US009271150B2

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Baek et al.

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(54) **MOBILE TERMINAL AND CONTROL METHOD THEREOF**

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(73) Assignee: **LG ELECTRONICS INC.**, Seoul (KR)

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(30) **Foreign Application Priority Data**

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Nov. 12, 2013 (KR) 10-2013-0137129

(51) **Int. Cl.**

H04M 1/66	(2006.01)
H04W 12/06	(2009.01)
G06F 3/048	(2013.01)
G06F 21/32	(2013.01)
H04M 1/67	(2006.01)
H04M 1/725	(2006.01)
H04L 29/06	(2006.01)
H04W 4/20	(2009.01)

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

CPC ***H04W 12/06*** (2013.01); ***G06F 3/048*** (2013.01); ***G06F 21/32*** (2013.01); ***H04L 63/0861*** (2013.01); ***H04M 1/67*** (2013.01); ***H04M 1/72563*** (2013.01); *H04M 2250/52* (2013.01); *H04W 4/206* (2013.01)

(58) **Field of Classification Search**

CPC H04M 1/0266; H04M 1/575; H04M 2250/22; G06F 21/32; H04W 12/06; H04W 8/005; H04W 88/02; H04L 63/0861
USPC 455/411
See application file for complete search history.

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(74) *Attorney, Agent, or Firm* — Birch, Stewart, Kolasch & Birch, LLP

(57) **ABSTRACT**

A mobile terminal including a wireless communication unit configured to provide wireless communication; a display unit; and a controller configured to receive a fingerprint input on the display unit matching at least one of a first user's fingerprint and a second user's fingerprint, said first user being a main user of the mobile terminal and being different than the second user, and control at least one of the mobile terminal of the first user and a terminal of the second user based on the received fingerprint input.

18 Claims, 25 Drawing Sheets

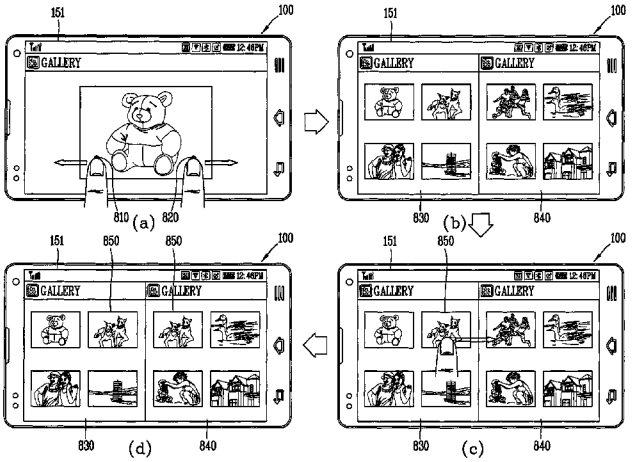


FIG. 1

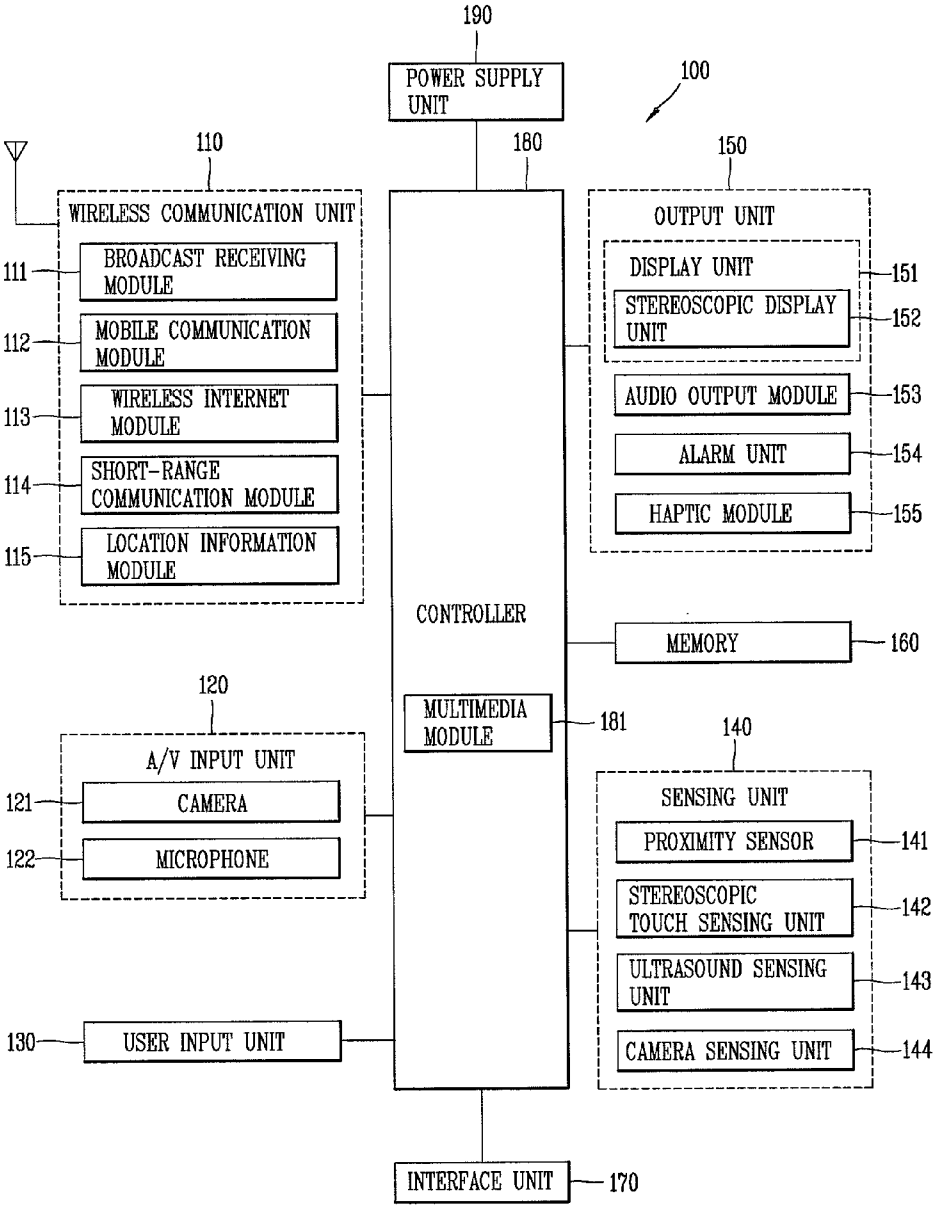

190
POWER SUPPLY UNIT
100
110
180
150
WIRELESS COMMUNICATION UNIT
111
BROADCAST RECEIVING MODULE
112
MOBILE COMMUNICATION MODULE
113
WIRELESS INTERNET MODULE
114
SHORT-RANGE COMMUNICATION MODULE
115
LOCATION INFORMATION MODULE
OUTPUT UNIT
DISPLAY UNIT
151
STEREOSCOPIC DISPLAY UNIT
152
AUDIO OUTPUT MODULE
153
ALARM UNIT
154
HAPTIC MODULE
155
CONTROLLER
MEMORY
160
120
MULTIMEDIA MODULE
181
140
A/V INPUT UNIT
121
CAMERA
122
MICROPHONE
SENSING UNIT
PROXIMITY SENSOR
141
STEREOSCOPIC TOUCH SENSING UNIT
142
ULTRASOUND SENSING UNIT
143
CAMERA SENSING UNIT
144
130
USER INPUT UNIT
INTERFACE UNIT
170

FIG. 2A

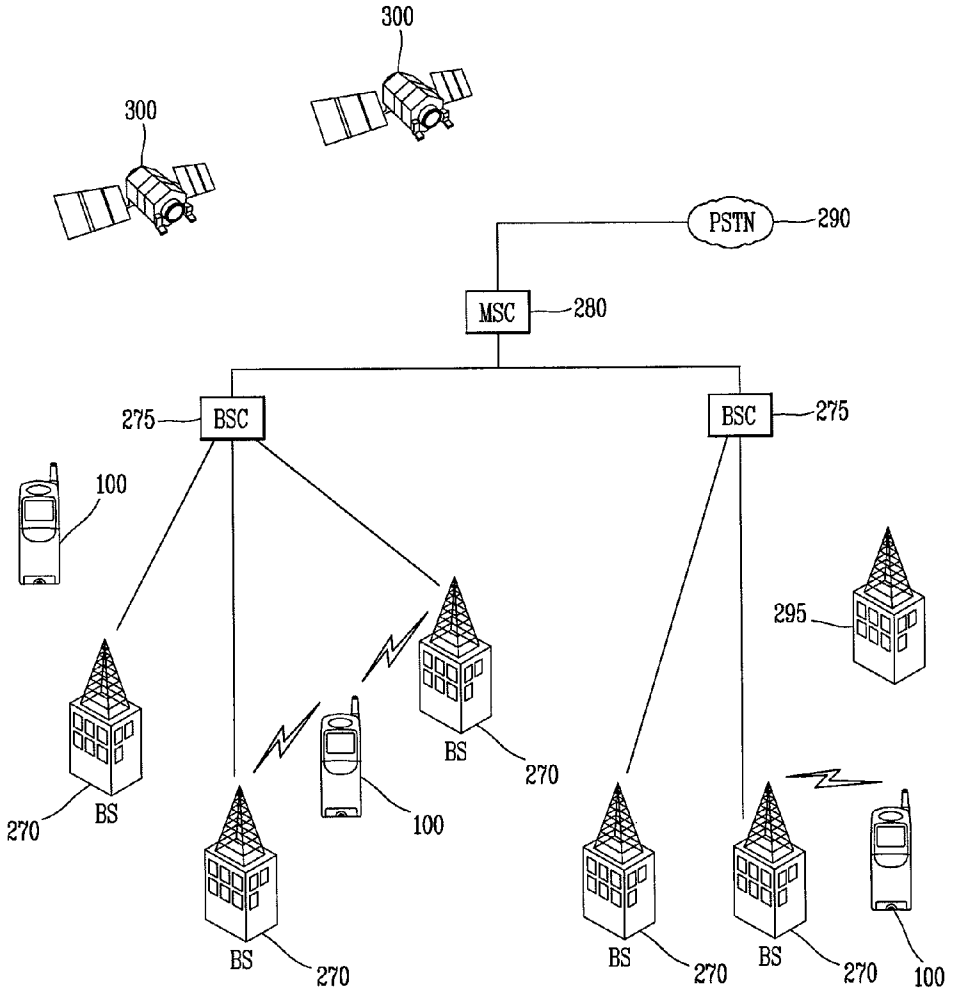

300
300
PSTN
290
MSC
280
275
BSC
BSC
275
100
295
BS
270
BS
270
100
BS
270
BS
270
BS
270
100

FIG. 2B

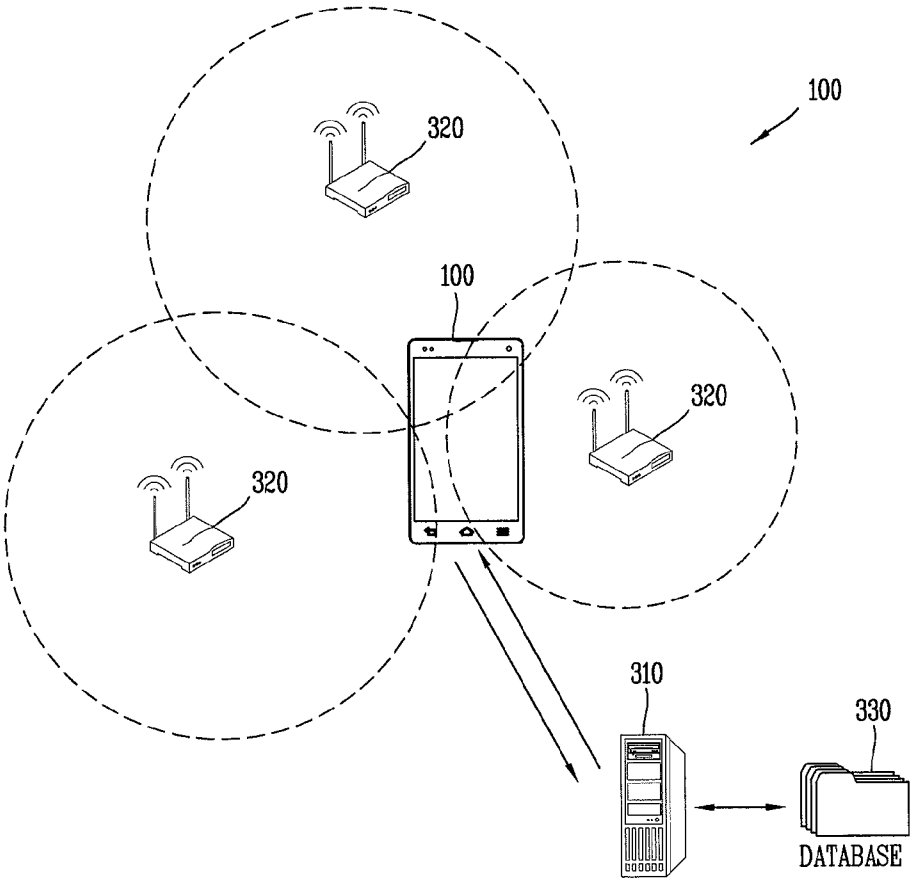


FIG. 3A

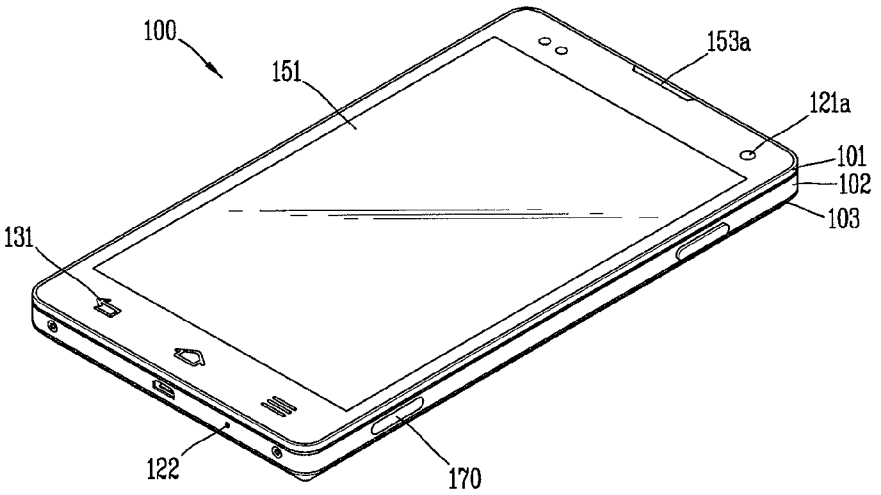

100
151
153a
121a
101
102
103
131
122
170

FIG. 3B

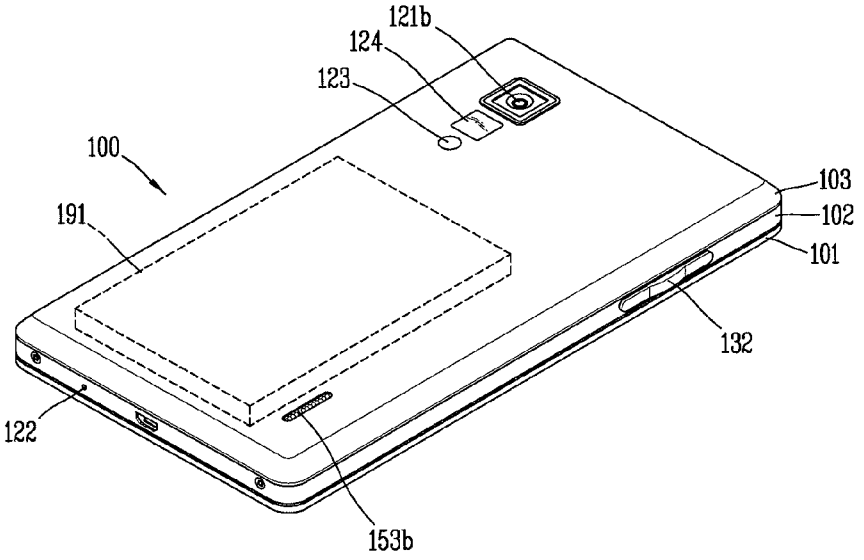

121b
124
123
100
191
103
102
101
132
122
153b

FIG. 4

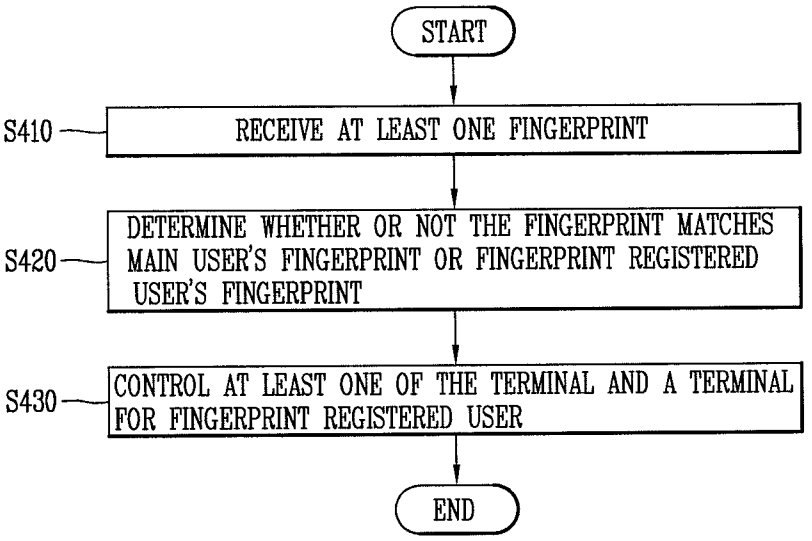

START
S410
RECEIVE AT LEAST ONE FINGERPRINT
S420
DETERMINE WHETHER OR NOT THE FINGERPRINT MATCHES MAIN USER'S FINGERPRINT OR FINGERPRINT REGISTERED USER'S FINGERPRINT
S430
CONTROL AT LEAST ONE OF THE TERMINAL AND A TERMINAL FOR FINGERPRINT REGISTERED USER
END

FIG. 5

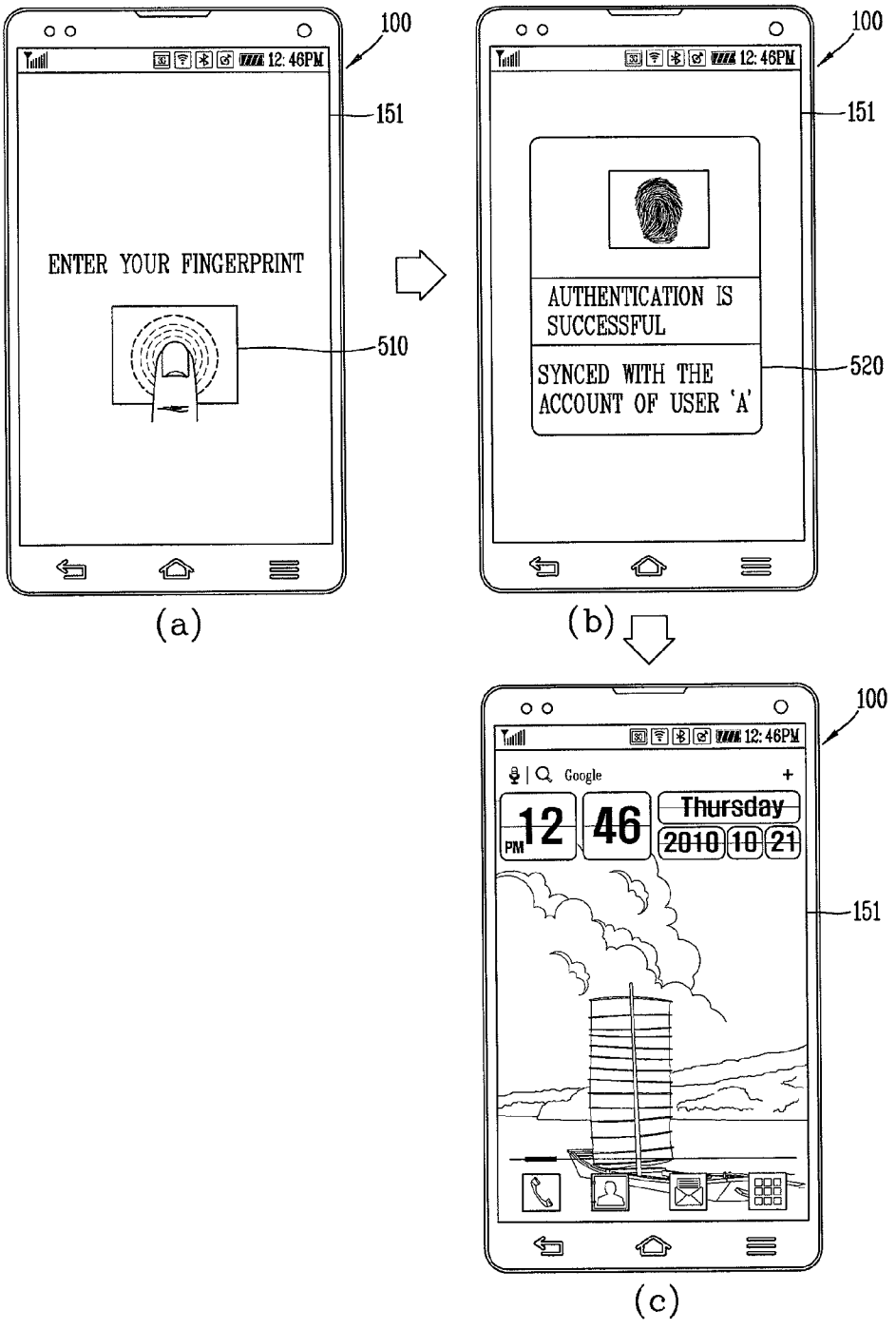

100
151
ENTER YOUR FINGERPRINT
510
(a)
AUTHENTICATION IS SUCCESSFUL
SYNCED WITH THE ACCOUNT OF USER 'A'
520
(b)
Google
PM 12 46
Thursday
2010 10 21
(c)

FIG. 6

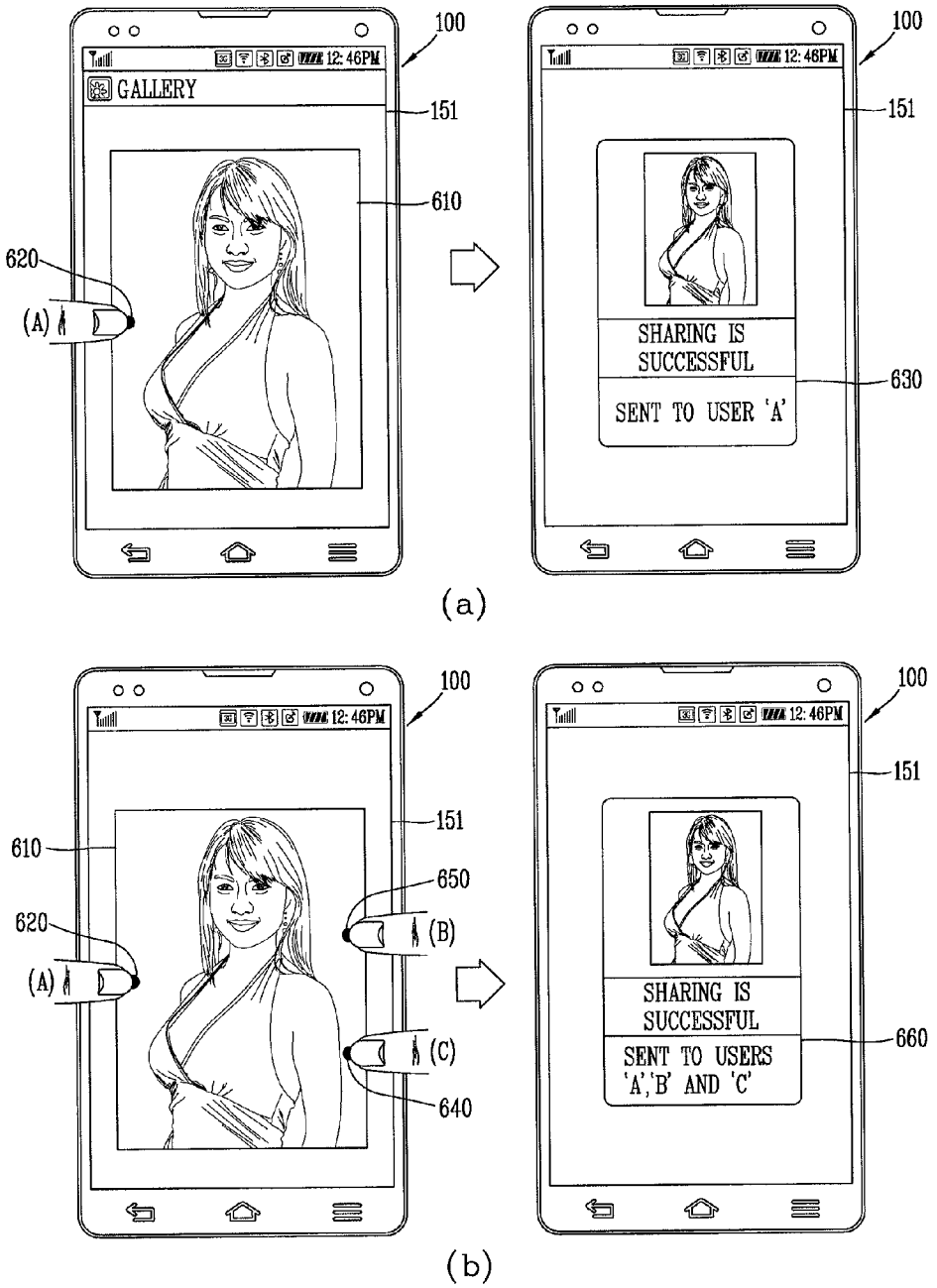

100
12:46PM
GALLERY
151
610
620
(A)
SHARING IS SUCCESSFUL
SENT TO USER 'A'
630
(a)
650
(B)
(C)
640
SENT TO USERS 'A','B' AND 'C'
660
(b)

FIG. 7

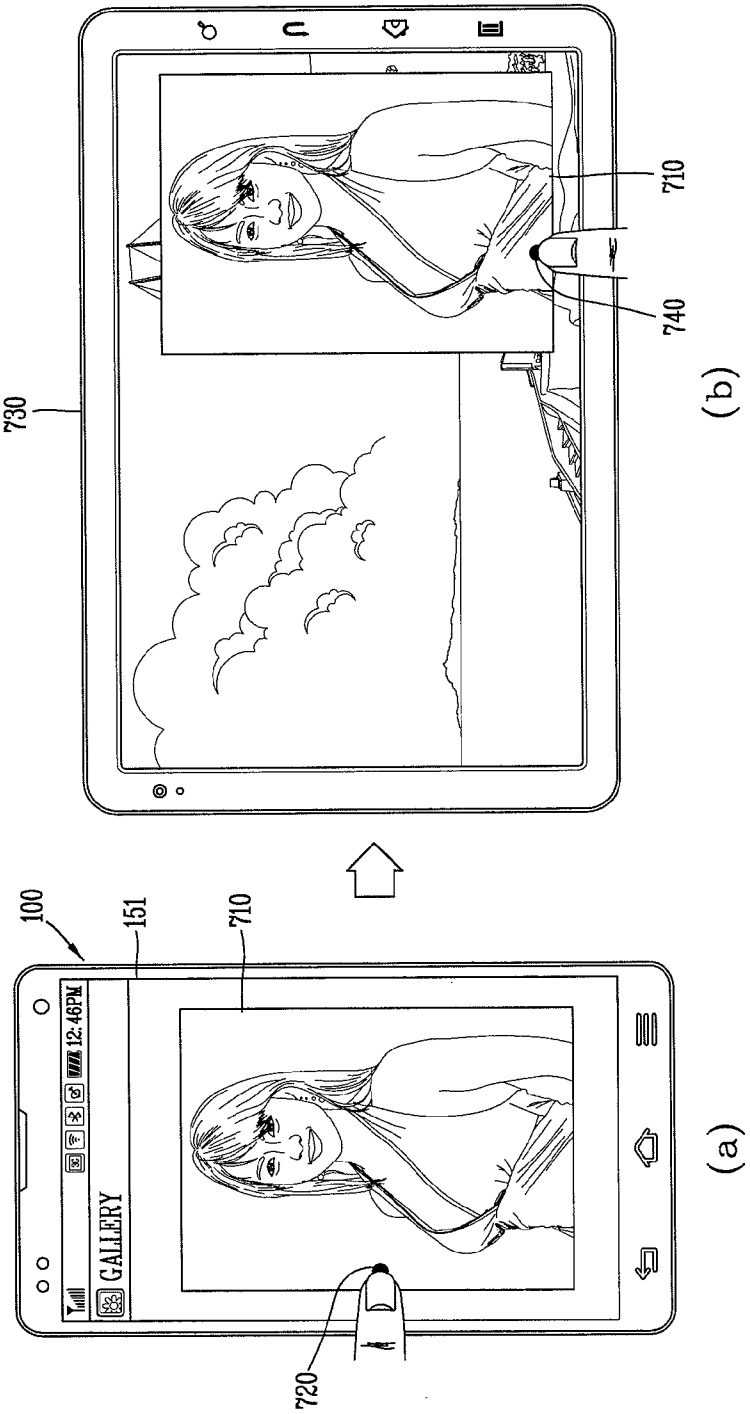


FIG. 8

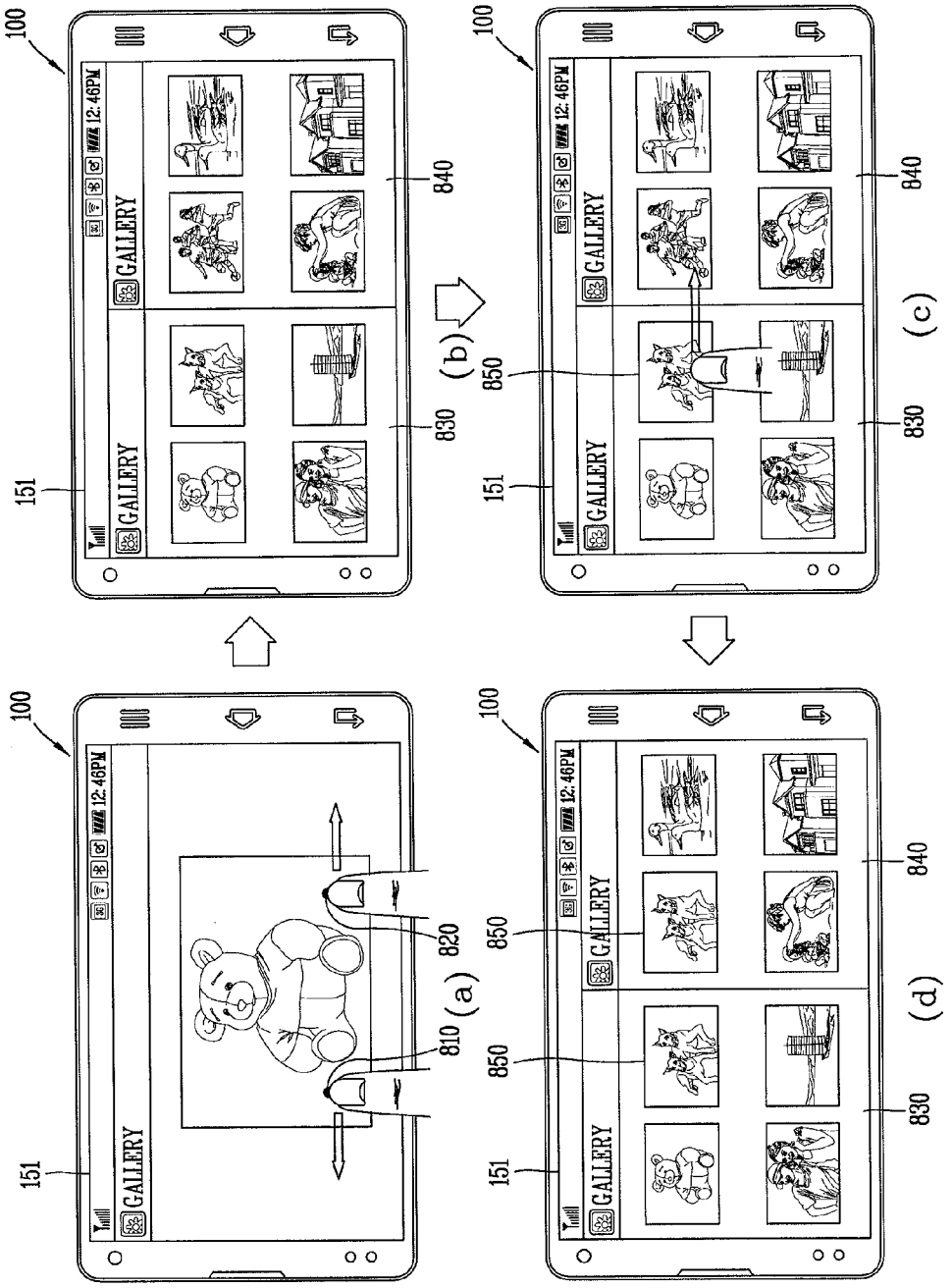


FIG. 9

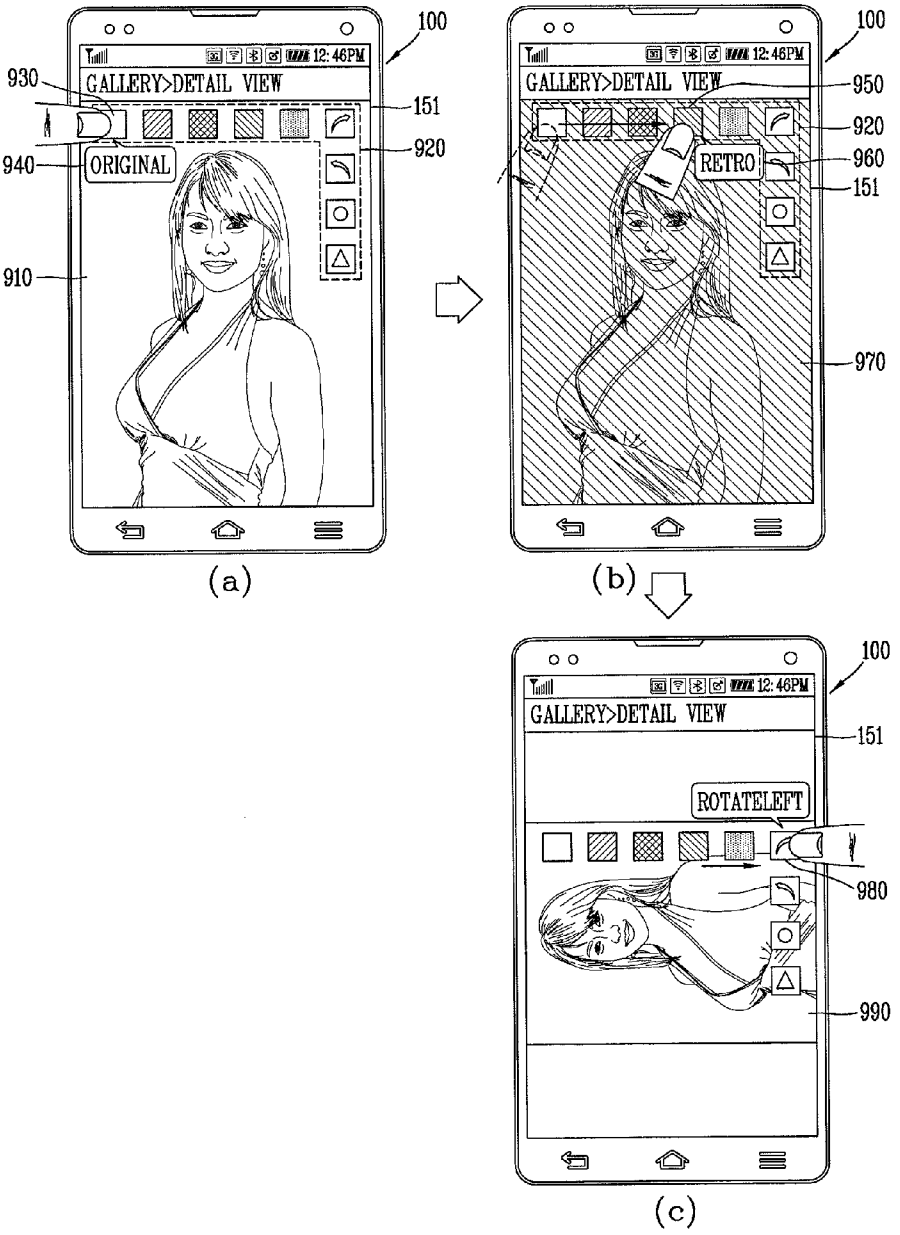

100
930
GALLERY>DETAIL VIEW
151
920
940
ORIGINAL
910
(a)
100
GALLERY>DETAIL VIEW
950
920
RETRO
960
151
970
(b)
100
GALLERY>DETAIL VIEW
151
ROTATELEFT
980
990
(c)

FIG. 10

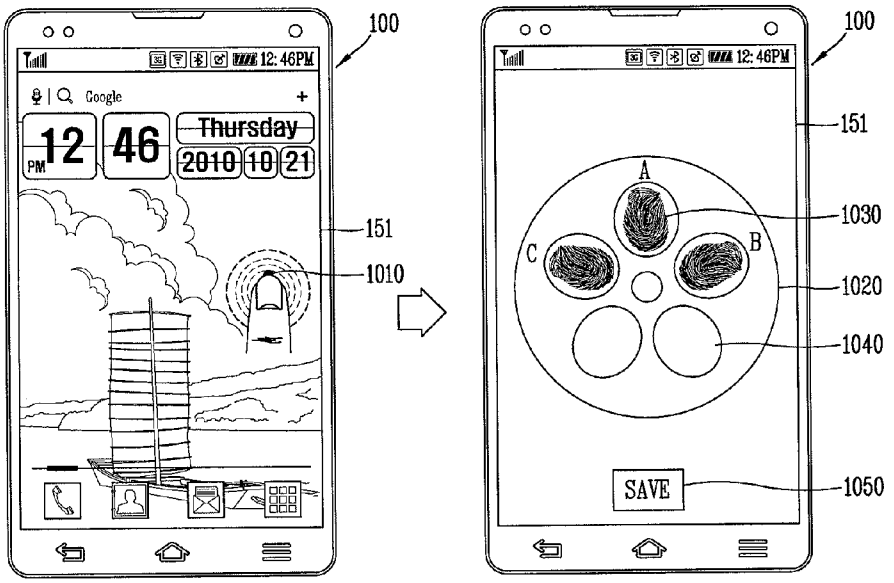

100
12: 46PM
Google
12
46
PM
Thursday
2010
10
21
151
1010
(a)
100
12: 46PM
151
A
B
C
1030
1020
1040
SAVE
1050
(b)

FIG. 11

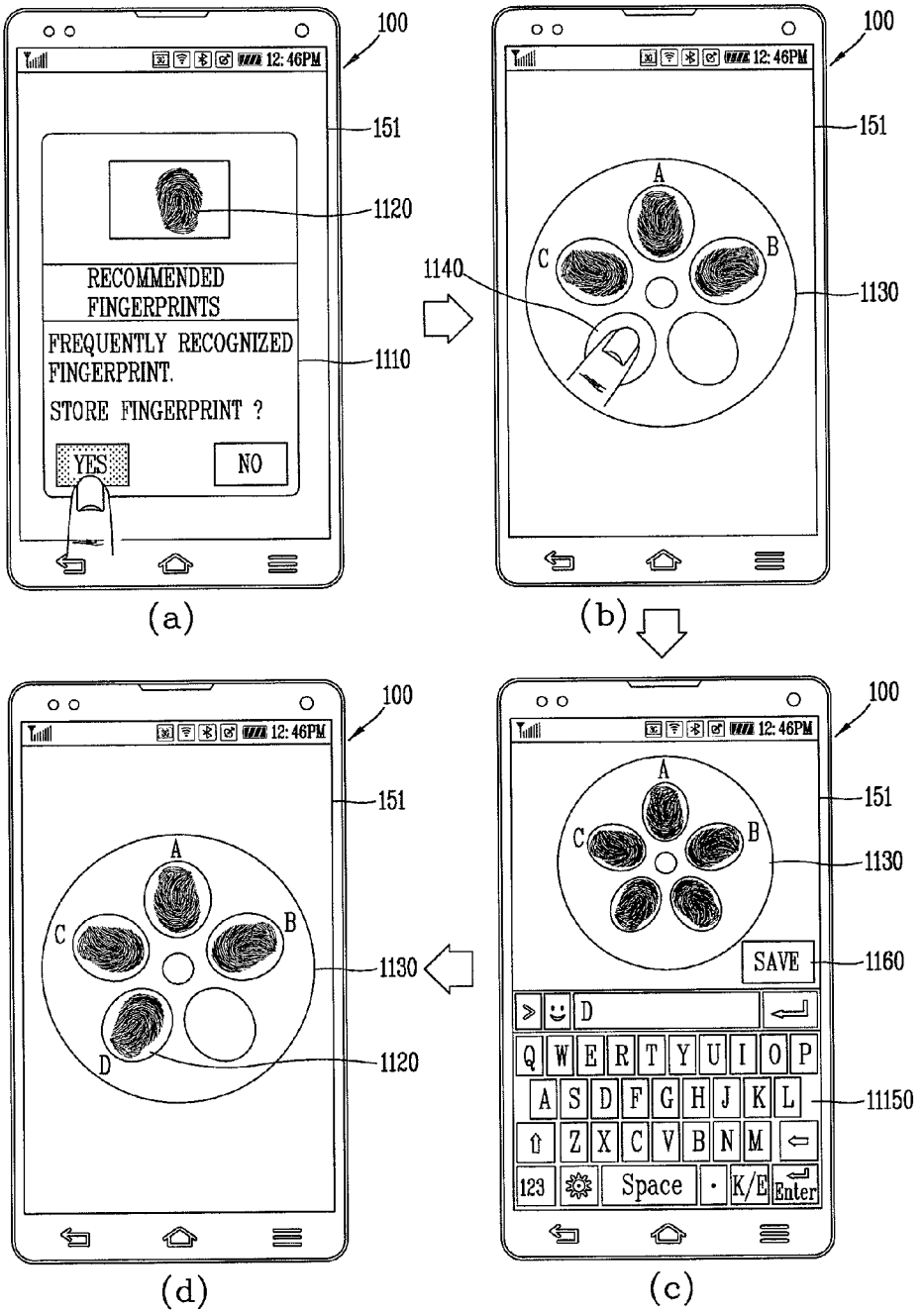

100
12:46PM
151
1120
RECOMMENDED FINGERPRINTS
FREQUENTLY RECOGNIZED FINGERPRINT.
STORE FINGERPRINT ?
1110
YES
NO
(a)
1140
A
B
C
1130
(b)
SAVE
1160
D
Q W E R T Y U I O P
A S D F G H J K L
11150
Z X C V B N M
123
Space
K/E
Enter
(c)
1120
(d)

FIG. 12

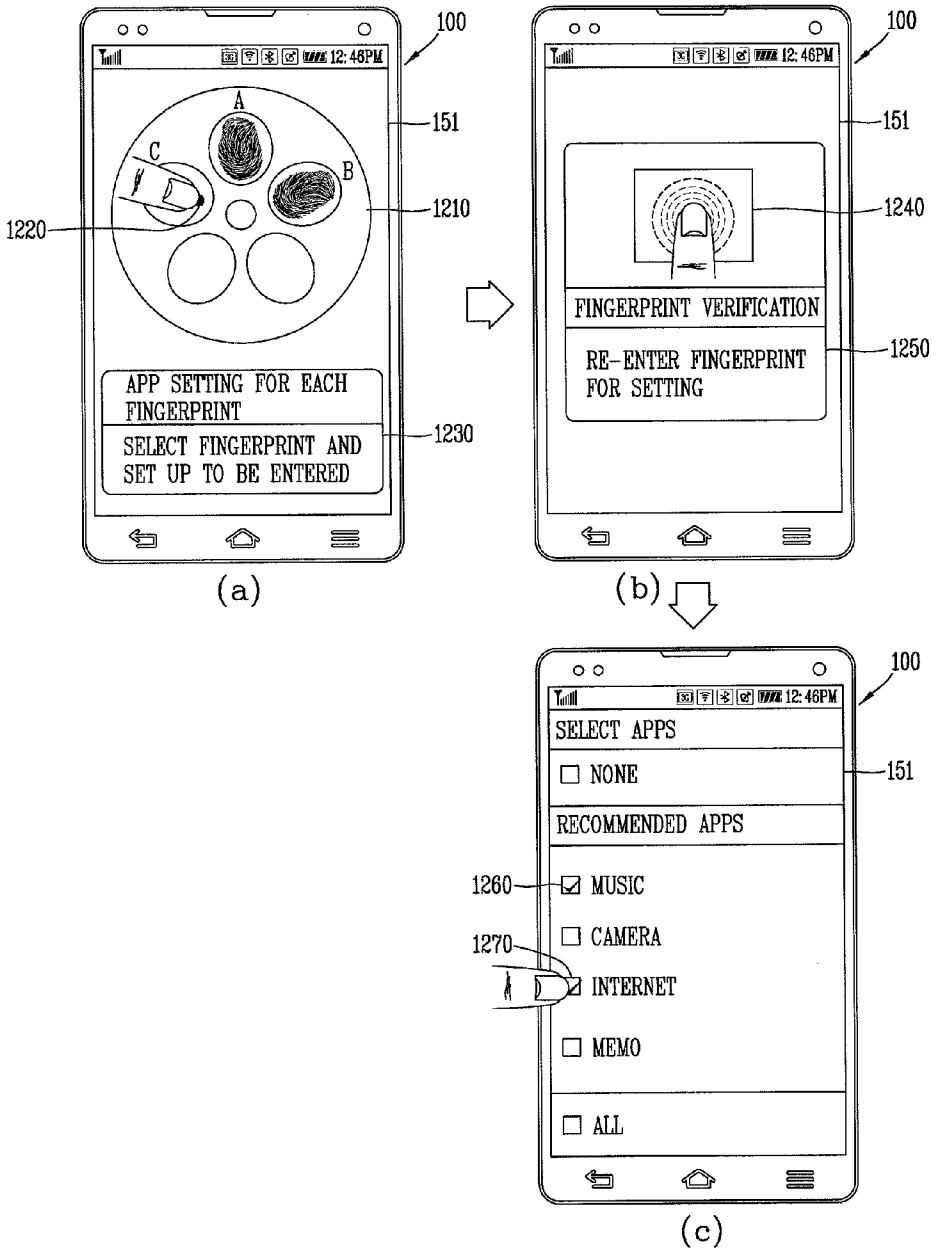

100
151
1210
1220
1230
A
B
C
APP SETTING FOR EACH FINGERPRINT
SELECT FINGERPRINT AND SET UP TO BE ENTERED
12:46PM
(a)
1240
1250
FINGERPRINT VERIFICATION
RE-ENTER FINGERPRINT FOR SETTING
(b)
SELECT APPS
NONE
RECOMMENDED APPS
1260
MUSIC
1270
CAMERA
INTERNET
MEMO
ALL
(c)

FIG. 13

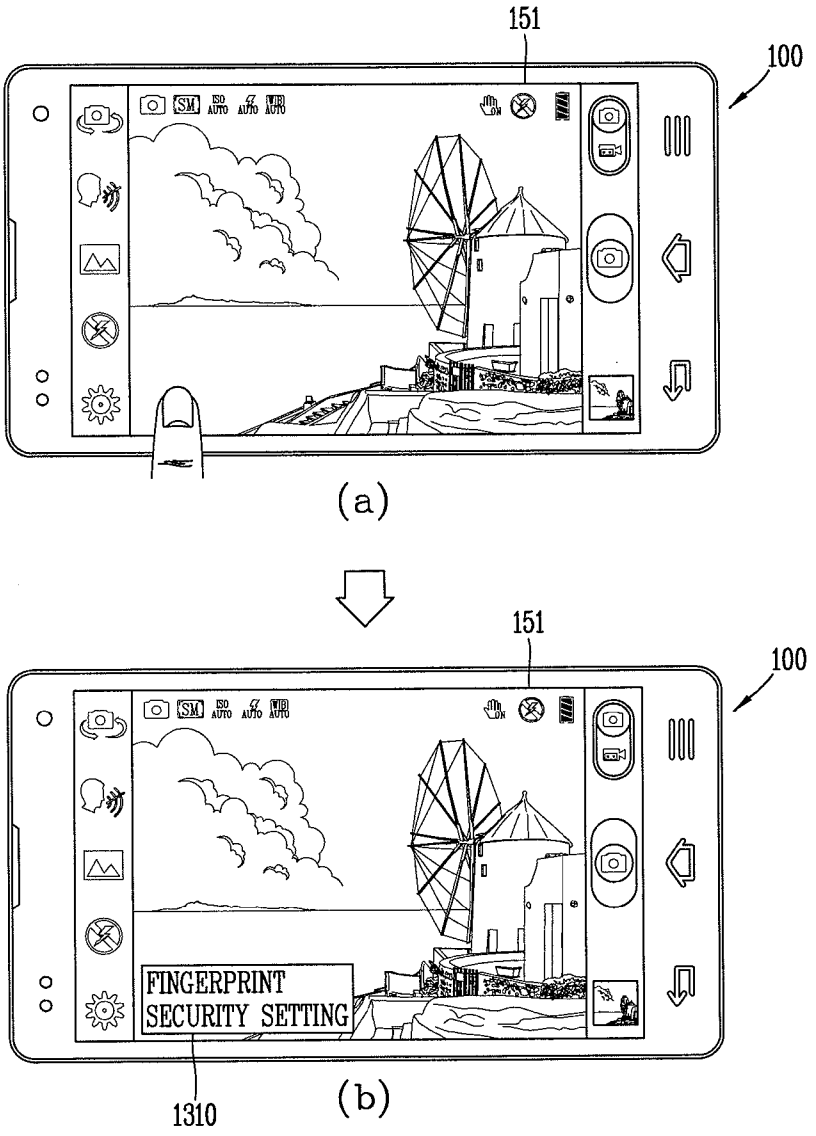


FIG. 14

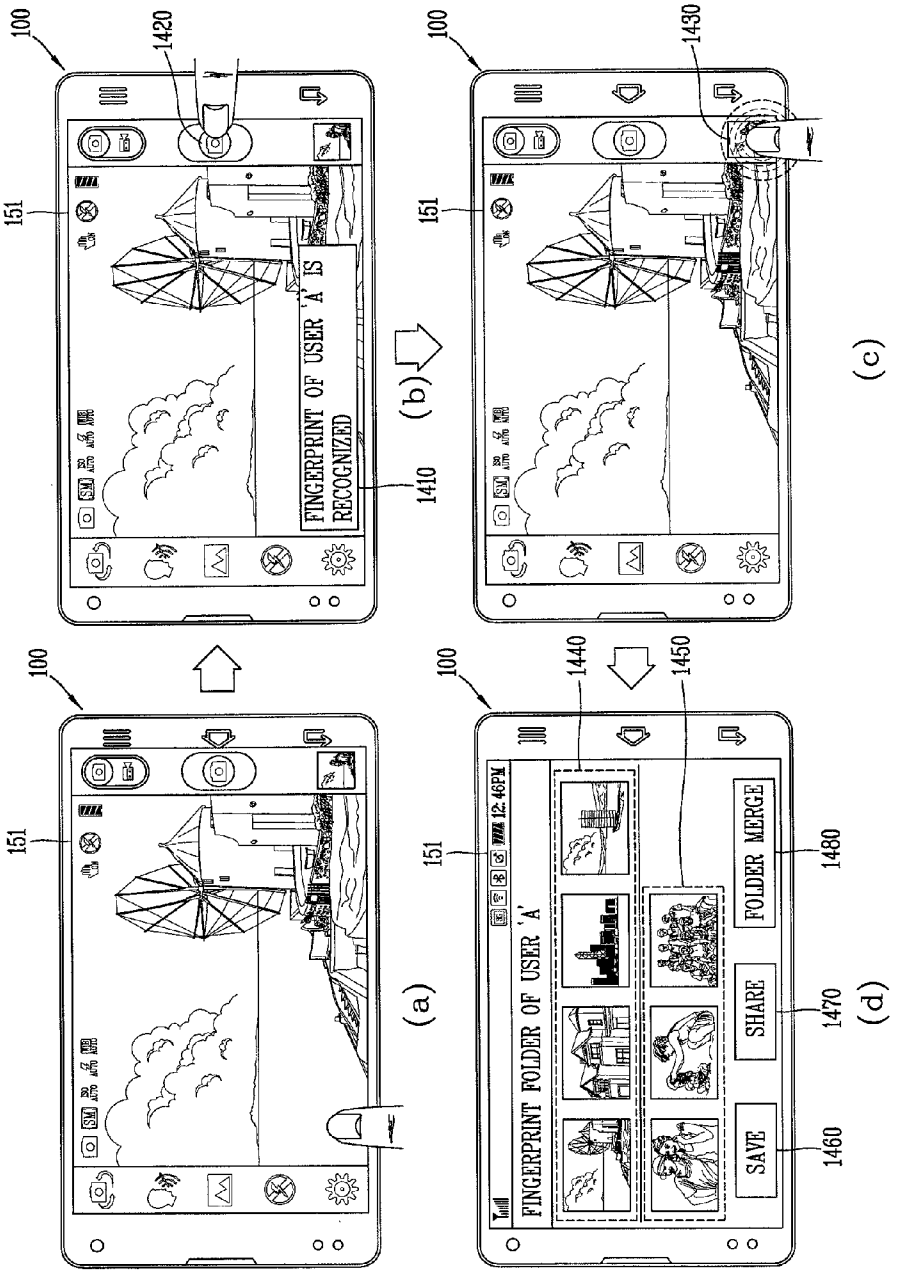

100
151
1420
FINGERPRINT OF USER 'A' IS RECOGNIZED
1410
(b)
1430
(c)
(a)
1440
1450
FINGERPRINT FOLDER OF USER 'A'
SAVE
SHARE
FOLDER MERGE
1460
1470
1480
(d)

FIG. 15

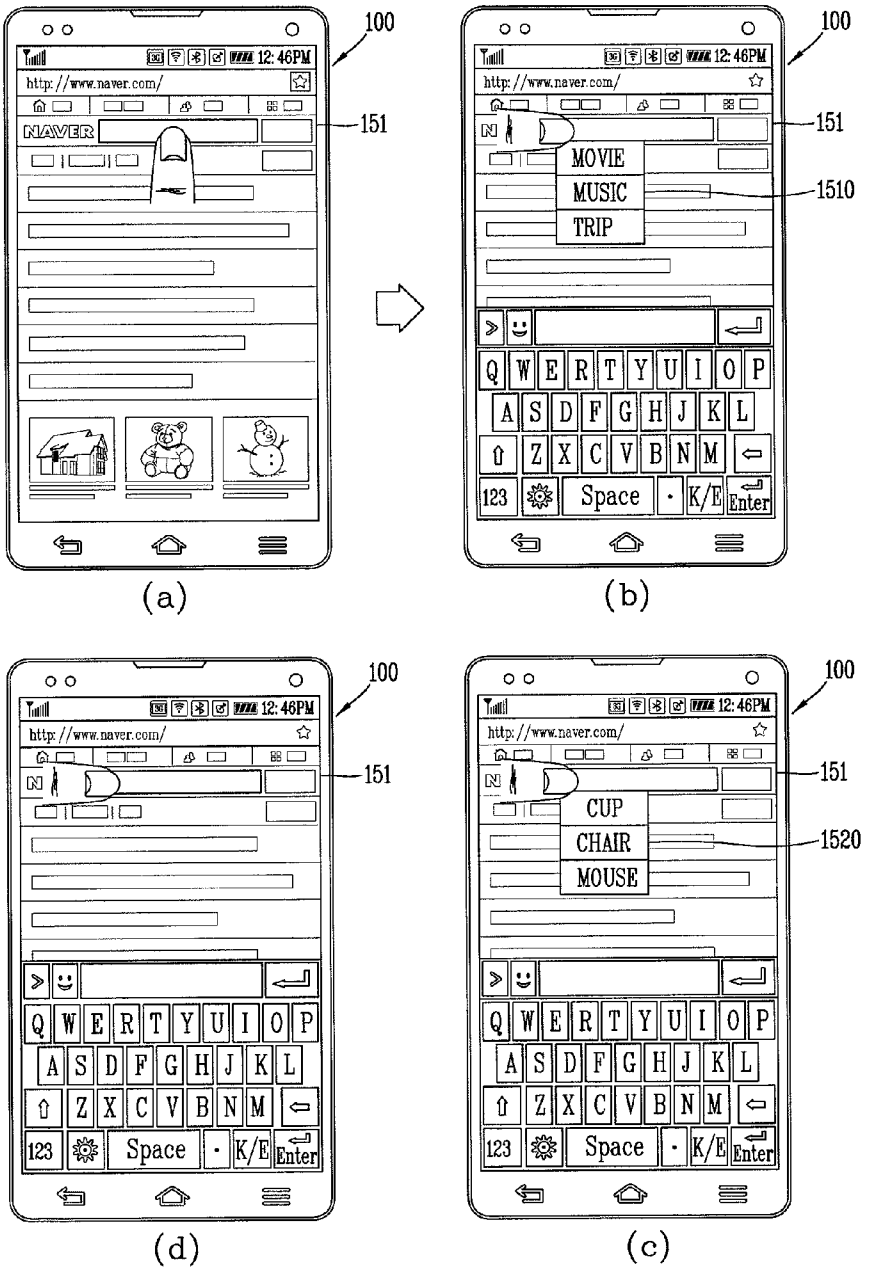

100
151
1510
1520
MOVIE
MUSIC
TRIP
CUP
CHAIR
MOUSE
http://www.naver.com/
NAVER
12:46PM
Space
Enter
(a)
(b)
(c)
(d)

FIG. 16

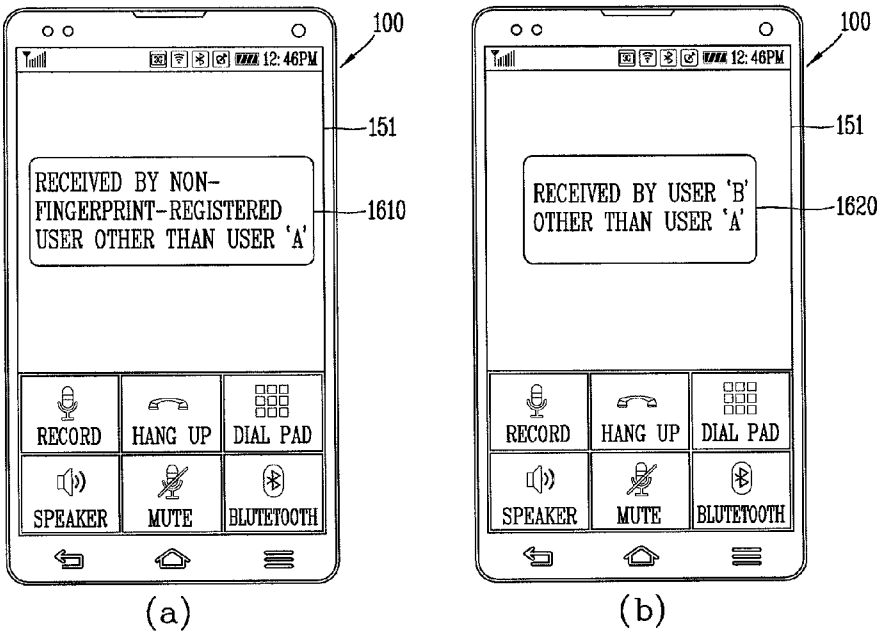

100
151
RECEIVED BY NON-FINGERPRINT-REGISTERED USER OTHER THAN USER 'A'
1610
RECORD
HANG UP
DIAL PAD
SPEAKER
MUTE
BLUTETOOTH
12: 46PM
(a)
100
151
RECEIVED BY USER 'B' OTHER THAN USER 'A'
1620
RECORD
HANG UP
DIAL PAD
SPEAKER
MUTE
BLUTETOOTH
12: 46PM
(b)

FIG. 17

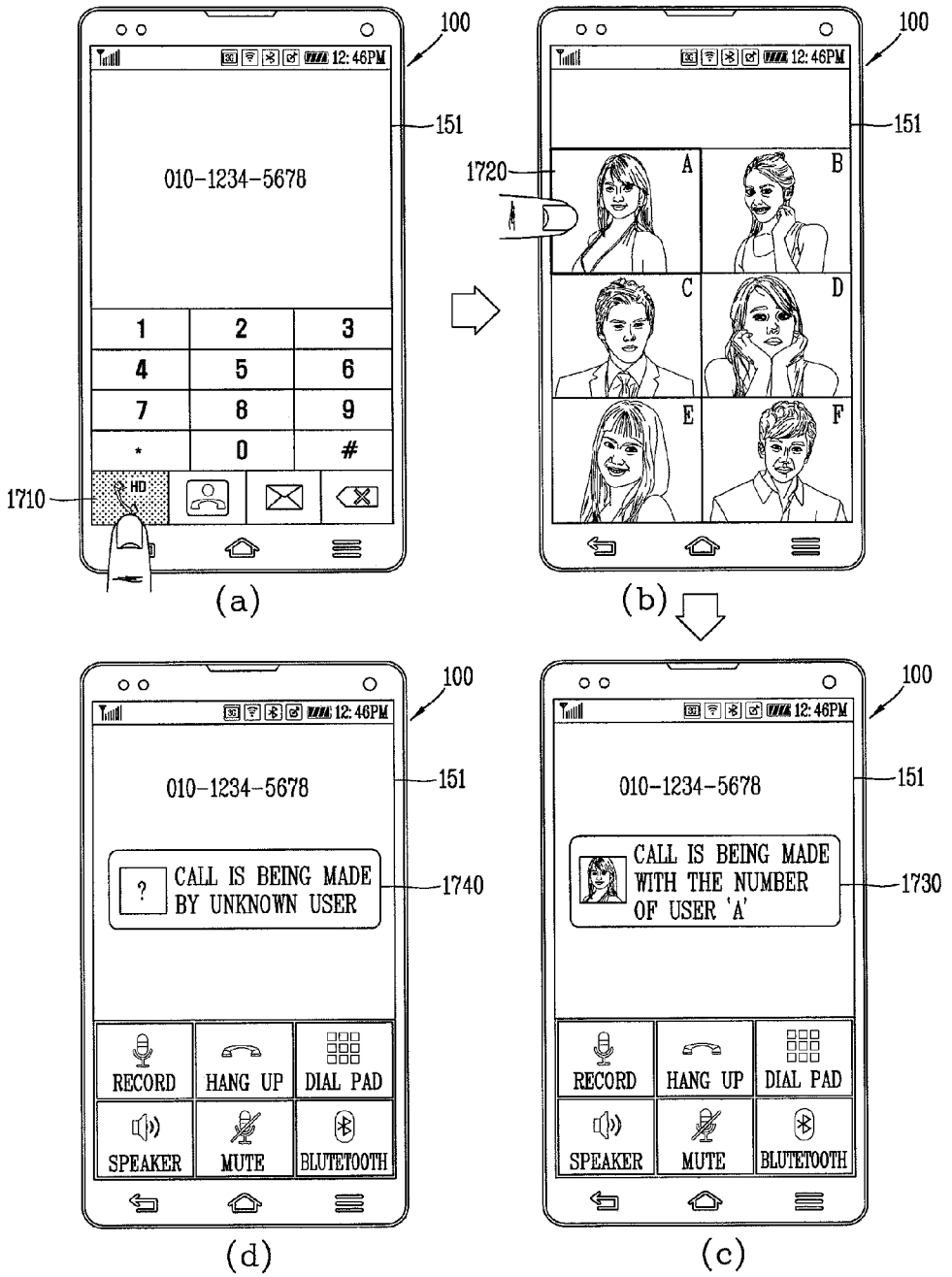

100
151
010-1234-5678
1710
1720
A
B
C
D
E
F
1740
CALL IS BEING MADE BY UNKNOWN USER
1730
CALL IS BEING MADE WITH THE NUMBER OF USER 'A'
RECORD
HANG UP
DIAL PAD
SPEAKER
MUTE
BLUETOOTH
(a)
(b)
(c)
(d)

FIG. 18

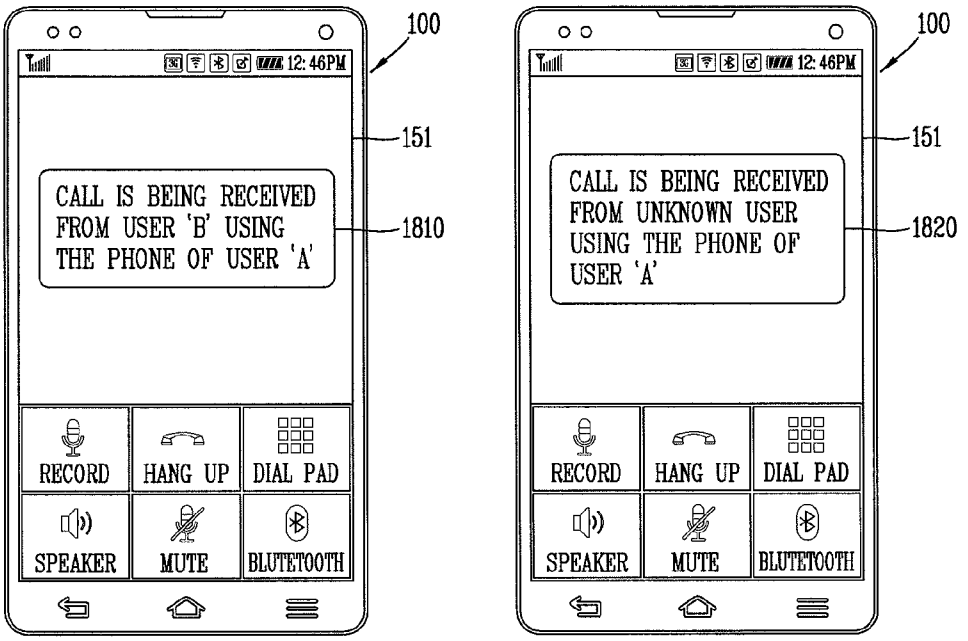

100
12: 46PM
151
CALL IS BEING RECEIVED FROM USER 'B' USING THE PHONE OF USER 'A'
1810
RECORD
HANG UP
DIAL PAD
SPEAKER
MUTE
BLUETOOTH
(a)
100
12: 46PM
151
CALL IS BEING RECEIVED FROM UNKNOWN USER USING THE PHONE OF USER 'A'
1820
RECORD
HANG UP
DIAL PAD
SPEAKER
MUTE
BLUETOOTH
(b)

FIG. 19

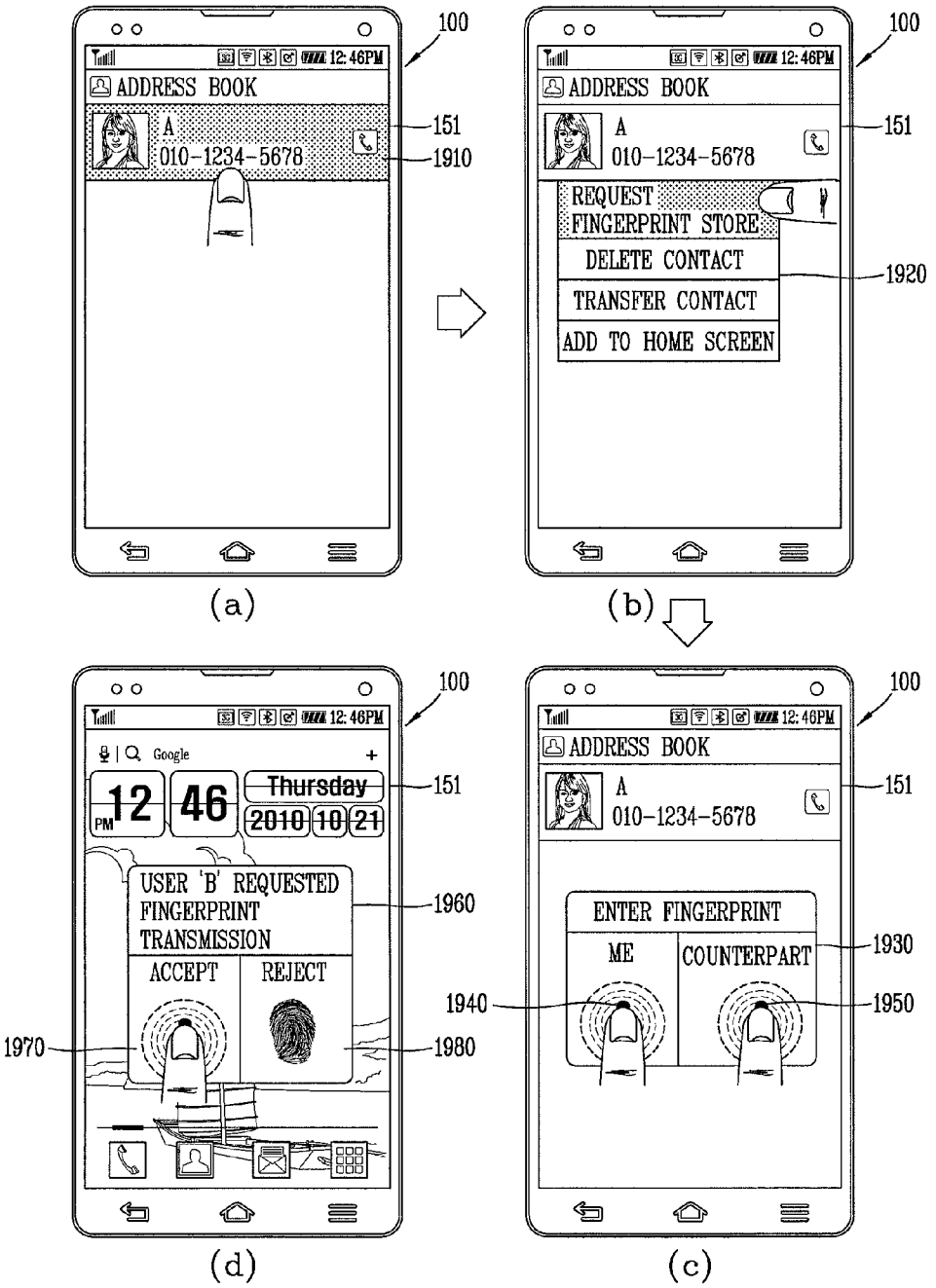

100
12:46PM
ADDRESS BOOK
A
010-1234-5678
151
1910
(a)
REQUEST FINGERPRINT STORE
DELETE CONTACT
TRANSFER CONTACT
ADD TO HOME SCREEN
1920
(b)
Google
PM 12 46
Thursday
2010 10 21
USER 'B' REQUESTED FINGERPRINT TRANSMISSION
ACCEPT
REJECT
1960
1970
1980
(d)
ENTER FINGERPRINT
ME
COUNTERPART
1930
1940
1950
(c)

FIG. 20

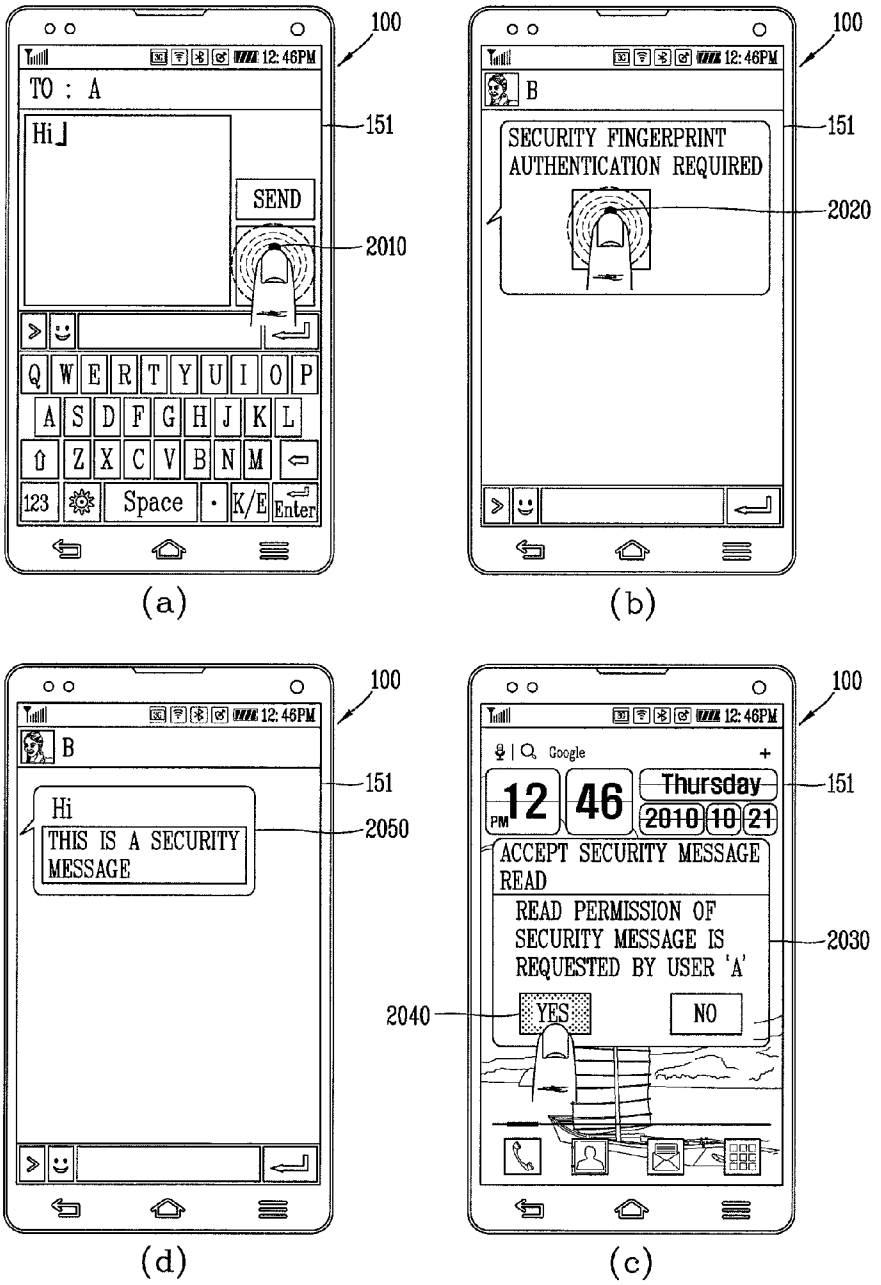

100
12:46PM
TO : A
Hi
SEND
151
2010
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
123
Space
K/E
Enter
(a)
100
12:46PM
B
SECURITY FINGERPRINT AUTHENTICATION REQUIRED
151
2020
(b)
100
12:46PM
B
Hi
THIS IS A SECURITY MESSAGE
151
2050
(d)
100
12:46PM
Google
12
46
PM
Thursday
2010 10 21
151
ACCEPT SECURITY MESSAGE READ
READ PERMISSION OF SECURITY MESSAGE IS REQUESTED BY USER 'A'
2030
2040
YES
NO
(c)

FIG. 21

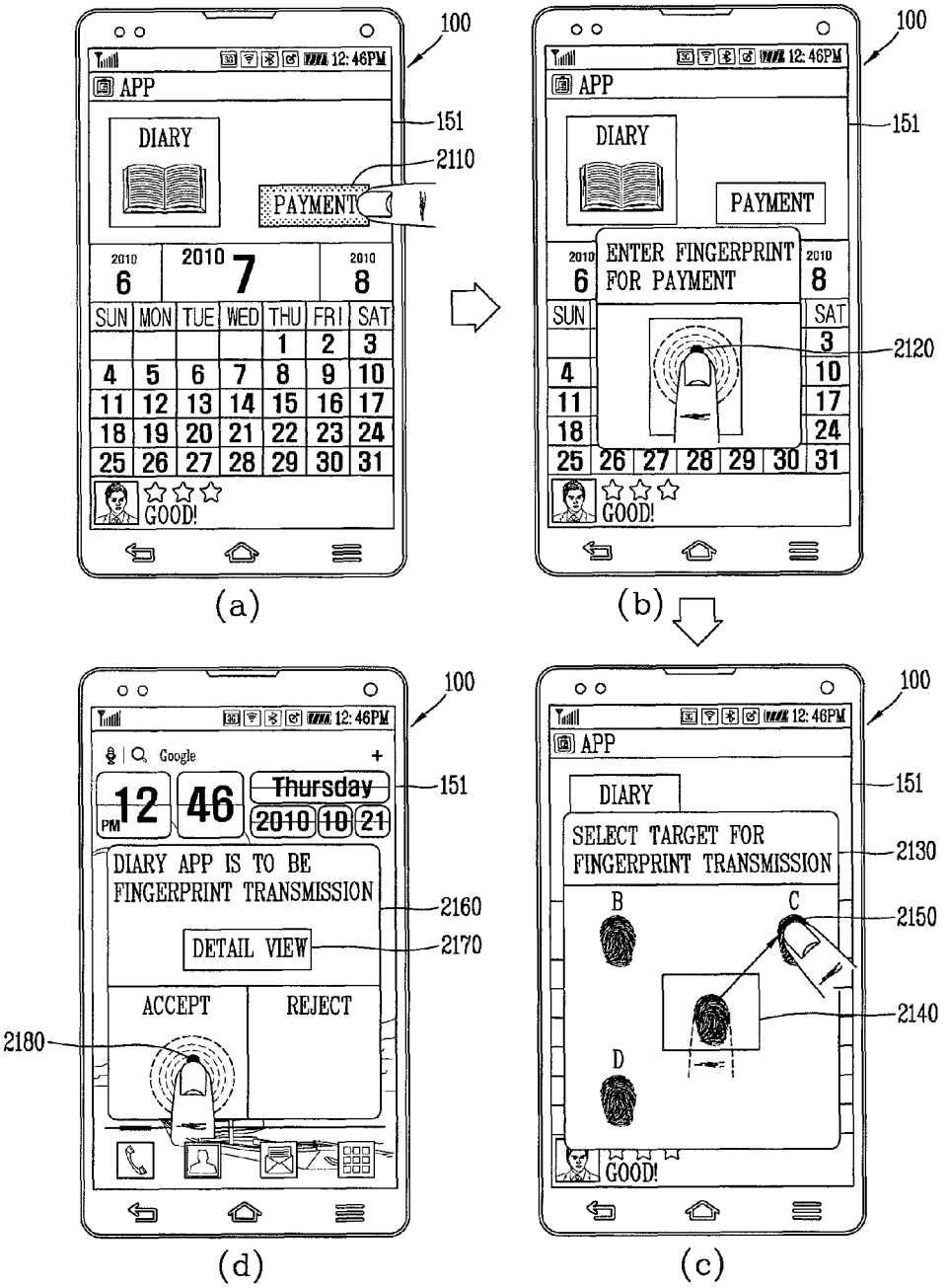

100
APP
DIARY
PAYMENT
151
2110
2010 6
2010 7
2010 8
SUN MON TUE WED THU FRI SAT
GOOD!
(a)
ENTER FINGERPRINT FOR PAYMENT
2120
(b)
Google
Thursday
12 46 PM
2010 10 21
DIARY APP IS TO BE FINGERPRINT TRANSMISSION
2160
DETAIL VIEW
2170
ACCEPT
REJECT
2180
(d)
SELECT TARGET FOR FINGERPRINT TRANSMISSION
2130
B
C
D
2150
2140
(c)

FIG. 22

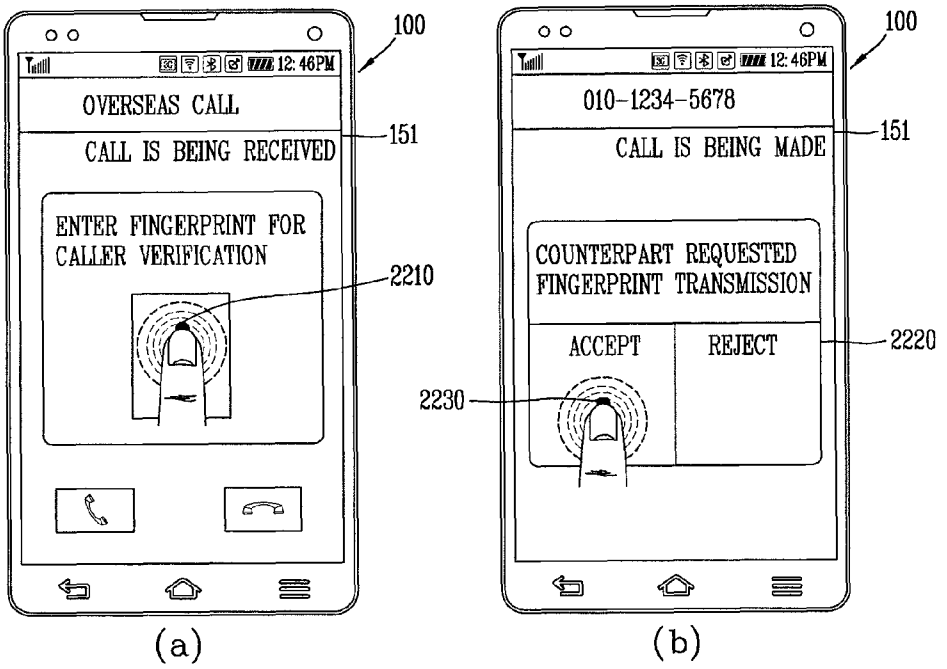

100
12:46PM
OVERSEAS CALL
CALL IS BEING RECEIVED
151
ENTER FINGERPRINT FOR CALLER VERIFICATION
2210
(a)
100
12:46PM
010-1234-5678
CALL IS BEING MADE
151
COUNTERPART REQUESTED FINGERPRINT TRANSMISSION
ACCEPT
REJECT
2220
2230
(b)

FIG. 23

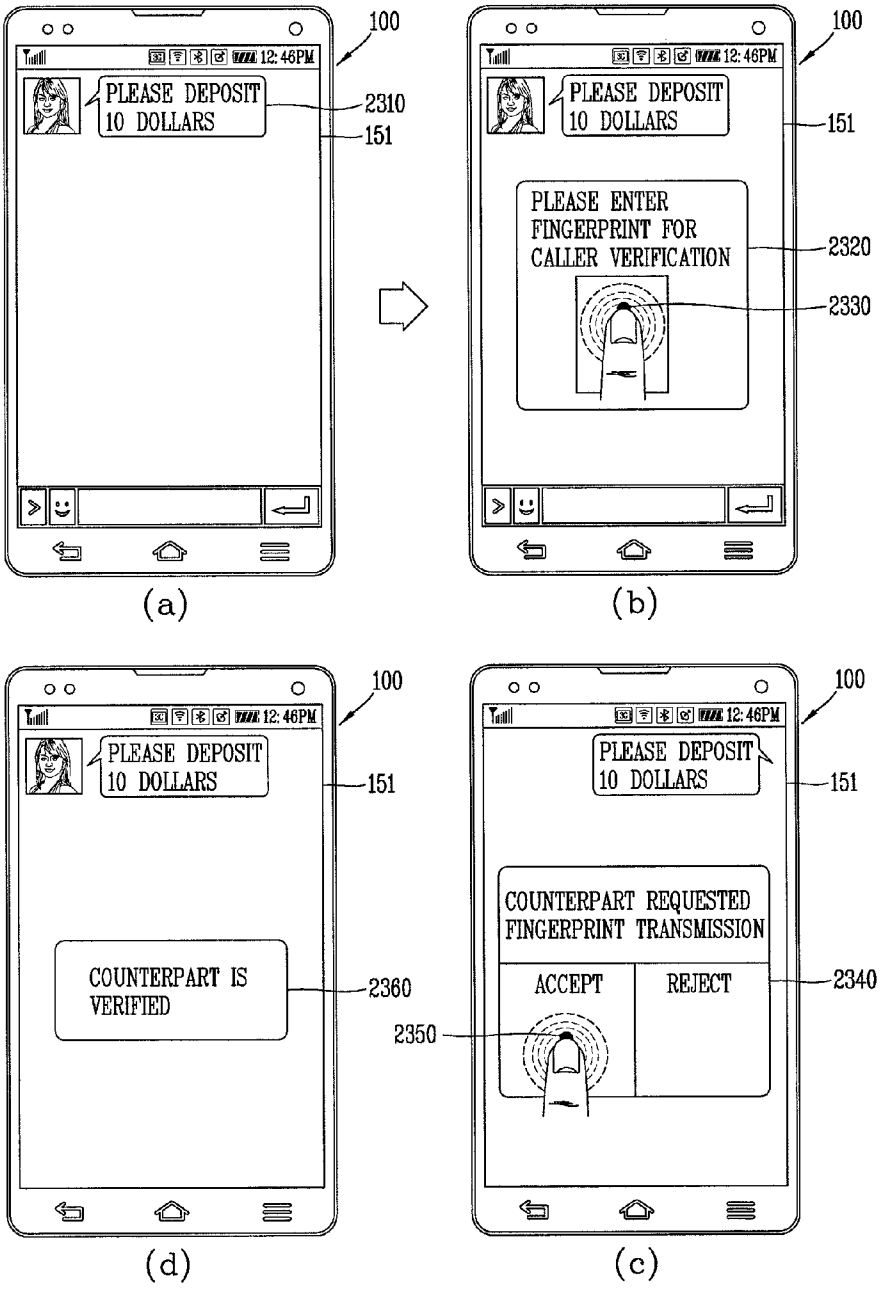
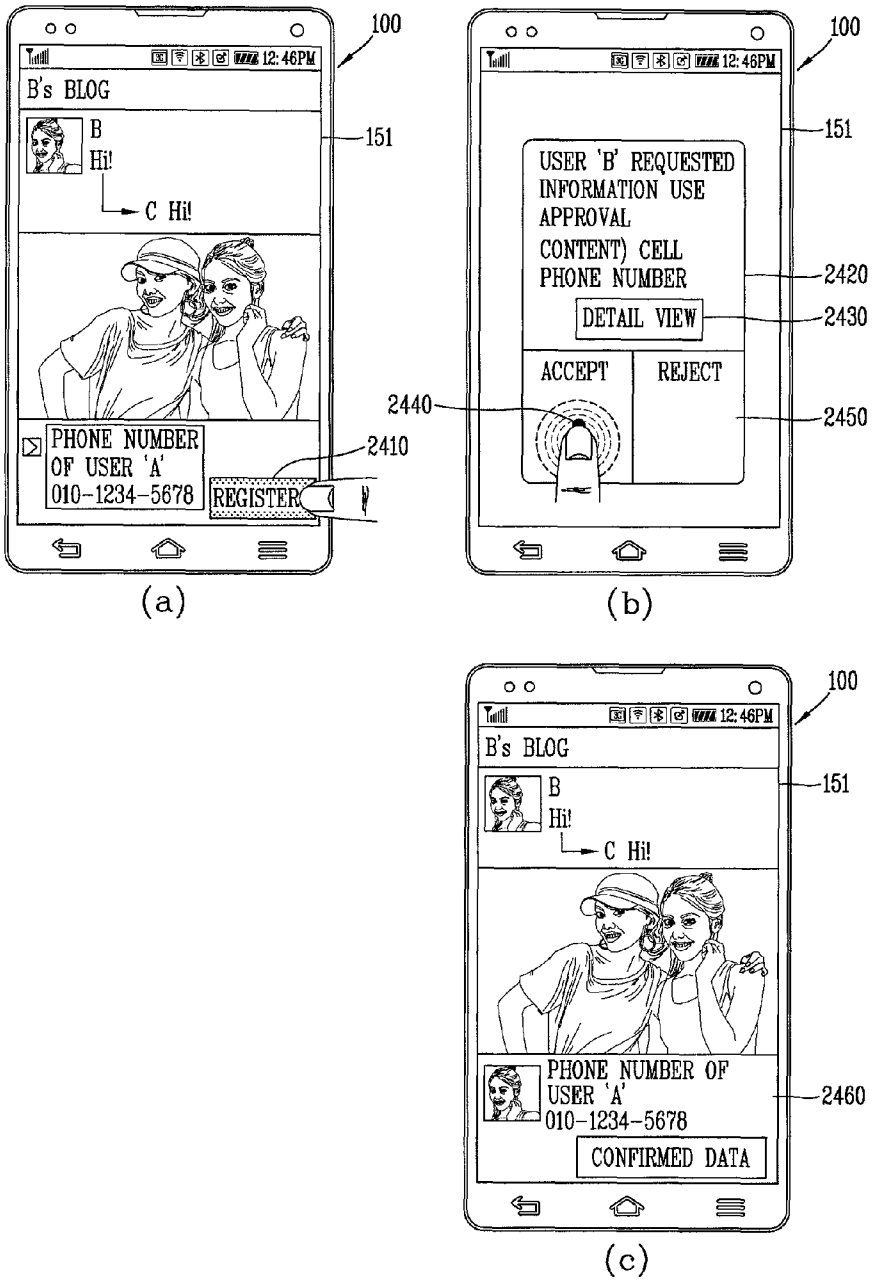

100
12:46PM
PLEASE DEPOSIT
10 DOLLARS
2310
151
(a)
100
12:46PM
PLEASE DEPOSIT
10 DOLLARS
151
PLEASE ENTER
FINGERPRINT FOR
CALLER VERIFICATION
2320
2330
(b)
100
12:46PM
PLEASE DEPOSIT
10 DOLLARS
151
COUNTERPART IS
VERIFIED
2360
(d)
100
12:46PM
PLEASE DEPOSIT
10 DOLLARS
151
COUNTERPART REQUESTED
FINGERPRINT TRANSMISSION
ACCEPT
REJECT
2340
2350
(c)

FIG. 24


100
12:46PM
B's BLOG
151
B
Hi!
C Hi!
PHONE NUMBER OF USER 'A' 010-1234-5678
REGISTER
2410
(a)
USER 'B' REQUESTED INFORMATION USE APPROVAL
CONTENT) CELL PHONE NUMBER
2420
DETAIL VIEW
2430
ACCEPT
REJECT
2440
2450
(b)
PHONE NUMBER OF USER 'A' 010-1234-5678
2460
CONFIRMED DATA
(c)

MOBILE TERMINAL AND CONTROL METHOD THEREOF

CROSS-REFERENCE TO A RELATED APPLICATION

This application claims the benefit of priority of Korean Patent Application Nos. 10-2013-0137128 and 10-2013-0137129, filed on Nov. 12, 2013 and Nov. 12, 2013, respectively which is herein expressly incorporated by reference in their entireties.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a mobile terminal, and more particularly, to a mobile terminal capable of fingerprint recognition and a control method thereof.

2. Description of the Related Art

Terminals can be classified into two types, such as a mobile or portable terminal and a stationary terminal based on its mobility. Furthermore, the mobile terminal can be further classified into two types, such as a handheld terminal and a vehicle mounted terminal based on whether or not it can be directly carried by a user.

As it becomes multifunctional, for example, such a terminal is allowed to capture still images or moving images, play music or video files, play games, receive broadcast and the like, so as to be implemented as an integrated multimedia player. Moreover, the improvement of structural or software elements of the terminal may be taken into consideration to support and enhance the functions of the terminal.

Owing to the enhancement, a mobile terminal may recognize a user's fingerprint entered thereto. However, only a limited feature such as implementing a lock release using a fingerprint input for the owner of the terminal has been mostly performed.

SUMMARY OF THE INVENTION

Accordingly, one object of the present invention is to provide a mobile terminal and control method thereof capable of receiving fingerprints for the owner of the terminal as well as another user with which his or her fingerprint is registered to implement various functions, thereby enhancing the user's convenience.

To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, the present invention provides in one aspect a mobile terminal including a wireless communication unit configured to provide wireless communication; a display unit; and a controller configured to: receive a fingerprint input on the display unit matching at least one of a first user's fingerprint and a second user's fingerprint, said first user being a main user of the mobile terminal and being different than the second user, and control at least one of the mobile terminal of the first user and a terminal of the second user based on the received fingerprint input. The present invention also provides a corresponding method of controlling a mobile terminal.

Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention.

In the drawings:

FIG. **1** is a block diagram illustrating a mobile terminal according to an embodiment disclosed in the present invention;

FIGS. **2**A and **2**B are conceptual views illustrating a communication system in which a mobile terminal according to the present invention is operable;

FIG. **3**A is a front perspective view illustrating an example of a mobile terminal associated with the present invention;

FIG. **3**B is a rear perspective view illustrating a mobile terminal illustrated in FIG. **3**A;

FIG. **4** is a flow chart illustrating a mobile terminal according to an embodiment of the present invention;

FIG. **5** is a conceptual view illustrating an embodiment for executing the account of the fingerprint registered user;

FIG. **6** is a conceptual view illustrating an embodiment for transmitting content according to a fingerprint input;

FIG. **7** is a conceptual view illustrating an embodiment for entering a fingerprint to a plurality of terminals to transmit content;

FIG. **8** is a conceptual view illustrating an embodiment for displaying content stored in a plurality of terminals, respectively, on one terminal and transmitting the content according to a fingerprint input;

FIG. **9** is a conceptual view illustrating an embodiment for editing an image according to a fingerprint input;

FIG. **10** is a conceptual view illustrating an embodiment for registering a fingerprint with a terminal;

FIG. **11** is a conceptual view illustrating an embodiment for recommending fingerprint store;

FIG. **12** is a conceptual view illustrating an embodiment for setting up an executable application for each fingerprint registered user;

FIG. **13** is a conceptual view illustrating an embodiment of a user interface displayed for a non-fingerprint-registered user in a camera capture mode;

FIG. **14** is a conceptual view illustrating an embodiment of a user interface displayed for a fingerprint registered user in a camera capture mode;

FIG. **15** is a conceptual view illustrating an embodiment for showing only search records that have been searched by himself or herself according to fingerprint recognition;

FIG. **16** is a conceptual view illustrating an embodiment in which a message is shown on a calling or receiving terminal when a main user of the receiving terminal does not receive the receiving terminal;

FIG. **17** is a conceptual view illustrating an embodiment in which a message is shown on a calling terminal when a main user of the calling terminal does not call the calling terminal;

FIG. **18** is a conceptual view illustrating an embodiment in which a message is shown on a receiving terminal when a main user of the calling terminal does not call the calling terminal;

FIG. **19** is a conceptual view illustrating another embodiment for registering a fingerprint with a terminal;

FIG. **20** is a conceptual view illustrating an embodiment of security data transmission;

FIG. **21** is a conceptual view illustrating an embodiment for receiving fingerprint transmission to execute online payment;

FIG. **22** is a conceptual view illustrating an embodiment for verifying the caller of an overseas call according to a fingerprint input;

FIG. **23** is a conceptual view illustrating an embodiment for making a request for fingerprint transmission to verify the caller; and

FIG. **24** is a conceptual view illustrating an embodiment for approving a case where a third person posts personal information.

DETAILED DESCRIPTION OF THE INVENTION

Hereinafter, preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings, and the same or similar elements are designated with the same numeral references regardless of the numerals in the drawings and their redundant description will be omitted. A suffix "module" or "unit" used for constituent elements disclosed in the following description is merely intended for easy description of the specification, and the suffix itself does not give any special meaning or function. Also, it should be noted that the accompanying drawings are merely illustrated to easily explain the concept of the invention, and therefore, they should not be construed to limit the concept of the invention by the accompanying drawings.

A mobile terminal disclosed herein may include a portable phone, a smart phone, a laptop computer, a digital broadcast mobile device, a personal digital assistant (PDA), a mobile multimedia player (PMP), a navigation, a slate PC, a tablet PC, an ultrabook, and the like. However, a configuration according to the following description may be applicable to a stationary terminal such as a digital TV, a desktop computer, and the like, excluding constituent elements particularly configured for mobile purposes.

FIG. **1** is a block diagram illustrating a mobile terminal **100** according to an embodiment disclosed in the present invention. The mobile terminal **100** may include a wireless communication unit **110**, an audio/video (A/V) input unit **120**, a user input unit **130**, a sensing unit **140**, an output unit **150**, a memory **160**, an interface unit **170**, a controller **180**, a power supply unit **190**, and the like. However, the mobile communication terminal may be implemented with greater or less number of elements than those illustrated elements.

The wireless communication unit **110** may include one or more modules allowing radio communication between the mobile terminal **100** and a wireless communication system, or allowing radio communication between the mobile terminal **100** and a network in which the mobile terminal **100** is located. For example, the wireless communication unit **110** may include at least one of a broadcast receiving module **111**, a mobile communication module **112**, a wireless Internet module **113**, a short-range communication module **114**, a location information module **115**, and the like.

The broadcast receiving module **111** receives a broadcast signal and/or broadcast associated information from an external broadcast managing entity via a broadcast channel. The broadcast channel may include a satellite channel and a terrestrial channel. The broadcast managing entity may indicate a server which generates and transmits a broadcast signal and/or broadcast associated information or a server which receives a pre-generated broadcast signal and/or broadcast associated information and sends them to the mobile terminal. The broadcast signal may be implemented as a TV broadcast signal, a radio broadcast signal, and a data broadcast signal, among others. The broadcast signal may further include a data broadcast signal combined with a TV or radio broadcast signal.

Examples of broadcast associated information may include information associated with a broadcast channel, a broadcast program, a broadcast service provider, and the like. The broadcast associated information may be provided via a mobile communication network, and received by the mobile communication module **112**. The broadcast associated information may be implemented in various formats. For instance, broadcast associated information may include Electronic Program Guide (EPG) of Digital Multimedia Broadcasting (DMB), Electronic Service Guide (ESG) of Digital Video Broadcast-Handheld (DVB-H), and the like.

The broadcast receiving module **111** may be configured to receive digital broadcast signals transmitted from various types of broadcast systems. Such broadcast systems may include Digital Multimedia Broadcasting-Terrestrial (DMB-T), Digital Multimedia Broadcasting-Satellite (DMB-S), Media Forward Link Only (MediaFLO), Digital Video Broadcast-Handheld (DVB-H), Integrated Services Digital Broadcast-Terrestrial (ISDB-T) and the like. Of course, the broadcast receiving module **111** may be configured to be suitable for every broadcast system transmitting broadcast signals as well as the digital broadcasting systems. Broadcast signals and/or broadcast associated information received via the broadcast receiving module **111** may be stored in a memory **160**.

The mobile communication module **112** transmits and receives wireless signals to and from at least one a base station, an external terminal and a server on a mobile communication network. Here, the wireless signals may include audio call signals, video call signals, or various formats of data according to the transmission and reception of text/multimedia messages.

The mobile communication module **112** may be configured to implement a video communication mode and a voice communication mode. The video communication mode refers to a configuration in which communication is made while viewing the image of the counterpart, and the voice communication mode refers to a configuration in which communication is made without viewing the image of the counterpart. The mobile communication module **112** may be configured to transmit or receive at least one of audio or video data to implement the video communication mode and voice communication mode.

The wireless Internet module **113** refers to a module for supporting wireless Internet access, and may be built-in or externally installed on the mobile terminal **100**. Here, it may be used a wireless Internet access technique including WLAN (Wireless LAN), Wi-Fi (Wireless Fidelity) Direct, DLNA (Digital Living Network Alliance), Wibro (Wireless Broadband), Wimax (World Interoperability for Microwave Access), HSDPA (High Speed Downlink Packet Access), and the like.

The short-range communication module **114** refers to a module for supporting a short-range communication. Here, it may be used a short-range communication technology including Bluetooth™, Radio Frequency IDentification (RFID), Infrared Data Association (IrDA), Ultra WideBand (UWB), ZigBee, Near Field Communication (NFC) and the like.

The location information module **115** is a module for checking or acquiring the location of the mobile terminal, and there is a Global Positioning Module (GPS) module or Wireless Fidelity (Wi-Fi) as a representative example.

Referring to FIG. **1**, the A/V (audio/video) input unit **120** receives an audio or video signal, and the A/V (audio/video) input unit **120** may include a camera **121** and a microphone **122**. The camera **121** processes image frames, such as still or moving images, obtained by an image sensor in a video phone call or image capturing mode. The processed image frame may be displayed on a display unit **151**.

The image frames processed by the camera **121** may be stored in the memory **160** or transmitted to an external device through the wireless communication unit **110**. Furthermore, the user's location information or the like may be produced from image frames acquired from the camera **121**. Two or more cameras **121** may be provided according to the use environment.

The microphone **122** receives an external audio signal through a microphone in a phone call mode, a recording mode, a voice recognition mode, and the like, and processes the audio signal into electrical voice data. The processed voice data may be converted and output into a format that is transmittable to a mobile communication base station through the mobile communication module **112** in the phone call mode. The microphone **122** may implement various types of noise canceling algorithms to cancel noise generated in a procedure of receiving the external audio signal.

The user input unit **130** may generate input data to control an operation of the terminal. The user input unit **130** may be configured by including a keypad, a dome switch, a touch pad (pressure/capacitance), a jog wheel, a jog switch, and the like.

The sensing unit **140** detects a current status of the mobile terminal **100** such as an opened or closed configuration of the mobile terminal **100**, a location of the mobile terminal **100**, a presence or absence of user contact with the mobile terminal **100**, an orientation of the mobile terminal **100**, an acceleration/deceleration of the mobile terminal **100**, and the like, so as to generate a sensing signal for controlling the operation of the mobile terminal **100**. For example, when the mobile terminal **100** is a slide phone type, the sensing unit **140** may sense whether a sliding portion of the mobile terminal is open or closed. Other examples include sensing functions, such as the sensing unit **140** sensing the presence or absence of power provided by the power supply unit **190**, the presence or absence of a coupling between the interface unit **170** and an external device.

The output unit **150** is configured to generate an output associated with visual sense, auditory sense or tactile sense, and may include a display unit **151**, an audio output module **153**, an alarm unit **154**, a haptic module **155**, and the like.

The display unit **151** may display (output) information processed in the mobile terminal **100**. For example, when the mobile terminal **100** is in a phone call mode, the display unit **151** may display a User Interface (UI) or a Graphic User Interface (GUI) associated with a call. When the mobile terminal **100** is in a video call mode or image capturing mode, the display unit **151** may display a captured image and/or received image, a UI or GUI.

The display unit **151** may include at least one of a Liquid Crystal Display (LCD), a Thin Film Transistor-LCD (TFT-LCD), an Organic Light Emitting Diode (OLED) display, a flexible display, a three-dimensional (3D) display, and an e-ink display. Some of those displays may be configured with a transparent or optical transparent type to allow viewing of the exterior through the display unit, which may be called transparent displays. An example of the typical transparent displays may include a transparent LCD (TOLED), and the like. Under this configuration, a user can view an object positioned at a rear side of a mobile terminal body through a region occupied by the display unit **151** of the mobile terminal body.

Two or more display units **151** may be implemented according to a configured aspect of the mobile terminal **100**. For instance, a plurality of the display units **151** may be arranged on one surface to be spaced apart from or integrated with each other, or may be arranged on different surfaces.

Furthermore, the display unit **151** may be configured with a stereoscopic display unit **152** for displaying a stereoscopic image. Here, stereoscopic image indicates a 3-dimensional stereoscopic image, and the 3-dimensional stereoscopic image is an image for allowing the user to feel the gradual depth and reality of an object located on the monitor or screen as in a real space. The 3-dimensional stereoscopic image may be implemented by using binocular disparity. Here, binocular disparity denotes a disparity made by the location of two eyes separated from each other, allowing the user to feel the depth and reality of a stereoscopic image when two eyes see different two-dimensional images and then the images are transferred through the retina and merged in the brain as a single image.

A stereoscopic method (glasses method), an auto-stereoscopic method (no-glasses method), a projection method (holographic method), and the like may be applicable to the stereoscopic display unit **152**. The stereoscopic method primarily used in a home television receiver and the like may include a Wheatstone stereoscopic method and the like.

The examples of the auto-stereoscopic method may include a parallel barrier method, a lenticular method, an integral imaging method, and the like. The projection method may include a reflective holographic method, a transmissive holographic method, and the like.

In general, a 3-dimensional stereoscopic image may include a left image (image for the left eye) and a right image (image for the right eye). The method of implementing a 3-dimensional stereoscopic image can be divided into a top-down method in which a left image and a right image are disposed at the top and bottom within a frame, a left-to-right (L-to-R) or side by side method in which a left image and a right image are disposed at the left and right within a frame, a checker board method in which the pieces of a left image and a right image are disposed in a tile format, an interlaced method in which a left and a right image are alternately disposed for each column and row unit, and a time sequential or frame by frame method in which a left image and a right image are alternately displayed for each time frame, according to the method of combining a left image and a right image into a 3-dimensional stereoscopic image.

Furthermore, for 3-dimensional thumbnail images, a left image thumbnail and a right image thumbnail may be generated from the left and the right image of the original image frame, and then combined with each other to generate a 3-dimensional stereoscopic image. Typically, thumbnail denotes a reduced image or reduced still video. The left and right thumbnail image generated in this manner are displayed with a left and right distance difference on the screen in a depth corresponding to the disparity of the left and right image, thereby implementing a stereoscopic space feeling.

A left image and a right image required to implement a 3-dimensional stereoscopic image are displayed on the stereoscopic display unit **152** by a stereoscopic processing unit. The stereoscopic processing unit receives a 3D image to extract a left image and a right image from the 3D image, or receives a 2D image to convert it into a left image and a right image.

Further, when the display unit **151** and a touch sensitive sensor (hereinafter, referred to as a "touch sensor") have an interlayer structure (hereinafter, referred to as a "touch screen"), the display unit **151** may be used as an input device in addition to an output device. The touch sensor may be implemented as a touch film, a touch sheet, a touch pad, and the like.

The touch sensor may be configured to convert changes of a pressure applied to a specific part of the display unit **151**, or a capacitance occurring from a specific part of the display unit **151**, into electric input signals. The touch sensor may be configured to sense not only a touched position and a touched area, but also a touch pressure at which a touch object body is touched on the touch sensor. Here, the touch object body may be a finger, a touch pen or stylus pen, a pointer, or the like as an object by which a touch is applied to the touch sensor.

When there is a touch input to the touch sensor, the corresponding signals are transmitted to a touch controller. The touch controller processes the signal(s), and then transmits the corresponding data to the controller **180**. Accordingly, the controller **180** can sense which region of the display unit **151** has been touched.

Referring to FIG. **1**, a proximity sensor **141** may be arranged at an inner region of the mobile device **100** surrounded by the touch screen, or adjacent to the touch screen. The proximity sensor **141** may be provided as an example of the sensing unit **140**. The proximity sensor **141** refers to a sensor to sense the presence or absence of an object approaching to a surface to be sensed, or an object disposed adjacent to a surface to be sensed, by using an electromagnetic field or infrared rays without a mechanical contact. The proximity sensor **141** has a longer lifespan and a more enhanced utility than a contact sensor.

The proximity sensor **141** may include an optical transmission type photoelectric sensor, a direct reflective type photoelectric sensor, a mirror reflective type photoelectric sensor, a high-frequency oscillation proximity sensor, a capacitance type proximity sensor, a magnetic type proximity sensor, an infrared rays proximity sensor, and so on. When the touch screen is implemented as a capacitance type, the proximity of an object having conductivity (hereinafter, referred to as a "pointer") to the touch screen is sensed by changes of an electromagnetic field. In this instance, the touch screen (touch sensor) may be categorized into a proximity sensor.

Hereinafter, for the sake of convenience of brief explanation, a behavior that the pointer is positioned to be proximate onto the touch screen without contact will be referred to as a "proximity touch", whereas a behavior that the pointer substantially comes in contact with the touch screen will be referred to as a "contact touch". For the position corresponding to the proximity touch of the pointer on the touch screen, such position corresponds to a position where the pointer faces perpendicular to the touch screen upon the proximity touch of the pointer.

The proximity sensor **141** senses a proximity touch, and a proximity touch pattern (e.g., proximity touch distance, proximity touch direction, proximity touch speed, proximity touch time, proximity touch position, proximity touch moving status, etc.). Information relating to the sensed proximity touch and the sensed proximity touch patterns may be output onto the touch screen.

When the stereoscopic display unit **152** and a touch sensor are configured with an interlayer structure (hereinafter, referred to as a "stereoscopic touch screen") or the stereoscopic display unit **152** and a 3D sensor for detecting a touch operation are combined with each other, the stereoscopic display unit **152** may be used as a 3-dimensional input device.

As an example of the 3D sensor, the sensing unit **140** may include a proximity sensor **141**, a stereoscopic touch sensing unit **142**, an ultrasound sensing unit **143**, and a camera sensing unit **144**.

The proximity sensor **141** measures a distance between the sensing object (for example, the user's finger or stylus pen) and a detection surface to which a touch is applied using an electromagnetic field or infrared rays without a mechanical contact. The terminal may recognize which portion of a stereoscopic image has been touched by using the measured distance. In particular, when the touch screen is implemented with a capacitance type, it may be configured such that the proximity level of a sensing object is sensed by changes of an electromagnetic field according to the proximity of the sensing object to recognize a 3-dimensional touch using the proximity level.

The stereoscopic touch sensing unit **142** may be configured to sense the strength or duration time of a touch applied to the touch screen. For example, stereoscopic touch sensing unit **142** senses a user applied touch pressure, and if the applied pressure is strong, then the stereoscopic touch sensing unit **142** recognizes it as a touch for an object located farther from the touch screen.

The ultrasound sensing unit **143** may be configured to sense the location of the sensing object using ultrasound. For example, the ultrasound sensing unit **143** may be configured with an optical sensor and a plurality of ultrasound sensors. The optical sensor may be formed to sense light, and the ultrasound sensor may be formed to sense ultrasound waves. Since light is far faster than ultrasound waves, the time for light to reach the optical sensor is far faster than the time for ultrasound waves to reach the ultrasound sensor. Accordingly, the location of the wave generating source may be calculated using a time difference between the light and ultrasound waves to reach the optical sensor.

The camera sensing unit **144** may include at least one of a camera **121**, a photo sensor, and a laser sensor. For example, the camera **121** and laser sensor may be combined to each other to sense a touch of the sensing object to a 3-dimensional stereoscopic image. Distance information sensed by the laser sensor is added to a two-dimensional image captured by the camera to acquire 3-dimensional information.

In another example, a photo sensor may be deposited on the display element. The photo sensor may be configured to scan the motion of the sensing object in proximity to the touch screen. More specifically, the photo sensor is integrated with photo diodes and transistors in the rows and columns thereof, and content placed on the photo sensor may be scanned by using an electrical signal that is changed according to the amount of light applied to the photo diode. In other words, the photo sensor performs the coordinate calculation of the sensing object according to the changed amount of light, and the location coordinate of the sensing object may be detected through this.

The audio output module **153** may output audio data received from the wireless communication unit **110** or stored in the memory **160**, in a call-receiving mode, a call-placing mode, a recording mode, a voice recognition mode, a broadcast reception mode, and so on. The audio output module **153** may output audio signals relating to the functions performed in the mobile terminal **100** (e.g., sound alarming a call received or a message received, and so on). The audio output module **153** may include a receiver, a speaker, a buzzer, and so on.

The alarm **154** outputs signals notifying occurrence of events from the mobile terminal **100**. The events occurring from the mobile terminal **100** may include call received,

message received, key signal input, touch input, and so on. The alarm **154** may output not only video or audio signals, but also other types of signals such as signals notifying occurrence of events in a vibration manner. Since the video or audio signals can be output through the display unit **151** or the audio output unit **153**, the display unit **151** and the audio output module **153** may be categorized into part of the alarm **154**.

The haptic module **155** generates various tactile effects which a user can feel. A representative example of the tactile effects generated by the haptic module **154** includes vibration. Vibration generated by the haptic module **154** may have a controllable intensity, a controllable pattern, and so on. For instance, different vibration may be output in a synthesized manner or in a sequential manner.

The haptic module **155** may generate various tactile effects, including not only vibration, but also arrangement of pins vertically moving with respect to a skin being touched, air injection force or air suction force through an injection hole or a suction hole, touch by a skin surface, presence or absence of contact with an electrode, effects by stimulus such as an electrostatic force, reproduction of cold or hot feeling using a heat absorbing device or a heat emitting device, and the like.

The haptic module **155** may be configured to transmit tactile effects through a user's direct contact, or a user's muscular sense using a finger or a hand. The haptic module **155** may be implemented in two or more in number according to the configuration of the mobile terminal **100**.

The memory **160** may store a program for processing and controlling the controller **180**. Alternatively, the memory **160** may temporarily store input/output data (e.g., phonebook, messages, still images, videos, and the like). Also, the memory **160** may store data related to various patterns of vibrations and sounds output upon the touch input on the touch screen.

The memory **160** may be implemented using any type of suitable storage medium including a flash memory type, a hard disk type, a multimedia card micro type, a memory card type (e.g., SD or DX memory), Random Access Memory (RAM), Static Random Access Memory (SRAM), Read-Only Memory (ROM), Electrically Erasable Programmable Read-only Memory (EEPROM), Programmable Read-only Memory (PROM), magnetic memory, magnetic disk, optical disk, and the like. Also, the mobile terminal **100** may operate in association with a web storage which performs the storage function of the memory **160** on the Internet.

The interface unit **170** may generally be implemented to interface the mobile terminal with external devices connected to the mobile terminal **100**. The interface unit **170** may allow a data reception from an external device, a power delivery to each component in the mobile terminal **100**, or a data transmission from the mobile terminal **100** to an external device. The interface unit **170** may include, for example, wired/wireless headset ports, external charger ports, wired/wireless data ports, memory card ports, ports for coupling devices having an identification module, audio Input/Output (I/O) ports, video I/O ports, earphone ports, and the like.

Further, the identification module may be configured as a chip for storing various information required to authenticate an authority to use the mobile terminal **100**, which may include a User Identity Module (UIM), a Subscriber Identity Module (SIM), and the like. Also, the device having the identification module (hereinafter, referred to as "identification device") may be implemented in a type of smart card. Hence, the identification device can be coupled to the mobile terminal **100** via a port.

Furthermore, the interface unit **170** may serve as a path for power to be supplied from an external cradle to the mobile terminal **100** when the mobile terminal **100** is connected to the external cradle or as a path for transferring various command signals input from the cradle by a user to the mobile terminal **100**. Such various command signals or power input from the cradle may operate as signals for recognizing that the mobile terminal **100** has accurately been mounted to the cradle.

The controller **180** typically controls the overall operations of the mobile terminal **100**. For example, the controller **180** performs the control and processing associated with telephony calls, data communications, video calls, and the like. The controller **180** can include a multimedia module **181** which provides multimedia playback. The multimedia module **181** may be configured as part of the controller **180** or as a separate component.

Furthermore, the controller **180** can perform a pattern recognition processing so as to recognize writing or drawing input performed on the touch screen as text or image. The controller **180** can also implement a lock state for limiting the user's control command input to applications when the state of the mobile terminal satisfies a preset condition. Furthermore, the controller **180** can control a lock screen displayed in the lock state based on a touch input sensed through the display unit **151** in the lock state.

The power supply unit **190** receives external and internal power to provide power required for various components under the control of the controller **180**.

Various embodiments described herein may be implemented in a computer or similar device readable medium using software, hardware, or any combination thereof.

For a hardware implementation, it may be implemented by using at least one of application specific integrated circuits (ASICs), digital signal processors (DSPs), digital signal processing devices (DSPDs), programmable logic devices (PLDs), field programmable gate arrays (FPGAs), processors, controllers, micro-controllers, microprocessors, and electrical units designed to perform the functions described herein. In some cases, such embodiments may be implemented in the controller **180**.

For a software implementation, the embodiments such as procedures or functions described in the present invention may be implemented with separate software modules. Each of the software modules may perform at least one function or operation described in the present invention. Software codes can be implemented by a software application written in any suitable programming language. The software codes may be stored in the memory **160** and executed by the controller **180**.

Next, a communication system that can be implemented through the mobile terminal **100** according to an embodiment of the present invention will be described.

FIGS. **2**A and **2**B are conceptual views illustrating a communication system in which a mobile terminal **100** according to the present invention is operable. First, referring to FIG. **2**A, the communication system may use different wireless interfaces and/or physical layers. For example, wireless interfaces that can be used by the communication system may include, frequency division multiple access (FDMA), time division multiple access (TDMA), code division multiple access (CDMA), universal mobile telecommunications system (UMTS) (particularly, long term evolution (LTE)), global system for mobile communications (GSM), and the like.

Hereinafter, for the sake of convenience of explanation, the description disclosed herein will be limited to CDMA. However, it is apparent that the present invention may be also

applicable to all communication systems including a CDMA wireless communication system.

As illustrated in FIG. **2**A, a CDMA wireless communication system may include a plurality of terminals **100**, a plurality of base stations (BSs) **270**, a plurality of base station controllers (BSCs) **275**, and a mobile switching center (MSC) **280**. The MSC **280** may interface with a Public Switched Telephone Network (PSTN) **290**, and the MSC **280** may also interface with the BSCs **275**. The BSCs **275** may be connected to the BSs **270** via backhaul lines. The backhaul lines may be configured in accordance with at least any one of E1/T1, ATM, IP, PPP, Frame Relay, HDSL, ADSL, or xDSL, for example. Further, the system illustrated in FIG. **2**A may include a plurality of BSCs **275**.

Each of the plurality of BSs **270** may include at least one sector, each sector having an omni-directional antenna or an antenna indicating a particular radial direction from the base station **270**. Alternatively, each sector may include two or more antennas with various forms. Each of the BSs **270** may be configured to support a plurality of frequency assignments, each frequency assignment having a particular spectrum (for example, 1.25 MHz, 5 MHz, etc.).

The intersection of a sector and frequency assignment may be referred to as a CDMA channel. The BSs **270** may also be referred to as Base Station Transceiver Subsystems (BTSs). In this instance, the term "base station" may collectively refer to a BSC **275**, and at least one BS **270**. The base stations may also indicate "cell sites". Alternatively, individual sectors for a specific BS **270** may also be referred to as a plurality of cell sites.

As illustrated in FIG. **2**A, the Broadcasting Transmitter (BT) **295** may transmit broadcasting signals to the mobile terminals **100** being operated within the system. The broadcast receiving module **111** as illustrated in FIG. **1** may be provided in the mobile terminal **100** to receive broadcast signals transmitted by the BT **295**.

In addition, FIG. **2**A illustrates several global positioning system (GPS) satellites **300**. Such satellites **300** facilitate locating at least one of a plurality of mobile terminals **100**. Though two satellites are illustrated in FIG. **2**A, location information may be obtained with a greater or fewer number of satellites. The location information module **115** as illustrated in FIG. **1** may cooperate with the satellites **300** as illustrated in FIG. **2**A to obtain desired location information. However, other types of position detection technology, all types of technologies capable of tracing the location may be used in addition to a GPS location technology. Furthermore, at least one of the GPS satellites **300** may alternatively or additionally provide satellite DMB transmissions.

During the operation of a wireless communication system, the BS **270** may receive reverse-link signals from various mobile terminals **100**. At this time, the mobile terminals **100** may perform calls, message transmissions and receptions, and other communication operations. Each reverse-link signal received by a specific base station **270** may be processed within that specific base station **270**. The processed resultant data may be transmitted to an associated BSC **275**. The BSC **275** may provide call resource allocation and mobility management functions including the systemization of soft handoffs between the base stations **270**. Furthermore, the BSCs **275** may also transmit the received data to the MSC **280**, which provides additional transmission services for interfacing with the PSTN **290**. Furthermore, similarly, the PSTN **290** may interface with the MSC **280**, and the MSC **280** may interface with the BSCs **275**. The BSCs **275** may also control the BSs **270** to transmit forward-link signals to the mobile terminals **100**.

Next, a method of acquiring the location information of a mobile terminal using a Wi-Fi (Wireless Fidelity) positioning system (WPS) will be described with reference to FIG. **2**B. The Wi-Fi positioning system (WPS) **300** refers to a location determination technology based on a wireless local area network (WLAN) using Wi-Fi as a technology for tracking the location of the mobile terminal **100** using a Wi-Fi module provided in the mobile terminal **100** and a wireless access point **320** for transmitting and receiving to and from the Wi-Fi module.

The Wi-Fi positioning system **300** may include a Wi-Fi location determination server **310**, a mobile terminal **100**, a wireless access point (AP) **320** connected to the mobile terminal **100**, and a database **330** stored with any wireless AP information.

The Wi-Fi location determination server **310** extracts the information of the wireless AP **320** connected to the mobile terminal **100** based on a location information request message (or signal) of the mobile terminal **100**. The information of the wireless AP **320** may be transmitted to the Wi-Fi location determination server **310** through the mobile terminal **100** or transmitted to the Wi-Fi location determination server **310** from the wireless AP **320**.

The information of the wireless AP extracted based on the location information request message of the mobile terminal **100** may be at least one of MAC address, SSID, RSSI, channel information, privacy, network type, signal strength and noise strength. The Wi-Fi location determination server **310** receives the information of the wireless AP **320** connected to the mobile terminal **100** as described above, and compares the received wireless AP **320** information with information contained in the pre-established database **330** to extract (or analyze) the location information of the mobile terminal **100**.

Further, referring to FIG. **2**B, as an example, the wireless AP connected to the mobile terminal **100** is illustrated as a first, a second, and a third wireless AP **320**. However, the number of wireless APs connected to the mobile terminal **100** may be changed in various ways according to a wireless communication environment in which the mobile terminal **100** is located. When the mobile terminal **100** is connected to at least one of wireless APs, the Wi-Fi positioning system **300** can track the location of the mobile terminal **100**.

Next, considering the database **330** stored with any wireless AP information in more detail, various information of any wireless APs disposed at different locations may be stored in the database **330**. The information of any wireless APs stored in the database **330** may be information such as MAC address, SSID, RSSI, channel information, privacy, network type, latitude and longitude coordinate, building at which the wireless AP is located, floor number, detailed indoor location information (GPS coordinate available), AP owner's address, phone number, and the like.

Thus, any wireless AP information and location information corresponding to the any wireless AP are stored together in the database **330**, and thus the Wi-Fi location determination server **310** may retrieve wireless AP information corresponding to the information of the wireless AP **320** connected to the mobile terminal **100** from the database **330** to extract the location information matched to the searched wireless AP, thereby extracting the location information of the mobile terminal **100**.

Furthermore, the extracted location information of the mobile terminal **100** may be transmitted to the mobile terminal **100** through the Wi-Fi location determination server **310**, thereby acquiring the location information of the mobile terminal **100**.

Hereinafter, a mobile terminal according to an embodiment of the present invention as illustrated in FIG. **1** or a mobile terminal disposed with the constituent elements of the mobile terminal or the structure of a mobile terminal will be described.

FIG. **3**A is a front perspective view illustrating an example of the mobile terminal **100** associated with the present invention. The mobile terminal **100** disclosed herein is provided with a bar-type terminal body. However, the present invention is not limited to this, but also is applicable to various structures such as watch type, clip type, glasses type or folder type, flip type, swing type, swivel type, or the like, in which two and more bodies are combined with each other in a relatively movable manner.

The body includes a case (casing, housing, cover, etc.) forming the appearance of the terminal. In this embodiment, the case may be divided into a front case **101** and a rear case **102**. Various electronic components are incorporated into a space formed between the front case **101** and the rear case **102**. At least one middle case may be additionally disposed between the front case **101** and the rear case **102**, and a battery cover **103** for covering the battery **191** may be detachably configured at the rear case **102**. The cases may be formed by injection-molding a synthetic resin or may be also formed of a metal, for example, stainless steel (STS), titanium (Ti), or the like.

A display unit **151**, a first audio output module **153***a*, a first camera **121***a*, a first manipulating unit **131** and the like may be disposed on a front surface of the terminal body, and a microphone **122**, an interface unit **170**, a second manipulating unit **132** and the like may be provided on a lateral surface thereof.

The display unit **151** may be configured to display (output) information being processed in the mobile terminal **100**. The display unit **151** may include at least one of a liquid crystal display (LCD), a thin film transistor-liquid crystal display (TFT-LCD), an organic light emitting diode (OLED) display, a flexible display, a 3-dimensional (3D) display, and an e-ink display.

The display unit **151** may include a touch sensing mechanism to receive a control command by a touch method. When a touch is made to any one place on the display unit **151**, the touch sensing mechanism may be configured to sense this touch and enter the content corresponding to the touched place. The content entered by a touch method may be a text or numerical value, or a menu item capable of indication or designation in various modes.

The touch sensing mechanism may be formed with transparency to allow visual information displayed on the display unit **151** to be seen, and may include a structure for enhancing the visibility of a touch screen at bright places. Referring to FIG. **3**A, the display unit **151** occupies a most portion of the front surface of the front case **101**.

The first audio output unit **153***a* and the first camera **121***a* are disposed in a region adjacent to one of both ends of the display unit **151**, and the first manipulation input unit **131** and the microphone **122** are disposed in a region adjacent to the other end thereof. The second manipulation interface **132** (refer to FIG. B), the interface **170**, and the like may be disposed on a lateral surface of the terminal body.

The first audio output module **153***a* may be implemented in the form of a receiver for transferring voice sounds to the user's ear or a loud speaker for outputting various alarm sounds or multimedia reproduction sounds. It may be configured such that the sounds generated from the first audio output module **153***a* are released along an assembly gap between the structural bodies. In this instance, a hole independently formed to output audio sounds may not be seen or hidden in terms of appearance, thereby further simplifying the appearance of the mobile terminal **100**. However, the present invention may not be limited to this, but a hole for releasing the sounds may be formed on the window.

The first camera **121***a* processes video frames such as still or moving images obtained by the image sensor in a video call mode or capture mode. The processed video frames may be displayed on the display unit **151**. The user input unit **130** is manipulated to receive a command for controlling the operation of the mobile terminal **100**. The user input unit **130** may include a first and a second manipulation unit **131**, **132**. The first and the second manipulation unit **131**, **132** may be commonly referred to as a manipulating portion, and any method may be employed if it is a tactile manner allowing the user to perform manipulation with a tactile feeling such as touch, push, scroll or the like.

In the present drawing, it is illustrated on the basis that the first manipulation unit **131** is a touch key, but the present invention is not limited to this. For example, the first manipulation unit **131** may be configured with a mechanical key, or a combination of a touch key and a mechanical key.

The content received by the first and/or second manipulation units **131**, **132** may be set in various ways. For example, the first manipulation unit **131** may be used to receive a command such as menu, home key, cancel, search, or the like, and the second manipulation unit **132** may receive a command, such as controlling a volume level being output from the first audio output module **153***a*, or switching into a touch recognition mode of the display unit **151**. The microphone **122** may be formed to receive the user's voice, other sounds, or the like. The microphone **122** may be provided at a plurality of places, and configured to receive stereo sounds.

The interface unit **170** serves as a path allowing the mobile terminal **100** to exchange data with external devices. For example, the interface unit **170** may be at least one of a connection terminal for connecting to an earphone in a wired or wireless manner, a port for near field communication (for example, an Infrared Data Association (IrDA) port, a Bluetooth port, a wireless LAN port, and the like), and a power supply terminal for supplying power to the mobile terminal **100**. The interface unit **170** may be implemented in the form of a socket for accommodating an external card such as Subscriber Identification Module (SIM) or User Identity Module (UIM), and a memory card for information storage.

FIG. **3**B is a rear perspective view illustrating mobile terminal **100** illustrated in FIG. **3**A. Referring to FIG. **3**B, a second camera **121***b* may be additionally mounted at a rear surface of the terminal body, namely, the rear case **102**. The second camera **121***b* has an image capturing direction, which is substantially opposite to the direction of the first camera unit **121***a* (refer to FIG. **3**A), and may have a different number of pixels from that of the first camera unit **121***a*.

For example, it is preferable that the first camera **121***a* has a relatively small number of pixels enough not to cause difficulty when the user captures his or her own face and sends it to the other party during a video call or the like, and the second camera **121***b* has a relatively large number of pixels since the user often captures a general object that is not sent immediately. The first and the second camera **121***a*, **121***b* may be provided in the terminal body in a rotatable and popupable manner.

Furthermore, a flash **123** and a mirror **124** may be additionally disposed adjacent to the second camera **121***b*. The flash **123** illuminates light toward an object when capturing the object with the second camera **121***b*. The mirror **124** allows the user to look at his or her own face, or the like, in a

reflected way when capturing himself or herself (in a self-portrait mode) by using the second camera **121***b*.

A second audio output unit **153***b* may be additionally disposed at a rear surface of the terminal body. The second audio output unit **153***b* together with the first audio output unit **153***a* (refer to FIG. **3**A) can implement a stereo function, and may be also used to implement a speaker phone mode during a phone call.

An antenna for receiving broadcast signals may be additionally disposed at a lateral surface of the terminal body in addition to an antenna for making a phone call or the like. The antenna constituting part of the broadcast receiving module **111** may be provided in the terminal body in a retractable manner.

A power supply unit **190** for supplying power to the mobile terminal **100** may be mounted on the terminal body. The power supply unit **190** may be incorporated into the terminal body, or may include a battery **191** configured in a detachable manner on the outside of the terminal body. According to the drawing, it is illustrated that the battery cover **103** is combined with the rear case **102** to cover the battery **191**, thereby restricting the battery **191** from being released and protecting the battery **191** from external shocks and foreign substances.

Further, the mobile terminal may recognize a user's fingerprint entered. However, in the related art, only a limited feature such as implementing lock release using the fingerprint input for the owner of the terminal has been performed. Accordingly, the mobile terminal **100** and control method thereof capable of receiving fingerprints for the owner of the terminal as well as a user whose fingerprint is registered with the terminal to implement various functions, thereby enhancing the user's convenience, will be described below with reference to the accompanying drawings.

FIG. **4** is a flow chart illustrating a mobile terminal **100** according to an embodiment of the present invention. Referring to FIG. **4**, first, the process of receiving at least one fingerprint is performed (S**410**).

Specifically, the user may touch the display unit **151** to enter his or her fingerprint. Furthermore, a plurality of users may concurrently or sequentially touch the display unit **151** to enter their fingerprints. Subsequently, the process (S**420**) of determining whether the entered at least one fingerprint matches a main user's fingerprint for the terminal or matches a fingerprint registered user's fingerprint whose fingerprint is registered with the terminal other than the main user is performed.

Thus, a user's fingerprint to be set up as a main user for the terminal may be registered in advance. Furthermore, the fingerprints of other users other than the main user may be also registered. For example, the main user may be a primary user of the terminal or the owner of the terminal. However, the main user for the terminal may not be necessarily a primary user or owner, and the main user for the terminal may be set up at his or her own discretion.

Next, the process (S**430**) of controlling at least one of the terminal and a terminal for the fingerprint registered user according to the determined result is performed. Specifically, the terminal for the fingerprint registered user denotes a terminal that has been set up in advance to correspond to the fingerprint registered user. For example, the fingerprint registered user may be a primary user of the terminal for the fingerprint registered user or the owner of the terminal for the fingerprint registered user.

However, it is not necessarily required to have such a relationship, and a corresponding relationship between the fingerprint registered user and the terminal for the fingerprint registered user may be set up at his or her own discretion.

Further, when the controller **180** determines that a fingerprint registered user's fingerprint has been entered, it is possible to execute the account of the terminal for the fingerprint registered user.

FIG. **5** is a conceptual view illustrating an embodiment for executing the account of the fingerprint registered user. Referring to FIG. **5**(*a*), a user interface capable of entering a fingerprint may be displayed. In one embodiment, when touching a lock screen with his or her finger, a user interface for fingerprint recognition may be displayed. Accordingly, the user makes a long touch to the fingerprint input field **510** with his or her finger to enter his or her fingerprint.

In another embodiment, when dragging a status bar, an icon capable of displaying a user interface for fingerprint recognition may be unfolded. In still another embodiment, when pushing or touching a home key or back key on a lock screen, a user interface for fingerprint recognition may be displayed.

Referring to FIG. **5**(*b*), when the controller **180** determines that a registered user's fingerprint has been entered to the terminal, a popup window **520** indicating that authentication is successful may be displayed. Referring to FIG. **5**(*c*), a screen synchronized with the account of the fingerprint registered user may be displayed. For example, a home screen of the terminal for the fingerprint registered user may be displayed.

In other words, the fingerprint registered user may enter his or her fingerprint to obtain authentication, and then use a third person's terminal like a terminal for the fingerprint registered user. Further, when the controller **180** determines that at least one fingerprint registered user's fingerprint has been entered by touching content displayed on the display unit **151**, the controller can transmit the content to a terminal for the at least one fingerprint registered user, respectively.

Next, FIG. **6** is a conceptual view illustrating an embodiment for transmitting content according to a fingerprint input. Referring to FIG. **6**(*a*), when a first fingerprint registered user "A" applies a touch input **620** to a photo **610** displayed on the photo album (gallery), the fingerprint of user "A" is entered.

Accordingly, when confirmed that the fingerprint of user "A" has been registered, the photo **610** is transmitted to the terminal for user "A". Furthermore, a popup window **630** indicating that the photo **610** has been transmitted to the terminal for user "A" can be displayed on the terminal.

Referring to FIG. **6**(*b*), when a first fingerprint registered user "A", a second fingerprint registered user "B" and a third fingerprint registered user "C" concurrently or sequentially apply touch inputs **620**, **640**, **650** to the photo **610** displayed on the photo album, the fingerprints of the users "A", "B" and "C" are entered.

Accordingly, when confirmed that the fingerprints of the users "A", "B" and "C" have been registered, the photo **610** can be transmitted to the terminals for the users "A", "B" and "C". Furthermore, a popup window **660** indicating that the photo **610** has been transmitted to the terminals for the users "A", "B" and "C" may be displayed on the terminal.

In one embodiment, the fingerprint registered user may touch content such as a photo, a document, a video or the like to transmit the content to a terminal for the fingerprint registered user. In another embodiment, content touched and selected by the fingerprint registered user may be transmitted to a terminal for the fingerprint registered user through a text message, SNS, an e-mail, or the like.

In still another embodiment, when a main user of the first terminal enters his fingerprint to the first and the second terminal, content that has been displayed on the first terminal may be transmitted to the second terminal. Otherwise, when

a fingerprint registered user of the first terminal enters his fingerprint to the first and the second terminals, content that has been displayed on the first terminal can be transmitted to the second terminal.

FIG. **7** is a conceptual view illustrating an embodiment for entering a fingerprint to a plurality of terminals to transmit content. Referring to FIG. **7**(*a*), a main user of the mobile terminal **100** may apply a touch input **720** to a photo **710** displayed on the photo album to enter his or her fingerprint. Furthermore, the main user of the mobile terminal **100** may concurrently or sequentially apply a touch input **740** to the screen of a tablet **730**.

Referring to FIG. **7**(*b*), the photo **710** to which the touch input **720** has been applied is transmitted from the mobile terminal **100** to the tablet **730** and displayed thereon. In yet still another embodiment, when a browser is executed in the terminal **100**, the relevant browser may be immediately executed on the tablet **730** according to concurrent or sequential fingerprint inputs.

Further, when the controller **180** determines that the main user's fingerprint and the fingerprint registered user's fingerprint have been entered to a photo album displayed on the display unit **151**, the controller **180** can display content contained in the photo album of the terminal and content contained in the photo album of the terminal for the fingerprint registered user on the first and the second screen, respectively, into which the display unit **151** is divided.

Furthermore, the controller **180** can display content displayed on the first screen also on the second screen according to a drag input, and transmit the content to a terminal for the fingerprint registered user.

Next, FIG. **8** is a conceptual view illustrating an embodiment for displaying content stored in a plurality of terminals, respectively, on one terminal and transmitting the content according to a fingerprint input. Referring to FIG. **8**(*a*), a main user and a fingerprint registered user may apply a pinch-out input **810**, **820** to the photo album. During the pinch-out input **810**, **820**, the fingerprints of the main user and fingerprint registered user are entered.

Referring to FIG. **8**(*b*), the display unit **151** may be divided into a first and a second screen **830**, **840** to display content contained in the main user's photo album on the first screen **830** and display content contained in the fingerprint registered user's photo album on the second screen **840**.

Referring to FIG. **8**(*c*), the main user may apply an input for dragging one **850** of contents contained in the first screen **830** to the second screen **840**. Referring to FIG. **8**(*d*), the dragged content **850** may be also displayed on the second screen **840** according to a drag input in FIG. **8**(*c*). At the same time, the dragged content **850** may be transmitted to a terminal for the fingerprint registered user.

Similarly, the fingerprint registered user may apply an input for dragging one of contents contained in the second screen **840** to the first screen **830**. Accordingly, the dragged content may be also displayed on the first screen **830**, and the dragged content may be transmitted to the main user's terminal. Further, it is possible to enter a fast image edit mode through the main user's fingerprint recognition. The fast image edit mode denotes a function capable of showing a result to which an image edit effect has been applied in a preview form.

FIG. **9** is a conceptual view illustrating an embodiment for editing an image according to a fingerprint input. Referring to FIG. **9**(*a*), when a main user makes a long touch to a left edge portion of the photo **910** displayed on the photo album (gallery), the main user's fingerprint are entered. Accordingly, the terminal enters a fast image edit mode to display various edit icons **920** along the edge of the photo **910**.

When an edit effect is not yet applied to the left edge portion touched for the first time, an icon **930** indicating this can be displayed at a position to which the main user applies a long touch. Furthermore, a description content **940** of the icon **930** may be displayed.

Referring to FIG. **9**(*b*), the main user touches edit icons **920** with a drag input. Accordingly, a preview image **970** showing a result in which an image effect corresponding to the touched icon **950** has been applied to the photo **910** is displayed. For example, when the main user touches a RETRO icon **950** with a drag input, a preview image **970** showing a result in which an image effect corresponding to the RETRO icon **950** has been applied to the photo **910** is displayed. At this time, the description content **960** of the RETRO icon **950** may be displayed at the same time.

If the main user releases his or her finger in touch with the RETRO icon **950** without continuously applying a drag input thereto, the controller **180** performs an edit in which the image effect corresponding to the RETRO icon **950** is applied to the photo **910**.

Referring to FIG. **9**(*c*), the main user in FIG. **9**(*b*) may continuously apply a drag input without releasing his or her finger. Accordingly, when the main user touches a ROTATE LEFT icon **980**, a preview image **990** showing a result in which an image effect corresponding to the ROTATE LEFT icon **980** has been applied to the photo **910** is displayed. At this time, the description content of the ROTATE LEFT icon **980** may be displayed at the same time.

If the main user releases his or her finger in touch with the ROTATE LEFT icon **980** without continuously applying a drag input, the controller **180** performs an edit operation in which the photo **910** is rotated to the left by 90 degrees. Further, the terminal displays fingerprints stored therein to store a new fingerprint or change the stored fingerprint. Also, when a fingerprint is frequently recognized during the fingerprint input, a user interface for storage may be displayed.

Next, FIG. **10** is a conceptual view illustrating an embodiment for registering a fingerprint with a terminal. Referring to FIG. **10**, when a user makes a long touch with his or her finger or rubs his or her finger in the upward and downward direction or in the left and right direction on a lock screen, a fingerprint palette **1020** may be displayed. The fingerprint palette **1020** is one of the embodiments for collecting and displaying fingerprints stored therein.

At this time, the previously set fingerprint may be changed to an entered fingerprint **1010**. For example, the user may select the fingerprint **1030** of user "A", and then makes a touch to the save icon **1050**. Accordingly, the entered fingerprint **1010** may be stored as a new fingerprint for user "A".

Otherwise, the entered fingerprint **1010** may be stored as a fingerprint for a new user. For example, the user may select a space field **1040** in which his or her fingerprint can be stored, and then makes a touch to the save icon **1050**. Accordingly, the entered fingerprint **1010** may be stored as a fingerprint for a new user. At this time, prior to touching the save icon **1050**, it is possible to enter a new user's name, phone number or the like for the entered fingerprint **1010**.

FIG. **11** is a conceptual view illustrating an embodiment for recommending a fingerprint store operation. Referring to FIG. **11**(*a*), when an unregistered fingerprint is entered more than a previously set number of times, a popup window **1110** recommending fingerprint registration may be displayed along with a frequently entered fingerprint **1120**.

Referring to FIG. **11**(*b*), a fingerprint palette **1130** containing fingerprints stored therein may be displayed. At this time,

the user may apply a long touch input to a fingerprint input field **1140** capable of entering a new fingerprint to enter a fingerprint **1120**. Referring to FIG. **11**(*c*), a keypad **1150** capable of entering the name of the user (owner of the fingerprint) for the fingerprint **1120** may be displayed according to the input of the fingerprint **1120**, and the name of the user are entered and then stored by touching the save icon **1160**. For example, "D" is entered as the name of the user for the fingerprint **1120** and then stored by touching the save icon **1160**.

Referring to FIG. **11**(*d*), the fingerprint **1120** of user "D" is newly registered on the fingerprint palette **1130**. Further, it is possible to set up the scope of an application that can be executed for each fingerprint registered user.

FIG. **12** is a conceptual view illustrating an embodiment for setting up an executable application for each fingerprint registered user. Referring to FIG. **12**(*a*), when one **1220** of fingerprints displayed on the fingerprint palette **1210** is selected, a message window **1230** capable of selecting an application that can be approached (or executed) for each fingerprint may be displayed.

Referring to FIG. **12**(*b*), a fingerprint input field **1240** and a message window **1250** for asking to enter his or her fingerprint again for fingerprint check may be displayed. Accordingly, the user may touch the fingerprint input field **1240** to enter his or her fingerprint again. Referring to FIG. **12**(*c*), when the terminal **100** is used with the selected fingerprint **1220**, a user interface capable of selecting an approachable application.

Furthermore, during the selection of an application, a check indicator may be displayed on a check box corresponding to the application. For example, when NONE is selected, the user of fingerprint "C" **1220** cannot execute any application. In another example, when ALL is selected, the user of fingerprint "C" **1220** can execute all applications. In still another example, when applications MUSIC and INTERNET are selected, the user of fingerprint "C" **1220** can execute only applications MUSIC and INTERNET.

Further, when the controller **180** determines that a non-fingerprint-registered user's fingerprint with which his or her fingerprint is not registered has been entered other than the main user in a camera capture mode, only the camera capture mode may be executed. When the controller **180** determines that the fingerprint registered user's fingerprint has been entered in a camera capture mode, at least one of content captured by the fingerprint registered user and content displayed with the fingerprint registered user may be displayed. It is also possible to transmit at least one of content captured by the fingerprint registered user and content displayed with the fingerprint registered user to a terminal for the fingerprint registered user.

Next, FIG. **13** is a conceptual view illustrating an embodiment of a user interface displayed for a non-fingerprint-registered user in a camera capture mode. Referring to FIG. **13**, when the controller **180** determines that an unregistered fingerprint has been entered in a camera capture mode, a message **1310** indicating that fingerprint security has been set may be displayed. Accordingly, the user of the fingerprint (non-fingerprint-registered user) can perform only camera capture, but cannot execute other applications such as Internet, address book, memo and the like.

FIG. **14** is a conceptual view illustrating an embodiment of a user interface displayed for a fingerprint registered user in a camera capture mode. Referring to FIGS. **14**(*a*) and **14**(*b*), when the controller **180** determines that the fingerprint of a fingerprint registered user "A" has been entered in a camera capture mode, a message **1410** indicating that the fingerprint of user "A" has been recognized may be displayed. Subsequently, user "A" may touch the capture button **1420** to capture an image.

Referring to FIG. **14**(*c*), during the camera capture, a preview icon **1430** capable of showing photos associated with the fingerprint of user "A" may be displayed. Referring to FIG. **14**(*d*), when user "A" touches and selects the preview icon **1430** in FIG. **14**(*c*), photos associated with the fingerprint of user "A" may be displayed. For example, photos **1440** captured by user "A" or photos **1450** shown with user "A" therein may be displayed.

Accordingly, user "A" may touch the save button **1460** to store the previously captured photo in the relevant folder, namely, a folder (fingerprint folder of user "A") in which photos associated with the fingerprint of user "A" are stored. Otherwise, the user may touch a folder integrate icon **1480** to store it in another photo folder stored in the photo album of the terminal **100**.

In another embodiment, the user may touch the share button **1470** to transmit a photo captured by the terminal of user "A" through a scheme such as a text message, an email, SNS, and the like. Further, only search records that have been searched by himself of herself may be shown to a main user, a fingerprint registered user or a non-fingerprint-registered user.

FIG. **15** is a conceptual view illustrating an embodiment for showing only search records that have been searched by himself or herself according to fingerprint recognition. Referring to FIG. **15**(*a*), when the main user of the terminal **100** touches a search window for Internet search, the fingerprint of the main user may be recognized on the terminal **100**.

Referring to FIG. **15**(*b*), when the fingerprint of the main user is recognized as illustrated in FIG. **15**(*a*), the content **1510** that have been previously searched by the main user may be displayed. Referring to FIG. **15**(*c*), when a fingerprint registered user other than the main user touches a search window for Internet search, the fingerprint of the fingerprint registered user may be recognized on the terminal **100**.

Accordingly, the content **1520** that have been previously searched by the fingerprint registered user on the terminal **100** may be displayed. In other words, the fingerprint registered user cannot check the content **1510** that have previously been searched by the main user. In another embodiment, the content **1520** that have been previously searched by the fingerprint registered user on the terminal of the fingerprint registered user may be displayed.

Referring to FIG. **15**(*d*), when a non-fingerprint-registered user touches a search window for Internet search, the previously searched content is not displayed. In other words, the non-fingerprint-registered user cannot check the content **1510**, **1520** that have been searched by the main user or fingerprint registered user. Further, a different message may be displayed on the display unit **151** according to whether or not the main user's fingerprint has been entered to the terminal and whether or not a fingerprint of a user other than the main user has been entered to a terminal for the user other than the main user while making or receiving a call for the user other than the main user.

Specifically, a message displayed on the screen of the calling terminal may be determined according to whether the fingerprint of the caller or recipient is stored in the calling terminal, and a message displayed on the screen of the receiving terminal may be determined according to whether the fingerprint of the caller or recipient is stored in the receiving terminal.

FIG. **16** is a conceptual view illustrating an embodiment in which a message is shown on a calling or receiving terminal

when a main user of the receiving terminal does not receive the receiving terminal. Referring to FIG. **16**(*a*), when a call is made to the terminal of user "A" with the terminal **100** of the main user, a fingerprint entered to the terminal of user "A" while touching a receive button may not be the fingerprint of user "A" as well as may not be a fingerprint registered with the terminal **100** of the main user. Accordingly, a message **1610** indicating that a call has been received by a non-fingerprint-registered user other than user "A" along with a vibration feedback effect may be displayed on the terminal **100**.

Referring to FIG. **16**(*b*), when a call is made to the terminal of user "A" with the terminal **100** of the main user, a fingerprint entered to the terminal of user "A" while touching a receive button may be the fingerprint of user "B" registered with the terminal **100** of the main user but may not be the fingerprint of user "A". Accordingly, a message **1620** indicating that a call has been received by the fingerprint registered user "B" other than user "A" along with a vibration feedback effect may be displayed on the terminal **100**. Furthermore, the terminal numbers of the users "A" and "B" may be displayed at the same time.

Further, when the terminal of user "A" is received by another user other than user "A", messages **1610**, **1620** as illustrated in FIG. **16** may be also displayed on the received terminal of user "A". However, contrary to the forgoing description, the displayed message may be determined according to whether or not the recipient's fingerprint is registered on the received terminal of user "A".

Specifically, when the terminal **100** of user "A" is received by a user other than user "A" whose fingerprint is not registered with the terminal of user "A", a message **1610** as illustrated in FIG. **16**(*a*) may be displayed. Furthermore, when the terminal **100** of user "A" is received by user "B" other than user "A" whose fingerprint is registered with the terminal of user "A", a message **1620** as illustrated in FIG. **16**(*b*) may be displayed. In other words, a message displayed on the screen of the calling terminal is determined according to whether or not a recipient's fingerprint is stored in the calling terminal, and a message displayed on the screen of the receiving terminal is determined according to whether or not a recipient's fingerprint is stored in the receiving terminal.

FIG. **17** is a conceptual view illustrating an embodiment in which a message is shown on a calling terminal when a main user of the calling terminal does not call the calling terminal. Referring to FIGS. **17**(*a*) and **17**(*b*), when a fingerprint entered while touching a phone calling button **1710** of the main user terminal **100** is a fingerprint of the fingerprint registered user "A" registered with the terminal **100** other than the main user, namely, when user "A" makes a call to the terminal **100** of the main user, the photos, names or the like of the fingerprint registered users may be displayed. Accordingly, user "A" can select his or her own photo **1720** from the displayed list.

Referring to FIG. **17**(*c*), a message **1730** indicating that a call is made to the terminal **100** of the main user, namely, the terminal **100** that is making a call, with the number of user "A" may be displayed. Referring to FIG. **17**(*d*), when a fingerprint entered while touching a phone calling button **1710** of the main user terminal **100** is a fingerprint of the non-fingerprint-registered user that is not registered with the terminal **100**, a message **1740** indicating that an unknown user is making a call to the terminal **100** that is making a call may be displayed. In another embodiment, a vibration or sound effect may be output on the terminal **100** that is making a call along with the message **1730**, **1740**.

FIG. **18** is a conceptual view illustrating an embodiment in which a message is shown on a receiving terminal when a main user of the calling terminal does not call the calling terminal. Referring to FIG. **18**(*a*), when a user touching a call button on the terminal of user "A" is user "B" whose fingerprint is registered with the terminal **100** that is receiving a call, namely, when user "B" makes a call with the terminal of user "A", a message **1810** indicating that a call is being received from user "B" using the terminal of user "A" on the terminal **100** of the recipient. At this time, the number of the terminal of user "A" or "B" may be displayed at the same time.

Referring to FIG. **18**(*b*), when a user touching a call button on the terminal of user "A" is a non-fingerprint-registered user whose fingerprint is not registered with the terminal **100** that is receiving a call, namely when a non-fingerprint-registered user whose fingerprint is not registered with the terminal **100** that is receiving a call makes a call to the terminal of user "A", a message **1820** indicating that a call is being received from an unknown user using the terminal of user "A" may be displayed on the terminal **100** of user "A".

In another embodiment, user "C" may send a text message or SNS message from the terminal of user "A" to the terminal of user "B". At this time, when the fingerprint of user "C" is registered with the terminal of user "B", a message indicating that the message is a message written and transmitted by user "C" with the terminal of user "A" may be displayed along with the message written by user "C".

If the fingerprint of user "C" is not registered with the terminal of user "B", then a message indicating that the message is a message written and transmitted by an unknown user with the terminal of user "A" may be displayed along with the message written by user "C". Further, a fingerprint for a person stored in the address book may be registered with the terminal.

FIG. **19** is a conceptual view illustrating another embodiment for registering a fingerprint with a terminal. Referring to FIG. **19**(*a*), it is possible to make a long touch to select the contact number **1910** of user "A" desired to perform fingerprint registration on the address book.

Referring to FIG. **19**(*b*), a list **1920** capable of requesting a fingerprint store operation may be displayed in a popup form according to the long touch input in FIG. **19**(*a*), thereby touching and selecting the list **1920**. Referring to FIG. **19**(*c*), a popup window **1930** for fingerprint input may be displayed. Accordingly, the main user of the terminal **100** touches his or her own fingerprint input field **1940** to enter his or her fingerprint, and user "A" desired to register his or her fingerprint with the terminal **100** may touch the counterpart fingerprint input field **1950** to enter his or her fingerprint. At this time, the main user and user "A" may concurrently or sequentially enter their fingerprints, respectively.

Referring to FIG. **19**(*d*), when the fingerprint of user "A" is not entered in FIG. **19**(*c*), it is possible to request a fingerprint input to the terminal of user "A". Specifically, a popup window **1960** indicating that user "B" (main user) has requested fingerprint transmission may be displayed on the terminal of user "A". Accordingly, user "A" may touch a fingerprint input field **1970** for accepting fingerprint transmission to enter his or her fingerprint, and the fingerprint of user "A" is transmitted from the terminal of user "A" to the terminal **100** of the main user (B).

Furthermore, when fingerprint transmission is undesired, user "A" may touch and select a fingerprint input field **1980** for rejecting fingerprint transmission. Accordingly, the fingerprint of user "A" is not transmitted to the terminal **100** of the main user (B), and a message indicating that user "A" has rejected fingerprint transmission may be transmitted to the terminal **100** of the main user (B).

Further, when the fingerprint of the fingerprint registered user is transmitted from a terminal for the fingerprint registered user, security data may be transmitted to the terminal for the fingerprint registered user. The security data may be defined as data that can be read during the fingerprint input.

FIG. **20** is a conceptual view illustrating an embodiment of security data transmission. Referring to FIG. **20**(*a*), in order to transmit a security message from the terminal of user "B" to the terminal of user "A", user "B" may prepare a message that is to be transmitted to user "A" and then touch a fingerprint input field **2010** to enter his or her fingerprint.

Referring to FIG. **20**(*b*), the security message transmitted by user "B" is not immediately seen on the terminal of user "A". Furthermore, user "A" may touch a fingerprint input field **2020** for security authentication to enter his or her fingerprint. Referring to FIG. **20**(*c*), as user "A" enters his or her fingerprint as illustrated in FIG. **20**(*b*), a message window **2030** indicating that user "A" has requested a read permission of the security message may be displayed on the terminal of user "B". Subsequently, the fingerprint of user "B" is entered again while at the same time user "B" touches a button **2040** for authorizing the permission.

Referring to FIG. **20**(*d*), as the read permission of user "B" is authorized as illustrated in FIG. **20**(*c*), the content **2050** of the security message transmitted by user "B" may be displayed on the terminal of user "A". In other words, for the security reading of security data, the fingerprints of the caller and recipient should be entered. Further, when the fingerprint of the fingerprint registered user is transmitted from a terminal for the fingerprint registered user, it is possible to perform online payment.

Next, FIG. **21** is a conceptual view illustrating an embodiment for receiving fingerprint transmission to execute online payment. Referring to FIG. **21**(*a*), user "A" may touch a payment button **2110** of a paid application on the terminal of user "A" to make a payment. Referring to FIG. **21**(*b*), as the payment button **2110** is touched as illustrated in FIG. **21**A, a fingerprint input field **2120** for payment authorization may be displayed. User "A" may touch the fingerprint input field **2120** to enter his or her fingerprint.

Referring to FIG. **21**(*c*), the fingerprint of user "A" is entered as illustrated in FIG. **21**(*b*), and then a message window **2130** instructing to select a target to which fingerprint transmission is requested for payment authorization may be displayed. Accordingly, user "A" may touch a fingerprint input field **2140** for entering his or her own fingerprint again, and select a target to which fingerprint transmission is requested with a drag input. Specifically, it is possible to apply a drag input to the side **2150** at which the fingerprint of user "C" is shown to select user "C".

Referring to FIG. **21**(*d*), a message window **2160** requesting the purchase authorization of user "A" may be displayed on the terminal of user "C" who has requested fingerprint transmission in FIG. **21**(*c*). Accordingly, when user "C" touches a detail view icon **2170**, an application desired to be purchased by user "A", a price on the application, a rating on the application, and the like may be displayed.

Furthermore, user "C" may touch a fingerprint input field **2180** for authorizing the purchase of user "A" to enter his or her fingerprint. As a result, the fingerprint of user "C" is transmitted to the terminal of user "A" and payment for the relevant application is performed on the terminal of user "A" to which the fingerprint of user "C" has been transmitted. Otherwise, user "C" may touch a fingerprint input field **2190** for refusing the purchase of user "A" to enter his or her fingerprint, thereby refusing the payment of user "A".

In other words, the payment may be performed only when receiving both the fingerprints of the purchaser and purchase approver. Further, the caller of an overseas call may be verified according to a fingerprint input.

FIG. **22** is a conceptual view illustrating an embodiment for verifying the caller of an overseas call according to a fingerprint input. Referring to FIG. **22**(*a*), when caller verification is required while receiving an overseas call, the recipient may enter his or her fingerprint to a fingerprint input field **2210** for requesting caller verification to request caller check.

Referring to FIG. **22**(*b*), a message window **2220** indicating that the recipient has requested fingerprint transmission may be displayed on the terminal that is making an overseas call. Accordingly, the caller may enter his or her fingerprint to a fingerprint input field **2230** for approving fingerprint transmission to approve fingerprint transmission.

As a result, when the received fingerprint of the caller is stored in the terminal of the recipient, a message indicating that an overseas call is being received from the relevant caller may be displayed. Further, it is possible to request fingerprint transmission to a terminal for the fingerprint registered user while communicating with the terminal for the fingerprint registered user.

FIG. **23** is a conceptual view illustrating an embodiment for making a request for fingerprint transmission to verify the caller. Referring to FIGS. **23**(*a*) and **23**(*b*), when user "B" touches a message **2310** received from user "A", a message window **2320** instructing to enter a fingerprint may be displayed to verify the caller "A". Accordingly, user "B" may touch a fingerprint input field **2330** to enter his or her fingerprint.

Referring to FIG. **23**(*c*), a message window **2340** indicating that the counterpart "B" has requested fingerprint transmission may be displayed on the terminal of user "A". Accordingly, user "A" may touch a fingerprint input field **2350** for approving fingerprint transmission to enter his or her fingerprint.

Referring to FIG. **23**(*d*), a message window **2360** indicating that user "A" is authorized as himself or herself may be displayed on the terminal of user "B". Through this, it is possible to prevent a damage from being caused by financial fraud. Further, when a third person posts matters associated with personal information on the Internet or the like, it is possible to enter a fingerprint to approve this.

FIG. **24** is a conceptual view illustrating an embodiment for approving a case where a third person posts personal information. Referring to FIG. **24**(*a*), user "B" may post personal information on user "A" only when obtaining the approval of user "A". Specifically, when user "B" touches a register button **2410** for posting the cell phone number of user "A" on his or her own blog, the fingerprint of user "B" are entered. The personal information of user "A" may include the home phone number, cell phone number, home or office address, birthday, resident registration number, family relation, and the like of user "A".

Referring to FIG. **24**(*b*), a message window **2420** indicating that user "B" has requested information use approval may be displayed on the terminal of user "A". Furthermore, the content (cell phone number) that is to be posted by user "B" may be briefly displayed, and user "A" may touch a detail view button **2430** to check the detailed description to be posted by user "B".

In another embodiment, a message window **2420** may be displayed with a different color according to the level of security required for the content to be posted by user "B". For example, a red message window **2420** may be displayed when information such as his or her resident registration number

requiring a high security level is posted, and a yellow message window **2420** may be displayed when information such as his or her family relation requiring a low security level is posted.

Subsequently, user "A" may touch a fingerprint input field **2440** for information use approval to enter his or her fingerprint. Furthermore, when user "A" approves the information use, a statement of the approval may be stored in the database of the terminal of user "A". Accordingly, when user "A" selects the stored statement, authorization such as edit or the like may be acknowledged to user "A" to edit the content posted by user "B". For example, user "A" may modify or delete a portion in which his or her own personal information is posted on the blog of user "B".

Further, user "A" may touch a fingerprint input field **2450** for information use refusal to refuse the use of his or her own personal information. Accordingly, a message window for asking whether or not to obtain reapproval may be subsequently displayed.

Referring to FIG. **24**(*c*), according to the approval of user "A" in FIG. **24**B, user "B" may post the cell phone number **2460** of user "A". In another embodiment, when the information of user "A" posted by user "B" is forwarded or shared by a third person, it is possible to request whether or not approve this to user "A" again. Accordingly, when refused by user "A", the third person is unable to forward or read the relevant posting.

According to embodiments of the present invention, it is possible to receive a fingerprint registered user's fingerprint to execute the account of the fingerprint registered user, and transmit content to the terminal of the fingerprint registered user. Furthermore, a photo album of the terminal and a photo album of the fingerprint registered user terminal may be concurrently displayed to transmit content such as a photo or the like, and only a photo captured by the fingerprint registered user or captured with the fingerprint registered user may be managed and displayed with a separate folder.

In addition, a fingerprint entered while receiving or making a call may be recognized to determine the actual recipient or caller of the receiving or calling terminal, and display the resultant result on the receiving or calling terminal. Furthermore, it is possible to request the fingerprint transmission of a third person during a charge settlement. For example, a protector may manage an indiscreet act of payment of a protected person.

Further, it is possible check whether or not a message is sent by himself or herself through a fingerprint input, thereby preventing a damage due to financial fraud. As a result, it is possible to enhance the user's convenience.

According to an embodiment of present invention, the foregoing method may be implemented as codes readable by a processor on a medium written by a program. Examples of the processor-readable media may include ROM, RAM, CD-ROM, magnetic tape, floppy disk, and optical data storage device, and the like, and also include a device implemented in the form of a carrier wave (for example, transmission via the Internet).

The configurations and methods according to the above-described embodiments will not be applicable in a limited way to the foregoing mobile terminal, and all or part of each embodiment may be selectively combined and configured to make various modifications thereto.

What is claimed is:

1. A mobile terminal, comprising:

a wireless communication unit configured to provide wireless communication;

a display unit; and

a controller configured to:

register a first user's fingerprint corresponding to the mobile terminal and a second user's finger print corresponding to an external terminal,

receive both a first fingerprint input matching the first user's fingerprint and a second fingerprint input matching the second user's fingerprint on the display unit, and

control the display unit to display a first content list comprising at least one content contained in a photo album of the mobile terminal and a second content list comprising at least one content contained in a photo album of the external terminal on divided first and second screens of the display unit based on the received first and second fingerprint inputs.

2. The mobile terminal of claim **1**, wherein the controller is further configured to:

display an image on the display unit,

receive the second user's fingerprint on the displayed image, and

control the wireless communication unit to transmit the displayed image to the external terminal.

3. The mobile terminal of claim **1**, wherein the controller is further configured to:

receive a drag input from the first screen to the second screen,

display any one content included in the first content list also on the second screen according to the received drag input, and

transmit the any one content included in the first content list to the external terminal.

4. The mobile terminal of claim **1**, wherein the controller is further configured to:

restrict a non-fingerprint-register user to only being able to use a camera capture mode when a non-fingerprint-registered user's fingerprint input that does not match either the first user's fingerprint or the second user's fingerprint in the camera capture mode is received.

5. The mobile terminal of claim **1**, wherein the controller is further configured to:

receive the second user's fingerprint on the display unit in a camera capture mode, and

display on the display unit at least one of content captured by the second user and content including an image of the second user.

6. The mobile terminal of claim **5**, wherein the controller is further configured to:

control the wireless communication unit to transmit said at least one of the content captured by the second user and the content including the image of the second user to the external terminal.

7. The mobile terminal of claim **1**, wherein the controller is further configured to:

display a message on the display unit indicating a non-fingerprint-register user when a non-fingerprint-registered user's fingerprint input that does not match either the first user's fingerprint or the second user's fingerprint is received during an incoming call.

8. The mobile terminal of claim **1**, wherein the controller is further configured to:

receive the second user's fingerprint and corresponding security data transmitted from the external terminal.

9. The mobile terminal of claim **1**, wherein the controller is further configured to:

control the display unit to display a payment button for online payment,

request, via the wireless communication unit to the external terminal, a predetermined user's fingerprint when the payment button is touched, and

perform the online payment only when the predetermined user's fingerprint is input to the external terminal.

10. The mobile terminal of claim **1**, wherein the controller is further configured to:

communicate with the external terminal, and

request a fingerprint input to the external terminal for registering the second user's fingerprint using the wireless communication unit.

11. A method of controlling a mobile terminal, the method comprising:

registering a first user's fingerprint corresponding to the mobile terminal and a second user's fingerprint corresponding to an external terminal;

receiving both a first fingerprint input matching the first user's fingerprint and a second fingerprint input matching the second user's fingerprint on the display unit; and

controlling the display unit to display a first content list comprising at least one content contained in a photo album of the mobile terminal and a second content list comprising at least one content contained in a photo album of the external terminal on divided first and second screens of the display unit.

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

displaying an image on the display unit;

receiving the second user's fingerprint on the displayed image; and

controlling the wireless communication unit to transmit the displayed image to the external terminal.

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

receiving a drag input from the first screen to the second screen;

displaying any one content included in the first content list also on the second screen according to the received drag input; and

transmitting the any one content included in the first content list to the external terminal.

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

restricting a non-fingerprint-register user to only being able to use a camera capture mode when a non-fingerprint-registered user's fingerprint input that does not match either the first user's fingerprint or the second user's fingerprint in the camera capture mode is received.

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

receiving the second user's fingerprint on the display unit in a camera capture mode; and

displaying on the display unit at least one of content captured by the second user and content including an image of the second user.

16. The method of claim **15**, further comprising:

controlling the wireless communication unit to transmit said at least one of the content captured by the second user and the content including the image of the second user to the external terminal.

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

displaying a message on the display unit indicating a non-fingerprint-register user when a non-fingerprint-registered user's fingerprint input that does not match either the first user's fingerprint or the second user's fingerprint is received during an incoming call.

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

receiving the second user's fingerprint and corresponding security data transmitted from the external terminal.

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