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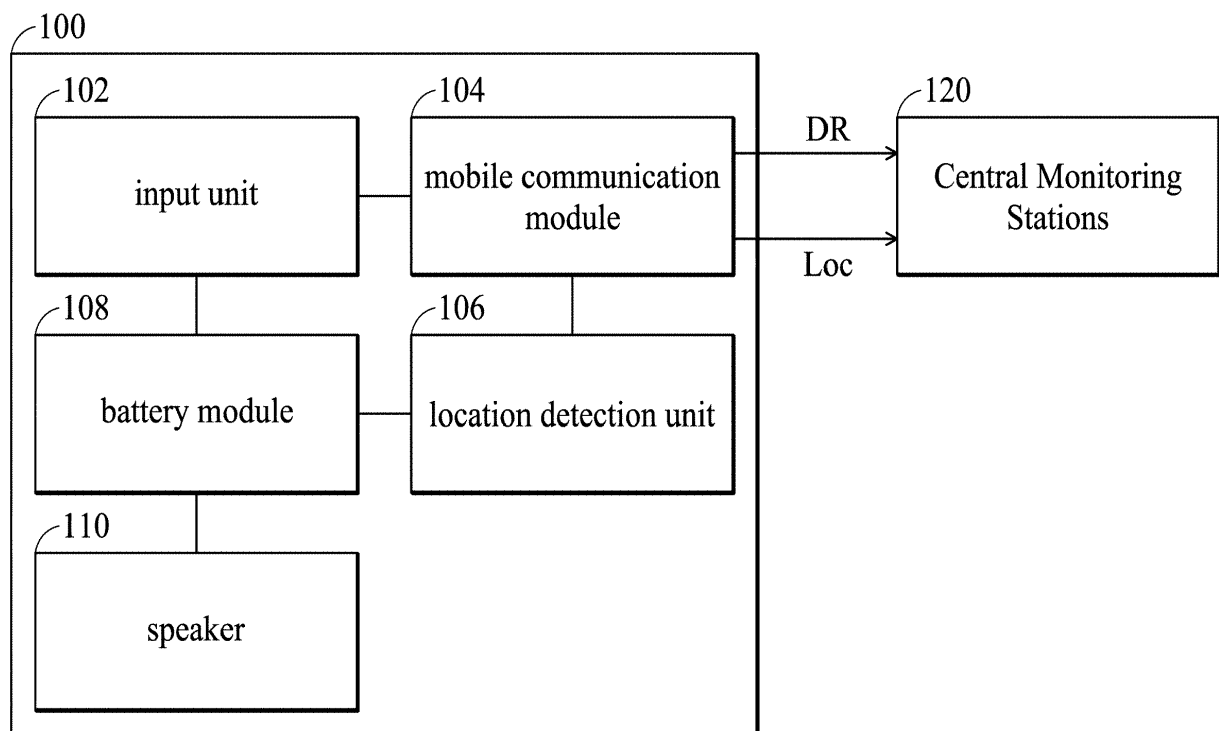
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(54) **Mobile alarm device and system**

(57) A mobile alarm device is provided, including: an input unit; a location detection unit, obtaining location information of the mobile alarm device; and a mobile communication module, transmitting a digital format report to Central Monitoring Stations via a Global System for Mo-

bile Communications, and transmitting the location information to the CMS, when the input unit is activated by a user, wherein the CMS processes a corresponding operation according to the location information and the digital format report.



**FIG. 1**

## Description

### CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This Application claims priority of U.S. Patent Application No. 13/604,314, filed on Sept. 5, 2012, the entirety of which is incorporated by reference herein.

### BACKGROUND OF THE INVENTION

#### Field of the Invention

[0002] The disclosure relates generally to an emergency alarm device and system, and more particularly relates to a mobile emergency alarm device capable of transmitting a digital report to Central Monitoring Stations.

#### Description of the Related Art

[0003] Alarms have been widely applied in various fields, such as medical assistance for elderly people, detection of carbon monoxide, or smoke detection, etc. Regarding the alarms used for medical assistance, when a user gets hurt or feels uncomfortable, the user may summon emergency help by press an emergency button on a medical alarm system. However, the conventional medical alarm system is only set in a fixed location in home, so the user's sphere of activities is limited.

[0004] Additionally, if the user travels to the outside of the home, even though an emergency call may be made, knowledge of the user's location may be difficult to determine. Therefore, valuable time may be lost before help arrives at the user.

### BRIEF SUMMARY OF THE INVENTION

[0005] An embodiment of a mobile alarm device is provided, comprising: an input unit; a location detection unit, obtaining location information of the mobile alarm device; and a mobile communication module, wherein the mobile communication module transmits a digital format report to a CMS (Central Monitoring Stations) via a GSM (Global System for Mobile Communications), and transmits the location information to the CMS, when the input unit is activated by a user, wherein the CMS processes a corresponding operation according to the location information and the digital format report.

[0006] An embodiment of a mobile alarm system is provided, comprising: a mobile alarm device and a base station device. The mobile alarm device comprises: an input unit; a location detection unit, obtaining location information of the mobile alarm device; and a mobile communication module, wherein the mobile communication module transmits a digital format report to a CMS (Central Monitoring Stations) via a GSM (Global System for Mobile Communications), and transmits the location information to the CMS, when the input unit is activated by a user; and a battery module, providing power to the mobile

alarm device, wherein the CMS processes a corresponding operation according to the location information and the digital format report. The base station device comprises: a charging cradle; and a charging module, charging the battery module when the mobile alarm device is inserted in the charging cradle.

[0007] An embodiment of a mobile alarm method for a mobile alarm device is provided, comprising: obtaining location information of the mobile alarm device; and when an input unit of the mobile alarm device is activated by a user, transmitting a digital format report to a CMS via a GSM and transmitting the location information to the CMS, wherein the CMS processes a corresponding operation according to the location information and the digital format report.

### BRIEF DESCRIPTION OF DRAWINGS

[0008] The invention will become more fully understood by referring to the following detailed description with reference to the accompanying drawings, wherein:

[0009] Fig. 1 is a block diagram illustrating an embodiment of a mobile alarm device and a CMS;

[0010] Fig. 2 is a block diagram illustrating an embodiment of a mobile alarm system;

[0011] Fig. 3 is a flowchart of an embodiment of a method for the mobile alarm device shown in Fig. 1.

### DETAILED DESCRIPTION OF THE INVENTION

[0012] The making and using of the embodiments of the present invention are discussed in detail below. It should be appreciated, however, that the embodiments provide many applicable inventive concepts that can be embodied in a wide variety of specific contexts. The specific embodiments discussed are merely illustrative of specific ways to make and use the invention, and do not limit the scope of the invention.

[0013] Fig. 1 is a block diagram illustrating an embodiment of a mobile alarm device 100. The mobile alarm device 100 comprises an input unit 102, a mobile communication module 104, a location detection unit 106, a battery module 108, and a speaker 110, wherein the battery module 108 provides power to the mobile alarm device 100. In order to make it easier to use, the input unit 102 may be a simple button, so that the user can quickly press the simple button to summon emergency help.

[0014] In the embodiments, when the user uses the input unit 102 to summon emergency help, such as to press an emergency button, the mobile communication module 104 sends a digital format report DR (ex. Contact ID reporting format report, Tunstall Telecom Format report or CPC format report) to the CMS (Central Monitoring Stations) 120 via a GSM (Global System for Mobile Communications). Meanwhile, the location detection unit 106 obtains location information of the mobile alarm device 100 and provides the location information to the mobile communication module 104, and the mobile communi-

cation module 104 sends the location information Loc to the CMS 120. In some embodiments, the mobile communication module 104 may send the location information Loc to the CMS 120 after receiving a location request from the CMS 120, wherein the CMS 120 sends the location request to the mobile communication module 104 when receiving the digital format report from the mobile communication module 104 of the mobile alarm device 100. Accordingly, when the CMS 120 receives the digital format report DR, the CMS 120 can determine what the situation is by decoding the event code of the digital format report DR. Also, when the CMS 120 receives the location information Loc, the CMS 120 can know where the user is according to the indication of the location information Loc. Next, the CMS 120 processes a corresponding operation according to the event code and the location information Loc. For example, when the CMS receives the digital format report DR and the location information Loc, the CMS decodes the digital format report DR to obtain the event code. If the event code corresponds to a medical alarm, the CMS 120 will send an ambulance to the location indicated by the location information Loc. Note that the event code is not limited thereto, and there are many event codes which may correspond to various events, such as a fire alarm, a panic alarm, a carbon monoxide alarm, etc. Therefore, the user can summon emergency help without being restricted to a home area, and it would take less time for a CMS to find the position of the user, such that help assistance would arrive at the user more quickly. In some embodiments, the mobile alarm device 100 may comprise a microphone, and the mobile communication module 104 would further dial an emergency call to the CMS personnel after transmitting the digital format report DR and the location information Loc, or the CMS 220 builds a two-way communication between the mobile alarm device 100 and the mobile communication module 204 when the CMS 220 receives the digital format report DR. Thus, the user can directly speak to the CMS personnel for help.

**[0015]** In an embodiment, the location detection unit 106 may be a GPS (Global Positioning System) module with an AGPS (Assisted Global Positioning System) and CellLocate technology. Accordingly, the location detection unit 106 can quickly locate the user even in challenging environments. In some embodiments, the location detection unit 106 may continually detect the location of the mobile alarm device 100 and provide the location information Loc to the mobile communication module 104. Also, the mobile communication module 104 may transmit the location information to the CMS or other host servers after the input unit 102 is activated by a user. In another embodiment, the mobile communication module 104 may periodically transmit the location information to the CMS or other host servers. Due to the location information continually being updated on the host servers, a user's family can easily use a PC or smart phone to access the host servers or CMS to check on the user at any time.

**[0016]** In an embodiment, the location detection unit 106 further determines whether the mobile alarm device 100 has moved from a non-predetermined area to a predetermined area, and the speaker 110 may output a corresponding prompt voice to remind the user, wherein the predetermined area may be the home area or a charging device nearby area. For example, when the location detection unit 106 detects that the mobile alarm device 100 has moved from a non-predetermined area to a predetermined area such as the home area, the speaker 110 outputs a prompt voice to remind the user to recharge the battery module 108. In some embodiments, the speaker 110 outputs another prompt voice when the power of the battery module 108 is below a predetermined level.

**[0017]** In addition, in an embodiment, the location detection unit 106 may further determine whether the mobile alarm device 100 has moved from a non-predetermined area to a predetermined area. For example, if the user of the mobile alarm device moves out of the predetermined area such as home area, the location detection unit 106 will detect that the mobile alarm device 100 has moved from a predetermined area to a non-predetermined area, and then the mobile communication module 104 sends a prompt message to the user's family or CMS personnel via an SMS or GPS. Therefore, the user's family can be alarmed when the user moves out of a safe zone.

**[0018]** Fig. 2 is a block diagram illustrating an embodiment of a mobile alarm system. In this embodiment, the mobile alarm system comprising a mobile alarm 200 and a base station device 230. The mobile alarm device 200 comprises an input unit 202, a mobile communication module 204, a location detection unit 206, a battery module 208, and a speaker 210, wherein the battery module 208 provides power to the mobile alarm device 200. In order to make it easier to use, the input unit 202 may be a simple button, so that the user can quickly press the simple button to summon emergency help. The base station device 230 comprises a button 232, a communication module 234, a charging module 208, a charging cradle 238, and a speaker 240.

**[0019]** In the embodiment, when the user uses the input unit 202 to summon emergency help, such as to press an emergency button, the mobile communication module 204 sends a digital format report DR1 (ex. Contact ID report, Tunstall report or CPC report) to the CMS (Central Monitoring Stations) 220 via a GSM (Global System for Mobile Communications). Meanwhile, the location detection unit 206 obtains location information of the mobile alarm device 200 and provides the location information to the mobile communication module 204, and the mobile communication module 204 sends the location information Loc to the CMS 220. Accordingly, when the CMS 220 receives the digital format report DR1, the CMS 220 can determine what the situation is by decoding an event code of the digital format report DR1. Also, when the CMS 220 receives the location information Loc, the CMS

220 can know where the user is according to the indication of the location information Loc. Next, the CMS 220 processes a corresponding operation according to the event code and the location information Loc. For example, when the CMS receives the digital format report DR1 and the location information Loc, the CMS decodes the digital format report DR1 to obtain the event code. If the event code corresponds to a medical alarm, the CMS 220 will send an ambulance to the location indicated by the location information Loc. Note that the event code is not limited thereto, and there are many event codes which may correspond to various events, such as a fire alarm, a panic alarm, a carbon monoxide alarm, etc. Therefore, the user can summon emergency help without being restricted to a home area, and it would take less time for a CMS to find the position of the user, such that help assistance would arrive at the user more quickly. In some embodiments, the mobile alarm device may comprise a microphone, and the mobile communication module 204 may further dial an emergency call to the CMS personnel after transmitting the digital format report DR1 and the location information Loc, or the CMS 220 builds a two-way communication between the mobile alarm device 200 and the mobile communication module 204 when the CMS 220 receives the digital format report DR. Thus, the user can directly speak to the CMS personnel for help.

**[0020]** Similarly, when a user press the button 232 of the base station device 230, the communication module 234 sends a digital format report DR2 (ex. Contact ID report, Tunstall report or CPC report) to the CMS (Central Monitoring Stations) 220 via a PSTN (Public Switched Telephone Network), GSM or Ethernet. When the CMS 220 receives the digital format report DR2, the CMS 220 processes a corresponding operation according to the event code of the digital format report DR2. For example, when the CMS receives the digital format report DR2, the CMS decodes the digital format report DR2 to obtain the event code. If the event code corresponds to a medical alarm, the CMS 220 will send an ambulance to a predetermined location. Note that the event code is not limited thereto, and there are many event codes which may correspond to various events, such as a fire alarm, a panic alarm, a carbon monoxide alarm, etc.

**[0021]** In the embodiment, the location detection unit 206 may be a GPS (Global Positioning System) module with an AGPS (Assisted Global Positioning System) and CellLocate technology. Accordingly, the location detection unit 206 can quickly locate the user even in challenging environments. In some embodiment, the location detection unit 206 may continually detect the location of the mobile alarm device 200 and provide the location information to the mobile communication module 204. Also, the mobile communication module 204 may transmit the location information to the CMS or other host servers after the input unit 202 is activated by a user. In another embodiment, the mobile communication module 204 may periodically transmit the location information to the CMS

or other host servers. Due to the location information periodically being updated on the host servers, the user's family can easily use a PC or smart phone to access the host servers or CMS to check on the user at any time.

**[0022]** In an embodiment, the location detection unit 206 further determines whether the mobile alarm device 200 has moved from a non-predetermined area to a predetermined area, and the speaker 210 may output a corresponding prompt voice to remind the user of putting the mobile alarm device 200 back into the charging cradle 238 of the base station device 230 for battery charging. For example, the predetermined area may be within 20 feet of a radius of the base station device 230. When the location detection unit 206 detects that the mobile alarm device 200 has move nearby to the base station device 230, the speaker 210 outputs a prompt voice to remind the user to recharge the battery module 208. In another embodiment, the speaker 240 of the base station device 230 can output a corresponding prompt voice to remind the user of putting the mobile alarm device 200 back into the charging cradle 238 of the base station device 230 for battery charging. In the embodiment, when the location detection unit 206 detects that the mobile alarm device 200 has move nearby to the base station device 230, the mobile communication module 204 send a remind signal RS1 to the CMS 220. Next, the CMS 220 send a remind signal RS2 to the communication module 234 according to the remind signal RS1. When the communication module 234 receives the remind signal RS2, the speaker 240 can output a corresponding prompt voice to remind the user of putting the mobile alarm device 200 back into the charging cradle 238 of the base station device 230 for battery charging.

**[0023]** In some embodiments, the speaker 210 also outputs a prompt voice when the power of the battery module 208 is below a predetermined level. At this time, the user can insert the mobile alarm device 200 into the charging cradle 238. When the mobile alarm device 200 is inserted to the charging cradle 238, the charging module 236 will start to charge the battery module 236.

**[0024]** In addition, in an embodiment, the location detection unit 206 further determines whether the mobile alarm device 200 has moved from a non-predetermined area to a predetermined area. For example, if the user of the mobile alarm device moves out of the predetermined area, the location detection unit 206 will detect that the mobile alarm device 200 has moved from a predetermined area to a non-predetermined area, and then the mobile communication module 204 would send a prompt message to the user's family or CMS personnel via an SMS or GPS. Therefore, the user's family can be alarmed when the user moves out of a safe zone.

**[0025]** Fig. 3 is a flowchart of an embodiment of a method for the mobile alarm device shown in Fig. 1. In step S302, the mobile communication module 104 sends a digital format report DR (ex. Contact ID report, Tunstall report or CPC report) to the CMS 120 via a GSM. In step S304, the location detection unit 106 obtains location in-

formation of the mobile alarm device 100. Next, in step S306, the location detection unit 106 provides the location information Loc to the mobile communication module 104. In step S308, the mobile communication module 104 sends the location information Loc to the CMS 120. In the Step S310, the CMS 120 decodes the event code of the digital format report DR. In step S312, the CMS 120 processes a corresponding operation according to the event code and the location information Loc.

**[0026]** Those who are skilled in this technology can still process deletion, addition, or change the order of the steps described above without departing from the scope of this invention. While the invention has been described by way of example and in terms of preferred embodiment, it is to be understood that the invention is not limited thereto. Those who are skilled in this technology can still make various alterations and modifications without departing from the scope of this invention. Therefore, the scope of the present invention shall be defined and protected by the following claims and their equivalents.

## Claims

### 1. A mobile alarm device, comprising:

an input unit;  
a location detection unit, obtaining location information of the mobile alarm device; and  
a mobile communication module, transmitting a digital format report to a CMS (Central Monitoring Stations) via a GSM (Global System for Mobile Communications), and transmitting the location information to the CMS when the input unit is activated by a user,  
wherein the CMS processes a corresponding operation according to the location information and the digital format report.

### 2. The mobile alarm device of claim 1, wherein the digital format report is Contact ID reporting format report, Tunstall Telecom Format report or CPC format report.

### 3. The mobile alarm device of claim 1 or 2, further comprising: a speaker, wherein the location detection unit further determines whether the mobile alarm device has moved from a non-predetermined area to a predetermined area, and the speaker outputs a first prompt voice for reminding the user to charge a battery module of the mobile alarm device when the mobile alarm device has moved from the non-predetermined area to the predetermined area.

### 4. The mobile alarm device of claim 1 or 3, further comprising: a speaker, wherein the battery module providing power to the mobile alarm device, and the speaker outputs a second prompt voice for remind-

ing the user to charge the battery module of the mobile alarm device when the power of the battery module is below a predetermined level.

### 5. The mobile alarm device according to any one of the preceding claims, wherein the location detection unit further determines whether the mobile alarm device has moved from a predetermined area to a non-predetermined area, and the mobile communication module transmits a prompt message to a mobile phone via an SMS when the mobile alarm device has moved from the predetermined area to the non-predetermined area.

### 6. The mobile alarm device according to any one of the preceding claims, wherein the location detection unit periodically provides location information of the mobile alarm device to the mobile communication module, and the mobile communication module transmits the location information to an external host for another user to check the location information of the mobile alarm device.

### 7. The mobile alarm device according to any one of the preceding claims, wherein the CMS transmit a location request to the mobile communication module when the CMS receives the digital format report, the location detection unit provides location information of the mobile alarm device to the mobile communication module, and the mobile communication module transmits the location information to the CMS when the mobile communication module receives the location request from the CMS.

### 8. A mobile alarm system, comprising:

a mobile alarm device, comprising:

an input unit;  
a location detection unit, obtaining location information of the mobile alarm device; and  
a mobile communication module, transmitting a digital format report to a CMS (Central Monitoring Stations) via a GSM (Global System for Mobile Communications), and transmitting the location information to the CMS, when the input unit is activated by a user, wherein the CMS processes a corresponding operation according to the location information and the digital format report; and  
a battery module, providing power to the mobile alarm device; and

a base station device, comprising:

a charging cradle; and  
a charging module, charging the battery

module when the mobile alarm device is inserted in the charging cradle.

9. The mobile alarm system of claim 8, wherein the mobile alarm device further comprises a speaker, and the location detection unit further determines whether the mobile alarm device has moved from a non-predetermined area to a predetermined area, and the speaker outputs a first prompt voice for reminding the user to charge a battery module of the mobile alarm device when the mobile alarm device has moved from the non-predetermined area to the predetermined area.
10. The mobile alarm system of claim 8 or 9, wherein the base station device further comprises a speaker and a communication module, the location detection unit further determines whether the mobile alarm device has moved from a non-predetermined area to a predetermined area; and  
wherein the mobile communication module transmits a first remind signal to the CMS when the location detection unit determines that the mobile alarm device has moved from the non-predetermined area to the predetermined area, the CMS transmits a second remind signal to the communication module of the base station device according to the first remind signal, and the speaker outputs a third prompt voice for reminding the user to charge a battery module of the mobile alarm device when the communication module receives the second remind signal.
11. The mobile alarm system as claimed in any one of the preceding claims 8-10, wherein the location detection unit further determines whether the mobile alarm device has moved from a predetermined area to a non-predetermined area, and the mobile communication module transmits a prompt message to a mobile phone via an SMS when the mobile alarm device has moved from the predetermined area to the non-predetermined area.
12. The mobile alarm system as claimed in any one of the preceding claims 8 - 11, wherein the CMS transmit a location request to the mobile communication module when the CMS receives the digital format report, the location detection unit provides location information of the mobile alarm device to the mobile communication module, and the mobile communication module transmits the location information to the CMS when the mobile communication module receives the location request from the CMS.
13. The mobile alarm system as claimed in any one of the preceding claims 8-12, wherein the base station device further comprises an emergency button and

a communication module, and the communication module sends the digital format report to the CMS via PSTN (Public Switched Telephone Network), GSM or Ethernet when the emergency button is pressed by the user.

14. A mobile alarm method for a mobile alarm device, comprising:  
obtaining location information of the mobile alarm device; and  
when an input unit of the mobile alarm device is activated by a user, transmitting a digital format report to a CMS via a GSM and transmitting the location information to the CMS, wherein the CMS processes a corresponding operation according to the location information and the digital format report.
15. The mobile alarm method of claim 14, further comprising:  
determining whether the mobile alarm device has moved from a non-predetermined area to a predetermined area; and  
outputting a first prompt voice for reminding the user to charge a battery module of the mobile alarm device when the mobile alarm device has moved from the non-predetermined area to the predetermined area.

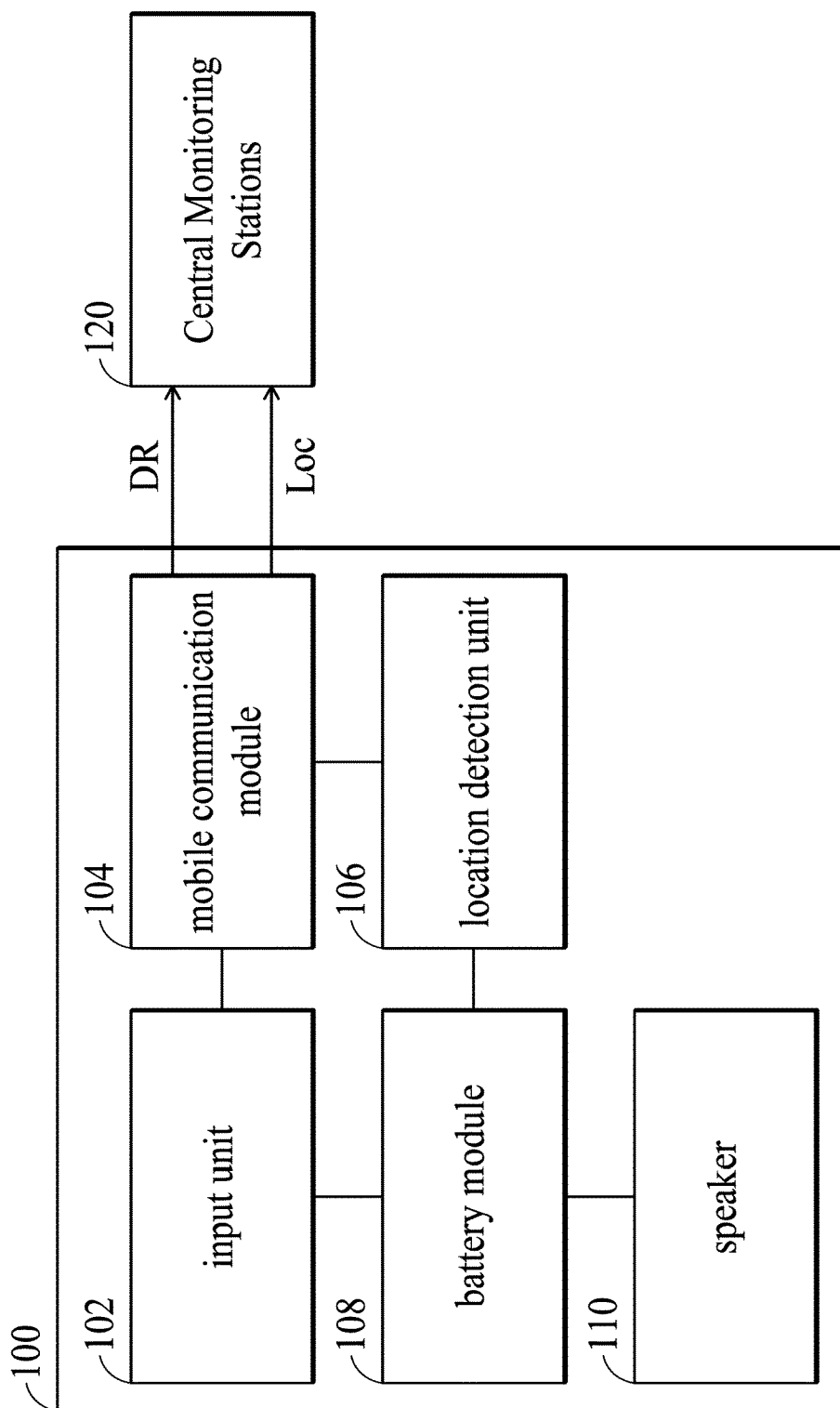


FIG. 1

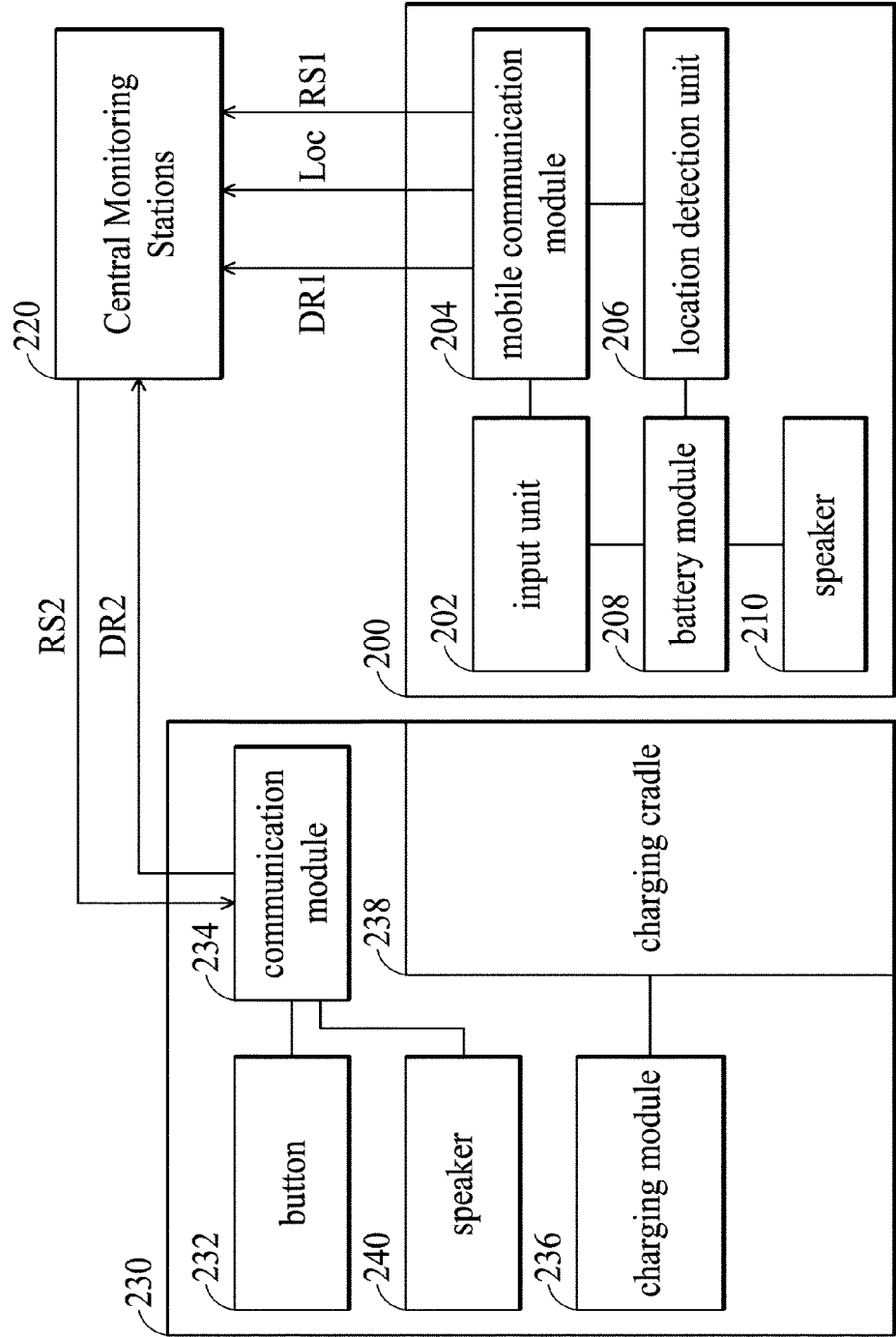


FIG. 2



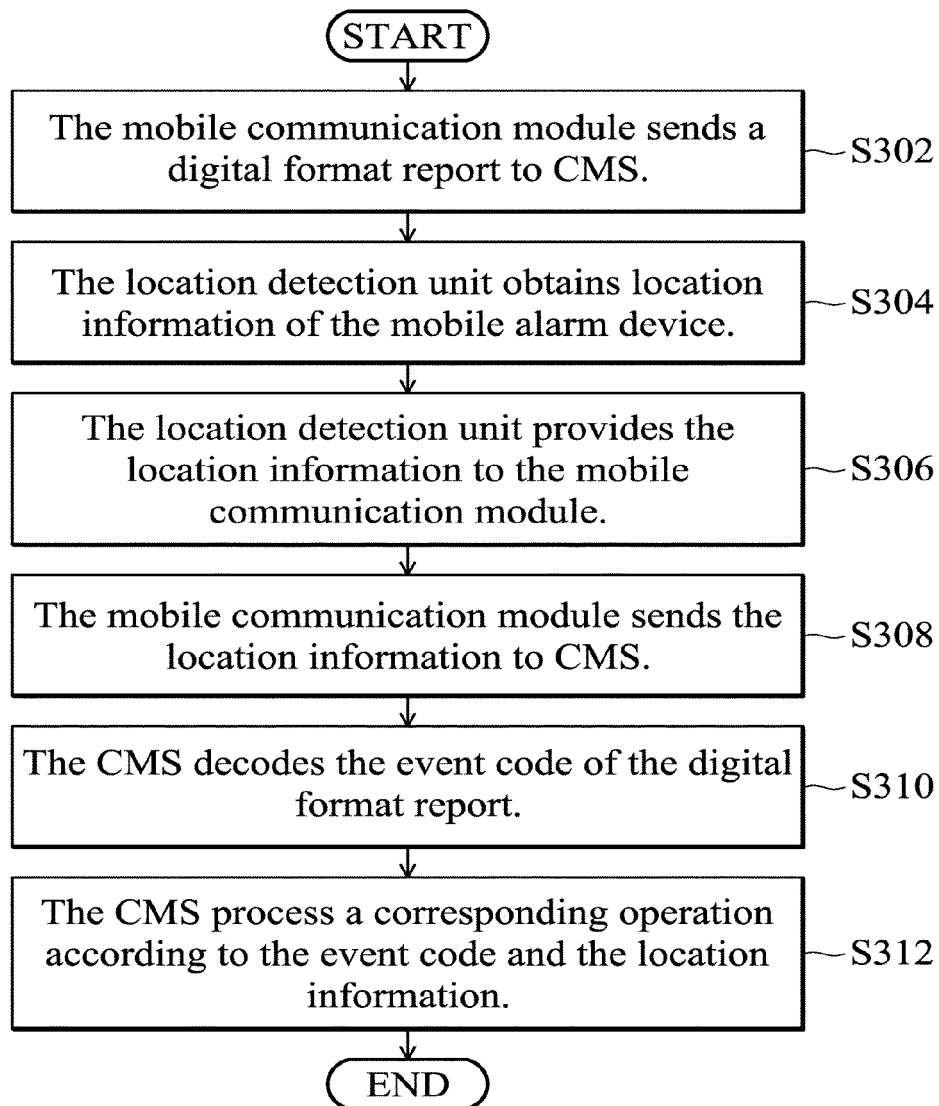


FIG. 3

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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