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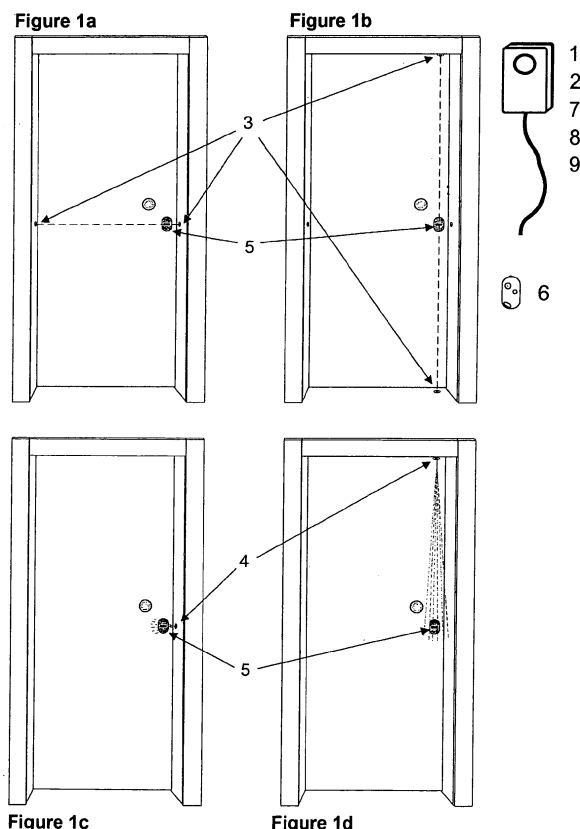
(54) **Door alarm system**

(57) The door alarm is a system consisting of a central alarm unit which includes a power supply, a siren and a remote control system, with two photoelectric sensors (3), or one ultrasonic sensor (4) and a wireless remote control transmitter (6) for arming and disarming the alarm.

The sensors (3) are placed-implanted in the vertical exterior parts of the door frame, at the height of the lock (5) and any interference from tools or hands with the lock activates the alarm. The ultrasonic sensor (4) is placed on the straight line from which its bundle comes through, vertically or horizontally in front of the lock.

The advantage of this alarm is that it prevents any burglary attempt and damage of the door and the lock.

DRAWING 1



Description

[0001] The invention refers to an exterior door alarm system.

[0002] According to the current state of art, today there are many alarm systems and tools, like magnetic traps, microwave rays, infrareds etc. The main technical problem created by the use of these systems, is that these systems and tools generally monitor, the exterior and interior places of a house or a commercial place, without total and particular targeting. Furthermore, most of these alarms work repressively. That is, they are activated after the burglary of the monitored area, and not before.

[0003] The present invention consist an alarm system, which is placed and works independently at each door of the flat, providing independent protection to every door. It is placed outside the front door or the windows and the French doors of the flat.

[0004] The main advantage of the present invention is that it works and is activated precautionarily. That is, as soon as the burglar gets near the door and before he even touches it, in contrast with the majority of the alarm systems of the current state of art, which are activated after the door is opened or broken open. As a consequence, on one hand the burglary is prevented, whilst on the other hand, damage to the door and the lock is avoided.

[0005] Therefore, the present invention works preventively and prevents burglary, since it deters the burglar from getting his hands or his tools near the door's lock. That is, it prevents the burglary attempt. The fact that the system is placed in a way that makes it completely visible to the one approaching the door from outside is crucial for the prevention of the burglary attempt.

[0006] A further advantage of the present invention is that as it provides independent protection to each door on which it is placed, the user will be able to consider which openings of the flat are at risk of violation and decide to place the alarm systems only on them, avoiding in that way unnecessary expenses and work.

[0007] In brief, the door alarm system consists of:

A power supply for the connection to the lower alternating current installation of the building, an infrared transmitter and receiver, which are connected to the electronic main unit, an incorporated rechargeable battery, an incorporated siren, a radiofrequency receiver and a random number of transmitters (remote controls), tuned to the transmitter for its wireless control.

[0008] The infrared transmitter and receiver consists a couple of photoelectric sensors. They are placed horizontally and in opposite position, on a stable point of the front door frame and in a height so that the infrared bundle covers the intake of the key at the lock, crosswise.

[0009] Instead of one couple of infrared photoelectric sensors, the system can alternately consist of an ultra-

sonic sensor.

[0010] Drawing 1 presents the door alarm system placed outside the front door of the flat, when it consists of one couple of infrared photoelectric sensors, in two possible placement versions of the sensors (Figure 1a and Figure 1b), as well as, when it alternately consists of an ultrasonic sensor, in two possible placement versions of the sensor (Figure 1c and Figure 1d).

[0011] Drawing 2 presents the alarm system placed outside the French door of the flat, when it consists of multiple couples of infrared photoelectric sensors, in two possible placement versions of the couples (Figure 2a and Figure 2b), as well as, when it alternately consists of multiple ultrasonic sensors, in two possible placement versions (Figure 2c and Figure 2d), indicatively.

[0012] An example implementing the invention follows with reference to the figures.

[0013] In the case that we use the couple of photoelectric sensors (3), the first of the two (transmitter) transmits a continuous visual signal and the second (receiver) receives it (e.g. via transmission of code data, varying code and asynchronous periodicity). As soon as, the expected visual signal changes or gets interrupted, the alarm siren (7) is activated. In particular, as depicted in drawing 1 figure 1a, the couple of infrared photo electronic sensors (3) is placed (implanted) on the left and the right side, on the two vertical parts of the door frame that we want to secure. The placement of the couple (3) is done horizontally (figure 1a) exactly at the height of the intake of the lock (5), in a way that the continuous signal between the transmitter and the receiver comes crosswise through the intake of the key of the lock.

[0014] The couple (3) can also be placed on the upper and lower side. That is, on the upper horizontal part of the door frame and on the lower part on the floor (figure 1b) and, in particular, on the straight line coming vertically through the lock (5). More couples of infrared photoelectric sensors (3) can be used, placed in a similar way (left-right). That is, on the two vertical parts of the door frame, horizontally (Drawing 2, figure 2a), or placed on the upper and lower part of the door frame, vertically (drawing 2, figure 2b). The distance between the couples can be either stable or not. All of the couples can be placed together horizontally, or vertically or diagonally, or in a horizontal, vertical and diagonal combination, so as to create a grid.

[0015] Preferably, the couples are placed in a way that they cover the part of the door more likely at risk of violation attempt.

[0016] The sensors (3) are connected to the central alarm unit (1) and create a circuit. In the case that the signal transmitted between the couple of infrared photoelectric sensors (3), from the first to the second sensor as an invisible infrared bundle of light and passes exactly in front of the intake of the key at the lock (5), gets interrupted by a tool or a hand, the interruption of communication between the two sensors, activates the central alarm unit, which afterwards activates the siren (7), which

works for a definite and adjustable time.

[0017] In the case that, alternately, the ultrasonic sensor (4) is used, it will be implanted in the vertical part of the door frame, next to the lock (5) (drawing 1, figure 1c), or vertically in the horizontal part of the door frame, in a way that the transmitting bundle can come crosswise through the lock (figure 1d). In this case, the sensor (4) detects every movement on the ray of its bundle and transmits a signal to the central alarm unit (1), which afterwards activates the siren (7).

[0018] It is also possible to implant more ultrasonic sensors (4) only in the vertical (drawing 2, figure 2c) or only in the horizontal (figure 2d) part of the door frame.

[0019] If a sensor gets ripped out intentionally or the communication between the sensors gets interrupted in any way (because of a hand or a tool), the siren is activated in any case.

[0020] The arming and disarming of the alarm is done with wireless remote control transmitters (6), of random number, that work with a stable or a rolling code. In particular, the remote system consists of an incorporated radiofrequency receiver and can support a random number of corresponding transmitters (the users' keys for the system) which allow arming and disarming the alarm unit by many users. Alternately, the remote system could consist of a corresponding transmitter and an infrared receiver or any other existing technology for the remote control of security and access systems, e.g. RFID.

[0021] The power supply of the system is done with 100-265 Vac/50-60 Hz and with rechargeable batteries (9), which the system uses in case of power cut.

Claims

1. Alarm system that includes:

- a. an alarm unit (1),
- b. a siren (7), a power supply (8) and a rechargeable battery (9), inside the alarm unit (1),
- c. at least one couple of infrared photoelectric sensors (3), from which, one is the transmitter transmitting a continuous bundle of light and the other one is the receiver, both connected to the alarm unit (1) or alternately from at least one ultrasonic sensor (4) connected to the alarm unit (1), placed on the exterior side of the door frame, and
- d. a radiofrequency receiver (2) inside the alarm unit (1), that communicates with wireless remote control transmitters (6) of random number, which arm and disarm the system.

2. Alarm system according to claim 1, **characterized by** the fact that on the one couple of photoelectric sensor with continuous bundle (3), or on the couples (3), the transmitter is always placed opposite the re-

ceiver, in a way that:

- i) when the couple (3) is placed outside the front door, the continuous signal of the transmitter comes crosswise through the intake of the key in the lock, horizontally or vertically, or in combination.
- ii) whilst when the couple (3) is placed outside the other exterior door frame, in any opposite point of the door case on the exterior side of the door frame horizontally, vertically, diagonally, and in case of more that one couple, in combination.

3. Alarm system according to claim 1, **characterized by** the fact that the ultrasonic sensor (4) is placed:

- i) outside the front door, on one of the vertical parts of the door frame, next to the lock, or
- ii) outside the front door on the horizontal part of the door frame, vertically, above the lock, as well as, by the fact that when the system consists of more than one ultrasonic sensors (4), they are placed on any point of the horizontal or the vertical part of the exterior part of the door frame.

4. Alarm system according to claims 1-3, **characterized by** the fact that the alarm unit (1) may consist of an acoustic, visual or telecommunications notification system, as well as by the fact that the siren can work for definite time or for time adjusted by the user.

5. Use of a remote alarm unit (1) with at least one couple of infrared photoelectric sensors (3), from which, one is the transmitter transmitting a continuous bundle of light and the other one is the receiver, or alternately with at least one ultrasonic sensor (4), connected to the unit (1), as an alarm system for exterior doors and windows.

6. Use of a remote alarm unit (1) according to claim 5, **characterized by** the fact that on the couple of photoelectric sensors with continuous bundle (3), or on the couples (3), the transmitter is placed always opposite the receiver, in a way that:

- i) when the couple (3) is placed outside the front door, the continuous signal of the transmitter comes crosswise through the intake of the key in the lock, horizontally or vertically, or in combination.
- ii) whilst when the couple (3) is placed outside another exterior door frame, in any opposite points of the door case on the exterior side of the door frame horizontally, vertically, diagonally and in case of more that one couple, in combi-

nation.

7. Use of a remote alarm unit (1) according to claim 5, **characterized by** the fact that the ultrasonic sensor (4) is placed:

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i) outside the front door on one of the vertical parts of the door frame, next to the lock, or
ii) outside the front door on the horizontal part of the door frame, vertically, above the lock,
as well as by the fact that when the system consists of more than one ultrasonic sensors (4), they are placed on any point of the horizontal or the vertical part of the exterior part of the door frame.

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DRAWING 1

Figure 1a

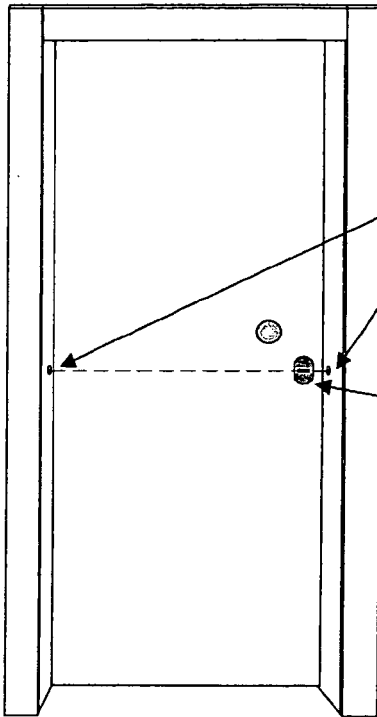


Figure 1b

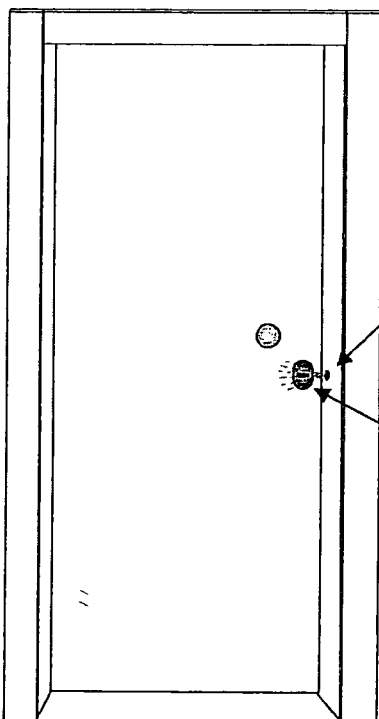
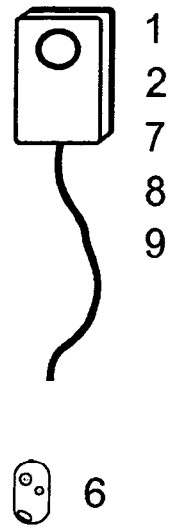
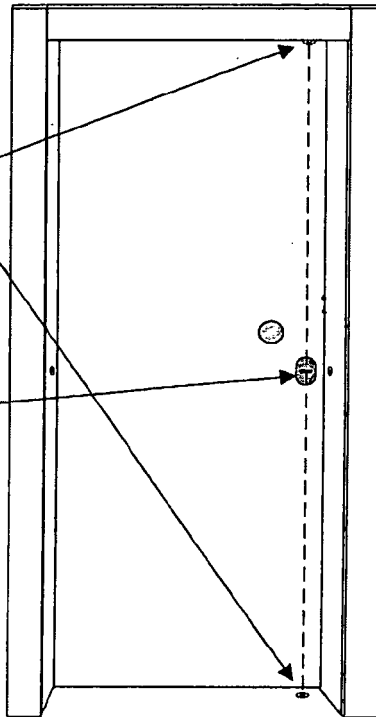


Figure 1c

Figure 1d

DRAWING 2

Figure 2a

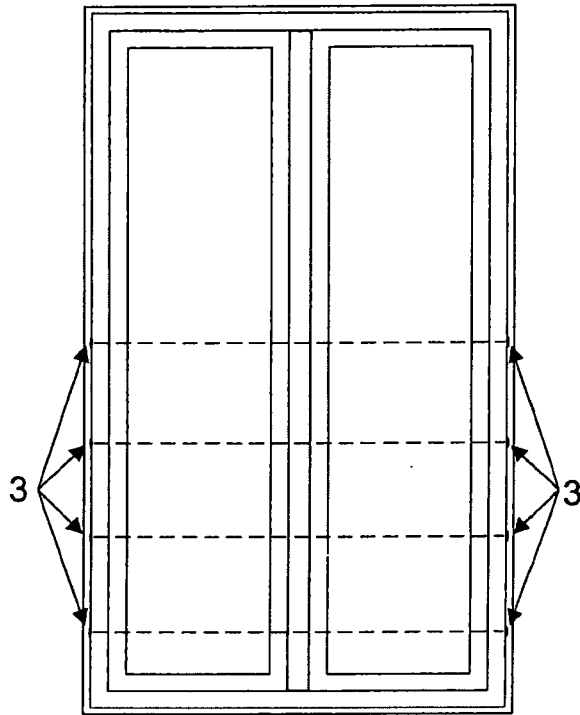


Figure 2b

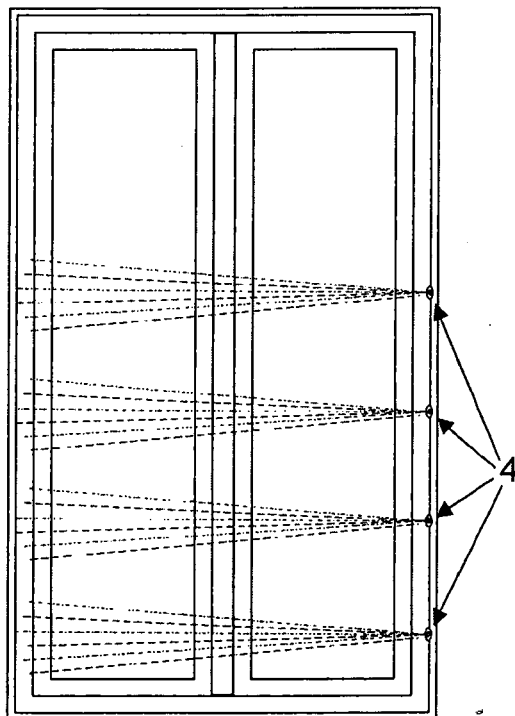
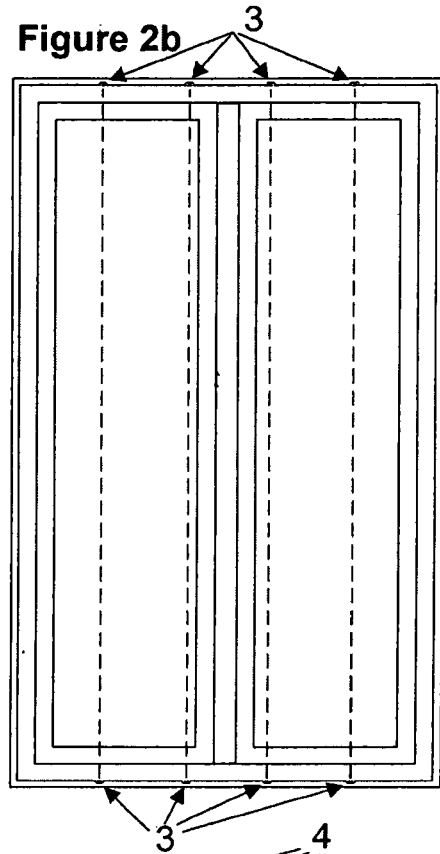


Figure 2c

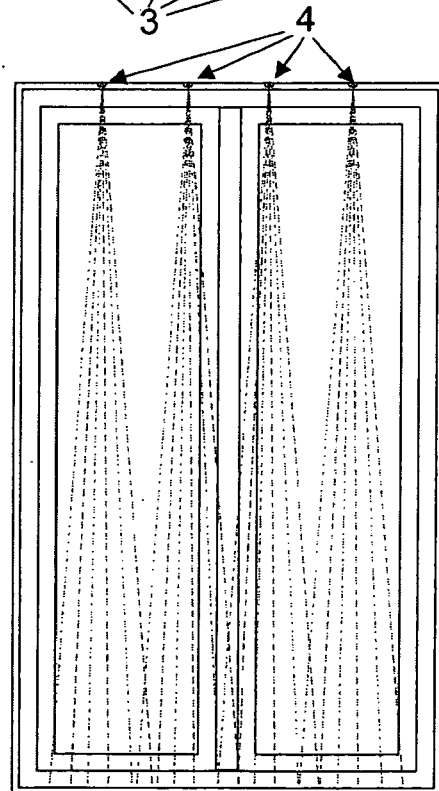


Figure 2d



EUROPEAN SEARCH REPORT

Application Number
EP 12 38 6010

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 27 June 2012	Examiner Sgura, Salvatore
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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