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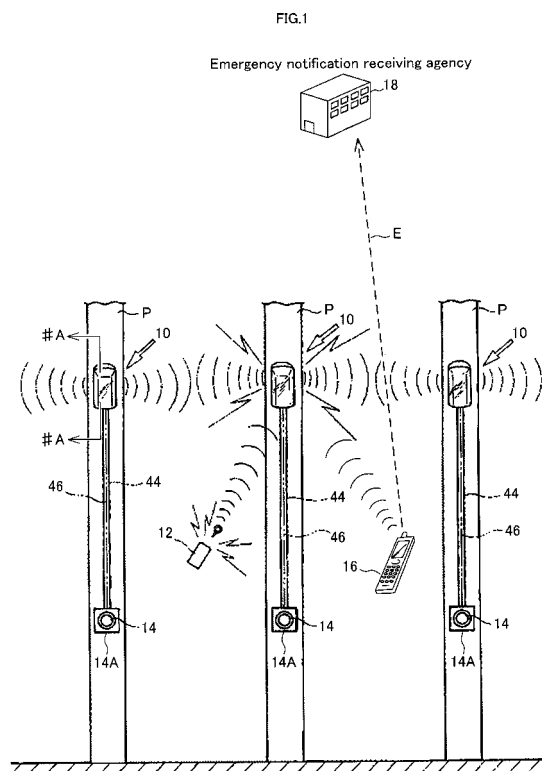
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(54) **SECURITY LIGHT, AND EMERGENCY WARNING RECEIVING SYSTEM**

(57) A security light is made installable in an appropriate position on a pole so that alarms from an alarm sounder can be transmitted reliably to the surroundings with no reduction in the light effects of lighting equipment and in the visibility of a warning light.

A security light 10 is formed by incorporating a security alarm device 22 including a warning light 24, an alarm sounder 26, and a control device 28 integrally in outdoor lighting equipment 20. The security alarm device 22 is operated when the control device 28 receives an emergency signal transmitted from a mobile terminal 12, an emergency push-button 14, or a cell phone 16. The warning light 24 includes red and yellow light emitting diodes as a light source, and the red light emitting diodes are turned on and off when the control device 28 receives the emergency signal, while the yellow light emitting diodes are turned on and off when the control device 28 receives a transmission signal from another security light 10.



Description

Technical Field

[0001] The present invention relates to a security light and an emergency notification system for notification of the occurrence of an emergency.

Background Art

[0002] The number of violent street crimes has recently been increasing, such as purse snatchings and molestations as well as stabbings by stalkers and random assaults, and measures to combat such crimes are needed to be taken quickly. The measures could include installing security alarm devices additionally on poles such as utility poles and streetlight poles arranged along roads. It is not uncommon for warning lights and alarm sounders included in the security alarm devices, considering the visibility of the warning lights from the surroundings and the sound effects of alarms from the alarm sounders, to be installed appropriately near the installation positions of street lighting equipment. For example, Patent Document 1 below discloses an emergency notification system including a flashing light 43 and a buzzer 42 provided below an outdoor light 47.

Patent Document 1: Japanese Published Unexamined Patent Application No. H7-37177 (Fig. 10)

[0003] Meanwhile, it is nowadays increasingly the case due to the popularity of cell phones that in the case of any emergency as mentioned above, a cell phone is used for emergency notification to an emergency notification receiving agency (e.g. police agency, fire agency, or marine safety agency). Cell phones are very useful for their high mobility in that in the case of an emergency, prompt emergency notification can be made from the emergency site to an emergency notification receiving agency.

Disclosure of the Invention

Problems to be Solved by the Invention

[0004] However, the above-described background arts suffer from the following disadvantages. First, installing a security alarm device including a flashing light and/or a buzzer below and close to an outdoor light as in Patent Document 1 above may cause light from the outdoor light to be obscured by the security alarm device. On the contrary, installing the security alarm device above and excessively close to the outdoor light may cause not only a reduction in the visibility of the warning light (e.g. flashing light) in the security alarm device but also alarms from the alarm sounder (e.g. buzzer) not to be transmitted sufficiently to the surroundings. It is therefore desired to make it possible to transmit alarms from

the alarm sounder reliably to the surroundings with no reduction in the light effects of lighting equipment such as outdoor lights and in the visibility of the warning light in the security alarm device.

[0005] Meanwhile, the number of emergency notifications made from cell phones has been increasing as mentioned above, and with the increase in the number of emergency notifications, it is increasingly the case that the command center of each emergency notification receiving agency takes time to locate notifiers. According to the statistics from the National Police Agency, the trend over the last few years has been that the average time (response time) between receiving a notification by a police agency and the arrival of a police officer, an emergency vehicle, or the like at the site has been increasing.

[0006] This is attributed in part to the fact that notifiers using a cell phone for emergency notification cannot easily know where they are calmly at a glance and inform an operator in an emergency notification receiving agency of their locations for the reason that they do not have the opportunity to orient themselves geographically because in many cases they are in a geographically unfamiliar area, do not know the exact address even in a familiar area, become upset, or are in a dangerous situation. It is therefore undeniable that in the case of an emergency notification from a cell phone, there is a natural limit as to depending on a notifier's geographical knowledge and/or judgment to locate the notifier.

[0007] As means for solving the above-described problems, there have been adopted, in the case of an emergency notification (emergency call) from a cell phone, a location system (GPS location system) based on a GPS location service provided by the cell phone and a location system (multi-base-station location system) based on synchronous signals from multiple base stations. However, in either of the systems, the notifier cannot be located precisely if he/she is in an area where GPS location cannot be performed sufficiently or it is difficult for radiowaves to penetrate, such as in an underground passage or a tunnel. Not only that, but also particularly in an area where radio communications between cell phones and base stations cannot be established sufficiently due to unstable radio reception by the cell phones, there is a possibility that the notifier cannot inform of the details of the situation including positional information by phone call. This may disadvantageously result in a delay in arrival of an emergency vehicle or the like at the site.

[0008] Further, at the present time in which social interaction among residents in local communities are weakening, it is also the fact that many of not only less crowded areas and ones apart far from private residences but also even crowded areas such as residential areas and housing complexes are actually blind areas beyond the sight of neighbors. In such areas, it is undeniable that even screaming for help and/or setting off alarms using a security buzzer may not reach neighbors. This can also result in a delay in notification to an emergency notification

tion receiving agency and therefore a delay in arrival of an emergency vehicle or the like at the site.

[0009] On the other hand, it is also the fact that there are many anti-crime support bases operated by regional cooperators and opened widely to local communities as places of refuge at which criminally vulnerable groups such as small children and pupils can call for help in the case of an emergency, such as the activities of "children's refuge centers," private cooperative bases catching on throughout the whole country with the support of the police agency. Therefore, in order to minimize the number of blind areas in local communities, it would be very advantageous if neighbors could be notified promptly and reliably of the occurrence of an emergency for help, and if an emergency notification receiving agency could be informed promptly and reliably of the occurrence of an emergency and its positional information in cooperation with anti-crime support bases in the case where an emergency notification is made using emergency call by a cell phone that is widely spread.

[0010] The present invention has been made focusing on the above circumstances, and an object thereof is to provide a security light as a deterrent against street crimes capable of transmitting alarms reliably to the surroundings with no reduction in the light effects of outdoor lighting equipment and in the visibility of the warning light. Another object is to provide an emergency notification system capable of proactively calling on neighbors or a specific agency for help utilizing the security light in the case of an emergency such as a crime or a sudden illness.

[0011] Still another object of the present invention is to provide an emergency notification system capable of promptly and reliably notifying neighbors of the occurrence of an emergency for help and/or support and of promptly and reliably informing an emergency notification receiving agency of the occurrence of the emergency and the positional information of the emergency site when a notifier makes an emergency notification using an emergency call by cell phone. A further object is to provide an emergency notification system capable of directly notifying an emergency vehicle from an emergency notification receiving agency cruising near a notifier of the occurrence of an emergency and its positional information to reduce the average time (response time) for the emergency vehicle to arrive at the site as short as possible.

Means for Solving the Problems

[0012] In order to achieve the foregoing objects, the present invention is directed to a security light in which a security alarm device including a warning light and an alarm sounder for notifying neighbors of the occurrence of an emergency is incorporated integrally in lighting equipment including an outdoor light fitting, in which the security alarm device includes a control device including: control means for controlling the operation of the warning

light and the alarm sounder; transmitting and receiving means for transmitting and receiving a signal; and signal determination means for determining the received signal, and in which the control device is adapted to operate the warning light and the alarm sounder when receiving an emergency signal transmitted from an emergency transmitter or an emergency signal transmitted in conjunction with an emergency call from a cell phone to an emergency notification receiving agency.

[0013] The present invention is also directed to an emergency notification system including: the security light; and emergency notification devices installed in one or more anti-crime support bases neighboring the security light, in which the security alarm device in the security light is adapted, when receiving an emergency signal transmitted in conjunction with an emergency call from the cell phone to the emergency notification receiving agency, to operate the warning light and the alarm sounder as well as to transmit a transmission signal for notification of the occurrence of the emergency to the emergency notification devices installed in the anti-crime support bases, and in which the emergency notification devices each have an emergency notification transmitter, an automatic sound reproducer, and a controller for controlling the operation of the emergency notification transmitter and the automatic sound reproducer as well as for transmitting and receiving a signal, and in which the controller is adapted, when receiving the transmission signal from the security alarm device, to make the emergency notification transmitter notify the emergency notification receiving agency of the occurrence of the emergency with automated sound by the automatic sound reproducer through a fixed telephone line in the anti-crime support base as well as to inform of positional information based on the phone number of the anti-crime support base.

[0014] The present invention is further directed to an emergency notification system including: a security alarm device arranged along a road and including a warning light and an alarm sounder for notifying neighbors of the occurrence of an emergency; and an emergency notification device installed in an anti-crime support base neighboring the security alarm device, in which the security alarm device includes a control device including: control means for controlling the operation of the warning light and the alarm sounder; transmitting and receiving means for transmitting and receiving a signal; and signal determination means for determining the received signal, and in which the control device is adapted, when receiving an emergency signal transmitted in conjunction with an emergency call from a cell phone to an emergency notification receiving agency, to operate the warning light and make the alarm sounder set off alarms as well as to transmit a transmission signal for notification of the occurrence of the emergency to the emergency notification device in the anti-crime support base, and in which the emergency notification device has an emergency notification transmitter, an automatic sound reproducer, and a controller for controlling the operation of the emergency

notification transmitter and the automatic sound reproducer as well as for transmitting and receiving a signal, and in which the controller is adapted, when receiving the transmission signal from the security alarm device, to make the emergency notification transmitter notify the emergency notification receiving agency of the occurrence of the emergency with automated sound by the automatic sound reproducer through a fixed telephone line in the anti-crime support base as well as to inform of positional information based on the phone number of the anti-crime support base. The foregoing and other objects, features, and advantages of the present invention will be apparent from the following detailed descriptions and the accompanying drawings.

Effects of the Invention

[0015] In accordance with the security light according to the present invention, the security light as a deterrent against street crimes is formed by incorporating the lighting equipment and the security alarm device integrally in an outdoor light (e.g. streetlight or gatepost light), which exhibits the advantages that the security alarm device can be installed in an appropriate position together with the outdoor light and that alarms from the alarm sounder can be transmitted reliably to the surroundings with no reduction in the light effects of the lighting equipment and in the visibility of the warning light in the security alarm device. The security alarm device can also be installed together with the outdoor light, which eliminates the need for extra time, cost, and installation structures such as brackets required when installing the security alarm device in an additional manner. Further, the emergency notification system utilizing the security light informs a notification addressee according to the type of emergency signal of the positional information of the security light in conjunction with an emergency call from a cell phone, which exhibits the advantage that the notifier can receive appropriate help and support more promptly.

[0016] In accordance with the emergency notification system according to the present invention, when the notifier utilizes an emergency call by a cell phone to make an emergency notification to the emergency notification receiving agency, the security alarm device arranged along the road can be operated to notify neighbors promptly and reliably of the occurrence of an emergency to call for help proactively. In addition, the emergency notification device provided in the anti-crime support base is adapted to inform the emergency notification receiving agency of the positional information of the anti-crime support base or the security alarm device in conjunction with the emergency call, which exhibits the advantage that the emergency notification receiving agency can be informed promptly and reliably of the occurrence of the emergency and its positional information even if the notifier may not have the opportunity to inform an operator in the emergency notification receiving agency of his/her positional information and/or may be in an area

where it is difficult to use the GPS location service of the cell phone and/or the positional information of the cell phone based on base station information.

[0017] Furthermore, the emergency vehicle from the emergency notification receiving agency may include receiving means for receiving an emergency signal from the cell phone, capturing a transmission signal from the emergency notification device, or capturing an identification code from the security alarm device to recognize the occurrence of the emergency and for acquiring the positional information of the cell phone, the positional information of the anti-crime support base based on the transmission signal from the emergency notification device, or the positional information of the security alarm device based on the identification code from the security alarm device, which exhibits the advantage that the emergency vehicle cruising near the notifier can be informed directly of the occurrence of the emergency and its positional information, so that the average time (response time) for the emergency vehicle to arrive at the site can be reduced as short as possible.

Brief Description of the Drawings

[0018]

Fig. 1 shows the configuration of principal parts of an emergency notification system using a security light according to a first embodiment of the present invention;

Fig. 2 is a cross-sectional view showing the configuration of the security light according to the first embodiment, viewed along arrows #A-#A in Fig. 1;

Fig. 3 is a cross-sectional view along arrows #B-#B in Fig. 2;

Fig. 4 is a block diagram showing the system configuration of a control device in a security alarm device included in the security light according to the first embodiment;

Fig. 5 is a front view schematically showing the configuration of a mobile terminal according to the first embodiment;

Fig. 6 is an illustrative view showing signal communications among multiple security lights in the case of an emergency call from a cell phone according to the first embodiment;

Fig. 7 is a cross-sectional view showing the configuration of principal parts of a security light according to a second embodiment of the present invention;

Fig. 8 is a cross-sectional view along arrows #C-#C in Fig. 7;

Fig. 9 is a cross-sectional view showing the configuration of principal parts of a security light according to a third embodiment of the present invention;

Fig. 10 is a schematic view showing the overall configuration of an emergency notification system using a security light according to a fourth embodiment of the present invention;

Fig. 11 is a schematic view showing the overall configuration of an emergency notification system according to a fifth embodiment of the present invention;

Fig. 12 is a block diagram showing the configuration of the emergency notification system according to the fifth embodiment;

Fig. 13 is a block diagram showing the system configuration of a control device in a security alarm device according to the fifth embodiment;

Fig. 14 shows another embodiment of the present invention; and

Fig. 15 shows still another embodiment of the present invention.

Description of Symbols

[0019]

10, 10A, 10A', 10A", 10B, 10B': Security lights
 12: Mobile terminal (emergency transmitter)
 12a: Casing
 12b: Operating part
 12A: Functional section (security buzzer)
 12B: Functional section (transmitter)
 14: Emergency push-button (emergency transmitter)
 14A: Button case
 16, 16': Cell phones
 16a: Imaging device (digital camera)
 18: Emergency notification receiving agency
 20: Lighting equipment
 20A, 52A, 72A: Light fittings
 20B: Control device
 20C: Globe
 20D: Chassis
 20E: Bracket
 20F: Through hole
 22: Security alarm device
 24: Warning light
 26: Alarm sounder
 28: Control device
 28A: Receiving unit
 28B: Transmitting unit
 28C: Signal determination unit
 28D: Control unit
 28E: Notification addressee information
 28F: Identification code
 28R: Signal intensity detection unit
 28S: Mail server
 29B: Intensity signal adding unit
 29C: Signal comparison unit
 30a: Red light emitting diode
 30b: Yellow light emitting diode
 32: Substrate
 32a: Substrate part
 32b: Support plate
 34: Wiring frame

36, 38, 40: Wirings
 42: Transmitting and receiving unit
 44: Protection pipe
 46: Wiring
 50: Security light
 52: Lighting equipment
 52A: Light fitting
 52B: Control device
 52C: Globe
 52D: Chassis
 54: Security alarm device
 56: Warning light
 58: Alarm sounder
 60: Control device
 64: Substrate
 70: Security light
 72: Lighting equipment
 72A: Light fitting
 72B: Control device
 72D: Chassis
 74: Security alarm device
 76: Warning light
 76A: Red revolving electric light
 76B: Yellow revolving electric light
 78: Alarm sounder
 80: Control device
 82: Housing
 82A: Red housing part
 82B: Yellow housing part
 84: Axial part
 86A, 86B: Electric lights
 88A, 88B: Mirror reflectors
 90: Rotation driving section
 92: Solitary old person's residence
 94: Emergency transmitter
 96: Anti-crime support base
 96A, 97A, 98A: Alarm devices
 97: Blue-light police car
 98: Private residence
 99: Emergency vehicle
 99A: Receiver
 100: Emergency notification system
 101: Road
 102: Outdoor structure (utility pole)
 104: Security alarm device
 106: Warning light
 108: Alarm sounder
 110: Control device
 112A: Notification addressee information
 112B: Identification code
 113: Timer
 114A: Receiving unit
 114B: Transmitting unit
 114C: Signal determination unit
 114D: Control unit
 114E: Signal intensity detection unit
 120: Emergency notification device
 122: Emergency notification transmitter

124: Automatic sound reproducer
 126: Controller
 130: Outdoor structure
 132: Alarm device
 134: Warning light
 136: Alarm sounder
 140: Gatepost light
 150: Emergency alert issuing agency
 E: Emergency call
 IA, IB: Reception intensity
 L: Fixed telephone line
 P: Pole
 S1, S2, S3: Control signals
 W1: Emergency signal
 W2, W3: Transmission signals

Best Mode for Carrying Out the Invention

[0020] Although the present invention can include many embodiments, an appropriate number of embodiments will hereinafter be shown and described in detail.

First Embodiment

[0021] First, a first embodiment of the present invention will be described with reference to Figs. 1 to 6. Fig. 1 is a conceptual diagram showing the configuration of principal parts of an emergency notification system using a security light according to the present embodiment. Figs. 2 and 3 show the security light according to the present embodiment, where Fig. 2 is a cross-sectional view along arrows #A-#A in Fig. 1 and Fig. 3 is a cross-sectional view along arrows #B-#B in Fig. 2. Fig. 4 is a block diagram showing the system configuration of a control device in a security alarm device included in the security light. Fig. 5 is a front view schematically showing the configuration of a mobile terminal according to the present embodiment. Fig. 6 is an illustrative view showing signal communications among multiple security lights in the case of an emergency call from a cell phone.

[0022] As shown in Fig. 1, security lights 10 according to the present embodiment are mounted on multiple poles P such as utility poles and streetlight poles arranged along a road in a preset security area, forming an emergency notification system (or security alarm system) adapted to operate based on an emergency signal transmitted from an emergency transmitter such as a mobile terminal 12 carried by, for example, a pedestrian or emergency push-buttons 14 provided on the poles P and/or on an emergency signal transmitted from a cell phone 16. As shown in Figs. 2 and 3, the security lights 10 are each formed by incorporating a security alarm device 22 including a warning light 24, an alarm sounder 26, and a control device 28 for controlling the operation of the warning light 24 and the alarm sounder 26 and for determining as well as transmitting and receiving various signals integrally in a chassis 20D of lighting equipment 20 that includes a streetlight fitting 20A composed of a

fluorescent lamp, a control device 20B for controlling the operation of the light fitting 20A, and a globe 20C covering the light fitting 20A. The poles P are each provided with an emergency push-button 14 connected electrically to the control device 28 and a button case 14A therefor. It is noted that each security light 10 is mounted on each pole P via a bracket 20E (refer to Fig. 2).

[0023] The warning light 24 in the security alarm device 22 includes as a light source multiple red light emitting diodes 30a and multiple yellow light emitting diodes 30b that are arranged alternately, and the red and yellow light emitting diodes 30a and 30b are arranged on a translucent substrate 32 surrounding the light fitting 20A in the lighting equipment 20. More specifically, the substrate 32 includes multiple elongated plate-like translucent substrate parts 32a each composed of a glass or synthetic resin substrate having an electric circuit of a transparent conductive film on a surface thereof, the substrate parts 32a being arranged in parallel to each other in the longitudinal direction at predetermined intervals as well as in such a manner as to form an approximately semi-cylindrical shape as a whole. Then, the longitudinal ends of the substrate parts 32a are supported by approximately circular support plates 32b, and the support plates 32b are fixed on a wiring frame 34 on which various wirings from the lighting equipment 20 and the security alarm device 22 are laid integrally, so that the multiple substrate parts 32a constituting the substrate 32 surround the light fitting 20A.

[0024] Then, the multiple red and yellow light emitting diodes 30a and 30b are arranged alternately on the outer surface of and along the longitudinal direction of each substrate part 32a of the substrate 32. The multiple substrate parts 32a are connected electrically to the wiring frame 34 via wirings 36 laid on the support plates 32b on either end of the substrate parts and then connected electrically to the control device 28 via a wiring 38 that electrically connects the wiring frame 34 and the control device 28.

[0025] It is noted that the substrate 32 is not restricted to such an arrangement in which the multiple red and yellow light emitting diodes 30a and 30b are arranged for electrical connection on the multiple substrate parts 32a each having an electric circuit of a transparent conductive film on a surface thereof. For example, the red and yellow light emitting diodes 30a and 30b may be arranged on translucent substrate parts merely composed of a glass or synthetic resin substrate that are not specially treated at all, and these diodes 30a and 30b may be connected electrically using conductors with a small diameter to the extent that the light effects of the lighting equipment 20 are not undermined.

[0026] Alternatively, the arrangement of the red and yellow light emitting diodes 30a and 30b is not restricted to the above-described configurations. For example, red light emitting diodes 30a or yellow light emitting diodes 30b may be arranged on each of the multiple substrate parts 32a constituting the substrate 32, and then sub-

strate parts 32a with red light emitting diodes 30a arranged thereon and substrate parts 32a with yellow light emitting diodes 30b arranged thereon may be arranged alternately in parallel to each other. The arrangement may also be adjusted appropriately depending on the number of light emitting diodes 30a and 30b and/or the shape and size of the substrate 32 on which the diodes are mounted.

[0027] Next, the alarm sounder 26 in the security alarm device 22 is formed as a small speaker device that sets off alarms through many through holes 20F formed in the upper surface of the chassis 20D of the lighting equipment 20. In the chassis 20D, the alarm sounder 26 is connected electrically to the wiring frame 34 via a wiring 40 and then connected electrically to the control device 28 via the wiring 38 that electrically connects the wiring frame 34 and the control device 28. It is noted that multiple alarm sounders 26 may be provided in the chassis 20D in consideration of the directionality of alarms set off therefrom.

[0028] As shown in Fig. 4, the control device 28 is adapted to receive emergency signals transmitted from the mobile terminal 12, cell phone 16, and emergency push-button 14, to transmit and receive a transmission signal to and from one or more neighboring security lights 10, and to control the operation of the warning light 24 and the alarm sounder 26 based on the received signal. Specifically, the control device 28 includes:

- (1) a receiving unit 28A for receiving an emergency signal transmitted from the mobile terminal 12 or the cell phone 16 and for receiving a transmission signal transmitted as a radiowave from the control devices 28 in the other security lights 10;
- (2) a transmitting unit 28B for transmitting a transmission signal to the control devices 28 in the other neighboring security lights 10;
- (3) a signal determination unit 28C for receiving the received signal sent from the receiving unit 28A and an emergency signal input from the emergency push-button 14 through a wiring 46, wiring frame 34, and wiring 38 to determine the source (type) of these received signals;
- (4) a control unit 28D for selectively operating the transmitting unit 28B, warning light 24, and alarm sounder 26 based on the determination result by the signal determination unit 28C; and
- (5) a signal intensity detection unit 28R coupled to the receiving unit 28A to detect the reception intensity when the receiving unit 28A receives a radio signal of an emergency call from the cell phone 16 to an emergency notification receiving agency 18 as an emergency signal.

[0029] The transmitting unit 28B also includes an intensity signal adding unit 29B for adding the reception intensity of an emergency call E that is detected by the signal intensity detection unit 28R to a transmission sig-

nal to be transmitted to other neighboring security lights 10. The signal determination unit 28C also includes a signal comparison unit 29C for comparing the reception intensity of the emergency call E by itself and the reception intensity at the other neighboring security lights 10 added to transmission signals received from the other security lights 10. In addition, the control device 28 includes notification addressee information 28E, an identification code 28F, and a mail server 28S, which will be described in detail in a fourth embodiment.

[0030] Accordingly, it is desirable to make an emergency signal transmitted from the mobile terminal 12 or the cell phone 16 and transmission signals transmitted from the transmitting units 28B in the control devices 28 in the other security lights 10 determinable at the signal determination unit 28C by making the wavelength, waveform, or frequency thereof different from each other or by taking other measures for the determination. In the present embodiment, the signal determination unit 28C and the control unit 28D are mounted on a circuit board and housed inside the control device 28, while the receiving unit 28A and the transmitting unit 28B are integrated as a transmitting and receiving unit 42 and arranged inside the control device 28.

[0031] If the signal input to the signal determination unit 28C is caused by an emergency signal from the mobile terminal 12 or the cell phone 16 that is sent from the receiving unit 28A or by an emergency signal from the emergency push-button 14, a determination signal is accordingly sent from the signal determination unit 28C to the control unit 28D. The control unit 28D then turns on and off the red light emitting diodes 30a in the warning light 24 periodically and sequentially in the circumferential direction of the substrate 32 and makes the alarm sounder 26 set off alarms, and further activates the transmitting unit 28B for transmission of a transmission signal to the other neighboring security lights 10.

[0032] On the other hand, if it is determined that the signal input to the signal determination unit 28C via the receiving unit 28A is a transmission signal transmitted from the control device 28 in one of the other security lights 10, a determination signal from the signal determination unit 28C causes the control unit 28D to turn on and off the yellow light emitting diodes 30b in the warning light 24 periodically and sequentially in the circumferential direction of the substrate 32 and to make the alarm sounder 26 set off alarms. In addition, the control unit 28D activates the transmitting unit 28B for transmission of a transmission signal to the other neighboring security lights 10 except that at which the transmission signal originates. It is noted that the on-and-off control of the red and yellow light emitting diodes 30a and 30b based on the determination result by the signal determination unit 28C in the control device 28 is not restricted to the above-described manner, and the on-and-off manners of the light emitting diodes 30a and 30b may be combined appropriately.

[0033] Next, as shown in Fig. 5, the mobile terminal 12

utilized as an emergency transmitter includes a functional section 12A as a security buzzer for setting off alarms and a functional section 12B as a transmitter adapted to operate in conjunction with the functional section 12A to transmit a radiowave emergency signal, the sections being housed inside a small casing 12a portable in a pocket, bag, or the like. The mobile terminal 12 also includes a drawing-type operating part 12b for activating the functional section 12A as a security buzzer, in which the functional section 12A as a security buzzer and the functional section 12B as a transmitter are adapted to operate by drawing the operating part 12b.

[0034] It is desirable to form the mobile terminal 12 as a self-holding one so that an emergency signal continues to be transmitted for a certain period of time even if the operating part 12b is released immediately after being operated. In this case, the self-holding may be released by, for example, a timer incorporated in the functional section 12B as a transmitter or by operating a release switch (not shown) provided on the casing 12a.

[0035] As an emergency transmitter, not only the mobile terminal 12 having the feature of transmitting an emergency signal on a triggering operation by the operating part 12b, but also the cell phone 16 having a similar security buzzer feature may be utilized. Alternatively, the cell phone 16 may have a feature of transmitting an emergency signal in conjunction with an emergency call E to the emergency notification receiving agency 18 such as a police agency, fire agency, or marine safety agency (refer to Fig. 1). In this case, the cell phone 16 may have a feature of transmitting an emergency signal composed of a weak radiowave having a short propagation distance in conjunction with the emergency call E so that the control device 28 in the security alarm device 22 can receive the emergency signal to operate the security alarm device 22. Alternatively, the control device 28 in the security alarm device 22 may capture a radio signal within a frequency range that the cell phone 16 uses for the emergency call E as an emergency signal itself to operate the security alarm device 22.

[0036] It is here advantageous if the emergency call E itself from the cell phone 16 can be utilized as an emergency signal, because the use of the mobile terminal 12 can be eliminated and the cell phone 16 is not required to have a special feature. In the case of utilizing the emergency call E itself as an emergency signal as mentioned above, since the installation interval between the security lights 10 is much smaller than that between base stations for the cell phone 16, multiple security lights 10A and 10B nearer the cell phone 16 may capture the emergency call E (indicated by the arrows FA and FB) to turn on red as shown in Fig. 6 (A). Then, the security lights 10A and 10B each turn on red and transmit a transmission signal for yellow light emission to the other neighboring security lights. That is, the security light 10A transmits a transmission signal for yellow light emission to the security lights 10B, 10A', and 10A" (indicated by the arrows FC and FD). On the other hand, the security light 10B trans-

mits a transmission signal for yellow light emission to the security lights 10A and 10B' (indicated by the arrows FE and FF).

[0037] In the case above, the security lights 10A and 10B according to the present embodiment detect the signal intensity IA of the received emergency call E at the signal intensity detection unit 28R in the control device 28. The detected signal intensity is then added by the intensity signal adding unit 29B to the transmission signal for yellow light emission to the neighboring security lights, and then transmitted to the neighboring security lights by the transmitting unit 28B. Further, in conjunction with the transmission of the transmission signal, the security lights 10A and 10B also detect at the signal intensity detection unit 28R the signal intensity IB of the emergency call E at the neighboring security lights from the transmission signals for yellow light emission transmitted by the neighboring security lights. These signal intensities IA and IB are then compared at the signal comparison unit 29C.

[0038] As a result, the security light 10A determines that the emergency call E is transmitted nearer itself than the neighboring security light 10B and, as shown in Fig. 6 (B), maintains the red light emission of its warning light 24 if it is determined that the signal intensity IA of the emergency call E by itself is higher than the signal intensity IB of the emergency call E at the security light 10B. The assigning of yellow light emission to the neighboring security lights 10B, 10A', and 10A" is also maintained.

[0039] On the other hand, the security light 10B determines that the signal intensity of the emergency call E by itself is lower than the signal intensity of the emergency call E at the security light 10A and therefore that the emergency call E is transmitted nearer the neighboring security light 10A, so that the control unit 28D changes its red light emission to yellow light emission and stops transmitting the transmission signal for yellow light emission to the neighboring security lights 10A and 10B'. Since this processing is performed electrically, the security light 10B, which once turns on red, will switch to yellow immediately. It is noted that the security light 10B' may be modified arbitrarily such that it continues its yellow light emission when existing in the security area, for example.

[0040] Meanwhile, the emergency push-button 14 utilized as one of the emergency transmitters is arranged on the front surface of the rectangular box-shaped button case 14A, and the button case 14A is fixed to the pole P. Further, a protection pipe 44 is provided in an extended manner between the button case 14A and the security light 10. The emergency push-button 14 is then connected electrically to the control device 28 via the wiring 46 running inside the protection pipe 44 and the wiring 38 that electrically connects the wiring frame 34 in the security light 10 and the control device 28 in the security alarm device 22. It is desirable that the emergency push-button 14 be installed at a height where even small children can perform a pressing operation easily.

[0041] Although it is desirable to arrange that if emer-

gency signals are transmitted simultaneously from the mobile terminal 12, cell phone 16, and emergency push-button 14, the emergency signals from the mobile terminal 12 and cell phone 16 are given preference, the arrangement may be appropriately changeable when needed. It will be appreciated here that the lighting equipment 20 and the security alarm device 22 constituting the security light 10 wholly have a waterproof structure so as to neither operate erroneously nor become eroded due to seepage of rainwater and the like.

[0042] Next, the operation of the present embodiment will be described. The thus arranged security light 10 informs the surroundings of the occurrence of an emergency when an emergency signal is transmitted by operating the mobile terminal 12 or the cell phone 16 in a security area and the control device 28 in the security alarm device 22 provided in the security light 10 that neighbors the site where the emergency signal is transmitted receives the emergency signal or when the control device 28 receives an emergency signal transmitted by pressing the emergency push-button 14 in any security light 10 in the security area. Specifically, the red light emitting diodes 30a of the warning light 24 in the security light 10 turn on and off periodically and sequentially in the circumferential direction of the approximately semi-cylindrical substrate 32 to be in a lighting manner like a red revolving light revolving in one direction in appearance. At the same time, alarms are set off from the alarm sounder 26, and further a transmission signal is transmitted from the transmitting unit 28B in the control device 28 to the other neighboring security lights 10. Then, in the other security lights 10 receiving the transmission signal, the yellow light emitting diodes 30b of the warning light 24 turn on and off periodically and sequentially in the circumferential direction of the substrate 32 to be in a lighting manner like a yellow revolving light revolving in one direction in appearance, and alarms are set off from the alarm sounder 26. In the present embodiment, the security lights 10 of yellow light emission each transmit a transmission signal to the remaining other neighboring security lights 10, and the same operation is performed for all of the security lights 10 in the security area.

[0043] In the case above, since each security light 10 is formed by incorporating the security alarm device 22 integrally in the lighting equipment 20, not only can the security alarm device 22 be installed in an appropriate position on the pole P, such as a utility pole and streetlight pole, together with the streetlight, but it can also be installed with no reduction in the light effects of the lighting equipment 20. In addition, the visibility of the warning light 24 in the security alarm device 22 cannot be reduced and alarms from the alarm sounder 26 can be transmitted reliably to the surroundings. Also, the security alarm device 22 can be installed together with the streetlight, which eliminates the need for extra cost, time, and installation structures (e.g. brackets) required when installing the security alarm device 22 in an additional manner. It is desirable that signals transmitted from the mobile ter-

minal 12 and the transmitting unit 28B in the security alarm device 22 be both weak radio signals having a short propagation distance, having an intensity low to an effective receivable extent at one or more neighboring security lights 10, and require no permission by the Radio Law and its related laws.

[0044] The first embodiment thus exhibits the following advantages.

(1) Starting from the security light 10 nearest to the site where an emergency such as a crime occurs, a transmission signal is transmitted sequentially to other neighboring security lights 10, and the red and yellow light emitting diodes 30a and 30b in the security lights 10 within the security area are turned on and off, based on signals received by the control devices 28 in the respective security lights 10, to be in a lighting manner like a red or yellow revolving light in appearance, as well as alarms being set off from the alarm sounders 26. It is therefore possible to inform the entire area of the occurrence of the emergency even if the emergency site may be in a less crowded area or in an area apart far from private residences.

(2) The red light emitting diodes 30a of the warning light 24 are turned on and off in the security light 10 nearest to the site where the notification is made, while the yellow light emitting diodes 30b of the warning light 24 are turned on and off in the neighboring security lights 10, whereby the emergency site can be located easily and it is possible to call for help proactively.

(3) The radio signal of the emergency call E from the cell phone 16 to the emergency notification receiving agency 18 is utilized as an emergency signal, whereby the emergency notification system (or security alarm system) can be established only with the security light 10 without providing an additional emergency transmitter.

(4) General outdoor lights such as streetlights and gatepost lights can be utilized as the lighting equipment 20, whereby the degree of freedom of selecting the installation position is high and also no uncomfortable feeling can occur in appearance.

[0045] It is noted that the first embodiment describes the case where the security light 10 can be operated by an emergency signal transmitted from any one of the mobile terminal 12, emergency push-button 14, and cell phone 16, but the configuration of the emergency notification system utilizing the security light according to the present invention is not restricted thereto. For example, the security light may be operated only by an emergency signal transmitted from the mobile terminal 12, only by an emergency signal transmitted by pressing the emergency push-button 14, only by an emergency signal transmitted in conjunction with an emergency call E from the cell phone 16 to the emergency notification receiving

agency 18, or only when capturing the emergency call E itself as an emergency signal.

Second Embodiment

[0046] Next, a second embodiment of the present invention will be described with reference to Figs. 7 and 8. It is noted that components identical or corresponding to those in the above-described first embodiment are designated by the same reference numerals (the same applies to the following embodiments). Fig. 7 is a cross-sectional view showing the configuration of principal parts of a security light according to the second embodiment, and Fig. 8 is a cross-sectional view along arrows #C-#C in Fig. 7. The security light 50 according to the present embodiment is formed by incorporating a security alarm device 54 integrally in approximately spherical suspended lighting equipment 52. Specifically, the security light 50 is formed by incorporating the security alarm device 54 including a warning light 56, an alarm sounder 58, and a control device 60 for controlling the operation of the warning light 56 and the alarm sounder 58 and for determining as well as transmitting and receiving signals in a chassis 52D including a bulb-type streetlight fitting 52A, a control device 52B for controlling the operation of the light fitting 52A, and a globe 52C covering the light fitting 52A.

[0047] The multiple red light emitting diodes 30a and the multiple yellow light emitting diodes 30b in the warning light 56 constituting the security alarm device 54 are arranged annularly in multiple rows and columns with the light emitting diodes 30a and 30b each having the same color in the column direction on an annular translucent substrate 64 disposed on the inner peripheral surface and along the latitude direction of the approximately spherical globe 52C. The red or yellow light emitting diodes 30a or 30b are adapted to turn on and off periodically and sequentially along the periphery of the globe 52C, based on a signal received by the control device 60, to be in a lighting manner like a red or yellow revolving light revolving in one direction in appearance.

[0048] It is noted that the light emitting diodes 30a and 30b may be arranged on the outer peripheral surface of the globe 52C in the lighting equipment 52 by providing the substrate 64 on the outer peripheral surface of the globe 52C. In this case, it will be appreciated that all the devices and parts constituting the security light 50 including the light emitting diodes 30a and 30b, substrate 64, and wirings for electrically connecting them to the control device 60 have a waterproof structure. Other configurations, operations, and advantages of the security light 50 according to the present second embodiment are basically the same as in the above-described first embodiment.

Third Embodiment

[0049] Next, a third embodiment of the present inven-

tion will be described with reference to Fig. 9. Fig. 9 is a cross-sectional view showing the configuration of principal parts of a security light according to the third embodiment. The security light 70 according to the present embodiment includes a security alarm device 74 including a warning light 76 that is formed by providing a red revolving electric light 76A and a yellow revolving electric light 76B vertically in an integrally coupled manner, the electric lights 76A and 76B including as a light source, respectively, electric lights 86A and 86B adapted to rotate together with respective mirror reflectors 88A and 88B. The warning light 76 is provided integrally on a chassis 72D of lighting equipment 72 including a streetlight fitting 72A, a control device 72B for controlling the operation of the light fitting 72A, and a globe covering the light fitting 72A. Also, an alarm sounder 78 constituting the security alarm device 74 and a control device 80 for controlling the operation of the warning light 76 and the alarm sounder 78 and for determining as well as transmitting and receiving signals are incorporated integrally in the chassis 72D of the lighting equipment 72.

[0050] More specifically, the warning light 76 includes: a housing 82 formed by providing a bottomed-cylindrical translucent red housing part 82A and yellow housing part 82B vertically in an integrally coupled manner; an axial part 84 inserted at the axial center of the housing 82 into the housing parts 82A and 82B; the electric lights 86A and 86B as white electric lights disposed on the axial part 84 in the respective housing parts 82A and 82B; the mirror reflectors 88A and 88B fitted integrally on the axial part 84 at position corresponding to the respective electric lights 86A and 86B to reflect light from the electric lights 86A and 86B; and a rotation driving section 90 provided inside the chassis 72D of the lighting equipment 72 and adapted to drive the axial part 84 rotationally to rotate the electric lights 86A and 86B and the mirror reflectors 88A and 88B. Then, a male thread portion (not shown) provided in the housing 82 itself and a female thread portion (not shown) provided on the upper surface of the chassis 72D of the lighting equipment 72 are coupled threadably to each other via a packing (not shown) so that the lower end portion of the yellow housing part 82B is fixed watertight to the chassis 72D of the lighting equipment 72.

[0051] When the control device 80 in the security alarm device 74 receives an emergency signal from the mobile terminal 12, emergency push-button 14, or cell phone 16, the rotation driving section 90 of the warning light 76 in the security light 70 is driven to rotate the mirror reflectors 88A and 88B and the electric light 86A on the axial part 84 in the red housing part 82A is turned on, so that the red revolving electric light 76A seems to rotate in appearance, and alarms are set off from the alarm sounder 78 in the security light 70. On the other hand, when the control device 80 receives a transmission signal from the control device 80 in another security light 70, the rotation driving section 90 of the warning light 76 in the security light 70 is driven to rotate the mirror reflectors

88A and 88B and the electric light 86B on the axial part 84 in the yellow housing part 82B is turned on, so that the yellow revolving electric light 76B seems to rotate in appearance. It will be appreciated that alarms may be set off from the alarm sounder 78 in conjunction with the lighting of the yellow revolving electric light 76B.

[0052] It is noted that the arrangement of the red and yellow revolving electric lights 76A and 76B constituting the warning light 76 is not restricted to the above-described configuration. For example, mirror reflectors 88A and 88B may rotate, respectively, around red and yellow electric lights 86A and 86B in an entirely colorless housing 82 having translucency. In the third embodiment, the electric lights 86A and 86B are adapted to rotate together with the respective mirror reflectors 88A and 88B by driving the axial part 84 rotationally in the red and yellow revolving electric lights 76A and 76B, but not restricted thereto, and the mirror reflectors 88A and 88B may rotate around the axial part 84 on which the electric lights 86A and 86B are disposed. Other configurations, operations, and advantages of the present third embodiment are basically the same as the above-described first embodiment.

Fourth Embodiment

[0053] Next, a fourth embodiment of the present invention will be described with reference to Fig. 10. In the above-described first embodiment, the security light 10 is adapted to turn on red the warning light 24 when receiving an emergency signal and to make the alarm sounder 26 set off alarms, and further to inform neighboring security lights 10 of the occurrence of the emergency to turn on yellow their warning lights. On the other hand, the present fourth embodiment adopts an arrangement that in conjunction with the transmission of a transmission signal from the security light 10 to the neighboring security lights 10, a certain pre-registered site or agency is informed of the occurrence of the emergency for more proactive support and/or help, showing an example having applications other than for security purposes. The emergency notification system according to the present embodiment includes multiple security lights 10, 10A, 10B... forming a network for support to an emergency with a solitary old person's residence 92, an anti-crime support base 96, a blue-light police car 97, an emergency notification receiving agency 18, and a private residence 98. An emergency transmitter 94 for transmitting a welfare emergency signal is provided in the solitary old person's residence 92. The configuration of the emergency transmitter 94 is the same as that of the mobile terminal 12 in the above-described first embodiment except for the type of signals to be transmitted. The security lights 10, 10A, and 10B are each formed by incorporating warning light 24, alarm sounder 26, and control device 28 therefor integrally in street lighting equipment 20, as is the case in the first embodiment.

[0054] The basic configuration of the control device 28

in the security light 10 according to the present embodiment is the same as that in the first embodiment shown in Fig. 4, including receiving unit 28A, transmitting unit 28B, signal determination unit 28C, control unit 28D, and signal intensity detection unit 28R. In addition to these components, the control device 28 according to the present embodiment further includes notification addressee information 28E and an identification code 28F associated with positional information and specific to the security light 10. Since the emergency notification system according to the present embodiment is utilized for not only the case of security communications concerning crimes but also the case of solitary old persons complaining about health problems, the signal determination unit 28C has a feature of determining if the signal received by the receiving unit 28A is a security emergency signal or a welfare emergency signal. Then, if it is determined based on the determination result by the signal determination unit 28C that a security emergency signal is received, the control unit 28D operates the warning light 24 and the alarm sounder 26 as well as activates the transmitting unit 28B to transmit a transmission signal to the neighboring security light 10A. In conjunction with this processing, the control unit 28D refers to the notification addressee information 28E for a pre-registered notification addressee for security and adds the identification code 28F to a transmission signal for notification of the occurrence of the emergency, and then the transmitting unit 28B transmits the transmission signal to the addressee.

[0055] The pre-registered notification addressee includes anti-crime support base 96 such as a children's refuge center, and an alarm device 96A provided in the anti-crime support base 96 receives the transmission signal and the identification code 28F to be informed of the occurrence of the emergency and the positional information of the emergency site. It is noted that the positional information of the emergency site may be, for example, reproduced with automated sound from the alarm device 96A by preliminarily providing a relational table between the identification code 28F and the positional information of the security light 10 in the alarm device 96A. If the emergency notification receiving agency 18 is set as a pre-registered notification addressee, and when an emergency call E is made from a cell phone 16 to the emergency notification receiving agency 18, the security light 10 may inform the emergency notification receiving agency 18 of the occurrence of the emergency and the positional information based on the identification code 28F. Alternatively, an alarm device 97A provided in the blue-light police car 97 may receive the emergency transmission signal and the identification code 28F from the security light 10.

[0056] On the other hand, if it is determined based on the determination result by the signal determination unit 28C that a welfare emergency signal transmitted from the emergency transmitter 94 in the solitary old person's residence 92 is received, the control unit 28D operates

the warning light 24 and the alarm sounder 26 as well as activates the transmitting unit 28B to transmit a welfare transmission signal for notification of the occurrence of the emergency and the identification code 28F to a pre-registered notification addressee for welfare (e.g. private residence 98 and/or care facility) obtained by referring to the notification addressee information 28E. An alarm device 98A in the private residence 98 receives the welfare transmission signal and the identification code 28F to be informed of the occurrence of the medical emergency and the positional information of the medical emergency site.

[0057] Thus, in accordance with the present fourth embodiment, the control device 28 in the security light 10 determines between a security emergency signal and a welfare emergency signal to notify a notification addressee according to the determination result among pre-registered notification addressees of the occurrence of the emergency and the identification code 28F associated with its positional information, which exhibits the advantage, in addition to those of the first embodiment, that the notifier can receive more appropriate help and support easily in accordance with the situation to which the notifier is exposed.

Fifth Embodiment

[0058] Next, a fifth embodiment of the present invention will be described with reference to Figs. 11 to 13. Fig. 11 shows the overall configuration of an emergency notification system according to the fifth embodiment of the present invention; Fig. 12 is a block diagram showing the system configuration of the emergency notification system according to the present embodiment; and Fig. 13 is a block diagram showing the configuration of a control device in a security alarm device. The emergency notification system 100 according to the present embodiment includes: multiple security alarm devices 104 installed on outdoor structures 102 such as utility poles that are arranged along a road 101; an emergency notification device 120 provided in an anti-crime support base 96 neighboring the security alarm devices 104; and an alarm device 132 including a warning light 134 and an alarm sounder 136 and installed on an outdoor structure 130 of the anti-crime support base 96.

[0059] The notifier, when exposed to an emergency such as a street crime, makes an emergency notification with an emergency call E from the cell phone 16 to the emergency notification receiving agency 18 and, in conjunction with it, one of the security alarm devices 104 is operated to notify neighbors of the occurrence of the emergency and the emergency notification device 120 in the anti-crime support base 96 neighboring the security alarm device 104 informs the emergency notification receiving agency 18 of the occurrence of the emergency and its positional information as well as the alarm device 132 installed on the outdoor structure 130 of the anti-crime support base 96 is operated. It is desirable that the

anti-crime support base 96 include regional cooperator groups' residences and stores supporting their local anti-crime activities like the "children's refuge center" exemplified in the above-described fourth embodiment, local educational institutions such as elementary and junior high schools, and facilities registered after going through a predetermined examination by the local government, jurisdictional police agency, or the like.

[0060] More specifically, as schematically shown in Fig. 11, the security alarm devices 104 are installed on outdoor structures 102 within easy reach of neighbors, such as utility poles and buildings, arranged along the road 101, the devices each including a warning light 106, an alarm sounder 108, and a control device 110 for controlling their operations and for determining as well as transmitting and receiving signals. The control device 110 has a feature of capturing a radio signal within a frequency range that the cell phone 16 uses for an emergency call E as an emergency signal W1 to operate the warning light 106 and make the alarm sounder 108 set off alarms as well as to transmit a transmission signal W2 for notification of the occurrence of the emergency to a controller 126 (to be described hereinafter) in the emergency notification device 120 installed in the anti-crime support base 96 neighboring the security alarm device 104. Specifically, as shown in Fig. 13, the control device 110 achieves the feature by having: notification addressee information 112A such as the anti-crime support base 96; a unique identification code 112B associated with positional information; a timer 113; a receiving unit 114A and a transmitting unit 114B for receiving and transmitting signals; a signal determination unit 114C for comparing the types of signals and the reception intensities; a control unit 114D; and a signal intensity detection unit 114E. It is noted that the operations of the components constituting the control device 110 are basically the same as those of the control device 28 in the security light 10 according to the above-described first embodiment.

[0061] It is also noted that means for transmitting the transmission signal W2 from the control device 110 in the security alarm device 104 to the controller 126 of the emergency notification device 120 in the neighboring anti-crime support base 96 includes wireless connections on various radiowaves such as wireless LANs and wired connections such as private lines including wired LANs, power lines, coaxial cables, communication lines, optical fibers, and CATV lines.

[0062] The warning light 106 includes red and yellow revolving lights, although not shown. The detailed configuration of the warning light 106 will be omitted, but may be in a manner like red and yellow revolving lights in appearance as is the case with the warning lights according to the above-described first and second embodiments, or may be red and yellow revolving lights utilizing an electric light as is the case with the warning light according to the above-described third embodiment, or may utilize still another known red and yellow revolving lights.

The alarm sounder 108 includes a speaker device (not shown) capable of setting off extremely loud alarms and is connected electrically to the control device 110 together with the warning light 106, being adapted to turn on one or both of the red and yellow revolving lights in the warning light 106 based on a control signal S1 output from the control device 110 when capturing the emergency signal W1 from the cell phone 16 and to make the alarm sounder 108 set off alarms.

[0063] The control device 110 in the security alarm device 104 has a further feature of transmitting and receiving a radiowave transmission signal W3 to and from the control devices 110 in one or more other security alarm devices 104 installed near the security alarm device 104 and, when receiving the emergency signal W1 from the cell phone 16, transmits the transmission signal W3 to the other neighboring security alarm devices 104. On the other hand, the control device 110, when receiving a transmission signal W3 from the control device 110 in one of the other security alarm devices 104, operates and controls the security alarm device 104 to transmit the transmission signal W3 to control devices 110 in other neighboring security alarm devices 104. It is noted that such a control by the control device 110 is the same as that by the control device 28 of the security alarm device 22 in the security light 10 according to the above-described first embodiment.

[0064] The control device 110 in the security alarm device 104 further includes a timer 113 for operating the warning light 106 and the alarm sounder 108 until a predetermined period of time elapses when receiving the emergency signal W1 from the cell phone 16, being adapted to operate the warning light 106 and the alarm sounder 108 until the time set by the timer 113 elapses. Alternatively, the cell phone 16 may be provided with stop signal transmitting means (not shown) and the control device 110 may stop the operation of the warning light 106 and the alarm sounder 108 when receiving a stop signal.

[0065] The emergency notification device 120 will next be described. As shown in Fig. 12, the emergency notification device 120 is installed in the anti-crime support base 96 neighboring the security alarm device 104 and includes an emergency notification transmitter 122, an automatic sound reproducer 124, and a controller 126 for controlling the operation of the foregoing components and the alarm device 132 installed on the anti-crime support base 96 and for receiving the transmission signal W2 from the security alarm device 104. The controller 126 is adapted, when receiving the transmission signal W2 from the security alarm device 104, to make the emergency notification transmitter 122 notify the emergency notification receiving agency 18 of the occurrence of the emergency with automated sound by the automatic sound reproducer 124 through a fixed telephone line L in the anti-crime support base 96 as well as to inform of positional information based on the phone number of the anti-crime support base 96.

[0066] The alarm device 132, which includes the warning light 134 and alarm sounder 136, is installed on the outdoor structure 130 within easy reach of neighbors, such as a gatepost in a regional cooperator's residence as the anti-crime support base 96, and is connected electrically to the emergency notification device 120. The warning light 134 is turned on and alarms are set off from the alarm sounder 136 based on a control signal S3 output from the controller 126 in the emergency notification device 120 to the alarm device 132 when the controller 126 receives the transmission signal W2 from the security alarm device 104. Then, an emergency vehicle or the like heading to the emergency site based on the positional information that is given through an emergency notification from the anti-crime support base 96 can find the anti-crime support base 96 easily and therefore can rush to the site. It is noted that if the warning light 134 in the alarm device 132 is a revolving light of a color different from the red and yellow revolving lights of the warning light 106 in the security alarm device 104, such as a blue revolving light, the warning light 134 can easily be differentiated from the warning light 106 advantageously.

[0067] Next, the operation of the thus arranged emergency notification system 100 will be described. When the notifier makes an emergency notification with an emergency call E from the cell phone 16 to the emergency notification receiving agency 18, and when the control device 110 in the security alarm device 104 arranged along the road 101 receives an emergency signal W1 transmitted from the cell phone 16 in conjunction with the emergency call E, the warning light 106 in the security alarm device 104 is operated and alarms are set off from the alarm sounder 108. The control device 110 in the security alarm device 104 then transmits a transmission signal W2 to the emergency notification device 120 in the neighboring anti-crime support base 96, and further transmits a transmission signal W3 to other neighboring security alarm devices 104.

[0068] In the case above, the controller 126 in the emergency notification device 120 receiving the transmission signal W2 makes the emergency notification transmitter 122 make an emergency notification to the corresponding emergency notification receiving agency 18 through the fixed telephone line L in the anti-crime support base 96, while making the automatic sound reproducer 124 reproduce automated sound to notify the emergency notification receiving agency 18 of the occurrence of the emergency and, at the same time, its positional information based on the phone number of the anti-crime support base 96.

[0069] On the other hand, the control device 110 in the security alarm device 104 receiving the transmission signal W3 makes the warning light 106 in the security alarm device 104 turn on yellow and the alarm sounder 108 set off alarms, and further transmits a transmission signal W3 from the security alarm device 104 to other neighboring security alarm devices 104. The same operation is performed for all of the security alarm devices 104 pro-

vided in the given area.

[0070] It is noted that many of such cell phones 16 include an imaging device (digital camera) 16a and can utilize a videophone service using the imaging device 16a. In this case, the imaging device 16a may be activated automatically or manually by the notifier when an emergency call E is made using the cell phone 16, and surrounding situations taken by the imaging device 16a may be transmitted as a video image to the emergency notification receiving agency 18 through a data communication link (line-switched data communication or packet communication) of the cell phone 16. This allows the emergency notification receiving agency 18 to promptly and reliably understand more specific situations at the site and thereby to give the emergency vehicle 99 heading to the site precise instructions.

[0071] Thus, in accordance with the emergency notification system 100 according to the present embodiment, the security alarm device 104 arranged along the road 101 is operated in conjunction with the emergency call E transmitted by the notifier from the cell phone 16 to the emergency notification receiving agency 18, whereby it is possible to notify neighbors promptly and reliably of the occurrence of the emergency to call for help. Moreover, not only does the cell phone 16 make the emergency notification, but also the emergency notification device 120 in the anti-crime support base 96 makes an emergency notification including positional information to the emergency notification receiving agency 18. It is therefore possible to notify the emergency notification receiving agency 18 promptly and reliably of the occurrence of the emergency. Even if the notifier using the cell phone 16 for emergency notification cannot easily know where he/she is and what happens to him/her at a glance and inform an operator in the emergency notification receiving agency 18 of the details of the situation for the reason that he/she does not have the opportunity to orient himself/herself geographically because he/she is in a geographically unfamiliar area, do not know the exact address even in a familiar area, become upset, or are in a dangerous situation, or if the notifier may be in an area where neither location using the GPS location service of the cell phone 16 nor location based on base station information for the cell phone 16, it is possible to inform the emergency notification receiving agency 18 promptly and reliably of the occurrence of the emergency and the positional information of the emergency site.

[0072] It is desirable that even if the notifier may make an emergency call E from the cell phone 16 to make an emergency notification to any emergency notification receiving agency 18, the emergency notification device 120 can automatically make an emergency notification to the emergency notification receiving agency 18. For that, it is preferable that the control device 110 in the security alarm device 104 have a feature of determining the emergency signal W1 transmitted from the cell phone 16, and that the controller 126 in the emergency notification device 120 is adapted to control to transmit a transmission

signal W2 having a specific wavelength, waveform, or frequency for each emergency notification receiving agency 18. It is also desirable to take other measures for determination between the emergency signal W1 and transmission signal W2 so that the control device 110 in the security alarm device 104 and the controller 126 in the emergency notification device 120 can determine between them. This arrangement for signal determination allows for identification between emergency notification receiving agencies 18 as well as application to such a welfare emergency notification system as described in the fourth embodiment, for example.

[0073] Meanwhile, in the above-described fifth embodiment, since the positional information given to the emergency notification receiving agency 18 is based on the phone number of the anti-crime support base 96 neighboring the security alarm device 104 receiving the emergency signal W1 from the cell phone 16, there cannot generally occur such a large positional error between the positional information and the actual emergency site. However, particularly in regions such as suburbs where residences are scattered about, there can occur a slight amount of error between the actual emergency site and the position of the anti-crime support base 96. It is therefore desirable that more precise positional information can be given to the emergency notification receiving agency 18 so that emergency vehicles and the like can head to the site as fast as possible.

[0074] In the case above, it is preferable that the control device 110 in the security alarm device 104 arranged along the road 101 have a unique identification code 112B associated with positional information, as shown in Fig. 13, and that the control device 110, when receiving the emergency signal W1 transmitted from the cell phone 16, transmit a transmission signal W2 including the identification code 112B to the controller 126 in the emergency notification device 120 in the neighboring anti-crime support base 96. The controller 126 in the emergency notification device 120 receiving the transmission signal W2 including the identification code 112B then transmits the positional information of the security alarm device 104 based on the identification code 112B to the emergency notification receiving agency 18 with automated sound by the automatic sound reproducer 122 or positional information data sent through a network utilizing the fixed telephone line L, whereby more precise positional information of the notifier who makes the emergency notification using the cell phone 16, that is, the site where the emergency occurs can be given to the emergency notification receiving agency 18.

[0075] It is noted that the identification of the positional information of the security alarm device 104 is not restricted to the foregoing method utilizing the identification code 112B. For example, if the security alarm device 104 is equipped with a GPS location service, GPS positional information obtained through the GPS location service may be held as an identification code 112B in the control device 110 in the security alarm device 104.

[0076] The emergency notification system 100 according to the present embodiment can adopt widely spread cell phones (wireless mobile communication terminals) 16 without modification and, as described in the first embodiment, the security alarm device 104 can be operated when the control device 110 in the security alarm device 104 captures a radio signal within a frequency range that each cell phone 16 uses for an emergency call E as an emergency signal W1. Alternatively, also as described in the first embodiment, if the cell phone 16 has a feature of transmitting an emergency signal W1 composed of a weak radiowave having a short propagation distance in conjunction with the emergency call E, the security alarm device 104 can be operated when the control device 110 in the security alarm device 104 receives the emergency signal W1. It is noted that the method of identifying the security alarm device 104 nearest to the site where the notification is made among multiple security alarm devices 104 when capturing the radio signal itself of the emergency call E as an emergency signal W1 is as described in the first embodiment.

[0077] Furthermore, the cell phone 16 may have an alarm activation feature of setting off alarms by receiving an emergency signal W1. With this arrangement, when a notifier exposed to an emergency makes an emergency call E using a cell phone 16 as shown in Fig. 12, some other cell phones 16' carried by neighbors receive an emergency signal W1 transmitted from the cell phone 16 in conjunction with the emergency call E and the alarm activation feature of each cell phone 16' is activated to set off alarms, whereby it is possible to notify the neighbors promptly and reliably of the occurrence of the emergency to call for help.

[0078] It will be appreciated that if the cell phone 16 has a feature of transmitting an emergency signal W1 composed of a weak radiowave having a short propagation distance as mentioned above, it is necessary to make the emergency signal W1 transmitted from the cell phone 16 and the transmission signal W3 transmitted from the control device 110 in the security alarm device 104 determinable at the control device 110 by making the wavelength, waveform, or frequency thereof different from each other or by taking other measures for the determination.

[0079] The cell phone 16 may further be provided with means for stopping the operation of the security alarm device 104. That is, the cell phone 16 may be arranged to be capable of transmitting a stop signal for stopping the operation of the security alarm device 104 by providing a button for transmitting the stop signal or by entering with dial buttons a security code predefined by a user of the cell phone 16, so that security alarm devices 104 erroneously operated due to, for example, an erroneous operation of the cell phone 16 and/or security alarm devices 104 that are no longer required to be operated can be stopped immediately. In this case, the control device 110 in the security alarm device 104 is adapted to control, when receiving the stop signal from the cell phone 16, to

transmit a stop signal to the controller 126 in the emergency notification device 120 and control devices 110 in some other neighboring security alarm devices 104 to stop the operation thereof.

[0080] Meanwhile, it is desirable to inform the emergency vehicle 99 from the emergency notification receiving agency 18 of the occurrence of the emergency and its positional information as promptly as possible. If the notifier can obtain the positional information utilizing the GPS location system or multi-base-station location system of the cell phone 16, the emergency vehicle 99 is only required to include a receiver 99A having a feature of receiving the emergency signal W1 from the cell phone 16 to recognize the occurrence of the emergency and of acquiring the positional information of the cell phone 16 obtained by one of the location systems above from a location server belonging to the cell-phone service provider via wireless communications on various radio-waves or from the emergency signal W1 transmitted from the cell phone 16. With this arrangement, it is possible to notify the emergency vehicle 99 cruising near the notifier directly of the occurrence of the emergency and precise positional information of the notifier without involving the emergency notification receiving agency 18, which allows the average time (response time) for the emergency vehicle 99 to arrive at the site to be reduced as short as possible.

[0081] In the case above, if the notifier is in an area where every location utilizing either the GPS location system or multi-base-station location system of the cell phone 16 is difficult, there is concern that the emergency vehicle 99 cannot be notified of the occurrence of the emergency and its positional information. However, the emergency vehicle 99 can be notified of the occurrence of the emergency and its positional information by adopting the following means.

[0082] That is, positional information based on the phone number of the anti-crime support base 96 shall be transmitted as a transmission signal (not shown) when the controller 126 in the emergency notification device 120 installed in the anti-crime support base 96 receives a transmission signal W2 from the control device 110 in the security alarm device 104, and the emergency vehicle 99 from the emergency notification receiving agency 18 shall include a receiver 99A for capturing the transmission signal transmitted from the emergency notification device 120 to recognize the occurrence of the emergency and for acquiring the positional information of the anti-crime support base 96 based on the transmission signal. Alternatively, the control device 110 in the security alarm device 104 shall have a unique identification code 112B associated with positional information and, when receiving an emergency signal W1 from the cell phone 16, transmit the identification code 112B together with a transmission signal W3 to other security alarm devices 104 neighboring the security alarm device 104, while when receiving an identification code 112B from the control device 110 in another security alarm device 104,

transmitting the identification code 112B together with a transmission signal W3 to control devices 110 in the other neighboring security alarm devices 104, and the emergency vehicle 99 from the emergency notification receiving agency 18 shall include a receiver 99A for capturing the identification code 112B from the security alarm device 104 to recognize the occurrence of the emergency and for acquiring the positional information of the security alarm device 104 based on the identification code 112B. With the arrangement above, it is possible to notify the emergency vehicle 99 cruising near the notifier directly of the occurrence of the emergency and the positional information of the anti-crime support base 96 or the security alarm device 104 neighboring the emergency site without involving the emergency notification receiving agency 18.

[0083] It is desirable for the emergency vehicle 99 to display the acquired positional information on a display device such as a vehicle navigation system (not shown) provided in the emergency vehicle 99 as map information and/or literal information. That is, it is preferable that the display device such as a vehicle navigation system serve also as the receiver 99A.

[0084] It is noted that the present invention is not restricted to the above-described embodiments, and various modifications may be made without departing from the gist of the present invention. For example, the present invention includes the following arrangements.

(1) The shape and size of the security lights 10, 50, and 70 shown in the first to third embodiments are merely illustrative and may be modified appropriately when needed.

(2) The arrangement of the light emitting diodes 30a and 30b shown in the first and second embodiments is also merely illustrative and may be modified appropriately as long as it exhibits the same advantages.

(3) The use of the red and yellow light emitting diodes 30a and 30b in the first and second embodiments is also merely illustrative and may be modified appropriately as long as it exhibits the same advantages. For example, in the first embodiment, if RGB light emitting diodes are used as a light source of the light fitting 20A in the lighting equipment 20, white light can be emitted in a normal state, while red or yellow light can be emitted when receiving an emergency signal, which allows the lighting equipment 20 to serve also as the warning light 24.

(4) The security light 10, which is incorporated integrally in the street lighting equipment 20 in the first embodiment, may be incorporated integrally in, for example, a gatepost light 140 in a personal residence, as shown in Fig. 14, without being restricted to such a streetlight along a road as long as it can be incorporated integrally in outdoor lighting equipment. The same applies to the fourth and fifth embodiments.

(5) The operations shown in the above-described embodiments are also merely illustrative and the design may be modified appropriately as long as it exhibits the same advantages. For example, the blue-light police car 97, which is adapted to receive a transmission signal from the security light 10 in the fourth embodiment, may be adapted to directly receive an emergency call E from the cell phone 16 to the emergency notification receiving agency 18, as shown in Fig. 11.

(6) The emergency notification system according to the present invention is suitable for construction of a security or welfare network, but not restricted to such an application. For example, when an earthquake warning, tsunami warning, flood warning or the like is issued from an emergency alert issuing agency 150 as shown in Fig. 15, the control device 28 in the security light 10 may receive the emergency alert signal at the receiving unit 28A to operate the security alarm device 22 so that passersby are informed of the issue of the alert.

(7) The system configurations shown in the above-described embodiments are merely illustrative and the design may be modified appropriately as long as it exhibits the same advantages. For example, in the fourth embodiment, the security light 10 is adapted to transmit a security transmission signal to the anti-crime support base 96, blue-light police car 97, and emergency notification receiving agency 18, while transmitting a welfare transmission signal to the private residence 98, but the transmission configuration of the emergency is not restricted thereto. For example, the control device 28 in the security light 10 may be provided with a mail server 28S, as shown in Fig. 4, to notify by electronic mail a predetermined notification addressee of the occurrence of an emergency. The predetermined notification addressee may be the cell-phone service provider or, if the owner of the cell phone 16 is a child, a cell phone owned by his/her parent. Alternatively, the predetermined notification addressee may be a children's refuge center, a cooperator's residence within a distance of 100m therearound, or a police car if an approval from the receiver has been obtained in advance, or may be a public institution such as a police headquarters, a police station, a city government office, or a fire station, or may be an organization or enterprise such as a patrol center or a taxi company. It will be appreciated that such a notification addressee is provided with a terminal capable of receiving electronic mail such as a cell phone or a personal computer. Then, displaying, as a content of electronic mail, stranger information, electrical outage, and/or emergency information together with detailed positional information (e.g. address including block number, street name/number, and town or city) of the security light 10 allows people to head to the site where the emergency occurs as fast as possible.

Industrial Applicability

[0085] In accordance with the present invention, an emergency signal transmitted from an emergency transmitter or an emergency signal transmitted in conjunction with an emergency call from a cell phone to an emergency notification receiving agency is received at a control device in a security alarm device neighboring the emergency transmitter or the cell phone to operate the security alarm device and transmitted to other neighboring security alarm devices and/or an emergency notification device in an anti-crime support base when needed, which is applicable to security lights and emergency notification systems for notifying neighbors proactively of the occurrence of an emergency and its positional information. This is particularly suitable for application to emergency notification systems in which an emergency call from a cell phone is captured as an emergency signal.

Claims

1. A security light in which a security alarm device including a warning light and an alarm sounder for notifying neighbors of the occurrence of an emergency is incorporated integrally in lighting equipment including an outdoor light fitting, wherein the security alarm device comprises a control device including: control means for controlling the operation of the warning light and the alarm sounder; transmitting and receiving means for transmitting and receiving a signal; and signal determination means for determining the received signal, and wherein the control device is adapted to operate the warning light and the alarm sounder when receiving an emergency signal transmitted from an emergency transmitter or an emergency signal transmitted in conjunction with an emergency call from a cell phone to an emergency notification receiving agency.
2. The security light according to claim 1, wherein the control device receiving the emergency signal is adapted to transmit a transmission signal for notification of the occurrence of the emergency to control devices in one or more other neighboring security lights, and wherein the control devices in the other security lights receiving the transmission signal are adapted to operate their respective security alarm devices in a manner different from that of the security alarm device at which the transmission signal originates.
3. The security light according to claim 1 or 2, wherein the cell phone has a feature of transmitting the emergency signal composed of a weak radiowave having a short propagation distance in conjunction with the emergency call, and wherein the control device is adapted to operate the warning

light and the alarm sounder by receiving the emergency signal.

4. The security light according to claim 1 or 2, wherein the control device is adapted to operate the warning light and the alarm sounder by capturing a radio signal within a frequency range that the cell phone uses for the emergency call as the emergency signal.

5. The security light according to claim 4, wherein the control device comprises:

signal intensity detection means for detecting the reception intensity of the emergency call from the cell phone;
 intensity signal adding means for adding the detected reception intensity of the emergency call to a transmission signal to be transmitted to the other neighboring security lights; and
 signal comparison means for comparing the reception intensity of the emergency call by itself and the reception intensity at other neighboring security lights added to transmission signals received from the other security lights,
 each control device in a plurality of security lights capturing the emergency call being adapted to make the signal comparison means compare the reception intensity by itself and at other security lights, and wherein
 the security alarm device in the security light having the highest reception intensity of the radio signal is operated in a manner on receiving the emergency signal, while
 the security alarm devices in the other respective security lights are operated in a manner based on the transmission signal transmitted from the security light having the highest reception intensity.

6. The security light according to any of claims 1 to 5, wherein the warning light comprises as a light source a plurality of light emitting diodes disposed in the lighting equipment.

7. The security light according to claim 6, wherein the warning light comprises as a light source a plurality of red light emitting diodes and a plurality of yellow light emitting diodes that are arranged alternately, and wherein the control device is adapted, when receiving the emergency signal, to turn on and off the red light emitting diodes in the warning light and make the alarm sounder set off alarms as well as to transmit a transmission signal for turning on and off yellow light emitting diodes in warning lights in the other neighboring security lights to control devices in the respective security lights.

8. The security light according to claim 6 or 7, wherein the plurality of light emitting diodes are arranged on a translucent substrate surrounding the light fitting in the lighting equipment, and the control device is adapted to turn on and off the plurality of light emitting diodes periodically and sequentially around the light fitting. 5
9. The security light according to claim 6 or 7, wherein the plurality of light emitting diodes are arranged on a substrate disposed around a globe that covers the light fitting in the lighting equipment, and the control device is adapted to turn on and off the plurality of light emitting diodes periodically and sequentially around the globe. 10
10. The security light according to claim 8 or 9, wherein the periodic on-and-off of the light emitting diodes is in a manner like a revolving light in which a lighting section rotates in one direction around the light fitting or the globe. 15
11. The security light according to claim 6, wherein the plurality of light emitting diodes include RGB colors and serve also as a light source of the light fitting in the lighting equipment. 25
12. The security light according to any of claims 1 to 5, wherein the warning light is constituted by a revolving electric light comprising an electric light as a light source. 30
13. The security light according to claim 12, wherein the warning light is constituted by a red revolving electric light and a yellow revolving electric light, and wherein the control device is adapted, when receiving the emergency signal, to operate the red revolving electric light in the warning light and make the alarm sounder set off alarms as well as to transmit a transmission signal for operating yellow revolving electric lights in warning lights in the other neighboring security lights to control devices in the respective security lights. 35
14. The security light according to any of claims 1 to 13, wherein the control device has a unique identification code associated with positional information, and wherein the control device is adapted, when receiving the emergency signal, to transmit the identification code together with a transmission signal for notification of the occurrence of the emergency to a receiver in a preset emergency notification addressee. 40
15. The security light according to claim 14, wherein the control device comprises mail server means for transmitting and receiving electronic mail, and wherein the control device is adapted, when receiving the emergency signal, to notify by electronic mail the receiver in the emergency notification addressee of the occurrence of the emergency with the positional information thereof being added as the identification code. 45
16. The security light according to any of claims 1 to 15, wherein the emergency transmitter or the cell phone can transmit at least one of a security emergency signal and a welfare emergency signal, and wherein the control device is adapted to determine if the received emergency signal is for security or for welfare and, based on the determination result, to control the operation of the warning light and the alarm sounder and transmit a transmission signal. 50
17. The security light according to any of claims 1 to 16, wherein the emergency transmitter or the cell phone can transmit a stop signal for stopping the operation of the security alarm device, and wherein the control device is adapted to stop the operation of the security alarm device when receiving the stop signal. 55
18. The security light according to any of claims 1 to 17, wherein the control device comprises timer means, and wherein the control device is adapted, when receiving the emergency signal, to operate the security alarm device until time set by the timer means elapses.
19. The security light according to any of claims 1 to 18, wherein the control device can receive an emergency alert signal transmitted from an emergency alert issuing agency and is adapted to operate the security alarm device when receiving the emergency alert signal.
20. An emergency notification system comprising:
 - the security light according to any of claims 1 to 19; and
 - emergency notification devices installed in one or more anti-crime support bases neighboring the security light, wherein the security alarm device in the security light is adapted, when receiving an emergency signal transmitted in conjunction with an emergency call from the cell phone to the emergency notification receiving agency, to operate the warning light and the alarm sounder as well as to transmit a transmission signal for notification of the occurrence of the emergency to the emergency

notification devices installed in the anti-crime support bases, and wherein the emergency notification devices each have an emergency notification transmitter, an automatic sound reproducer, and a controller for controlling the operation of the emergency notification transmitter and the automatic sound reproducer as well as for transmitting and receiving a signal, and wherein the controller is adapted, when receiving the transmission signal from the security alarm device, to make the emergency notification transmitter notify the emergency notification receiving agency of the occurrence of the emergency with automated sound by the automatic sound reproducer through a fixed telephone line in the anti-crime support base as well as to inform of positional information based on the phone number of the anti-crime support base.

21. An emergency notification system comprising:

a security alarm device arranged along a road and including a warning light and an alarm sounder for notifying neighbors of the occurrence of an emergency; and an emergency notification device installed in an anti-crime support base neighboring the security alarm device, wherein

the security alarm device comprises a control device including: control means for controlling the operation of the warning light and the alarm sounder; transmitting and receiving means for transmitting and receiving a signal; and signal determination means for determining the received signal, and wherein

the control device is adapted, when receiving an emergency signal transmitted in conjunction with an emergency call from a cell phone to an emergency notification receiving agency, to operate the warning light and make the alarm sounder set off alarms as well as to transmit a transmission signal for notification of the occurrence of the emergency to the emergency notification device in the anti-crime support base, and wherein

the emergency notification device has an emergency notification transmitter, an automatic sound reproducer, and a controller for controlling the operation of the emergency notification transmitter and the automatic sound reproducer as well as for transmitting and receiving a signal, and wherein

the controller is adapted, when receiving the transmission signal from the security alarm device, to make the emergency notification transmitter notify the emergency notification receiving agency of the occurrence of the emergency

with automated sound by the automatic sound reproducer through a fixed telephone line in the anti-crime support base as well as to inform of positional information based on the phone number of the anti-crime support base.

22. The emergency notification system according to claim 21, wherein

the control device in the security alarm device can transmit and receive a transmission signal to and from control devices in neighboring security alarm devices, and wherein

the control device is adapted, when receiving the emergency signal from the cell phone, to transmit a transmission signal to other neighboring security alarm devices and, when receiving a transmission signal from one of the control devices in the other security alarm devices, to operate the security alarm device as well as to transmit a transmission signal to the control devices in the other neighboring security alarm devices.

23. The emergency notification system according to claim 21 or 22, wherein

the control device is adapted to operate the warning light and the alarm sounder by capturing a radio signal within a frequency range that the cell phone uses for the emergency call as the emergency signal.

24. The emergency notification system according to claim 23, wherein

the control device comprises:

signal intensity detection means for detecting the reception intensity of the emergency call from the cell phone;

intensity signal adding means for adding the detected reception intensity of the emergency call to a transmission signal to be transmitted to the other neighboring security alarm devices; and signal comparison means for comparing the reception intensity of the emergency call by itself and the reception intensity at other neighboring security alarm devices added to transmission signals received from the other security alarm devices,

each control device in a plurality of security alarm devices capturing the emergency call being adapted to make the signal comparison means compare the reception intensity by itself and at other security alarm devices, and wherein the security alarm device in the security alarm device having the highest reception intensity of the radio signal is operated in a manner on receiving the emergency signal, while the security alarm devices in the other respective security alarm devices are operated in a manner based on the transmission signal trans-

mitted from the security alarm device having the highest reception intensity.

25. The emergency notification system according to claim 21 or 22, wherein
the cell phone comprises emergency signal transmitting means for transmitting the emergency signal composed of a weak radiowave having a short propagation distance in conjunction with the emergency call, and wherein
the control device is adapted to operate the warning light and the alarm sounder by receiving the emergency signal.
26. The emergency notification system according to claim 25, wherein
the cell phone comprises alarm sounder means for setting off alarms by receiving an emergency signal transmitted in conjunction with an emergency call by another cell phone.
27. The emergency notification system according to any of claims 21 to 26, wherein
the control device in the security alarm device has a unique identification code associated with positional information and is adapted to inform the emergency notification device in the anti-crime support base of the identification code together with the transmission signal when receiving the emergency signal transmitted in conjunction with the emergency call by the cell phone, and wherein
the controller in the emergency notification device receiving the transmission signal and the identification code is adapted to inform the emergency notification receiving agency of the positional information of the security alarm device based on the identification code.
28. The emergency notification system according to any of claims 21 to 27, wherein
the cell phone comprises stop means for stopping the operation of the security alarm device.
29. The emergency notification system according to any of claims 21 to 28, wherein
the control device comprises timer means, and wherein
the control device is adapted, when receiving the emergency signal from the cell phone, to operate the security alarm device until time set by the timer means elapses.
30. The emergency notification system according to any of claims 20 to 29, wherein
the anti-crime support base is provided with an alarm device including a warning light and an alarm sounder, and wherein
the controller in the emergency notification device is

adapted to notify the emergency notification receiving agency in conjunction with the emergency call from the cell phone as well as to operate the alarm device.

31. The emergency notification system according to any of claims 20 to 30, wherein
an emergency vehicle from the emergency notification receiving agency comprises receiving means for receiving the emergency signal transmitted in conjunction with the emergency call by the cell phone to recognize the occurrence of the emergency and for acquiring the positional information of the cell phone.
32. The emergency notification system according to any of claims 20 to 30, wherein
the controller in the emergency notification device is adapted, when receiving the transmission signal from the control device in the security alarm device, to transmit positional information based on the phone number of the anti-crime support base in which the emergency notification device is installed as a transmission signal, and wherein
an emergency vehicle from the emergency notification receiving agency comprises receiving means for capturing the transmission signal from the emergency notification device to recognize the occurrence of the emergency and for acquiring the positional information of the anti-crime support base based on the transmission signal.
33. The emergency notification system according to any of claims 20 to 30, wherein
the control device in the security alarm device has a unique identification code associated with positional information and is adapted, when receiving the emergency signal from the cell phone, to transmit the identification code together with the transmission signal to the other neighboring security alarm devices and, when receiving an identification code from one of the control devices in the other security alarm devices, to transmit the identification code together with the transmission signal to the control devices in the other neighboring security alarm devices, and wherein
an emergency vehicle from the emergency notification receiving agency comprises receiving means for capturing the identification code from the security alarm device to recognize the occurrence of the emergency and for acquiring the positional information of the security alarm device based on the identification code.
34. The emergency notification system according to any of claims 20 to 33, wherein
the cell phone comprises imaging means and is adapted to activate the imaging means when trans-

mitting an emergency call and transmit surrounding situations taken by the imaging means to the emergency notification receiving agency through a communication link of the cell phone.

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FIG.1

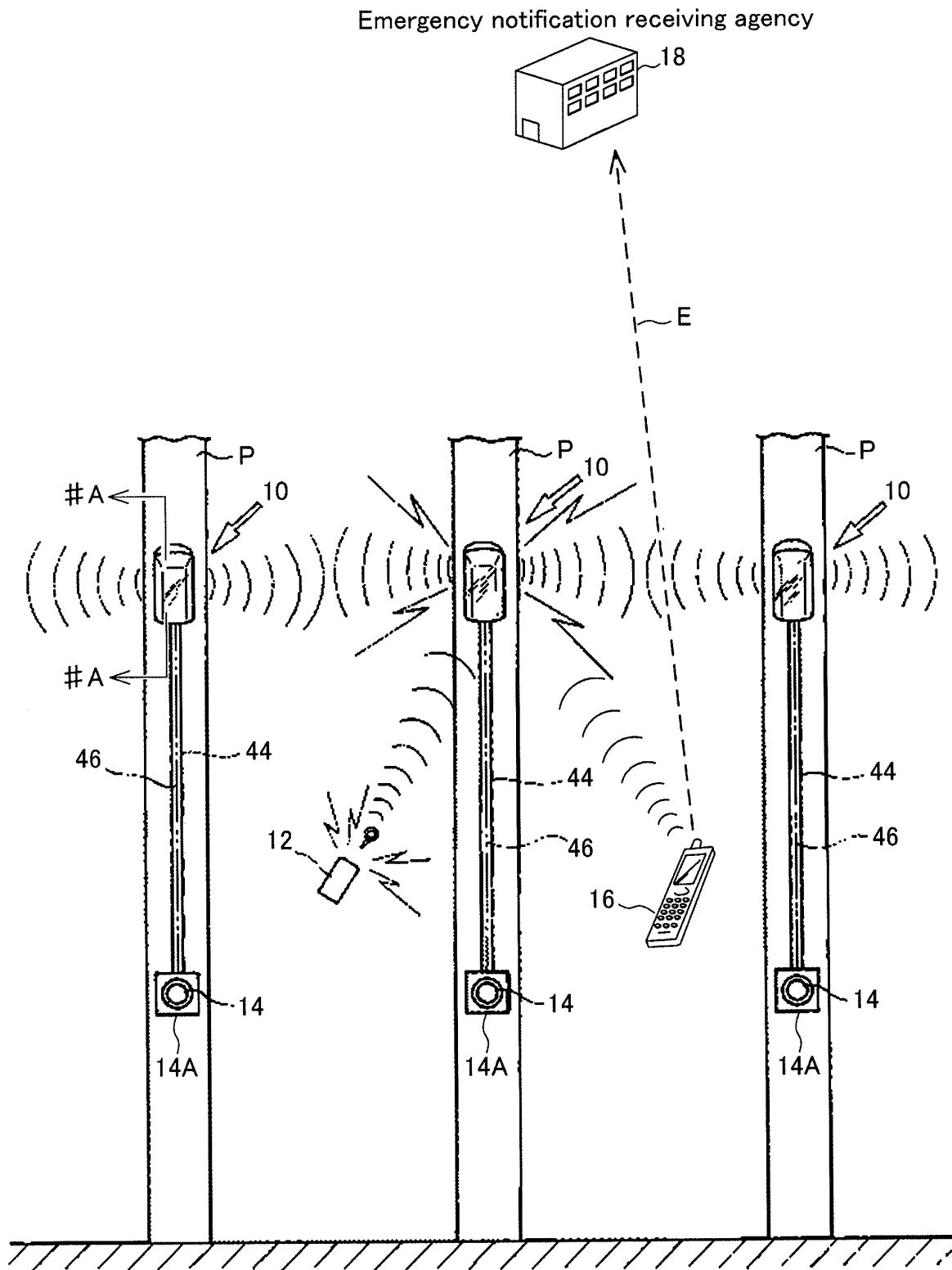


FIG.2

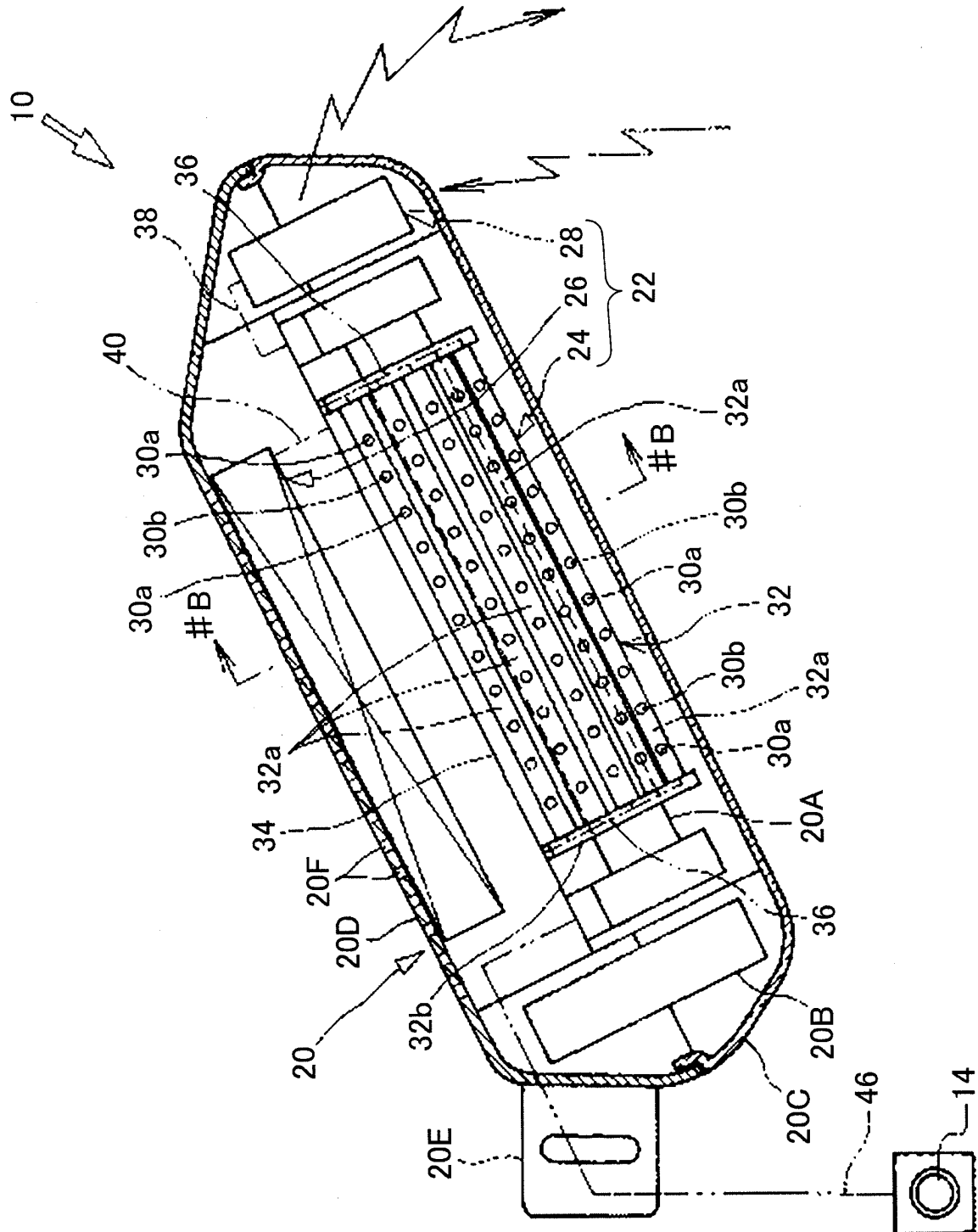


FIG.3

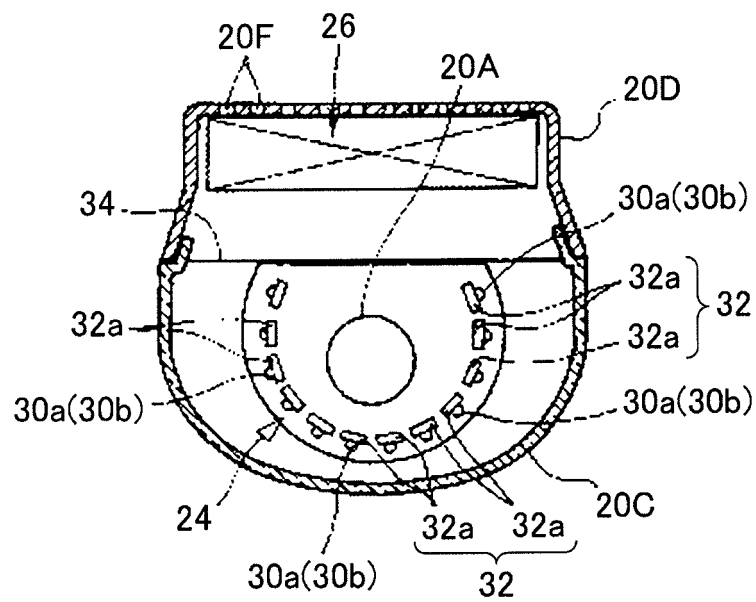


FIG.4

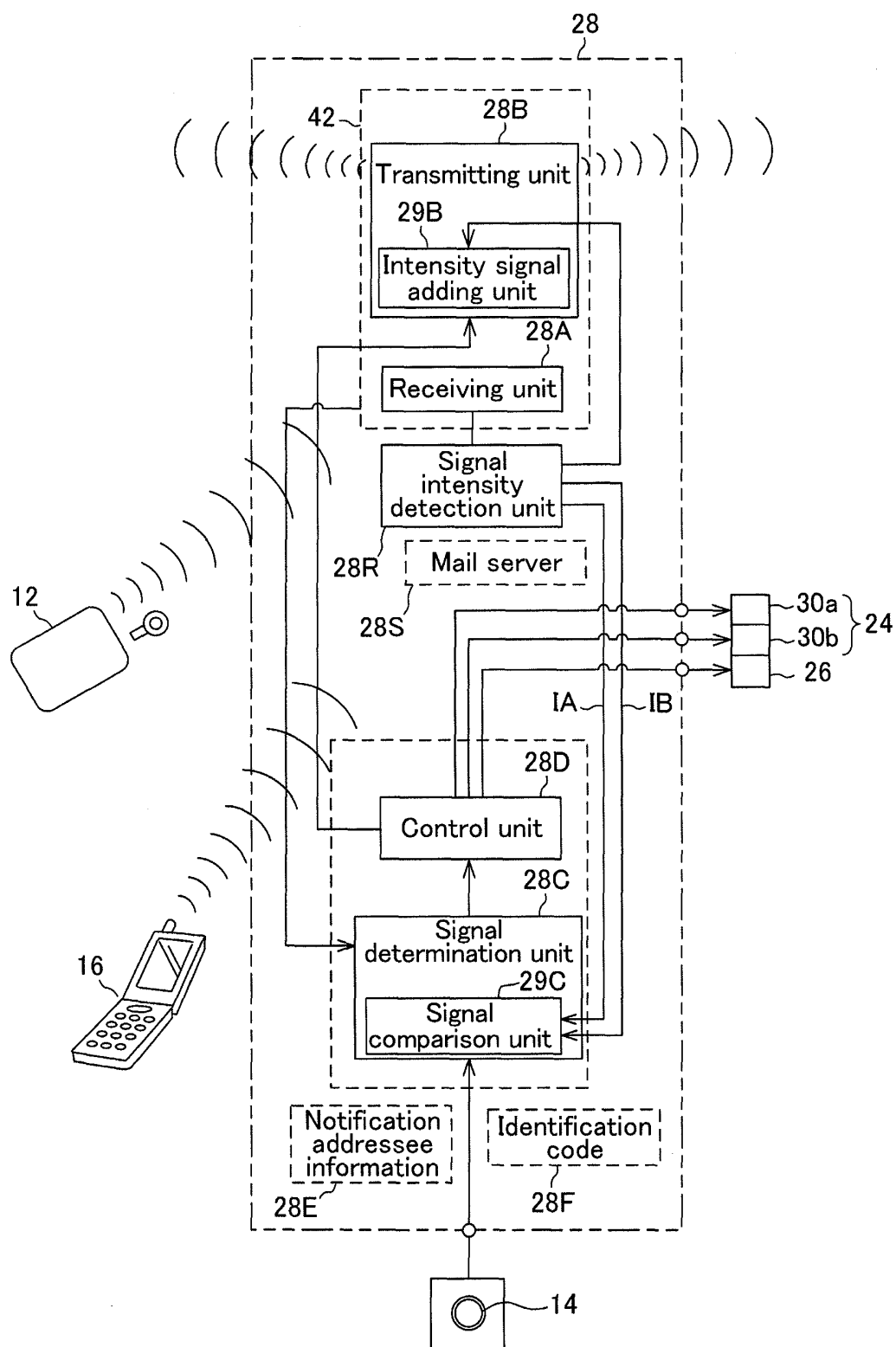


FIG.5

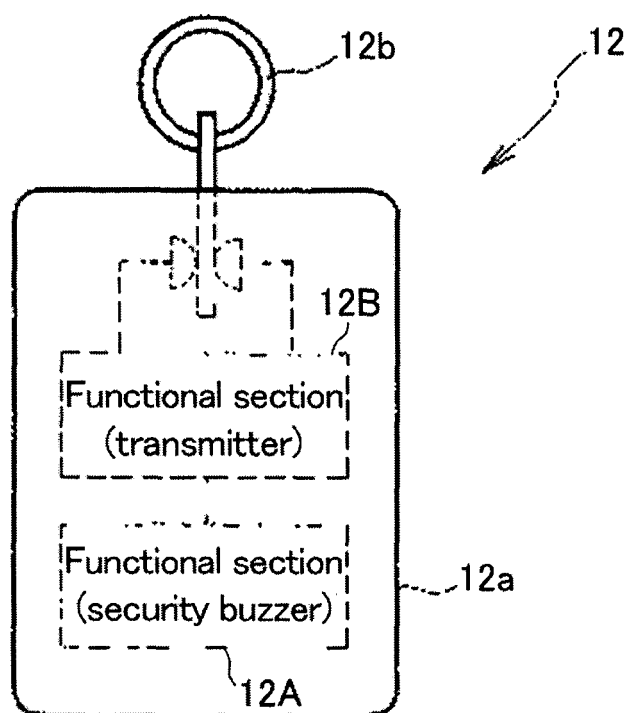


FIG.6

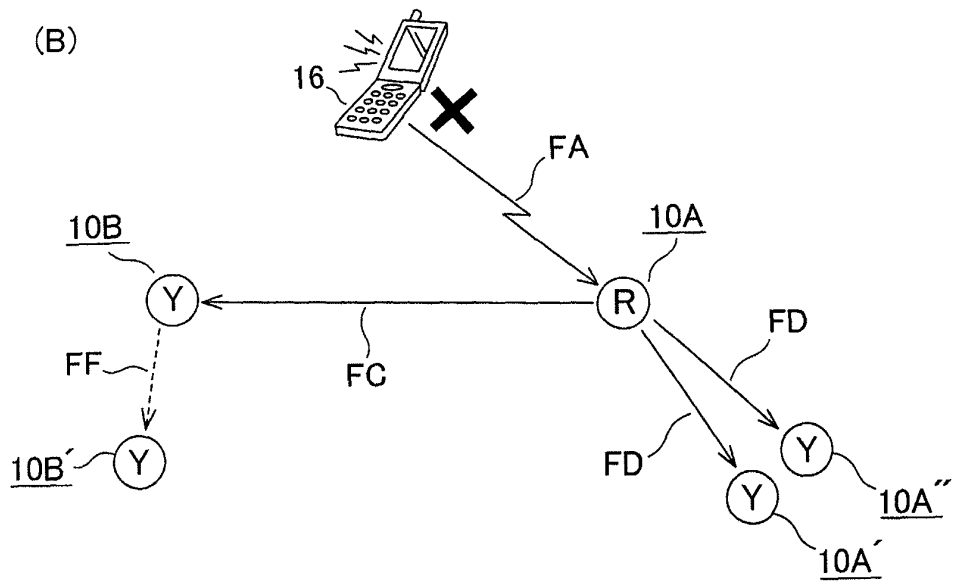
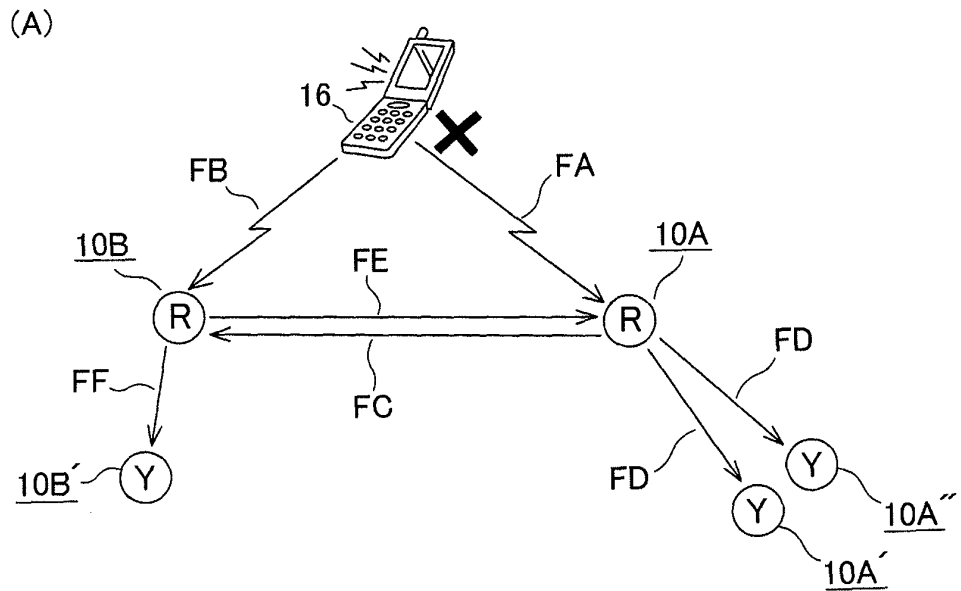


FIG.7

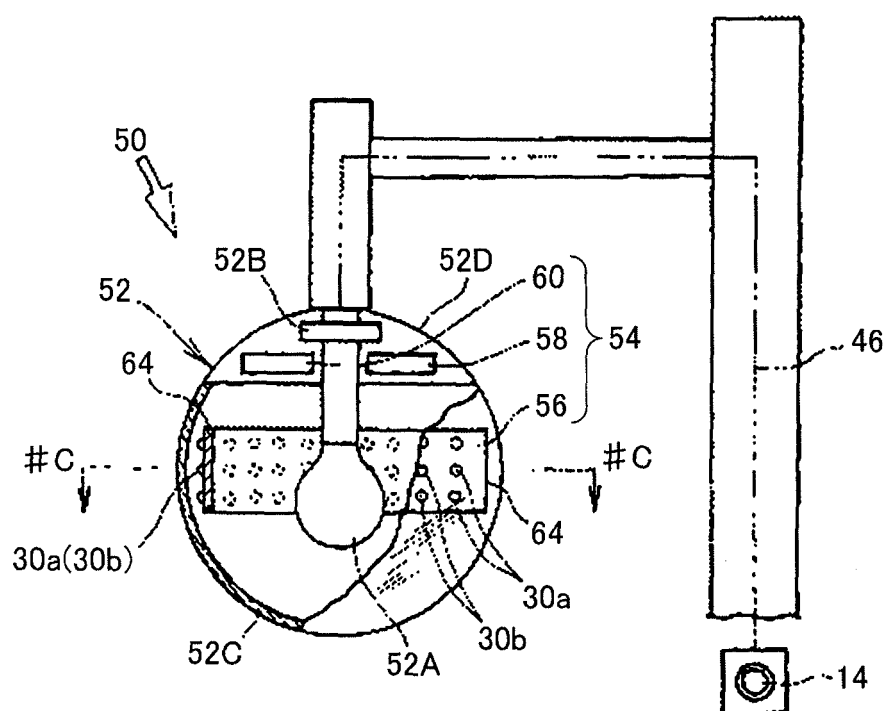


FIG.8

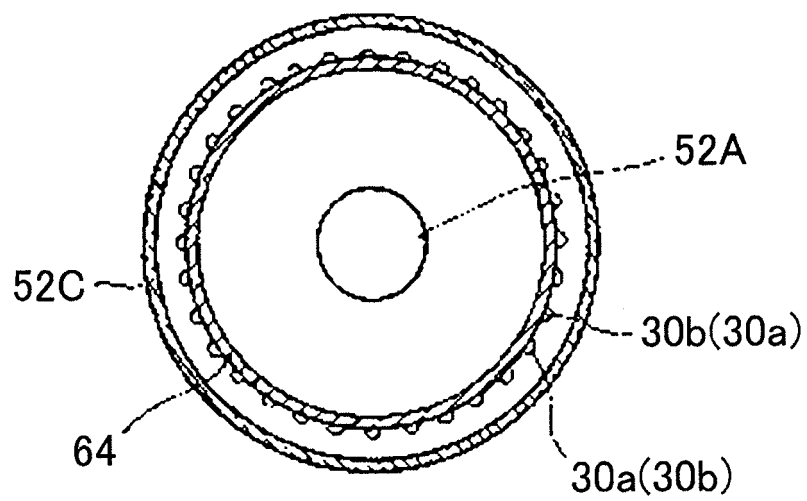


FIG.9

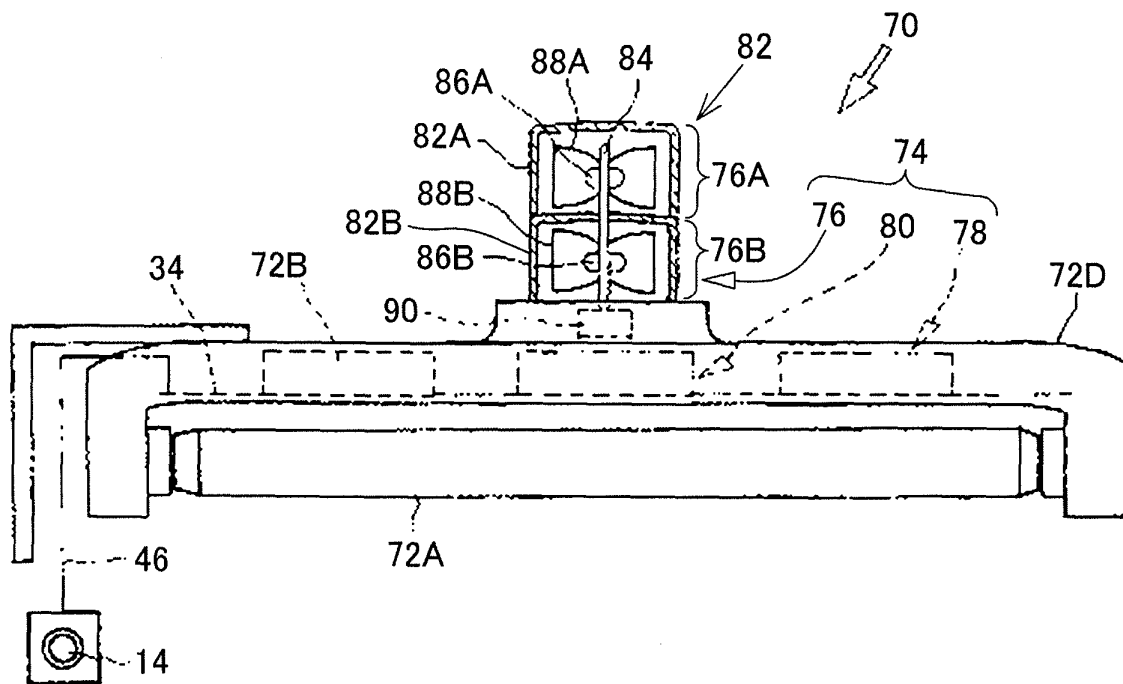


FIG.10

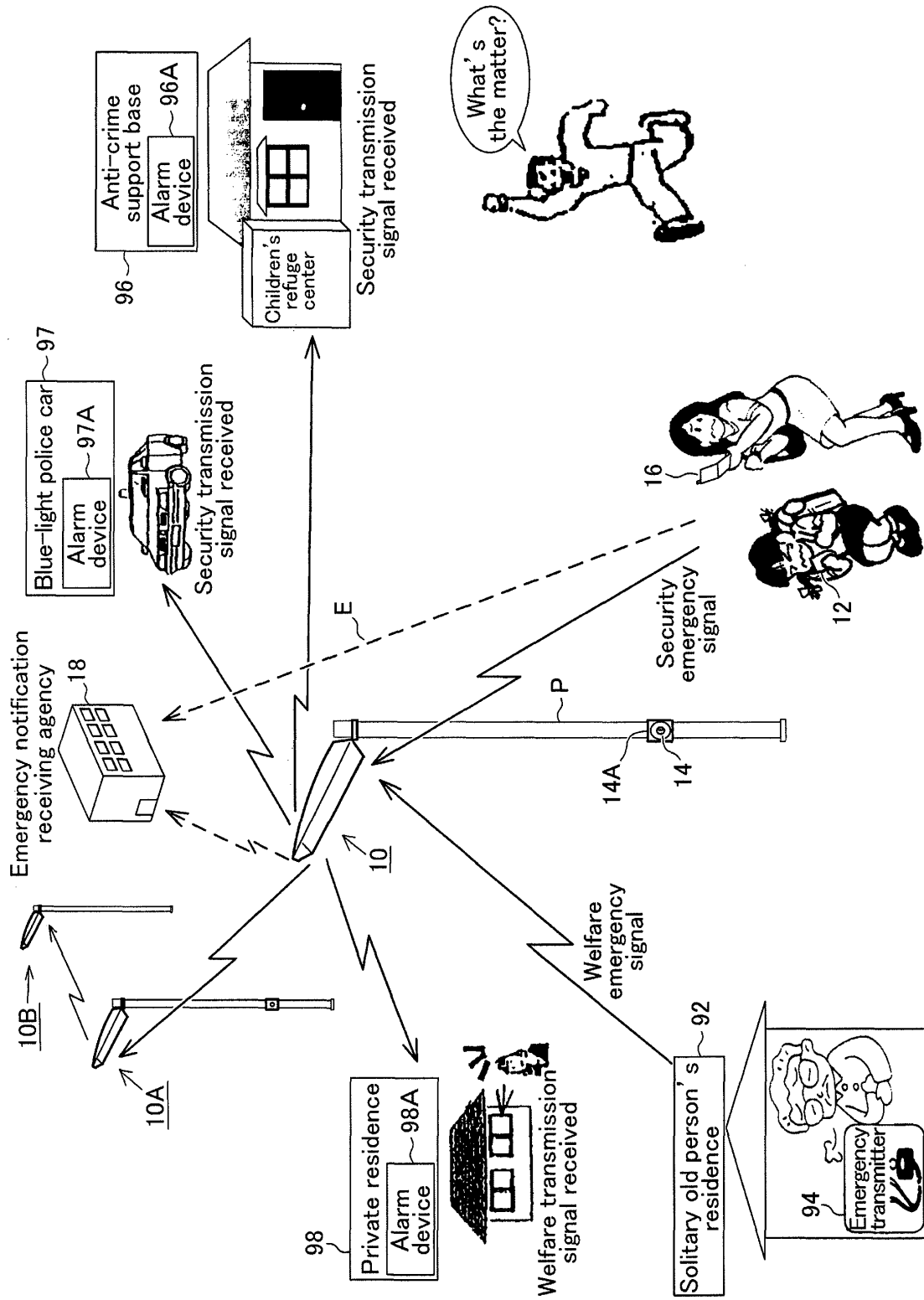


FIG.11

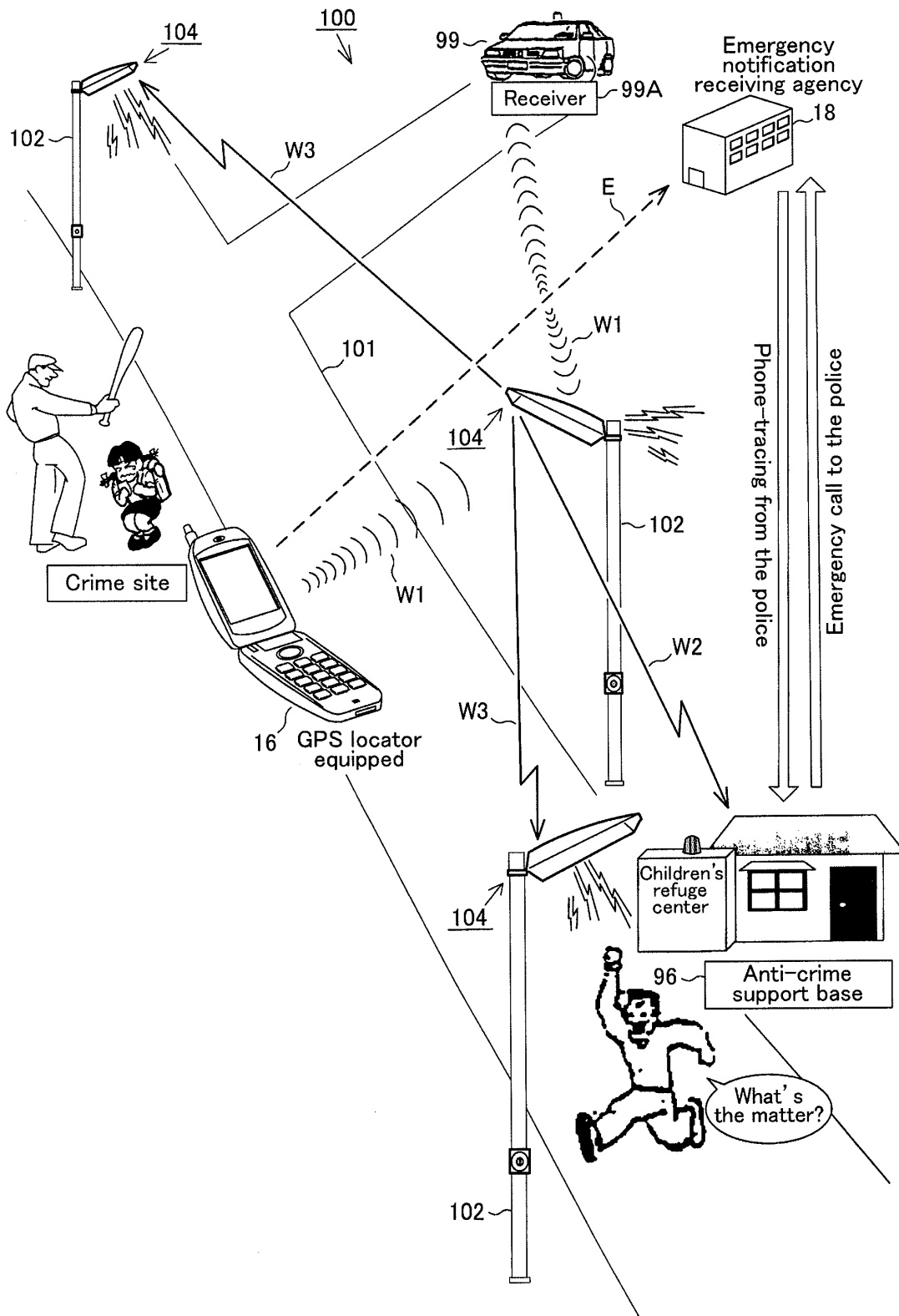


FIG.12

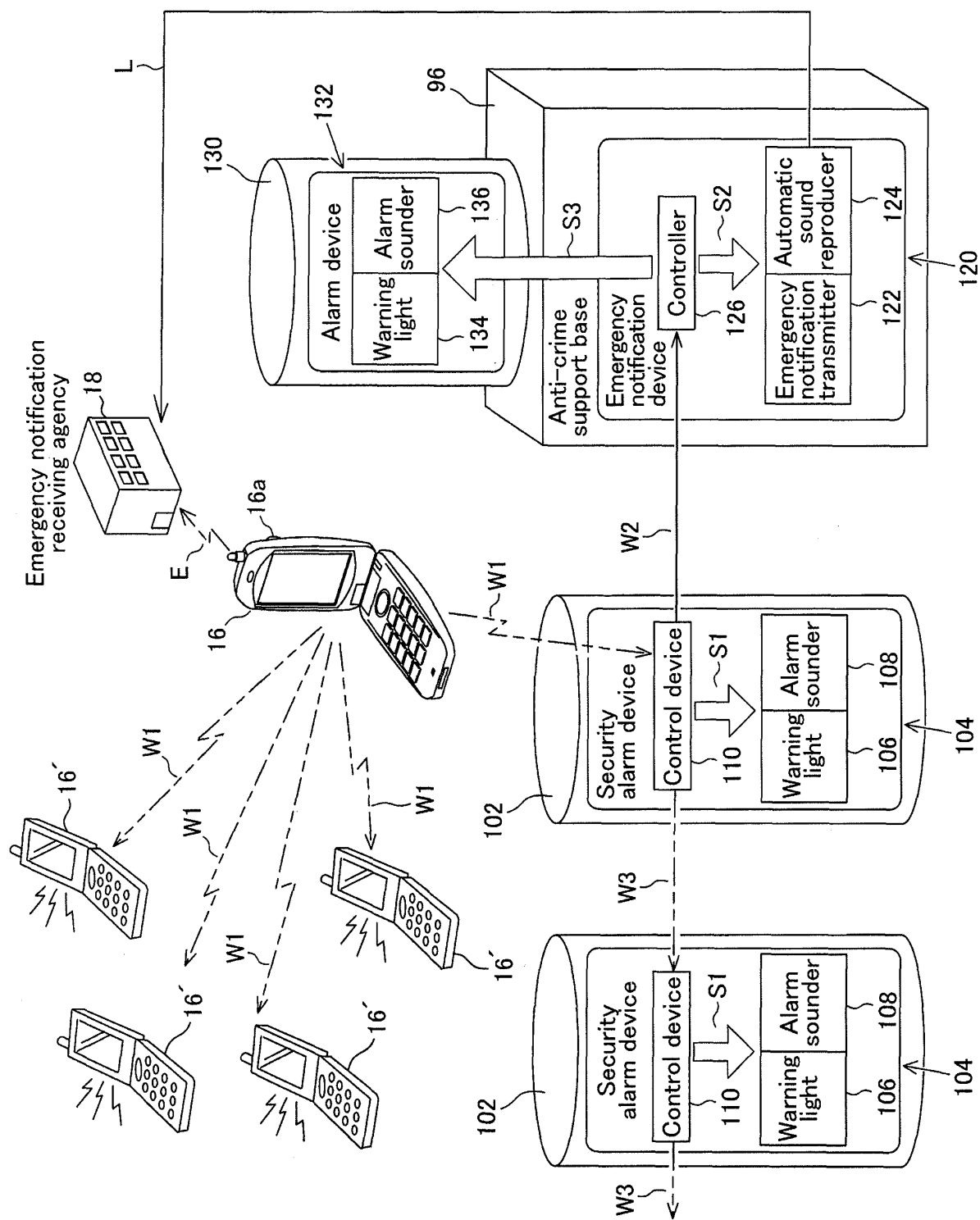


FIG.13

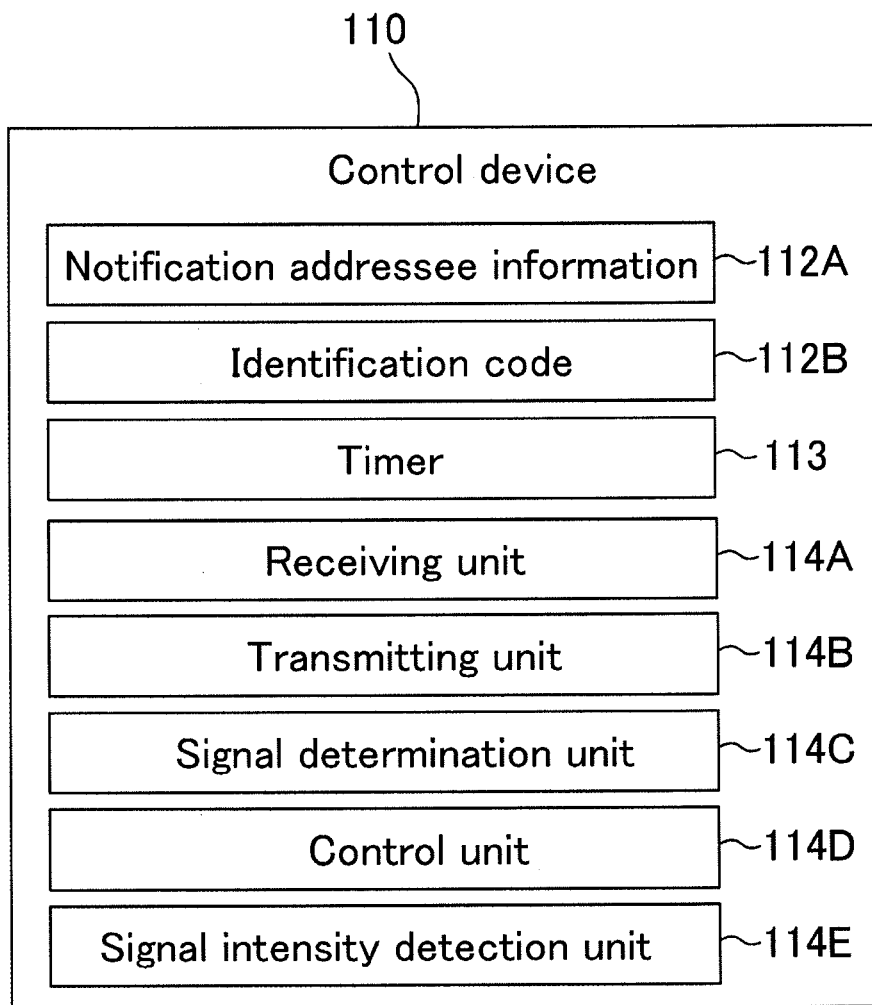


FIG.14

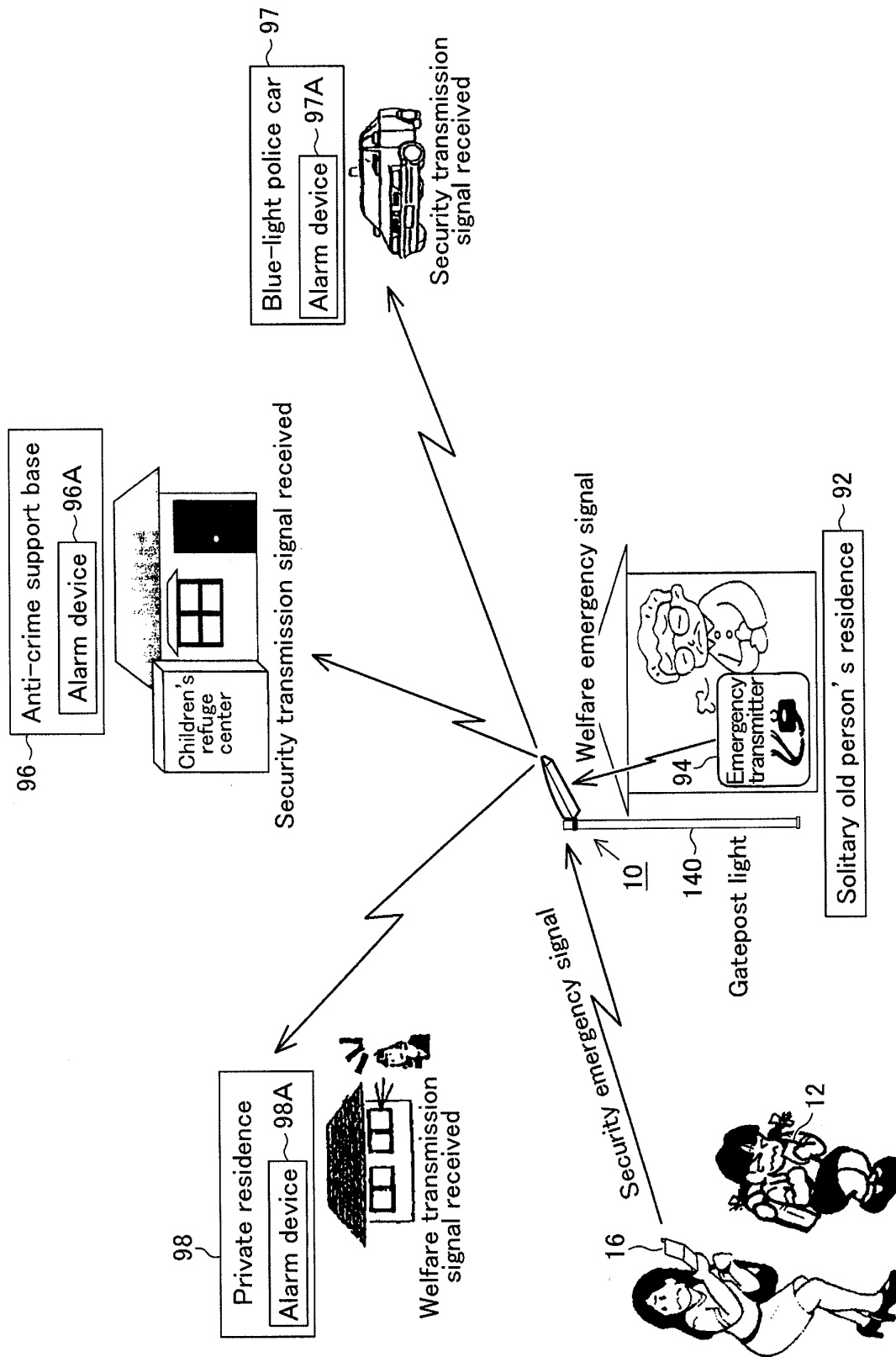
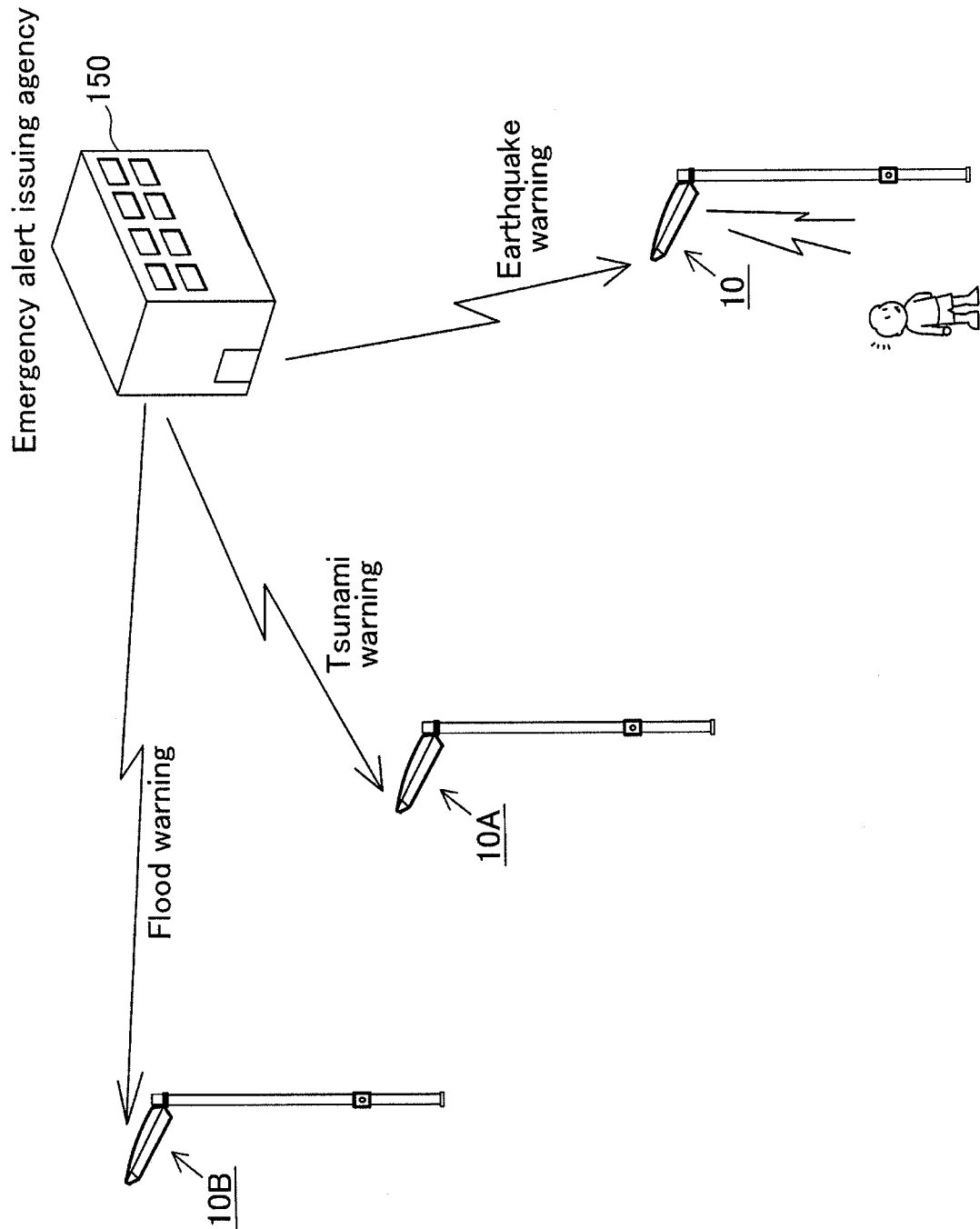


FIG.15



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2008/052887

A. CLASSIFICATION OF SUBJECT MATTER

G08B23/00(2006.01)i, F21S8/08(2006.01)i, G08B25/01(2006.01)i, G08B25/10(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G08B23/00, F21S8/08, G08B25/01, G08B25/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2008
Kokai Jitsuyo Shinan Koho	1971-2008	Toroku Jitsuyo Shinan Koho	1994-2008

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2002-334793 A (NEC Corp.), 22 November, 2002 (22.11.02), Par. Nos. [0015], [0016], [0021]; Fig. 1 (Family: none)	1, 2, 6, 11, 12, 14-19
A		3-5, 7-10, 13, 20-34
Y	JP 2004-311067 A (Kictec Inc.), 04 November, 2004 (04.11.04), Par. Nos. [0040], [0041], [0048], [0049]; Figs. 6, 7 (Family: none)	1, 2, 6, 11, 12, 14-19
Y	JP 2005-339291 A (Kyocera Corp.), 08 December, 2005 (08.12.05), Par. Nos. [0052] to [0057] (Family: none)	2, 6, 11, 12, 14-19

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

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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
14 March, 2008 (14.03.08)Date of mailing of the international search report
25 March, 2008 (25.03.08)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2008/052887

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CD-ROM of the specification and drawings annexed to the request of Japanese Utility Model Application No. 107348/1991 (Laid-open No. 2293/1993) (Osamu OTA), 14 January, 1993 (14.01.93), Par. Nos. [0006], [0010]; Fig. 1 (Family: none)	12, 14-19
Y	JP 2003-78590 A (Yugen Kaisha Sumato Komyunikeshon Fakutori), 14 March, 2003 (14.03.03), Par. Nos. [0096] to [0098], [0100], [0121] to [0123]; Fig. 8 (Family: none)	14-19
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