(12) UK Patent Application (19) GB (11) 2 404 479 (13) A

(43) Date of A Publication 02.02.2005

(21) Application No: 0322693.3

(22) Date of Filing: 29.09.2003

(30) Priority Data:
(31) 0318131 (32) 31.07.2003 (33) GB

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(51) INT CL[7]:
G08B 13/00

(52) UK CL (Edition X):
G4N NPPXP N2V1

(56) Documents Cited:
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(58) Field of Search:
UK CL (Edition V) G4N
INT CL[7] E06B, G08B
Other: ONLINE: WPI, EPODOC, PAJ

(54) Abstract Title: **Intruder alarm detecting motion in between a window or door and a blind, curtain or shutter**

(57) An intruder alarm consists of a passive infra red sensor mounted between a window or door and a blind, curtain or shutter. When motion is detected the window or door is illuminated. The light may be white or coloured, steady or pulsing. In addition an audible alarm, paint or dye canister, camera or external alarm system may be used. The intruder alarm may be integrated with a roller blind or shutter.

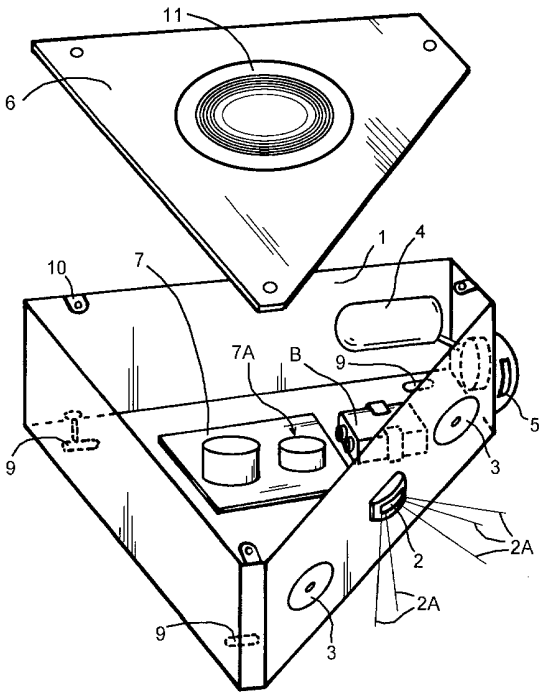

Fig. 1

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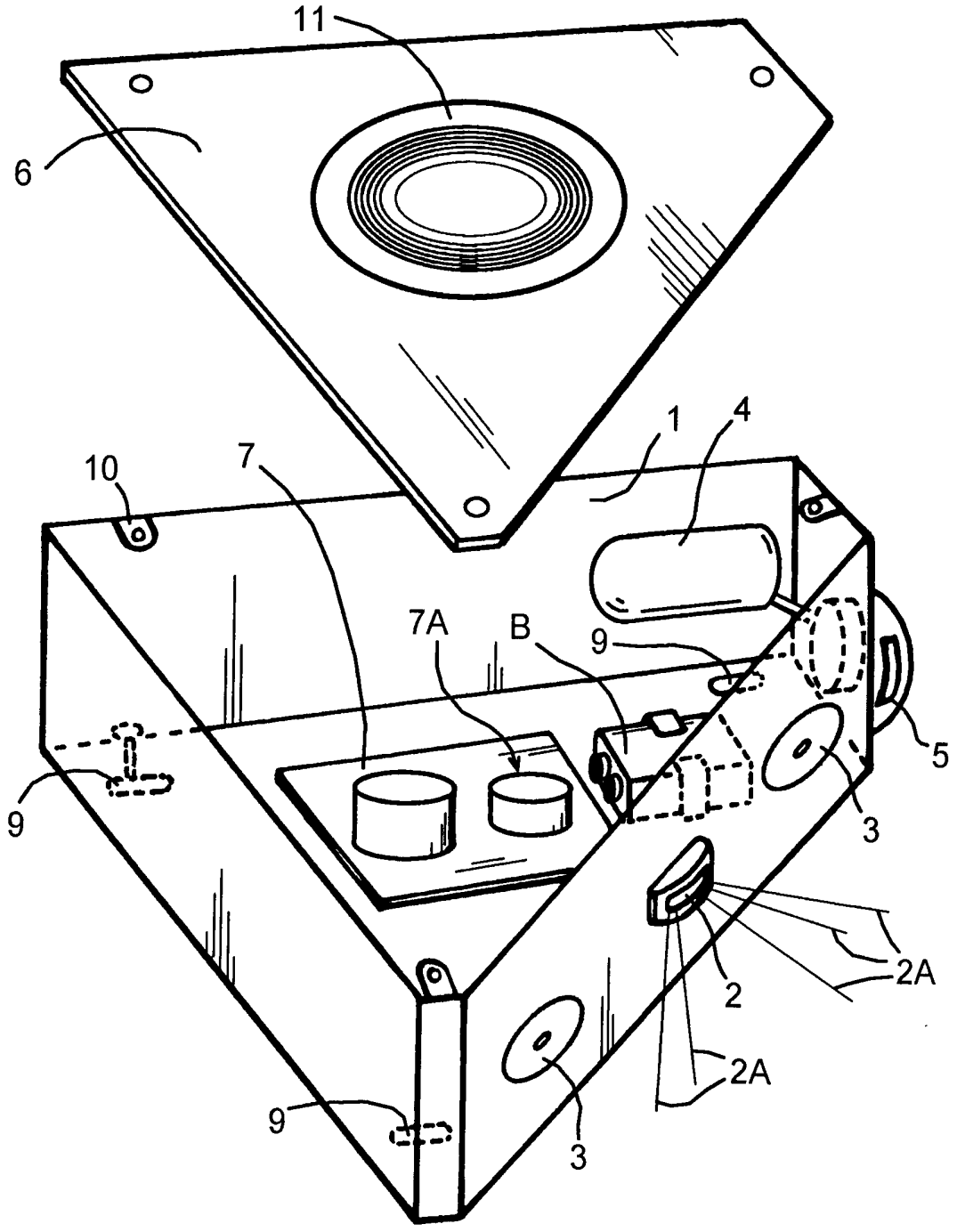

Fig. 1

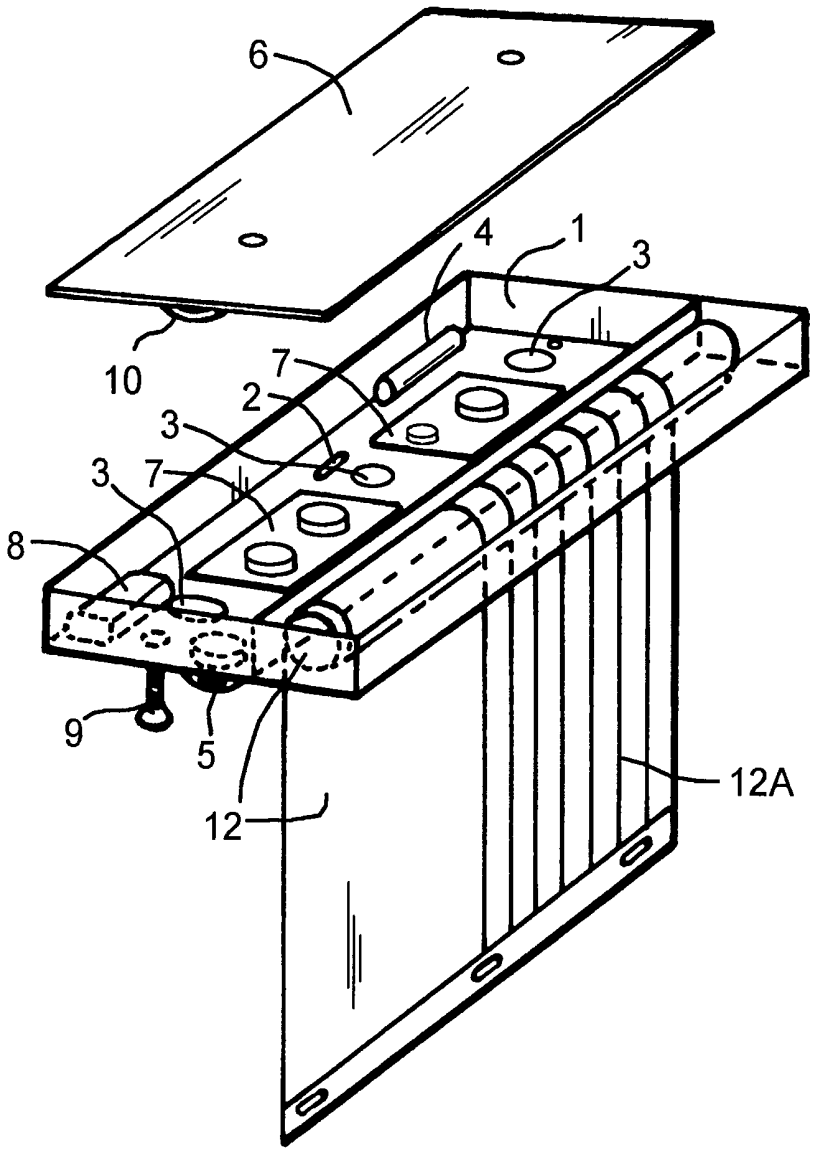

Fig. 2

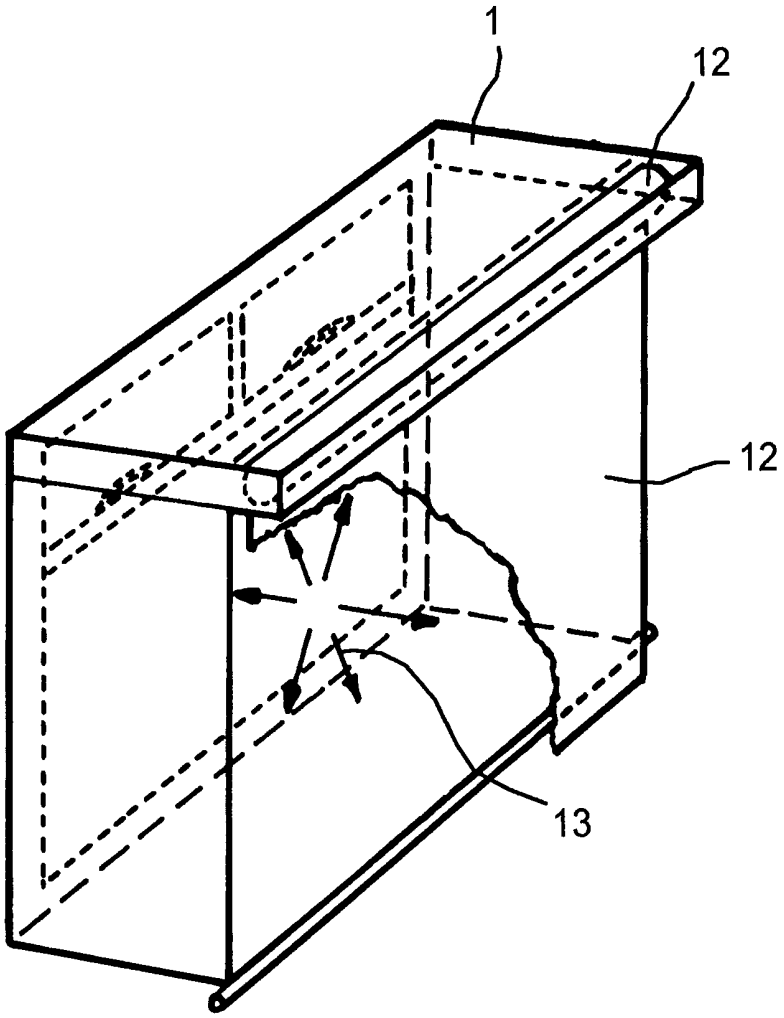

Fig. 3

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DEVICE FOR HIGHLIGHTING INTRUDERS

TECHNICAL FIELD OF THE INVENTION

This invention relates to a security device for protecting a room or other space within the confines of a building.

BACKGROUND

Existing intruder alarm systems which are commonly installed in buildings have a number of disadvantages. Movement detectors are commonly installed at various points within the building connected a central control box. When movement is detected within one of the critical areas protected by the intruder alarm the control box triggers an audible alarm which is commonly located outside the building. Contact sensors may also be fitted to critical entry points such as doors and windows, which trigger the alarm when an intruder attempts to enter the building. With such systems, the alarm may only be triggered once an intruder has physically entered the protected space so that the intruder often has sufficient time to grab any valuable items and make good his escape before anyone can respond to the alarm. Another disadvantage is that the system must be at least partially disarmed

while the building is in normal use (e.g. during the day) in order to prevent legitimate users from triggering the alarm system. Increasingly, many burglaries take place while occupants are present within the building.

The present invention seeks to provide a new and inventive form of security device which does not have the above-noted disadvantages.

SUMMARY OF THE INVENTION

The present invention provides a method of protecting a room, or other space defined within the confines of a building, against intruders, which includes forming a substantially enclosed protection zone within the space covering a portal such as a door or window, providing a movement detector within said protection zone which is triggered by movement within the zone due to an intruder entering through the portal, and providing illumination means to illuminate the protection zone in response to triggering of the movement detector.

The invention also provides a security device which includes a housing for location in a substantially enclosed protection zone through which an intruder could gain access to a space within the confines of a building, the housing being provided with a movement detector which is triggered by movement within the entry zone, illumination means which is operated when the movement detector is triggered in order to illuminate the entry zone, and a power source for the illumination means.

The security device could be used in place of, or in addition to, an existing

intruder alarm system.

BRIEF DESCRIPTION OF THE DRAWINGS

The following description and the accompanying drawings referred to therein are included by way of non-limiting example in order to illustrate how the invention may be put into practice. In the drawings:

Figure 1 is a general exploded view of a first form of security device in accordance with the invention;

Figure 2 is a general exploded view of a second form of security device in accordance with the invention; and

Figure 3 shows the device of Fig. 2 mounted in a window recess.

DETAILED DESCRIPTION OF THE DRAWINGS

The security device which is shown in **Fig. 1** includes a case or housing 1 which can be of metal or plastic for example. The housing could be rectangular, circular, or of any other suitable shape, but in this example the case is generally triangular allowing it to be unobtrusively mounted in a corner. The device could be permanently installed by screws inserted through selected fixing holes 9, although other means of fixing could be used such as suction pads for temporary attachment to glass or other

smooth surfaces, pads incorporating a contact adhesive, etc. The housing 1 has a removable cover 6 through which access may be gained to the interior of the housing during assembly and for battery replacement, for example. The cover may be secured by screws inserted into lugs 10, or by snap-engagement for example.

At least one movement sensor 2 is mounted in the wall of the housing 1 to detect movement within an arc 2A of at least 90°. By providing two or more sensors in different faces of the housing it would be possible to increase the coverage up to 360° around the device if desired, although if the device is mounted adjacent to a wall for example a smaller coverage will often be sufficient. The sensor is of the passive infra red type (PIR), although other known kinds of movement sensor can be used such as ultra sonic detectors etc.

The sensor 2 is connected to a main printed circuit board 7, mounted inside the housing 1, which carries an electronic controller 7A. The controller may be powered by a small battery 8, also mounted inside the housing 1. The battery may be of the alkaline type, which requires periodic replacement, or a rechargeable battery could be used. The battery can be charged from a solar cell to provide power at night or from an external power source to provide battery backup during external power failures.

A directional high intensity light source 3 is mounted in the wall of the housing 1, preferably one or more halogen lamps, directed to provide the main field of illumination within the response area 2A of the movement sensor 2. These are operated by the controller 7A to provide illumination of an area adjacent to the device when the sensor 2 is triggered. The light

source or sources could emit white (clear) light or coloured light (e.g. red or blue), and the light could be constant or pulsed (flashing).

The main use of the device is protecting a room, or other space defined within the confines of a building, against intruders who attempt to gain entry through a portal such as a door or window. A substantially enclosed protection zone is formed within the space, covering the entry portal, in which the device can operate. This may be achieved by placing a blind or curtain over a doorway or window making use of the recess within which most doors and windows are installed. The device is mounted within the space thereby created, preferably near the top of the door or window, orientated such that the entire door or window opening falls within the beam area 2A of the sensor and the main beam area of the light source 3.

It is important to appreciate that the vast majority of intruders rely on stealth to achieve their objective. When someone attempts to enter the protected space, whether through an unlocked door or window or by making a forcible entry, they will trigger the sensor as soon as they move into the protection zone. This will cause the device to illuminate the entry zone and highlight the intruder. This usually takes the intruder by surprise and this alone will often be sufficient to cause an intruder to flee, even during hours of daylight. In addition, the presence of the intruder is highlighted to occupiers, neighbours, any members of the general public in the vicinity, the police, and any surveillance systems which may be installed.

When the sensor 2 is triggered the control unit 7A can initiate other security measures in addition to the illumination of the light source 3. For example, an alarm bell or siren could additionally be mounted within the housing 1.

The audibility of the alarm is ensured by provision of a sound and ventilation grille 11. Another useful addition is an electrically-triggerable canister 4 filled with non-toxic paint or dye in order to indelibly but harmlessly mark the intruder. This can be mounted inside the housing 1 for direct operation by the controller 7A, with a small jet outlet inserted through the wall of the housing. Alternatively the canister 4 can be mounted outside the housing and operated remotely by the controller.

The unit may also include a still or video camera 5 which is mounted on the housing 1. When the sensor 2 detects movement within its field the camera is operated to record an image of the intruder whilst illuminated by the light source 3. It is preferable to provide a short delay between operation of the camera 5 and setting off the paint or dye canister 4 (when used) so that the image is not obscured when the substance is ejected.

The controller 7A can also be connected up to trigger external alarms, so that the unit could, for example, operate a conventional intruder alarm when the sensor 2 detects movement. Two or more such units can be armed and de-armed remotely from a central control panel using a pin number or key. The unit can also be arranged to raise a remote alarm via a telephone system in known manner, e.g. to raise an alarm at a police station.

The unit may also be used as a panic alarm, which is of particular benefit to disabled or bed-ridden occupants. The controller 7A is provided with an input from a remote activator which is preferably in the form of a key fob acting via a wire-less link. A signal from the remote activator causes the light source 3 to be illuminated and the audible alarm to sound. Where a number of units are installed within a building they can all be simultaneously

activated to draw maximum attention to the presence of a possible intruder or show when assistance is required.

The unit could also have additional uses. A small form of the device provided with suction pads or other temporary means of attachment would be useful for travellers when staying in hotels, guest houses or caravans, or for use in temporary rented accommodation for example. Such a device can also be used to protect vans, lorries or transportation containers. If the device is not mounted in a fixed position it could also serve as a portable personal alarm or carried in a handbag or briefcase and actuated by means of a remote control or push button system.

Fig. 2 shows a modified form of the security device in which items which correspond to those described above in relation to **Fig. 1** have the same alphanumeric references. In this case the housing 1 is of elongate rectangular form and incorporates a roller blind 12 extending along one of its longitudinal edges. The blind may be of natural or synthetic fabric, plastic such as pvc, rubber or like sheet materials. The blind preferably incorporates a series of vertical metal strands 12A. In use, the device may affixed to the top of a doorway or a window recess 13 as shown in **Fig. 3**, spanning substantially the entire width of the opening. When the blind 12 is pulled down a protected entry zone is formed between the blind and the window glass or door surface, falling substantially within the full field of the sensor 2. Again, should an intruder enter the protection zone 2A, for example by breaking or forcing the window or simply entering an open window or opening a door, the device will be triggered as described.

It will thus be appreciated that since the forms of device described above are

adapted to protect a specific entry zone rather than the entire volume of a room or similar space they can be allowed to remain in operation even when the building is occupied. People are free to move within the building and go about their legitimate business provided they do not enter a protected entry zone. Of course, if legitimate users are likely to enter one of the protected zones inadvertently the audible alarm and paint/dye canister can be omitted or disabled.

Additional useful features can be incorporated into the unit without departing from the scope of the invention. For example, smoke or gas detectors can be added at moderate cost so that the unit could fulfil the combined function of a safety and security device.

It will be appreciated that the features disclosed herein may be present in any feasible combination. Whilst the above description lays emphasis on those areas which, in combination, are believed to be new, protection is claimed for any inventive combination of the features disclosed herein.

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CLAIMS

1. A method of protecting a room, or other space defined within the confines of a building, against intruders, which includes forming a substantially enclosed protection zone within the space covering a portal such as a door or window, providing a movement detector within said protection zone which is triggered by movement within the zone due to an intruder entering through the portal, and providing illumination means to illuminate the protection zone in response to triggering of the movement detector.

2. A method according to Claim 1, in which the protection zone is formed by providing a temporary screen over part of the building which includes the entry portal.

3. A method according to Claim 2, in which the temporary screen is a curtain, blind or shutter.

4. A method according to Claim 2 or 3, in which the temporary screen is a roller blind which is included in a housing including the movement detector, illumination means and a power source for the illumination means.

5. A method according to any preceding claim, in which the illumination means emits white light

6. A method according to any of Claims 1 to 4, in which the illumination means emits coloured light

7. A method according to any preceding claim, in which the illumination means emits pulses of light.

8. A method according to any preceding claim, in which the housing includes an audible alarm.

9. A method according to any preceding claim, in which the housing includes a canister of paint or dye which is ejected in response to triggering of the movement sensor.

10. A method according to any preceding claim, in which the housing includes a camera for capturing an image of an intruder within the protection zone.

11. A method according to any preceding claim, in which the device is connected to an external intruder alarm system installed within the protected building.

12. A security device which includes a housing for location in a substantially enclosed protection zone through which an intruder could gain access to a space within the confines of a building, the housing being provided with a movement detector which is triggered by movement within the entry zone, illumination means which is operated when the movement detector is triggered in order to illuminate the entry zone, and a power source for the illumination means.

13. A security device according to Claim 12, in which the housing includes a roller blind or shutter.

14. A security device according to Claim 12 or 13, in which the illumination means emits white light

15. A security device according to Claim 12 or 13, in which the illumination means emits coloured light

16. A security device according to any of Claims 12 to 15, in which the illumination means emits pulses of light.

17. A security device according to any of Claims 12 to 16, in which the housing includes an audible alarm.

18. A security device according to any of Claim 12 to 17, in which the housing includes a canister of paint or dye which is ejected in response to triggering of the movement sensor.

19. A security device according to any of Claims 12 to 18, in which the housing includes a camera for capturing an image of an intruder within the protection zone.

20. A security device according to any of Claims 12 to 19, in which the device is connected to an external intruder alarm system installed within the protected building.

21 A security device according to any of Claims 12 to 20, in which

the device can be remotely activated to act as a panic alarm.

22. A method of protecting a room, or other space defined within the confines of a building, against intruders, which is substantially as described with reference to Figures 1 and 2 or Figure 3 of the drawings.

23. A security device substantially as described with reference to Figures 1 and 2 or Figure 3 of the drawings.

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Application No: GB 0322693 3 **Examiner:** Mark Simms
Claims searched: All **Date of search:** 18 December 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
Y	1, 2, 3, 4, 12, 13	DE 2538242 A1	(ROHUE ROLLADEN HUEBLER) Page 2
Y	1, 2, 3, 4, 12, 13	EP 0299219 A1	(BECKER) Abstract, Fig 1
Y	1, 2, 3, 4, 12, 13	EP 1146199 A1	(BUBENDORFF) Abstract, Fig 1-3
Y	1, 2, 3, 4, 12, 13	GB 2364809 A	(LAWRENCE) Abstract, Fig 1
Y	1, 2, 3, 4, 12, 13	US 4864278	(ROBERT HOOKE) Abstract, Fig 1
Y	1, 2, 3, 4, 12, 13	WO 01/043100 A1	(BONE) Abstract, Fig 5
Y	1, 2, 3, 4, 12, 13	US 4754263	(TRIMBLE) Abstract, Fig 1

Categories

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[V]:

G4N

Worldwide search of patent documents classified in the following areas of the IPC[7]:

G08B, E06B

The following online and other databases have been used in the preparation of this search report:

WPI, EPODOC, PAJ