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(54) **ELECTRONIC INFORMATION LABEL, SERVER, AND METHOD OF TRANSMITTING CALL SIGNAL**

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CPC ***G06Q 30/0613*** (2013.01)

(57) **ABSTRACT**

An Electronic Information Label (EIL), a server, and a method of transmitting a call signal are provided. According to an exemplary embodiment, an EIL includes: a receiver configured to receive manipulation from a user; a detector configured to cause an interrupt signal by detecting the manipulation received in the receiver; and a call request transmitter configured to wake up in response to detection of the interrupt signal, and transmit a call request signal to a management server to request a call for a person in charge.

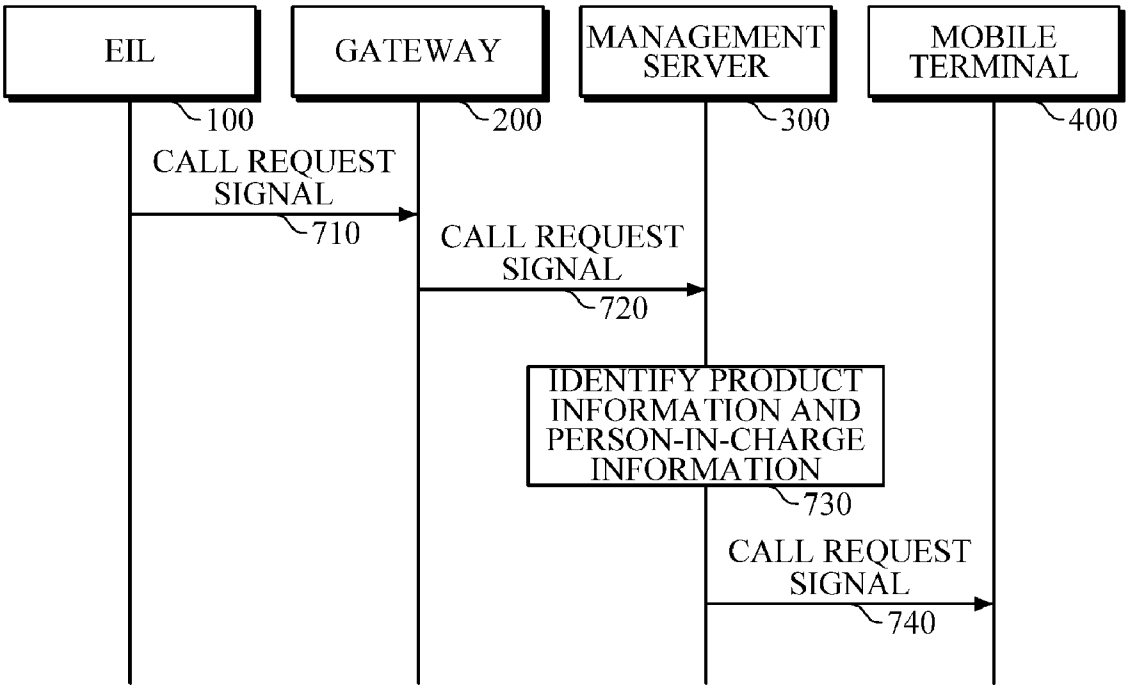


FIG. 1

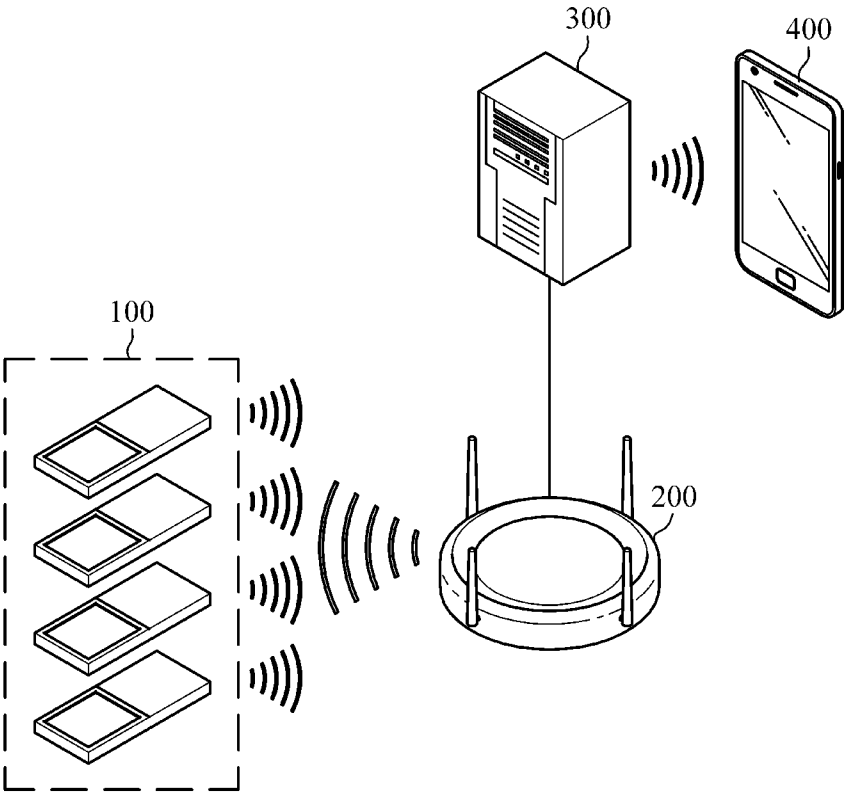


FIG. 2

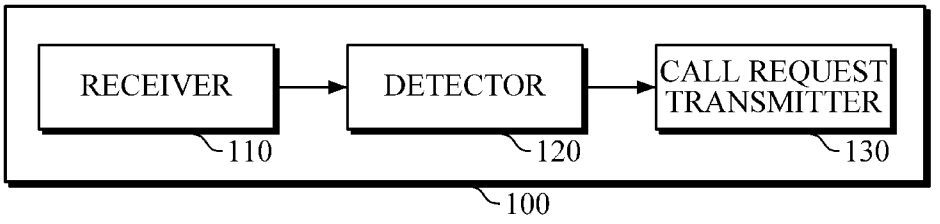

RECEIVER
110
DETECTOR
120
CALL REQUEST TRANSMITTER
130
100

FIG. 3

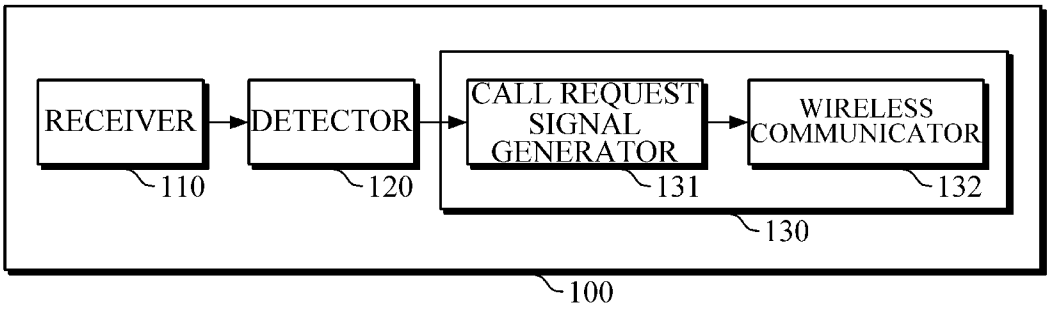

RECEIVER
110
DETECTOR
120
CALL REQUEST SIGNAL GENERATOR
131
WIRELESS COMMUNICATOR
132
130
100

FIG. 4

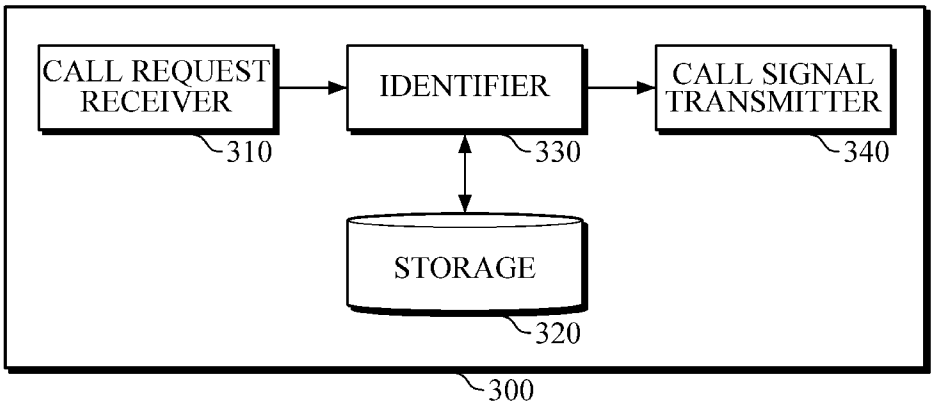

CALL REQUEST RECEIVER
310
IDENTIFIER
330
CALL SIGNAL TRANSMITTER
340
STORAGE
320
300

FIG. 5

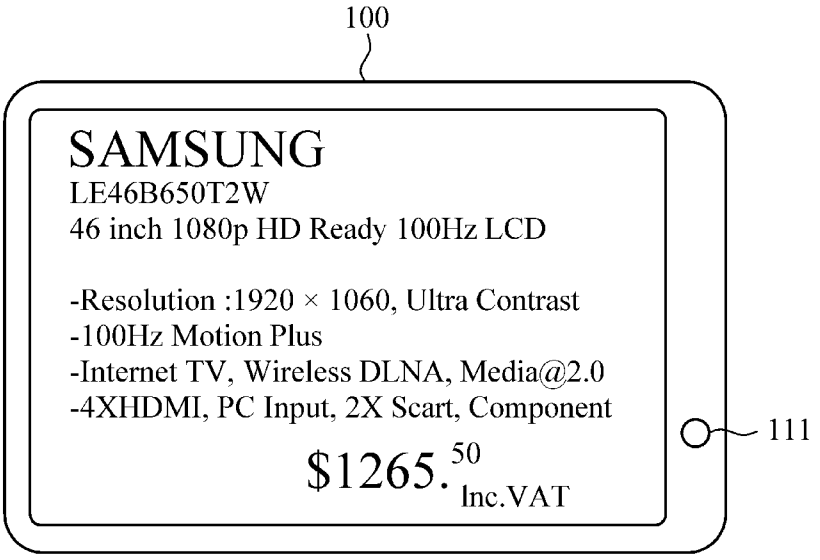

100
SAMSUNG
LE46B650T2W
46 inch 1080p HD Ready 100Hz LCD
-Resolution :1920 × 1060, Ultra Contrast
-100Hz Motion Plus
-Internet TV, Wireless DLNA, Media@2.0
-4XHDMI, PC Input, 2X Scart, Component
$1265.50
Inc.VAT
111

FIG. 6

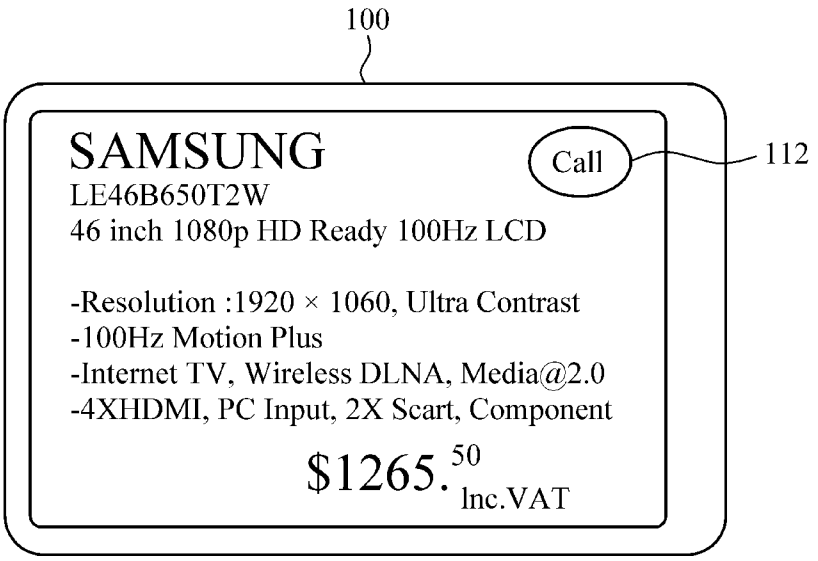

100
SAMSUNG
Call
112
LE46B650T2W
46 inch 1080p HD Ready 100Hz LCD
-Resolution :1920 × 1060, Ultra Contrast
-100Hz Motion Plus
-Internet TV, Wireless DLNA, Media@2.0
-4XHDMI, PC Input, 2X Scart, Component
$1265.50
Inc.VAT

FIG. 7

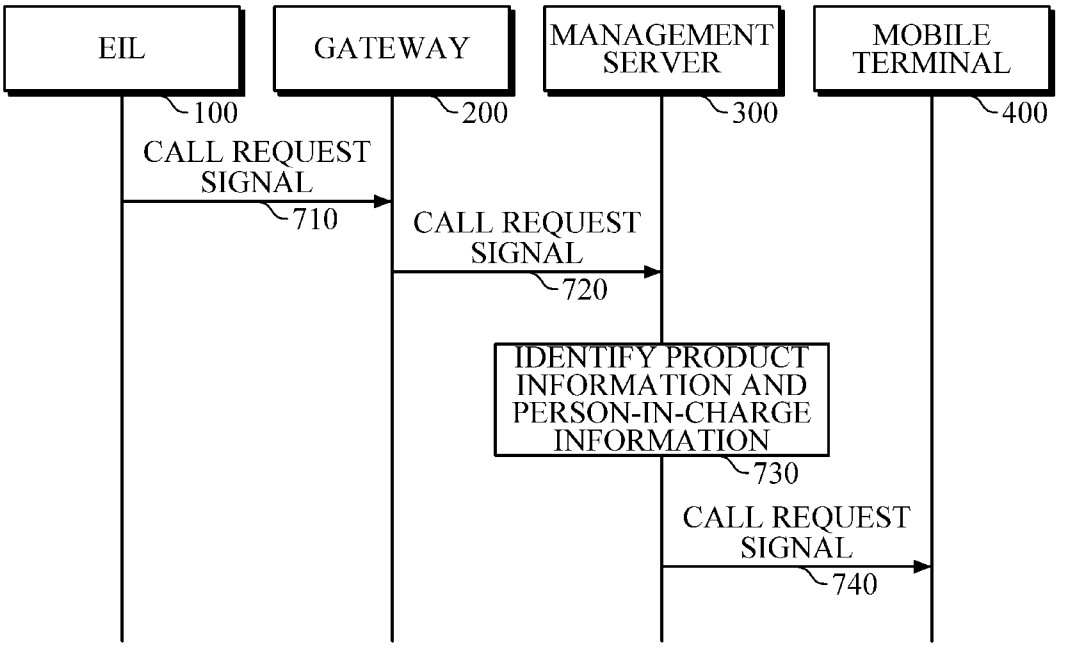

EIL
GATEWAY
MANAGEMENT SERVER
MOBILE TERMINAL
100
200
300
400
CALL REQUEST SIGNAL
710
CALL REQUEST SIGNAL
720
IDENTIFY PRODUCT INFORMATION AND PERSON-IN-CHARGE INFORMATION
730
CALL REQUEST SIGNAL
740

FIG. 8

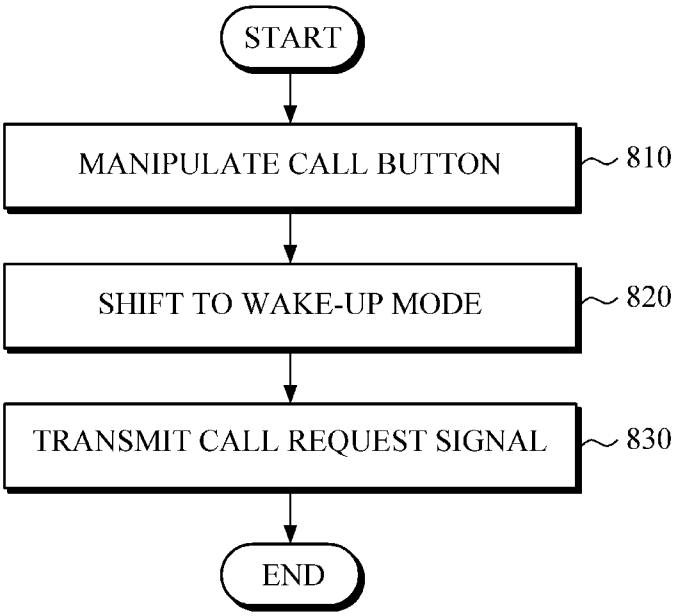
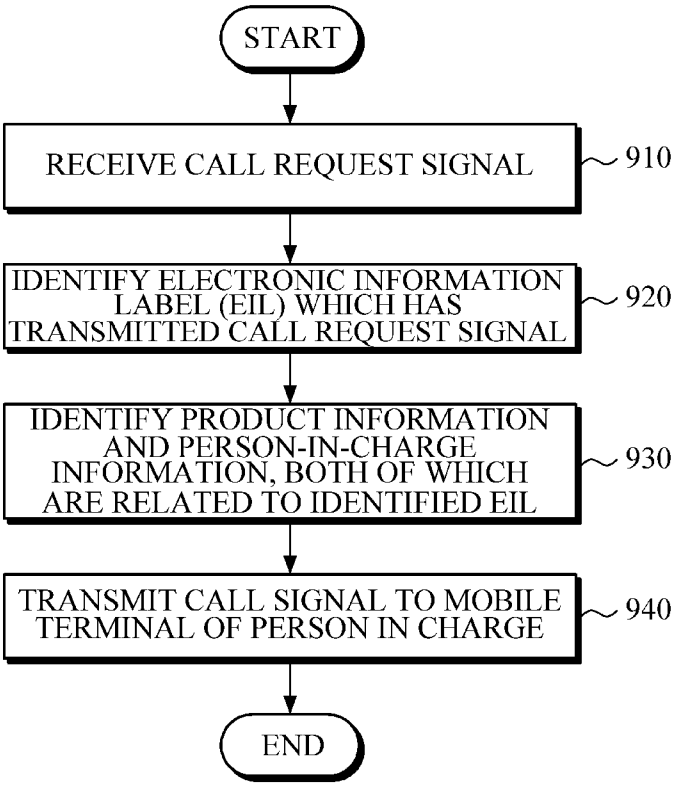

START
MANIPULATE CALL BUTTON
810
SHIFT TO WAKE-UP MODE
820
TRANSMIT CALL REQUEST SIGNAL
830
END

FIG. 9


START
RECEIVE CALL REQUEST SIGNAL
910
IDENTIFY ELECTRONIC INFORMATION LABEL (EIL) WHICH HAS TRANSMITTED CALL REQUEST SIGNAL
920
IDENTIFY PRODUCT INFORMATION AND PERSON-IN-CHARGE INFORMATION, BOTH OF WHICH ARE RELATED TO IDENTIFIED EIL
930
TRANSMIT CALL SIGNAL TO MOBILE TERMINAL OF PERSON IN CHARGE
940
END

ELECTRONIC INFORMATION LABEL, SERVER, AND METHOD OF TRANSMITTING CALL SIGNAL

CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] This application claims priority from Korean Patent Application Nos. 10-2014-0037254, filed on Mar. 28, 2014, 10-2014-0041955, filed on Apr. 8, 2014, and 10-2014-0093583, filed on Jul. 23, 2014, in the Korean Intellectual Property Office, the entire disclosures of which are incorporated herein by reference for all purposes.

BACKGROUND

[0002] 1. Field

[0003] The following description relates to an Electronic Information Label (EIL) and an electronic label system.

[0004] 2. Description of the Related Art

[0005] An Electronic Information Label (EIL) system used in retail stores can prevent errors that may be made by a manager or may occur when printing a paper price tag, so that customers may trust the price of merchandise in the store more.

[0006] A central server of the EIL system can control and manage all information on products in the store. However, limited information can be displayed on an EIL, and customers have to ask a staff member to obtain additional information about a product.

[0007] There are not enough staff members deployed at store floor, so customers have to look for a staff member when need arises. In addition, in a case where each staff member manages a different product category, a customer has to find out the right person in charge.

SUMMARY

[0008] The following description relates to an Electronic Information Label (EIL), a server, and a method of transmitting a call signal, whereby a user is enabled to call a staff member easily and quickly using an EIL.

[0009] In one general aspect, there is provided an Electronic Information Label (EIL) including: a receiver configured to receive manipulation from a user; a detector configured to cause an interrupt signal by detecting the manipulation received in the receiver; and a call request transmitter configured to wake up in response to detection of the interrupt signal, and transmit a call request signal to a management server to request a call for a person in charge.

[0010] The receiver may be further configured to comprise a call button to receive the manipulation of the user.

[0011] The call button may be arranged on a front or side of the EIL.

[0012] The call button may be a touch screen that is included in a display of the EIL.

[0013] The call request transmitter may be further configured to include: a call request signal generator configured to generate a call request signal by detecting the interrupt signal; and a wireless communicator configured to transmit the call request signal to the management server.

[0014] The call request signal may include identification information of the EIL.

[0015] The identification information may be an MAC address of the EIL.

[0016] In another general aspect, there is provided a method of transmitting a call signal using an Electronic Information Label (EIL) having a call button, the method including: detecting manipulation of the call button; in response to detection of the manipulation, shifting an operational mode to a wake-up mode; and transmitting a call request signal to a management server to request a call for a person in charge.

[0017] The call request signal may include identification information of the EIL.

[0018] The identification information may be an MAC address of the EIL.

[0019] In still another general aspect, there is provided a server including: a call request receiver configured to receive a call request signal from an Electronic Information Label (EIL); a storage configured to store product information and person-in-charge information, both of which correspond to each of a plurality of EILs arranged in a store; an identifier configured to identify the EIL which has transmitted the call request signal, and identify product information and person-in-charge information, both of which corresponds to the identified EIL from among the whole product information and person-in-charge information stored in the storage; and a call signal transmitter configured to transmit a call signal to a mobile terminal of a person in charge based on the identified person-in-charge information.

[0020] The call request signal may include identification information of the EIL which has transmitted the call request signal, and the identifier may be further configured to, based on the identification information, identify the EIL which has transmitted the call request signal.

[0021] The identification information may be an MAC address of the EIL.

[0022] The call request signal may include the identified product information.

[0023] The product information may include one or more of a name, a number of inventories, and a display location of a product corresponding to the identified EIL.

[0024] In yet another general aspect, there is provided a method of transmitting a call signal, including: receiving a call request signal from an Electronic Information Label (EIL); identifying the EIL which has transmitted the call request signal; identifying product information and person-in-charge, both of which correspond to the identified EIL; and transmitting a call signal to a mobile terminal of a person in charge based on the identified person-in-charge information.

[0025] The call request signal may include identification information of the EIL, and the identifying of the EIL may include, based on the identification information, identifying the EIL which has transmitted the call request signal.

[0026] The identification information may be an MAC address of the EIL.

[0027] The call signal may include the identified product information.

[0028] The product information may include one or more of a name, a number of inventories, and a display location of a product corresponding to the identified EIL.

[0029] Other features and aspects may be apparent from the following detailed description, the drawings, and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] FIG. **1** is a diagram illustrating an Electronic Information Label (EIL) system according to an exemplary embodiment.

[0031] FIG. **2** is a diagram illustrating an EIL according to an exemplary embodiment.

[0032] FIG. **3** is a diagram illustrating a call request transmitter according to an exemplary embodiment.

[0033] FIG. **4** is a diagram illustrating a management server according to an exemplary embodiment.

[0034] FIGS. **5** and **6** are exemplary embodiments of a call button according to an exemplary embodiment.

[0035] FIG. **7** is a flowchart illustrating a method of transmitting a call signal in an EIL system according to an exemplary embodiment.

[0036] FIG. **8** is a flowchart illustrating a method of transmitting a call request signal in an EIL according to an exemplary embodiment.

[0037] FIG. **9** is a flowchart illustrating a method of transmitting a call signal in a management server according to an exemplary embodiment.

[0038] Throughout the drawings and the detailed description, unless otherwise described, the same drawing reference numerals will be understood to refer to the same elements, features, and structures. The relative size and depiction of these elements may be exaggerated for clarity, illustration, and convenience.

DETAILED DESCRIPTION

[0039] The following description is provided to assist the reader in gaining a comprehensive understanding of the methods, apparatuses, and/or systems described herein. Accordingly, various changes, modifications, and equivalents of the methods, apparatuses, and/or systems described herein will be suggested to those of ordinary skill in the art. Also, descriptions of well-known functions and constructions may be omitted for increased clarity and conciseness.

[0040] FIG. **1** is a diagram illustrating an Electronic Information Label (EIL) according to an exemplary embodiment.

[0041] Referring to FIG. **1**, an electronic information label system includes an Electronic Information Label (EIL) **100**, a gateway **200**, and a management server **300**.

[0042] The EIL **100** displays information on products on store shelves using an electronic display, such as Liquid Crystal Display (LCD) and e-paper. Specifically, the EIL **100** may receive display information from the management server **300** through a gateway **200**, and display the received display information on a display. The display information may include, for example, a product name, a manufacturer, a manufactured date, an expiration date, price information, and the like.

[0043] The EIL **100** operates either in a sleep mode or in a wake-up mode to minimize power consumption. Specifically, the EIL **100** waits in a sleep mode for most of time, and shifts to a wake-up mode at predetermined wake-up intervals so as to receive product information from the management server **300** and update information displayed on a display.

[0044] According to an exemplary embodiment, the EIL **100** may include a call button, and, if a customer or a staff member in the store manipulates the call button, the EIL **100** shifts to a wake-up mode to transmit a call request signal to the management server **300**.

[0045] The gateway **200** relays data transmission between the EIL **100** and the management server **300**. Specifically, the gateway **200** may communicate with the management server **300** using a wired communication network, such as, for example, Ethernet.

[0046] In addition, the gateway **200** may communicate with at least one EIL **100** using a short-range communication technique, such as Zigbee, Bluetooth, or Bluetooth Low Energy (LE).

[0047] Although the electronic label system shown in FIG. **1** includes a single gateway **200**, the number of gateways **200** is not limited to the embodiment of FIG. **1**. That is, the electronic label system may include one or more gateways **200** according to a wireless environment in a store.

[0048] The management server **300** may be a database server that stores and manages product information of products on store shelves and person-in-charge information which indicates a staff member in charge of each product. The management server **300** may enable updating information displayed on a display of the corresponding EIL, by generating display information of each EIL **100** arranged in the store and transmitting the display information to a corresponding EIL **100** through the gateway **200**.

[0049] According to an exemplary embodiment, the management server **300** may store product information and person-in-charge information by matching the same with each EIL **100** arranged in the store. For example, the management server **300** may store and manage identification information of each EIL **100** arranged in the store, and store identification information of an EIL **100** which displays information on a specific product on a display thereof by matching the identification information of the EIL **100** with product information and person-in-charge information of the specific product.

[0050] According to an exemplary embodiment, the management server **300** may communicate with a mobile terminal **400** of a person in charge using wireless communication, and, in response to a call request signal from an EIL **100**, transmit a call signal to the mobile terminal **400**. Various wireless communication techniques, for example, WiFi, Bluetooth, and Zigbee, may be used as the wireless communication between the management server **300** and the mobile terminal **400**.

[0051] The mobile terminal **400** may include various types of wireless communication devices that a person in charge is able to carry out inside the store. The mobile terminal **400** may include, for example, Personal Digital Assistant (PDA), a smart phone, a tablet PC, and the like.

[0052] According to an exemplary embodiment, in response to a call signal from the management server **300**, the mobile terminal **400** display, for example, a a pop-up message and the like to notify receipt of the call signal, thereby enabling a person in change to respond to the call signal immediately.

[0053] FIG. **2** is a diagram illustrating an Electronic Information Label (EIL) according to an exemplary embodiment.

[0054] Referring to FIG. **2**, the EIL **100** includes a receiver **110**, a detector **120**, and a call request transmitter **130**.

[0055] The receiver **310** is configured to receive a user's manipulation aiming to call a person in charge, and includes a call button that may be manipulated by the user.

[0056] For example, when wanting to call a person in charge, a customer or a staff member in the store may manipulate a call button included in the EIL **100**.

[0057] According to an exemplary embodiment, a call button may be arranged on the front or side of the EIL **100**. Specifically, a call button may be arranged on a front side of the EIL **100**, as shown in FIG. **5**. By pressing the call button **111** arranged on the EIL **100**, a user may enable transmitting a call request signal to the management server **100** so as to call

a person in charge. Meanwhile, arrangement of the call button is not limited to the embodiment of FIG. **5**, and the call button may be selectively arranged at various locations.

[0058] According to another exemplary embodiment, a call button may be a touch screen that is included in a display of the EIL **100**. Specifically, a call button may be displayed on a touch screen, as shown in the embodiment of FIG. **6**. The touch screen may be in various forms, such as a capacitive overlay touch screen and a resistive touch screen. In this case, by pressing a call button **111** displayed on a touch screen, a user may enable transmitting a call request signal. However, where the call button is placed in FIG. **6** is merely exemplary, and the call button may be selectively placed at various locations on a display.

[0059] The detector **120** detects manipulation of a call button and generates an interrupt signal to wake up the call request transmitter **130**. For example, in a case where the call button **111** is placed on the front or side of the EIL **110**, the detector **120** may be configured as a switch circuit connected to the call button **111**. In this case, when a user presses the call button **111**, the detector **120** causes the switch to close to apply constant voltage to the call request transmitter **130**, thereby causing an interrupt signal to occur.

[0060] In another example, in a case where a call button is a touch screen, as shown in FIG. **6**, when detecting a touch on a location where the call button **112** is displayed on the touch screen, the detector **120** generates constant voltage and applies the constant voltage to the call request transmitter **130**, thereby causing an interrupt signal to occur.

[0061] According to whether the receiver **110** receives an input of a user's manipulation, the call request transmitter **130** transmits a call request signal to the management server **300**. Specifically, the call request transmitter **130** may operate either in a sleep mode or in a wake-up mode at predetermined wake-up intervals, and, in response to detection an interrupt signal that occurs by the detector **120**, immediately shift to a wake-up mode to transmit a call request signal to the management server.

[0062] FIG. **3** is a diagram illustrating a call request transmitter according to an exemplary embodiment.

[0063] Referring to FIG. **3**, the call request transmitter **130** includes a call request signal generator **131** and a wireless communicator **132**. The receiver **110** and the detector in FIG. **3** has the same configurations as those illustrated in FIG. **2**, and thus, detailed descriptions thereof are herein omitted.

[0064] The call request signal generator **131** may generate a call request signal by detecting an interrupt signal occurring in the detector **120**. The call request signal aims to call a person in charge who is related to the EIL **100**, and may include identification information of the EIL **100** according to an exemplary embodiment. For example, identification information of the EIL **100** may be an MAC address thereof.

[0065] The wireless communicator **132** may perform data communications with the gateway **200** using short-range wireless communication, such as, for example, Zigbee, Bluetooth, Bluetooth LE, infrared-ray communication, and the like. According to an exemplary embodiment, when a call request signal is generated in the call request signal generator **131**, the wireless communicator **132** transmits the call request signal to the management server **300** through the gateway **200**.

[0066] FIG. **4** is a diagram illustrating a management server according to an exemplary embodiment.

[0067] Referring to FIG. **4**, the management server **300** includes a call request receiver **310**, a storage **320**, an identifier **330**, and a call signal transmitter **340**.

[0068] The call request receiver **310** receives a call request signal from the EIL **100** through the gateway **200**. According to an exemplary embodiment, the call request signal may include identification information of the EIL **100**. For example, identification information of the EIL **100**, which is included in the call request signal, may be an MAC address of the EIL **100**.

[0069] The storage **320** may store product information and person-in-charge information, both of which correspond to an EIL arranged in the store.

[0070] The product information may include, for example, a display location, a name, a price, a manufacturer, information on promotion sale, information on discount sale, the number of inventories, and the like.

[0071] In addition, the person-in-charge information may include, for example, name, contact number, and information about a mobile terminal **400** of a person in charge of each product.

[0072] According to an exemplary embodiment, the storage **320** may store product information and person-in-charge information by matching the same with identification information on each of a plurality of EILs **100**. For example, in a case where information displayed on a display of a specific EIL **100** is information on a specific product, the storage **320** may store the specific product's product information and person-in-charge information by matching the same with identification information of the specific EIL **100**.

[0073] The storage **320** may include various storage medium, for example, a flash memory type, a hard disk type, a multimedia card micro type, a card-type memory (e.g., an SD or XD memory), Random Access Memory (RAM), Static Random Access Memory (SRAM), Ready-Only Memory (ROM), Electrically Erasable Programmable Read-Only Memory (EEPROM), Programmable Read-Only Memory (PROM), a magnetic memory, a magnetic disc, an optical disc, and the like.

[0074] In response to a call request signal from the EIL **100**, the identifier **330** identifies the EIL **100** which has transmitted the call request signal, and identifies product information and person-in-charge information, both of which correspond to the identified EIL **100**.

[0075] Specifically, the call request signal received from the EIL **100** may include identification information of the EIL **100**, and the identifier **330** may identify the EIL **100** by comparing identification information included in the call request signal with all the electronic labels' identification information stored in the storage **320**.

[0076] In addition, the identifier **330** may identify product information and person-in-charge information, both of which correspond to the identified EIL **100** among the entire product information and person-in-charge information stored in the storage **320**. That is, as described above, the storage **320** may store product information and person-in-charge information by matching the same with identification information of each EIL **100** arranged in the store, and identifies product information and person-in-charge information of an EIL **100** which has transmitted a call request signal, by using identification information of the EIL **100**.

[0077] The call signal transmitter **340** transmits a call signal to a mobile terminal **400** of a person in charge based on person-in-charge information identified by the identifier **330**.

According to an exemplary embodiment, the call signal may include product information identified by the identifier **330**. For example, product information transmitted to the mobile terminal **400** may include one or more of the number of inventories, name, and a display location of a product. At this point, the display location of a product may be a location of an EIL that has transmitted the call request signal.

[0078] FIG. **7** is a flowchart illustrating a method of transmitting a call signal in an electronic information label system according to an exemplary embodiment.

[0079] Referring to FIG. **7**, in response to detection of manipulation of a call button, an EIL **100** transmits a call request signal to the gateway **200** in **710**.

[0080] In response to receipt of the call request signal from the EIL **100**, the gateway **200** transmits the received call request signal to the management server **300** in **720**.

[0081] In response to receipt of the call request signal through the gateway **200**, the management server identifies the EIL **100** that has transmitted the call request signal, and identifies product information and person-in-charge information, both of which correspond to the identified EIL **100**, in **730**.

[0082] Then, the management server **300** transmits a call signal to a mobile terminal of a person in charge based on the identified person-in-charge information in **740**.

[0083] FIG. **8** is a flowchart illustrating a method of transmitting a call request signal of an EIL according to an exemplary embodiment.

[0084] Referring to FIG. **8**, when detecting manipulation of a call button in **810**, an EIL **100** shifts an operational mode to a wake-up mode in **820**.

[0085] Then, the EIL **100** **100** transmits a call request signal to the gateway **200** in **830**. According to an exemplary embodiment, the call request signal may include identification information of the EIL **100**, and the identification information may be an MAC address of the EIL **100**.

[0086] FIG. **9** is a flowchart illustrating a method of transmitting a call signal in a management server according to an exemplary embodiment.

[0087] Referring to FIG. **9**, the management server **300** receives a call request signal from an EIL **100** through the gateway **200**. According to an exemplary embodiment, the call request signal may include identification information of the EIL **100**, and the identification information may be, for example, an MAC address of the EIL **100**.

[0088] In response to receipt of the call request signal, the management server **300** identifies the EIL which has transmitted the call request signal in **9230**. For example, the management server **300** may identify the EIL **100**, by comparing identification information included in the call request signal with all the EILs' identification information stored in the management server **300**.

[0089] After identifying the EIL **100** which has transmitted the call request signal, the management server **300** identifies product information and person-in-charge information, both of which correspond to the identified EIL **100**, in **930**. For example, the management server **300** may store product information and person-in-charge information, by matching the same with each EIL **100** arranged in the store, and identify product information and person-in-charge information of the EIL **100** which has transmitted the call request signal, by using identification information of the EIL **100**.

[0090] Then, the management server **300** transmits a call signal to a mobile terminal of a person in charge based on the identified person-in-charge information in **940**. According to an exemplary embodiment, the call signal may include identified product information. The product information may include one or more of the number of inventories, name, and a display location. In addition, the display location may be a location of the EIL **100** which has transmitted the call request signal.

[0091] The present disclosure enables customers to call a staff member conveniently and quickly when having a question about a product, thereby improving customer satisfaction. In addition, the present disclosure allows customers to let a staff member know that no product is left on a shelf, so that it may improve efficiency of product management.

[0092] The invention can also be embodied as computer readable codes on a computer readable recording medium. The computer readable recording medium is any data storage device that can store data which can be thereafter read by a computer system. Examples of the computer readable recording medium include read-only memory (ROM), random-access memory (RAM), CD-ROMs, magnetic tapes, floppy disks, optical data storage devices.

[0093] Also, functional programs, codes, and code segments for accomplishing the present invention can be easily construed by programmers skilled in the art to which the present invention pertains.

[0094] A number of examples have been described above. Nevertheless, it should be understood that various modifications may be made. For example, suitable results may be achieved if the described techniques are performed in a different order and/or if components in a described system, architecture, device, or circuit are combined in a different manner and/or replaced or supplemented by other components or their equivalents. Accordingly, other implementations are within the scope of the following claims.

What is claimed is:

1. An Electronic Information Label (EIL) comprising:

a receiver configured to receive manipulation from a user;

a detector configured to cause an interrupt signal by detecting the manipulation received in the receiver; and

a call request transmitter configured to wake up in response to detection of the interrupt signal, and transmit a call request signal to a management server to request a call for a person in charge.

2. The EIL of claim **1**, wherein the receiver is further configured to comprise a call button to receive the manipulation of the user.

3. The EIL of claim **2**, wherein the call button is arranged on a front or side of the EIL.

4. The EIL of claim **2**, wherein the call button is a touch screen that is included in a display of the EIL.

5. The EIL of claim **1**, wherein the call request transmitter is further configured to comprise:

a call request signal generator configured to generate a call request signal by detecting the interrupt signal; and

a wireless communicator configured to transmit the call request signal to the management server.

6. The EIL of claim **1**, wherein the call request signal comprises identification information of the EIL.

7. The EIL of claim **6**, wherein the identification information is an MAC address of the EIL.

8. A method of transmitting a call signal using an Electronic Information Label (EIL) having a call button, the method comprising:

detecting manipulation of the call button;

is in response to detection of the manipulation, shifting an operational mode to a wake-up mode; and

transmitting a call request signal to a management server to request a call for a person in charge.

9. The method of claim **8**, wherein the call request signal comprises identification information of the EIL.

10. The method of claim **9**, wherein the identification information is an MAC address of the EIL.

11. A server comprising:

a call request receiver configured to receive a call request signal from an Electronic Information Label (EIL);

a storage configured to store product information and person-in-charge information, both of which correspond to each of a plurality of EILs arranged in a store;

an identifier configured to identify the EIL which has transmitted the call request signal, and identify product information and person-in-charge information, both of which corresponds to the identified EIL from among the whole product information and person-in-charge information stored in the storage; and

a call signal transmitter configured to transmit a call signal to a mobile terminal of a is person in charge based on the identified person-in-charge information.

12. The server of claim **11**, wherein:

the call request signal comprises identification information of the EIL which has transmitted the call request signal, and

the identifier is further configured to, based on the identification information, identify the EIL which has transmitted the call request signal.

13. The server of claim **12**, wherein the identification information is an MAC address of the EIL.

14. The server of claim **11**, wherein the call request signal comprises the identified product information.

15. The server of claim **14**, wherein the product information comprises one or more of a name, a number of inventories, and a display location of a product corresponding to the identified EIL.

16. A method of transmitting a call signal, comprising:

receiving a call request signal from an Electronic Information Label (EIL);

identifying the EIL which has transmitted the call request signal;

identifying product information and person-in-charge, both of which correspond to the identified EIL; and

transmitting a call signal to a mobile terminal of a person in charge based on the identified person-in-charge information.

17. The method of claim **16**, wherein:

the call request signal comprises identification information of the EIL, and

the identifying of the EIL comprises, based on the identification information, identifying the EIL which has transmitted the call request signal.

18. The method of claim **17**, wherein the identification information is an MAC address of the EIL.

19. The method of claim **16**, wherein the call signal comprises the identified product information.

20. The method of claim **19**, wherein the product information comprises one or more of a name, a number of inventories, and a display location of a product corresponding to the identified EIL.

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