Title: SYSTEM, APPARATUS AND METHOD FOR KEEPING A PERSON UNDER SURVEILLANCE

Abstract: Provided are a surveillance system and method. The surveillance system includes: an ankle transceiver attached to a monitored subject's body, transmitting and receiving a wireless signal, and thereby monitoring whether or not the monitored subject carries a Portable Integrated Surveillance Device (PISD); the PISD for providing a location information signal of the monitored subject by a cellular method using a mobile communication base station or a Global Positioning System (GPS) using a satellite, and when a wireless signal is not received from the ankle transceiver, providing an abnormal signal and the location information signal; and a monitoring device for determining whether or not the monitored subject has violated a rule on the basis of the signal provided from the PISD.

Fig. 2

Published: with international search report
Description

SYSTEM, APPARATUS AND METHOD FOR KEEPING A PERSON UNDER SURVEILLANCE

Technical Field

[1] The present invention relates to a surveillance system and method, and more particularly, to a system and method for monitoring an offender by a cellular method using a Global Positioning System (GPS) tracking system or a mobile communication base station.

Background Art

[2] In general, a conventional electronic monitoring system is a punishment system for remotely checking and monitoring whether or not an offender is in his/her own residence other than a correctional institution and whether or not the offender is in a designated place at a designated time using electronic equipment, i.e., a Home Monitoring Unit (HMU).

[3] According to this method, an electronic bracelet is placed on the monitored subject, a signal received from the bracelet is transmitted to a control center, and thereby whether the monitored subject is in his/her residence is checked, or the control center regularly calls the monitored subject to check the same.

[4] The HMU is a home monitoring system that collects information on whether a house arrestee exists within or has broken away from a specific range using various systems, transfers it to a control center, and receives and processes a signal transferred from the control center. The HMU mainly comprises a verifier, a receiver, a processor, a telephone, and so on.

[5] The verifier is for transferring the unique number of a house arrestee to the control center so that the control center can remotely check whether a monitored person is the house arrestee. When the control center requests authentication from a user during a phone call, the user presses a button in a transmitter worn on his/her wrist or ankle for 3 to 9 seconds to transmit data for authentication to the receiver of the verifier. When the transmitted data is analyzed and equals the unique number of the house arrestee, the verifier transfers a verification signal to the control center and receives verification.

[6] The receiver receives a signal transmitted every 30 seconds from the transmitter constantly worn on his/her wrist, and transfers the signal's information to the processor.

[7] An alcohol sensor checks during a telephone call whether a house arrestee who is prohibited from drinking alcohol has drunk alcohol. According to a method of checking during a telephone call whether or not a person has drunk alcohol, an
Analog/Digital (A/D) converter installed in the HMU determines whether or not a person has drunk alcohol using an alcohol sensor installed in the telephone and transfers a signal corresponding to the determination to the processor, and then the processor transfers the signal to a monitoring station through a modem.

The telephone is for the control center to talk with a house arrestee and check his/her personal state. The telephone has been developed to conform to domestic telephone standards and operates in the same way as a common telephone, but has the alcohol sensor for detecting whether or not a user has drunk alcohol.

A transmitter is equipment that a house arrestee constantly wears on his/her wrist or ankle and automatically transmits its own location about every 30 seconds.

However, according to the conventional method, it is not possible to monitor the monitored subject when he/she is permitted to go out of a designated residence and move within a permitted area.

Disclosure of Invention

Technical Problem

The present invention is directed to a system and method for monitoring a monitored subject, e.g., an offender, that can accurately detect his/her location and prevent crime when the monitored subject is permitted to move within a permitted area, while permitting the monitored subject a predetermined degree of freedom of movement.

The present invention is also directed to appropriately operating a surveillance system while economizing on the battery power of a surveillance apparatus and communication cost.

Technical Solution

One aspect of the present invention provides a surveillance system comprising: an ankle transceiver attached to a monitored subject's body, transmitting and receiving a wireless signal, and thereby monitoring whether or not the monitored subject carries a Portable Integrated Surveillance Device (PISD); the PISD for providing a location information signal of the monitored subject by a cellular method using a mobile communication base station or a Global Positioning System (GPS) using a satellite, and when a wireless signal is not received from the ankle transceiver, providing an abnormal signal as well as the location information signal; and a monitoring device for determining whether or not the monitored subject has violated a rule on the basis of the signal provided from the PISD.

Another aspect of the present invention provides a method of monitoring a subject, comprising the steps of: requesting location check for a monitored subject; determining, at a PISD, whether or not a wireless transmission signal is received from a
transceiver attached to the monitored subject's body; tracking, at the PISD, a location of the monitored subject by a cellular method using a mobile communication base station or a GPS using a satellite; when a wireless signal is not received from the transceiver, transmitting, at the PISD, an abnormal signal and a location signal to a monitoring device, and when the wireless signal is received from the transceiver, transmitting the location signal to the monitoring device; determining, at the monitoring device, whether the monitored subject observes an established rule on the basis of the signal received from the PISD; and when it is determined that the monitored subject has violated the rule, transmitting a warning signal and notification information to the PISD and an associated observer, respectively. Here, violation of a rule indicates cases in which the monitored subject is in a prohibited area, the ankle transceiver is separated from the PISD for more than a predetermined time during movement, and so on. The ankle transceiver and the PISD transmit and receive a wireless signal to/from each other. When the monitored subject violates the rule and attaches the PISD to another moving object without carrying it on his body, or leaves it alone at a spot, the PISD cannot receive a signal from the wireless transceiver attached to the monitored subject. When the PISD cannot receive a wireless signal for the predetermined time, it transmits the abnormal signal informing that the monitored subject has violated the rule to the monitoring device. When such violation of the rule occurs, the monitoring device may provide the notification information to a victim, e.g., whom the monitored subject is prohibited from approaching, as well as to the associated observer of the monitored subject using various methods, such as a Short Message Service (SMS) text message, voice message, and so on.

In addition, the method may further comprise the step of obtaining, at a motion sensor of the PISD, movement or motion information of the monitored subject and transmitting the obtained information to the monitoring device. Thus, it is possible to more accurately estimate the state of the monitored subject in consideration of his/her motion as well as his/her location.

**Brief Description of the Drawings**

FIG. 1 illustrates the configuration of a conventional home monitoring system;

FIG. 2 illustrates the configuration of a surveillance system according to an exemplary embodiment of the present invention;

FIG. 3 is a block diagram of a Portable Integrated Surveillance Device (PISD) according to an exemplary embodiment of the present invention;

FIG. 4 is a block diagram of a monitoring device according to an exemplary embodiment of the present invention; and
FIG. 5 is a flowchart showing a method of monitoring a subject according to an exemplary embodiment of the present invention.

Best Mode for Carrying Out the Invention

Hereinafter, an exemplary embodiment of the present invention will be described in detail. However, the present invention is not limited to the exemplary embodiment disclosed below, but can be implemented in various types. Therefore, the present exemplary embodiment is provided for complete disclosure of the present invention and to fully inform the scope of the present invention to those ordinarily skilled in the art.

FIG. 2 illustrates the configuration of a surveillance system according to an exemplary embodiment of the present invention. Reference numeral 10 denotes a satellite, 20 denotes an ankle transceiver, 30 denotes a Portable Integrated Surveillance Device (PISD), 40 denotes a monitoring device, 50 denotes a Home Monitoring Unit (HMU), and 60 denotes a terminal of a person associated with a monitored subject. As illustrated in FIG. 2, according to the surveillance system of the present invention, when it is necessary to continuously monitor, for example, a habitual sex offender for protection and surveillance after a term of imprisonment, a small wireless transceiver, i.e., an electronic bracelet, is attached to the monitored subject's ankle or wrist, and a PISD having the mixed functions of a Global Positioning System (GPS) receiver and a cellular phone is placed around the monitored subject's waist, so that the proper authorities can know the habitual sex offender's movement at any time no matter where he/she goes. Consequently, the surveillance system is used to prevent sex crime.

When the monitored subject is in his/her house, he/she is monitored using the HMU and the ankle transceiver that are conventional electronic surveillance devices. When the ankle transceiver transmits a wireless transmission signal, the home monitoring unit sends the signal to a control center to check whether the monitored subject is in his/her house and monitor him/her. Here, the monitored subject is not allowed to attach and release the ankle transceiver without reason.

When the monitored subject moves out of his/her house, he/she is allowed to move with the PISD 30, which has the mixed functions of a GPS receiver and a cellular phone, and the small wireless transceiver 20, which is attached to his/her ankle, to monitor his/her location. The monitoring device 40 of the control center receives a location information signal from the PISD, and a location analyzer 43 extracts location information. The location analyzer 43 automatically analyzes and classifies the location information and converts it into voice information, text information and graphic information. The graphic information is displayed as a location on a map. The detected location is stored in a storage 45. A controller 42 compares information on the
detected location with monitored subject-specific permitted area information previously stored in the storage 45. When the detected location is out of the permitted area, the controller 42 transmits a warning signal to the PISD and provides notification information to an associated victim or to an associated person who performs a monitoring operation. Otherwise, when the monitored subject does not return to a permitted area from a limited area within a predetermined time after the warning signal is first transmitted to the monitored subject, a notification signal may be transmitted to the associated victim or to the associated person who performs the monitoring operation. The PISD carried by the monitored subject who has received the warning signal makes an alarm 36 warn him/her using one of voice, vibration and a Light Emitting Diode (LED) display according to control of the controller, thereby calling upon him/her to return to the permitted area.

[26] In addition, the PISD receives an electric wave signal emitted from the GPS satellite using a GPS receiver, receives a signal of the transceiver placed around the monitored subject's wrist or ankle using a radio frequency (RF) receiver, and transmitting the signals to the monitoring device, i.e., a protection and surveillance control center. When the monitored subject goes out without attaching or carrying the PISD, the PISD cannot receive a wireless signal from the ankle transceiver attached to his/her body. When this situation lasts for a predetermined time, the PISD transmits an abnormal signal to the monitoring device. Then, the monitoring device of the control center considers that the monitored subject has broken away from his/her residence without permission, and informs this to an associated person or the police to cope with the situation. In this way, it is possible to prevent the monitored subject from breaking away without permission.

[27] Meanwhile, when the monitored subject is in his/her house, communication is performed between the ankle transceiver and the HMU. Therefore, to reduce the battery consumption of the PSID, the monitoring device transmits a signal to the PISD to switch to a sleep mode, i.e., a standby mode. Then, when the monitored subject goes out, communication is not performed between the ankle transceiver and the HMU. When the HMU cannot perform communication for a predetermined time, the monitoring device of the control center considers that the monitored subject has gone out and transmits a signal to the PISD to switch to an operation mode.

[28] Electronic monitoring methods in the operation mode are classified into 3 types as described below.

[29] According to active tracking, location information, such as movement and location of a sex offender, is transmitted to the control center about every 2 to 3 minutes using a Code Division Multiple Access (CDMA) communication network. Active tracking is the strongest control means but has disadvantages of high communication cost and
short battery life.

Next, according to passive tracking, location data and events are continuously stored and transmitted to the control center at a designated time. Passive tracking requires low communication cost and can use a battery for the longest time because the system performs a minimal operation, but has a disadvantage in that control is limited.

Next, hybrid tracking is a method in which active and passive tracking methods are mixed. According to hybrid tracking, i.e., active + passive tracking, a monitored subject is monitored by the passive tracking method for a predetermined time period to reduce communication cost. However, when violation of a rule occurs, the system immediately and automatically switches to the active tracking mode, tracks the sex offender, and reports the result in real time to a control center. Since hybrid tracking transmits location information to the control center only upon violation of a rule, it requires a relatively satisfactory communication cost and has a relatively satisfactory battery life. A mode selector 46 is included in the monitoring device, and thus a monitored subject can be monitored in the operation mode according to a selected one of the methods.

Meanwhile, in order to efficiently and appropriately monitor movement of a monitored subject, it is important to constantly check a battery state of the PISD carried by the monitored subject through the monitoring device. Therefore, when the monitored subject stays in his/her residence, he/she is made to charge the PISD using a battery charging unit of the HMU, and the HMU transfers a signal informing a charge status to the monitoring device. On the other hand, when the monitored subject goes out, the PISD transmits a signal informing a battery charge status checked by a power monitor to the monitoring device.

FIG. 3 illustrates the configuration of the PISD 30 according to an exemplary embodiment of the present invention. The PISD is used to transmit and receive violation of a rule, the location of a monitored subject, etc., to/from a central control center. The PISD includes a wireless transceiver 32 and a wireless cellular modem 31 to receive a signal from an ankle transceiver and to transmit a wireless signal to a monitoring device. The PISD receives a signal from the ankle transceiver, and thereby it is possible to check that the monitored subject is carrying the PISD. A GPS receiver 33 receives a location signal from a satellite and tracks its own location (or tracks its own location by a cellular method using a mobile communication base station). The signal is transmitted to a controller 34 and transmitted back to the monitoring device of the control center. While controlling respective components overall, the controller transmits location information of the GPS signal received from the satellite to the monitoring device through the wireless cellular modem. When the wireless signal is not received from the ankle transceiver of the monitored subject for a predetermined
time, the controller transmits an abnormal signal to the monitoring device through the modem. A memory stores monitored subject identification information, respective location information received from the satellite, and motion information of the monitored subject obtained from a motion sensor. The motion sensor perceives motion of the monitored subject. Thus, it is possible to indirectly recognize a behavior of the monitored subject through his/her motion even when the location of the monitored subject is unknown, and it is also possible to more accurately recognize a state of the monitored subject when using the motion information together with location information. When a warning signal against violation of a rule is transmitted from the monitoring device, the alarm 36 performs one of voice warning, LED warning and vibration warning. In addition, when a battery life becomes a predetermined time period or less, the alarm 36 performs one of the abovementioned warnings according to a signal transferred from a power monitor. The PISD further includes a battery supplying power required for operation of the components, and the power monitor checking and informing the life of the battery to the monitoring device. As described above, the PISD operates on the premise that a monitored subject always carries it at his/her waist or other body part during movement. When the monitored subject moves without carrying the PISD, the PISD cannot receive the signal from the ankle transceiver of the monitored subject, thus transmitting an abnormal signal informing violation of a rule and a location signal to the monitoring device. On the other hand, when the monitored subject faithfully moves with the PISD, the PISD accurately informs only the location of the monitored subject to the monitoring device.

FIG. 4 illustrates the configuration of a monitoring device of a control center according to an exemplary embodiment of the present invention.

The monitoring device has a wireless transceiver transmitting and receiving a wireless signal from/to a PISD, an HMU, and a participant terminal. A location analysis means extracts location information from a location signal transmitted from the PISD, and detects in real time the current location of a monitored subject. Information on the detected location is displayed on a display as a graphic. The storage stores unique identification information, checked location information, limited area information and rule information on the monitored subject. The controller compares the area information stored in the storage with the location information detected by the location analysis means to determine whether the monitored subject has violated a rule. When the monitored subject has violated a rule, the controller 42 transmits a warning signal to the PISD of the monitored subject and provides notification information to an associated person. Also, when an abnormal signal is received from the PISD, the controller 42 considers that the monitored subject has
violated a rule and transmits the same warning and alarm signals. In addition, when the controller 42 receives a wireless signal in communication with an HMU, it controls the PISD carried by the monitored subject to switch to the sleep mode. On the other hand, when a wireless signal is not received from the HMU, the controller 42 determines that the monitored subject has gone out and promptly controls the PISD of the monitored subject to switch to the operation mode. Furthermore, in order to reduce power consumption and communication cost, the controller 42 selects an appropriate surveillance mode by the mode selector 46 as occasion demands. In the operation mode, it is possible to select one of the active tracking mode, the passive tracking mode and the hybrid, i.e., active + passive, tracking mode. If the PISD operates in the passive tracking mode while the monitored subject is out, location information not yet transmitted to the monitoring device may remain when the monitored subject returns to his/her residence. Therefore, the PISD checks whether there is nontransmitted location information before switching to the sleep mode according to control of the monitoring device. When there is nontransmitted location information, the PISD transmits it to the monitoring device.

In addition, an associated person who performs a monitoring operation and a victim associated with the monitored subject, e.g., whom the monitored subject is prohibited from approaching, are allowed to access the monitoring device of the control center through a wired/wireless communication network, such as the Internet, a public switched telephone network (PSTN), a wireless communication network, etc., and obtain location information of the monitored subject in person. Even when the monitored subject has not violated a rule, the associated person and the victim are allowed to request the monitoring device for location information and to know movement of the monitored subject at any time.

FIG. 5 is a flowchart showing a method of monitoring a subject according to an exemplary embodiment of the present invention.

A monitoring device requests location check of a monitored subject according to a selected surveillance mode (step S501). A wireless signal is received from a wireless transceiver (step S502). The PISD of the monitored subject tracks the location of the monitored subject by a cellular method using a mobile communication base station or a GPS using a satellite (step S503). The PISD transmits an abnormal signal and a location signal to the monitoring device when a wireless signal is not received from the transceiver of the monitored subject, and transmits a location signal to the monitoring device when a wireless signal is received from the transceiver (step S504). The monitoring device determines whether or not the monitored subject has violated a rule on the basis of the signal received from the PISD (step S505). When the abnormal signal is received, or it is determined that the monitored subject is out of a permitted
area after extracting location information from the location signal and comparing it with regulated location information, it is determined that the monitored subject has violated a rule. In this case, a warning signal and notification information are transmitted to the PISD and an associated person, respectively (step S506). In addition, the method further includes the step of obtaining, at the motion sensor of the PISD, motion information of the monitored subject and transmitting it to the monitoring device. The motion sensor perceives motion of the monitored subject. Thus, it is possible to indirectly recognize a behavior of the monitored subject through his/her motion even when the location of the monitored subject is unknown, and it is also possible to more accurately recognize a state of the monitored subject when using the motion information together with location information. In particular, this may be more useful when it is necessary to know movement or motion of a monitored subject, such as a dementia patient and a child. This is because when there is no motion for a predetermined time, it is possible to determine that the subject has an emergency situation and cope with the situation. In addition, the method further includes the steps of: determining whether a wireless signal is transmitted from an HMU to the monitoring device; when the wireless signal is received, determining that the monitored subject is in his/her residence, and transmitting a control signal so that the PISD switches to the sleep mode to reduce battery consumption; and when the wireless signal is not received from the HMU, determining that the monitored subject has gone out, and transmitting a control signal so that the PISD switches from the sleep mode to the operation mode. Furthermore, in order to constantly monitor a battery state of the PISD, the method further includes the steps of: when the monitored subject is out, and the PISD is in the operation mode, informing, at the power monitor of the PISD, a battery state to the monitoring device; and when the monitored subject is in his/her residence, informing, at the HMU, a battery charge status of the PISD, which is connected to the charging unit of the HMU and charged, to the monitoring device.

[39] Although the above descriptions are made with the example of a criminal offender, they also can be applied to a person who needs protection, e.g., a child, a patient, an aged person, etc., in the same way.

[40] While the invention has been shown and described with reference to certain exemplary embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

[41] Industrial Applicability

[42] According to the surveillance system and method of the present invention,
movement of a monitored subject, particularly an offender, is detected in real time, whether the monitored subject violates a rule is determined, warning and notification information according to the determination is provided to the monitored subject in movement, an associated observer, etc., and thus it is possible to efficiently prevent crime.

[43] In addition, it is distinguished whether the monitored subject is in or out of his/her residence. Even when a Portable Integrated Surveillance Device (PISD) is in an operation mode, it is possible to appropriately perform surveillance while efficiently economizing on battery consumption and communication cost by selecting one of 3 surveillance modes.

[44]
Claims

[1] A surveillance system, comprising:
an ankle transceiver attached to a monitored subject’s body, transmitting and receiving a wireless signal, and monitoring whether or not the monitored subject carries a Portable Integrated Surveillance Device (PISD);
the PISD for providing a location information signal of the monitored subject by a cellular method using a mobile communication base station or a Global Positioning System (GPS) using a satellite, and when a wireless signal is not received from the ankle transceiver, providing an abnormal signal as well as the location information signal; and
a monitoring device for determining whether or not the monitored subject has violated a rule on the basis of the signal provided from the PISD.

[2] The surveillance system of claim 1, wherein when it is determined that the monitored subject has violated a rule, the monitoring device transmits a warning signal to the PISD and notification information to an associated observer or a victim associated with the monitored subject.

[3] The surveillance system of claim 1 or 2, wherein the monitoring device transmits a location check command signal to a Home Monitoring Unit (HMU) at regular intervals, and when a check signal corresponding to the check command signal is received from the HMU, transmits a control signal so that the PISD switches to a sleep mode.

[4] The surveillance system of claim 1 or 2, wherein the monitoring device transmits a location check command signal to a Home Monitoring Unit (HMU) at regular intervals, and when a check signal corresponding to the check command signal is not received from the HMU, transmits a control signal to switch the PISD to an operation mode.

[5] The surveillance system of claim 3, wherein when the PISD is charged through the HMU, the HMU transfers a signal informing a charge status to the monitoring device.

[6] The surveillance system of claim 4, wherein the PISD transmits a signal informing a battery charge status to the monitoring device.

[7] The surveillance system of claim 3, wherein before switching to the sleep mode, the PISD checks whether there is location information not transmitted to the monitoring device, and when there is nontransmitted location information, transmits the nontransmitted location information.

[8] A Portable Integrated Surveillance Device (PISD), comprising:
a wireless transceiver for transmitting and receiving a wireless signal;
a Global Positioning System (GPS) receiver for receiving a GPS signal from a satellite;
a wireless cellular modem for communicating with an external monitoring device through a cellular phone network;
a memory for storing identification information of a monitored subject's transceiver, received respective location information, and motion information;
a motion sensor for perceiving motion of the monitored subject;
a controller for controlling respective components overall, transmitting location information to the monitoring device by a cellular method using a mobile communication base station or a GPS using the satellite, and when a wireless signal is not received from the monitored subject's transceiver for a predetermined time, controlling a location signal and an abnormal signal to be transmitted to the monitoring device;
an alarm for performing one of voice warning, Light Emitting Diode (LED) warning, and vibration warning when a warning signal against violation of a rule of the monitored subject is received, or battery life becomes a predetermined time period or less;
a battery for supplying power required for operation of the components; and
a power monitor for checking a life of the battery.

[9] The PISD of claim 8, wherein when the power monitor perceives a battery charge status, the controller controls a signal informing the battery charge status to be transmitted to the external monitoring device.

[10] An apparatus for monitoring a location of a subject, comprising:
a wireless transceiver for transmitting and receiving a wireless signal;
a storage for storing unique identification information on a monitored subject, checked location information, motion information, limited area information and rule information;
a location analysis means for extracting a location signal from a wireless signal transmitted through a wireless communication network and detecting in real time a current location of the monitored subject;
a display for displaying the detected location;
a mode selector for selecting a surveillance mode for the monitored subject; and
a controller for controlling the respective components, communicating with a Home Monitoring Unit (HMU), controlling a Portable Integrated Surveillance Device (PISD) carried by the monitored subject to switch to a sleep mode when a wireless signal is received, controlling the PISD of the monitored subject to switch to an operation mode when the wireless signal is not received, determining whether the monitored subject violates a rule, and transmitting a
warning signal to the PISD of the monitored subject and notification information
to an associated person when the monitored subject has violated a rule.

[11] The apparatus of claim 10, wherein one of an active tracking mode, a passive
tracking mode and a hybrid (active + passive) tracking mode is selected as the
operation mode.

[12] A method of monitoring a subject, comprising the steps of:
requesting location check for a monitored subject;
determining, at a Portable Integrated Surveillance Device (PISD), whether a
wireless transmission signal is received from a transceiver attached to the
monitored subject's body;
tracking, at the PISD, a location of the monitored subject by a cellular method
using a mobile communication base station or a Global Positioning System
(GPS) using a satellite;
when a wireless signal is not received from the transceiver, transmitting, at the
PISD, an abnormal signal and a location signal to a monitoring device, and when
the wireless signal is received from the transceiver, transmitting the location
signal to the monitoring device;
determining, at the monitoring device, whether the monitored subject observes
an established rule on the basis of the signal received from the PISD; and
when it is determined that the monitored subject has violated the rule,
transmitting a warning signal and notification information to the PISD and an
associated observer, respectively.

[13] The method of claim 12, further comprising the step of:
 obtaining and transmitting motion information of the monitored subject to the
 monitoring device.

[14] The method of claim 12, further comprising the step of:
 when a wireless signal is received from a Home Monitoring Unit (HMU), de-
termining that the monitored subject is in his/her residence and transmitting a
control signal so that the PISD switches to a sleep mode, and when the wireless
signal is not received, determining that the monitored subject has gone out and
transmitting a control signal so that the PISD switches to an operation mode.

[15] The method of claim 12, further comprising the step of:
 informing, at a Home Monitoring Unit (HMU), a battery charge status of the
PISD to the monitoring device in a sleep mode, and informing, at the PISD, the
battery charge status to the monitoring device in an operation mode.

[16] The method of claim 12, further comprising the step of:
 providing a realtime location of the monitored subject through a wired/wireless
communication network using an automatic response service (ARS), the internet,
a notification message, etc., according to a request from the associated observer or a victim.
[Fig. 5]

1. REQUEST LOCATION CHECK (S501)
2. RECEIVE WIRELESS SIGNAL FROM ANKLE TRANSCEIVER (S502)
3. TRACK LOCATION USING SATELLITE/BASE STATION (S503)
4. RECEIVE WIRELESS SIGNAL FROM PSTD (S504)
5. DETERMINE WHETHER OR NOT RULE HAS BEEN VIOLATED (S505)
   - If N, go back to S501
   - If Y, WARNING AND ALARM (S506)
A. CLASSIFICATION OF SUBJECT MATTER

H04N 7/18(2006.01)1

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)

IPC 8 GOIS 17/06, G08B 21/00, G08B 23/00, G08B 25/10

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

Korean Utility models and applications for Utility Models since 1975

Japanese Utility Models and application for Utility Models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKIPASS (KIPO internal) "monitoring system","wrist","surveillance"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Date of the actual completion of the international search

15 FEBRUARY 2008 (15.02.2008)

Date of mailing of the international search report

15 FEBRUARY 2008 (15.02.2008)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea

Authorized officer

NAM, Ock Woo

Facsimile No 82-42-472-7140

Telephone No 82-42-481-5713
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