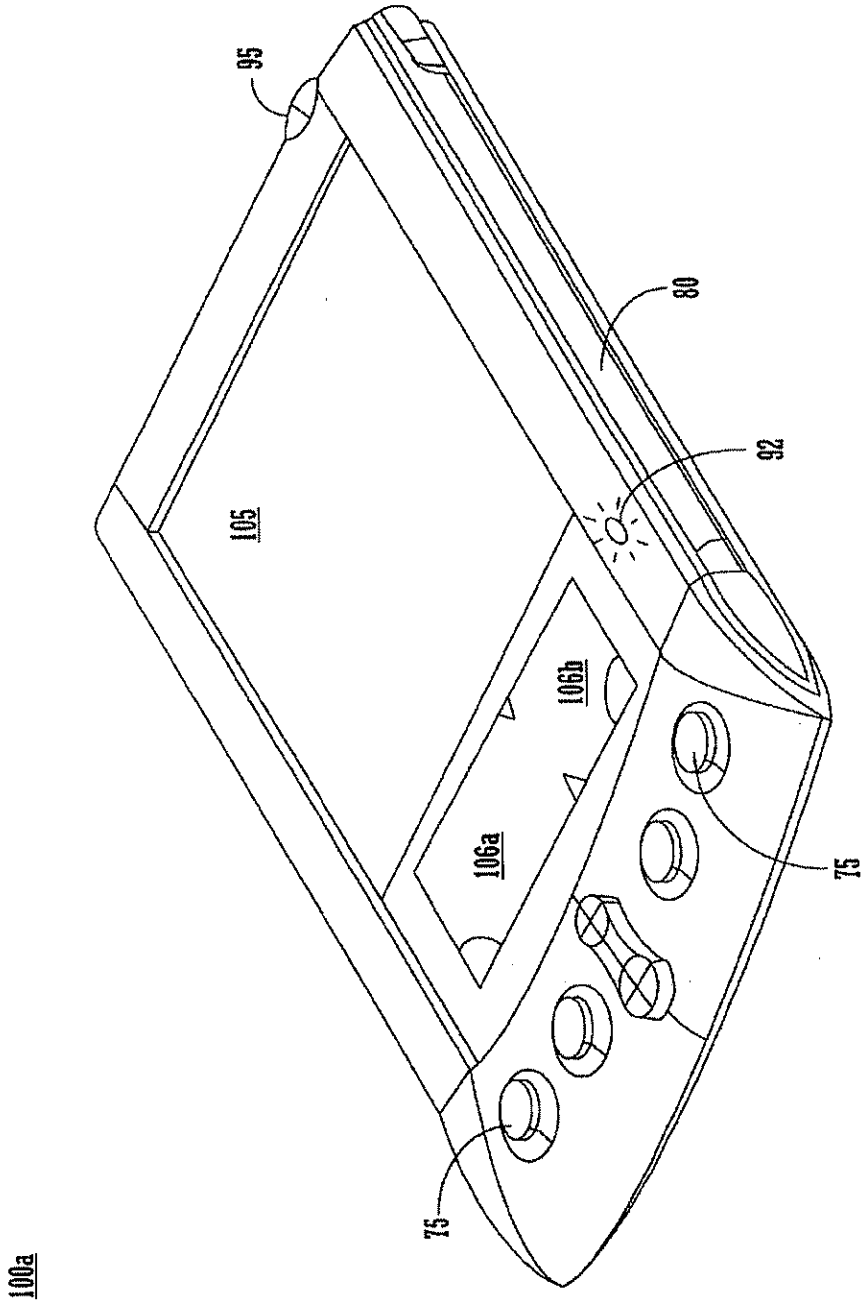


FIGURE 2A

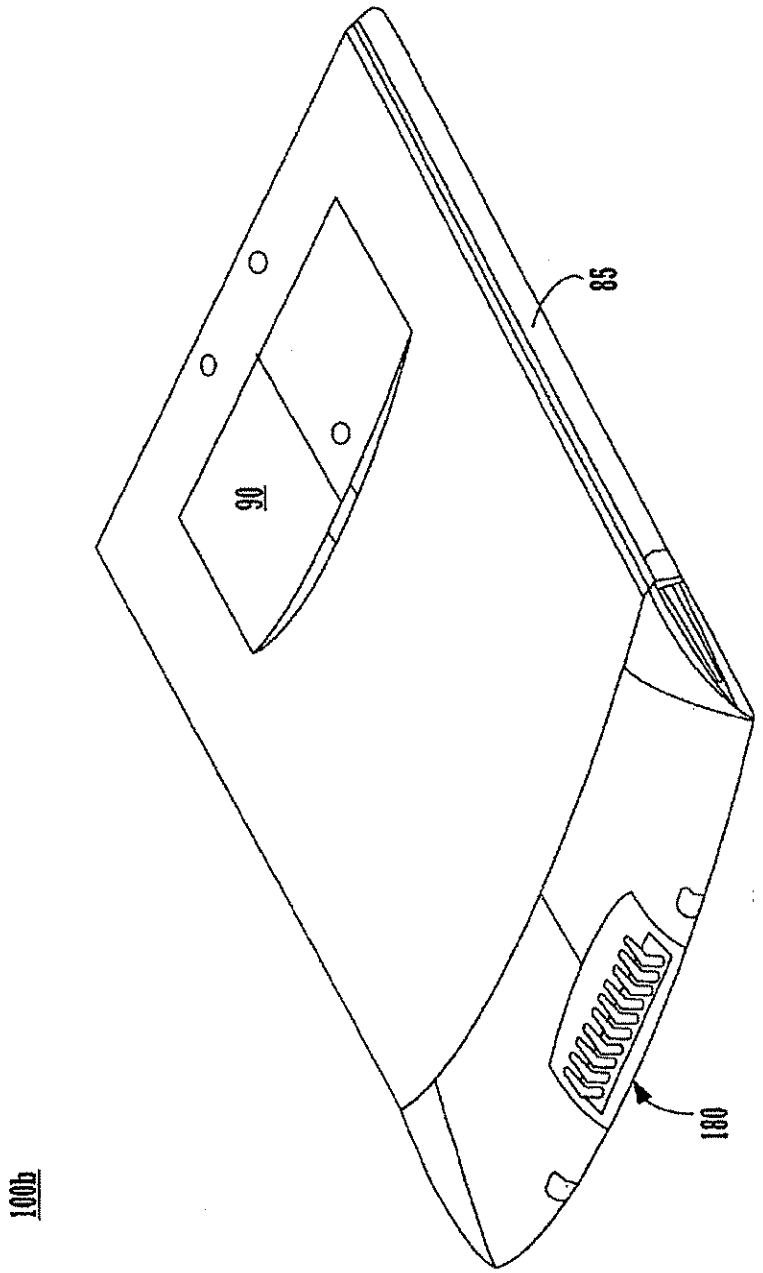


FIGURE 2B

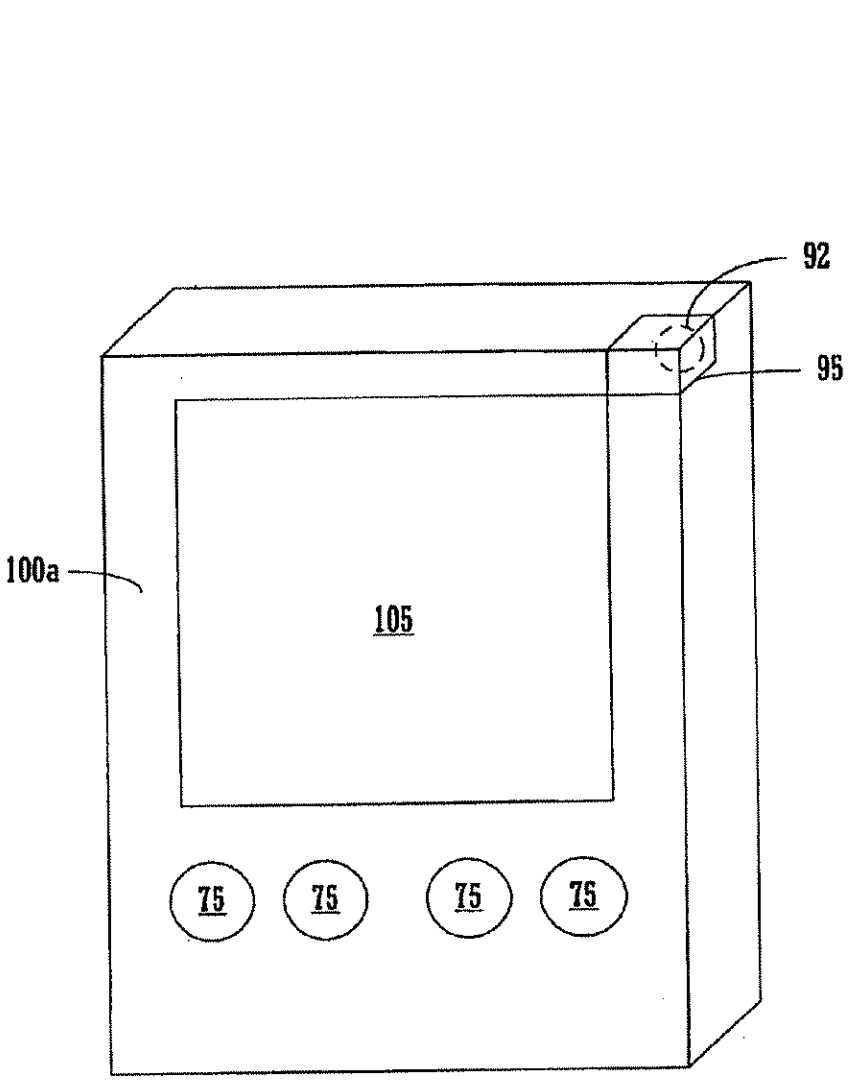


FIGURE 3

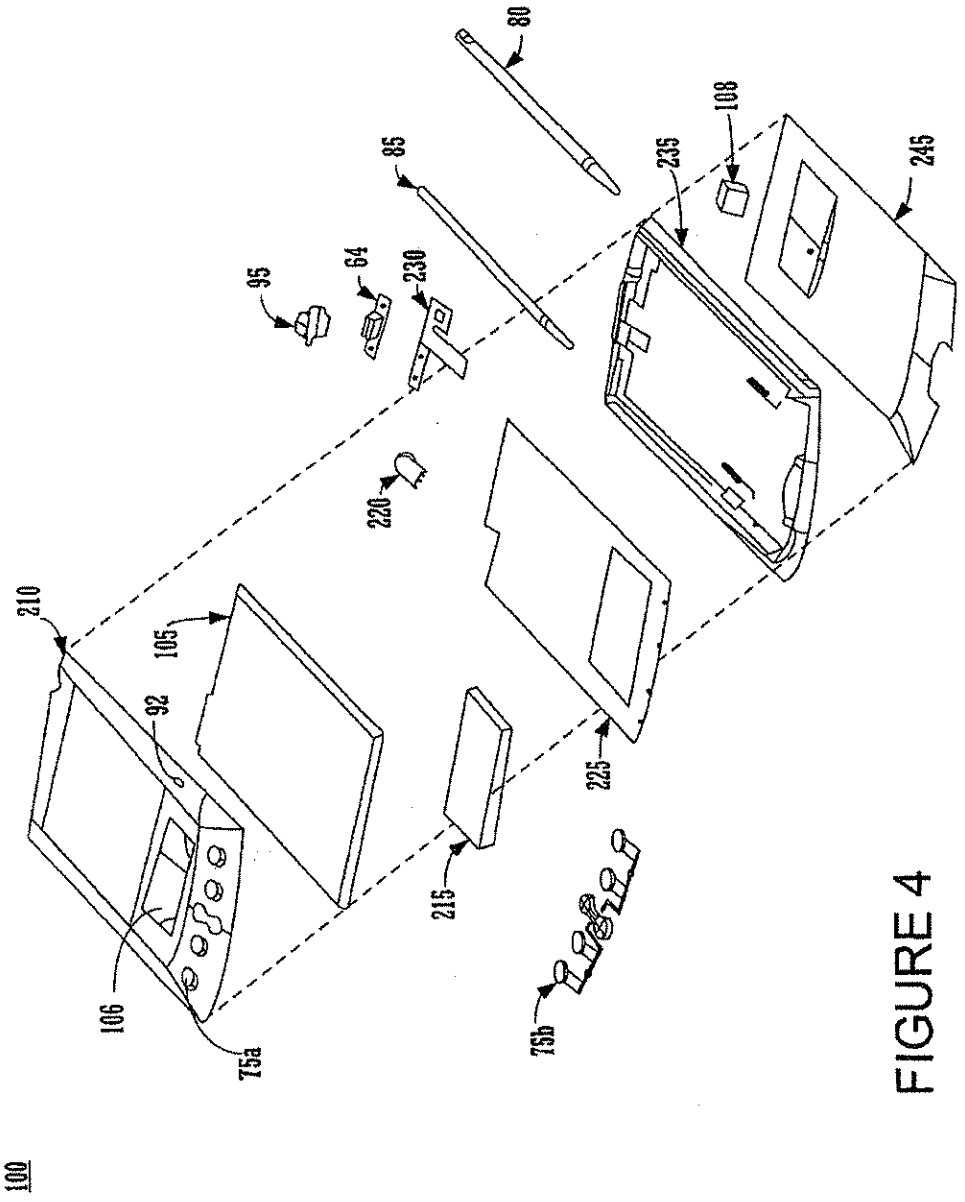


FIGURE 4

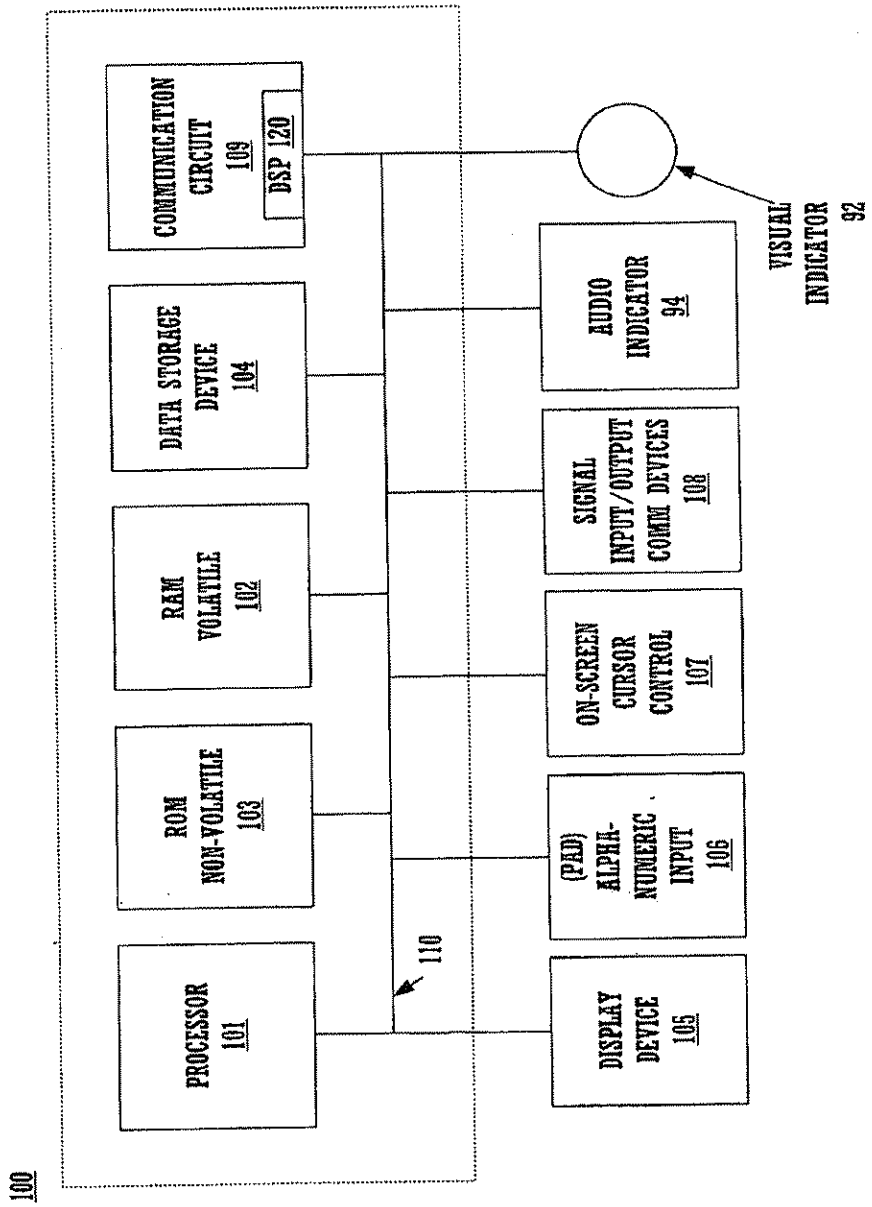

100
PROCESSOR 101
ROM NON-VOLATILE 103
RAM VOLATILE 102
DATA STORAGE DEVICE 104
COMMUNICATION CIRCUIT 109
DSP 120
110
DISPLAY DEVICE 105
(PAD) ALPHA-NUMERIC INPUT 106
ON-SCREEN CURSOR CONTROL 107
SIGNAL INPUT/OUTPUT COMM DEVICES 108
AUDIO INDICATOR 94
VISUAL INDICATOR 92

FIGURE 5

600

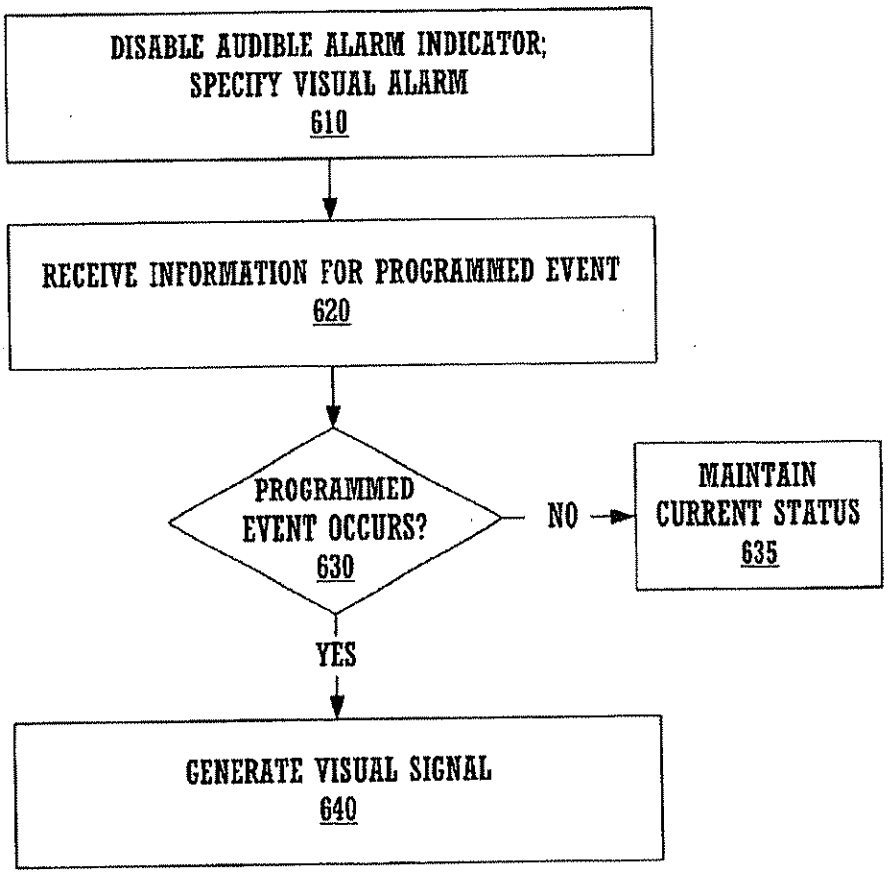

DISABLE AUDIBLE ALARM INDICATOR; SPECIFY VISUAL ALARM
610
RECEIVE INFORMATION FOR PROGRAMMED EVENT
620
PROGRAMMED EVENT OCCURS?
630
NO
MAINTAIN CURRENT STATUS
635
YES
GENERATE VISUAL SIGNAL
640

FIGURE 6

METHOD AND APPARATUS FOR VISUAL SILENT ALARM INDICATOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the field of portable computer systems such as personal digital assistants or palmtops. Specifically, the present invention relates to a method and apparatus for providing a silent visual indicator (e.g., an alarm) for portable computer systems.

2. Related Art

As the components required to build a computer system have reduced in size, new categories of computer systems have emerged. One of the more recent categories of computer systems is the portable or "palmtop" computer system, or personal digital assistant (PDA). A palmtop computer system is a computer that is small enough to be held in the hand of a user and is thus "palm-sized." As a result, palmtops are readily carried about in a briefcase or purse, and some palmtops are compact enough to fit into a person's pocket. By virtue of their size, palmtop computer systems are also lightweight and so are exceptionally portable and convenient.

Because of the portability and convenience of palmtops, it is becoming increasingly desirable to increase the range of applications and functions for which they can be used. It is advantageous to expand the capabilities of a palmtop so that it can provide many of the same, if not the same, services provided by a personal computer (e.g., a desktop or laptop computer system), particularly with regard to access to the World Wide Web as well as the ability to communicate with other palmtops and personal computers. As such, information currently available via the Internet over personal computers, such as on-line access to news and financial information, can also be provided via a palmtop. In addition, a palmtop can be used for electronic mail ("e-mail") and multi-player gaming, and features such as voice recognition can also be added.

Palmtop computers are also used very frequently as personal calendars, containing a user's schedule of meetings, appointments, and other items of significance such as birthdays and anniversaries. The user can open (e.g., display) the calendar to check for upcoming events. In addition, palmtops are generally equipped with an alarm that provides an audible indication to a user of an imminent appointment.

The audible alarm currently used in palmtops is problematic because it is not appropriate for all situations and cannot be used by the hearing impaired. In an environment that is supposed to be quiet (such as a theater), the audible signal can be disruptive and impolite. In an environment where there are many palmtop users (such as a business meeting), there are many occasions when multiple palmtops will sound their alarms at about the same time. In these situations, the sound of multiple alarms is exceptionally disruptive. In addition, it is not easy to trace an audible alarm to its source, and so there will also be some initial confusion while people try to determine whether it is their palmtop that is creating the alarm, further disrupting the meeting.

Furthermore, because of their disruptive nature, audible alarms cannot always be used to signal events other than appointments, etc. That is, there may be a number of conditions associated with the different functions and applications mentioned above for which a user may wish to receive an alert, but with an audible alarm the signals may be virtually continuous, especially in an environment where multiple palmtops are present. Thus, instead of being subjected to too much noise, or subjecting others nearby to the noise, a user may elect to not receive an audible alarm when he or she would really rather have one.

On the other hand, an audible signal can also be problematic in a noisy environment. It may not be possible to hear an audible alarm over the surrounding noise, in this case rendering the alarm useless.

SUMMARY OF THE INVENTION

Accordingly, what is needed is an apparatus and/or method that can be used in a portable computer system and that adds or maintains the functionality of an audible alarm, but addresses the shortcomings of an audible alarm. Also, what is needed is an apparatus and/or method that satisfies the above need and increases the number of conditions or events for which an alarm can be used, in particular for a portable computer system environment where the number of applications and functions are increasing. The present invention provides these advantages and others not specifically mentioned above but described in the sections to follow.

An apparatus and method thereof are described, in which a portable computer system or personal digital assistant is adapted to generate a visual signal in response to the occurrence of a programmed event. In one embodiment, the portable computer system uses a light emitting diode to visually signal an alarm at a specified time. When enabled, the visual signal is generated in lieu of an audible signal, thus providing to the user a silent alarm that does not disturb other people in proximity.

The visual signal can be varied in order to indicate the type of event or condition associated with the alarm. In one implementation, the visual signal blinks at a particular rate depending on the type of event. In another implementation, the visual signal blinks a prescribed number of times or according to a particular pattern depending on the type of event. In yet another implementation, the visual signal uses different colors depending on the type of event. The visual signal can thus be used to signal a wide variety of different events, and in particular can do so in an unobtrusive manner.

In one embodiment, the visual signal is disposed such that it is visible when the portable computer system is viewed either from the front or on edge. In another embodiment, one of the buttons of the portable computer system is made translucent or transparent, and the visual indicator is situated beneath the button. When activated, the visual signal can be seen through the button; therefore, the button performs its normal function and also serves to provide the visual signal. For example, in one implementation, the on/off button is located on the top edge of the front surface and so it can be seen when the portable computer system is viewed from the front or on edge. The on/off button can be made translucent and the visual indicator installed underneath it, and thus the button can perform both its normal function as well as the visual indicator function.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a block diagram of an exemplary network environment including a portable computer system in accordance with one embodiment of the present invention.

FIG. 1B is a block diagram of a portable computer system connected to other computer systems and the Internet via a cradle device in accordance with one embodiment of the present invention.

FIG. 1C is a perspective view of the cradle device for connecting the portable computer system to other systems via a communication interface in accordance with one embodiment of the present invention.

FIG. 2A is a top side perspective view of a portable computer system with a visual indicator in accordance with one embodiment of the present invention.

FIG. 2B is a bottom side perspective view of the portable computer system of FIG. 2A.

FIG. 3 is a perspective view of a portable computer system with a visual indicator in accordance with another embodiment of the present invention.

FIG. 4 is an exploded view of the components of a portable computer system in accordance with one embodiment of the present invention.

FIG. 5 is a block diagram of one embodiment of a portable computer system with a visual indicator in accordance with the present invention.

FIG. 6 is a flowchart of the steps in a process for providing a visual indication in accordance with one embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

In the following detailed description of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be recognized by one skilled in the art that the present invention may be practiced without these specific details or with equivalents thereof. In other instances, well known methods, procedures, components, and circuits have not been described in detail as not to unnecessarily obscure aspects of the present invention.

Notation and Nomenclature

Some portions of the detailed descriptions, which follow, are presented in terms of procedures, steps, logic blocks, processing, and other symbolic representations of operations on data bits that can be performed on computer memory. These descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. A procedure, computer executed step, logic block, process, etc., is here, and generally, conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated in a computer system. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, or the like.

It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise as apparent from the following discussions, it is appreciated that throughout the present invention, discussions utilizing terms such as "causing" or "generating" or "varying" or "receiving" or "enabling" or "disabling" or the like, refer to the action and processes of a computer system (e.g., process **600** of FIG. 6), or similar electronic computing device, that manipulates and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

Exemplary Portable Computer System Network Environment

FIG. 1A is a block diagram of an exemplary network environment **50** including a portable computer system **100** in accordance with one embodiment of the present invention. Portable computer system **100** is also known as a palmtop or palm-sized computer system or as a personal digital assistant (PDA). In one embodiment, portable computer system **100** has the ability to transmit and receive data and information over a wireless communication interface (e.g., a radio interface). In one embodiment, the wireless communication interface is integrated into portable computer system **100**; in another embodiment, the wireless communication interface is accomplished with a wireless modem attachment (not shown).

In the present embodiment, base station **32** is both a transmitter and receiver base station, which can be implemented by coupling it into an existing public telephone network **34**. Implemented in this manner, base station **32** enables portable computer system **100** to communicate with a proxy server computer system **36**, which is coupled by wire to the existing public telephone network **34**. Furthermore, proxy server computer system **36** is coupled to the Internet **52**, thereby enabling portable computer system **100** to communicate with the Internet **52**.

Coupled with Internet **52** are multiple servers exemplified by server **30**. Residing on server **30** is a Web site **40**. When communicating with a Web site over Internet **52**, protocols such as CTP (Compact Transport Protocol) and CML (Compact Markup Language) can be used by portable computer system **100** in the present embodiment.

It should be appreciated that within the present embodiment, one of the functions of proxy server **36** is to perform operations over the Internet **52** on behalf of portable computer system **100**. For example, proxy server **36** has a particular Internet address and acts as a proxy device for portable computer system **100** over the Internet **52**.

It should be further appreciated that other embodiments of a communications network, planned or envisioned, may be utilized in accordance with the present invention. For example, a wireless connection may be made from portable computer system **100** directly to the Internet **52**.

The data and information which are communicated between base station **32** and portable computer system **100** are the same type of information and data that can conventionally be transferred and received over a public telephone wire network system. However, a wireless communication interface is utilized to communicate data and information between portable computer system **100** and base station **32**. It should be appreciated that one embodiment of a wireless communication system in accordance with the present invention is the Mobitex wireless communication system.

FIG. 1B illustrates another embodiment of a system **51** that can be used in conjunction with various embodiments of the present invention. System **51** comprises a host computer system **56** which can either be a desktop unit as shown, or, alternatively, can be a laptop system **58**. Optionally, one or more host computer systems can be used within system **51**. Host computer systems **58** and **56** are shown connected to a communication bus **54**, which in one embodiment can be a serial communication bus, but could be of any of a number of well known designs, e.g., a parallel bus, Ethernet Local Area Network (LAN), etc. Bus **54** can provide communication with the Internet **52** using a number of well-known

protocols. Coupled with Internet **52** are multiple servers exemplified by server **30**. Residing on server **30** is a Web site **40**.

Importantly, bus **54** is also coupled to a cradle **60** for receiving and initiating communication with portable computer system **100** of the present invention. Cradle **60** provides an electrical and mechanical communication interface between bus **54** (and anything coupled to bus **54**) and the computer system **100** for two-way communications. It is appreciated that, in accordance with the present invention, portable computer system **100** may instead be coupled to host computer systems **56** and **58** via a wireless (radio) connection. Computer system **100** also contains a wireless infrared communication mechanism **64** for sending and receiving information from other devices (e.g., "beaming").

With reference to both FIGS. **1**A and **1**B, it is appreciated that portable computer system **100** can be used in a network environment combining elements of networks **50** and **51**. That is, portable computer system **100** can include both a wireless infrared communication mechanism and a signal (e.g., radio) receiver/transmitter device.

FIG. **1**C is a perspective illustration of one embodiment of the cradle **60** for receiving the portable computer system **100**. Cradle **60** contains a mechanical and electrical interface **260** for interfacing with communication interface **180** (FIG. **2**B below) of computer system **100** when system **100** is slid into the cradle **60** in an upright position. Once inserted, button **270** can be pressed to initiate two-way communication (e.g., a communication session) between computer system **100** and other computer systems coupled to serial communication **265**.

Apparatus for Visual Silent Alarm Indicator

FIG. **2**A is a perspective illustration of the top face **100***a* of the housing of one embodiment of the portable computer system **100** of the present invention. The top face **100***a* contains a display screen **105** surrounded by a bezel or cover. A removable stylus **80** is also shown. The display screen **105** is a touch screen able to register contact between the screen and the tip of the stylus **80**. The stylus **80** can be of any material to make contact with the screen **105**. The top face **100***a* also contains one or more dedicated and/or programmable buttons **75** for selecting information and causing the computer system to implement functions. The on/off button **95** is also shown.

FIG. **2**A also illustrates a handwriting recognition pad or "digitizer" containing two regions **106***a* and **106***b*. Region **106***a* is for the drawing of alphabetic characters therein (and not for numeric characters) for automatic recognition, and region **106***b* is for the drawing of numeric characters therein (and not for alphabetic characters) for automatic recognition. The stylus **80** is used for stroking a character within one of the regions **106***a* and **106***b*. The stroke information is then fed to an internal processor for automatic character recognition. Once characters are recognized, they are typically displayed on the screen **105** for verification and/or modification.

In accordance with one embodiment of the present invention, a visual indicator **92** is situated on the top face **100***a* of portable computer system **100**. Visual indicator **92** comprises a light emitting diode (LED) or some other type of illuminating or visible element. In another embodiment, visual indicator **92** is located within the housing of portable computer system **100**, and a optical pipe (or similar type of device) is used to convey the visible signal from visual indicator **92** to a position where the signal is visible to a user.

Visual indicator **92** illuminates or blinks to provide a visual signal or visual alarm to a user. It is appreciated that visual indicator **92** may be situated in a position other than that shown (see FIG. **3** below, for example). It is further appreciated that, in another embodiment, visual indicator **92** may be incorporated into display device **105**, such that display device **105** flashes, blinks or otherwise provides a visual alert to a user.

The visual signal can be used to alert a user to an upcoming meeting or appointment, or to alert the user that it is a particular time of day. A visual signal can also be used to alert a user of a particular condition associated with the functions and applications of portable computer system **100** (a "programmed event"). For example, a user may program portable computer system **100** to provide a visual signal as part of a single-player or multi-player game, when an e-mail is received, when battery power is low, when an input error is made, when information is beamed successfully (or not) from one portable device to another, etc. Additional information is provided in conjunction with FIG. **6** below.

With reference still to FIG. **2**A, in one embodiment, visual indicator **92** can vary the visual signal in order to indicate different types of conditions or programmed events. For example, the visual signal can blink at a particular rate, blink a prescribed number of times, blink according to a particular pattern (e.g., a combination of longer and shorter blinks), or use different colors to signify the occurrence of different types of events or conditions. It is appreciated that the visual signal can be varied in other ways in accordance with the present invention.

Thus, the present invention can be used to signal a large number of different events or conditions associated with the various applications and functions performed by portable computer system **100**, depending on user preferences. In particular, the present invention accomplishes these alert functions in an unobtrusive manner.

In one embodiment, portable computer system **100** also incorporates an audible indicator (not shown) that provides an audible indication or alarm to a user. In this embodiment, visual indicator **92** provides a visual signal in lieu of an audible signal, although it is appreciated that any combination of a visual and audible signal can also be used in accordance with the present invention. It is further appreciated that visual indicator **92** may be enabled or disabled depending on the user's preferences.

Because a visual signal can be used instead of an audible signal, the present invention addresses the shortcomings of an audible signal. Namely, the visual signal generated by visual indicator **92** is not disruptive to others nearby, and it can be used by the hearing impaired. Furthermore, the visual signal makes it easier to identify which device is generating the alarm, and it is suitable for a noisy environment where an audible signal may not be heard.

FIG. **2**B illustrates the bottom side **100***b* of the housing of one embodiment of the portable computer system that can be used in accordance with various embodiments of the present invention. An extendible antenna **85** is shown, and also a battery storage compartment door **90** is shown. A communication interface **180** is also shown. In one embodiment of the present invention, the communication interface **180** is a serial communication port, but could also alternatively be of any of a number of well-known communication standards and protocols, e.g., parallel, SCSI (small computer system interface), Firewire (IEEE 1394), Ethernet, etc.

FIG. **3** is a perspective view of a portable computer system **100** with a visual indicator **92** in accordance with another embodiment of the present invention. In this embodiment, visual indicator **92** is situated along the top edge of the top face **100***a*, and as such can be seen by the

user whether the user views portable computer system **100** from the front face or on edge. Thus, for example, should a user choose to wear portable computer system **100** attached to a belt, or should the user choose to put portable computer system **100** into his or her pocket, visual indicator **92** would still be visible and thus able to alert a user of a programmed event.

In one embodiment, on/off button **95** is transparent or translucent, and visual indicator **92** is situated beneath on/off button **95** or within the button itself. Thus, a visual signal can be seen through on/off button **95**. In the embodiments illustrated in FIGS. **2**A and **3**, on/off button **95** is situated along the top edge of the top face **100***a*, and as such the visual signal can be seen by the user whether the user views portable computer system **100** from the front face or on edge, as described above. Accordingly, on/off button **95** performs its normal function and also serves the additional function of emitting a visual signal generated by visual indicator **92**. Such a design is advantageous because it efficiently utilizes the limited space available given the compactness of portable computer system **100**. It is appreciated that, in other embodiments, other buttons or elements for performing a function or for causing a function to be performed, such as programmable buttons **75**, can be made transparent or translucent and combined with visual indicator **92** in a similar manner.

FIG. **4** is an exploded view of the portable computer system **100** in accordance with one implementation. Computer system **100** has a housing comprised of a back cover **245** and a front cover **210**, which has an outline of region **106** and holes **75***a* for receiving buttons **75***b*. A flat panel display **105** (both liquid crystal display and touch screen) fits into front cover **210**. Any of a number of display technologies can be used, e.g., liquid crystal display (LCD), field emission display (FED), plasma, etc., for the flat panel display **105**. A battery **215** provides electrical power. A contrast adjustment (potentiometer) **220** is also shown, as well as an on/off button **95**. A flex circuit **230** is shown along with a printed circuit (PC) board **225** containing electronics and logic (e.g., memory, communication bus, processor, etc.) for implementing computer system functionality. The digitizer pad is also included in PC board **225**. A midframe **235** is shown along with stylus **80**. Position-adjustable antenna **85** is shown.

Infrared communication mechanism **64** (e.g., an infrared emitter and detector device) is for sending and receiving information from other similarly equipped devices (see FIG. **1**B). A signal (e.g., radio) receiver/transmitter device **108** is also shown. The receiver/transmitter device **108** is coupled to the antenna **85** and also coupled to communicate with the PC board **225**. In one implementation the Mobitex wireless communication system is used to provide two-way communication between computer system **100** and other networked computers and/or the Internet via a proxy server (see FIG. **1**A).

Visual indicator **92** is for providing a visual signal to a user, as described above in conjunction with FIG. **2**A. In one embodiment of the present invention, a port pin on a microprocessor drives a transistor which allows visual indicator **92** to blink on or off. It is appreciated that other mechanisms and devices can be used to provide and control a visual signal in accordance with the present invention.

FIG. **5** illustrates circuitry of computer system **100**, some of which can be implemented on PC board **225** (FIG. **4**). Computer system **100** includes an address/data bus **110** for communicating information, a central processor **101** coupled with the bus for processing information and instructions, a volatile memory **102** (e.g., random access memory, RAM) coupled with the bus **110** for storing information and instructions for the central processor **101** and a non-volatile memory **103** (e.g., read only memory, ROM) coupled with the bus **110** for storing static information and instructions for the processor **101**. Computer system **100** also includes an optional data storage device **104** (e.g., memory stick) coupled with the bus **110** for storing information and instructions. Device **104** can be removable. As described above, computer system **100** also contains a display device **105** coupled to the bus **110** for displaying information to the computer user. PC board **225** can contain the processor **101**, the bus **110**, the ROM **103** and the RAM **102**.

With reference still to FIG. **5**, computer system **100** also includes a signal transmitter/receiver device **108**, which is coupled to bus **110** for providing a physical communication link between computer system **100**, and a network environment (e.g., network environments **50** and **51** of FIGS. **1**A and **1**B, respectively). As such, signal transmitter/receiver device **108** enables central processor unit **101** to communicate wirelessly with other electronic systems coupled to the network. It should be appreciated that within the present embodiment, signal transmitter/receiver device **108** is coupled to antenna **85** (FIG. **4**) and provides the functionality to transmit and receive information over a wireless communication interface. It should be further appreciated that the present embodiment of signal transmitter/receiver device **108** is well suited to be implemented in a wide variety of ways. For example, signal transmitter/receiver device **108** could be implemented as a modem.

In one embodiment, computer system **100** includes a communication circuit **109** coupled to bus **110**. Communication circuit **109** includes an optional digital signal processor (DSP) **120** for processing data to be transmitted or data that are received via signal transmitter/receiver device **108**. Alternatively, processor **101** can perform some or all of the functions performed by DSP **120**.

Also included in computer system **100** of FIG. **5** is an optional alphanumeric input device **106** that in one implementation is a handwriting recognition pad ("digitizer") having regions **106***a* and **106***b* (FIG. **2**), for instance. Alphanumeric input device **106** can communicate information and command selections to processor **101**. Computer system **100** also includes an optional cursor control or directing device (on-screen cursor control **107**) coupled to bus **110** for communicating user input information and command selections to processor **101**. In one implementation, on-screen cursor control device **107** is a touch screen device incorporated with display device **105**. On-screen cursor control device **107** is capable of registering a position on display device **105** where the stylus makes contact. The display device **105** utilized with computer system **100** may be a liquid crystal display device, a cathode ray tube (CRT), a field emission display device (also called a flat panel CRT) or other display device suitable for generating graphic images and alphanumeric characters recognizable to the user. In the preferred embodiment, display device **105** is a flat panel display.

In the present embodiment of the present invention, visual indicator **92** is also coupled to processor **101** and to memory (e.g., RAM **102** or ROM **103**) via bus **110**. As described previously, visual indicator **92** functions to provide a visual signal or alarm to a user. Portable computer system **100** can be programmed to actuate visual indicator **92** at one or more times of day specified by a user. Visual indicator **92** can also be programmed to alert a user of one or more specified

conditions or events associated with the various applications and functions performed by portable computer system **100**.

In one embodiment, also coupled to bus **110** is audio indicator **94** for providing an audible signal or alarm to a user. In accordance with the present invention, visual indicator **92** may be used in combination with or in lieu of audio indicator **94**. It is appreciated that visual indicator **92** and/or audio indicator **94** may be enabled or disabled depending on the user's preferences.

Method for Visual Silent Alarm Indicator

FIG. **6** is a flowchart of the steps in a process **600** for providing a visual indication in a portable computer system **100** (FIG. **5**) in accordance with one embodiment of the present invention. In the present embodiment, process **600** is implemented using visual indicator **92** in combination with processor **101** and RAM **102** or ROM **103** of FIG. **5**. Various types of dialog boxes and graphical user interfaces can be used by portable computer system **100** to receive the user input described below.

In step **610** of FIG. **6**, depending on the user's preferences, the audible alarm (e.g., audio indicator **94** of FIG. **5**) is disabled and visual indicator **92** is enabled. It is appreciated that, in accordance with the present invention, the visual signal can be used in lieu of the audible alarm, or that a combination of an audible alarm and a visual signal can be used.

In accordance with the present invention, a separate alarm can be set for any number of individual events or conditions, and each alarm can be signaled either visually or audibly or both. In one embodiment, the user makes a selection with regard to a visual and/or audible alarm when programming into portable computer system **100** the events or conditions for which he or she wishes to be alerted (see step **620**).

In step **620** of FIG. **6**, portable computer system **100** is programmed with (e.g., receives) information regarding the particular events or conditions that will be signaled to the user. For example, a user selects the calendar function of portable computer system **100** and, in a known fashion, enters information with regard to an upcoming meeting. At this time, the user can also enable or disable the alarm function for this particular meeting. If enabled, the user can specify whether the alarm should be an audible alarm or a visual alarm or both.

In a similar manner, a user can identify other events or conditions for which an alert is to be provided, and can specify whether the alert should be visual and/or audible. For example, a user may program portable computer system **100** to provide a visual signal as part of a single-player or multi-player game, when an e-mail is received, when battery power is low, when an input error is made, when information is beamed successfully (or not) from one portable device to another, etc. In addition, the user may specify certain types of visual signals depending on the type of event or condition. For example, the user may specify that visual indicator **92** should signal an upcoming meeting with a series of blinks according to one pattern, the arrival of an e-mail according to another pattern, and an input error by one relatively long signal.

At step **630** of FIG. **6**, if an event or condition programmed by a user does not occur, then portable computer system **100** functions in its normal manner (step **635**). When a programmed event does occur (step **640**), a visual signal can be generated in accordance with the present invention to alert the user that the event has occurred. For example, for the case where the user wishes to be alerted to an upcoming meeting, the user can program portable computer system **100** to provide an alert a few minutes before the meeting. At the designated time, visual indicator **92** is directed to generate a visual signal. In particular, a specific type of visual signal can be used to indicate that the alert is for an upcoming meeting, as described above.

In summary, the present invention provides an apparatus and method for generating a visual signal for a portable computer system **100** (FIG. **5**) that can be used instead of or in combination with an audible signal. As such, the present invention provides an apparatus and method that maintains the functionality of an audible alarm, but addresses the shortcomings of an audible alarm. Namely, the visual signal generated by visual indicator **92** (FIG. **5**) is not disruptive to others nearby, and it can be used by the hearing impaired. Furthermore, the visual signal makes it easier to identify which device is generating the alarm, and it is suitable for a noisy environment where an audible signal may not be heard.

The present invention also provides an apparatus and method that can provide alarms for any number of different conditions or events associated with the applications and functions performed by a portable computer system. Importantly, the present invention accomplishes these alert functions in an unobtrusive manner.

The preferred embodiment of the present invention, method and apparatus for visual silent alarm indicator, is thus described. While the present invention has been described in particular embodiments, it should be appreciated that the present invention should not be construed as limited by such embodiments, but rather construed according to the below claims.

What is claimed is:

1. A portable computer system comprising:

a bus;

a processor coupled to said bus;

a memory unit coupled to said bus;

a handwriting recognition pad having regions for alphabetic characters and numeric characters coupled to said bus;

a housing sized so that it is portable substantially within one hand of a user, wherein said bus, processor, memory unit and handwriting recognition pad are disposed within said housing;

a visual indicator comprising a single light emitting diode and coupled to receive a signal from said processor, said visual indicator adapted to generate a visual signal at a specified point in time, said visual indicator generating said visual signal at said point in time independent of an occurrence of another event, said visual indicator functioning as a visual alarm to alert said user that said point in time has been reached; and

an audible indicator coupled to receive a signal from said processor, said audible indicator adapted to generate an audible signal at said specified point in time independent of an occurrence of another event, said audible indicator functioning as an audible alarm to alert said user that said point in time has been reached, wherein said audible indicator can be disabled by said user so that only said visual indicator provides said alert.

2. The portable computer system of claim **1** wherein said visual signal is varied to indicate a specific type of event associated with said visual signal.

3. The portable computer system of claim **2** wherein said visual signal is caused to blink at different rates.

4. The portable computer system of claim **2** wherein said visual signal is caused to change colors.

5. The portable computer system of claim **2** wherein said visual indicator is caused to blink.

6. The portable computer system of claim 1 wherein said visual signal is visible on both a first surface of said housing and an edge of said housing.

7. The portable computer system of claim 1 wherein said visual indicator is also adapted to cause said portable computer system to implement a function in addition to an alarm function.

8. The portable computer system of claim 1 wherein said visual indicator can be used in combination with an audible indicator.

9. A portable computer system comprising:

a bus;

a processor coupled to said bus;

a memory unit coupled to said bus;

a housing sized so that it is portable substantially within one hand of a user, wherein said bus, processor and memory unit are disposed within said housing;

a visual indicator comprising a single light emitting diode and coupled to receive a signal from said processor, said visual indicator adapted to generate a visual signal at a specified point in time, said visual indicator generating said visual signal at said point in time independent of an occurrence of another event, said visual indicator functioning as a visual alarm to alert said user that said point in time has been reached; and

an audible indicator coupled to receive a signal from said processor, said audible indicator adapted to generate an audible signal at said specified point in time independent of an occurrence of another event, said audible indicator functioning as an audible alarm to alert said user that said point in time has been reached, wherein said audible indicator can be disabled by said user so that only said visual indicator provides said alert.

10. The portable computer system of claim 9 wherein said visual signal is varied to indicate a specific type of event associated with said visual signal.

11. The portable computer system of claim 10 wherein said visual signal is caused to blink at different rates.

12. The portable computer system of claim 10 wherein said visual signal is caused to change colors.

13. The portable computer system of claim 10 wherein said visual indicator is caused to blink.

14. The portable computer system of claim 9 wherein said visual signal is visible on both a first surface of said housing and an edge of said housing.

15. The portable computer system of claim 9 wherein said visual indicator is also adapted to cause said portable computer system to implement a function in addition to an alarm function.

* * * * *

EXHIBIT B



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

(10) **Patent No.: US 7,093,764 B1**
(45) **Date of Patent: Aug. 22, 2006**

(54) **INTEGRATED SIM HOLDER WITH BACKCASE AND ROTATING DOOR**

(75) Inventors: **Tony Valenzuela**, Everett, WA (US); **Chris Kratle**, San Jose, CA (US); **Troy Hulick**, Saratoga, CA (US)

(73) Assignee: **Palm, Inc.**, Sunnyvale, CA (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.: **09/839,893**

(22) Filed: **Apr. 20, 2001**

(51) **Int. Cl.**
G06K 7/00 (2006.01)

(52) **U.S. Cl.** **235/486**; 235/492; 439/326

(58) **Field of Classification Search** 235/492, 235/486, 483, 485, 479, 482, 441; 439/331, 439/326

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,353,328	A		10/1994	Jokimies	379/58
5,436,969	A	*	7/1995	Kobayashi	379/433.09
5,603,629	A	*	2/1997	DeFrasne et al.	439/331
5,699,406	A	*	12/1997	Liikanen et al.	455/558
5,748,720	A		5/1998	Loder	379/144
5,790,659	A		8/1998	Strand	379/433
5,813,878	A	*	9/1998	Kuwata et al.	439/326
5,815,570	A	*	9/1998	Hannon et al.	379/433.09
5,883,786	A		3/1999	Nixon	361/737
5,894,597	A	*	4/1999	Schwartz et al.	235/441
5,901,049	A		5/1999	Schmidt	361/787
5,933,328	A	*	8/1999	Wallace et al.	439/326
5,969,331	A		10/1999	Hoolhorst	235/486
5,971,280	A		10/1999	Hoolhorst	235/486
5,979,771	A		11/1999	Adams	235/486
5,984,707	A	*	11/1999	Kuwata	439/326
6,006,987	A		12/1999	Hoolhorst	235/375
6,018,669	A		1/2000	Stoegmueller	455/558
6,021,945	A		2/2000	Hoolhorst	235/441
6,047,070	A		4/2000	Raaf	380/270
6,050,492	A		4/2000	Hoolhorst	235/475
6,106,317	A	*	8/2000	Michaelis et al.	439/326
6,174,188	B1	*	1/2001	Martucci	439/326
6,175,505	B1	*	1/2001	Cheng et al.	361/752
6,179,649	B1	*	1/2001	An	439/500
6,193,557	B1	*	2/2001	Luvini et al.	439/630
6,210,193	B1	*	4/2001	Ito et al.	439/326
6,220,882	B1	*	4/2001	Simmel et al.	439/326
6,226,189	B1	*	5/2001	Haffenden et al.	361/814

(Continued)

FOREIGN PATENT DOCUMENTS

DE	4008655	A1 *	8/1991

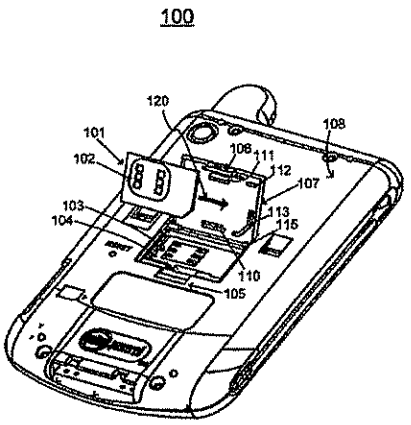
(Continued)

Primary Examiner—Uyen-Chau N Le

(57) **ABSTRACT**

An apparatus for holding a SIM (subscriber identification module) card for an electronic device. The electronic device is implemented using integrated circuits on a PCB (printed circuit board) contained within a device housing. A SIM connector is mounted on the PCB and is configured to electrically connect a SIM card to the PCB when the SIM card is engaged with the SIM connector. The SIM card is releasably held in position by a SIM card door. The SIM card door is configured to move the SIM card into engagement with the SIM connector when in a closed position. The SIM card door can be configured to slidably accept the SIM card into a properly aligned position when the SIM card door is in the open position. The SIM card door is releasably engageable with the housing and is rotatably attached to the housing such that the SIM card door swings into the closed position from the open position. Holding the SIM card with the SIM card door provides for a smaller SIM connector and thus a minimum amount of PCB area for mounting the SIM connector.

16 Claims, 3 Drawing Sheets



U.S. PATENT DOCUMENTS

6,234,810	B1 *	5/2001	Schnell et al.	439/76.1
6,424,118	B1 *	7/2002	Tu	320/115
6,450,408	B1 *	9/2002	Shiue	235/492
6,468,101	B1 *	10/2002	Suzuki	439/326
6,547,138	B1 *	4/2003	Braun et al.	235/441
6,724,618	B1 *	4/2004	Jenkins et al.	361/684

FOREIGN PATENT DOCUMENTS

EP	0475210	B1	8/1991
EP	0503434	B1	3/1992
EP	0564105	A2	6/1993
EP	0989683	A2	9/1999
EP	967771	A2 *	12/1999
EP	1004979	A *	5/2000
GB	2842603	A1	9/1978
GB	4419073	A1	5/1994
GB	19611237	A1	3/1996
GB	19703007	A1	1/1997
GB	19834436	A1	7/1998
GB	WO99/44378		1/1999
GB	2327791	A	2/1999
GB	2327792	A	2/1999
GB	2338811	A	12/1999
JP	08329203	A *	12/1996
JP	2002101170	A *	4/2002
WO	WO 99/64976		12/1999

* cited by examiner

100

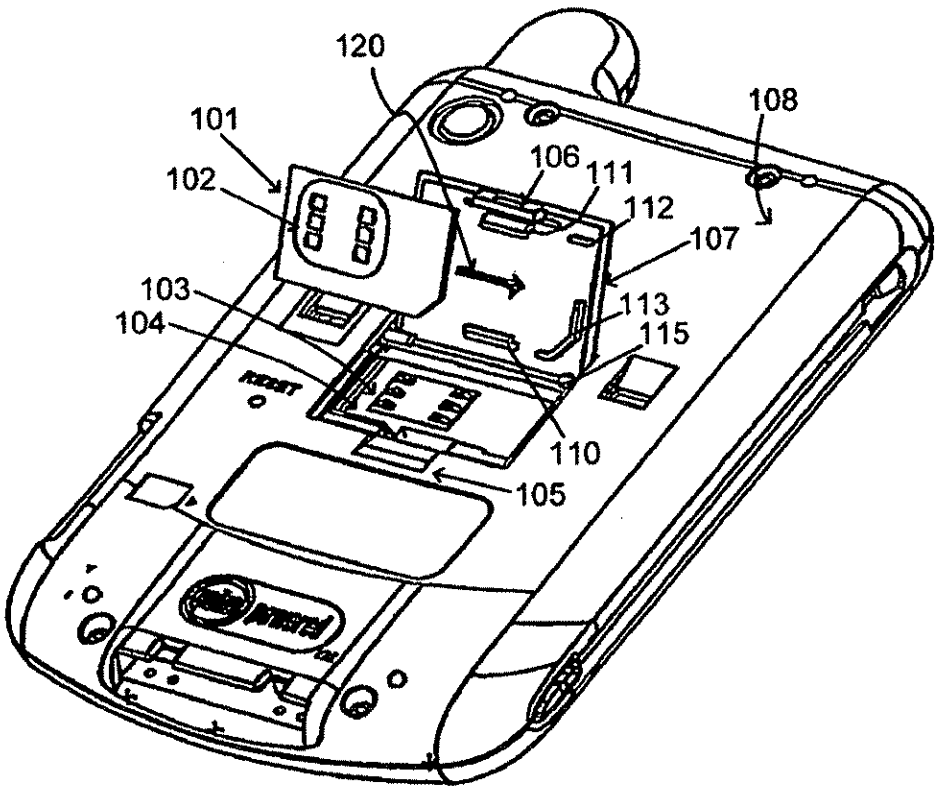


FIG. 1

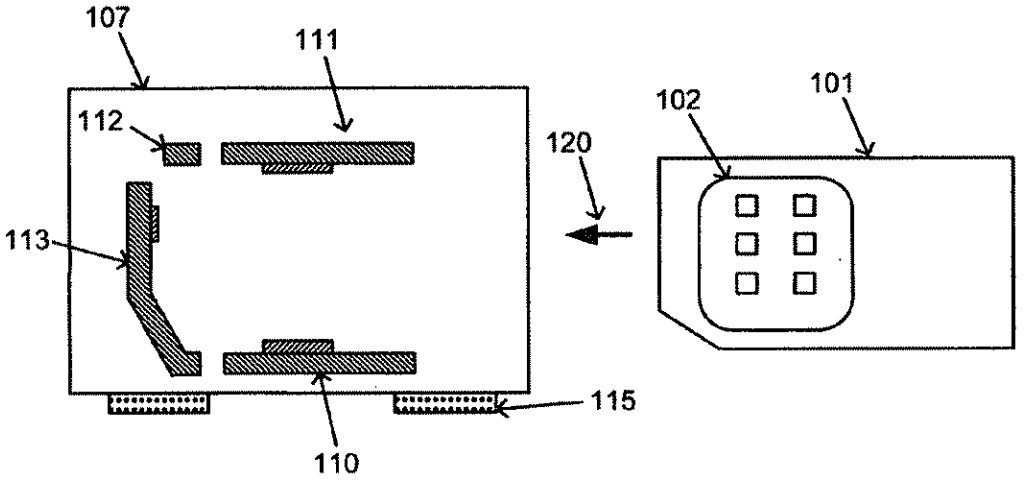

107
111
112
113
120
102
101
115
110

FIG. 2

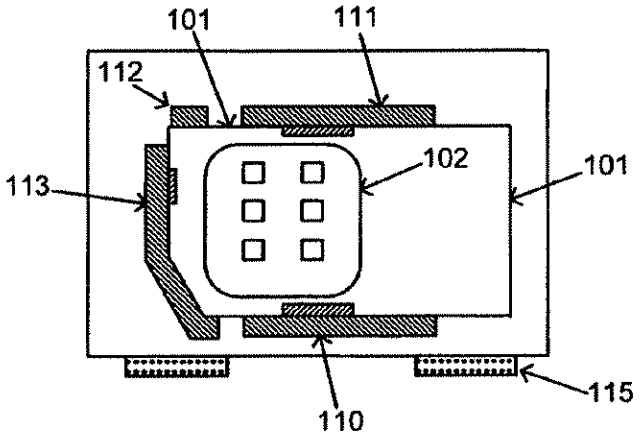

101
111
112
113
102
101
115
110

FIG. 3

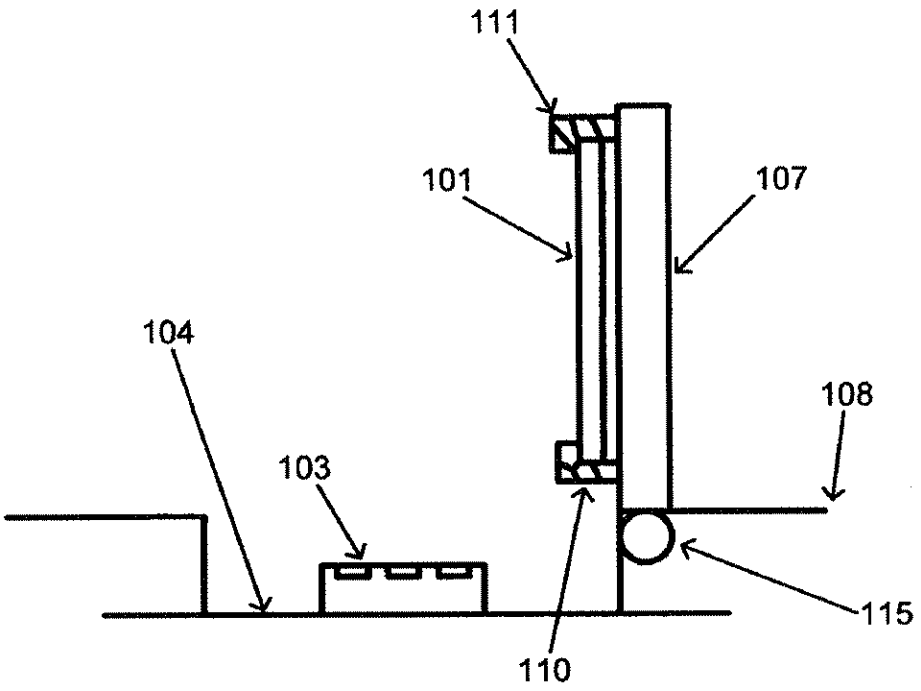


FIG. 4

INTEGRATED SIM HOLDER WITH BACKCASE AND ROTATING DOOR

TECHNICAL FIELD

The present invention relates to a system and method by which computing devices may more easily utilize SIM (subscriber identification module) card mechanisms. In particular, the present invention relates to a system and method for implementing a secure SIM card confinement mechanism with minimal mounting area and convenient access.

BACKGROUND ART

As the components required to build a computer system have reduced in size, new categories of computer systems have emerged. One of the new categories of computer systems is the "palmtop" computer system. A palmtop computer system is a computer that is small enough to be held in the hand of a user. Most palmtop computer systems are used to implement various Personal Information Device (PID) applications such as an address book, a daily organizer, and electronic notepads.

Personal Information Devices include the class of computers, personal digital assistants and electronic organizers that tend both to be physically smaller than conventional computers and to have more limited hardware and data processing capabilities. PIDs include, for example, products sold by Palm, Inc. of Santa Clara, Calif., under such trademark as Pilot, and Pilot 1000, Pilot 5000, PalmPilot, PalmPilot Personal, PalmPilot Professional, Palm, and Palm III, Palm V, Palm VII, as well as other products sold under such trade names as WorkPad, Franklin Quest, and Franklin Convey.

PIDs are generally discussed, for example, in U.S. Pat. Nos. 5,125,0398; 5,727,202; 5,832,489; 5,884,323; 5,889,888; 5,900,875; 6,000,000; 6,006,274; and 6,034,686, which are incorporated herein by reference. PIDs typically include a screen and data processor, allowing the PID user to operate a substantial variety of applications relating to, for example: electronic mail, a calendar, appointments, contact data (such as address and telephone numbers), notebook records, expense reports, to do lists, or games. PIDs also often include substantial electronic memory for storing such applications as well as data entered by the user. Due to their substantial variety of applications and uses, personal information devices are becoming increasingly widely used.

The use of subscriber identification module (SIM) cards in portable hand-held devices, such as PIDs or cellular phones, is a requirement for any GSM enabled device. In a GSM cellular phone, the SIM card is typically used for billing and security. The SIM card may also be used for storing operational data such as a phone book, small programs, and/or quick dial numbers. With a SIM card, a user can operate various phones and still retain, for example, a single billable account. As PIDs incorporate GSM radio capabilities, they will assume the roles and applications of cellular telephones. These same capabilities (e.g., phone book, billing information, etc.) are provided by incorporating SIM cards into the PIDs. The SIM card thus eliminates the need to reprogram information (e.g., phone numbers, addresses, etc.) and enables a single billable customer account for multiple SIM card enabled devices.

In prior art mechanisms, the SIM card is typically mounted in the housing of the hand-held device and secured with a latching assembly. Various latching assemblies are known, however, they typically contain two or more distinct components. When the SIM card is located in a cosmetic region of the phone, a door is typically used to access the SIM card. A separate latching mechanism is integrated into the SIM connector to securely hold the SIM card. In this arrangement, the user must open the door and then unlatch the card by sliding a locking mechanism and/or rotating the lock to gain access to the SIM card. This manipulation can be very difficult due to the small parts and intricate areas involved. These integrated SIM latching connectors also require excessive amounts of PCB (printed circuit board) space, which also makes them a less attractive solution.

Other prior art mechanisms implement a SIM connector snapped into the rear housing of a hand-held device, or fixed directly to the device's printed circuit board (PCB) with a SIM card door for preventing the SIM card from falling out of the device. For example, when the door is open, the SIM card can be removed by simply turning the phone upside-down and allowing the SIM card to fall out. In this arrangement, a confining apparatus must be included to properly confine the SIM card in place. This confining "well" adds size and area to the SIM connector (e.g., consuming excessive amounts of PCB area), and allows the SIM card to simply fall out if the hand-held device is inadvertently turned upside-down with the door open.

Thus, what is required is a solution that eliminates the requirement for a separate latching mechanism integrated into a SIM connector. The required solution should facilitate easy operation by a user. The required solution should require a minimum amount of PCB (printed circuit board) area for mounting a SIM connector. The required solution should securely hold a SIM card when in an open position to prevent inadvertently loosing the SIM card. The required solution should be intuitive and compatible with typical hand-held device cases with which users have become familiar. The present invention provides a novel solution to the above requirements.

SUMMARY OF THE INVENTION

The present invention provides a solution that eliminates the requirement for a separate latching mechanism integrated into a SIM connector. The present invention requires a minimum amount of PCB area for mounting a SIM connector and securely holds a SIM card when in an open position to prevent inadvertently loosing the SIM card. The present invention facilitates the easy operation by a user and is compatible with typical hand-held device cases with which users have become familiar.

In one embodiment, the present invention is implemented as an integrated back case and rotating door SIM card holder apparatus. The apparatus functions by holding a SIM (subscriber identification module) card for the electronic device. The electronic device is implemented using integrated circuits on a PCB (printed circuit board) contained within a device housing. A SIM connector is mounted on the PCB and is configured to electrically connect the SIM card to the PCB when the SIM card is engaged with the SIM connector. The SIM card is releasably held in position by a SIM card door. The SIM card door is configured to move the SIM card into engagement with the SIM connector when in a closed position. The SIM card door can be configured to slidably accept the SIM card into a properly aligned position when the SIM card door is in the open position. The SIM card door also includes features that force the user to orient the SIM card properly in the SIM card door to ensure proper engagement with the SIM connector when closed. The SIM card door is releasably engageable with the back case of the

housing and is rotatably attached to the back case such that the SIM card door swings into the closed position from the open position.

Holding the SIM card with the SIM card door provides for a smaller SIM connector and thus a minimum amount of PCB area for mounting the SIM connector. Additionally, the SIM card door securely holds a SIM card when in an open position to prevent inadvertently loosing the SIM card. Manipulation (e.g., inserting, removing) of the SIM card and opening and closing of the SIM card door is intuitive to the user.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example and not by way of limitation in the Figures of the accompanying drawings, in which like reference numerals refer to similar elements, and in which:

FIG. **1** shows a diagram of a back case of a housing of a personal information device including a SIM card door apparatus in accordance with one embodiment of the present invention.

FIG. **2** shows a close-up view of a SIM card door and a SIM card prior to the SIM card being inserted into the proper position.

FIG. **3** shows a close-up view of a SIM card door and a SIM card after the SIM card has been inserted into the proper position.

FIG. **4** shows a side close-up view of a SIM card door and a SIM card prior to the SIM card door being rotated into the post position.

DETAILED DESCRIPTION OF THE INVENTION

In the following detailed description of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be obvious to one skilled in the art that the present invention may be practiced without these specific details. In other instances well known methods, procedures, components, and circuits have not been described in detail as not to obscure aspects of the present invention unnecessarily.

The present invention comprises an integrated back case and rotating door SIM card holder apparatus. The apparatus of the present invention provides a solution that eliminates the requirement for a separate latching mechanism integrated into a SIM connector. The present invention requires a minimum amount of PCB area for mounting a SIM connector and securely holds a SIM card when in an open position to prevent inadvertently loosing the SIM card. The present invention facilitates the easy operation by a user and is compatible with typical hand-held device cases with which users have become familiar. The present invention and its benefits are further described below.

FIG. **1** shows a diagram of the back case **108** of a PID (personal information device) **100** in accordance with one embodiment of the present invention. The present invention comprises a back case **108** having an integrated rotating door SIM card holder apparatus, SIM card door **107**. Although the present invention is described in the context of a PID, it should be noted that embodiments of the present invention are suited for use in other types of hand-held electronic devices (cellular telephones, pagers, etc.).

As depicted in FIG. **1**, PID **100** is enclosed a case housing, of which back case **108** (e.g., the back of PIC **100**) is shown.

As depicted in FIG. **1**, SIM card door **107** is in an open position. SIM card door **107** is configured to accept SIM card **101**, as SIM card **101** is slid into position from left to right as indicated by arrow **120**. SIM card door **107** is configured to hold the SIM card **101** in the proper position using the integral holders **110**, **111**, **112**, and **113**. Holders **110–113** thus releasably confine and hold SIM card **101** in the proper position.

Once the SIM card **101** is slid into position (e.g., slid from left to right into holders **110–113**), the SIM card door **107** can be rotated into the closed position, where the electrical contacts **102** of SIM card **101** are brought into electrical contact with a SIM connector **103**. SIM connector **103** functions by communicatively coupling electrical contacts **102** of the SIM card **101** with other integrated circuit devices of a PCB (printed circuit board) **104**. SIM card door **107** rotates/swings between the open position and the closed position about a pivot **115**. SIM card door **107** uses a latch **106** and a latch receiver **105** to securely latch into the closed position, such that SIM card door **107** is releasably engageable with back case **108**. By latching into the closed position, SIM card door **107** moves SIM card **101** (e.g., contacts **102**) into electrical connection with the SIM card connector **103**. The latch **106** is integral with the SIM card door **107**.

Referring still to FIG. **1**, it should be noted that holding the SIM card **101** with the SIM card door **107** provides for a smaller SIM connector **103** in comparison to the prior art. In accordance with the present invention, SIM connector **103** is only required to electrically connect the electrical contacts **102** of SIM card **101** with PCB **104**. The task of confining and holding SIM card **101** in the proper position is performed by SIM card door **107**. SIM connector **103** need only establish a reliable electrical connection. Thus, SIM connector **103** can be optimized to use a minimum amount of PCB area. For example, as depicted in FIG. **1**, SIM connector **103** is much smaller the SIM card **101**, and thus requires a very small mounting area on PCB **104**. The very small mounting area reduces costs associated with fabricating SIM connector **103**, and more importantly, conserves valuable surface area of the PCB **104** itself.

Additionally, it should be noted that the SIM card door **107** securely holds SIM card **101** when in both the open position and in the closed position. Thus, SIM card door **107** prevents inadvertently loosing the SIM card **101** when SIM card door **107** is open. Manipulation (e.g., inserting, removing) of the SIM card **101** and opening and closing of the SIM card door **107** requires a positive action by the user (e.g., SIM card **101** will not fall out if the electronic device **100** is turned over). The operation of SIM card door **107** is intuitive to the user. Also, SIM card door **107** facilitates easy operation by a user and is compatible with typical hand-held device cases and housings with which users have become familiar.

FIG. **2** shows a close-up view of SIM card door **107** and SIM card **101**. As described above, SIM card door **107** includes holders **110–113** which receive SIM card **101** as it is slid into place by the user, as indicated by arrow **120**. FIG. **2** shows SIM card door **107** prior to receiving SIM card **101**.

FIG. **3** shows a close-up view of SIM card door **107** and SIM card **101** after SIM card **101** has been slid into position. As described above, once in position, SIM card **101** is held in place by holders **110–113**. Holders **110–113** are configured such that the electrical contacts **102** of SIM card **101** are in proper alignment, such that when SIM card door **107** is rotated into the closed position, contacts **102** will properly connect with SIM connector **103** (shown in FIG. **1**).

FIG. **4** shows a close-up side view of SIM card door **107** and SIM card **101** after SIM card **101** has been slid into position. As depicted in FIG. **4**, SIM card door **107** is in the open position. As described above, the task of confining and holding SIM card **101** in the proper position is performed by SIM card door **107**. Thus, SIM connector **103** can be optimized to use a minimum amount of area of PCB **104**. To close SIM card door **107**, the user rotates SIM card door **107** about pivot **115**, such that SIM card door **107** swings into the closed position and latches.

Thus, the present invention provides a solution that eliminates the requirement for a separate latching mechanism integrated into a SIM connector. The present invention requires a minimum amount of PCB area for mounting a SIM connector and securely holds a SIM card when in an open position to prevent inadvertently loosing the SIM card. The present invention facilitates the easy operation by a user and is compatible with typical hand-held device cases with which users have become familiar.

The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order best to explain the principles of the invention and its practical application, thereby to enable others skilled in the art best to utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the claims appended hereto and their equivalents.

What is claimed is:

1. An apparatus for holding a SIM (subscriber identification module) card for a personal information device, comprising:

a SIM card;

a PCB (printed circuit board) within a single piece back housing of the personal information device;

a SIM connector mounted on the PCB, the SIM connector configured to electrically connect the SIM card to the PCB when the SIM card is engaged with the SIM connector, wherein the SIM connector includes a plurality of contacts and is smaller than the SIM card; and

a SIM card door comprising a plurality of holders disposed on the surface of the SIM card door for releasably holding the SIM card in the proper position and further configured to hold the SIM card when the SIM card door is in the open position and wherein said plurality of holders and said SIM card door form a single piece door, the single piece SIM card door configured to move the SIM card into engagement with the SIM connector when in a closed position.

2. The apparatus of claim **1**, wherein the SIM card door is configured to releasably hold the SIM card such that the SIM card is properly aligned with the SIM connector when the SIM card door is moved into the closed position.

3. The apparatus of claim **1**, wherein the SIM card door is configured to slidably accept the SIM card into a properly aligned position when the SIM card door is in the open position.

4. The apparatus of claim **1**, further comprising a front housing for combining with the back housing for containing the electronic device, wherein the SIM card door is releasably engageable with the back housing.

5. The apparatus of claim **4** wherein the SIM card door is rotatably attached to the back housing such that the SIM card door swings into the closed position from the open position.

6. A SIM door apparatus for holding a SIM (subscriber identification module) card for a personal information device, comprising:

a PCB (printed circuit board);

a housing of the personal information device containing the PCB;

a SIM card door rotatably attached to the housing, the SIM card door comprising a plurality of holders disposed on the surface of the SIM card door wherein said plurality of holders and said SIM card door form a single piece SIM card door and configured to hold the SIM card in the proper position and further configured to releasably hold the SIM card when the single piece SIM card door is in the open position; and

a SIM connector mounted on the PCB, the SIM connector configured to electrically connect a SIM card to the PCB when the SIM card door swings the SIM card into engagement with the SIM connector by rotating into a closed position, wherein the SIM connector includes a plurality of contacts and is smaller than the SIM card and is smaller than the single piece SIM card door.

7. The SIM card door apparatus of claim **6**, wherein the SIM card door is configured to releasably hold the SIM card such that the SIM card is properly aligned with the SIM connector when the SIM card door is moved into the closed position.

8. The SIM card door apparatus of claim **6** wherein the SIM card door is configured to slidably accept the SIM card into a properly aligned position when the SIM card door is in the open position.

9. The SIM card door apparatus of claim **6** wherein the SIM card door is releasably engageable with the housing.

10. The SIM card door apparatus of claim **9** wherein the SIM card door includes a latch in order to maintain the closed position.

11. The SIM card door apparatus of claim **6** wherein the SIM card door is rotatably attached to a back case of the housing.

12. A personal information device, comprising:

a PCB (printed circuit board);

a personal information device housing containing the PCB;

a SIM card door rotatably attached to the housing, the SIM card door comprising a plurality of holders disposed on the surface of the SIM card door wherein said plurality of holders and said SIM card door form a single piece SIM card door, the single piece SIM card door configured to releasably hold the SIM card; and

a SIM connector mounted on a PCB included in the personal information device and connector configured to electrically connect a SIM card to the PCB when the single piece SIM card door swings the SIM card into engagement with the SIM connector by rotating into a close position, wherein the SIM connector includes a plurality of contacts and is smaller than the SIM card and is smaller than the single piece SIM card door;

wherein the holders are configured to releasably hold the SIM card in the proper position such that the SIM card is properly aligned with the SIM connector when the single piece SIM card door is moved into the closed position;

wherein the holders are configured to slidably accept and hold the SIM card into a properly aligned position when the single piece SIM card door is in the open position.

13. The SIM card door apparatus of claim **12** wherein the SIM card door is releasably engageable with the housing.

14. The SIM card door apparatus of claim **13** wherein the SIM card door includes a latch in order to maintain the closed position.

15. The SIM card door apparatus of claim **14**, further comprising a plurality of holders disposed on the surface of the SIM card door, the holders configured to hold the SIM card in the proper position.

16. The SIM card door apparatus of claim **15** wherein the holders are configured to hold the SIM card when the SIM card door is in the open position.

* * * * *

EXHIBIT C

US007096049B2

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

(10) **Patent No.: US 7,096,049 B2**
(45) **Date of Patent: Aug. 22, 2006**

(54) **WIRELESS TRANSACTION ENABLED HANDHELD COMPUTER SYSTEM AND METHOD**

(75) Inventors: **Craig S. Skinner**, Snohomish, WA (US); **David Mai**, Shoreline, WA (US); **Edward Joseph Vertatschitsch**, Bellevue, WA (US)

(73) Assignee: **Palm, Inc.**, Santa Clara, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 483 days.

(21) Appl. No.: **09/865,657**

(22) Filed: **May 25, 2001**

(65) **Prior Publication Data**

US 2002/0177473 A1 Nov. 28, 2002

(51) **Int. Cl.**
H04Q 7/32 (2006.01)

(52) **U.S. Cl.** **455/573**; 455/572; 455/550.1; 455/556.1; 455/557; 455/556.2; 455/343.1; 320/114; 320/115; 320/113; 320/108

(58) **Field of Classification Search** 455/556.1, 455/556.2, 557, 550.1, 575.1, 572, 573, 569.1, 455/569.2, 403, 412.1, 412.2, 414.1, 422.1, 455/343, 552.1, 344, 347, 349, 351, 517, 455/343.1, 500; 320/125, 160, 107, 108, 320/113, 114, 115; 709/250, 218, 217, 201, 709/219, 227, 252
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,684,870 A * 8/1987 George et al. 320/140
5,444,867 A * 8/1995 Marui et al. 455/573
5,771,471 A * 6/1998 Alberth, Jr. et al. 455/573
5,949,216 A * 9/1999 Miller 320/125
6,256,518 B1 * 7/2001 Buhrmann 455/572
6,323,775 B1 * 11/2001 Hansson 340/636.1
2002/0078248 A1 * 6/2002 Janik et al. 709/252
2002/0133565 A1 * 9/2002 Huat 709/218
2002/0163778 A1 * 11/2002 Hazzard et al. 361/683
2002/0193152 A1 * 12/2002 Soini et al. 455/569

OTHER PUBLICATIONS

Installation and Getting Started Guide, Blackberry Enterprise Edition (Last revised Jan. 26, 2001), ©Research In Motion Limited, 295 Phillip Street, Waterloo, Ontario, Canada N2L 3W8, pp. 21-31.

* cited by examiner

Primary Examiner—Keith Ferguson
(74) *Attorney, Agent, or Firm*—Foley & Lardner LLP

(57) **ABSTRACT**

A handheld computer system is disclosed. The handheld computer system includes a housing, a display supported by the housing, and a processor coupled to the display. The handheld computer system also includes a rechargeable battery configured to power the processor and the display. Further, the handheld computer system includes a recharging connector coupled to the rechargeable battery. Further still, the handheld computer system includes a recharger coupled to the recharging connector. Yet further still, the handheld computer system includes a radio frequency transceiver coupled to the processor and powerable by the battery when the battery has a charge above a predetermined low level, the transceiver configured to send and receive data while the battery charge is below the low level and the charger provides charge to the rechargeable battery and to the transceiver.

20 Claims, 2 Drawing Sheets

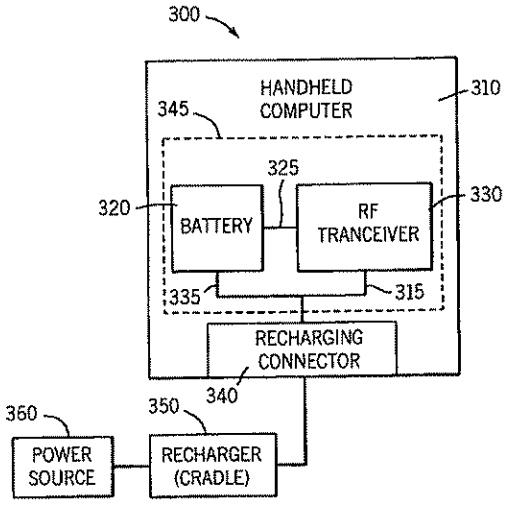


FIG. 1

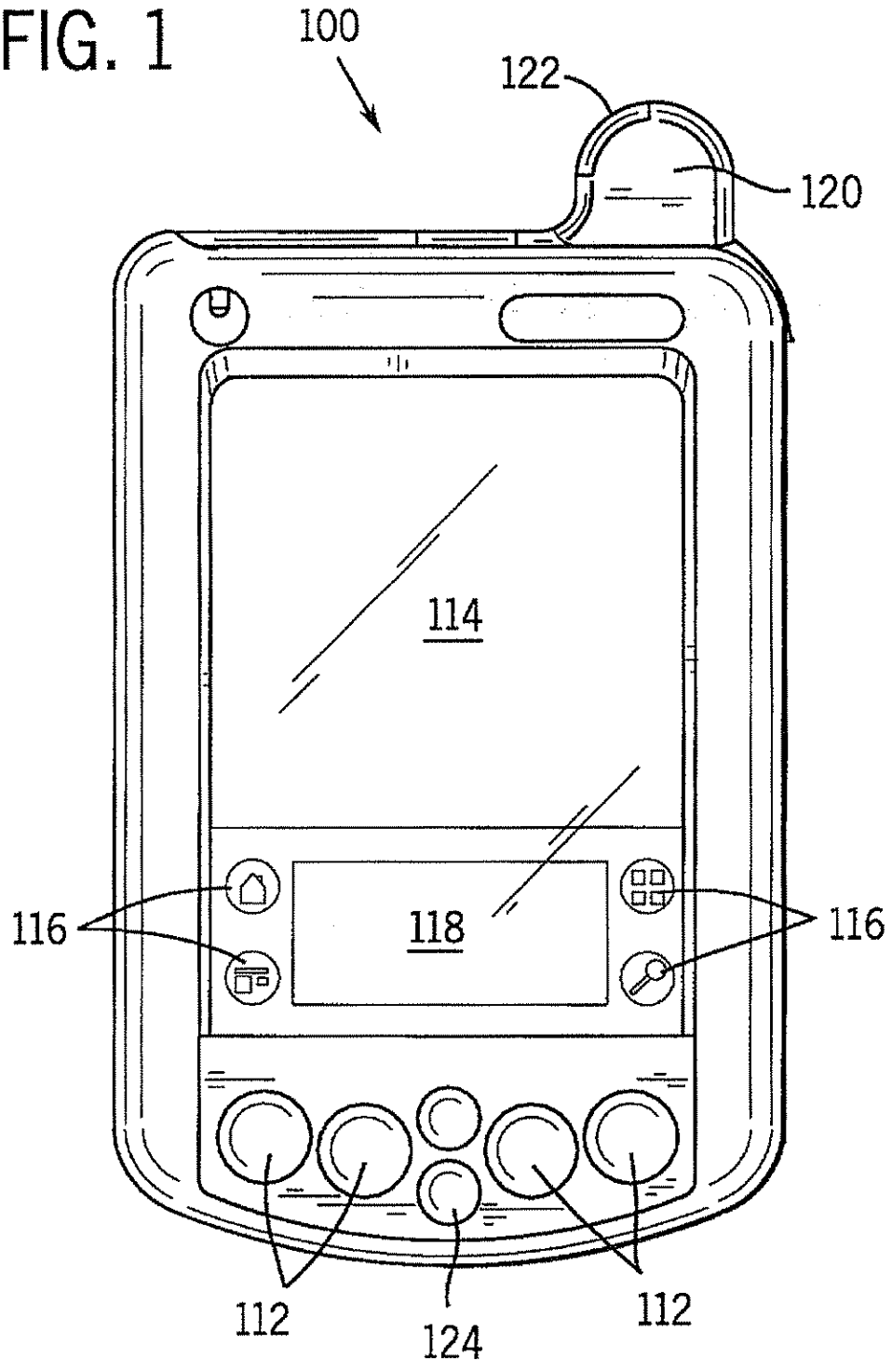


FIG. 2

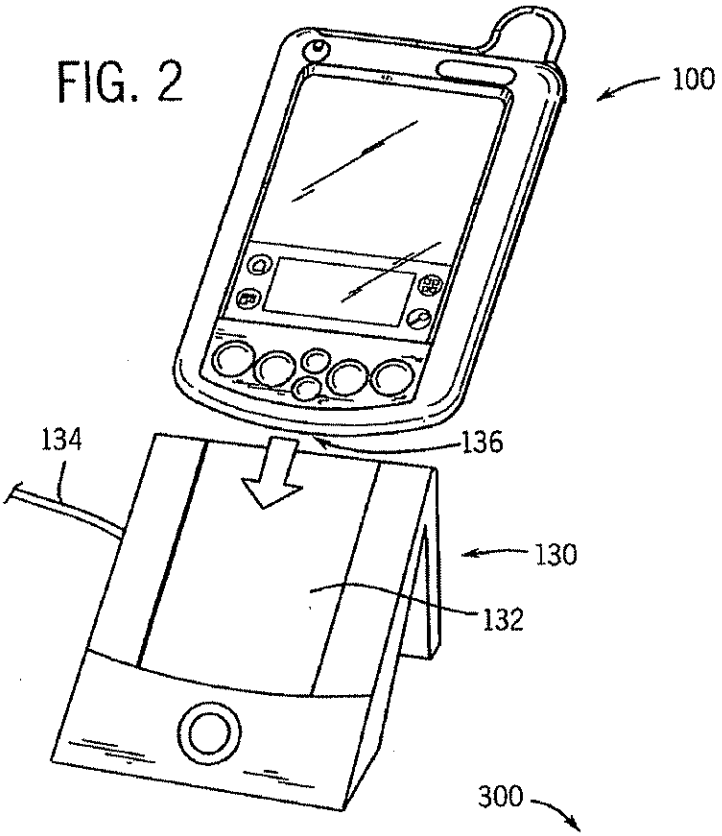
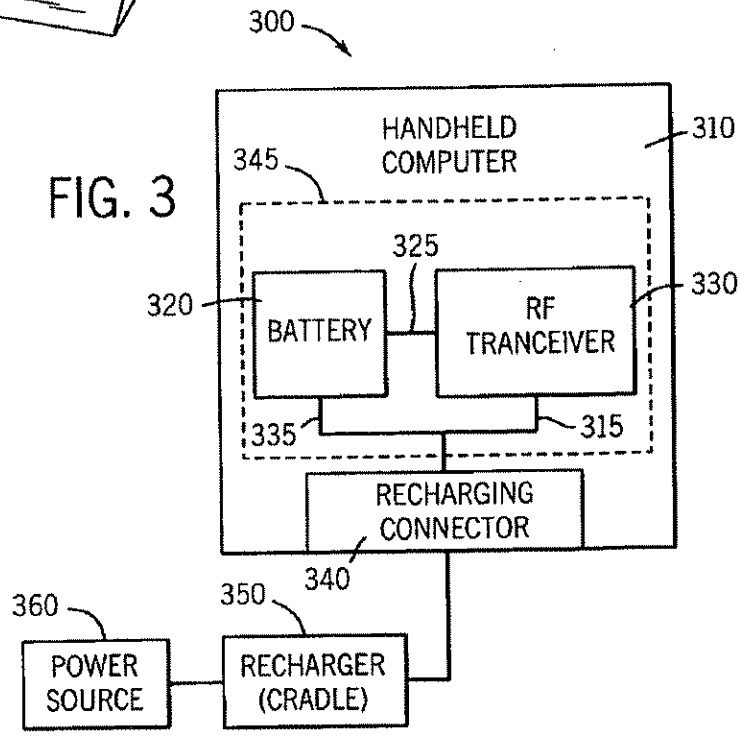

100
134
136
130
132

FIG. 3


300
HANDHELD COMPUTER
310
345
325
320
BATTERY
RF TRANCEIVER
330
335
315
RECHARGING CONNECTOR
340
360
350
POWER SOURCE
RECHARGER (CRADLE)

WIRELESS TRANSACTION ENABLED HANDHELD COMPUTER SYSTEM AND METHOD

BACKGROUND

Handheld computing devices, "palmtops," "palmhelds," personal digital assistants (PDAs), or handheld computers typically weigh less than a pound and fit in a pocket. These handhelds generally provide some combination of personal information management, database functions, word processing, and spreadsheets as well as voice memo recording, wireless e-mail, and wireless telephony functions. Because of the small size and portability of handhelds, strict adherence to hardware constraints such as battery hardware constraints must be maintained. It is conventional to include a rechargeable battery in the handheld unit and further to include a recharging connector that is coupleable to a power source to enable battery recharging.

Handheld computing devices may include rechargeable batteries used to power the handheld computer and other on-board devices such as a wireless phone or wireless transceiver. The user must periodically recharge the rechargeable batteries by plugging the unit directly into a battery recharger or by placing the handheld computing device into a synchronization cradle that also functions as a battery charger.

Handheld computing devices that utilize radio frequency (RF) connections for data or voice communications require power for the RF transceiver modules that require substantial signal amplification for transmission and further require transceiver power for reception. Conventionally, handheld computing devices do not allow receiving of RF transmissions and/or the performance of RF transmissions when the battery has a charge that is below a minimum level. Accordingly, when a battery charge falls below a low minimum level communications are disabled. In such a case where the battery charge is too low for wireless communications, a user may plug the battery and/or the device into a recharger. The rechargeable battery will be charged during the time in which the handheld computer is connected to the recharger, but the wireless communications will be disabled during the charging period.

Accordingly, there is a need for a handheld computer in which wireless communications are enabled when the computer battery is below a low minimum charge level and when the handheld computer is receiving power from a power source for battery recharging, at least some of the power being used to power the RF transceiver. Further, there is a need for a handheld computer that allows RF transceiver operations when the handheld computer battery is being recharged.

The teachings herein below extend to those embodiments that fall within the scope of the appended claims, regardless of whether they accomplish one or more of the above-mentioned needs.

SUMMARY

An exemplary embodiment relates to a handheld computer system. The handheld computer system includes a housing, a display supported by the housing, and a processor coupled to the display. The handheld computer system also includes a rechargeable battery configured to power the processor and the display. Further, the handheld computer system includes a recharging connector coupled to the rechargeable battery. Further still, the handheld computer system includes a recharger coupled to the recharging connector. Yet further still, the handheld computer system includes a radio frequency transceiver coupled to the processor and powerable by the battery when the battery has a charge above a predetermined low level, the transceiver configured to send and receive data while the battery charge is below the low level and the charger provides charge to the rechargeable battery and to the transceiver.

Another exemplary embodiment relates to a method of transmitting data over a radio frequency (RF) link from a handheld computer having a low battery charge. The method includes providing the handheld computer with a rechargeable battery having a relatively low charge. The method also includes coupling the handheld computer to a recharger. Further, the method includes providing power from the charger to a transceiver of the handheld computer while the handheld computer is coupled to the recharger. Further still, the method includes establishing an RF link using the transceiver.

Yet another exemplary embodiment relates to a handheld computer. The handheld computer includes a housing, a display supported by the housing, a processor coupled to the display, and a rechargeable battery configured to power the processor and the display. The handheld computer also includes a recharging connector coupled to the rechargeable battery. Further the handheld computer includes a radio frequency (RF) transceiver coupled to the processor and powerable by the battery when the battery has a charge above a predetermined low level, the transceiver configured to send and receive data while the battery charge is below the low level and the charging connector receives power from a power source and provides power to the rechargeable battery and to the transceiver.

Yet still another exemplary embodiment relates to a handheld computer. The handheld computer includes an expansion module including a rechargeable battery and a radio frequency (RF) transceiver, the battery configured to power the transceiver when the battery has a charge above a predetermined low level. The handheld computer also includes a processor, a display, and a module connector configured to couple to the expansion module. The RF transceiver is configured to send and receive data while the battery charge is below the low level and the module receives power from a power source and provides power to the rechargeable battery and to the transceiver.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will become more fully understood from the following detailed description, taken in conjunction with the accompanying drawings, wherein like reference numerals refer to like elements, in which:

FIG. **1** is an exemplary front elevation view of a handheld computer;

FIG. **2** is a perspective view of a handheld computer and a battery charging cradle; and

FIG. **3** is a block diagram of a handheld computer and recharging system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. **1**, a handheld computer **100** is depicted according to an exemplary embodiment. Handheld computer **100** may include Palm style computers manufactured by Palm, Inc., of Santa Clara, Calif. Other exemplary embodiments may include Windows CE handheld computers, or

other handheld computers and personal digital assistants, as well as mobile telephones, and other mobile computing devices.

Preferably, handheld computer **100** includes interactive hardware and software that performs functions such as maintaining calendars, phone lists, task lists, note pads, calculator applications, spreadsheets, games, and other applications capable of running on a computing device. Further, handheld computer **100** may be configured for such functions as voice memo recording and playback as well as communications network connectivity, internet connectivity, wireless messaging, e-mail, always-on e-mail, and wireless telephony.

Handheld computer **100**, depicted in FIG. **1** includes a plurality of input function keys **112** and a display **114** having graphical user interface features. Display **114** may be provided with a touch screen interface that allows a user to select and alter displayed content using a pointer, such as but not limited to a stylus, a pen tip, a fingertip, or other pointing devices.

Referring again to FIG. **1**, in an exemplary embodiment, display **114** also includes a Graffiti™ (or other handwriting recognition software) writing section **118** for tracing alphanumeric characters as input. A plurality of input icons **116** for performing automated or preprogrammed functions may be provided on a portion of display **114**.

In an exemplary embodiment, handheld computer **100** may include an integrated antenna **120** configured to transmit and receive wireless communication signals, such as, but not limited to, cellular telephone communication signals and other radio frequency (RF) communications signals using an RF transceiver. Antenna **120** may further include an indicator light **122** integrated into antenna **120** for indicating the transmission and reception of wireless communication signals. Further, light **122** may be used to indicate other states of handheld computer **100**.

In an exemplary embodiment, handheld computer **100** also includes navigation buttons **124** that may be utilized for navigating or scrolling of information displayed on display **114**. Further, navigation buttons **124** may be programmed for other uses depending on the application running on handheld computer **100**. Handheld computer **100** may be used for any of a variety of wireless communications, including, but not limited to, communications with the World Wide Web, mobile telephone communications, e-mail communications, etc.

Referring to FIG. **2**, in an exemplary embodiment, handheld computer **100** may be coupled to a cradle, such as a synchronization cradle **130**. Cradle **130** may include a platform **132** configured to receive handheld computer **100**, and a power or data cord **134** (which, in an exemplary embodiment may be, but is not limited to a universal serial bus (USB) cord) that may be coupled to a personal computer and a wall outlet to supply power to cradle **130** (alternatively, cradle **130** may draw power through the data cord from the personal computer).

Handheld computer **100** further includes a battery used to power the various features of handheld computer **100**. The battery may be a rechargeable lithium polymer battery, lithium ion battery, or any other type of battery applicable to a handheld device that requires periodic charging from an external power source. In an exemplary embodiment the battery may have a maximum voltage of 4.2V and provide power to an RF transceiver of handheld computer **100** when the charge is in the range of 3.6V to 4.2V, however, any applicable maximum and minimum voltages may be applied depending on the hardware and design specifications.

Handheld computer **100** may be electrically coupled to cradle **130** via any of a variety of connectors, including but not limited to a universal connector (which may be a pinned connector, in an exemplary embodiment located adjacent the bottom edge of handheld computer **100**) in an exemplary embodiment. When handheld computer **100** is electrically connected to cradle **130**, the battery may be charged. In a further exemplary embodiment, the battery may be charged when handheld computer **100** is coupled to an AC power cord that functions as a battery charger.

Referring now to FIG. **3**, an exemplary block diagram **300** of a handheld computer **310** and charging system is depicted. Handheld computer **310** includes a battery **320**, an RF transceiver **330**, and a recharging connector **340**. Recharging connector **340** is selectively coupled to a recharger **350** (or multipurpose cradle such as but not limited to a synchronization and recharging cradle). Recharger **350** receives power, and optionally data, from a power source **360**, which may be but is not limited to a personal computer or an electrical outlet.

When the user desires to charge the battery of handheld computer **310**, handheld computer **310** may be connected to recharger **350**, which will permit the charging of the battery. Conventionally, when handheld computer **310** has a low battery status, or when the battery charge has dropped below a low minimum level, RF transceiver **330** is unable to or is not permitted to function. Accordingly, any data intended for handheld computer **310** is not received by RF transceiver **330** and any requests for transmission of data by the user of handheld computer **310** are denied.

In a conventional application a user would couple handheld computer **310** to recharger **350** and begin the charging process, all the while the RF transceiver remained disabled.

In an exemplary embodiment, handheld computer **310** includes a connection, such as but not limited to connection **315** that is configured to provide power to RF transceiver **330** while battery **320** is charging. Accordingly, because of a power connection, such as connection **315**, a user of handheld computer **310** is able to transmit information while battery **320** is charging. Further, handheld computer **310** and transceiver **330** are configured to receive data while battery **320** is charging because charger **315** includes connection **315** which supplies power to RF transceiver **330**. In an alternative embodiment, a power supply connection **325** may be provided from battery **320**, in which case power delivered to battery **320** over connection **335** may be provided to RF transceiver **330** via battery **320**, while battery **320** is charging. Accordingly, a user may utilize RF transceiver **330** while charging battery **320**, even if battery **320** has a charge below a low minimum level. Further, as may be desired, for example, in a device configured for an "always-on" e-mail application, RF transceiver **330** will continue to receive e-mail or be enabled to provide other types of RF communications while battery **320** is being charged.

In another exemplary embodiment the battery, such as battery **320** may be a rechargeable battery for an optional expansion module **345** utilizing an RF transceiver. Such an expansion module may be, but is not limited to a cell phone expansion module, a wireless networking module, and the like. Accordingly, the RF transceiver of expansion module **345** having a rechargeable battery may be enabled when drawing power from a charger, even when the battery of expansion module **345** has a charge below a minimum level.

While the detailed drawings, specific examples and particular formulations given describe exemplary embodiments, they serve the purpose of illustration only. The hardware and software configurations shown and described

may differ depending on the chosen performance characteristics and physical characteristics of the computing devices. The systems shown and described are not limited to the precise details and conditions disclosed. Furthermore, other substitutions, modifications, changes, and omissions may be made in the design, operating conditions, and arrangement of the exemplary embodiments without departing from the scope of the invention as expressed in the appended claims.

What is claimed is:

1. A handheld computer system, comprising:
a housing;
a display supported by the housing;
a processor coupled to the display;
a rechargeable battery configured to power the processor and the display;
a recharging connector coupled to the rechargeable battery;
a recharger coupled to the recharging connector; and
a radio frequency transceiver coupled to the processor and powerable by the battery when the battery has a charge above a low level, the transceiver configured to send and receive data while the battery charge is below the low level and the recharger provides charge to the rechargeable battery and to the transceiver, the low level being a level at which the battery is unable to power the transceiver when the charge is below the low level.

2. The handheld computer system of claim 1, wherein the recharger is a recharging cradle.

3. The handheld computer system of claim 1, wherein the recharger includes a recharger connector configured to couple to the recharging connector.

4. The handheld computer system of claim 1, wherein the recharger is also a synchronization cradle.

5. The handheld computer of claim 4, wherein the synchronization cradle includes an electrical connector that is configured to couple to the recharging connector.

6. The handheld computer system of claim 5, wherein the electrical connector is configured to couple to a data connector on the handheld computer.

7. A method of transmitting data over a radio frequency (RF) link from a handheld computer having a low battery charge, comprising:
providing the handheld computer wit a rechargeable battery having a relatively low charge, the relatively low charges being too low to transmit information using a transceiver of the handheld computer;
coupling the handheld computer to a recharger;
providing power from the recharger to the transceiver of the handheld computer and the battery while the handheld computer is coupled to the recharger;
establishing an RF link using the transceiver while the battery has a relatively low charge and the handheld computer is coupled to the recharger.

8. The method of claim 7, further comprising:
providing power from the rechargeable battery to the transceiver.

9. The method of claim 7, further comprising:
coupling the handheld computer to a synchronization cradle, the synchronization cradle having a charger connector.

10. The method of claim 7, further comprising:
providing data across the RF link.

11. The method of claim 7, further comprising:
draining the rechargeable battery to a charge level at which the transceiver is unable to establish an RF link.

12. The method of claim 7, further comprising:
receiving an e-mail message.

13. The method of claim 7, further comprising:
receiving a cellular telephone call.

14. A handheld computer, comprising:
a housing;
a display supported byte housing;
a processor coupled to the display;
a rechargeable battery configured to power the processor and the display;
a recharging connector coupled to the rechargeable battery; and
a radio frequency (RF) transceiver coupled to the processor and powerable by the battery when the battery has a charge above a low level, the transceiver configured to send and receive data while the bakery charge is below the low level and the recharging connector receives power from a power source and provides power to the rechargeable battery and to the transceiver, the low level being a level at which the battery is unable to power the transceiver when the charge is below the low level.

15. The handheld computer of claim 14, further comprising:
a computer program running on the processor, the computer program configured to request access to the RF transceiver.

16. The handheld computer of claim 15, wherein the computer program is an e-mail program.

17. The handheld computer of claim 15, wherein the computer program is an always-on e-mail program.

18. The handheld computer of claim 14, further comprising:
an expansion connector coupled to the processor, the expansion connector configured to couple to input/output devices.

19. The handheld computer of claim 18, wherein the RF transceiver is coupled to the expansion connector.

20. A handheld computer, comprising:
an expansion module including a rechargeable battery and a radio frequency (RF) transceiver, the battery configured to power the transceiver when the battery has a charge above a low level;
a processor
a display; and
a module connector configured to couple to the expansion module,
wherein the RF transceiver is configured to send and receive data while the battery charge is below the low level and the module receives power from a power source and provides power to the rechargeable battery and to the transceiver, the low level being a level at which the battery is unable to power the transceiver when the charge is below the low level.

* * * * *