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Attorneys for Plaintiff
FIRSTFACE CO., LTD.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

FIRSTFACE CO., LTD., Plaintiff, v. APPLE INC., Defendant.	CASE NO. 18-CV-2245 **ORIGINAL COMPLAINT FOR PATENT INFRINGEMENT** **DEMAND FOR JURY TRIAL**

Plaintiff Firstface Co., Ltd. files this Original Complaint against Apple Inc. for infringement of U.S. Patent No. 8,831,557 ("the '557 patent"), U.S. Patent No. 9,633,373 ("the '373 patent"), and U.S. Patent No. 9,779,419 ("the '419 patent").

THE PARTIES

1. Firstface Co., Ltd. ("Firstface") is a corporation organized and existing under the laws of the Republic of Korea with a principal place of business at 22F, Seoul City Tower, 110, Huam ro, Jung-Gu, Seoul, 04637, Korea.

2. Apple Inc. ("Apple") is a California corporation with its principal place of business in Cupertino, California, within the Northern District of California. This Defendant may be served with process through its agent, CT Corporation System, 818 West Seventh Street, Suite 930, Los Angeles, California 90017. Apple does business in the State of California and in the Northern District of California.

JURISDICTION AND VENUE

3. This action arises under the patent laws of the United States, namely 35 U.S.C. §§ 271, 281, and 284-285, among others.

4. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

5. Venue is proper in this judicial district under 28 U.S.C. § 1400(b). Apple resides in this district, has committed acts of infringement in this district, and has a regular and established place of business in this district.

6. Apple is subject to this Court's specific and general personal jurisdiction pursuant to due process and/or the California Long Arm Statute, due at least to its substantial business in this State and judicial district, including: (1) at least part of its infringing activities alleged herein; and (2) regularly doing or soliciting business, engaging in other persistent conduct, and/or deriving substantial revenue from goods sold and services provided to California residents.

COUNT I

(INFRINGEMENT OF U.S. PATENT NO. 8,831,557)

7. Firstface incorporates paragraphs 1 through 6 herein by reference.

8. Firstface is the assignee of the '557 patent, entitled "Method, System, and Mobile Communication Terminal for Performing Specific Function When Mobile Communication Terminal Is Activated," with ownership of all substantial rights in the '557 patent, including the right to exclude others and to enforce, sue, and recover damages for past, present, and future infringements. A true and correct copy of the '557 patent is attached as Exhibit A.

9. The '557 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

10. Apple has directly infringed and/or indirectly infringed, and continues to directly infringe and/or indirectly infringe, one or more claims of the '557 patent in this judicial district and elsewhere in California and the United States, without the consent or authorization of Firstface, including at least claims 1, 8, 9, and 15 by, among other things, making, using, offering for sale, selling, and/or importing Apple mobile devices that support fingerprint authentication. Such Apple mobile devices include iPhone 5s, iPhone 6, iPhone 6 Plus, iPhone 6s Plus, iPhone SE, iPhone 7, iPhone 7 Plus, iPhone 8, iPhone 8 Plus, iPad (2017 version, a/k/a the iPad (5th generation)), iPad (2018 version, a/k/a the iPad (6th generation)), iPad Air 2, iPad mini 3, iPad mini 4, iPad Pro (12.9 inch) (1st generation), iPad Pro (9.7 inch) (1st generation), iPad Pro (12.9 inch) (2nd generation), and iPad Pro (10.5 inch) (2nd generation). These devices are collectively referred to in this Count as the "Accused Products."

11. Apple directly infringes the apparatus claims of the '557 patent by making, using, offering to sell, selling, and/or importing the Accused Products. Apple also directly infringes the '557 patent by making, using, selling, offering to sell, and/or importing the Accused Products to practice the claimed methods. Apple is therefore liable for direct infringement.

12. Specifically, each of the Accused Products has a display unit and an activation button (or "home button") that, when pressed, switches the display from an off state to an on state. Each of the Accused Products also contains a user identification unit that uses fingerprint recognition to identify the user simultaneously with switching the display from the off state to the on state. The user identification function recognizes a user by comparing a fingerprint acquired by the activation button with fingerprint information of a user stored in the device.

13. Additionally, Apple is liable for indirect infringement of the '557 patent because it induces and/or contributes to the direct infringement of the patent by its customers and other end users.

14. Apple learned of the '557 patent in early 2015 when Firstface presented Apple with an opportunity to purchase and/or license Firstface's patent portfolio, including the '557 patent. Apple also has knowledge of the '557 patent at least based on filing and service of this Complaint.

15. Despite having knowledge of the '557 patent, Apple has specifically intended, and continues to specifically intend, for persons who acquire and use the Accused Products, including its customers, to use such devices in a manner that infringes the '557 patent. This is evident when Apple encourages and instructs customers and other end users in the use and operation of the Accused Products, including use of the activation button to turn on the display and unlock the device using fingerprint authentication.

16. In particular, despite having knowledge of the '557 patent, Apple has provided, and continues to provide, instructional materials, such as user guides, owner manuals, and similar online resources (available via https://support.apple.com, for instance) that specifically teach and encourage customers and other end users to use the Accused Products in an infringing manner. By providing such instructions, Apple knows (and has known), or should know (and should have known), that its actions have actively induced, and continue to actively induce, infringement.

17. Additionally, Apple knows, and has known, that the Accused Products include proprietary hardware components and software instructions that work in concert to perform specific, intended functions. Such specific, intended functions, carried out by these hardware and software combinations, are a material part of the inventions of the '557 patent and are not staple articles of commerce suitable for substantial non-infringing uses.

18. Specifically, each Accused Product contains memory and a processor that are specifically programmed and/or configured to implement the functionality described in paragraph 12, which infringes the '557 patent. Apple is, thus, liable for contributory infringement.

19. Firstface has been damaged as a result of Apple's infringing conduct described in this Count. Apple is, thus, liable to Firstface in an amount that adequately compensates it for Apple's

infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

20. Despite having knowledge of the '557 patent, and knowledge that it is potentially directly and/or indirectly infringing claims of the '557 patent, Apple has nevertheless continued its infringing conduct in an egregious manner. On information and belief, Apple reviewed the claims of the '557 patent, yet continued to manufacture and sell infringing products. At the very least, Apple was willfully blind to the '557 patent and its application to the Accused Products. For at least these reasons, Apple's infringing activities have been, and continue to be, willful, wanton, and deliberate in disregard of Firstface's rights with respect to the '557 patent, justifying enhanced damages under 35 U.S.C. § 284.

COUNT II

(INFRINGEMENT OF U.S. PATENT NO. 9,633,373)

21. Firstface incorporates paragraphs 1 through 20 herein by reference.

22. Firstface is the assignee of the '373 patent, entitled "Activating Display and Performing Additional Function in Mobile Terminal With One-Time User Input," with ownership of all substantial rights in the '373 patent, including the right to exclude others and to enforce, sue, and recover damages for past, present, and future infringements. A true and correct copy of the '373 patent is attached as Exhibit B.

23. The '373 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

24. Apple has directly infringed and/or indirectly infringed, and continues to directly infringe and/or indirectly infringe, one or more claims of the '373 patent in this judicial district and elsewhere in California and the United States, without the consent or authorization of Firstface, including at least claims 1-2, 4-6, and 11-14, by, among other things, making, using, offering for sale, selling, and/or importing Apple mobile devices that support fingerprint authentication and Siri functionality, including iPhone 5s, iPhone 6, iPhone 6 Plus, iPhone 6s Plus, iPhone SE, iPhone 7, iPhone 7 Plus, iPhone 8, iPhone 8 Plus, iPad (2017 version, a/k/a the iPad (5th generation)), iPad (2018 version, a/k/a the iPad (6th generation)), iPad Air 2, iPad mini 3, iPad mini 4, iPad Pro (12.9 inch) (1st generation), iPad Pro (9.7

inch) (1st generation), iPad Pro (12.9 inch) (2nd generation), and iPad Pro (10.5 inch) (2nd generation). In addition, Apple has directly infringed and/or indirectly infringed, and continues to directly infringe and/or indirectly infringe, at least claims 10 and 18 of the '373 patent in this judicial district and elsewhere in California and the United States, by, among other things, making, using, offering for sale, selling and/or importing Apple smartphones that support fingerprint authentication and Siri functionality, including iPhone 5s, iPhone 6, iPhone 6 Plus, iPhone 6s Plus, iPhone SE, iPhone 7, iPhone 7 Plus, iPhone 8, and iPhone 8 Plus. The devices listed in this paragraph are collectively referred to in this Count as the "Accused Products."

25. Apple directly infringes the apparatus claims of the '373 patent by making, using, offering to sell, selling, and/or importing the Accused Products. Apple also directly infringes the '373 patent by making, using, selling, offering to sell, and/or importing the Accused Products to practice the claimed methods. Apple is therefore liable for direct infringement.

26. Specifically, each of the Accused Products (many of which are smartphones) has a touch screen display, a camera, a power button configured to turn on and off the device by pressing, and an activation button (or "home button") separate from the power button and located outside the touchscreen display that, when pressed, turns on the touch screen display and can initiate one or more additional functions of the device. Each Accused Product includes a fingerprint authentication function (performed by a user identification module and configured in user settings) and a Siri function (a hands-free function). Upon pressing of the activation button (sensed by an activation sensor), each Accused Product is configured to turn on the touch screen display and perform fingerprint authentication (a first function). A lock screen is displayed on the touch screen display while the fingerprint authentication is performed. If the fingerprint authentication authenticates the user, the Accused Product is configured to release the lock state. If the fingerprint authentication fails to authenticate the user, the Accused Product is configured to continue the lock state and display a message (e.g., a "Try Again" message) on the touch screen display. In addition, upon pressing of the activation button for longer than a reference time period, each Accused Product is configured to activate the Siri functionality (a second function) after turning on the touch screen display.

27. Apple is also liable for indirect infringement of the ’373 patent because it induces and/or contributes to the direct infringement of the patent by its customers and other end users.

28. Apple has knowledge of the ’373 patent at least based on filing and service of this Complaint.

29. Despite having knowledge of the ’373 patent, Apple has specifically intended, and continues to specifically intend, for persons who acquire and use the Accused Products, including its customers, to use such devices in a manner that infringes the ’373 patent. This is evident when Apple encourages and instructs customers and other end users in the use and operation of the Accused Products, including use of the activation button to turn on the display, unlock the device using fingerprint authentication, and activate Siri.

30. In particular, despite having knowledge of the ’373 patent, Apple has provided, and continues to provide, instructional materials, such as user guides, owner manuals, and similar online resources (available via https://support.apple.com, for instance) that specifically teach and encourage customers and other end users to use the Accused Products in an infringing manner. By providing such instructions, Apple knows (and has known), or should know (and should have known), that its actions have actively induced, and continue to actively induce, infringement.

31. Additionally, Apple knows, and has known, that the Accused Products include proprietary hardware components and software instructions that work in concert to perform specific, intended functions. Such specific, intended functions, carried out by these hardware and software combinations, are a material part of the inventions of the ’373 patent and are not staple articles of commerce suitable for substantial non-infringing uses.

32. Specifically, each Accused Product contains a memory and processor that are specifically programmed and/or configured to implement the functionality described in paragraph 26, which infringes the ’373 patent. Apple is, thus, liable for contributory infringement.

33. Firstface has been damaged as a result of Apple’s infringing conduct described in this Count. Apple is, thus, liable to Firstface in an amount that adequately compensates it for Apple’s

infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT III

(INFRINGEMENT OF U.S. PATENT NO. 9,779,419)

34. Firstface incorporates paragraphs 1-33 herein by reference.

35. Firstface is the assignee of the '419 patent, entitled "Activating Display and Performing User Authentication in Mobile Terminal With One-Time User Input," with ownership of all substantial rights in the '419 patent, including the right to exclude others and to enforce, sue, and recover damages for past, present, and future infringements. A true and correct copy of the '419 patent is attached as Exhibit C.

36. The '419 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

37. Apple has directly infringed and/or indirectly infringed, and continues to directly infringe and/or indirectly infringe, one or more claims of the '419 patent in this judicial district and elsewhere in California and the United States, without the consent or authorization of Firstface, including at least claims 1-4, 6-7, 10, 12-13, and 15-17, by, among other things, making, using, offering for sale, selling, and/or importing Apple mobile devices that support fingerprint authentication and Siri functionality. Such Apple mobile devices include iPhone 5s, iPhone 6, iPhone 6 Plus, iPhone 6s Plus, iPhone SE, iPhone 7, iPhone 7 Plus, iPhone 8, iPhone 8 Plus, iPad (2017 version, a/k/a the iPad (5th generation)), iPad (2018 version, a/k/a the iPad (6th generation)), iPad Air 2, iPad mini 3, iPad mini 4, iPad Pro (12.9 inch) (1st generation), iPad Pro (9.7 inch) (1st generation), iPad Pro (12.9 inch) (2nd generation), and iPad Pro (10.5 inch) (2nd generation). In addition, Apple has directly infringed and/or indirectly infringed, and continues to directly infringe and/or indirectly infringe, at least claim 9 of the '419 patent in this judicial district and elsewhere in California and the United States, by, among other things, making, using, offering for sale, selling and/or importing Apple smartphones that support fingerprint authentication and Siri functionality, including iPhone 5s, iPhone 6, iPhone 6 Plus, iPhone 6s Plus,

iPhone SE, iPhone 7, iPhone 7 Plus, iPhone 8, and iPhone 8 Plus. The devices listed in this paragraph are collectively referred to in this Count as the "Accused Products."

38. Apple directly infringes the apparatus claims of the '419 patent by making, using, offering to sell, selling, and/or importing the Accused Products. Apple also directly infringes the '419 patent by making, using, selling, offering to sell, and/or importing the Accused Products to practice the claimed methods. Apple is therefore liable for direct infringement.

39. Specifically, each of the Accused Products (many of which are smartphones) has a touch screen display, a camera, a power button that turns on and off the device by pressing, and an activation button separate from the power button and located outside the touchscreen display that, when pressed, turns on the touch screen display. Each Accused Product includes a fingerprint authentication function (performed by a user identification module and configured in user settings) and a Siri function (a hands-free operation and an operation that involves playing a sound). Upon pressing of the activation button (sensed by an activation sensor), each Accused Product is configured to turn on the touch screen display and perform fingerprint authentication. A lock screen is displayed on the touch screen display while the fingerprint authentication is performed. If the fingerprint authentication authenticates the user, the Accused Product is configured to release the lock state. If the fingerprint authentication fails to authenticate the user, the Accused Product is configured to continue the lock state and display a message (e.g., a "Try Again" message) on the touch screen display. In addition, upon pressing of the activation button for longer than a reference time period, each Accused Product is configured to activate the Siri functionality after turning on the touch screen display.

40. Apple is also liable for indirect infringement of the '419 patent because it induces and/or contributes to the direct infringement of the patent by its customers and other end users.

41. Apple has knowledge of the '419 based on filing and service of this Complaint.

42. Despite having knowledge of the '419 patent, Apple has specifically intended, and continues to specifically intend, for persons who acquire and use the Accused Products, including its customers, to use such devices in a manner that infringes the '419 patent. This is evident when Apple encourages and instructs customers and other end users in the use and operation of the Accused Products,

including use of the activation button to turn on the display, unlock the device using fingerprint authentication, and activate Siri.

43. In particular, despite having knowledge of the '419 patent, Apple has provided, and continues to provide, instructional materials, such as user guides, owner manuals, and similar online resources (available via https://support.apple.com, for instance) that specifically teach and encourage customers and other end users to use the Accused Products in an infringing manner. By providing such instructions, Apple knows (and has known), or should know (and should have known), that its actions have actively induced, and continue to actively induce, infringement.

44. Additionally, Apple knows, and has known, that the Accused Products include proprietary hardware components and software instructions that work in concert to perform specific, intended functions. Such specific, intended functions, carried out by these hardware and software combinations, are a material part of the inventions of the '419 patent and are not staple articles of commerce suitable for substantial non-infringing uses.

45. Specifically, each Accused Product contains a memory and processor that are specifically programmed and/or configured to implement the functionality described in paragraph 39, which infringes the '419 patent. Apple is, thus, liable for contributory infringement.

46. Firstface has been damaged as a result of Apple's infringing conduct described in this Count. Apple is, thus, liable to Firstface in an amount that adequately compensates it for Apple's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

JURY DEMAND

Firstface hereby requests a trial by jury pursuant to Rule 38 of the Federal Rules of Civil Procedure.

PRAYER FOR RELIEF

Firstface requests that the Court find in its favor against Apple, and that the Court grant Firstface the following relief:

a. Judgment that one or more claims of the '557, '373, and '419 patents have been infringed, either literally and/or under the doctrine of equivalents, by Apple and/or by others whose infringements have been induced by Apple and/or by others to whose infringements Apple contributed;

b. Judgment that Apple account for and pay to Firstface all damages to, and costs incurred by, Firstface because of Apple's infringing activities and other conduct complained of herein;

c. Judgment that Apple account for and pay to Firstface a reasonable, ongoing, post-judgment royalty because of Apple's infringing activities and other conduct complained of herein;

d. That Apple's infringement of the '557 patent be found willful from the time that Apple became aware of the infringing nature of its products, and that the Court award treble damages pursuant to 35 U.S.C. § 284;

e. That Firstface be granted pre-judgment and post-judgment interest on the damages caused by Apple's infringing activities and other conduct complained of herein; and

f. That Firstface be granted such other and further relief as the Court may deem just and proper under the circumstances.

Dated: April 13, 2018

Respectfully submitted,

/s/ Christopher D. Banys

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Texas Bar No. 24053687
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Attorneys for Plaintiff FIRSTFACE CO., LTD.

Exhibit “A”

US008831557B2

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

(10) **Patent No.: US 8,831,557 B2**
(45) **Date of Patent: Sep. 9, 2014**

(54) **METHOD, SYSTEM, AND MOBILE COMMUNICATION TERMINAL FOR PERFORMING SPECIFIC FUNCTION WHEN MOBILE COMMUNICATION TERMINAL IS ACTIVATED**

(75) Inventors: **Jae Lark Jung**, Goyang-si (KR); **Kyoung Duck Bae**, Seoul (KR)

(73) Assignee: **Ideazzan Company, Inc.**, Seoul (KR)

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

(21) Appl. No.: **13/590,483**

(22) Filed: **Aug. 21, 2012**

(65) **Prior Publication Data**

US 2013/0102273 A1 Apr. 25, 2013

(30) **Foreign Application Priority Data**

Oct. 19, 2011 (KR) 10-2011-0106839

(51) **Int. Cl.**

H04M 11/04	(2006.01)
H04M 1/725	(2006.01)
H04W 4/22	(2009.01)
H04W 4/02	(2009.01)
H04M 1/67	(2006.01)

(52) **U.S. Cl.**

CPC ***H04M 1/72519*** (2013.01); *H04W 4/22* (2013.01); *H04W 4/02* (2013.01); *H04M 2250/52* (2013.01); ***H04M 1/7258*** (2013.01); *H04M 1/67* (2013.01)

USPC **455/404.2**; 455/566

(58) **Field of Classification Search**

CPC H04W 4/02; H04W 4/22

USPC 455/404.2, 566

See application file for complete search history.

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Primary Examiner — Charles Shedrick
(74) *Attorney, Agent, or Firm* — The PL Law Group, PLLC

(57) **ABSTRACT**

Provided is a mobile communication terminal including a display unit and an activation button configured to switch from an inactive state, which is an OFF state of the display unit, to an active state, which is an ON state of the display unit, wherein a predetermined operation is performed simultaneously with switching to the active state by pressing the activation button.

15 Claims, 5 Drawing Sheets

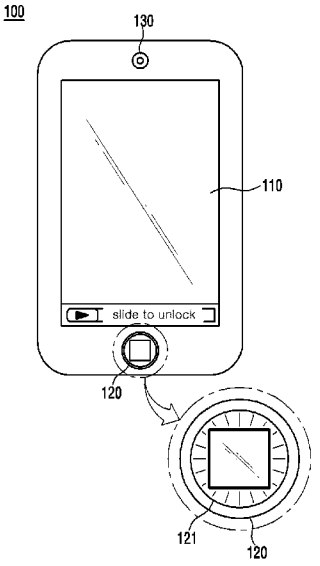


FIG. 1

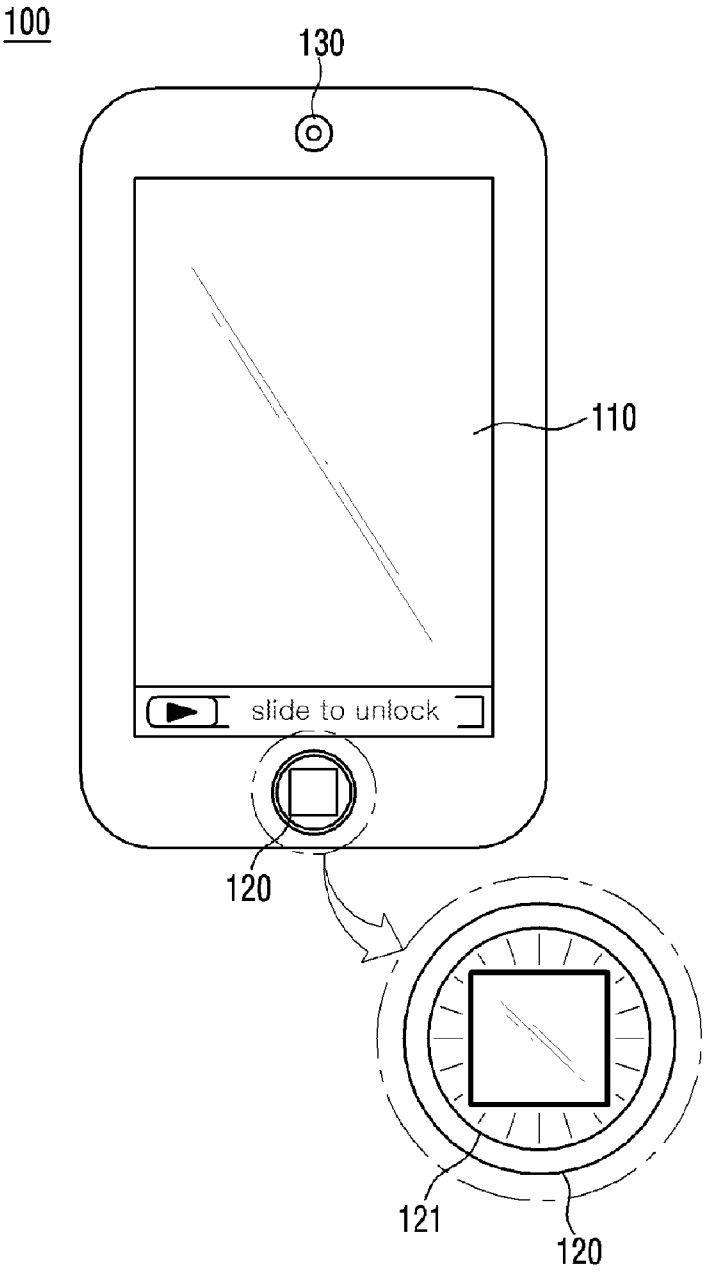


FIG. 2

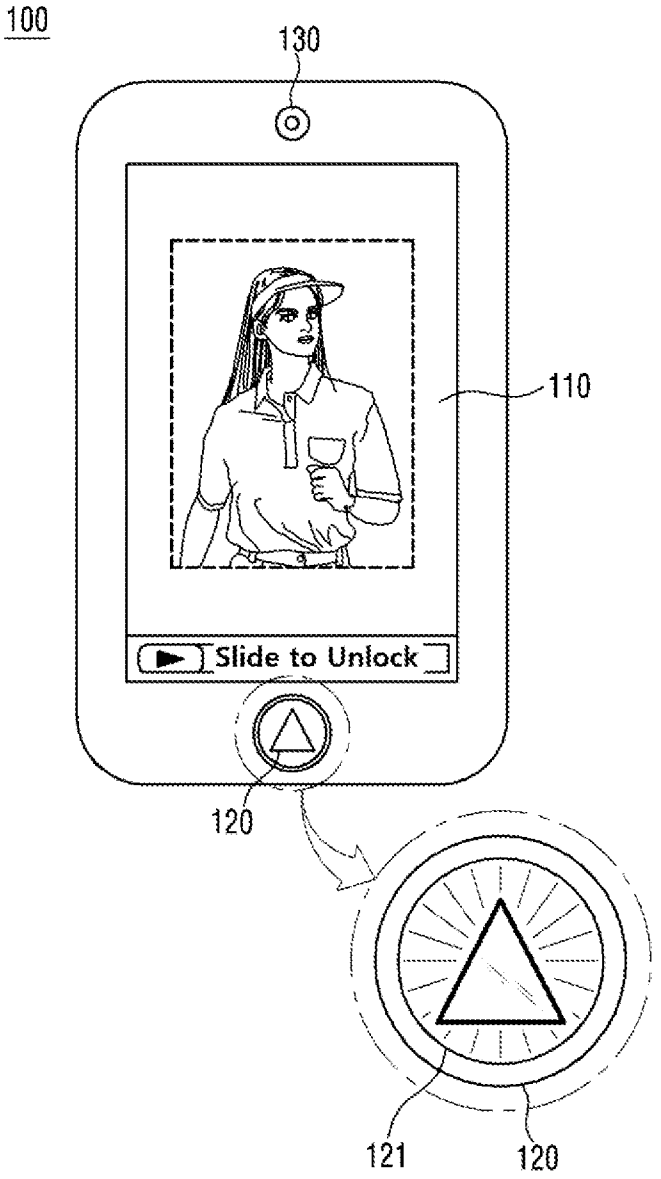


FIG. 3A

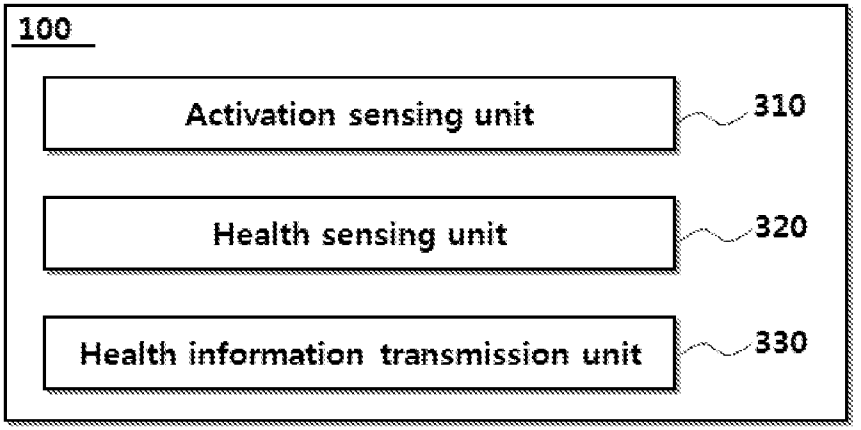

100
Activation sensing unit
310
Health sensing unit
320
Health information transmission unit
330

FIG. 3B

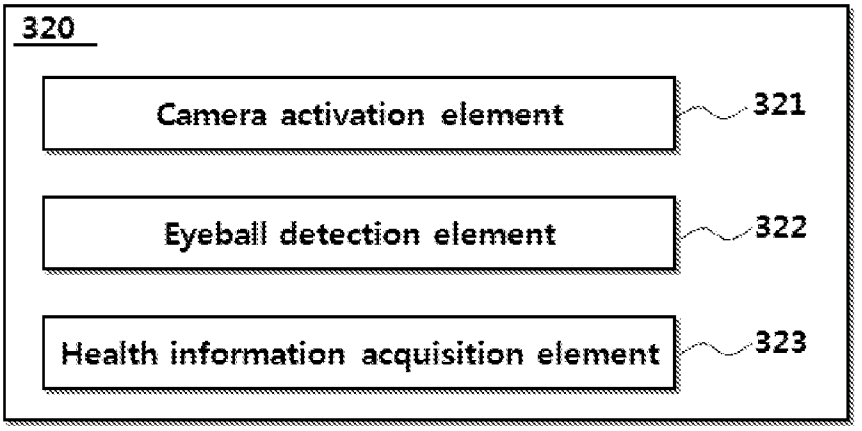

320
Camera activation element
321
Eyeball detection element
322
Health information acquisition element
323

FIG. 4A

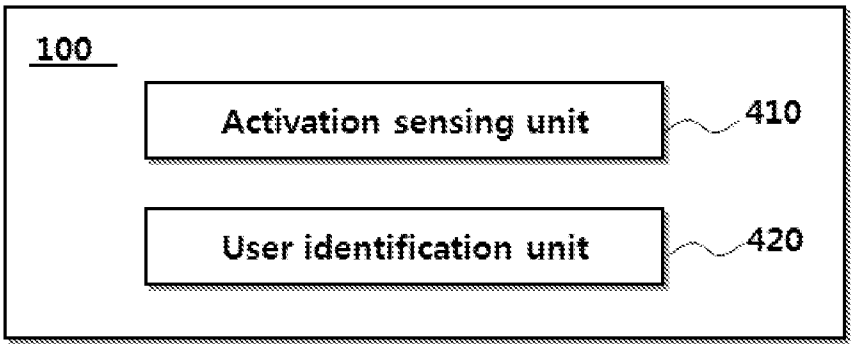


FIG. 4B

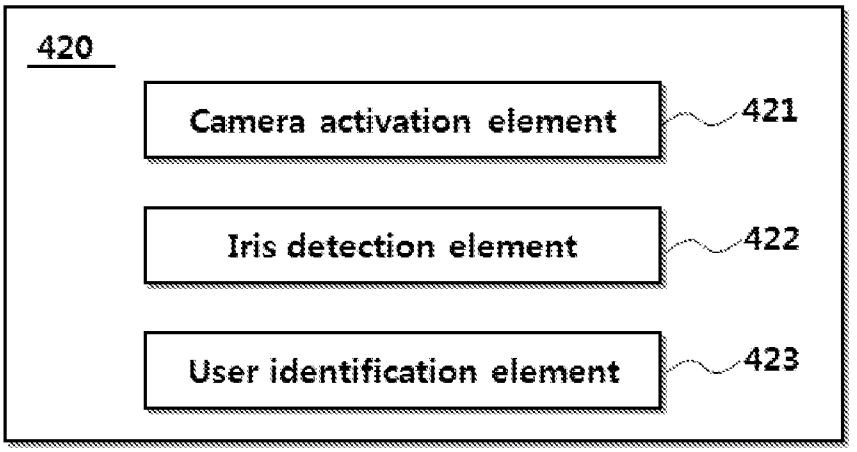


FIG. 5

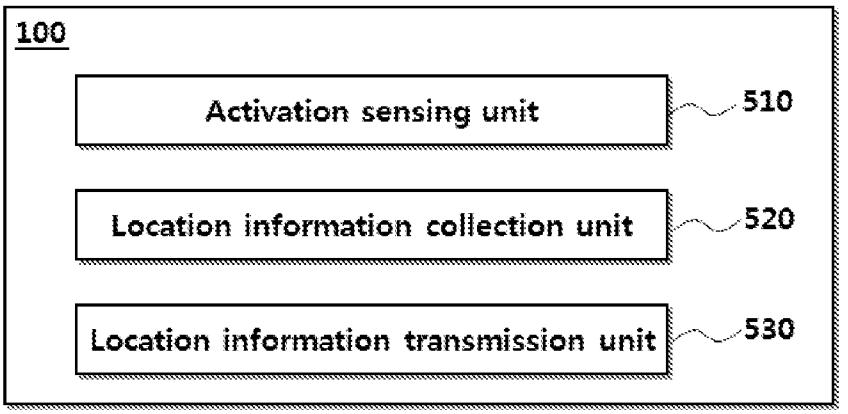
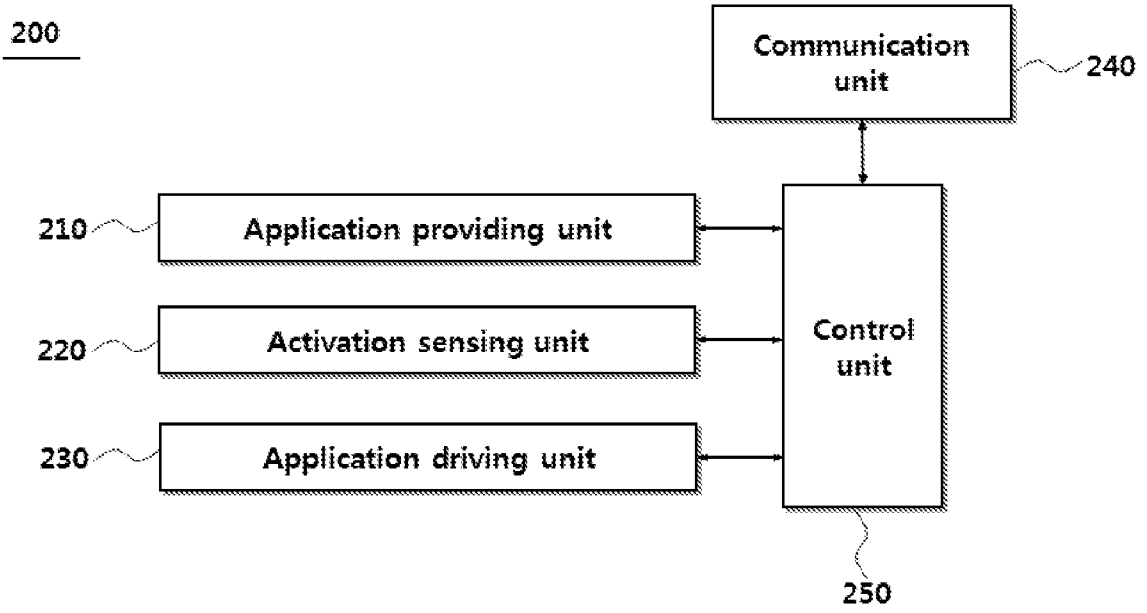


FIG. 6


200
Communication unit
240
210
Application providing unit
220
Activation sensing unit
230
Application driving unit
Control unit
250

METHOD, SYSTEM, AND MOBILE COMMUNICATION TERMINAL FOR PERFORMING SPECIFIC FUNCTION WHEN MOBILE COMMUNICATION TERMINAL IS ACTIVATED

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of Korean Patent Application No. 10-2011-0106839, filed on Oct. 19, 2011, and all the benefits accruing therefrom under 35 U.S.C. §119 which is hereby incorporated by reference as if fully set forth herein.

BACKGROUND

1. Field

The disclosure relates to a method, a system, and a mobile communication terminal for performing a specific function when a mobile communication terminal is activated, and more particularly to a method, a system, and a mobile communication terminal for performing various functions according to the number of presses or a press time of a button for switching from an inactive state to an active state.

2. Description of the Related Art

Recently, various terminals, for example, such as smart phones, mobile phones, personal digital assistants (PDAs), and web pads, having not only communication functions but also various other functions have come into wide use. These terminals have rapidly been generalized because not only can an environment identical or similar to a desktop computer be implemented anytime and anywhere on the above-described terminals, but they also include a telephone function.

At present, in order to operate a corresponding function among various functions included in a terminal such as those described above, a certain operation should be performed in a state in which the terminal is in an active state, that is, in a state in which a display is turned on. In addition, in order to add a certain function, an interface or button for performing the function should be added to the terminal. For example, it is possible to transmit a rescue signal indicating an emergency or urgent situation by pressing an emergency button only when the emergency button for the urgent situation is separately added.

On the other hand, users of the terminals described above perform operations of habitually taking out and activating the terminals on the move or in a standby state while carrying the terminals.

SUMMARY

Exemplary embodiments provide technology for enabling an advantageous function to be utilized with only a simple operation of pressing an activation button that is habitually pressed by connecting various operations to the activation button provided in a terminal.

Exemplary embodiments provide technology for enabling health check of an aged person to be performed with only a simple operation and enabling information regarding the health check to be transmitted to a protector or a medical authority.

Exemplary embodiments provide technology for enabling a user authentication process of which the security is enhanced to be operable with only a simple procedure.

Exemplary embodiments provide technology for enabling an urgent message to be transmitted along with location information with only a simple operation in an urgent situation.

According to an exemplary embodiment, there is provided a mobile communication terminal including: a display unit; and an activation button configured to switch from an inactive state, which is an OFF state of the display unit, to an active state, which is an ON state of the display unit, wherein a predetermined operation is performed simultaneously with switching to the active state by pressing the activation button.

According to another exemplary embodiment, there is provided a method of performing a specific function when a mobile communication terminal is activated, including: sensing whether or not an activation button has been pressed to switch from an inactive state, which is an OFF state of a display unit, to an active state, which is an ON state of the display unit; and performing a predetermined operation within the mobile communication terminal simultaneously with switching to the active state if the pressing of the activation button has been sensed in the inactive state.

According to still another exemplary embodiment, there is provided a system for providing a service to operate a specific function when a mobile communication terminal is activated, including: an activation sensing unit configured to receive a sensing signal indicating switching from an inactive state, which is an OFF state of the display unit, to an active state, which is an ON state of the display unit, from the mobile communication terminal; and an application driving unit configured to control a predetermined operation to be performed within the mobile communication terminal according to the switching to the active state.

BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary embodiments are described in further detail below with reference to the accompanying drawings. It should be understood that various aspects of the drawings may have been exaggerated for clarity:

FIG. **1** is a diagram illustrating an external appearance of a mobile communication terminal according to an exemplary embodiment of the present invention;

FIG. **2** is a diagram illustrating an example of an operation of the mobile communication terminal when an activation button has been pressed according to an exemplary embodiment of the present invention;

FIGS. **3**A and **3**B are block diagrams illustrating the operation of the mobile communication terminal according to an exemplary embodiment of the present invention;

FIGS. **4**A and **4**B are block diagrams illustrating the operation of the mobile communication terminal according to another exemplary embodiment of the present invention;

FIG. **5** is a block diagram illustrating the operation of the mobile communication terminal according to still another exemplary embodiment of the present invention; and

FIG. **6** is a block diagram illustrating an operation of a system according to an exemplary embodiment of the present invention.

DETAILED DESCRIPTION

In the following detailed description, reference is made to the accompanying drawings that show, by way of illustration, specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention. It is to be understood that the various embodiments of the invention, although different, are not necessarily mutually exclusive. For example, a particular feature, structure, or characteristic described herein in connection with one embodiment may be implemented within other embodiments without departing

from the spirit and scope of the present invention. Also, it is to be understood that the positions or arrangements of individual elements in the embodiment may be changed without separating the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims that should be appropriately interpreted along with the full range of equivalents to which the claims are entitled. In the drawings, like reference numerals identify like or similar elements or functions through the several views.

Hereinafter, exemplary embodiments of the present invention will be explained in detail with reference to the accompanying drawing so that those skilled in the art can easily practice the invention.

[Exemplary Embodiments of Present Invention]

The term "mobile communication terminal" used herein refers to a digital device that includes a memory means and a microprocessor with computing capability as in a mobile phone, a navigation system, a web pad, a PDA, a workstation, a personal computer (for example, a notebook computer or the like) as a digital device including wired/wireless communication functions or other functions. Although an example of the mobile communication terminal (for example, a mobile phone) will be described in part of this specification, the present invention is not limited thereto.

The term "inactive state" used herein refers to a state in which the mobile communication terminal is communicable but a display screen is turned off Even when the display screen is turned off, a predetermined function (for example, a music play function or the like) is operable. As described above, the term "inactive state" used herein refers to a concept encompassing states in which the display screen is turned off, regardless of whether or not the mobile communication terminal performs a predetermined operation. However, a state in which the mobile communication terminal is completely turned off is excluded.

The term "active state" used herein refers to a state in which the display screen of the mobile communication terminal is turned on. Switching from the "inactive state" to the "active state" refers to switching of the display screen from the OFF state to the ON state, regardless of information displayed on the display screen in the ON state. For example, the mobile communication terminal can be determined to be in the "active state" even when only a lock screen is displayed.

Configuration of Mobile Communication Terminal

FIG. **1** is a diagram illustrating an external appearance of the mobile communication terminal according to an exemplary embodiment of the present invention.

Referring to FIG. **1**, the mobile communication terminal **100** according to this exemplary embodiment can include a display unit **110** and an activation button **120**. The mobile communication terminal **100** can further include a camera **130**.

Although the display unit **110** is provided on the front side of a frame constituting the mobile communication terminal **100**, the activation button **120** is provided on a lower part of the display unit **110**, and the camera **130** is provided on an upper part of the display unit **110** as illustrated in FIG. **1**, other forms may be configured. For example, the display unit **110** need not necessarily be formed on the entire surface of the mobile communication terminal **100**. That is, the display unit **110** is only required to be formed on at least part of the mobile communication terminal **100**, and the activation button **120** is only required to be formed on a part different from that of the display unit **110**. In addition, the camera **130** can be formed on the other side on which the display unit **110** is not provided in the mobile communication terminal **100**.

The display unit **110** displays various information regarding operation states of the mobile communication terminal **100**, and also displays an interface for a user's input if the mobile communication terminal **100** drives a touch screen. In general, if a state in which the user's operation on the mobile communication terminal **100** is absent continues for a predetermined period of time, the mobile communication terminal **100** is in the inactive state. The user's operation refers to an input through the interface displayed on the display unit **110**, an operation through the button **120**, or an operation through a function key (for example, a volume control key or the like). A condition in which the inactive state is reached can be set by the user. For example, the condition can be set using a setting menu through the interface displayed on the display unit **110**. On the other hand, the state can be switched to the inactive state by pressing another button (for example, an ON/OFF button) provided on the mobile communication terminal **100**. For example, the mobile communication terminal **100** can be completely turned off if the ON/OFF button is pressed for a long time when the mobile communication terminal **100** is in the active state, but the mobile communication terminal **100** can be in the inactive state as a communicable state in which a phone call can be received if the ON/OFF button is pressed for a short time.

The activation button **120** is means for switching the mobile communication terminal **100** from the inactive state to the active state. That is, if the user presses the activation button **120** when the mobile communication terminal **100** is in the inactive state, switching to the active state is performed. FIG. **1** illustrates a state in which a lock screen is displayed on the display unit **110** after pressing the activation button **120** when the mobile communication terminal **100** is in the inactive state. However, the activation button **120** can function as means for another operation (for example, means for moving to a standby screen while a certain operation state is displayed on the display unit **110** or means for displaying a list of programs currently being operated).

According to an exemplary embodiment of the present invention, if the user presses the activation button **120** when the mobile communication terminal **100** is in the inactive state, the mobile communication terminal **100** performs a predetermined operation instead of switching to the active state. When the mobile communication terminal **100** is in the inactive state, the user can set an operation to be performed by pressing the activation button **120**. For example, an operation of the mobile communication terminal **100** connected to the activation button **120** can be set using a setting menu through the interface displayed on the display unit **110**. In addition, according to an exemplary embodiment of the present invention, an operation which differs according to the number of presses or a press time of the activation button **120** can be performed when the mobile communication terminal **100** is in the inactive state. For example, a first operation can be set to be performed if the activation button **120** is pressed once, and a second operation can be set to be performed if the activation button **120** is continuously pressed three times. In addition, as another example, the first operation can be set to be performed if the activation button **120** is pressed once for a short time, and the second operation can be set to be performed if the activation button **120** is pressed once for a long time. The mobile communication terminal **120** can include a predetermined clock circuit or timer to calculate the cumulative number of continuous presses of the activation button **120** and measure a period of time for which the activation button **120** is pressed. For example, the number of presses is deter-

mined to be two if the activation button **120** is re-pressed within a threshold time after one press. If the activation button **120** is pressed for the threshold time or more, a long press of the activation button **120** can be determined. Operations capable of being performed by pressing the activation button **120** in the inactive state will be described later.

According to an exemplary embodiment of the present invention, a sub-display unit **121** can be provided on the activation button **120**. Information regarding an operation to be performed by pressing the activation button **120** can be displayed on the sub-display unit **121**. Various types such as a shape, a character, a graphic, and color can be displayed. When the display type is the shape, a circle, a triangle, a rectangle, a hexagon, or the like can be displayed. For example, the circle can be displayed on the sub-display unit **121** when the first operation is set to be performed by pressing the activation button **120**, and the triangle can be displayed on the sub-display unit **121** when the second operation is set to be performed by pressing the activation button **120**, and vice versa. A display type of the sub-display unit **121** and a correspondence relationship between operations and displays can also be set by the user. For example, the user can select the first operation as the operation to be performed by pressing the activation button **120** from a setting menu and select the triangle as the display type of the sub-display unit **121** of the activation button **120**. Accordingly, the user can recognize that the first operation is performed when the user has pressed the activation button **120** because the triangle is displayed on the sub-display unit **121** even when the mobile communication terminal **100** is in the inactive state.

Although the sub-display unit **121** can be implemented by a general display such as liquid crystal, a liquid crystal display (LCD), or a light emitting diode (LED), the present invention is not limited thereto.

An operation of controlling driving of the display unit **110** and the sub-display unit **121** can be performed in the same processor and the same method or in different processors and different methods.

Hereinafter, various exemplary embodiments for operations of the mobile communication terminal **100** capable of being performed by pressing the activation button **120** will be described.

Operations through Activation Button

Operations to be described below can be performed by pressing the activation button **120** when the mobile communication terminal **100** is in the inactive state, and set by the user. The operations described below are only examples. Of course, other operations can be performed by pressing the activation button **120**.

1. Camera Activation Function

When the mobile communication terminal **100** is in the inactive state, the camera **130** provided in the mobile communication terminal **100** can be activated by pressing the activation button **120**, and a screen currently imaged by the camera **130** can be displayed on the display unit **110**.

FIG. **2** is a diagram illustrating an example in which the camera **130** is activated after the activation button **120** is pressed and an imaged scene is displayed on the display unit **110**.

2. Health Sensing and Health Information Transmission Functions

When the mobile communication terminal **100** is in the inactive state, the health sensing function can be driven, so that sensed health information can be transmitted to a medical authority such as a doctor or a protector.

FIGS. **3**A and **3**B are block diagrams of the mobile communication terminal **100** illustrating the above-described functions. FIGS. **3**A and **3**B illustrate functional block diagrams illustrating the above-described functions of the mobile communication terminal **100**.

Referring to FIG. **3**A, the mobile communication terminal **100** can include an activation sensing unit **310**, a health sensing unit **320**, and a health information transmission unit **330**.

When the mobile communication terminal **100** is in the inactive state, the activation sensing unit **310** senses whether or not the user has pressed the activation button **120**.

The health sensing unit **320** is operated when the activation sensing unit **310** has sensed that the activation button **120** has been pressed, and senses a health state of the user in various methods.

FIG. **3**B is a block diagram illustrating an example of the health sensing unit **320**. Referring to FIG. **3**B, the health sensing unit **320** can include a camera activation element **321**, an eyeball detection element **322**, and a health information acquisition element **323**.

The camera activation element **321** activates the camera **130** provided in the mobile communication terminal **100**. According to the activation of the camera **130**, a video currently captured by the camera **130** is displayed on the display unit **110**. If an eye or face of the user is imaged by the camera **130**, the eyeball detection element **322** performs a function of recognizing and extracting an eyeball of the user. A general eyeball detection algorithm can be used for eyeball detection. The health information acquisition element **323** acquires various health information through the eyeball detected through the eyeball detection element **322**. It is possible to recognize a stress index, a diabetes index, or retinal diseases of the user through a color or health state of the eyeball. A well-known algorithm in the related art can be used as an algorithm for detecting health information from characteristics of the detected eyeball.

The health information acquired as described above can be transmitted by the health information transmission unit **330** to the mobile communication terminal of a protector, a medical authority such as a doctor or the like, or a predetermined server. Information regarding the protector (for example, a phone number or an e-mail address) can be stored in advance. The acquired health information can be displayed on the display unit **110** so that the user can check the acquired health information.

The above-described operations, that is, the eyeball detection function and the health sensing function based on information regarding the detected eyeball, can be performed by installing a predetermined application. That is, the application includes an eyeball detection algorithm and a health sensing algorithm, so that the operations as described above can be performed by installing the application in the mobile communication terminal **100**. The user can download this application and install the downloaded application in the mobile communication terminal **100**. In addition, although an example of only health sensing through eyeball detection has been described above, it is possible to install an application, for example, for health sensing through face detection, and connect the application to the activation button **120**. The user can use the functions as described above by setting the application to be operated immediately when the activation button **120** is pressed through the setting menu in the inactive state of the mobile communication terminal **100**.

In general, aged persons may not use the health sensing function due to a difficult operation even when the health sensing function is provided in the mobile communication terminal **100**. However, according to the above-described exemplary embodiment of the present invention, the health sensing function is operated only by pressing the activation

button **120** without a special operation. Accordingly, it is possible to easily check health information and transmit the health information to a protector or a doctor.

3. User Identification Function

When the mobile communication terminal **100** is in the inactive state, a user authentication process can be performed for security by pressing the activation button **120**.

FIGS. **4**A and **4**B illustrate block diagrams of the mobile communication terminal **100** illustrating the above-described functions. Referring to FIG. **4**A, the mobile communication terminal **100** can include an activation sensing unit **410** and a user identification unit **420**.

When the mobile communication terminal **100** is in the inactive state, the activation sensing unit **410** senses whether or not the user has pressed the activation button **120**.

If the activation sensing unit **410** senses that the activation button **120** has been pressed, the user identification unit **420** operates the user identification function in various methods.

FIG. **4**B is a block diagram illustrating an example of the user identification unit **420**. Referring to FIG. **4**B, the user identification unit **420** can include a camera activation element **421**, an iris detection element **422**, and a user identification element **423**.

The camera activation element **421** activates the camera **130** provided in the mobile communication terminal **100**. According to the activation of the camera **130**, a video currently captured by the camera **130** is displayed on the display unit **110**. If an eye or face of the user is imaged by the camera **130**, the iris detection element **422** performs a function of recognizing and extracting an iris from an eyeball of the user. A general iris detection algorithm can be used for iris recognition. The user identification element **423** performs a function of comparing the iris detected by the iris detection element **422** to pre-stored iris information of the user, and authenticating the current user as a true user if the two match. For this, the user identification element **423** can use iris information of the user pre-stored in a database (not illustrated). The iris information of the user can be stored by registering information regarding the iris detected by the iris detection element **422** using a video of the true user first captured by the camera **130**. Predetermined identification information (for example, an identifier (ID), a password, a social security number, or the like) should be input to change the registered iris information of the true user. If the user identification element **423** authenticates the current user as the true user, the lock state of the mobile communication terminal **100** is released and all functions are available. If the current user is not authenticated as the true user, the lock state continues along with a display of an alarm message.

The above-described operations, that is, the iris detection function, the user identification function, and the user authentication function, can be performed by installing a predetermined application. That is, the application includes the iris detection algorithm and the authentication algorithm based on an iris comparison, so that the operations as described above can be performed by installing the application in the mobile communication terminal **100**. The user can download this application and install the downloaded application in the mobile communication terminal **100**. The user can use the functions as described above by setting the application to be operated immediately when the activation button **120** is pressed through the setting menu in the inactive state of the mobile communication terminal **100**.

Accordingly, it is possible to efficiently reduce security risks by setting the user authentication process to be performed through a separate setting, that is, by pressing the activation button **120**, when the mobile communication terminal **100** is used in a region vulnerable to the security risks.

Although an example of an authentication method through iris recognition has been described above, other authentication methods, for example, an authentication key matching method, a password matching method, a face recognition method, a fingerprint recognition method, and the like, can be used. That is, one or more authentication methods can be performed by pressing the activation button **120**.

4. Location Information Transmission Function

When the mobile communication terminal **100** is in the inactive state, collected location information can be transmitted to a protector or a protection authority (a police station or a fire station) by pressing the activation button **120**.

FIG. **5** illustrates a block diagram of the mobile communication terminal **100** illustrating the above-described function. Referring to FIG. **5**, the mobile communication terminal **100** can include an activation sensing unit **510**, a location information collection unit **520**, and a location information transmission unit **530**.

When the mobile communication terminal **100** is in the inactive state, the activation sensing unit **510** senses whether or not the user has pressed the activation button **120**.

When the activation sensing unit **510** senses that the activation button **120** has been pressed, the location information collection unit **520** collects a current location using a global positioning system (GPS) sensor or other location sensors.

The location information transmission unit **530** performs a function of transmitting location information collected by the location information collection unit **520** to a protector or a protection authority. In an urgent situation, a message indicating the urgent situation can be transmitted along with the location information. The location information and the urgent message can be optionally transmitted. On the other hand, this operation may differ according to the number of presses or a press time of the activation button **120**. For example, it is possible to set an operation of transmitting the urgent message to a police station along with the location information when the activation button **120** is pressed for a short time, and set an operation of transmitting only the location information to the protector when the activation button **120** is pressed for a long time. In addition, as another example, it is possible to set an operation of transmitting the location information to the police station along with the urgent message when the activation button **120** is pressed once and set an operation of transmitting the location information to a fire station along with the urgent message when the activation button **120** is pressed three times.

The above-described operations can be performed by installing a predetermined application. That is, the application includes an algorithm for collecting location information and transmitting the collected located information along with an urgent message, so that the operations as described above can be performed by installing the application in the mobile communication terminal **100**. The user can download this application and install the downloaded application in the mobile communication terminal **100**. The user can use the functions as described above by setting the application to be operated immediately when the activation button **120** is pressed through the setting menu in the inactive state of the mobile communication terminal **100**.

Accordingly, it is possible to efficiently escape a dangerous situation because the user can report the dangerous situation to a protector or a protection authority along with his/her location information with only a simple operation.

5. File Transmission Function

When the mobile communication terminal **100** is in the inactive state, a function of uploading content (for example, contact information, a photo, a moving image, or an application) included in the mobile communication terminal **100** to another mobile communication terminal **100** or a media space (for example, a personal media space such as Twitter, Facebook, or a blog or a community media space such as a café or club community) can be operated.

6. Mode Change During Drive

When the mobile communication terminal **100** is in the inactive state, the mobile communication terminal **100** can be switched to a hands-free function or some communication functions (a voice communication function, a short message service (SMS) function, and an Internet function) of the mobile communication terminal **100** can be interrupted by pressing the activation button **120**.

Accordingly, it is possible to significantly reduce traffic accident risks by switching the mode of the mobile communication terminal **100** or interrupting the communication function with only a simple operation of pressing the activation button **120** during driving.

7. Advertisement Display Operation

When the mobile communication terminal **100** is in the inactive state, the activation button **120** is pressed so that an advertisement can be displayed on at least a part of the display unit **110**. The advertisement display can be implemented by displaying an advertisement provided from an external server in real time, and driven by an advertisement-related application previously installed within the mobile communication terminal **100**.

This application for enabling the advertisement to be displayed may be received in advance from an advertisement distribution server, an advertiser server, or a server for providing a service according to an exemplary embodiment of the present invention, that is, a service for driving a predetermined application according to a button input that switches the mobile communication terminal **100** from the inactive state to the active state.

An advertisement display method can be implemented by a method of randomly displaying advertisements of advertisers joining this service, a customized advertisement display method based on user information, and an advertisement display method based on a current location.

The user information can be pre-stored in a corresponding application and pre-transmitted to a server that provides an advertising service. On the other hand, location information collection necessary for the advertisement display method based on the current location can be used in conjunction with **4**. Location Information Function described above. That is, current location information is collected simultaneously with the activation of the mobile communication terminal **100** and transmitted to an advertising-service providing server. Based on the current location information, advertisements related to the current location are distributed to the mobile communication terminal **100**.

8. Other Application Operations

If a predetermined operation is performed instead of switching to a simple active state by pressing the activation button **120** when the mobile communication terminal **100** is in the inactive state, this belongs to the scope of the present invention.

For example, an entertainment operation (for example, an operation of a music or video player, execution of a game application, or news reception) can be performed by pressing the activation button **120**.

Operation Standby of Application

According to an exemplary embodiment of the present invention, the above-described predetermined applications are driven when the mobile communication terminal **100** is switched from the inactive state to the active state.

For this, when the mobile communication terminal **100** is in the inactive state, the applications should be maintained in an operation standby state. When the mobile communication terminal **100** is switched from the active state to the inactive state, the above-described applications can be in the operation standby state. That is, a selected application to be driven when the mobile communication terminal **100** is switched to the active state can be in the operation standby state when the mobile communication terminal **100** is switched to the inactive state.

However, a predetermined application operable when the mobile communication terminal **100** is switched from the inactive state to the active state regardless of the operation standby state or an operation disable state of the application belongs to the present invention.

Service Providing Server

Hereinafter, the service providing server according to an exemplary embodiment will be described.

FIG. **6** is a diagram illustrating a configuration of a service providing system (server) for enabling a specific function to be operated when the mobile communication terminal is activated according to an exemplary embodiment of the present invention.

Referring to FIG. **6**, the service providing server **200** can include an application providing unit **210**, an activation sensing unit **220**, an application driving unit **230**, a communication unit **240**, and a control unit **250**. According to an exemplary embodiment of the present invention, the application providing unit **210**, the activation sensing unit **220**, the application driving unit **230**, the communication unit **240**, and the control unit **250** of the service providing server **200** can be program modules or hardware communicable with an external apparatus. The program modules or hardware can be included in the service providing server **200** or another apparatus communicable with the service providing server **200** in the form of an operation system, an application program module, and other program modules, and physically stored in various known storage apparatuses. On the other hand, these program modules or hardware include a routine, a sub routine, a program, an object, a component, and a data structure, each of which executes a specific task to be described later or specific abstract data, but the present invention is not limited thereto.

The application providing unit **210** enables the predetermined application described above to be transmitted to the mobile communication terminal **100**. The user can receive a desired application by accessing the service providing server **200** through the mobile communication terminal **100**, and install the received application within the mobile communication terminal **100**. The application can include a control function of controlling a predetermined operation to be performed when the mobile communication terminal **100** is activated, and can independently perform the predetermined operation. For example, the application transmitted from the application providing unit **210** can be an application for enabling an advertisement to be displayed on the display unit **110** when the mobile communication terminal **100** is switched from the inactive state to the active state.

The activation sensing unit **220** according to an exemplary embodiment can sense the switching of the mobile communication terminal **100** from the inactive state to the active state. The user can transmit a signal indicating the activation

of the mobile communication terminal **100** to the service providing server **200** by pressing the activation button of the mobile communication terminal **100**.

The application driving unit **230** according to an exemplary embodiment enables a predetermined operation to be performed in the mobile communication terminal **100** when the activation of the mobile communication terminal **100** is sensed. That is, the application driving unit **230** drives a predetermined application within the mobile communication terminal **100** and enables a related screen to be displayed on the display unit **110**. For example, if the activation of the mobile communication terminal **100** is sensed, an advertisement-related application can be executed. The application driving unit **230** can perform an additional operation related to driving of a corresponding application. For example, an application for enabling an advertisement to be displayed is driven to receive current location information and control advertisement information related to a corresponding location to be displayed on the display unit **110** of the mobile communication terminal **100**. In addition, it is possible to collect user information (for example, a sex, an age, a region of residence, a matter of interest, and the like) and control advertisement information customized for a corresponding user to be displayed. Necessary advertisement information (for example, advertisement information to be transmitted to the mobile communication terminal **100** based on location information or user information) can be transmitted from an advertiser server or an advertisement distribution server. As described above, the application driving unit **230** can drive a predetermined application simultaneously with the activation within the mobile communication terminal **100** and perform an additional operation for optimally driving the application.

The communication unit **240** according to an exemplary embodiment makes information communication between the service providing server **200**, the mobile communication terminal **100**, and another apparatus possible. That is, the communication unit **240** can transmit an application to the mobile communication terminal **100** and receive an activation signal and information for driving the application from the mobile communication terminal **100**.

The control unit **250** according to an exemplary embodiment can perform a function of controlling data flows between the application providing unit **210**, the activation sensing unit **220**, the application driving unit **230**, and the communication unit **240**. That is, the control unit **250** according to the exemplary embodiment can control the application providing unit **210**, the activation sensing unit **220**, the application driving unit **230**, and the communication unit **240** to perform unique functions.

According to exemplary embodiments of the present invention, it is possible to enable an advantageous function to be utilized and improve an interest of a terminal user because various operations can be performed only by pressing an activation button when a terminal is in an inactive state.

According to exemplary embodiments of the present invention, it is possible to enable health check of an aged person to be performed with a simple operation and enable information regarding the health check to be transmitted to a protector or a medical authority.

According to exemplary embodiments of the present invention, it is possible to enable a user authentication process of which the security is enhanced to be operable with only a simple procedure.

According to exemplary embodiments of the present invention, it is possible to enable an urgent message to be transmitted along with location information with only a simple operation in an urgent situation.

The embodiments according to the present invention described above may be implemented in the form of program instructions that may be executed through various computer components and recorded on a computer-readable medium. The computer-readable medium may include program instructions, data files, data structures, and the like individually or in combination. The program instructions recorded on the medium may be specifically designed for the present invention or may be well known to one of ordinary skill in the art of software. Examples of the computer-readable recording medium include a magnetic medium such as a hard disk, a floppy disk, or a magnetic tape, an optical medium such as a compact disc-read only memory (CD-ROM) or a digital versatile disc (DVD), a magneto-optical medium such as a floptical disk, and a hardware device such as ROM, a random access memory (RAM), or a flash memory that is specially designed to store and execute program instructions. Examples of the program instructions include not only machine code generated by a compiler or the like but also high-level language codes that may be executed by a computer using an interpreter or the like. The hardware device described above may be constructed so as to operate as one or more software modules for performing the operations of the embodiments of the present invention, and vice versa.

Although the present invention has been described with reference to the specific embodiments and drawings together with specific details such as detailed components, the above description is provided only for better understanding of the present invention and it will be apparent to those skilled in the art that various modifications and variations may be made from the above description.

While exemplary embodiments have been disclosed herein, it should be understood that other variations may be possible. Such variations are not to be regarded as a departure from the spirit and scope of exemplary embodiments of the present application, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

What is claimed is:

1. A mobile communication terminal comprising:

a display unit; and

an activation button configured to switch from an inactive state, which is an OFF state of the display unit, to an active state, which is an ON state of the display unit; and

a user identification unit configured to operate a user identification function,

wherein the user identification function is performed simultaneously with switching from the inactive state of the display unit to the active state of the display unit by pressing the activation button,

wherein the user identification function includes a fingerprint recognition.

2. The mobile communication terminal according to claim **1**, wherein the activation button internally includes a sub-display unit.

3. The mobile communication terminal according to claim **1**, wherein the user identification function differs according to the number of presses or a press time of the activation button.

4. The mobile communication terminal according to claim **3**, further comprising a predetermined clock circuit or timer to measure a period of time for which the activation button is pressed for determining whether the activation button is pressed for a short time or a long time,

wherein the activation button is determined as being pressed for a long time when the period of time is equal or more than threshold time.

5. The mobile communication terminal according to claim 4, wherein the user identification function is performed if the activation button is pressed for a long time.

6. The mobile communication terminal according to claim 3, further comprising a predetermined clock circuit or timer to calculate the cumulative number of continuous presses of the activation button for determining whether the activation button is pressed once or multiple times,

wherein the number of presses is determined as being pressed multiple times when the activation button is re-pressed within a threshold time after a first press.

7. The mobile communication terminal according to claim 6, wherein the user identification function is performed if the activation button is pressed multiple times.

8. The mobile communication terminal according to claim 1, wherein, the fingerprint recognition is performed by comparing a fingerprint acquired by the activation button to pre-stored fingerprint information of a user.

9. A method of performing a user identification for a mobile communication terminal, the method comprising:

sensing whether or not an activation button has been pressed to switch from an inactive state, which is an OFF state of a display unit, to an active state, which is an ON state of the display unit; and

performing a user identification process by a fingerprint recognition simultaneously with switching from the inactive state of the display unit to the active state of the display unit if the pressing of the activation button is sensed.

10. The method of claim 9, wherein the performing of the user identification process differs according to the number of presses or a press time of the activation button.

11. The method of claim 10, further comprising measuring a period of time for which the activation button is pressed to determine whether the activation button is pressed for a short time or a long time,

wherein the activation button is determined as being pressed for the long time when the period of time is equal or longer than a threshold time, and the activation button is determined as being pressed for the short time when the period of time is shorter than the threshold time.

12. The method of claim 11, wherein the performing of the user identification process is performed if the activation button is pressed for the long time.

13. The method of claim 10, further comprising calculating the cumulative number of continuous presses of the activation button to determine whether the activation button is pressed once or multiple times,

wherein the number of presses is determined as being pressed multiple times when the activation button is re-pressed within a threshold time after a first press.

14. The method of claim 13, wherein the performing of the user identification process is performed if the activation button is pressed multiple times.

15. The method of claim 9, wherein the performing of the user identification process comprises comparing a fingerprint acquired by the activation button to pre-stored fingerprint information of a user.

* * * * *

Exhibit “B”

US009633373B2

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

(10) **Patent No.: US 9,633,373 B2**
(45) **Date of Patent: *Apr. 25, 2017**

(54) **ACTIVATING DISPLAY AND PERFORMING ADDITIONAL FUNCTION IN MOBILE TERMINAL WITH ONE-TIME USER INPUT**

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(73) Assignee: **FIRSTFACE CO., LTD.**, Seoul (KR)

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

This patent is subject to a terminal disclaimer.

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(65) **Prior Publication Data**

US 2015/0381617 A1 Dec. 31, 2015

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(51) **Int. Cl.**
H04M 1/00 (2006.01)
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CPC ***G06Q 30/0262*** (2013.01); ***G06F 3/04883*** (2013.01); ***G06F 21/32*** (2013.01);
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(58) **Field of Classification Search**
CPC H04W 4/02; H04W 12/08; H04W 8/22; H04W 52/027; H04W 12/06; H04M 1/67;
(Continued)

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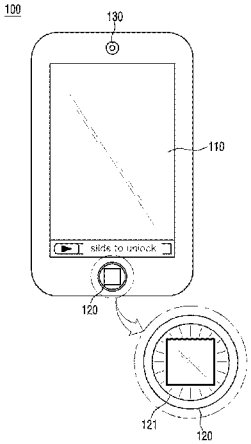
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Primary Examiner — Charles Shedrick
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(57) **ABSTRACT**

Disclosed is a mobile terminal including a touch screen display, a camera, a power button and an activation button for turning on the touch screen display. The mobile terminal has a first function and a second function to perform in response to user input and provides user settings for configuring at least one of the first and second functions such that the at least one of the first and second functions is performed along with turning on the touch screen display when pressing of the activation button is detected while the touch screen display is turned off. The mobile terminal is configured to perform the first and second functions depending upon length of pressing of the activation button in addition to turning on the touch screen display.

18 Claims, 5 Drawing Sheets



Related U.S. Application Data

continuation of application No. 14/058,761, filed on Oct. 21, 2013, now Pat. No. 8,918,074, which is a continuation of application No. 13/590,483, filed on Aug. 21, 2012, now Pat. No. 8,831,557.

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H04M 1/67	(2006.01)
H04M 1/725	(2006.01)
H04W 8/22	(2009.01)
G06F 21/32	(2013.01)
H04W 12/06	(2009.01)
H04W 52/02	(2009.01)
G06F 3/0488	(2013.01)
G06K 9/00	(2006.01)
H04L 29/06	(2006.01)
H04W 12/08	(2009.01)
G06F 21/36	(2013.01)
G06F 21/62	(2013.01)
H04W 4/22	(2009.01)
H04W 88/02	(2009.01)

(52) **U.S. Cl.**

CPC ***G06F 21/36*** (2013.01); ***G06F 21/62*** (2013.01); ***G06K 9/00006*** (2013.01); ***G06K 9/00087*** (2013.01); ***G06K 9/00221*** (2013.01); ***G06K 9/00597*** (2013.01); ***G06Q 30/0241*** (2013.01); ***G06Q 30/0261*** (2013.01); ***G06Q 30/0267*** (2013.01); ***G06Q 30/0269*** (2013.01); ***H04L 63/0861*** (2013.01); ***H04M 1/67*** (2013.01); ***H04M 1/7258*** (2013.01); ***H04M 1/72519*** (2013.01); ***H04W 4/02*** (2013.01); ***H04W 8/22*** (2013.01); ***H04W 12/06*** (2013.01); ***H04W 12/08*** (2013.01); ***H04W 52/027*** (2013.01); *H04M 2250/12* (2013.01); *H04M 2250/52* (2013.01); *H04W 4/22* (2013.01); *H04W 88/02* (2013.01)

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CPC H04M 1/7258; H04M 2250/52; H04M 1/72519; G06F 21/32

USPC 455/411, 414.1, 420, 404.2, 410; 726/1, 726/16

See application file for complete search history.

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FIG. 1

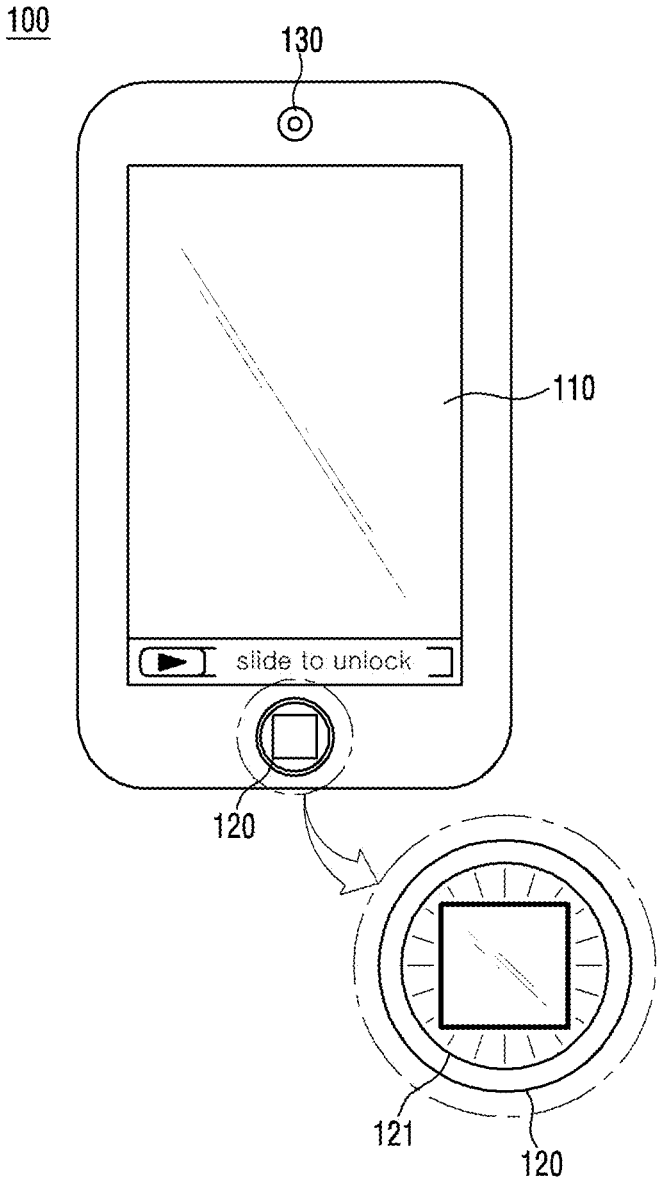


FIG. 2

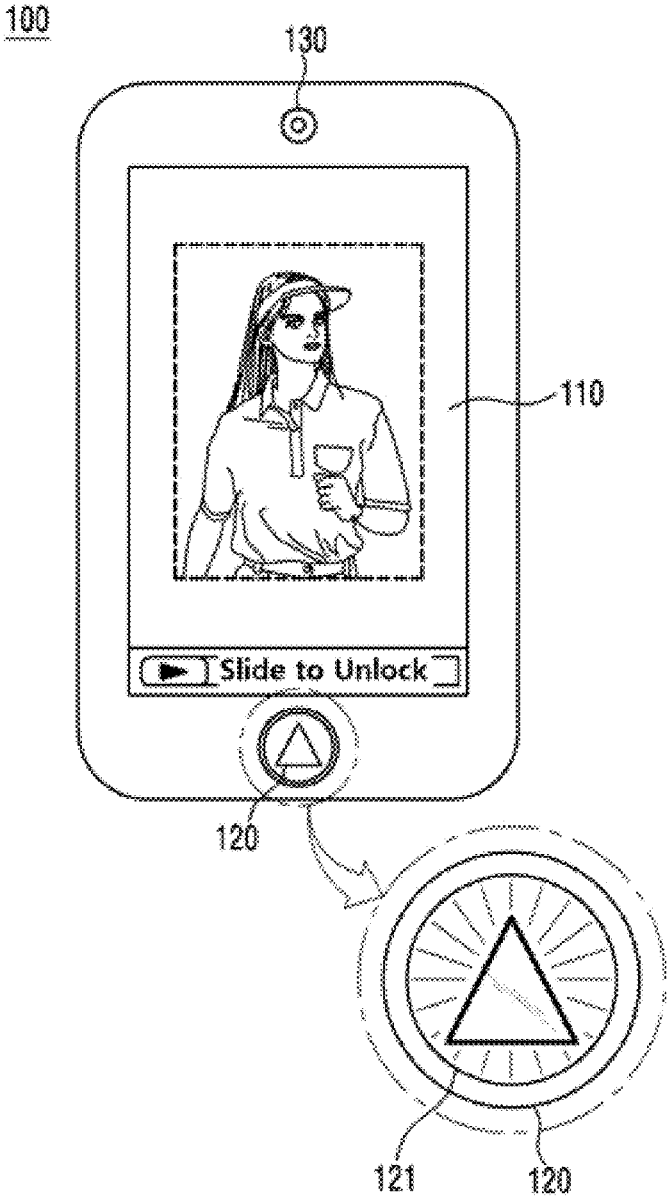


FIG. 3A

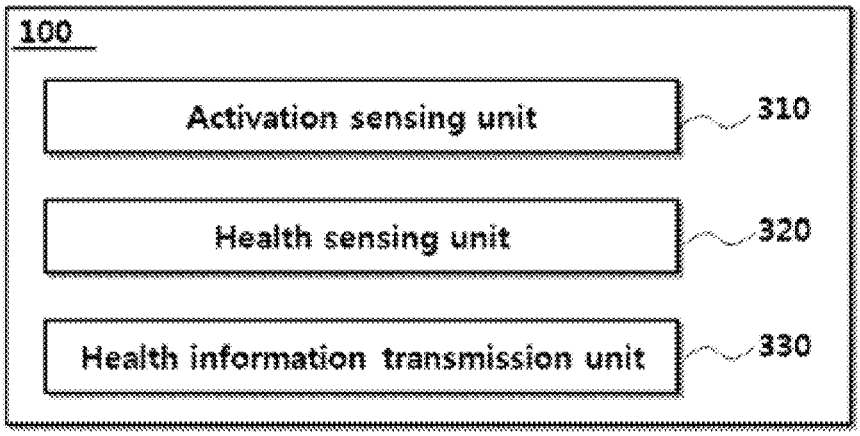

100
Activation sensing unit
310
Health sensing unit
320
Health information transmission unit
330

FIG. 3B

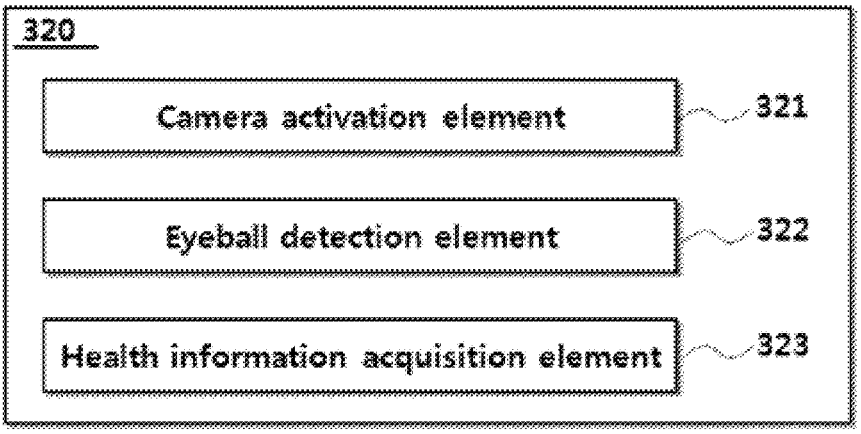

320
Camera activation element
321
Eyeball detection element
322
Health information acquisition element
323

FIG. 4A

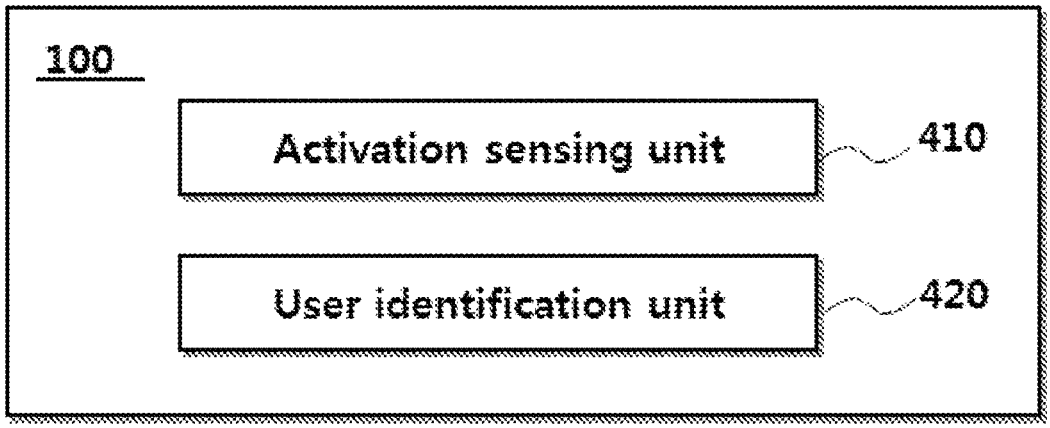

100
Activation sensing unit
410
User identification unit
420

FIG. 4B

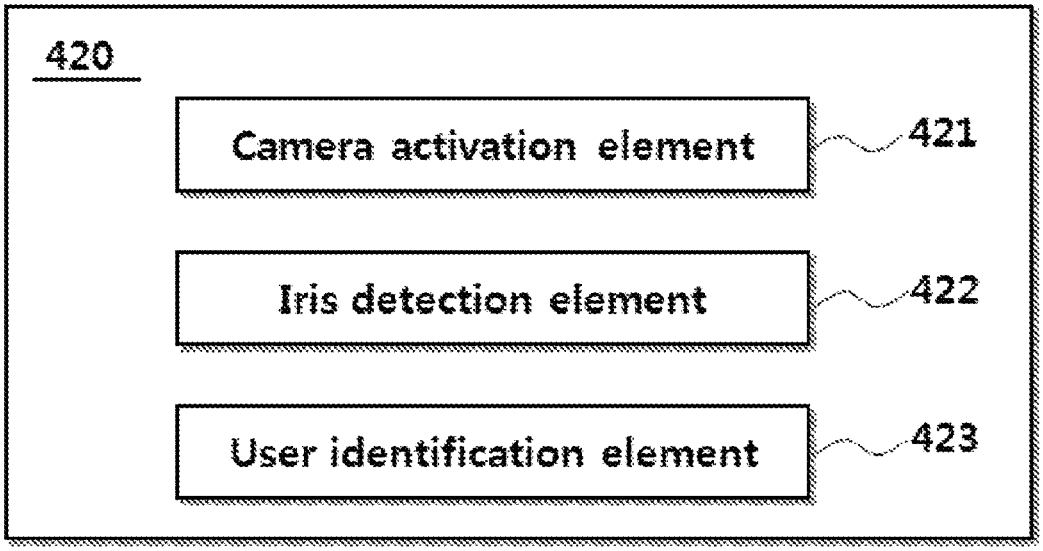

420
Camera activation element
421
Iris detection element
422
User identification element
423

FIG. 5

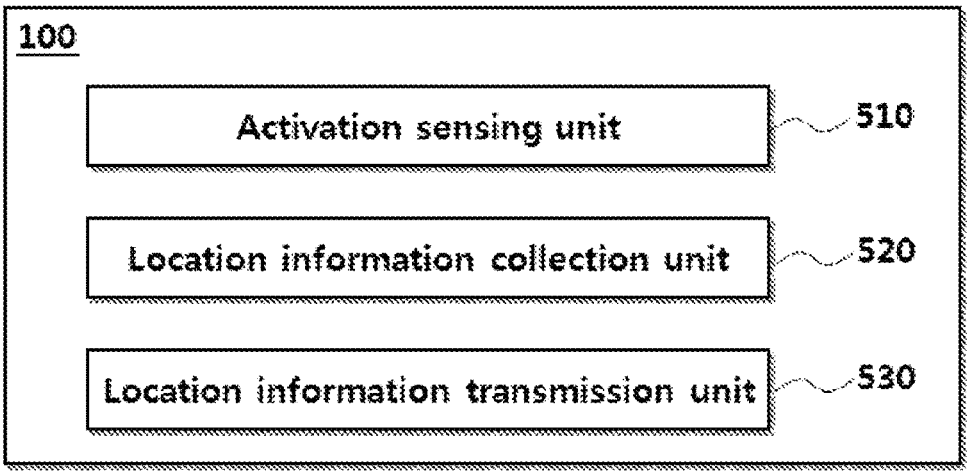
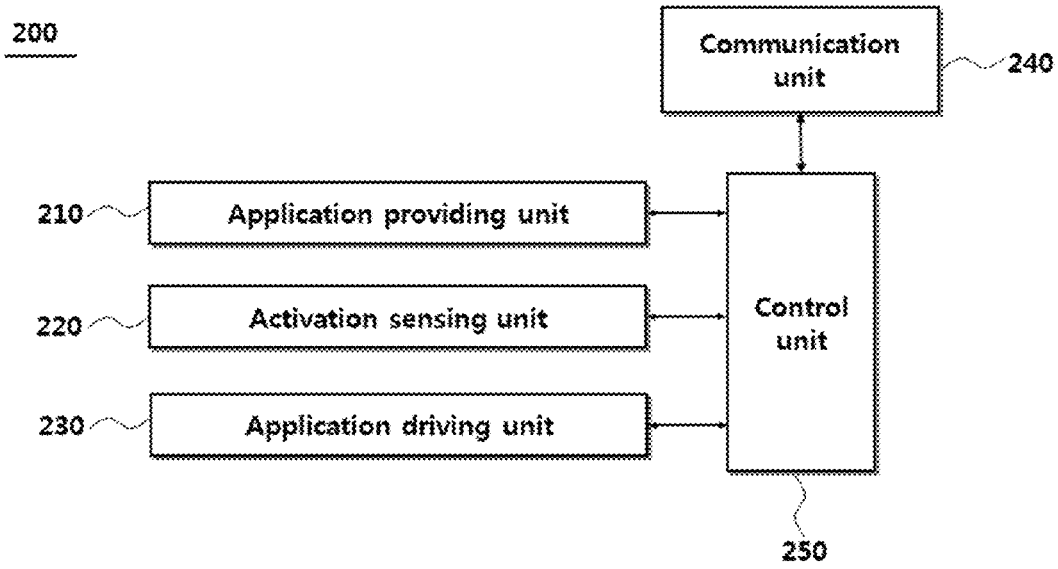

100
Activation sensing unit
510
Location information collection unit
520
Location information transmission unit
530

FIG. 6


200
Communication unit
240
210
Application providing unit
220
Activation sensing unit
230
Application driving unit
Control unit
250

ACTIVATING DISPLAY AND PERFORMING ADDITIONAL FUNCTION IN MOBILE TERMINAL WITH ONE-TIME USER INPUT

INCORPORATION BY REFERENCE TO ANY PRIORITY APPLICATIONS

Any and all applications for which a foreign or domestic priority claim is identified in the Application Data Sheet as filed with the present application are hereby incorporated by reference under 37 CFR 1.57.

BACKGROUND

Field

The disclosure relates to a method and mobile communication terminal for performing a specific function when a mobile communication terminal is activated, and more particularly to a method and mobile communication terminal for performing various functions according to the number of presses or a press time of a button for switching from an inactive state to an active state.

Description of the Related Art

Recently, various terminals, for example, such as smart phones, mobile phones, personal digital assistants (PDAs), and web pads, having not only communication functions but also various other functions have come into wide use. These terminals have rapidly been generalized because not only can an environment identical or similar to a desktop computer be implemented anytime and anywhere on the above-described terminals, but they also include a telephone function.

At present, in order to operate a corresponding function among various functions included in a terminal such as those described above, a certain operation should be performed in a state in which the terminal is in an active state, that is in a state in which a display is turned on. In addition, in order to add a certain function, an interface or button for performing the function should be added to the terminal. For example, it is possible to transmit a rescue signal indicating an emergency or urgent situation by pressing an emergency button only when the emergency button for the urgent situation is separately added.

On the other hand, users of the terminals described above perform operations of habitually taking out and activating the terminals on the move or in a standby state while carrying the terminals.

SUMMARY

According to an embodiment, there is provided a mobile communication terminal comprising: a display unit including a touch screen capable of receiving user's input through the touch screen for controlling the mobile communication terminal; a memory unit; a communication unit and an activation sensing unit, wherein the activation sensing unit detects a change from an inactive state of the mobile communication terminal to an active state of the mobile communication terminal, wherein the inactive state is defined that the display unit being turned off while the mobile communication terminal being communicable and the active state is defined that the display unit being turned on while the mobile communication terminal being communicable, wherein the mobile communication terminal performs a predetermined operation by an application of the mobile communication terminal when the activation sensing unit detects the change from the inactive state to the active state.

According to an another embodiment, there is provided a method for performing a specific function when a mobile communication terminal is activated, the method comprising: sensing a change from an inactive state of the mobile communication terminal to an active state of the mobile communication terminal, wherein the inactive state is defined that a display unit being turned off while the mobile communication termini being communicable, wherein the active state is defined that a display unit being turned on while the mobile communication terminal being communicable; and performing a predetermined operation by an application of the mobile communication terminal when the mobile communication terminal changes from the inactive state to the active state.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are described in further detail below with reference to the accompanying drawings. It should be understood that various aspects of the drawings may have been exaggerated for clarity:

FIG. **1** is a diagram illustrating an external appearance of a mobile communication terminal according to an embodiment of the present invention;

FIG. **2** is a diagram illustrating an example of an operation of the mobile communication terminal when an activation button has been pressed according to an embodiment of the present invention;

FIGS. **3**A and **3**B are block diagrams illustrating the operation of the mobile communication terminal according to an embodiment of the present invention;

FIGS. **4**A and **4**B are block diagrams illustrating the operation of the mobile communication terminal according to another embodiment of the present invention;

FIG. **5** is a block diagram illustrating the operation of the mobile communication terminal according to still another embodiment of the present invention; and

FIG. **6** is a diagram illustrating a configuration of a service providing system (server) for enabling a specific function to be operated when the mobile communication terminal is activated according to an embodiment of the present invention.

DETAILED DESCRIPTION

In the following detailed description, reference is made to the accompanying drawings that show, by way of illustration, specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention. It is to be understood that the various embodiments of the invention, although different, are not necessarily mutually exclusive. For example, a particular feature, structure, or characteristic described herein in connection with one embodiment may be implemented within other embodiments without departing from the spirit and scope of the present invention. Also, it is to be understood that the positions or arrangements of individual elements in the embodiment may be changed without separating the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims that should be appropriately interpreted along with the full range of equivalents to which the claims

are entitled. In the drawings, like reference numerals identify like or similar elements or functions through the several views.

Hereinafter, embodiments of the present invention will be explained in detail with reference to the accompanying drawing so that those skilled in the art can easily practice the invention.

TERMS

The term "mobile communication terminal" used herein refers to a digital device that includes a memory means and a microprocessor with computing capability as in a mobile phone, a navigation system, a web pad, a PDA, a workstation, a personal computer (for example, a notebook computer or the like) as a digital device including wired/wireless communication functions or other functions. Although an example of the mobile communication terminal (for example, a mobile phone) will be described in part of this specification, the present invention is not limited thereto.

The term "inactive state" used herein refers to a state in which the mobile communication terminal is communicable but a display screen is turned off. Even when the display screen is turned off, a predetermined function (for example, a music play function or the like) is operable. As described above, the term "inactive state" used herein refers to a concept encompassing states in which the display screen is turned off, regardless of whether or not the mobile communication terminal performs a predetermined operation. However, a state in which the mobile communication terminal is completely turned off is excluded.

The term "active state" used herein refers to a state in which the display screen of the mobile communication terminal is turned on. Switching from the "inactive state" to the "active state" refers to switching of the display screen from the OFF state to the ON state, regardless of information displayed on the display screen in the ON state. For example, the mobile communication terminal can be determined to be in the "active state" even when only a lock screen is displayed.

Mobile Communication Terminal

FIG. **1** is a diagram illustrating an external appearance of the mobile communication terminal according to an embodiment of the present invention.

Referring to FIG. **1**, the mobile communication terminal **100** according to this embodiment can include a display unit **110** and an activation button **120**. The mobile communication terminal **100** can further include a camera **130**.

Although the display unit **110** is provided on the front side of a frame constituting the mobile communication terminal **100**, the activation button **120** is provided on a lower part of the display unit **110**, and the camera. **130** is provided on an upper part of the display unit **110** as illustrated in FIG. **1**, other forms may be configured. For example, the display unit **110** need not necessarily be formed on the entire surface of the mobile communication terminal **100**. That is, the display unit **110** is only required to be formed on at least part of the mobile communication terminal **100**, and the activation button **120** is only required to be formed on a part different from that of the display unit **110**. In addition, the camera **130** can be formed on the other side on which the display unit **110** is not provided in the mobile communication terminal **100**.

The display unit **110** displays various information regarding operation states of the mobile communication terminal **100**, and also displays an interface for a user's input if the mobile communication terminal **100** drives a touch screen. In general, if a state in which the user's operation on the mobile communication terminal **100** is absent continues for a predetermined period of time, the mobile communication terminal **100** is in the inactive state. The user's operation refers to an input through the interface displayed on the display unit **110**, an operation through the button **120**, or an operation through a function key (for example, a volume control key or the like). A condition in which the inactive state is reached can be set by the user. For example, the condition can be set using a setting menu through the interface displayed on the display unit **110**. On the other hand, the state can be switched to the inactive state by pressing another button (for example, an ON/OFF button) provided on the mobile communication terminal **100**. For example, the mobile communication terminal **100** can be completely turned off if the ON/OFF button is pressed for a long time when the mobile communication terminal **100** is in the active state, but the mobile communication terminal **100** can be in the inactive state as a communicable state in which a phone call can be received if the ON/OFF button is pressed for a short time.

The activation button **120** is means for switching the mobile communication terminal **100** from the inactive state to the active state. That is, if the user presses the activation button **120** when the mobile communication terminal **100** is in the inactive state, switching to the active state is performed. FIG. **1** illustrates a state in which a lock screen is displayed on the display unit **110** after pressing the activation button **120** when the mobile communication terminal **100** is in the inactive state. However, the activation button **120** can function as means for another operation (for example, means for moving to a standby screen while a certain operation state is displayed on the display unit **110** or means for displaying a list of programs currently being operated).

According to an embodiment of the present invention, if the user presses the activation button **120** when the mobile communication terminal **100** is in the inactive state, the mobile communication terminal **100** performs a predetermined operation in addition to switching to the active state. For example, image information is displayed on a lock screen of the display unit **110** when the predetermined operation is being performed. The image information is displayed on a lock screen of the display unit when the predetermined operation is being performed. The lock screen is configured to be displayed when the mobile communication terminal **100** changes from the inactive state to the active state. The display unit **110** can provide an unlock means on a part of the display unit **110** when the predetermined operation is being performed.

When the mobile communication terminal **100** is in the inactive state, the user can set an operation to be performed by pressing the activation button **120**. For example, an operation of the mobile communication terminal **100** connected to the activation button **120** can be set using a setting menu through the interface displayed on the display unit **110**. In addition, according to an embodiment of the present invention, an operation which differs according to the number of presses or a press time of the activation button **120** can be performed when the mobile communication terminal **100** is in the inactive state. For example, a first operation can be set to be performed if the activation button **120** is pressed once, and a second operation can be set to be performed if the activation button **120** is continuously pressed three times. In addition, as another example, the first operation can be set to be performed if the activation button **120** is pressed once for a short time, and the second operation can be set to

be performed if the activation button **120** is pressed once for a long time. The mobile communication terminal **120** can include a predetermined clock circuit or timer to calculate the cumulative number of continuous presses of the activation button **120** and measure a period of time for which the activation button **120** is pressed. For example, the number of presses is determined to be two if the activation button **120** is re-pressed within a threshold time after one press. If the activation button **120** is pressed for the threshold time or more, a long press of the activation button **120** can be determined. Operations capable of being performed by pressing the activation button **120** in the inactive state will be described later.

According to an embodiment of the present invention, a sub-display unit **121** can be provided on the activation button **120**. Information regarding an operation to be performed by pressing the activation button **120** can be displayed on the sub-display unit **121**. Various types such as a shape, a character, a graphic, and color can be displayed. When the display type is the shape, a circle, a triangle, a rectangle, a hexagon, or the like can be displayed. For example, the circle can be displayed on the sub-display unit **121** when the first operation is set to be performed by pressing the activation button **120**, and the triangle can be displayed on the sub-display unit **121** when the second operation is set to be performed by pressing the activation button **120**, and vice versa. A display type of the sub-display unit **121** and a correspondence relationship between operations and displays can also be set by the user. For example, the user can select the first operation as the operation to be performed by pressing the activation button **120** from a setting menu and select the triangle as the display type of the sub-display unit **121** of the activation button **120**. Accordingly, the user can recognize that the first operation is performed when the user has pressed the activation button **120** because the triangle is displayed on the sub-display unit **121** even when the mobile communication terminal **100** is in the inactive state.

Although the sub-display unit **121** can be implemented by a general display such as liquid crystal, a liquid crystal display (LCD), or a light emitting diode (LED), the present invention is not limited thereto.

An operation of controlling driving of the display unit **110** and the sub-display unit **121** can be performed in the same processor and the same method or in different processors and different methods.

Hereinafter, various embodiments for operations of the mobile communication terminal **100** capable of being performed by pressing the activation button **120** will be described.

Operations through Activation Button

Operations to be described below can be performed by pressing the activation button **120** when the mobile communication terminal **100** is in the inactive state, and set by the user. The operations described below are only examples. Of course, other operations can be performed by pressing the activation button **120**.

1. Camera Activation Function

When the mobile communication terminal **100** is in the inactive state, the camera **130** provided in the mobile communication terminal **100** can be activated by pressing the activation button **120**, and a screen currently imaged by the camera **130** can be displayed on the display unit **110**.

FIG. **2** is a diagram illustrating an example in which the camera **130** is activated after the activation button **120** is pressed and an imaged scene is displayed on the display unit **110**.

2. Health Sensing and Health Information Transmission Functions

When the mobile communication terminal **100** is in the inactive state, the health sensing function can be driven, so that sensed health information can be transmitted to a medical authority such as a doctor or a protector.

FIGS. **3**A and **3**B are block diagrams of the mobile communication terminal **100** illustrating the above-described functions. FIGS. **3**A and **3**B illustrate functional block diagrams illustrating the above-described functions of the mobile communication terminal **100**.

Referring to FIG. **3**A, the mobile communication terminal **100** can include an activation sensing unit **310**, a health sensing unit **320**, and a health information transmission unit **330**.

When the mobile communication terminal **100** is in the inactive state, the activation sensing unit **310** senses whether or not the user has pressed the activation button **120**.

The health sensing unit **320** is operated when the activation sensing unit **310** has sensed that the activation button **120** has been pressed, and senses a health state of the user in various methods.

FIG. **3**B is a block diagram illustrating an example of the health sensing unit **320**. Referring to FIG. **3**B, the health sensing unit **320** can include a camera activation element **321**, an eyeball detection element **322**, and a health information acquisition element **323**.

The camera activation element **321** activates the camera **130** provided in the mobile communication terminal **100**. According to the activation of the camera **130**, a video currently captured by the camera **130** is displayed on the display unit **110**. If an eye or face of the user is imaged by the camera **130**, the eyeball detection element **322** performs a function of recognizing and extracting an eyeball of the user. A general eyeball detection algorithm can be used for eyeball detection. The health information acquisition element **323** acquires various health information through the eyeball detected through the eyeball detection element **322**. It is possible to recognize a stress index, a diabetes index, or retinal diseases of the user through a color or health state of the eyeball. A well-known algorithm in the related art can be used as an algorithm for detecting health information from characteristics of the detected eyeball.

The health information acquired as described above can be transmitted by the health information transmission unit **330** to the mobile communication terminal of a protector, a medical authority such as a doctor or the like, or a predetermined server. Information regarding the protector (for example, a phone number or an e-mail address) can be stored in advance. The acquired health information can be displayed on the display unit **110** so that the user can check the acquired health information.

The above-described operations, that is, the eyeball detection function and the health sensing function based on information regarding the detected eyeball, can be performed by installing a predetermined application. That is, the application includes an eyeball detection algorithm and a health sensing algorithm, so that the operations as described above can be performed by installing the application in the mobile communication terminal **100**. The user can download this application and install the downloaded application in the mobile communication terminal **100**. In addition, although an example of only health sensing through eyeball detection has been described above, it is possible to install an application, for example, for health sensing through face detection, and connect the application to the activation button **120**. The user can use the functions

as described above by setting the application to be operated immediately when the activation button **120** is pressed through the setting menu in the inactive state of the mobile communication terminal **100**.

In general, aged persons may not use the health sensing function due to a difficult operation even when the health sensing function is provided in the mobile communication terminal **100**. However, according to the above-described embodiment of the present invention, the health sensing function is operated only by pressing the activation button **120** without a special operation. Accordingly, it is possible to easily check health information and transmit the health information to a protector or a doctor.

3. User Identification Function

When the mobile communication terminal **100** is in the inactive state, a user authentication process can be performed for security by pressing the activation button **120**.

FIGS. **4**A and **4**B illustrate block diagrams of the mobile communication terminal **100** illustrating the above-described functions. Referring to FIG. **4**A, the mobile communication terminal **100** can include an activation sensing unit **410** and a user identification unit **420**.

When the mobile communication terminal **100** is in the inactive state, the activation sensing unit **410** senses whether or not the user has pressed the activation button **120**.

If the activation sensing unit **410** senses that the activation button **120** has been pressed, the user identification unit **420** operates the user identification function in various methods.

FIG. **4**B is a block diagram illustrating an example of the user identification unit **420**. Referring to FIG. **4**B, the user identification unit **420** can include a camera activation element **421**, an iris detection element **422**, and a user identification element **423**.

The camera activation element **421** activates the camera **130** provided in the mobile communication terminal **100**. According to the activation of the camera **130**, a video currently captured by the camera **130** is displayed on the display unit **110**. If an eye or face of the user is imaged by the camera **130**, the iris detection element **422** performs a function of recognizing and extracting an iris from an eyeball of the user. A general iris detection algorithm can be used for iris recognition. The user identification element **423** performs a function of comparing the iris detected by the iris detection element **422** to pre-stored iris information of the user, and authenticating the current user as a true user if the two match. For this, the user identification element **423** can use iris information of the user pre-stored in a database (not illustrated). The iris information of the user can be stored by registering information regarding the iris detected by the iris detection element **422** using a video of the true user first captured by the camera **130**. Predetermined identification information (for example, an identifier (ID), a password, a social security number, or the like) should be input to change the registered iris information of the true user. If the user identification element **423** authenticates the current user as the true user, the lock state of the mobile communication terminal **100** is released and all functions are available. If the current user is not authenticated as the true user, the lock state continues along with a display of an alarm message.

The above-described operations, that is, the iris detection function, the user identification function, and the user authentication function, can be performed by installing a predetermined application. That is, the application includes the iris detection algorithm and the authentication algorithm based on an iris comparison, so that the operations as described above can be performed by installing the application in the mobile communication terminal **100**. The user can download this application and install the downloaded application in the mobile communication terminal **100**. The user can use the functions as described above by setting the application to be operated immediately when the activation button **120** is pressed through the setting menu in the inactive state of the mobile communication terminal **100**.

Accordingly, it is possible to efficiently reduce security risks by setting the user authentication process to be performed through a separate setting, that is, by pressing the activation button **120**, when the mobile communication terminal **100** is used in a region vulnerable to the security risks.

Although an example of an authentication method through iris recognition has been described above, other authentication methods, for example, an authentication key matching method, a password matching method, a face recognition method, a fingerprint recognition method, and the like, can be used. That is, one or more authentication methods can be performed by pressing the activation button **120**.

4. Location Information Transmission Function

When the mobile communication terminal **100** is in the inactive state, collected location information can be transmitted to a protector or a protection authority (a police station or a fire station) by pressing the activation button **120**.

FIG. **5** illustrates a block diagram of the mobile communication terminal **100** illustrating the above-described function. Referring to FIG. **5**, the mobile communication terminal **100** can include an activation sensing unit **510**, a location information collection unit **520**, and a location information transmission unit **530**.

When the mobile communication terminal **100** is in the inactive state, the activation sensing unit **510** senses whether or not the user has pressed the activation button **120**.

When the activation sensing unit **510** senses that the activation button **120** has been pressed, the location information collection unit **520** collects a current location using a global positioning system (GPS) sensor or other location sensors.

The location information transmission unit **530** performs a function of transmitting location information collected by the location information collection unit **520** to a protector or a protection authority. In an urgent situation, a message indicating the urgent situation can be transmitted along with the location information. The location information and the urgent message can be optionally transmitted. On the other hand, this operation may differ according to the number of presses or a press time of the activation button **120**. For example, it is possible to set an operation of transmitting the urgent message to a police station along with the location information when the activation button **120** is pressed for a short time, and set an operation of transmitting only the location information to the protector when the activation button **120** is pressed for a long time. In addition, as another example, it is possible to set an operation of transmitting the location information to the police station along with the urgent message when the activation button **120** is pressed once and set an operation of transmitting the location information to a fire station along with the urgent message when the activation button **120** is pressed three times.

The above-described operations can be performed by installing a predetermined application. That is, the application includes an algorithm for collecting location information and transmitting the collected located information along with an urgent message, so that the operations as described above can be performed by installing the application in the

mobile communication terminal **100**. The user can download this application and install the downloaded application in the mobile communication terminal **100**. The user can use the functions as described above by setting the application to be operated immediately when the activation button **120** is pressed through the setting menu in the inactive state of the mobile communication terminal **100**.

Accordingly, it is possible to efficiently escape a dangerous situation because the user can report the dangerous situation to a protector or a protection authority along with his/her location information with only a simple operation.

5. File Transmission Function

When the mobile communication terminal **100** is in the inactive state, a function of uploading content (for example, contact information, a photo, a moving image, or an application) included in the mobile communication terminal **100** to another mobile communication terminal **100** or a media space (for example, a personal media space such as Twitter, Facebook, or a blog or a community media space such as a café or club community) can be operated.

6. Mode Change During Drive

When the mobile communication terminal **100** is in the inactive state, the mobile communication terminal **100** can be switched to a hands-free function or some communication functions (a voice communication function, a short message service (SMS) function, and an Internet function) of the mobile communication terminal **100** can be interrupted by pressing the activation button **120**.

Accordingly, it is possible to significantly reduce traffic accident risks by switching the mode of the mobile communication terminal **100** or interrupting the communication function with only a simple operation of pressing the activation button **120** during driving.

7. Advertisement Display Operation

When the mobile communication terminal **100** is in the inactive state, the activation button **120** is pressed so that an advertisement can be displayed on at least a part of the display unit **110**. The advertisement display can be implemented by displaying an advertisement provided from an external server in real time, and driven by an advertisement-related application previously installed within the mobile communication terminal **100**.

This application for enabling the advertisement to be displayed may be received in advance from an advertisement distribution server, an advertiser server, or a server for providing a service according to an embodiment of the present invention, that is, a service for driving a predetermined application according to a button input that switches the mobile communication terminal **100** from the inactive state to the active state.

An advertisement display method can be implemented by a method of randomly displaying advertisements of advertisers joining this service, a customized advertisement display method based on user information, and an advertisement display method based on a current location.

The user information can be pre-stored in a corresponding application and pre-transmitted to a server that provides an advertising service. On the other hand, location information collection necessary for the advertisement display method based on the current location can be used in conjunction with 4. Location Information Function described above. That is, current location information is collected simultaneously with the activation of the mobile communication terminal **100** and transmitted to an advertising-service providing server. Based on the current location information, advertisements related to the current location are distributed to the mobile communication terminal **100**.

8. Other Application Operations

If a predetermined operation is performed in addition to switching to a simple active state by pressing the activation button **120** when the mobile communication terminal **100** is in the inactive state, this belongs to the scope of the present invention.

For example, an entertainment operation (for example, an operation of a music or video player, execution of a game application, or news reception) can be performed by pressing the activation button **120**.

Operation Standby of Application

According to an embodiment of the present invention, the above-described predetermined applications are driven when the mobile communication terminal **100** is switched from the inactive state to the active state.

For this, when the mobile communication terminal **100** is in the inactive state, the applications should be maintained in an operation standby state. When the mobile communication terminal **100** is switched from the active state to the inactive state, the above-described applications can be in the operation standby state. That is, a selected application to be driven when the mobile communication terminal **100** is switched to the active state can be in the operation standby state when the mobile communication terminal **100** is switched to the inactive state.

However, a predetermined application operable when the mobile communication terminal **100** is switched from the inactive state to the active state regardless of the operation standby state or an operation disable state of the application belongs to the present invention.

Service Providing Server

Hereinafter, the service providing server according to an embodiment will be described.

FIG. **6** is a diagram illustrating a configuration of a service providing system (server) for enabling a specific function to be operated when the mobile communication terminal is activated according to an embodiment of the present invention.

Referring to FIG. **6**, the service providing server **200** can include an application providing unit **210**, an activation sensing unit **220**, an application driving unit **230**, a communication unit **240**, and a control unit **250**. According to an embodiment of the present invention, the application providing unit **210**, the activation sensing unit **220**, the application driving unit **230**, the communication unit **240**, and the control unit **250** of the service providing server **200** can be program modules or hardware communicable with an external apparatus. The program modules or hardware can be included in the service providing server **200** or another apparatus communicable with the service providing server **200** in the form of an operation system, an application program module, and other program modules, and physically stored in various known storage apparatuses. On the other hand, these program modules or hardware include a routine, a sub routine, a program, an object, a component, and a data structure, each of which executes a specific task to be described later or specific abstract data, but the present invention is not limited thereto.

The application providing unit **210** enables the predetermined application described above to be transmitted to the mobile communication terminal **100**. The user can receive a desired application by accessing the service providing server **200** through the mobile communication terminal **100**, and install the received application within the mobile communication terminal **100**. The application can include a control function of controlling a predetermined operation to be performed when the mobile communication terminal **100** is

activated, and can independently perform the predetermined operation. For example, the application transmitted from the application providing unit **210** can be an application for enabling an advertisement to be displayed on the display unit **110** when the mobile communication terminal **100** is switched from the inactive state to the active state.

The activation sensing unit **220** according to an embodiment can sense the switching of the mobile communication terminal **100** from the inactive state to the active state. The user can transmit a signal indicating the activation of the mobile communication terminal **100** to the service providing server **200** by pressing the activation button of the mobile communication terminal **100**.

The application driving unit **230** according to an embodiment enables a predetermined operation to be performed in the mobile communication terminal **100** when the activation of the mobile communication terminal **100** is sensed. That is, the application driving unit **230** drives a predetermined application within the mobile communication terminal **100** and enables a related screen to be displayed on the display unit **110**. For example, if the activation of the mobile communication terminal **100** is sensed, an advertisement-related application can be executed. The application driving unit **230** can perform an additional operation related to driving of a corresponding application. For example, an application for enabling an advertisement to be displayed is driven to receive current location information and control advertisement information related to a corresponding location to be displayed on the display unit **110** of the mobile communication terminal **100**. In addition, it is possible to collect user information (for example, a sex, an age, a region of residence, a matter of interest, and the like) and control advertisement information customized for a corresponding user to be displayed. Necessary advertisement information (for example, advertisement information to be transmitted to the mobile communication terminal **100** based on location information or user information) can be transmitted from an advertiser server or an advertisement distribution server. As described above, the application driving unit **230** can drive a predetermined application simultaneously with the activation within the mobile communication terminal **100** and perform an additional operation for optimally driving the application.

The communication unit **240** according to an embodiment makes information communication between the service providing server **200**, the mobile communication terminal **100**, and another apparatus possible. That is, the communication unit **240** can transmit an application to the mobile communication terminal **100** and receive an activation signal and information for driving the application from the mobile communication terminal **100**.

The control unit **250** according to an embodiment can perform a function of controlling data flows between the application providing unit **210**, the activation sensing unit **220**, the application driving unit **230**, and the communication unit **240**. That is, the control unit **250** according to the embodiment can control the application providing unit **210**, the activation sensing unit **220**, the application driving unit **230**, and the communication unit **240** to perform unique functions.

According to embodiments of the present invention, it is possible to enable an advantageous function to be utilized and improve an interest of a terminal user because various operations can be performed only by pressing an activation button when a terminal is in an inactive state.

According to embodiments of the present invention, it is possible to enable health check of an aged person to be performed with a simple operation and enable information regarding the health check to be transmitted to a protector or a medical authority.

According to embodiments of the present invention, it is possible to enable a user authentication process of which the security is enhanced to be operable with only a simple procedure.

According to embodiments of the present invention, it is possible to enable an urgent message to be transmitted along with location information with only a simple operation in an urgent situation.

The embodiments according to the present invention described above may be implemented in the form of program instructions that may be executed through various computer components and recorded on a computer-readable medium. The computer-readable medium may include program instructions, data files, data structures, and the like individually or in combination. The program instructions recorded on the medium may be specifically designed for the present invention or may be well known to one of ordinary skill in the art of software. Examples of the computer-readable recording medium include a magnetic medium such as a hard disk, a floppy disk, or a magnetic tape, an optical medium such as a compact disc-read only memory (CD-ROM) or a digital versatile disc (DVD), a magneto-optical medium such as a floptical disk, and a hardware device such as ROM, a random access memory (RAM), or a flash memory that is specially designed to store and execute program instructions. Examples of the program instructions include not only machine code generated by a compiler or the like but also high-level language codes that may be executed by a computer using an interpreter or the like. The hardware device described above may be constructed so as to operate as one or more software modules for performing the operations of the embodiments of the present invention, and vice versa.

Although the present invention has been described with reference to the specific embodiments and drawings together with specific details such as detailed components, the above description is provided only for better understanding of the present invention and it will be apparent to those skilled in the art that various modifications and variations may be made from the above description.

While embodiments have been disclosed herein, it should be understood that other variations may be possible. Such variations are not to be regarded as a departure from the spirit and scope of embodiments of the present application, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

What is claimed is:

1. A mobile communication terminal comprising:

a touch screen display;

a camera;

a power button configured to turn on and off the terminal by pressing; and

an activation button separate from the power button and located outside the touch screen display, the activation button configured for pressing to turn on the touch screen display and to initiate one or more additional functions of the terminal,

wherein the terminal has a first function and a second function to perform in response to user input via the activation button and is configured to provide user settings for configuring at least one of the first and second functions such that at least one of the first and second functions is set to be performed in addition to

turning on the touch screen display upon pressing of the activation button while the touch screen display is turned off, wherein the first and second functions are different from each other and selected from the group consisting of fingerprint authentication, activating the camera, and an operation that involves playing a sound,

wherein upon one-time pressing of the activation button while the touch screen display is turned off, the terminal is configured to turn on the touch screen display and further perform at least one of the first and second functions in addition to turning on the touch screen display such that:

a lock screen is displayed on the touch screen display upon turning on the touch screen display in response to the one-time pressing of the activation button while the touch screen display is turned off,

in response to the one-time pressing of the activation button, the first function is performed in addition to turning on the touch screen display for displaying the lock screen thereon, and

the second function is performed when the one-time pressing is for long time longer than a reference time period,

wherein at least one of the first and second functions is performed subsequent to turning on the touch screen display and displaying the lock screen in response to the one-time pressing of the activation button,

wherein the touch screen display displays the lock screen when at least one of the first and second functions is being performed.

2. The terminal of claim **1**, wherein the first function is the fingerprint authentication.

3. The terminal of claim **2**, wherein upon one-time pressing of the activation button for long time while the touch screen display is turned off, the terminal is configured to turn on the touch screen display for displaying the lock screen and further configured to display the lock screen when the second function is being performed.

4. The terminal of claim **1**, wherein one of the first and second functions comprises the fingerprint authentication, wherein the terminal is configured to turn on the touch screen display for displaying the lock screen and further configured to display the lock screen when the fingerprint authentication is being performed in response to the one-time pressing of the activation button while the touch screen display is turned off.

5. The terminal of claim **4**, wherein the terminal is configured to continue its lock state when the fingerprint authentication fails to authenticate a user, whereas the terminal is configured to release the lock state and make its other functions available when the fingerprint authentication authenticates a user.

6. The terminal of claim **5**, wherein the terminal is configured to display a message on the touch screen display when the lock state continues due to failure of user authentication by the fingerprint authentication.

7. The terminal of claim **1**, wherein at least one of the first and second functions is associated with software downloadable by the terminal.

8. The terminal of claim **1**, wherein the terminal is configured to have a mobile application stay in a standby state when the touch screen display is turned off while the mobile application is running, wherein in response to the one-time pressing of the activation button while the touch screen display is turned off, the terminal is configured to perform at least one of the first and second functions regardless of whether at least one of the first and second functions is in its standby state or an operation disable state.

9. The terminal of claim **1**, wherein upon repeated pressing of the activation button while the touch screen display is turned off, the terminal is configured to turn on the touch screen display and further perform a third function other than the first and second functions in addition to turning on the touch screen display.

10. The terminal of claim **1**, wherein the terminal comprises a smartphone which comprises an activation sensor configured to detect pressing of the activation button and a user identification module configured to perform the fingerprint authentication.

11. A method of operating a mobile computing terminal, the method comprises:

providing a mobile computing terminal which comprises a touch screen display, a camera, a power button for pressing to turn on/off the terminal, and an activation button for pressing to turn on the touch screen display, the activation button located outside the touch screen display, the terminal having a first function and a second function that are different from each other and selected from the group consisting of fingerprint authentication, activating the camera, and an operation that involves playing a sound;

detecting one-time pressing of the activation button while the terminal is in an inactive state in which the touch screen display is turned off;

in response to the one-time pressing, changing the terminal from the inactive state to an active state in which the touch screen display is turned on; and

in addition to changing to the active state, further performing at least one of the first and second functions without additional user input other than the one-time pressing;

wherein in changing to the active state and performing at least one of the first and second functions, the terminal operates such that:

a lock screen is displayed on the touch screen display upon changing from the inactive state to the active state in response to the one-time pressing of the activation button while the touch screen display is turned off,

in response to the one-time pressing of the activation button, the first function is performed in addition to changing to the active state for displaying the lock screen, and

the second function is performed when the one-time pressing is for long time longer than a reference time period,

wherein at least one of the first and second functions is initiated subsequent to changing to the active state and displaying the lock screen in response to the one-time pressing of the activation button,

wherein the touch screen display displays the lock screen when at least one of the first and second functions is being performed.

12. The method of claim **11**, further comprising:

receiving user input on a setting menu of the terminal; and

configuring, based on the user input, settings of the terminal such that the at least one of the first and second functions is set to be performed in addition to changing to the active state upon one-time pressing of the activation button while the terminal is in its inactive state.

13. The method of claim **11**, wherein the at least one of the first and second functions comprises the fingerprint authentication, in which the lock screen is displayed on the touch

screen display when the fingerprint authentication is being performed, wherein in performing the fingerprint authentication, the terminal operates such that;

a lock state of the terminal continues when the fingerprint authentication fails to authenticate a user, and

the lock state is released for enabling other functions of the terminal when the fingerprint authentication authenticates a user.

14. The method of claim **13**, wherein the touch screen display displays a message thereon when the lock state continues due to failure of user authentication by the fingerprint authentication.

15. The method of claim **11**, wherein the at least one of the first and second functions is associated with software downloadable by the terminal.

16. The method of claim **11**, wherein the terminal is configured to have a mobile application stay in a standby state when the touch screen display is turned off while the mobile application is running, wherein in response to the one-time pressing of the activation button while the terminal is in its inactive state, the terminal performs the at least one of the first and second functions regardless of whether the at least one of the first and second functions is in its standby state or an operation disable state.

17. The method of claim **11**, further comprising:

detecting repeated pressing of the activation button while the terminal is in its inactive state;

in response to the repeated pressing, changing the terminal from the inactive state to the active state; and

in addition to changing to the active state, further performing a third function other than the first and second functions without additional user input;

wherein in changing to the active state and performing the at least one of the first and second functions, the terminal operates such that:

the touch screen display displays the lock screen thereon as the terminal changes to the active state in response to the repeated pressing,

the lock screen is displayed on the touch screen display when the third function is being performed.

18. The method of claim **11**, wherein the terminal comprises a smartphone which comprises an activation sensor configured to detect pressing of the activation button and a user identification module configured to perform the fingerprint authentication.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,633,373 B2
APPLICATION NO. : 14/848156
DATED : April 25, 2017
INVENTOR(S) : Jae Lark Jung et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification

In Column 1 at Line 37 (approx.), Change “that is” to --that is,--.

In Column 1 at Line 57, Change “unit” to --unit;--.

In Column 2 at Line 11, Change “termini” to --terminal--.

In Column 3 at Line 52, Change “camera.” to --camera--.

In the Claims

In Column 13 at Line 6, In Claim 1, change “and an operation that involves playing a sound,” to --playing music and a hands-free function,--.

In Column 14 at Lines 24-25, In Claim 11, change “and an operation that involves playing a sound;” to --playing music and a hands-free function;--.

Signed and Sealed this
Twenty-seventh Day of June, 2017



Joseph Matal
Performing the Functions and Duties of the
Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,633,373 B2
APPLICATION NO. : 14/848156
DATED : April 25, 2017
INVENTOR(S) : Jae Lark Jung

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims

In Column 13 at Line 23, in Claim 1, change “for long time” to --for a long time,--.

In Column 13 at Line 35, in Claim 3, change “for long time” to --for the long time--.

In Column 14 at Line 49, in Claim 11, change “for long time” to --for a long time,--.

Signed and Sealed this
Twentieth Day of March, 2018



Andrei Iancu
Director of the United States Patent and Trademark Office

Exhibit “C”

US009779419B2

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

(10) **Patent No.: US 9,779,419 B2**
(45) **Date of Patent: *Oct. 3, 2017**

(54) **ACTIVATING DISPLAY AND PERFORMING USER AUTHENTICATION IN MOBILE TERMINAL WITH ONE-TIME USER INPUT**

(71) Applicant: **FIRSTFACE CO., LTD.**, Seoul (KR)

(72) Inventors: **Jae Lark Jung**, Goyang-si (KR); **Kyoung duck Bae**, Seoul (KR)

(73) Assignee: **FIRSTFACE CO., LTD.**, Seoul (KR)

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

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/848,191**

(22) Filed: **Sep. 8, 2015**

(65) **Prior Publication Data**

US 2015/0378595 A1 Dec. 31, 2015

Related U.S. Application Data

(63) Continuation of application No. 14/538,880, filed on Nov. 12, 2014, now Pat. No. 9,179,298, which is a (Continued)

(30) **Foreign Application Priority Data**

Oct. 19, 2011 (KR) 10-2011-0106839

(51) **Int. Cl.**
H04M 1/00 (2006.01)
G06Q 30/02 (2012.01)
(Continued)

(52) **U.S. Cl.**
CPC ***G06Q 30/0262*** (2013.01); ***G06F 3/04883*** (2013.01); ***G06F 21/32*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04W 4/02; H04W 12/08; H04W 8/22; H04W 52/027; H04W 12/06; H04M 1/67;
(Continued)

(56) **References Cited**

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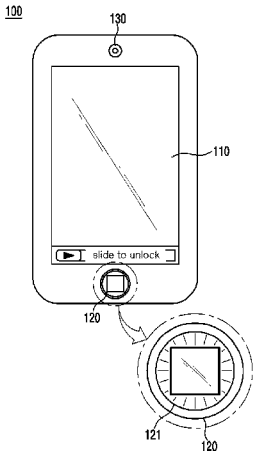
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Primary Examiner — Charles Shedrick
(74) *Attorney, Agent, or Firm* — Knobbe Martens Olson & Bear LLP

(57) **ABSTRACT**

Disclosed is a mobile terminal including a touch screen display, a power button and an activation button for turning on the touch screen display. Upon detection of one-time pressing of the activation button while the touch screen display is turned off, the terminal is configured to turn on the touch screen display and perform a fingerprint authentication function in addition to turning on the touch screen display. The touch screen display displays a lock screen thereon as it is turned on in response to the detection of one-time pressing, and the lock screen is displayed on the touch screen display when the fingerprint authentication function is being performed. A lock state of the terminal continues when the fingerprint authentication function fails to authenticate a user, and the lock state is released for
(Continued)



enabling other functions of the terminal when the fingerprint authentication function authenticates a user.

18 Claims, 5 Drawing Sheets

Related U.S. Application Data

continuation of application No. 14/058,761, filed on Oct. 21, 2013, now Pat. No. 8,918,074, which is a continuation of application No. 13/590,483, filed on Aug. 21, 2012, now Pat. No. 8,831,557.

(51) **Int. Cl.**

H04W 4/02	(2009.01)
H04M 1/67	(2006.01)
H04M 1/725	(2006.01)
H04W 8/22	(2009.01)
G06F 21/32	(2013.01)
H04W 12/06	(2009.01)
H04W 52/02	(2009.01)
G06F 3/0488	(2013.01)
G06K 9/00	(2006.01)
H04L 29/06	(2006.01)
H04W 12/08	(2009.01)
G06F 21/36	(2013.01)
G06F 21/62	(2013.01)
H04W 4/22	(2009.01)
H04W 88/02	(2009.01)

(52) **U.S. Cl.**

CPC ***G06F 21/36*** (2013.01); ***G06F 21/62*** (2013.01); ***G06K 9/00006*** (2013.01); ***G06K 9/00087*** (2013.01); ***G06K 9/00221*** (2013.01); ***G06K 9/00597*** (2013.01); ***G06Q 30/0241*** (2013.01); ***G06Q 30/0261*** (2013.01); ***G06Q 30/0267*** (2013.01); ***G06Q 30/0269*** (2013.01); ***H04L 63/0861*** (2013.01); ***H04M 1/67*** (2013.01); ***H04M 1/7258*** (2013.01); ***H04M 1/72519*** (2013.01); ***H04W 4/02*** (2013.01); ***H04W 8/22*** (2013.01); ***H04W 12/06*** (2013.01); ***H04W 12/08*** (2013.01); ***H04W 52/027*** (2013.01); *H04M 2250/12* (2013.01); *H04M 2250/52* (2013.01); *H04W 4/22* (2013.01); *H04W 88/02* (2013.01); *Y02B 60/50* (2013.01)

(58) **Field of Classification Search**

CPC H04M 1/7258; H04M 2250/52; H04M 1/72519; G06F 21/32

USPC 455/411, 414.1, 420, 404.2, 410; 726/1, 726/16

See application file for complete search history.

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FIG. 1

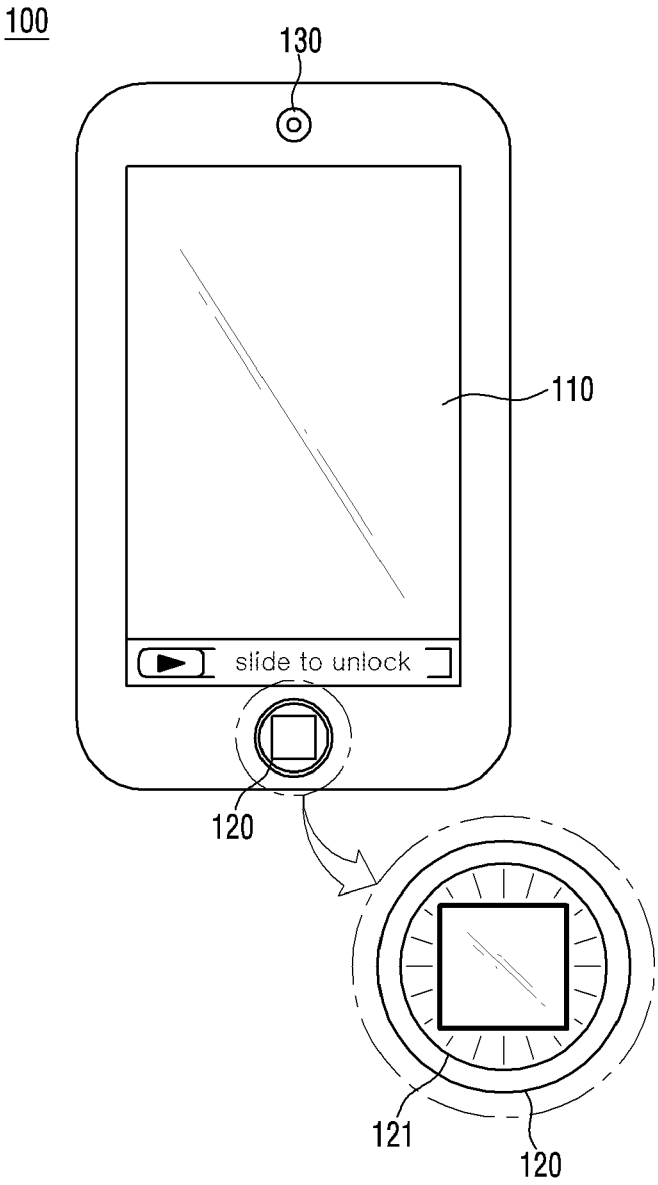


FIG. 2

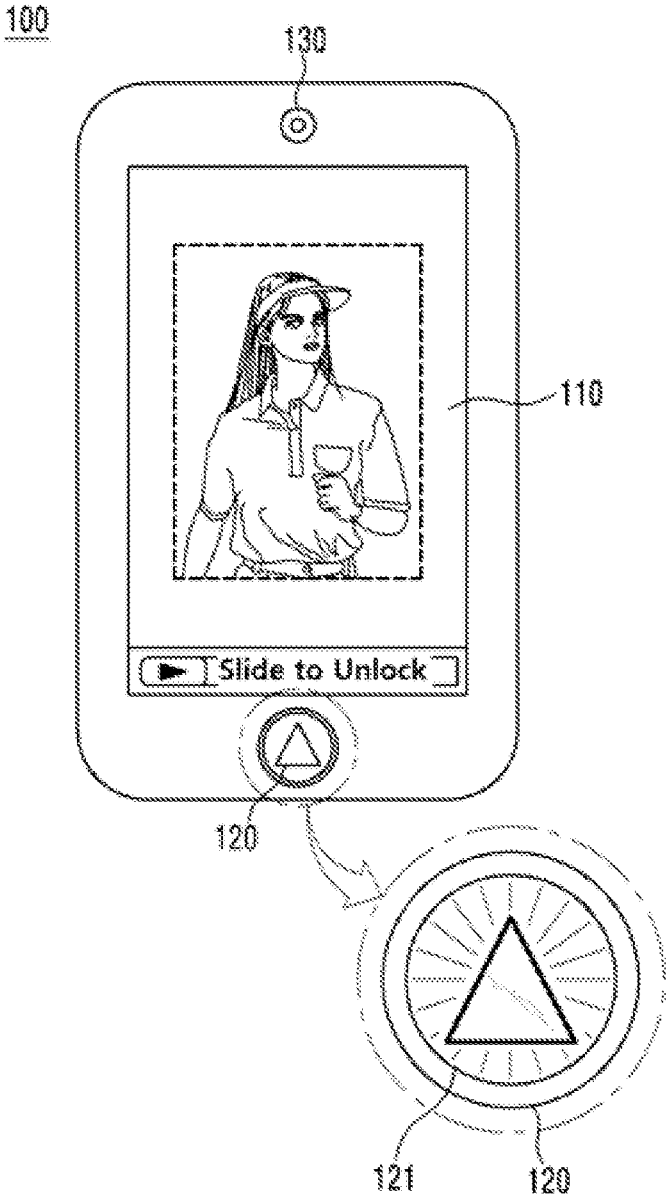


FIG. 3A

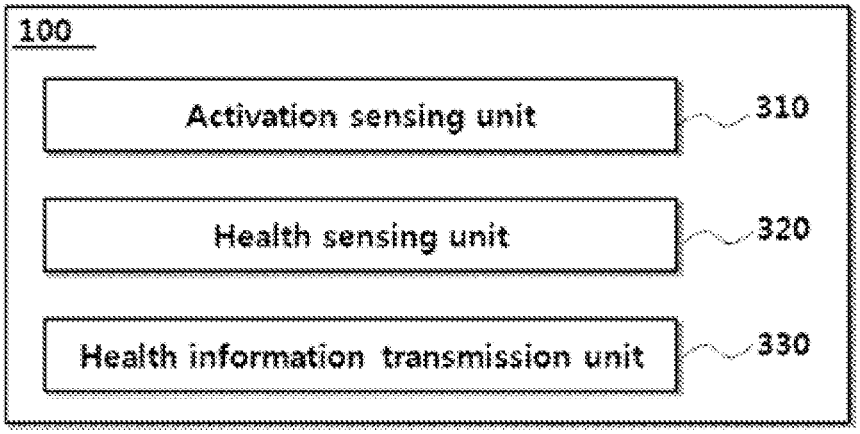

100
Activation sensing unit
310
Health sensing unit
320
Health information transmission unit
330

FIG. 3B

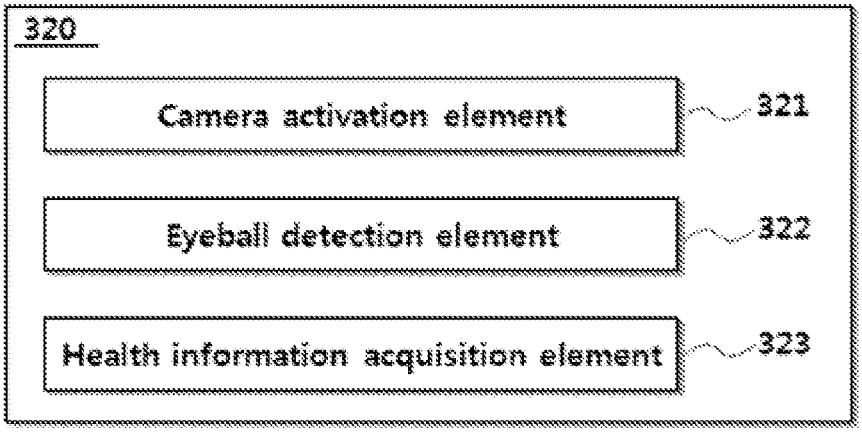

320
Camera activation element
321
Eyeball detection element
322
Health information acquisition element
323

FIG. 4A

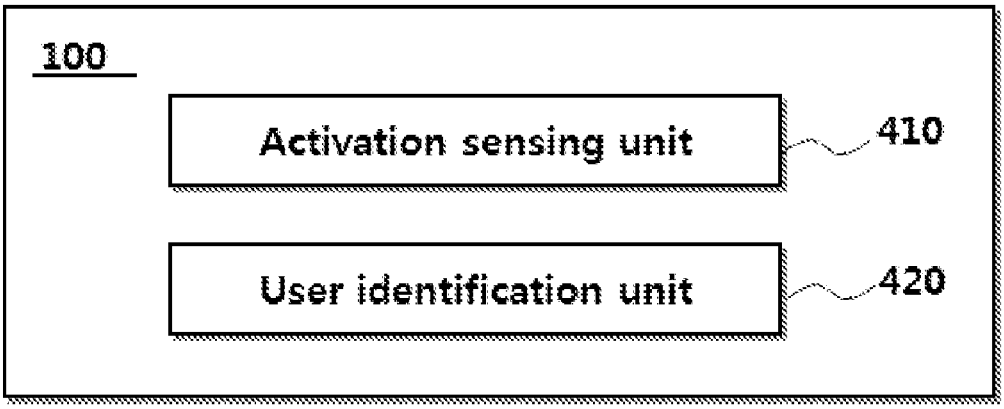

100
Activation sensing unit
410
User identification unit
420

FIG. 4B

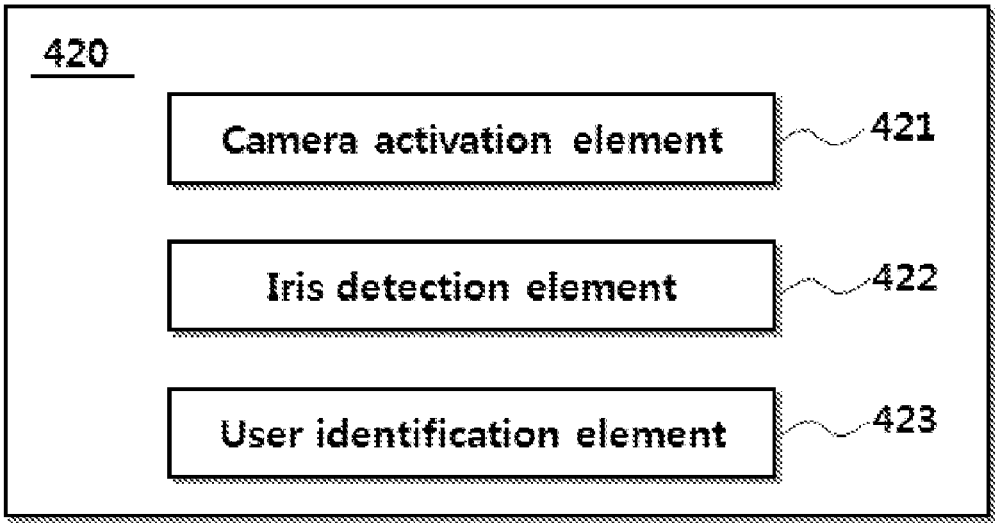

420
Camera activation element
421
Iris detection element
422
User identification element
423

FIG. 5

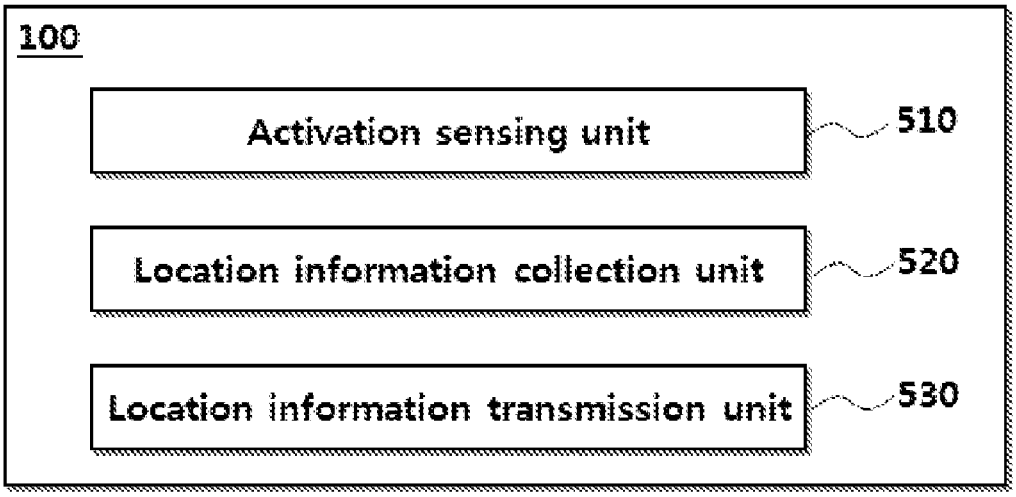
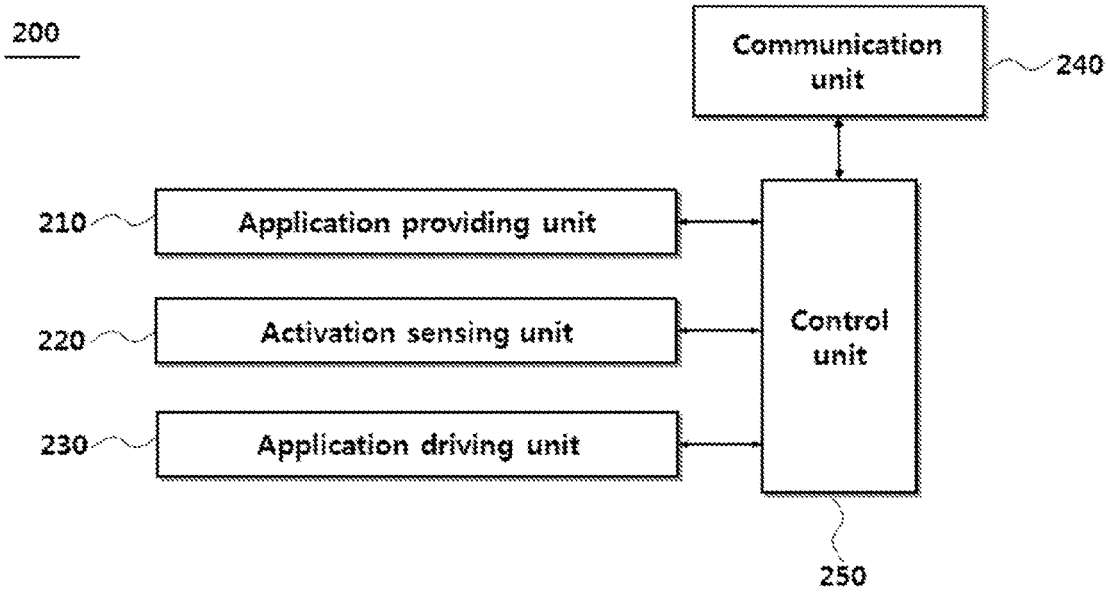

100
Activation sensing unit
510
Location information collection unit
520
Location information transmission unit
530

FIG. 6


200
Communication unit
240
210
Application providing unit
220
Activation sensing unit
230
Application driving unit
Control unit
250

ACTIVATING DISPLAY AND PERFORMING USER AUTHENTICATION IN MOBILE TERMINAL WITH ONE-TIME USER INPUT

INCORPORATION BY REFERENCE TO ANY PRIORITY APPLICATIONS

Any and all applications for which a foreign or domestic priority claim is identified in the Application Data Sheet as filed with the present application are hereby incorporated by reference under 37 CFR 1.57.

BACKGROUND

Field

The disclosure relates to a method and mobile communication terminal for performing a specific function when a mobile communication terminal is activated, and more particularly to a method and mobile communication terminal for performing various functions according to the number of presses or a press time of a button for switching from an inactive state to an active state.

Description of the Related Art

Recently, various terminals, for example, such as smart phones, mobile phones, personal digital assistants (PDAs), and web pads, having not only communication functions but also various other functions have come into wide use. These terminals have rapidly been generalized because not only can an environment identical or similar to a desktop computer be implemented anytime and anywhere on the above-described terminals, but they also include a telephone function.

At present, in order to operate a corresponding function among various functions included in a terminal such as those described above, a certain operation should be performed in a state in which the terminal is in an active state, that is, in a state in which a display is turned on. In addition, in order to add a certain function, an interface or button for performing the function should be added to the terminal. For example, it is possible to transmit a rescue signal indicating an emergency or urgent situation by pressing an emergency button only when the emergency button for the urgent situation is separately added.

On the other hand, users of the terminals described above perform operations of habitually taking out and activating the terminals on the move or in a standby state while carrying the terminals.

SUMMARY

According to an embodiment, there is provided a mobile communication terminal comprising: a display unit including a touch screen capable of receiving user's input through the touch screen for controlling the mobile communication terminal; a memory unit; a communication unit; and an activation sensing unit, wherein the activation sensing unit detects a change from an inactive state of the mobile communication terminal to an active state of the mobile communication terminal, wherein the inactive state is defined that the display unit being turned off while the mobile communication terminal being communicable and the active state is defined that the display unit being turned on while the mobile communication terminal being communicable, wherein the mobile communication terminal performs a predetermined operation by an application of the mobile communication terminal when the activation sensing unit detects the change from the inactive state to the active state.

According to an another embodiment, there is provided a method for performing a specific function when a mobile communication terminal is activated, the method comprising: sensing a change from an inactive state of the mobile communication terminal to an active state of the mobile communication terminal, wherein the inactive state is defined that a display unit being turned off while the mobile communication terminal being communicable, wherein the active state is defined that a display unit being turned on while the mobile communication terminal being communicable; and performing a predetermined operation by an application of the mobile communication terminal when the mobile communication terminal changes from the inactive state to the active state.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are described in further detail below with reference to the accompanying drawings. It should be understood that various aspects of the drawings may have been exaggerated for clarity:

FIG. **1** is a diagram illustrating an external appearance of a mobile communication terminal according to an embodiment of the present invention;

FIG. **2** is a diagram illustrating an example of an operation of the mobile communication terminal when an activation button has been pressed according to an embodiment of the present invention;

FIGS. **3**A and **3**B are block diagrams illustrating the operation of the mobile communication terminal according to an embodiment of the present invention;

FIGS. **4**A and **4**B are block diagrams illustrating the operation of the mobile communication terminal according to another embodiment of the present invention;

FIG. **5** is a block diagram illustrating the operation of the mobile communication terminal according to still another embodiment of the present invention; and

FIG. **6** is a diagram illustrating a configuration of a service providing system (server) for enabling a specific function to be operated when the mobile communication terminal is activated according to an embodiment of the present invention.

DETAILED DESCRIPTION

In the following detailed description, reference is made to the accompanying drawings that show, by way of illustration, specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention. It is to be understood that the various embodiments of the invention, although different, are not necessarily mutually exclusive. For example, a particular feature, structure, or characteristic described herein in connection with one embodiment may be implemented within other embodiments without departing from the spirit and scope of the present invention. Also, it is to be understood that the positions or arrangements of individual elements in the embodiment may be changed without separating the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims that should be appropriately interpreted along with the full range of equivalents to which the claims

are entitled. In the drawings, like reference numerals identify like or similar elements or functions through the several views.

Hereinafter, embodiments of the present invention will be explained in detail with reference to the accompanying drawing so that those skilled in the art can easily practice the invention.

TERMS

The term "mobile communication terminal" used herein refers to a digital device that includes a memory means and a microprocessor with computing capability as in a mobile phone, a navigation system, a web pad, a PDA, a workstation, a personal computer (for example, a notebook computer or the like) as a digital device including wired/wireless communication functions or other functions. Although an example of the mobile communication terminal (for example, a mobile phone) will be described in part of this specification, the present invention is not limited thereto.

The term "inactive state" used herein refers to a state in which the mobile communication terminal is communicable but a display screen is turned off. Even when the display screen is turned off, a predetermined function (for example, a music play function or the like) is operable. As described above, the term "inactive state" used herein refers to a concept encompassing states in which the display screen is turned off, regardless of whether or not the mobile communication terminal performs a predetermined operation. However, a state in which the mobile communication terminal is completely turned off is excluded.

The term "active state" used herein refers to a state in which the display screen of the mobile communication terminal is turned on. Switching from the "inactive state" to the "active state" refers to switching of the display screen from the OFF state to the ON state, regardless of information displayed on the display screen in the ON state. For example, the mobile communication terminal can be determined to be in the "active state" even when only a lock screen is displayed.

Mobile Communication Terminal

FIG. **1** is a diagram illustrating an external appearance of the mobile communication terminal according to an embodiment of the present invention.

Referring to FIG. **1**, the mobile communication terminal **100** according to this embodiment can include a display unit **110** and an activation button **120**. The mobile communication terminal **100** can further include a camera **130**.

Although the display unit **110** is provided on the front side of a frame constituting the mobile communication terminal **100**, the activation button **120** is provided on a lower part of the display unit **110**, and the camera **130** is provided on an upper part of the display unit **110** as illustrated in FIG. **1**, other forms may be configured. For example, the display unit **110** need not necessarily be formed on the entire surface of the mobile communication terminal **100**. That is, the display unit **110** is only required to be formed on at least part of the mobile communication terminal **100**, and the activation button **120** is only required to be formed on a part different from that of the display unit **110**. In addition, the camera **130** can be formed on the other side on which the display unit **110** is not provided in the mobile communication terminal **100**.

The display unit **110** displays various information regarding operation states of the mobile communication terminal **100**, and also displays an interface for a user's input if the mobile communication terminal **100** drives a touch screen. In general, if a state in which the user's operation on the mobile communication terminal **100** is absent continues for a predetermined period of time, the mobile communication terminal **100** is in the inactive state. The user's operation refers to an input through the interface displayed on the display unit **110**, an operation through the button **120**, or an operation through a function key (for example, a volume control key or the like). A condition in which the inactive state is reached can be set by the user. For example, the condition can be set using a setting menu through the interface displayed on the display unit **110**. On the other hand, the state can be switched to the inactive state by pressing another button (for example, an ON/OFF button) provided on the mobile communication terminal **100**. For example, the mobile communication terminal **100** can be completely turned off if the ON/OFF button is pressed for a long time when the mobile communication terminal **100** is in the active state, but the mobile communication terminal **100** can be in the inactive state as a communicable state in which a phone call can be received if the ON/OFF button is pressed for a short time.

The activation button **120** is means for switching the mobile communication terminal **100** from the inactive state to the active state. That is, if the user presses the activation button **120** when the mobile communication terminal **100** is in the inactive state, switching to the active state is performed. FIG. **1** illustrates a state in which a lock screen is displayed on the display unit **110** after pressing the activation button **120** when the mobile communication terminal **100** is in the inactive state. However, the activation button **120** can function as means for another operation (for example, means for moving to a standby screen while a certain operation state is displayed on the display unit **110** or means for displaying a list of programs currently being operated).

According to an embodiment of the present invention, if the user presses the activation button **120** when the mobile communication terminal **100** is in the inactive state, the mobile communication terminal **100** performs a predetermined operation in addition to switching to the active state. For example, image information is displayed on a lock screen of the display unit **110** when the predetermined operation is being performed. The image information is displayed on a lock screen of the display unit when the predetermined operation is being performed. The lock screen is configured to be displayed when the mobile communication terminal **100** changes from the inactive state to the active state. The display unit **110** can provide an unlock means on a part of the display unit **110** when the predetermined operation is being performed.

When the mobile communication terminal **100** is in the inactive state, the user can set an operation to be performed by pressing the activation button **120**. For example, an operation of the mobile communication terminal **100** connected to the activation button **120** can be set using a setting menu through the interface displayed on the display unit **110**. In addition, according to an embodiment of the present invention, an operation which differs according to the number of presses or a press time of the activation button **120** can be performed when the mobile communication terminal **100** is in the inactive state. For example, a first operation can be set to be performed if the activation button **120** is pressed once, and a second operation can be set to be performed if the activation button **120** is continuously pressed three times. In addition, as another example, the first operation can be set to be performed if the activation button **120** is pressed once for a short time, and the second operation can be set to

be performed if the activation button **120** is pressed once for a long time. The mobile communication terminal **120** can include a predetermined clock circuit or timer to calculate the cumulative number of continuous presses of the activation button **120** and measure a period of time for which the activation button **120** is pressed. For example, the number of presses is determined to be two if the activation button **120** is re-pressed within a threshold time after one press. If the activation button **120** is pressed for the threshold time or more, a long press of the activation button **120** can be determined. Operations capable of being performed by pressing the activation button **120** in the inactive state will be described later.

According to an embodiment of the present invention, a sub-display unit **121** can be provided on the activation button **120**. Information regarding an operation to be performed by pressing the activation button **120** can be displayed on the sub-display unit **121**. Various types such as a shape, a character, a graphic, and color can be displayed. When the display type is the shape, a circle, a triangle, a rectangle, a hexagon, or the like can be displayed. For example, the circle can be displayed on the sub-display unit **121** when the first operation is set to be performed by pressing the activation button **120**, and the triangle can be displayed on the sub-display unit **121** when the second operation is set to be performed by pressing the activation button **120**, and vice versa. A display type of the sub-display unit **121** and a correspondence relationship between operations and displays can also be set by the user. For example, the user can select the first operation as the operation to be performed by pressing the activation button **120** from a setting menu and select the triangle as the display type of the sub-display unit **121** of the activation button **120**. Accordingly, the user can recognize that the first operation is performed when the user has pressed the activation button **120** because the triangle is displayed on the sub-display unit **121** even when the mobile communication terminal **100** is in the inactive state.

Although the sub-display unit **121** can be implemented by a general display such as liquid crystal, a liquid crystal display (LCD), or a light emitting diode (LED), the present invention is not limited thereto.

An operation of controlling driving of the display unit **110** and the sub-display unit **121** can be performed in the same processor and the same method or in different processors and different methods.

Hereinafter, various embodiments for operations of the mobile communication terminal **100** capable of being performed by pressing the activation button **120** will be described.

Operations Through Activation Button

Operations to be described below can be performed by pressing the activation button **120** when the mobile communication terminal **100** is in the inactive state, and set by the user. The operations described below are only examples. Of course, other operations can be performed by pressing the activation button **120**.

1. Camera Activation Function

When the mobile communication terminal **100** is in the inactive state, the camera **130** provided in the mobile communication terminal **100** can be activated by pressing the activation button **120**, and a screen currently imaged by the camera **130** can be displayed on the display unit **110**.

FIG. **2** is a diagram illustrating an example in which the camera **130** is activated after the activation button **120** is pressed and an imaged scene is displayed on the display unit **110**.

2. Health Sensing and Health Information Transmission Functions

When the mobile communication terminal **100** is in the inactive state, the health sensing function can be driven, so that sensed health information can be transmitted to a medical authority such as a doctor or a protector.

FIGS. **3**A and **3**B are block diagrams of the mobile communication terminal **100** illustrating the above-described functions. FIGS. **3**A and **3**B illustrate functional block diagrams illustrating the above-described functions of the mobile communication terminal **100**.

Referring to FIG. **3**A, the mobile communication terminal **100** can include an activation sensing unit **310**, a health sensing unit **320**, and a health information transmission unit **330**.

When the mobile communication terminal **100** is in the inactive state, the activation sensing unit **310** senses whether or not the user has pressed the activation button **120**.

The health sensing unit **320** is operated when the activation sensing unit **310** has sensed that the activation button **120** has been pressed, and senses a health state of the user in various methods.

FIG. **3**B is a block diagram illustrating an example of the health sensing unit **320**. Referring to FIG. **3**B, the health sensing unit **320** can include a camera activation element **321**, an eyeball detection element **322**, and a health information acquisition element **323**.

The camera activation element **321** activates the camera **130** provided in the mobile communication terminal **100**. According to the activation of the camera **130**, a video currently captured by the camera **130** is displayed on the display unit **110**. If an eye or face of the user is imaged by the camera **130**, the eyeball detection element **322** performs a function of recognizing and extracting an eyeball of the user. A general eyeball detection algorithm can be used for eyeball detection. The health information acquisition element **323** acquires various health information through the eyeball detected through the eyeball detection element **322**. It is possible to recognize a stress index, a diabetes index, or retinal diseases of the user through a color or health state of the eyeball. A well-known algorithm in the related art can be used as an algorithm for detecting health information from characteristics of the detected eyeball.

The health information acquired as described above can be transmitted by the health information transmission unit **330** to the mobile communication terminal of a protector, a medical authority such as a doctor or the like, or a predetermined server. Information regarding the protector (for example, a phone number or an e-mail address) can be stored in advance. The acquired health information can be displayed on the display unit **110** so that the user can check the acquired health information.

The above-described operations, that is, the eyeball detection function and the health sensing function based on information regarding the detected eyeball, can be performed by installing a predetermined application. That is, the application includes an eyeball detection algorithm and a health sensing algorithm, so that the operations as described above can be performed by installing the application in the mobile communication terminal **100**. The user can download this application and install the downloaded application in the mobile communication terminal **100**. In addition, although an example of only health sensing through eyeball detection has been described above, it is possible to install an application, for example, for health sensing through face detection, and connect the application to the activation button **120**. The user can use the functions

as described above by setting the application to be operated immediately when the activation button **120** is pressed through the setting menu in the inactive state of the mobile communication terminal **100**.

In general, aged persons may not use the health sensing function due to a difficult operation even when the health sensing function is provided in the mobile communication terminal **100**. However, according to the above-described embodiment of the present invention, the health sensing function is operated only by pressing the activation button **120** without a special operation. Accordingly, it is possible to easily check health information and transmit the health information to a protector or a doctor.

3. User Identification Function

When the mobile communication terminal **100** is in the inactive state, a user authentication process can be performed for security by pressing the activation button **120**.

FIGS. **4**A and **4**B illustrate block diagrams of the mobile communication terminal **100** illustrating the above-described functions. Referring to FIG. **4**A, the mobile communication terminal **100** can include an activation sensing unit **410** and a user identification unit **420**.

When the mobile communication terminal **100** is in the inactive state, the activation sensing unit **410** senses whether or not the user has pressed the activation button **120**.

If the activation sensing unit **410** senses that the activation button **120** has been pressed, the user identification unit **420** operates the user identification function in various methods.

FIG. **4**B is a block diagram illustrating an example of the user identification unit **420**. Referring to FIG. **4**B, the user identification unit **420** can include a camera activation element **421**, an iris detection element **422**, and a user identification element **423**.

The camera activation element **421** activates the camera **130** provided in the mobile communication terminal **100**. According to the activation of the camera **130**, a video currently captured by the camera **130** is displayed on the display unit **110**. If an eye or face of the user is imaged by the camera **130**, the iris detection element **422** performs a function of recognizing and extracting an iris from an eyeball of the user. A general iris detection algorithm can be used for iris recognition. The user identification element **423** performs a function of comparing the iris detected by the iris detection element **422** to pre-stored iris information of the user, and authenticating the current user as a true user if the two match. For this, the user identification element **423** can use iris information of the user pre-stored in a database (not illustrated). The iris information of the user can be stored by registering information regarding the iris detected by the iris detection element **422** using a video of the true user first captured by the camera **130**. Predetermined identification information (for example, an identifier (ID), a password, a social security number, or the like) should be input to change the registered iris information of the true user. If the user identification element **423** authenticates the current user as the true user, the lock state of the mobile communication terminal **100** is released and all functions are available. If the current user is not authenticated as the true user, the lock state continues along with a display of an alarm message.

The above-described operations, that is, the iris detection function, the user identification function, and the user authentication function, can be performed by installing a predetermined application. That is, the application includes the iris detection algorithm and the authentication algorithm based on an iris comparison, so that the operations as described above can be performed by installing the application in the mobile communication terminal **100**. The user can download this application and install the downloaded application in the mobile communication terminal **100**. The user can use the functions as described above by setting the application to be operated immediately when the activation button **120** is pressed through the setting menu in the inactive state of the mobile communication terminal **100**.

Accordingly, it is possible to efficiently reduce security risks by setting the user authentication process to be performed through a separate setting, that is, by pressing the activation button **120**, when the mobile communication terminal **100** is used in a region vulnerable to the security risks.

Although an example of an authentication method through iris recognition has been described above, other authentication methods, for example, an authentication key matching method, a password matching method, a face recognition method, a fingerprint recognition method, and the like, can be used. That is, one or more authentication methods can be performed by pressing the activation button **120**.

4. Location Information Transmission Function

When the mobile communication terminal **100** is in the inactive state, collected location information can be transmitted to a protector or a protection authority (a police station or a fire station) by pressing the activation button **120**.

FIG. **5** illustrates a block diagram of the mobile communication terminal **100** illustrating the above-described function. Referring to FIG. **5**, the mobile communication terminal **100** can include an activation sensing unit **510**, a location information collection unit **520**, and a location information transmission unit **530**.

When the mobile communication terminal **100** is in the inactive state, the activation sensing unit **510** senses whether or not the user has pressed the activation button **120**.

When the activation sensing unit **510** senses that the activation button **120** has been pressed, the location information collection unit **520** collects a current location using a global positioning system (GPS) sensor or other location sensors.

The location information transmission unit **530** performs a function of transmitting location information collected by the location information collection unit **520** to a protector or a protection authority. In an urgent situation, a message indicating the urgent situation can be transmitted along with the location information. The location information and the urgent message can be optionally transmitted. On the other hand, this operation may differ according to the number of presses or a press time of the activation button **120**. For example, it is possible to set an operation of transmitting the urgent message to a police station along with the location information when the activation button **120** is pressed for a short time, and set an operation of transmitting only the location information to the protector when the activation button **120** is pressed for a long time. In addition, as another example, it is possible to set an operation of transmitting the location information to the police station along with the urgent message when the activation button **120** is pressed once and set an operation of transmitting the location information to a fire station along with the urgent message when the activation button **120** is pressed three times.

The above-described operations can be performed by installing a predetermined application. That is, the application includes an algorithm for collecting location information and transmitting the collected located information along with an urgent message, so that the operations as described above can be performed by installing the application in the

mobile communication terminal **100**. The user can download this application and install the downloaded application in the mobile communication terminal **100**. The user can use the functions as described above by setting the application to be operated immediately when the activation button **120** is pressed through the setting menu in the inactive state of the mobile communication terminal **100**.

Accordingly, it is possible to efficiently escape a dangerous situation because the user can report the dangerous situation to a protector or a protection authority along with his/her location information with only a simple operation.

5. File Transmission Function

When the mobile communication terminal **100** is in the inactive state, a function of uploading content (for example, contact information, a photo, a moving image, or an application) included in the mobile communication terminal **100** to another mobile communication terminal **100** or a media space (for example, a personal media space such as Twitter, Facebook, or a blog or a community media space such as a café or club community) can be operated.

6. Mode Change During Drive

When the mobile communication terminal **100** is in the inactive state, the mobile communication terminal **100** can be switched to a hands-free function or some communication functions (a voice communication function, a short message service (SMS) function, and an Internet function) of the mobile communication terminal **100** can be interrupted by pressing the activation button **120**.

Accordingly, it is possible to significantly reduce traffic accident risks by switching the mode of the mobile communication terminal **100** or interrupting the communication function with only a simple operation of pressing the activation button **120** during driving.

7. Advertisement Display Operation

When the mobile communication terminal **100** is in the inactive state, the activation button **120** is pressed so that an advertisement can be displayed on at least a part of the display unit **110**. The advertisement display can be implemented by displaying an advertisement provided from an external server in real time, and driven by an advertisement-related application previously installed within the mobile communication terminal **100**.

This application for enabling the advertisement to be displayed may be received in advance from an advertisement distribution server, an advertiser server, or a server for providing a service according to an embodiment of the present invention, that is, a service for driving a predetermined application according to a button input that switches the mobile communication terminal **100** from the inactive state to the active state.

An advertisement display method can be implemented by a method of randomly displaying advertisements of advertisers joining this service, a customized advertisement display method based on user information, and an advertisement display method based on a current location.

The user information can be pre-stored in a corresponding application and pre-transmitted to a server that provides an advertising service. On the other hand, location information collection necessary for the advertisement display method based on the current location can be used in conjunction with 4. Location Information Function described above. That is, current location information is collected simultaneously with the activation of the mobile communication terminal **100** and transmitted to an advertising-service providing server. Based on the current location information, advertisements related to the current location are distributed to the mobile communication terminal **100**.

8. Other Application Operations

If a predetermined operation is performed in addition to switching to a simple active state by pressing the activation button **120** when the mobile communication terminal **100** is in the inactive state, this belongs to the scope of the present invention.

For example, an entertainment operation (for example, an operation of a music or video player, execution of a game application, or news reception) can be performed by pressing the activation button **120**.

Operation Standby of Application

According to an embodiment of the present invention, the above-described predetermined applications are driven when the mobile communication terminal **100** is switched from the inactive state to the active state.

For this, when the mobile communication terminal **100** is in the inactive state, the applications should be maintained in an operation standby state. When the mobile communication terminal **100** is switched from the active state to the inactive state, the above-described applications can be in the operation standby state. That is, a selected application to be driven when the mobile communication terminal **100** is switched to the active state can be in the operation standby state when the mobile communication terminal **100** is switched to the inactive state.

However, a predetermined application operable when the mobile communication terminal **100** is switched from the inactive state to the active state regardless of the operation standby state or an operation disable state of the application belongs to the present invention.

Service Providing Server

Hereinafter, the service providing server according to an embodiment will be described.

FIG. **6** is a diagram illustrating a configuration of a service providing system (server) for enabling a specific function to be operated when the mobile communication terminal is activated according to an embodiment of the present invention.

Referring to FIG. **6**, the service providing server **200** can include an application providing unit **210**, an activation sensing unit **220**, an application driving unit **230**, a communication unit **240**, and a control unit **250**. According to an embodiment of the present invention, the application providing unit **210**, the activation sensing unit **220**, the application driving unit **230**, the communication unit **240**, and the control unit **250** of the service providing server **200** can be program modules or hardware communicable with an external apparatus. The program modules or hardware can be included in the service providing server **200** or another apparatus communicable with the service providing server **200** in the form of an operation system, an application program module, and other program modules, and physically stored in various known storage apparatuses. On the other hand, these program modules or hardware include a routine, a sub routine, a program, an object, a component, and a data structure, each of which executes a specific task to be described later or specific abstract data, but the present invention is not limited thereto.

The application providing unit **210** enables the predetermined application described above to be transmitted to the mobile communication terminal **100**. The user can receive a desired application by accessing the service providing server **200** through the mobile communication terminal **100**, and install the received application within the mobile communication terminal **100**. The application can include a control function of controlling a predetermined operation to be performed when the mobile communication terminal **100** is

activated, and can independently perform the predetermined operation. For example, the application transmitted from the application providing unit **210** can be an application for enabling an advertisement to be displayed on the display unit **110** when the mobile communication terminal **100** is switched from the inactive state to the active state.

The activation sensing unit **220** according to an embodiment can sense the switching of the mobile communication terminal **100** from the inactive state to the active state. The user can transmit a signal indicating the activation of the mobile communication terminal **100** to the service providing server **200** by pressing the activation button of the mobile communication terminal **100**.

The application driving unit **230** according to an embodiment enables a predetermined operation to be performed in the mobile communication terminal **100** when the activation of the mobile communication terminal **100** is sensed. That is, the application driving unit **230** drives a predetermined application within the mobile communication terminal **100** and enables a related screen to be displayed on the display unit **110**. For example, if the activation of the mobile communication terminal **100** is sensed, an advertisement-related application can be executed. The application driving unit **230** can perform an additional operation related to driving of a corresponding application. For example, an application for enabling an advertisement to be displayed is driven to receive current location information and control advertisement information related to a corresponding location to be displayed on the display unit **110** of the mobile communication terminal **100**. In addition, it is possible to collect user information (for example, a sex, an age, a region of residence, a matter of interest, and the like) and control advertisement information customized for a corresponding user to be displayed. Necessary advertisement information (for example, advertisement information to be transmitted to the mobile communication terminal **100** based on location information or user information) can be transmitted from an advertiser server or an advertisement distribution server. As described above, the application driving unit **230** can drive a predetermined application simultaneously with the activation within the mobile communication terminal **100** and perform an additional operation for optimally driving the application.

The communication unit **240** according to an embodiment makes information communication between the service providing server **200**, the mobile communication terminal **100**, and another apparatus possible. That is, the communication unit **240** can transmit an application to the mobile communication terminal **100** and receive an activation signal and information for driving the application from the mobile communication terminal **100**.

The control unit **250** according to an embodiment can perform a function of controlling data flows between the application providing unit **210**, the activation sensing unit **220**, the application driving unit **230**, and the communication unit **240**. That is, the control unit **250** according to the embodiment can control the application providing unit **210**, the activation sensing unit **220**, the application driving unit **230**, and the communication unit **240** to perform unique functions.

According to embodiments of the present invention, it is possible to enable an advantageous function to be utilized and improve an interest of a terminal user because various operations can be performed only by pressing an activation button when a terminal is in an inactive state.

According to embodiments of the present invention, it is possible to enable health check of an aged person to be performed with a simple operation and enable information regarding the health check to be transmitted to a protector or a medical authority.

According to embodiments of the present invention, it is possible to enable a user authentication process of which the security is enhanced to be operable with only a simple procedure.

According to embodiments of the present invention, it is possible to enable an urgent message to be transmitted along with location information with only a simple operation in an urgent situation.

The embodiments according to the present invention described above may be implemented in the form of program instructions that may be executed through various computer components and recorded on a computer-readable medium. The computer-readable medium may include program instructions, data files, data structures, and the like individually or in combination. The program instructions recorded on the medium may be specifically designed for the present invention or may be well known to one of ordinary skill in the art of software. Examples of the computer-readable recording medium include a magnetic medium such as a hard disk, a floppy disk, or a magnetic tape, an optical medium such as a compact disc-read only memory (CD-ROM) or a digital versatile disc (DVD), a magneto-optical medium such as a floptical disk, and a hardware device such as ROM, a random access memory (RAM), or a flash memory that is specially designed to store and execute program instructions. Examples of the program instructions include not only machine code generated by a compiler or the like but also high-level language codes that may be executed by a computer using an interpreter or the like. The hardware device described above may be constructed so as to operate as one or more software modules for performing the operations of the embodiments of the present invention, and vice versa.

Although the present invention has been described with reference to the specific embodiments and drawings together with specific details such as detailed components, the above description is provided only for better understanding of the present invention and it will be apparent to those skilled in the art that various modifications and variations may be made from the above description.

While embodiments have been disclosed herein, it should be understood that other variations may be possible. Such variations are not to be regarded as a departure from the spirit and scope of embodiments of the present application, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

What is claimed is:

1. A mobile communication terminal comprising:

a touch screen display;

a power button configured to turn on and off the terminal by pressing; and

an activation button separate from the power button and located outside the touch screen display, the activation button configured for pressing to turn on the touch screen display,

wherein upon one-time pressing of the activation button while the touch screen display is turned off, the terminal is configured to turn on the touch screen display and perform a fingerprint authentication function in addition to turning on the touch screen display such that:

a lock screen is displayed on the touch screen display upon turning on the touch screen display in response

to the one-time pressing of the activation button while the touch screen display being turned off,

in addition to turning on the touch screen display and displaying the lock screen, the one-time pressing while the touch screen display being turned off initiates the fingerprint authentication function,

the lock screen is displayed on the touch screen display when the fingerprint authentication function initiated by the one-time pressing is being performed,

a lock state of the terminal continues when the fingerprint authentication function fails to authenticate a user, and

the lock state is released for enabling other functions of the terminal when the fingerprint authentication function authenticates a user in response to the one-time pressing of the activation button while the touch screen display being turned off, wherein the terminal is further configured to perform at least one function other than the fingerprint authentication function in addition to turning on the touch screen display for displaying the lock screen in response to the one-time pressing of the activation button when the one-time pressing is for long time longer than a reference time period, wherein the at least one function to perform in addition to turning on the touch screen display for displaying the lock screen in response to the one-time pressing for long time is associated with initiating a hands-free operation of the terminal.

2. The terminal of claim **1**, wherein the terminal is configured to perform at least one additional function in addition to the fingerprint authentication function after turning on the touch screen display for displaying the lock screen when the one-time pressing of the activation button is detected while the touch screen display is turned off.

3. The terminal of claim **1**, wherein the terminal is further configured to perform at least one function other than the fingerprint authentication function in addition to turning on the touch screen display for displaying the lock screen in response to the one-time pressing of the activation button when the one-time pressing is for long time longer than a reference time period, wherein the at least one function is selected from the group consisting of activating a camera, and an operation that involves playing a sound.

4. The terminal of claim **3**, wherein the touch screen display displays the lock screen thereon as it is turned on in response to the one-time pressing for long time, wherein the lock screen is displayed on the touch screen display when the at least one function is being initiated.

5. The terminal of claim **3**, wherein the terminal is configured to have a mobile application stay in a standby state when the touch screen display is turned off while the mobile application is running, wherein in response to the one-time pressing of the activation button while the touch screen display is turned off, the terminal is configured to perform the at least one function regardless of whether the at least one function is in its standby state or an operation disable state.

6. The terminal of claim **1**, wherein the terminal is configured to display a message on the touch screen display when the lock state continues due to failure of fingerprint authentication by the fingerprint authentication function.

7. The terminal of claim **1**, wherein the terminal is further configured to perform at least one function other than the fingerprint authentication function in addition to turning on the touch screen display for displaying the lock screen in response to the one-time pressing of the activation button when the one-time pressing is for long time longer than a reference time period.

8. The terminal of claim **1**, wherein upon repeated pressing of the activation button while the touch screen display is turned off, the terminal is configured to turn on the touch screen display and further perform at least one function other than the fingerprint authentication function in addition to turning on the touch screen display.

9. The terminal of claim **1**, wherein the terminal comprises a smartphone which comprises an activation sensor configured to detect pressing of the activation button and a user identification module configured to perform the fingerprint authentication function.

10. A method of operating a mobile computing terminal, the method comprising:

providing a mobile computing terminal which comprises a touch screen display, a camera, a power button for pressing to turn on/off the terminal, and an activation button for pressing to turn on the touch screen display, the activation button located outside the touch screen display;

detecting one-time pressing of the activation button while the terminal is in an inactive state in which the touch screen display is turned off;

in response to the one-time pressing, changing the terminal from the inactive state to an active state in which the touch screen display is turned on; and

in addition to changing to the active state, further performing a fingerprint authentication function using fingerprint recognition without additional user input,

wherein in changing to the active state and performing the fingerprint authentication function, the terminal operates such that:

a lock screen is displayed on the touch screen display upon changing the terminal from the inactive state to the active state in response to the one-time pressing of the activation button while the terminal being in the inactive state,

in addition to changing the terminal to the active state, the one-time pressing while the terminal being in the inactive state initiates the fingerprint authentication function,

the lock screen is displayed on the touch screen display when the fingerprint authentication function initiated by the one-time pressing is being performed,

a lock state of the terminal continues when the fingerprint authentication function fails to authenticate a user, and

the lock state is released for enabling other functions of the terminal when the fingerprint authentication function authenticates a user in response to the one-time pressing of the activation button while the terminal being in the inactive state, wherein the method further comprises performing at least one function other than the fingerprint authentication function in addition to changing to the active state in response to the one-time pressing during the terminal's inactive state when the one-time pressing is for long time longer than a reference time period, wherein the at least one function to perform in addition to turning on the touch screen display for displaying the lock screen in response to the one-time pressing for long time is associated with initiating a hands-free operation of the terminal.

11. The method of claim **10**, wherein performing at least one function in addition to the fingerprint authentication

function after changing to the active state for displaying the lock screen when the one-time pressing is detected while the terminal being in the inactive state.

12. The method of claim **10**, wherein the method further comprises performing at least one function other than the fingerprint authentication function in addition to changing to the active state in response to the one-time pressing during the terminal's inactive state when the one-time pressing is for long time longer than a reference time period, wherein the at least one function is selected from the group consisting of activating the camera, a hands-free operation and an operation that involves playing a sound.

13. The method of claim **12**, wherein the touch screen display displays the lock screen thereon as the terminal changes to its active state in response to the one-time pressing for long time, wherein the lock screen is displayed on the touch screen display when the at least one function is being initiated.

14. The method of claim **12**, wherein the terminal is configured to have a mobile application stay in a standby state when the touch screen display is turned off while the mobile application is running, wherein in response to the one-time pressing of the activation button while the terminal is in its inactive state, the terminal performs the at least one function regardless of whether the at least one function is in its standby state or an operation disable state.

15. The method of claim **12**, wherein the touch screen display displays a message thereon when the lock state continues due to failure of fingerprint authentication by the fingerprint authentication function.

16. The method of claim **12**, further comprising:

receiving user input on a setting menu of the terminal; and

configuring, based on the user input, settings of the terminal such that the at least one function is set to be performed in addition to changing to the active state in response to the one-time pressing of the activation button while the terminal is in its inactive state.

17. The method of claim **10**, wherein the method further comprises performing at least one function other than the fingerprint authentication function in addition to changing to the active state in response to the one-time pressing during the terminal's inactive state when the one-time pressing is for long time longer than a reference time period.

18. The method of claim **10**, further comprising:

detecting repeated pressing of the activation button while the terminal is in its inactive state;

in response to the repeated pressing, changing the terminal from the inactive state to the active state; and

in addition to changing to the active state, further performing at least one function other than the fingerprint authentication function without additional user input,

wherein in changing to the active state and performing the at least one function, the terminal operates such that:

the touch screen display displays the lock screen thereon as the terminal changes to the active state in response to the repeated pressing,

the lock screen is displayed on the touch screen display when the at least one function is being performed.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,779,419 B2
APPLICATION NO. : 14/848191
DATED : October 3, 2017
INVENTOR(S) : Jae Lark Jung

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims

In Column 13 at Line 24, in Claim 1, change “for long time” to --for a long time,--.

In Column 13 at Line 28, in Claim 1, change “for long time” to --for the long time--.

In Column 13 at Lines 42-43, in Claim 3, change “for long time longer than a reference time period,” to --for the long time, longer than the reference time period,--.

In Column 13 at Line 48, in Claim 4, change “for long time,” to --for the long time,--.

In Column 14 at Lines 2-3, in Claim 7, change “for long time longer than a reference time period.” to --for the long time, longer than the reference time period.--.

In Column 14 at Lines 59-60, in Claim 10, change “for long time” to --for a long time,--.

In Column 14 at Line 64, in Claim 10, change “for long time” to --for the long time--.

In Column 15 at Line 9, in Claim 12, change “for long time longer than a reference time period,” to --for the long time, longer than the reference time period,--.

In Column 15 at Line 16, in Claim 13, change “for long time,” to --for the long time,--.

In Column 16 at Line 13, in Claim 17, change “for long time longer than a reference time period.” to --for the long time, longer than the reference time period.--.

Signed and Sealed this
Twentieth Day of March, 2018



Andrei Iancu
Director of the United States Patent and Trademark Office