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Device for opening a window or a door, especially of the sliding type.

The device comprises a driver (11), which is designed for movement from a passive position to an opening position, thus moving the window (5) from a closed to an open position, a spring (27) for actuating the driver (11) in a direction towards the opening position, and a coupling device (10) for

retaining the driver (11) in the passive position, which coupling device may be activated and inactivated, and a guide rail system (12, 13) for controlling the movement of the driver (11) from the passive position to the opening position.

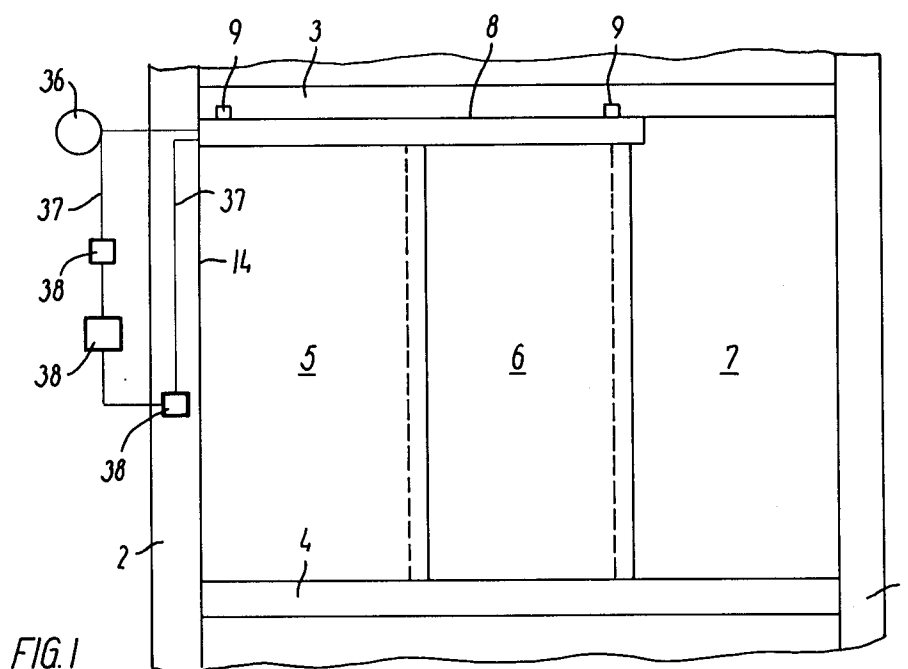


FIG. 1

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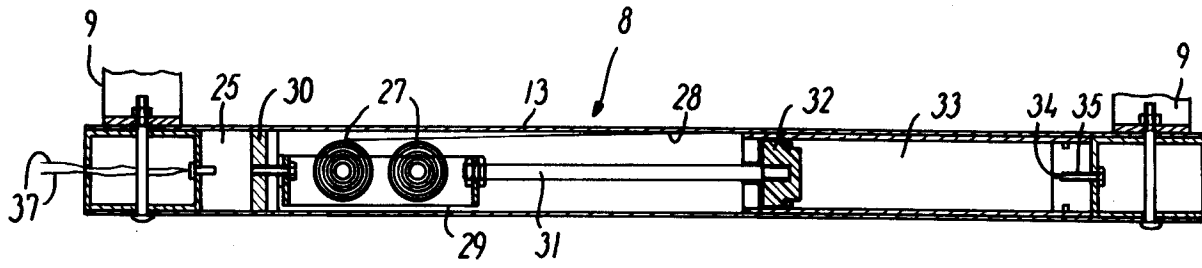


FIG. 2

The invention relates to a device for opening a window or a door, particularly of the sliding type.

When renovating facades with balconies, these are sometimes closed in order to thereby provide a relatively inexpensive extension of the inhabited area by means of an exterior room, which thus may be utilized throughout the year.

Normally there will be access to a balcony from a room situated behind or next to the balcony. However, now and then there will also be rooms located behind or next to the balcony from which there is no access to the balcony, while the only openable windows belonging to such rooms open out into the balcony. In such a case the fire authorities require that it must be possible for a person in distress in the room to attract the attention of the rescue party by crying for help or by signaling in some other manner. This possibility does not exist if the windows of the closed balcony cannot be opened from the room without direct access to the balcony.

The object of the invention is therefore to provide a device, which can easily be installed in connection with sliding windows, sliding glass, or sliding doors, such that these may be opened by means of remote control from the room in question without direct access to the balcony.

The object is according to the invention fulfilled by a device including a driver, where said driver is designed in such a way that it may be moved from a passive position to an opening position, thus moving the door or the window from a closed position to an opened position, a spring for actuating the driver in a direction towards the opening position, a coupling device for retaining the driver in the passive position, which coupling device can be activated and inactivated, and a guide rail system for controlling the movement of the driver from the passive position to the opening position. Thus a device that is easily installed in connection with existing sliding windows is achieved, where the said device does not obstruct or affect the normal operation of the window. In addition it is achieved that the driver of the device, after having released or inactivated the coupling device, easily may be returned to the passive position, and may be fixed in this position by activating the coupling device.

In one embodiment the spring is a coiled spring. Thus a very simple embodiment of the device is achieved.

In a further embodiment the coiled part of the coiled spring is provided with a bearing, the uncoiled part of the spring extending from the coiled part along the guide rail to a fastener for the outer end of the uncoiled part, the fastener or the bearing being fixed to the driver while the other is fixed with respect to the frame of the window or door.

The releasable coupling device is preferably operated by remote control and may include an electromagnet for fixing the driver in its passive position.

The device can include a damper, which dampens the movement of the driver.

In a second embodiment of the invention the device includes a member designed to be fixed, a movable member, where the spring is designed to actuate the movable member in a direction away from the fixed member, a flexible pulling means, such as a wire, which at one end is connected to one of the said members while by way of roll means being guided around at least the other of said members and at its other end being connected to the driver, such that a movement of the movable member away from the fixed member causes a driver movement, which is at least twice as large.

In a further embodiment the device comprises a housing designed for fixed mounting, wherein the fixed member is mounted, including a slot through which the driver extends. Furthermore the spring, for instance a gas-filled spring, can be designed as a compression spring, and the two members may include journal means, these being attached to opposite ends of the spring while supporting said roll means.

The invention will in the following be explained in more detail by means of exemplary embodiments and with reference to the drawing, in which

Figure 1 shows a section of sliding glass in a balcony, where the device according to the invention is installed,

Figure 2 the device in Figure 1 in a vertical sectional view along its longitudinal axis,

Figure 3 the device in Figure 1 in a horizontal sectional view,

Figure 4 the device shown in Figures 2 and 3 in a vertical cross-sectional view,

Figure 5 a vertical sectional view of the device in Figure 1 according to a second embodiment,

Figure 6 a cut along axis III-III in Figure 5 and

Figure 7 a cut along axis IV-IV in Figure 5.

In Figure 1 a section of sliding glass in a closed balcony is shown schematically and from the inside, where the section comprises posts 1, 2, top and bottom window frame members 3, 4, and three sliding glass members 5, 6, 7, which may be suspended from rails in the top member of the frame 3 or driven through rails in the bottom member of the frame 4.

An opening device 8 is by means of a mounting 9 suspended from the top member of the window frame 3. The opening device 8 includes a driver 11 (Figure 3), which extends through a slot in the housing 13 of the opening device 8. The driver 11, which in Figure 1 is concealed behind

the opening device 8, is in contact with the left side edge 14 of the sliding glass 5 (Figure 1).

Figures 2-4 show the design of the opening device 8 illustrated in Figure 1. This comprises the housing 13 in the shape of a pipe with a rectangular cross section, at the side of which the slot 12 is provided. In the housing 13 an electromagnet 25 and a frame 29 is provided, the end of the frame 29 being designed with a holding plate 30 for the electromagnet 25. In the frame 29 coiled springs 27 with uncoiled ends 28 are mounted onto axles 26, where the said uncoiled ends 28 are fastened to the housing 13 at the opposite end of the said housing with respect to the electromagnet 25. Thus the springs 27 will attempt to pull the frame 29 away from the electromagnet 25.

As shown in Figure 3, the driver 11 is attached to one of the axles 26, and is thus connected to the frame 29. The driver 11 is provided with an arm 23 for engaging with the left side edge 14 of the sliding glass 5.

The frame 29 is connected to a piston 32 of an air-filled cylinder 33 by means of a piston rod 31, the air-filled cylinder 33 functioning as a damper for the movement of the frame 29. The air-filled cylinder 33 is supplied with an outlet 34 and an adjustment screw 35 for adjusting the damping effect of the air-filled cylinder 33.

The electromagnet 25 is connected to a current source 36 through a set of electrical leads 37. When the electromagnet is activated, i.e. connected to the current source 36, it fixes the holding plate 30 and thus operates as a coupling device for retaining the driver 11 in a passive position.

In order to release the holding plate 30 and thus the frame 29 and the driver 11 the electromagnet is inactivated by disconnecting the electrical connection to the current source 36 by means of a switch 38.

The opening device 8 will normally be in the passive position shown in Figures 2 and 3, where the driver 11 by means of the electromagnet 25 is fixed in the shown extreme position, which in Figure 1 is furthest to the left. When the driver 11 is in this passive position, the sliding glass members 5, 6, and 7 can be operated in the usual manner. In addition the sliding glass member 5 and possibly also 6 can be opened, i.e. slid towards the right in Figure 1, by disconnecting the current supplied to the electromagnet 25, thus releasing the driver 11, which due to the force provided by the springs 27 will be moved towards the left in Figures 1, 2, and 3, and the sliding glass 5 will follow as a result of the engagement of the arm 23 with the side edge 14 of the said sliding glass 5.

In a second embodiment shown in Figures 5-7 the opening device is designed with a housing 13, wherein there onto a bolt 15 are mounted two

pulleys 16, one on each side of the gas-filled spring 17, one end of which likewise is attached to the bolt 15, which in the shown instance in addition is utilized for fastening one of the mountings 9. The bolt 15 and the members mounted onto said bolt are thus fixed with respect to the window frame member 3 above the sliding glass members.

The gas-filled spring 17 has a piston rod 18, at the end of which two additional pulleys 19 are mounted by means of a traversing pin not shown. The piston rod 18 is designed such that it moves together with the pulleys 19, and such that this movement is performed in the lengthwise direction of the housing 13.

A wire 20 is by means of a wire lock 21 fastened onto one of the pulleys 16. From this position the wire is placed around one of the pulleys 19, then around the other pulley 16 in order to finally be placed around the other pulley 19, and from there to the driver 11.

The placement of the wire 20 is further apparent in Figures 6 and 7, where the connection to the driver 11 by way of a branch 22 is evident. Besides the branch 22 the driver 11 includes an arm 23 for engagement with the sliding glass and a tab 24 for engagement with the coupling device 10, which in addition to the tab 24 comprises an electromagnet 25.

As apparent in Figure 1, several disconnecting switches 28 may be provided, and these may be placed as desired in different rooms, while a disconnecting switch 38 also may be placed on the outside, since this in certain cases is required by the fire authorities. Furthermore, one of the switches 38 may be an automatic switch, for instance designed as a smoke detector or the like, such that it disconnects the current in case of fire.

The driver can be connected to the sliding glass 5 for instance by means of a sliding bolt. Thus it is avoided that the glass can be opened for instance by a child. It will however not be possible as such to bolt the sliding glass to the post 2 by means of a sliding bolt, since the opening device in that case will not be able to open the sliding glass 5 unless the bolted attachment is released at the same time as the coupling device or the electromagnet 25.

Claims

1. A device for opening a window (5) or a door, particularly of the sliding type, **characterized in that** the device includes a driver (11), where said driver is designed such that it may be moved from a passive position to an opening position, thus moving the door or the window (5) from a closed position to an opened position, a spring (17, 27) for actuating the driver

(11) in a direction towards the opening position, a coupling device (10) for retaining the driver (11) in the passive position, which coupling device can be activated and inactivated, and a guide rail system (12, 13) for controlling the movement of the driver (11) from the passive position to the opening position.

2. A device according to claim 1, **characterized in that** the spring is a coiled spring (27). 10

3. A device according to claim 2, **characterized in that** a coiled part of the spring (27) has a bearing (26), in that an uncoiled part (28) of the spring (27), when the driver (11) is in the passive position, extends from the coiled part (27) along the guide rail system (12, 13) to an attachment (22) for the outer end of the uncoiled part, and in that one end of the bearing (26) and the attachment (22) is attached to the driver (11) while the other end is fixed with respect to the frame member (3) of the window (5, 6, 7) or door. 15 20

4. A device according to claims 1-3, **characterized in that** the coupling device (10) is operated by remote control. 25

5. A device according to claims 1-4, **characterized in that** it includes a damper (33), which dampens the movement of the driver (11). 30

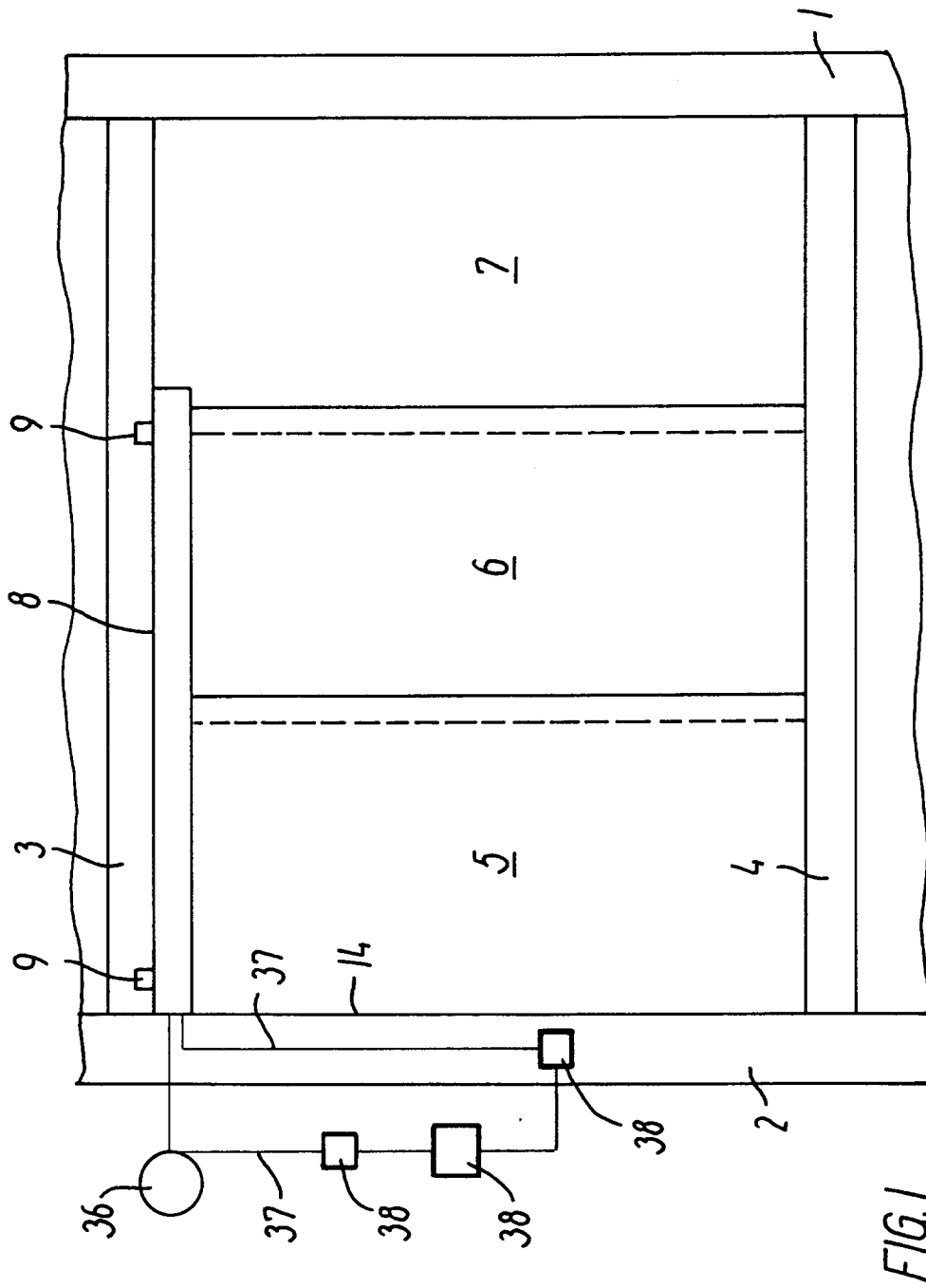
6. A device according to claims 1-5, **characterized in that** the releasable coupling device (10) includes an electromagnet (25), which is designed for retaining the driver (11) in the passive position. 35

7. A device according to claim 1, **characterized by** an member for fixed mounting (15, 16) and a movable member (18, 19), where the spring (17) is designed such that it actuates the movable member (18, 19) in a direction away from the fixed member (15, 16), in addition to a flexible pulling means (20), such as a wire, which at one of its ends is connected to one of the said members (16), by way of roll means (19, 16) is guided around at least the other of said members (18, 19), and at its other end is connected to the driver (11), such that a movement of the movable member (18, 19) away from the fixed member (15, 16) causes a movement of the driver (11), which is at least twice as large. 40 45 50 55

8. A device according to claim 7, **characterized by** a housing (13) designed for fixed mounting, wherein the fixed member (15, 16) is mounted,

and including a slot (12) through which the driver (11) extends.

9. A device according to claim 7 or 8, **characterized** in that the spring (17), for instance a gas-filled spring, is a compression spring, in that the two members (15, 16; 18, 19) includes journal means, which are attached one at each end of the spring (17) and support the said roll means (16, 19).



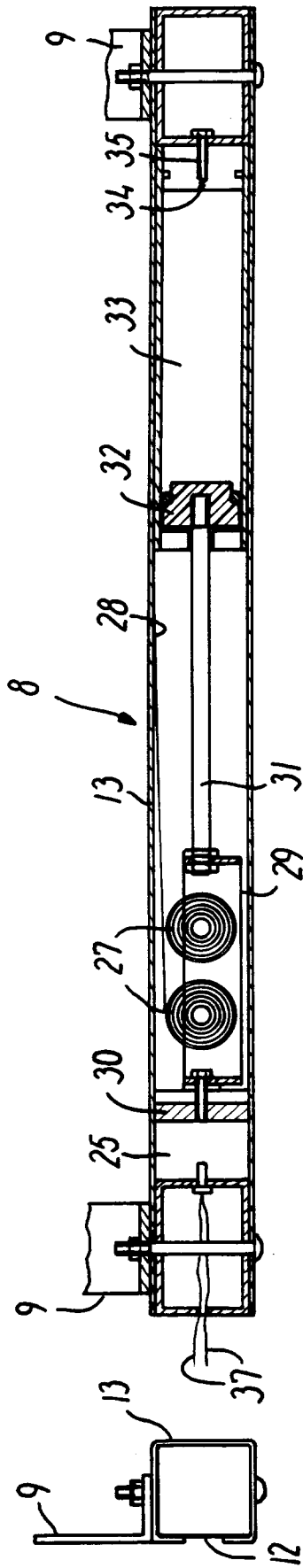


FIG. 2

FIG. 4

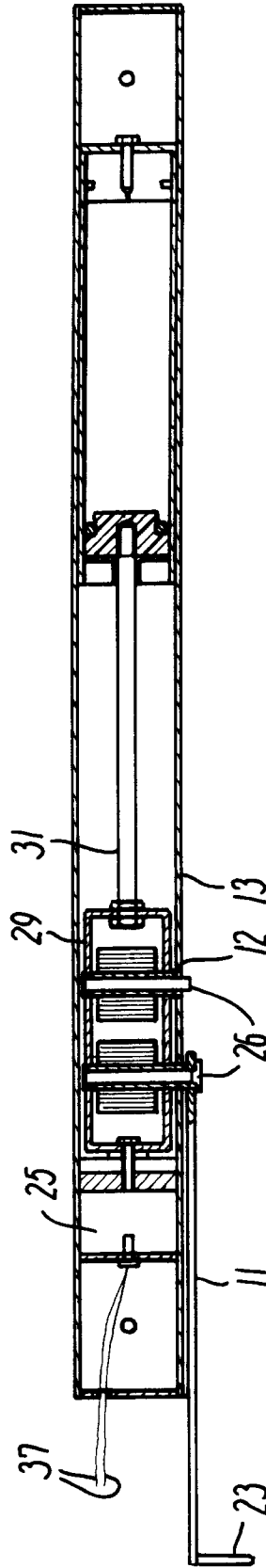


FIG. 3

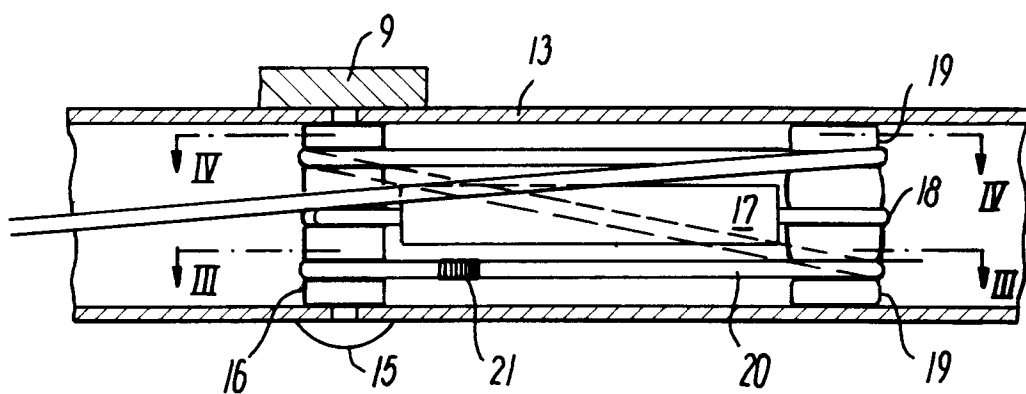


FIG. 5

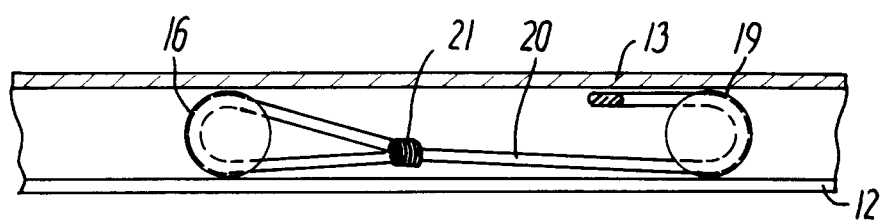


FIG. 6

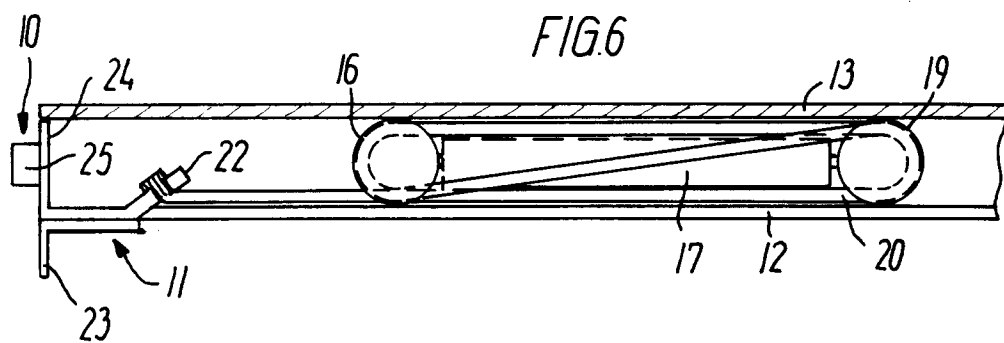


FIG. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 93 61 0054

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.5)
X Y	AU-B-8 812 809 (CARROLL) * page 8, line 27 - page 10, line 8 * * page 14, line 23 - page 15, line 5; figures 1-5 * ---	1,2,4-6 3,7	E05F15/20 E05D13/00
Y	GB-A-1 505 782 (FOSTER) * page 2, line 39 - line 74; figures 1-5 * ---	3	
Y A	GB-A-2 178 793 (CATNIC COMPONENTS) * abstract * * page 2, line 7 - line 84; figures 1,2 * -----	7 8,9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			E05F E05D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 January 1994	Examiner GUILLAUME, G
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