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[Continued on next page]

(54) Title: DEVICE COVER

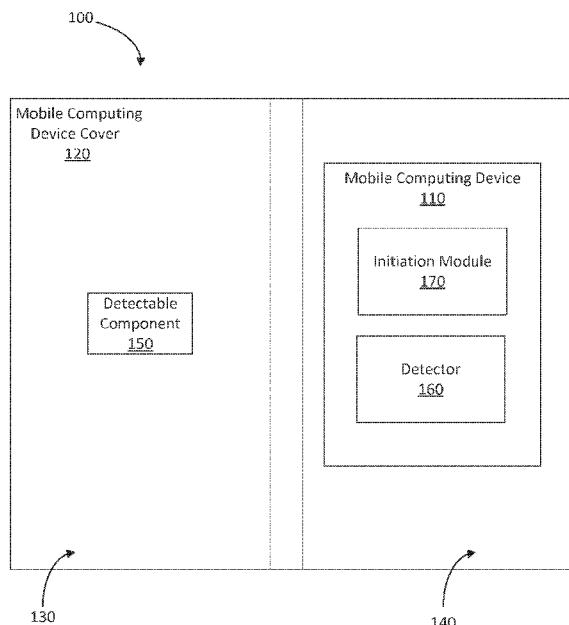


FIG. 1

(57) Abstract: In one example, a mobile computing device cover is provided. The mobile computing device cover includes a detectable component integrated in the mobile computing device cover, where at least a portion of the detectable component is movable from at least a first position with respect to the mobile computing device cover to a second position with respect to the mobile device cover.



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DEVICE COVER

BACKGROUND

[0001] Mobile computing devices such as tablets and smartphones are ubiquitous in today's environment. Such devices provide users with instant access to a plethora of information regardless of their location. Moreover, such devices enable users to communicate in a prompt and user-friendly manner with other computing devices via various communication approaches (e.g., talk, text, and/or email).

[0002] Given the importance of mobile computing devices in day-to-day life, users tend to add protection to their device. Such protection can be seen in various forms, including screen protectors and device covers. Among other things, these protection mechanisms may enhance the life of a mobile computing device by protecting the mobile computing device's housing and/or display screen. Without such protection, the mobile computing device may be damaged or even rendered non-functional in the event of a drop or liquid spill.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] Examples are described in the following detailed description and in reference to the drawings, in which:

[0004] Fig. 1 depicts an example system comprising a mobile computing device and a mobile computing device cover in an open position in accordance with an implementation;

[0005] Fig. 2 depicts an example mobile computing device cover in a closed position in accordance with an implementation;

[0006] Fig. 3 depicts an example mobile computing device cover in a closed position in accordance with another implementation;

[0007] Fig. 4(a) – 4(c) depict example mobile computing device covers with stationary detectable components in different locations in accordance with an implementation;

[0008] Fig. 5 depicts an example association table comprising associations between detected locations and functions in accordance with an implementation;

[0009] Fig. 6 depicts an example mobile computing device in accordance with an implementation; and

[00010] Fig. 7 depicts an example process flow diagram for system operation in accordance with an implementation.

NOTATION AND NOMENCLATURE

[00011] Certain terms are used throughout the following description and claims to refer to particular system components. As one skilled in the art will appreciate, technology companies may refer to components by different names. This document does not intend to distinguish between components that differ in name but not function. In the following discussion and in the claims, the terms “including” and “comprising” are used in an open-ended fashion, and thus should be interpreted to mean “including, but not limited to...” Also, the term “couple” or “couples” is intended to mean either an indirect or direct connection unless specified otherwise. Thus, if a first device couples to a second device, that connection may be through a direct electrical or mechanical connection, or through an indirect electrical or mechanical connection via other devices and connections. Additionally, the term “detectable component” is intended to mean a component that may be detected, and in particular, the location and/or state of at least a portion of the detectable component is discernable by another component/module. For example, the detectable component may comprise at least one magnet, RFID tag, NFC tag, switch, rotatable dial, push button, and/or any another component where at least a portion of the component’s state/location is detectable. Also, the term “detector” is intended to mean a component that is able to detect the state and/or location of the detectable component. For example, the detector may be a magnetometer such as a Hall effect sensor. Alternatively, the detector may be a component that detects the current state of a switch, dial, or button. In some implementations, the detector may be integrated with a module within a mobile computing device (e.g., integrated with a processing device), while in other implementations the detector is a discrete component (e.g., a discrete magnetometer). Moreover, the detector may detect the exact location, approximate location, and/or distance of the detectable component from the detector, depending on the implementation.

DETAILED DESCRIPTION

[00012] As mentioned above, protection mechanisms are used on mobile computing devices to protect the device from damage and thereby enhance the life of the product. An example protective mechanism is a mobile computing device cover. These covers come in various forms factors, including covers that protect the rear portion of the mobile computing device, covers that protect the front portion of the mobile computing device, and covers that protect the front and rear portion of the mobile computing device. Regardless of the form factor, the cover typically provides a single function – protect the mobile computing device from damage. While this function is important, it is limited.

Therefore, aspects of the present disclosure enhance the cover functionality by integrating technology into the cover to trigger various functions on the associated mobile computing device. More particularly, and as discussed below with reference to various examples and figures, aspects of the present disclosure provide a "smart" cover that enables a user to rapidly trigger functionality on the mobile computing device via manipulation of movable components integrated in the cover. In addition, aspects of the present disclosure provide a "smart" cover that enables a manufacturer to rapidly trigger functionality on the mobile computing device by integrating stationary components in different locations in the cover. Such functionality may be triggered prior to or in response to a portion of the cover being opened/closed.

[00013] For instance, in one example implementation, a system comprises a mobile computing device (e.g., a smartphone or tablet) and a mobile computing device cover (e.g., a "clam shell" cover). The mobile computing device cover includes a rear cover portion to receive and hold the mobile computing device and a front cover portion coupled to the rear cover portion. In addition, the cover includes a stationary/movable detectable component (e.g., a slider switch, rotating switch, and/or magnet.) The mobile computing device utilizes an integrated detector (e.g., at least one magnetometer such as a Hall effect sensor) to detect the location/state of at least a portion of the movable/stationary detectable component within the cover. The mobile computing device further includes an initiation module to cause the mobile computing device to conduct a pre-determined function based on the detected location/state of the detectable component within the mobile computing device cover. The function may include actions such as launching at least one application on the mobile computing device (e.g., launching an email application), changing a power state of the mobile computing device (e.g., changing from low to normal power state), changing a communication setting of the mobile computing device (e.g., turning ON/OFF WIFI or Bluetooth communication), changing a notification setting of the mobile computing device (e.g., placing the computing device in silent, vibrate, and/or audible mode), inputting login credentials on the mobile device (e.g., inputting username, password, and/or PIN information to an application and/or the mobile device), and/or initiating communication with another computing device (e.g., speed dialing a contact). In some implementations, this action occurs in response to the front cover transitioning from the closed position to an open position relative to the mobile computing device (or vice versa). Thus, for example, the mobile computing device may launch an email application if the detectable component is in a first position when the user opens the cover, and further launch a text message application if the detectable component is in a

second position when the user opens the cover. Among other things, this may enable a user to promptly launch an application (e.g., the text message or email application) when the cover is opened instead of the user having to navigate through various screens and select the particular application to conduct the same functionality.

[00014] In some examples, a user may associate various applications for “quick launch” with various locations of a movable detectable component (e.g., a slide switch). As such, the user may manipulate the location of the detectable component on the cover to cause different applications to quick launch. For example, a user may quick launch an email application when the cover is opened by placing the detectable component in a first position, the user may quick launch a phone dialing application when the cover is opened by placing the detectable component in a second position, the user may quick launch a text messaging application when the cover is opened by placing the detectable component in a third position, the user may quick launch a gaming application when the cover is opened by placing the detectable component in a fourth position, the user may speed dial a contact when the cover is opened by placing the dateable component in a fifth position, and so forth.

[00015] In other examples, a manufacturer may associate different functions with different locations of a stationary detectable component (e.g., an integrated magnet). As such, the manufacturer may produce different covers with different locations for the detectable component to trigger different functions. For example, a manufacturer may integrate a stationary magnet in a first location of a first cover (e.g., upper right corner) to trigger a retail point of sale application to launch when the cover is opened (i.e., a retail-focused cover). The manufacturer may integrate a stationary magnet in a second location of a second cover (e.g., lower right corner) to trigger an educational application to launch when the cover is opened (i.e., an education-focused cover). Hence, the retailer may utilize different covers to trigger different “quick-launch” or other functionality on mobile computing devices. These and various other examples are discussed further below with reference to various figures.

[00016] Looking now at Fig. 1, this figure depicts an example system 100 comprising a mobile computing device 110 and a mobile computing device cover 120 in an open position in accordance with one implementation. It should be understood that the figure depicts one example implementation, and various components may be added, removed, or modified in accordance with various other implementations without departing from the scope of the present disclosure.

[00017] The mobile computing device 110 may be, for example, a tablet computer, smartphone, digital reader, gaming device, calculator, retail point of sale device, or another computing device configured to be easily transportable and protectable via a cover. The mobile device cover 120 may be, for example, a cover to protect the front and rear portions of the mobile computing device 110 (e.g., in a “book” or “clamshell” configuration), a cover to protect the front portion of the mobile computing device 110, or a cover to protect the rear portion of the mobile computing device 110. Depending on the implementation, the cover 120 may be integrated with or discrete from the mobile computing device. 110.

[00018] The mobile computing device cover 120 comprises a front cover portion 130 and rear cover portion 140. In addition, the cover 120 comprises a detectable component 150. The detectable component 150 is a component that may be detected, and in particular, the location and/or state of at least a portion of the detectable component 150 is discernable by another component/module. For example, the detectable component 150 may comprise at least one magnet, RFID tag, NFC tag, switch, rotatable dial, and/or push button within the cover 120.

[00019] In some implementations, the detectable component 150 is stationary within the cover 120. For example, the detectable component 150 may be a stationary magnet, RFID tag, and/or NFC within the cover 120. In this case, the manufacturer may position the detectable component 150 in different positions in different covers 120 based on the desired functionality to be conducted at the mobile computing device 110. For example, the manufacturer may position the detectable component 150 in an upper left portion of the front cover portion 130 in a cover 120 intended for the healthcare industry, where opening the front cover portion 130 may trigger a healthcare application to open on the mobile computing device 110. Alternatively, the manufacturer may position the detectable component 150 in an upper right portion of the front cover portion 130 for a cover 120 intended for the education industry, where opening the front cover portion 130 may trigger one or multiple educational applications to open on the mobile computing device 110. Still further, the manufacturer may position the detectable component 150 in a lower left portion of the front cover portion 130 for a cover 120 intended for the retail industry, where opening the front cover portion 130 may trigger a retail point of sale application to open on the mobile computing device 110.

[00020] In other implementations, at least a portion of the detectable component 150 is movable to at least two positions on the cover 120. For example, the detectable component 150 may be a slide switch with a portion slidable to multiple positions. Each position may trigger different functionality. For example, when a switch portion is in a first

location nothing may happen, when the switch portion is in a second location a first application may launch, when the switch portion is in a third position a second application may launch, and so forth. In other examples, the detectable component 150 comprises a rotating dial where different functionality is conducted based on the current location of the dial (e.g., 0° = no function, 90° = function 1, 180° = function 2, and 270° = function 3). It should be understood that the detectable component 150 is not limited to sliding switches and/or rotating dials, and any other movable component where the state/location may be detected is included. For instance, the detectable component 150 may be a series of depressable buttons where different functions are triggered based on the collective state of the various buttons.

[00021] Turning now to the mobile computing device 110, this device 110 comprises at least a detector 160 and initiation module 170. The detector 160 detects the locations and/or state of the above-discussed detectable component 150 within the cover 120. For example, in the situation where the detectable component 150 is a stationary magnet, the detector 160 may detect the location of a stationary magnet within the cover (e.g., detect the magnet is located in top right or bottom right location). In the situation where the detectable component 150 is a slider switch, the detector 160 may detect the current location of a portion of the slider switch (e.g., position 1, position 2, position 3, etc.). In the situation where the detectable component 150 is a rotating dial, the detector 160 may detect the current orientation of a portion of the rotating dial (e.g., 0° , 90° , 180° , 270° , etc.). Still further, in the case where the detectable component 150 is a plurality of depressable buttons, the detector 160 may detect the current state the buttons (e.g., 0 depressed, 1 depressed, 2 depressed, etc.). Depending on the implementation, the detector 160 may comprise a magnetometer such as a Hall effect sensor, a RFID reader, a NFC reader, an ASIC, a processing device, a circuit, or any other component configured to detect the location/state of the detectable component 150.

[00022] The initiation module 170 is communicatively coupled to the detector 160. The initiation module 170 determines the detected location/state of the detectable component 150 based on information received from the detector 160 (e.g., magnetic field proximity detection by a Hall effect sensor). The initiation module 170 then causes the mobile computing device 110 to conduct functionality based on the detected location/state of the detectable component 150. For example, the initiation module 170 may cause the mobile computing device 110 to launch an application (e.g., launch a search engine), change power states (e.g., power down/up and/or transition between power states), change communication settings (e.g., enable/disable Bluetooth communication), input

login credentials (e.g., input username, password, and/or PIN information to an application and/or the mobile device), and/or initiate a communication session (e.g., connect to a VPN or to a wearable computing device). In some implementations, one function is triggered, while in other implementations, multiple functions are triggered in a simultaneous or sequential manner. For example, the triggered function may be for the mobile computing device 110 to launch an Internet radio service (e.g., Pandora®) and connect to a portable speaker to play the received audio content.

[00023] In some implementations, the particular functions may be default functions programmed by a manufacturer. In other implementations, the functions may be user programmable. For example, the user may download an application which allows the user to specify functions to be conducted for different detected states/locations. The user may further specify whether the function is to be conducted in response to the cover being opened, in response to the cover being closed, and/or in response to a detected location/state change of the detectable component 150. In the last case, the function may be immediately conducted on the computing device to reduce latency. For example, the mobile computing device 110 may immediately launch an application in response to a detected location/state change of the detectable component 150. In some implementations, the application may run in the background and/or the mobile computing device 110 may return to a low power state until the front cover portion 130 is opened.

[00024] In various implementations, the initiation module 170 comprises a computer-readable medium and a processing device to execute instructions stored on the computer readable medium to cause the mobile computing device 110 to conduct functions described herein. In other implementations, the initiation module comprises a functionally equivalent circuit (e.g., an ASIC) to cause the mobile computing device 110 to conduct functions described herein. Regardless of the implementation, the initiation module 170 causes the mobile computing device 110 to conduct functions based on the detected state/location of the detectable component 150, as discussed above.

[00025] Turning now to Fig. 2, this figure depicts an example cover 120 in a closed position in accordance with an implementation. The cover 120 includes a rear cover portion 140 to receive and hold a mobile computing device 110. Additionally, the cover 120 includes a front cover portion 130 coupled to the rear cover portion 140 to cover at least a portion of the mobile computing device 110 when the front cover portion 130 is in a closed position relative to the mobile computing device 110. Still further, the cover 120 includes a detectable component 150 integrated in the cover 120, wherein at least a portion of the detectable component is movable from at least a first position 210 with

respect to the mobile computing device cover to a second position 220 with respect to the mobile computing device cover 120. More particularly, the detectable component 150 comprises a sliding switch where different functionality is triggered on the mobile computing device 110 based on whether the movable portion of the sliding switch is detected to be in the first position 210, second position 220, third position 230, fourth position 240, or fifth position 250.

[00026] Looking at Fig. 3, this figure depicts an example cover 120 in a closed position in accordance with another implementation. In particular, the front portion of the cover 130 includes a rotating dial 150, where different functionality is triggered on the mobile computing device 110 based on whether the rotating dial is detected to be in the first position 310, second position 320, third position 330, or fourth position 340.

[00027] Turning to Figs. 4(a), 4(b), and 4(c), these figures depict example covers 120 with stationary detectable components 150 in different locations in accordance with an implementation. In particular, and as discussed above, a manufacturer may produce multiple covers 120 with stationary detectable components 150 (e.g., magnets) located in different locations to trigger different functionality. For example and referring to Fig. 4(a), the detected location of the stationary detectable component 150 in the lower right portion of the front cover portion 130 may trigger a first function (e.g., launching an educational application). Referring to Fig. 4(b), the detected location of the stationary detectable component 150 in the middle right portion of the front cover portion 130 may trigger a second function (e.g., launching a retail point of sale application). Referring to Fig. 4(c), the detected location of the stationary detectable component 150 in the upper right portion of the front cover portion 130 may trigger a third function (e.g., launching a financial application). Hence, a manufacturer may market different covers 120 to different vertical markets (e.g., healthcare market, educational market, and financial market) to address their different needs.

[00028] With respect to Fig. 5, this figure depicts an example association table 500 comprising associations between detected locations and functions in accordance with an implementation. As mentioned above, the table 500 may be based on a manufacturer's default settings or set by a user based on current preferences. When set by the user, the mobile computing device may have an application thereon that provides the ability to associate locations/states with various functions. As shown, the table 500 comprises various detectable component locations in column 1 and associated functions in column 2. While only locations are shown, in some implementations, detectable states may be utilized. For example, in a depressable button implementation, depressing one button may

trigger one function, depressing two buttons may trigger another function, and so forth. Moreover, in some implementations, multiple functions may be associated with a location/state. Thus, detected location 2 may launch Pandora® and connect the mobile computing device to a portable speaker in a parallel or sequential manner. Furthermore, an option may be provided to determine when the function should occur. For example, one option may trigger the function prior to opening the front cover portion, another option may trigger the function in response to opening the front cover portion, and yet another option may trigger the function in response to closing the front cover portion.

[00029] Looking now at Fig. 6, this figure depicts an example mobile computing device 110 in accordance with an implementation. The mobile computing device 110 comprises a detector 160 and initiation module 170 coupled via a communication bus 610. The initiation module 170 comprises a processing device 620 and a non-transitory machine readable medium 630. The processing device 620 is to retrieve and execute instructions stored on the machine-readable medium 630. Depending on the implementation, the processing device 620 may be a central processing unit (CPU), graphics processing unit (GPU), system-on-chip (SoC), or another processing device to execute instructions. Put another way, the processing device 620 may fetch, decode, and execute instructions stored on the machine readable storage medium 630 to implement the functionalities described above and below.

[00030] The machine readable storage medium 630 may correspond to any typical storage device that stores machine-readable instructions, such as programming code, software, firmware, or the like. For example, the machine readable medium 630 may include one or more of a non-volatile memory, a volatile memory, and/or a storage device. Examples of non-volatile memory include, but are not limited to, electronically erasable programmable read only memory (EEPROM) and flash memory. Examples of volatile memory include, but are not limited to, static random access memory (SRAM) and dynamic random access memory (DRAM). Examples of storage devices include, but are not limited to, hard disk drives, compact disc read/write drives, digital versatile disc drives, optical read/write devices, and flash memory devices. The machine readable medium 630 comprises initiation instructions 640 and an association table 500. The initiation instructions 640, when executed by the processing device 640, cause the mobile computing device to conduct the various functions discussed herein. For example, in one implementation, the instructions cause the mobile computing device to perform a function specified in the association table 500 based on the detected information provided by the detector 160. For example, the initiation instructions 640 may cause the mobile computing

device to launch at least one application, change a power state, change a communication setting, change a notification setting, input login credentials, and/or initiate communication with another device.

[00031] Turning now to Fig. 7, this figure depicts an example process flow diagram 700 for system 100 operation in accordance with an implementation. It should be readily apparent that the processes depicted in Fig. 7 represent generalized illustrations, and that other processes may be added or existing processes may be removed, modified, or rearranged without departing from the scope and spirit of the present disclosure. In addition, it should be understood that at least some of the processes depicted in Fig. 7 may represent instructions stored on a machine-readable storage medium that, when executed, cause a mobile computing device to respond, to perform actions, to change states, and/or to make decisions. Alternatively, at least some of the processes may be conducted by a functionally-equivalent circuit.

[00032] The process 700 may begin at block 710, where the user manipulates the location/state of at least a portion of a detectable element located on a mobile computing device cover. At block 720, a detector integrated in a mobile computing device detects the change in location/state of at least the portion of the detectable element and provides information to the initiation module. At block 730, the user opens the front cover portion of the mobile computing device cover. In response to this detected opening, at block 740, the initiation module checks an association table and causes the mobile computing device to conduct a function based on the information provided by the detector and the information within the association table.

[00033] Aspects of the foregoing describe a “smart” cover that enables a user to rapidly trigger functionality on a mobile computing device via manipulation of a movable and detectable component integrated in a mobile computing device cover. Moreover, aspects of the present disclosure provide a “smart” cover that enables a manufacturer to rapidly trigger functionality on the mobile computing device by integrating stationary and detectable components in different locations on a cover. Regardless of the implementation, the described approach may enable a user to promptly launch an application (e.g., the text message or email application) when the cover is opened instead of the user having to navigate through various screens and select the particular application. While the present disclosure has been shown and described with reference to the foregoing examples, it should be understood that other forms, details, and implementations may be made without departing from the spirit and scope of the disclosure that is defined in the following claims.

WHAT IS CLAIMED IS:

1. A system, comprising:

a mobile computing device cover including a rear cover portion, a front cover portion coupled to the rear cover portion, and a detectable component, wherein the rear cover portion is to receive and hold a mobile computing device, and the front cover portion is to cover at least a portion of the mobile computing device when the front cover is in a closed position relative to the mobile computing device; and

the mobile computing device including an initiation module and at least one detector, wherein the at least one detector is to detect the location of at least a portion of the detectable component within the mobile computing device cover, and wherein the initiation module is to cause the mobile computing device to conduct a function based on the detected location of the at least portion of the detectable component within the mobile computing device cover.

2. The system of claim 1, wherein the function comprises launching at least one application on the mobile computing device.

3. The system of claim 1, wherein the function comprises at least one of: launching at least one application on the mobile computing device, changing a power state of the mobile computing device, changing a communication setting of the mobile computing device, changing a notification setting of the mobile computing device, inputting login credentials on the mobile device, and initiating communication with another computing device.

4. The system of claim 1, wherein the function comprises launching at least one application on the mobile computing device in response to the front cover transitioning from the closed position to an open position relative to the mobile computing device.

5. The system of claim 1, wherein the function comprises launching at least one application on the mobile computing device prior to the front cover transitioning from the closed position to an open position relative to the mobile computing device.

6. The system of claim 1, wherein the at least portion of the detectable component is movable from at least a first position with respect to the mobile computing device cover to a second position with respect to the mobile device cover.

7. The system of claim 1, wherein the initiation module is to cause the mobile computing device to conduct the function based on the detected location of the at least portion of the detectable component within the mobile computing device based on pre-programmed associations between detected locations and functions.

8. The system of claim 1, wherein the at least portion of the detectable component is stationary within the mobile computing device cover.

9. A mobile computing device cover, comprising:
a rear cover portion to receive and hold a mobile computing device;
a front cover portion coupled to the rear cover portion to cover at least a portion of the mobile computing device when the front cover is in a closed position relative to the mobile computing device; and
a detectable component integrated in the mobile computing device cover, wherein at least a portion of the detectable component is movable from at least a first position with respect to the mobile computing device cover to a second position with respect to the mobile device cover.

10. The mobile computing device cover of claim 9, further comprising an initiation module to detect whether the at least portion of the detectable component is in the first position or second position and communicate the determined position to the mobile computing device.

11. The mobile computing device cover of claim 9, wherein the location of the at least portion of the detectable component is determinable by the mobile computing device without the mobile computing device cover communicating with the mobile computing device.

12. A mobile computing device, comprising:
at least one detector to determine the location of at least a portion of a detectable component within a mobile computing device cover; and

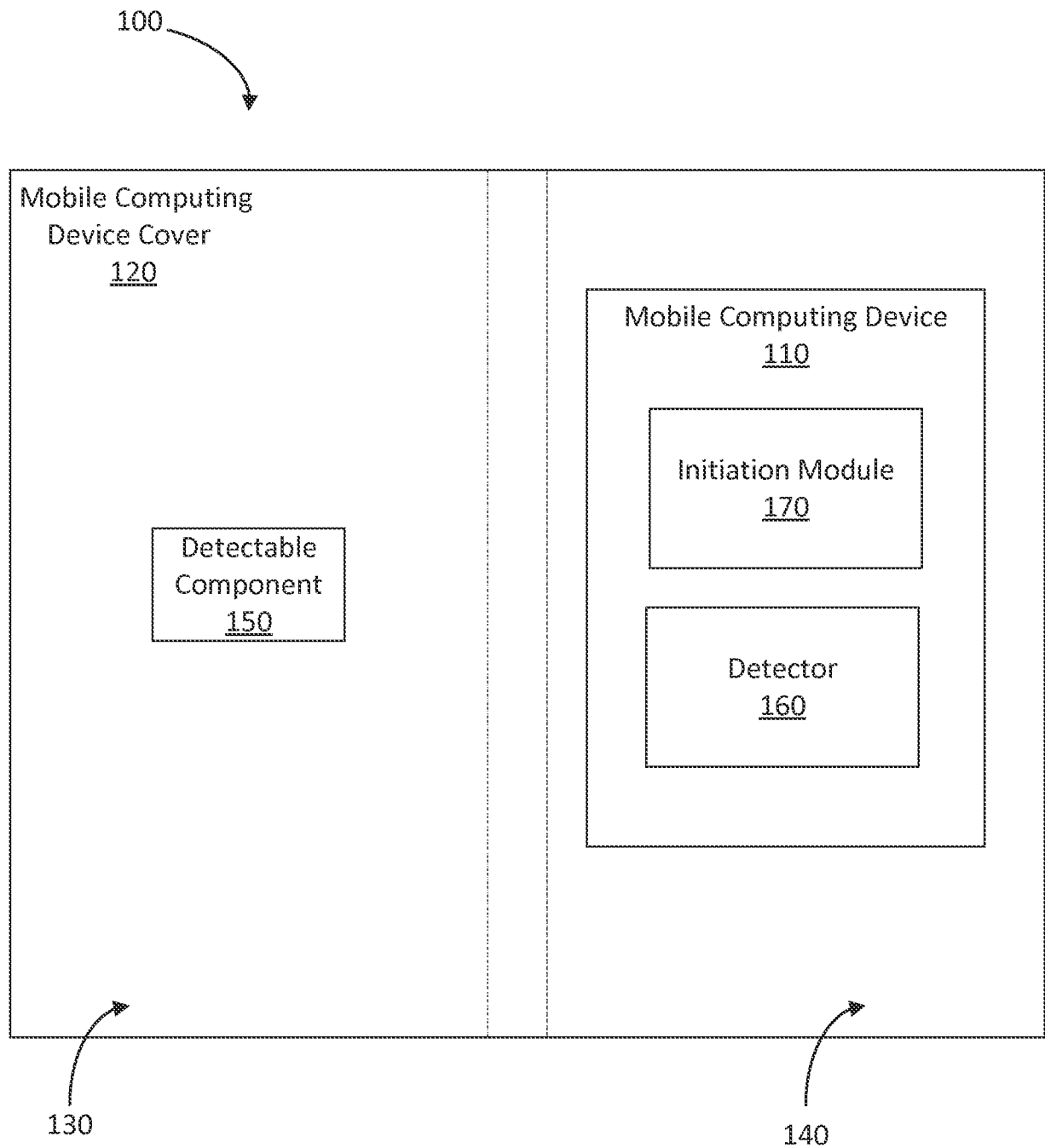
an initiation module to cause the mobile computing device to conduct a function based on the detected location of the at least portion of the detectable component within the mobile computing device cover,

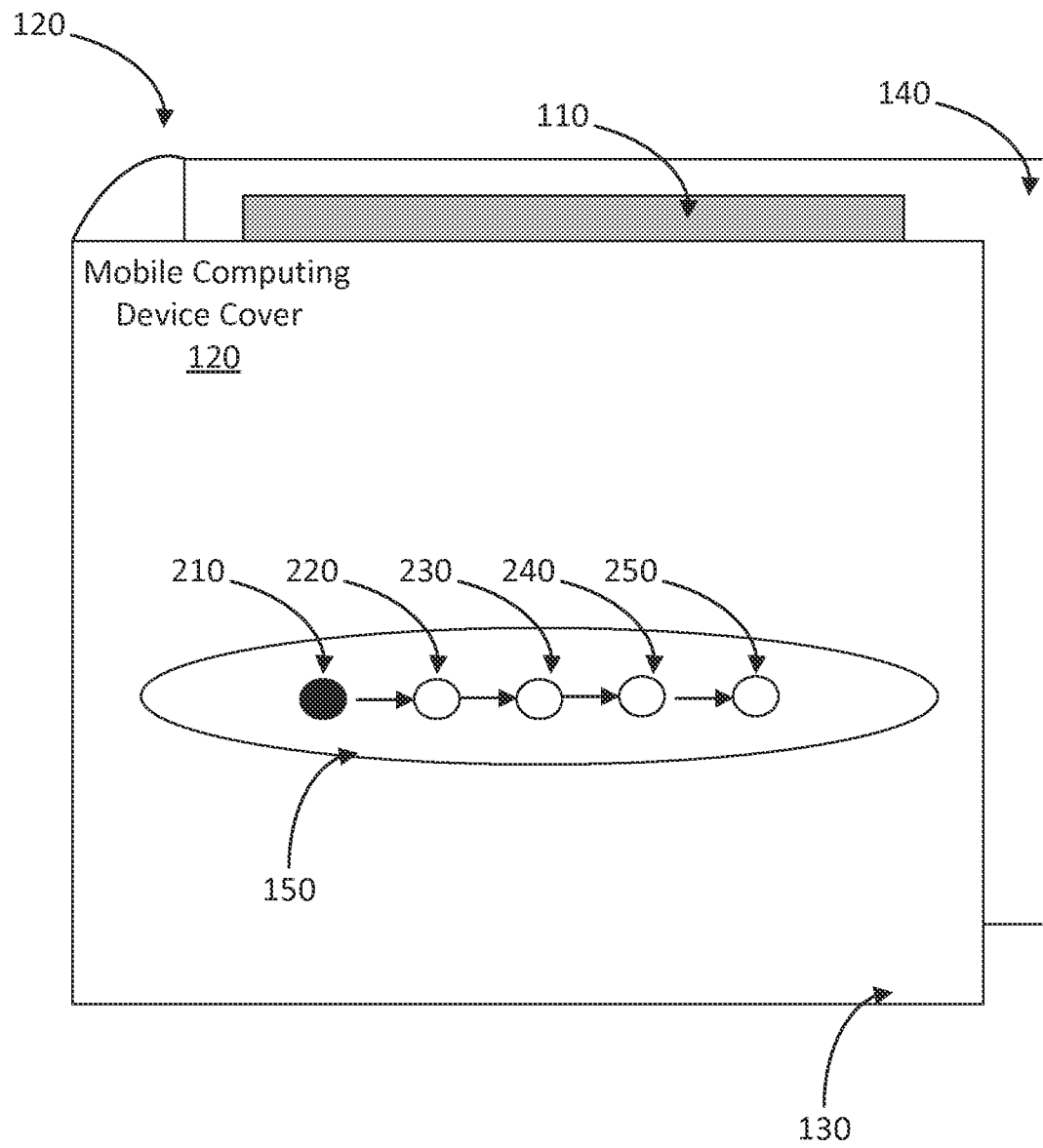
wherein the function comprises at least one of launching at least one application on the mobile computing device, changing a power state of the mobile computing device, changing a communication setting of the mobile computing device, changing a notification setting of the mobile computing device, inputting login credentials on the mobile device, and initiating communication with another computing device.

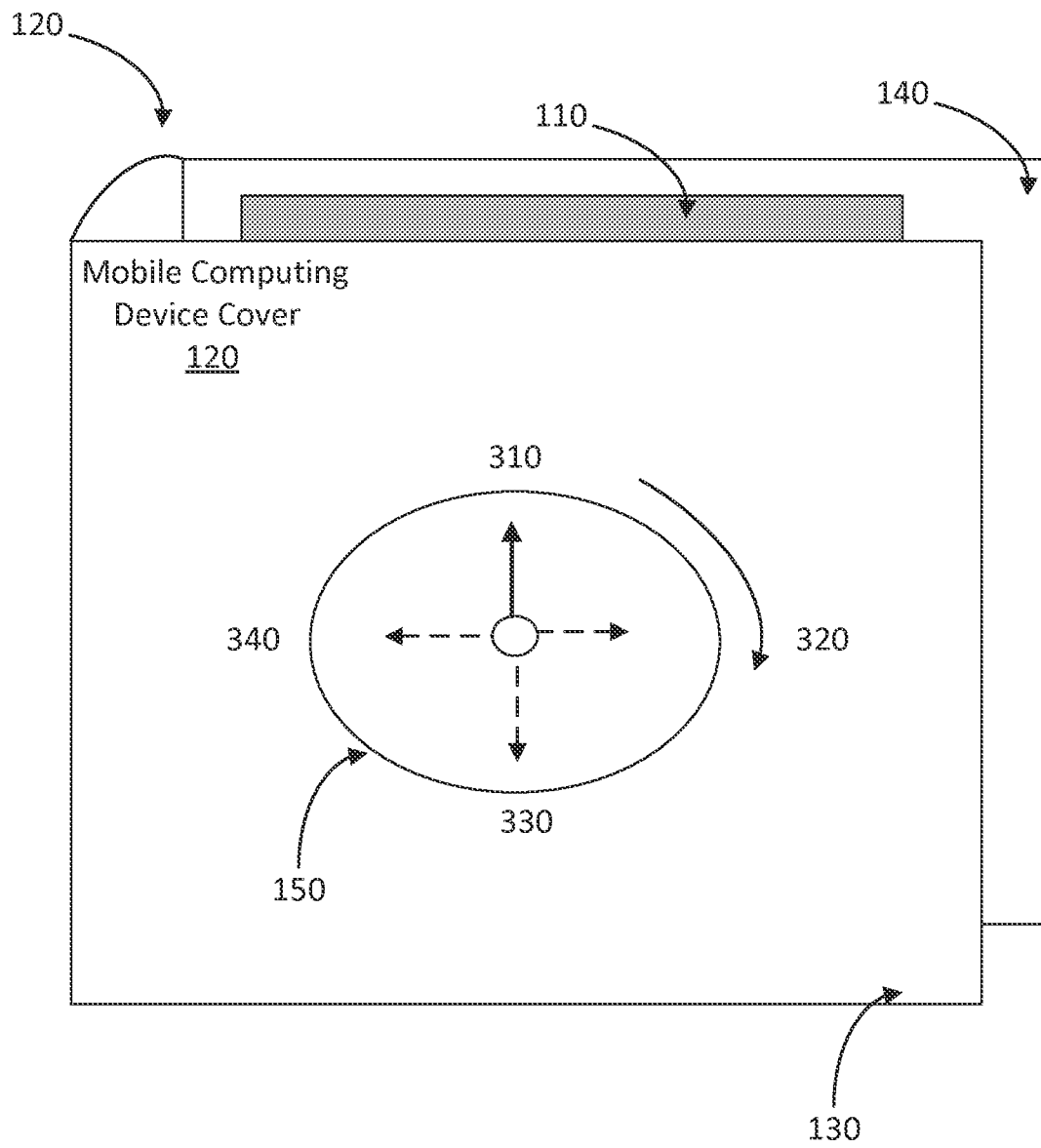
13. The mobile computing device of claim 12, wherein the initiation module is to cause the mobile computing device to conduct the function based on pre-programmed associations between detected locations and functions.

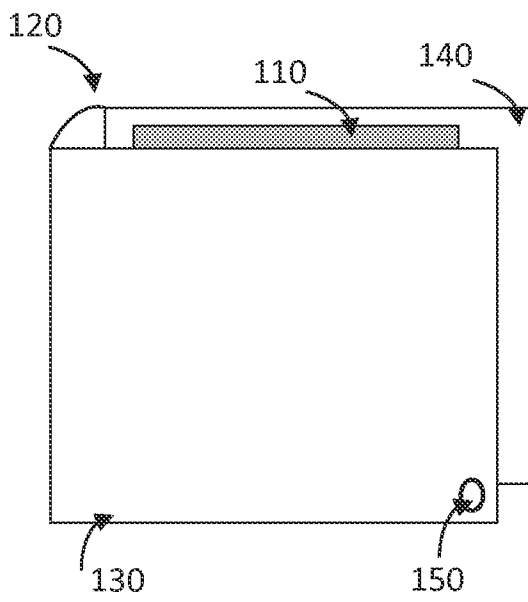
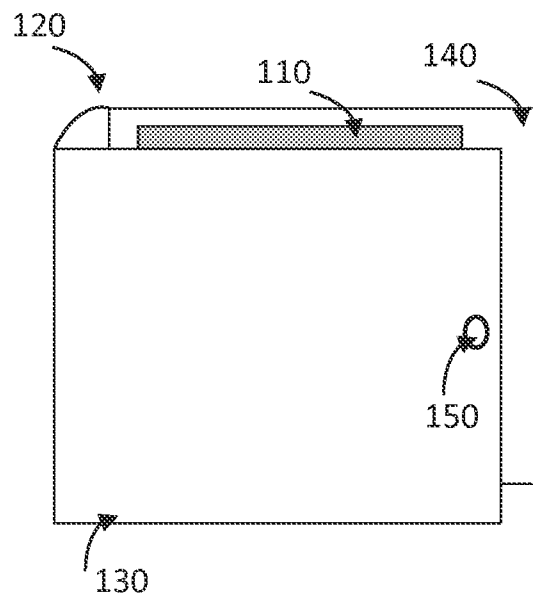
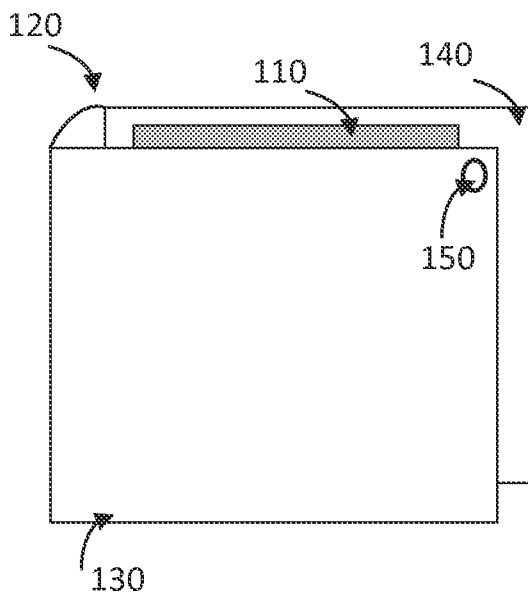
14. The mobile computing device of claim 12, wherein the initiation module is to cause the mobile computing device to conduct the function in response to a front cover of the mobile computing device cover transitioning from a closed position to an open position relative to the mobile computing device.

15. The mobile computing device of claim 12, wherein the initiation module is to cause the mobile computing device to conduct the function prior to a front cover of the mobile computing device cover transitioning from a closed position to an open position relative to the mobile computing device.

**FIG. 1**

**FIG. 2**

**FIG. 3**

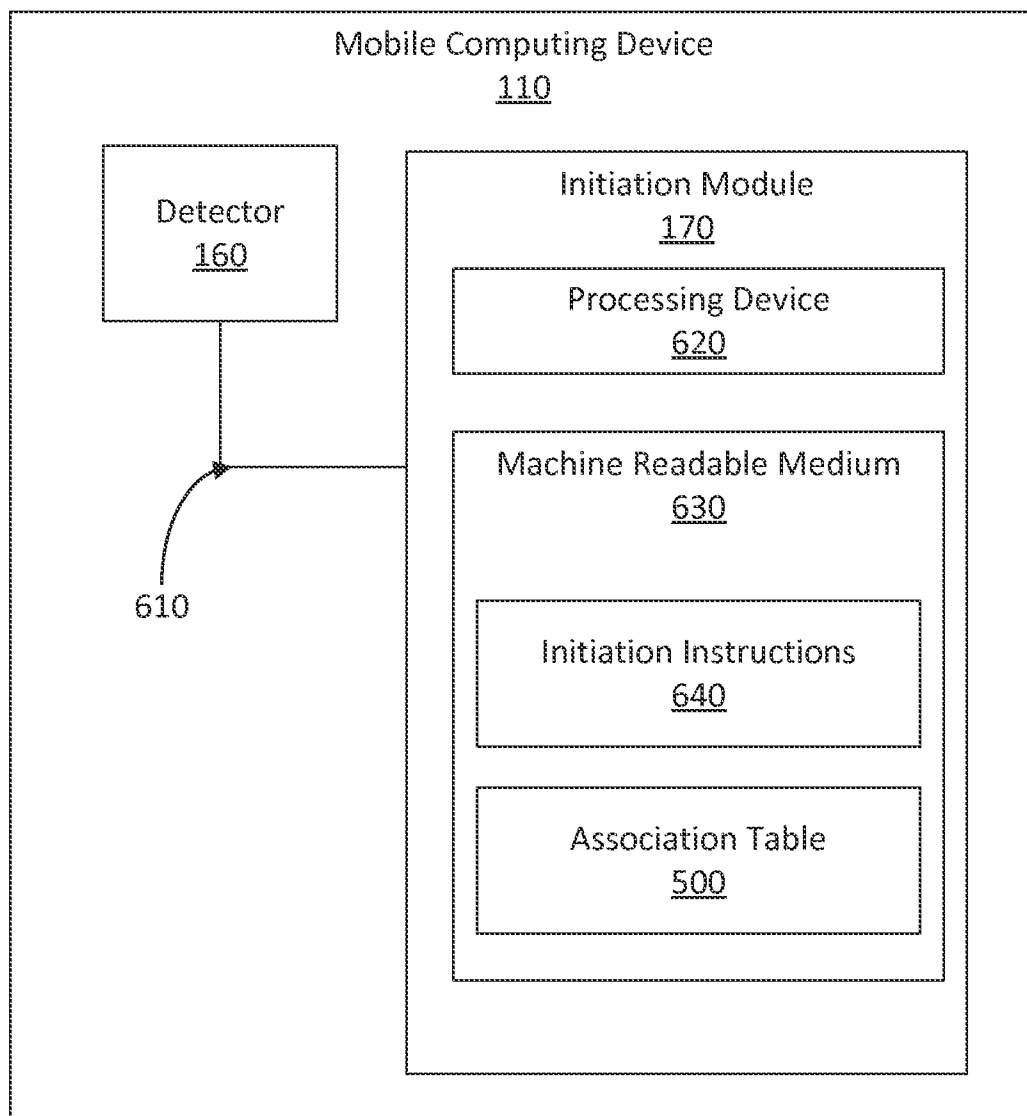
**FIG. 4(a)****FIG. 4(b)****FIG. 4(c)**

500

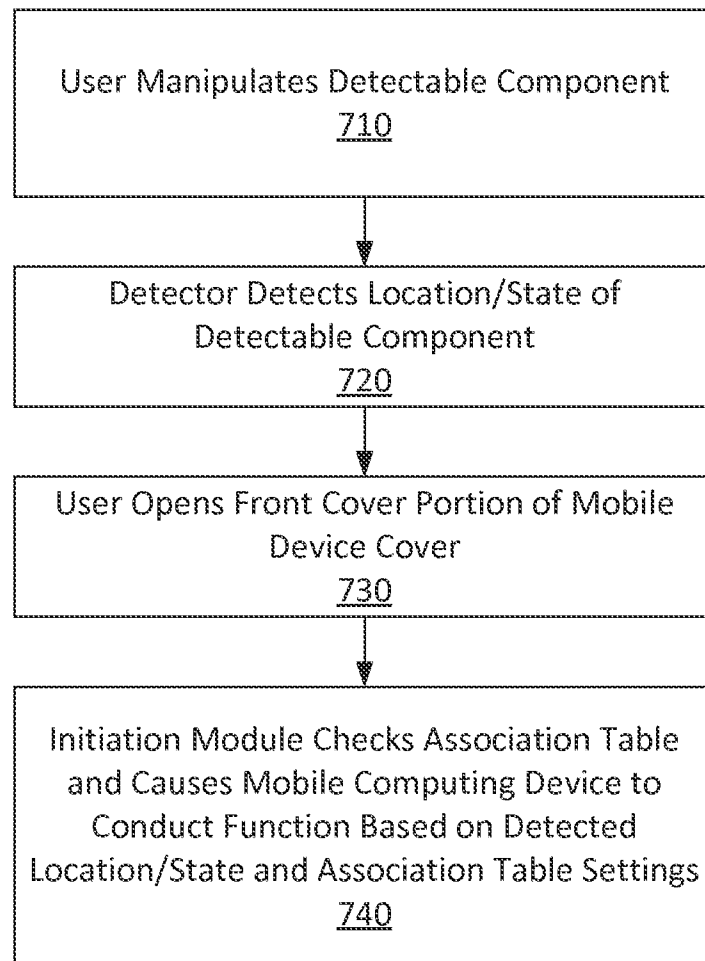


Detectable Component Location	Function
Location 0	No Function
Location 1	Speed Dial Fred
Location 2	Launch Internet Radio Service
Location 3	Mute Device
Location 4	Launch Internet Search Application
Location 5	Launch Email Application

FIG. 5

**FIG. 6**

700

**FIG. 7**

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/055795**A. CLASSIFICATION OF SUBJECT MATTER****G06F 1/16(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
G06F 1/16; G06F 9/44; H04B 1/40; H04B 1/38; H04M 1/00; H04M 1/00; H04W 88/02Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: mobile, cover, detector, location, initiation**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-1245922 B1 (DUK-SEUNG KIM) 20 March 2013 See paragraphs [0036]-[0039], [0041], [0044]; and figure 2.	12-13
Y		1-11, 14-15
Y	KR 10-2014-0096893 A (LG ELECTRONICS INC.) 06 August 2014 See paragraphs [0007]-[0008], [0032]-[0035]; and figure 1.	1-11, 14-15
A	US 2010-0048268 A1 (PATRICK O'NEILL et al.) 25 February 2010 See paragraphs [0025]-[0027]; and figure 1.	1-15
A	US 2008-0096620 A1 (MIN-SOO LEE et al.) 24 April 2008 See paragraph [0074]; and figure 2A.	1-15
A	US 2012-0077548 A1 (LYNNE GOLDBERG) 29 March 2012 See paragraphs [0016]-[0019]; and figure 1.	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

24 May 2015 (24.05.2015)

Date of mailing of the international search report

26 May 2015 (26.05.2015)

Name and mailing address of the ISA/KR

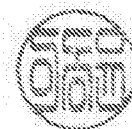
International Application Division
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Republic of Korea

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2014/055795

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		EP 2760186 A1	30/07/2014
		US 2014-0210803 A1	31/07/2014
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US 2008-0096620 A1	24/04/2008	KR 10-0867581 B1	10/11/2008
		KR 10-1172454 B1	07/08/2012
		US 8046039 B2	25/10/2011
US 2012-0077548 A1	29/03/2012	None	