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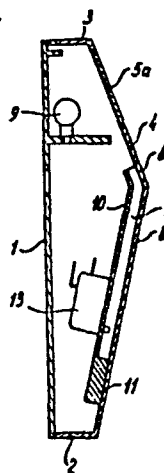
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54 System for detecting the presence of at least one person in a room.

57 System for detecting the presence of at least one person in a room comprising

- a box mounted in a suitable position within the room and containing at least one switch, the operating parts of which can be reached only through a channel (7) in the box shaped device. The switch is destined to activate predetermined energy consuming user systems within the room;
- a switch activating device embodied such that it can be inserted into the channel to activate the at least one switch within the box. The switch activating device is coupled to a key necessary to open the door to the room.

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System for detecting the presence of at least one person in a room.

The invention relates in general to a system for detecting the presence of at least one person in a room.

A major problem in multiroom buildings which are used by many different persons, such as hotels, motels, office buildings, etc., is the fact that most people forget to switch off the energy consuming user systems, such as the central heating, airconditioning, climate control systems, illumination or lighting systems, as they leave the room with the inherent result that energy is consumed in not occupied rooms without anyone enjoying the benefits thereof.

Therefore there is a growing need for an occupancy detector device by means of which it is detected whether there is a user in a room or not. Only in case the room is occupied by a user the various above mentioned systems should function properly such that the user has all the comfort thereof.

An occupancy detector as such is already known. This prior art occupancy detector, however, comprises an ultrasonic transmitter/receiver installed somewhere at a suitable location in the room. If an object or person is moving within the room then the received signal will be subjected to a Doppler-shift and as long as such a Doppler-shift is recognized an information signal is supplied to a relay circuit to switch on the energy consuming user systems in the occupied room.

A disadvantage of this device is that in case the occupant or user in the room finds himself in a non-movement or low movement situation (is e.g. asleep) or if the occupant/user is located in a "dead" corner or has moved into an adjacent room forming part of the main room but is not equipped with such a sensing device, the ultrasonic detector will not register any movement and as consequence thereof will decide that the room is not occupied. Because of this erroneous information the energy consuming user system such as the central heating, the illumination etc., will be switched on which is a very undesirable situation.

Another disadvantage appears when the ultrasonic detector is adjusted at a too sensitive level. In that case any move-

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ment even caused by a very small object, such as an insect or a mouse, will be detected and as result thereof e.g. the illumination will be switched on at various moments where it is sometimes very undesirable.

5 An object of the invention is now to provide an occupancy detector that does not have the aforementioned disadvantages, that can be produced and installed at relatively low costs and has such a simple construction that the function of the whole system is practically failure-free.

10 In agreement with said object the invention now provides a system for detecting the presence of at least one person in a room comprising

- a box shaped device mounted in a suitable position within said room and containing at least one switch, the operating parts of which can be reached only through a channel in the box shaped device, said switch being destined to activate predetermined energy consuming user systems within said room,
- a switch actuating device embodied such that it can be inserted into said channel to activate the at least one switch within said box shaped device, said switch activating device being coupled to a key necessary to open the door to said room.

Within the scope of the system according to the invention any person has to use a key to open the door to a specific room after which he is able to enter the room. The key is coupled to the switch-activating device. Directly after opening the door the person inserts the switch activating device in the channel of the box shaped device, whereafter e.g. the illumination is switched on and the central heating system or airconditioning system is switched from the stand-by condition into the activated condition.

The system according to the invention can be used e.g. for controlling a central heating system, an airconditioning system, a climate control system, an illumination system, an electrical power supply system, powering e.g. a radio or television set, etc.

Because it may be inconvenient to switch off e.g. the illumination at the same moment the switch-activating device is withdrawn from the channel of the box shaped device in a

preferred embodiment of the system the switch is coupled to a timing device maintaining the illumination system and/or the electrical power supply system activated during a pre-determined period after the switch-activating device is
5 removed from the channel of the box shaped device.

A preferred embodiment of the system according to the invention is characterized in that the key to the door of the room, the lock of said door and the channel in the box-shaped device are all embodied such that the key can be used
10 also as switch activating device.

In this embodiment of the system the key to the door as well as the switch-activating device are incorporated into only one device used both for opening the door as well as for activating the energy consuming systems in the room.

15 The switch-activating device (whether or not it is also functioning as a key to the door) can be embodied as a generally flat and generally rectangular card or strip which is very easy to produce and, in the related cases, to couple to a normal key. Furthermore this embodiment has the advantage that
20 e.g. instructions to the user can be printed onto both surfaces of the rectangular card or strip.

It is furthermore possible that the box shaped device contains a predetermined number of switches each destined to activate a specified energy consuming user system or a
25 number of specified energy consuming user systems. Such an embodiment may have the advantage that it is not necessary to combine various systems at one point, i.e. the point where all the systems are controlled by only one switch within the box shaped device. In this embodiment it is possible to use
30 e.g. one switch for the illumination system and another switch for the central heating.

Although it is preferred to switch off some of the energy consuming systems completely after the user has left the room, which implies e.g. to the illumination system of the room,
35 it is also preferred that other energy consuming systems are not switched off completely. Therefore a preferred embodiment of the system has the characteristic that during the periods in which no switch activating device is inserted into the channel of the box shaped device one or more specified energy
40 consuming user systems (e.g. the central heating, the air-

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conditioning, ...) are switched into a low energy consuming stand-by condition.

The invention will now be described with reference to the attached drawings, illustrating a specific embodiment of the invention which is tested in practice.

Fig. 1 illustrates a sectional view of the box shaped device according to the invention according to line I-I in Fig. 2.

Fig. 2 illustrates a sectional view of the box shaped device of the invention according to line II-II in Fig. 1.

Fig. 3 illustrates an embodiment of the switch activating card destined to be used in the box shaped device illustrated in Fig. 1 and 2.

The box shaped device illustrated in Fig. 1 and 2 comprises a back wall 1, a lower wall 2, an upper wall 3 and side walls 4 and 5. The box is closed by an angular front wall consisting of a lower part 8 and an upper part 5. The upper part 5 comprises a section 5a which is light transparent such that e.g. the light of an incandescent lamp 9 is visible through said transparent section 5a. Furthermore the wall section 5a contains a slot 6 at the end of a channel 7 formed by the lower front wall part 8 and a plate 10 mounted in a condition parallel to the front wall section 8. The underside of the channel 7 is closed by a transverse element 11 which e.g. is integrally formed with the channel wall section 10.

The illustrated embodiment comprises two microswitches 12 and 13 mounted to the wall section 10 of the channel 7 such that the operating elements thereof in the form of a little stud are projecting into the channel 7 as is indicated in Fig. 2.

Fig. 3 illustrates a card or strip of in general rectangular form. Said card 14 comprises a passage 15 at the left hand side destined to connect the card 14 to a key ring or key holder. At the right hand side two slanting excavations 16 and 17 are formed destined to operate the operating parts of both microswitches 12 and 13 when the card is through the slot 6 inserted into the channel 7.

It will be clear without further reference to any specific embodiment that the microswitches 12 and 13 can be used e.g. directly to enable the use of the illumination

circuits within a room or the use of a central heating system. On the other hand these microswitches can be used to deliver a signal to a central processor which in turn control the central heating, the illumination, the airconditioning etc.

5 There are already key-lock-systems in which the key is formed by a card or strip of rectangular shape, e.g. covered by a magnetisable layer in which layer a code is stored matching with the lock of one specific door in the building. In that case it is possible to use that key card also as
10 switch-activating card in the system according to the underlying application. In that case the combination of a key destined to open the door and a switch-activating card destined to be used in the system according to the invention can be replaced by only one card which can be used for both
15 functions.

It will be clear that the system according to the invention is especially useful for application in hotels and motels, but furthermore the advantages thereof will become clear when the system is applied in office buildings,
20 industrial areas and other environments in which lots of people are using lots of room.

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CLAIMS

1. System for detecting the presence of at least one person in a room comprising

- a box shaped device mounted in a suitable position within said room and containing at least one switch, the operating parts of which can be reached only through a channel in the box shaped device, said switch being destined to activate predetermined energy consuming user systems within said room,
- a switch activating device embodied such that it can be inserted into said channel to activate the at least one switch within said box shaped device, said switch activating device being coupled to a key necessary to open the door to said room.

2. System according to claim 1, in which the predetermined energy consuming user systems comprise a central heating system.

3. System according to claim 1 or 2, in which the predetermined energy consuming user systems comprise an air-conditioning system.

4. System according to one of the preceding claims, in which the predetermined energy consuming user systems comprise a climate control system.

5. System according to one of the preceding claims, in which the predetermined energy consuming user systems comprise an illumination system.

6. System according to claim 1, in which at least one switch is used as main switch for the electrical power supply system of said room.

7. System according to claim 5 or 6, in which the switch is coupled to a timing device maintaining the illumination system and/or the electrical power supply system activated during a predetermined period after the switch activating device is removed from the channel of the box shaped device.

8. System according to one of the preceding claims, in which the key to the door of said room, the lock of said door and the channel in the box shaped device are all embodied such that the key can be used also as switch activating device.

9. System according to one of the preceding claims,

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characterized in that the switch activating device is embodied as a generally flat and generally rectangular card or strip.

10. System according to one of the preceding claims in which the box shaped device contains a predetermined number of switches each destined to activate a specified energy consuming user system or a number of specified energy consuming user systems.

11. System according to one of the preceding claims, in which during the periods in which no switch activating device is inserted into the channel of the box shaped device one or more specified energy consuming user systems (e.g. the central heating, the airconditioning, . . .) are switched into a low energy consuming stand-by condition.

12. System according to one of the preceding claims, in which said box shaped device comprises a source of illumination visible through a transparent part of the box shaped device, which source of illumination is switched on at least during periods in which no switch activating device is inserted into the channel of the box shaped device.

fig-1

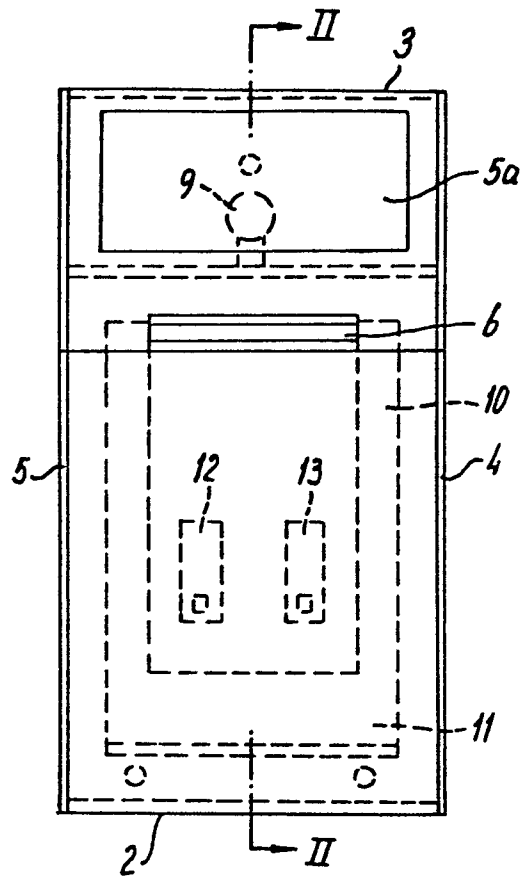


fig-2

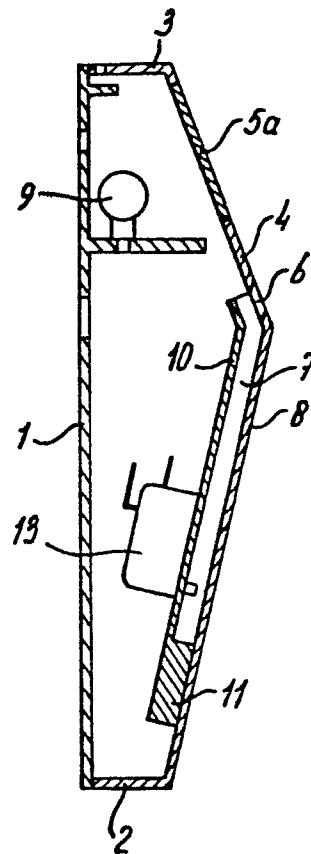
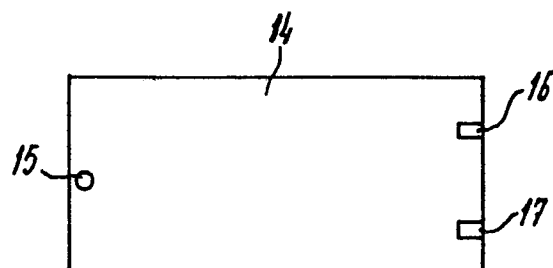


fig - 3





European Patent
Office

EUROPEAN SEARCH REPORT

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Application number

EP 85 20 0666

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	US-A-4 232 819 (BOST) * Whole document *	1-4, 7, 8	H 01 H 27/00
E	WO-A-8 502 054 (JEUNEU) * Whole document *	1-7, 12	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			H 01 H E 05 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-11-1985	Examiner VAN BOGAERT J.A.M.M.
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	