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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ANTI-THEFT ALARM SYSTEM

(57) Abstract: The invention relates to an anti-theft alarm system which comprises a detecting sensor (2), detecting electronics (8; 6, 9, 11) and alarm means (4, 6, 8) provided with a sound signal device (4). The detecting sensor (2), detecting electronics (8; 6, 9, 11), and alarm means (4, 6, 8) are connected to a portable digital information medium, which may be a telecommunication means (1) or a pocket computer. Especially when connected to a mobile phone, the anti-theft alarm system can be connected to use at least partly the same alarm means (4, 6) as the mobile phone uses for alarming of incoming telephone calls. The anti-theft alarm can be distinguished from other alarms by means of a different alarm sound.
Anti-theft alarm system

The invention relates to an anti-theft alarm system which comprises a detecting sensor, detecting electronics, a power supply, and alarm means, including a sound signal device, wherein the detecting sensor, detecting electronics, and alarm means are connected to a portable digital information medium, such as a telecommunication means or a pocket computer.

Known are battery-operated anti-theft alarm systems intended for home use, which are attached to a desired point on a wall and comprise a numeric keypad for activating and inactivating the alarm system. This type of an alarm system is not suitable for taking along, for example, during travel to protect personal property and to improve safety, for example, in night time.

On the other hand, for example, from the patent publication US 5,278,888 is known an intelligent burglar alarm which can be connected directly to the telephone network from which the device obtains its operating power supply. This device is also a relatively expensive separate device intended to be used only as a burglar alarm and which is only suitable for use in offices and homes when permanently installed, but not as a portable personal safety device.

In the present invention the detecting sensor receives an infrared signal which is emitted by the object to be monitored, as is usual with the conventional rigidly mounted burglar alarms. A bi-directional active sensor with reflecting mirror is not needed as in the system according to EP-0782310. So, the present invention is a true personal burglar alarm for versatile circumstances of use.

The aim of the invention is to provide an anti-theft alarm system which is suitable for use as a portable personal safety device, which can be located freely at a desired monitoring site and is in addition inexpensive as regards costs.
This aim is achieved by means of the invention in such a way that the detecting sensor is an infrared detector with a limited observation beam which can be aimed through the selection of the position of the anti-theft alarm system, the infrared detector being adopted to detect infrared radiation emitted by the object to be observed. A mobile phone, especially, is an information medium which is carried by an increasing number of people on their person. At a relatively low additional cost, the detecting sensor, such as an infrared detector and/or an infrasound sensor, can be connected so as to use at least partly the same alarm means as the telecommunication means - such as a mobile phone - uses for alarming of incoming message signals, such as telephone calls.

The idea behind the invention is, therefore, to integrate an anti-theft alarm system into the type of digital information medium which is in any case carried on one's person, and the component parts and functions and facilities of which can be utilised as a part of the anti-theft alarm system in such a way that only a detecting sensor and a small amount of electronics need to be added to the information medium, as well as making some minor changes and additions to the processor program.

The invention is illustrated in the following with reference to the appended drawings, in which

Figure 1 shows the combination of an anti-theft alarm system and a telecommunication means relating to the invention as a block diagram, and

Figure 2 shows the anti-theft alarm system relating to the invention when integrated into a mobile phone.

The telecommunication means shown in Figure 1, such as a mobile phone, comprises a keypad 5 by means of which the processor 9 can be given commands and instructions via an ASIC circuit 6. The processor 9 carries out
the functions and facilities requested on the keypad 5 in accordance with the programs stored in the memory 11. Different operate conditions of the communication means, information stored in the memory 11, and received text or image messages can be monitored on the display 10 by means of numerical messages, text messages or image messages. The data management system comprised of the keypad 5, the processor 9 and the memory 11 is in bilateral data communication with a mobile telephone network through radio, via an antenna 7. The ASIC circuit 6 also includes a sound signal device 4 for sounding different alarms. Such alarms include, for example, a notice of an incoming phone call or text message, or an alarm clock alarm or calendar alarm. According to the invention, to this group of alarms has been added an anti-theft alarm, for which purpose a detecting sensor 2 has been connected to the information medium. The detector sensor detects an infrared signal which is emitted by the object to be monitored. The detecting sensor 2 is, for example, an infrared detector with a limited observation beam 3 which can be aimed through selection of the position of the information medium. The detecting sensor 2 may also be an infrasound detector which reacts to sounds below the audibility range caused, among other things, by opening doors or windows. Both of the above-mentioned types of sensors may also be used, and can optionally be activated either separately or so as to be used together.

To the ASIC circuit 6 is connected an electronic component 8 which adapts the signal of the detecting sensor 2 to the data bus of the processor 9. The electronic component 8 may also comprise means for switching the connection between the detector 2 and the processor 9 on or off to activate the device as an anti-theft alarm system or to inactivate it. The control of the electronic component 8 may take place by means of a separate additional key or number code which can be entered by means of the numeric keypad 5 serving the usual information functions and facilities of the information medium. Alternatively, this activation and inactivation may also take place by means of a program stored in the memory 11 which is commissioned or decommissioned by a number code on the keypad 5. Naturally, operation may also be based on a combination
where the program in the memory 11 controls one or more electronic switches of
the electronic component 8 on the basis of a number code entered on the
keypad 5.

The operate condition as an anti-theft alarm system can also be shown on the
display 10, for example, "security alarm; sensors 1 and 2 in activated; sound
signal alarm; alarm call".

In addition to the device sounding an anti-theft alarm by means of the sound
signal device 4, an unconfirmed anti-theft alarm can be arranged to be sent,
after a set time, as an alarm message through radio to a preselected alarm
number in the mobile phone network. The sound signal device 4 has an alarm
sound selected by means of a program, which sound may be similar to or
different from other normal calls, such as the alarm for an incoming phone call.

If the same alarm sounds are used as for other alarms, for example, the wake-
up alarm sound or even an incoming phone call sound, on the display should
read, for example, "alarm - contact police", whereby pressing one shortcut key
would start the alarm call. An alarm system calling an alarm number can be
provided with an optional operate condition in which the alarm is not given by a
sound signal device but instead only the alarm call to the selected number is
made. When the alarm call is answered, sounds in the space monitored can be
listened via the mobile phone that gave the alarm. Instead of a sound signal
device 4, or in addition to it, the signalling can also be carried out by means of a
signal light.

Figure 2 shows the placing of the infrared detector 2 in a mobile phone in such
a way that the direction of the observation beam 3 of the infrared detector 2 is
essentially the same as the direction of the longitudinal axis of the mobile phone
1. When the observation beam 3 is sufficiently narrow, the mobile phone can
easily be placed in alarm status into such a position that, for example, in a hotel
room, there will be limited possibilities for staying and moving in the room
without an alarm being sounded. When an infrasound detector is used, the
alarm must comprise alarm limit sensitivity control, for which may be arranged a separate adjusting knob or software controlling the electronic component 8 in the program memory 11, whereby the processor will commission the selected program on the basis of option instructions entered on the keypad 5.

The digital information medium 1 has its own accumulator or battery which also acts as the power supply of the anti-theft alarm system relating to the invention. In standby status, the power consumption of the anti-theft alarm system is very low compared with, for example, the power consumption of a mobile phone, and thus the need for charging the accumulator or battery does not increase to any significant degree as a result of the additional facility relating to the invention.
Claims

1. An anti-theft alarm system which comprises a detecting sensor (2), detecting electronics (8; 6, 9, 11), a power supply, and alarm means (4, 6, 8), including a sound signal device (4), wherein the detecting sensor (2), detecting electronics (8; 6, 9, 11), and alarm means (4, 6, 8) are connected to a portable digital information medium, such as a telecommunication means (1) or a pocket computer, characterised in that the detecting sensor (2) is an infrared detector with a limited observation beam (3) which can be aimed through the selection of the position of the anti-theft alarm system, the infrared detector (2) being adopted to detect infrared radiation emitted by the object to be observed.

2. An anti-theft alarm system as claimed in claim 1, characterised in that the information medium is a mobile phone (1).

3. An anti-theft alarm system as claimed in claim 1 or 2, characterised in that the detecting sensor (2) is connected so as to use at least partly the same alarm means (4, 6) as the telecommunication means (1) uses for alarming of incoming message signals, such as telephone calls.

4. An anti-theft alarm system as claimed in any of the claims 1 to 3, characterised in that the information medium (1) can be activated as an anti-theft alarm system, or inactivated by means of a number code which can be entered by means of the numeric keypad (5) serving the information functions and facilities of the information medium.

5. An anti-theft alarm system as claimed in any of the claims 1 to 4, characterised in that an unconfirmed anti-theft alarm is arranged to be sent, after a set time or by a shortcut key, as an alarm message through radio to a preselected alarm number in the mobile phone network.
6. An anti-theft alarm system as claimed in any of the claims 1 to 5, **characterised** in that the detecting sensor (2) is an infrared detector and/or an infrasound detector, and the signal device (4) is a sound signal device and/or a signal light.

7. An anti-theft alarm system as claimed in claim 2, **characterised** in that the direction of the observation beam (3) is essentially the same as the direction of the longitudinal axis of the mobile phone (1).

8. An anti-theft alarm system as claimed in any of the claims 1 to 7, **characterised** in that the anti-theft alarm system has an alarm sound which can be selected through a program, which sound may be similar to or different from the alarm sound for incoming message signals to the telecommunication means (1).

9. An anti-theft alarm system as claimed in any of the claims 1 to 8, **characterised** in that the detecting electronics (8; 6, 9, 11) of the anti-theft alarm system are arranged to use at least partly the same electronic components as the information medium (1) uses when functioning as a telecommunication means or pocket computer.
INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 01/00310

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04M 11/04, G08B 13/19
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)

IPC7: H04M, G08B

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

SE, DK, FI, NO classes as above

Electronic database consulted during the international search (name of database and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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[X] Further documents are listed in the continuation of Box C.  [X] See patent family annex.

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