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**(54) Safety catch for a hinged window**

(57) This invention relates to safety catch (10) for restricting the opening movement of a hinged window panel (14) relative to its frame (16). The safety catch has a channel member (22) and a stay (24), the channel member being adapted for securement to one of the window panel and frame, and the stay being adapted for securement to the other of the window panel and frame. The stay has a slider (30) which can move relative to the channel member. The safety catch has a stop member (36) which is movable between active and inactive positions, the stop member in its active position being engageable

by the slider so as to limit the movement of the slider relative to the channel member. Movement of the stop member between its active and inactive positions is controlled by an electrically-operated actuator (50). The invention is likely to find its greatest utility on public and commercial buildings such as hospitals, hotels and the like with a large number of hinged windows, many or all of which can have a restricted opening movement in normal use. Upon issuance of a control signal to the electrically-operated actuators the safety catches can be released permitting the restricted windows to be fully opened for use as emergency exits.

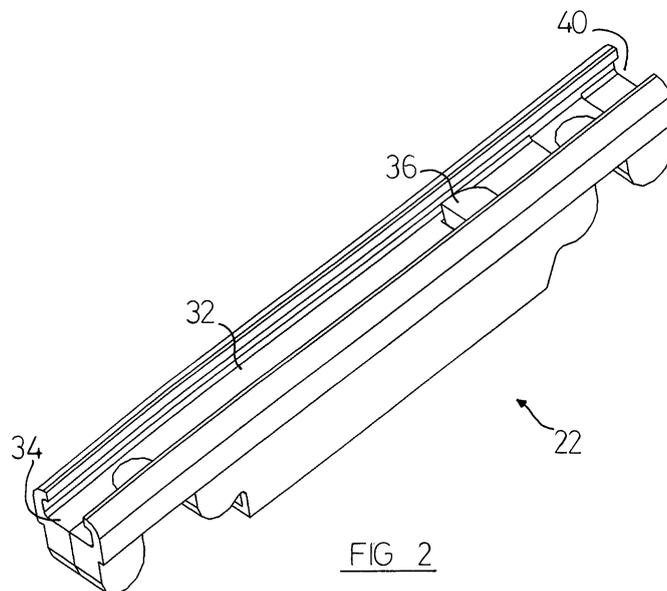


FIG 2

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## Description

### FIELD OF THE INVENTION

**[0001]** This invention relates to safety catch for a hinged window. The invention is likely to find its greatest utility on public and commercial buildings such as hospitals, hotels and the like with a large number of hinged windows.

### BACKGROUND OF THE INVENTION

**[0002]** A safety catch according to the invention is often called a window restrictor, and is a device which can be fitted to a hinged window so as to restrict the pivoting opening movement of the window. When a hinged window is manufactured it will typically be fitted with hinges which allow a predetermined opening movement relative to the frame surrounding the window panel. However, such "full" opening is not always desired, for example for the windows on the upper-storey of buildings, where it is often desired to restrict the opening movement of a window so that a person cannot fall out of that window.

**[0003]** In a hospital or hotel for example many of the windows on the upper storeys will be hinged, and all of them may be fitted with restrictors so that they can be partially opened to allow for ventilation, but not opened sufficiently for an occupant to fall through.

**[0004]** Fire safety officers usually, however, wish for full opening of windows, even on the upper storeys of buildings, so that the occupants have an escape route in the event of fire or other emergency.

**[0005]** Many safety catches are therefore releasable, so that the opening movement of the window is normally restricted, but the catch can be disabled or released by the occupant in order to allow full opening of the window and to allow the occupant a route of escape in the event of fire or other emergency.

**[0006]** A releasable safety catch is described in our patent GB 2 262 934.

**[0007]** The utility of a safety catch to restrict the opening movement of a window is lost once the catch is released or disabled, and it is therefore often desired to ensure that the catch is not inadvertently disabled, for example by a child. Lockable releasable safety catches have therefore been developed, including that described in our patent application GB 2 398 102 which requires a key to unlock and subsequently release the safety catch.

**[0008]** Whilst the security afforded by a lockable releasable safety catch is therefore increased over a non-lockable releasable safety catch, in the event of a fire or other emergency the use of a key is required before the catch can be disabled and the window fully opened. In order to be readily available in the event of a fire or other emergency the key should be kept close to the window, but if the key is on public display the safety catch will often be released in a non-emergency situation (for example to increase the ventilation on a hot day). Also, if

the safety catch is unlocked and subsequently re-locked by a non-authorized person the key may not be returned to its correct location, so that it is not readily available when required. The use of lockable releasable safety catches in public and commercial buildings is therefore not always appropriate and the additional security they offer over non-lockable safety catches is not always available.

**[0009]** It will be appreciated from the foregoing discussion that the use of safety catches almost always represents a compromise between safety of the occupant in normal conditions when opening of the window is desired to be restricted, and safety of the occupant in an emergency when full opening of the window is desired.

### SUMMARY OF THE INVENTION

**[0010]** The present invention seeks to avoid or reduce at least some of that compromise, so that the advantages of safety catches, and in particular lockable releasable safety catches, can be more widely utilised.

**[0011]** According to the invention, there is provided a safety catch for restricting the opening movement of a hinged window panel relative to its surrounding frame, the safety catch comprising a channel member and a stay, the channel member being adapted for securement to one or other of the window panel and frame, and the stay being adapted for securement to the other of the window panel and frame, the stay having a slider which is slidably engageable with the channel member, the safety catch having a stop member which is movable between active and inactive positions, the stop member in its active position being engageable by the slider so as to limit the movement of the slider relative to the channel member, movement of the stop member between its active and inactive positions being controlled by an electrically-operated actuator.

**[0012]** Accordingly, when the stop member is in its active position the sliding movement of the slider relative to the channel member can be limited to the extent desired to restrict the opening movement of the window, whereas when the stop member is in its inactive position the slider is not so limited and the opening movement of the window is not so restricted.

**[0013]** Desirably, the stop member is biased into its active position, suitably by a resilient biasing member such as a torsion spring.

**[0014]** The electrically-operated actuator is preferably connected to a receiver adapted to receive a radio signal (although a direct electrical connection is not excluded). Preferably, the radio signal is generated automatically upon issuance of a fire or smoke alarm. Fire and smoke alarms which issue radio signals are known for use in public and commercial buildings such as hospitals and the like, and the radio signal is used to send a warning signal to a control station or the like. It can be arranged that the safety catch of the present invention responds to the same radio signal to allow the stop member to

move to its inactive position, or it can be arranged that a separate control signal is sent from the control station to the safety catch (or more likely to each of a number of separate safety catches on each of the hinged windows of the building).

**[0015]** The electrically-controlled actuator may be adapted to move the stop member to its inactive position upon receipt of a control signal, or more preferably it may be adapted to release the stop member from a secured condition so that the stop member can be moved from its active position to its inactive position as an occupant opens the window.

#### BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

**[0016]** The invention will now be described in more detail, by way of example, with reference to the accompanying drawings, in which:

- Fig.1 shows a perspective view of a window fitted with a safety catch according to the present invention;
- Fig.2 shows a perspective view of the channel member of the safety catch, with the stop member in its active position;
- Fig.3 shows a view as Fig.2 but with the stop member in its inactive position;
- Fig.4 shows a sectional side view of the channel member of the safety catch, with the stop member in its active position;
- Fig.5 shows a view as Fig.4 but with the stop member in its inactive position;
- Fig.6 shows an exploded view of part of the channel member; and
- Fig.7 shows a view as Fig.1 with the stay of the safety catch separated from the channel member.

#### DETAILED DESCRIPTION

**[0017]** The safety catch 10 according to the present invention is adapted for fitment to a hinged window 12. As is typical, the hinged window 12 comprises a glazed window panel 14 surrounded by a frame 16. The window panel 14 is connected to the frame 16 by way of hinges 20 (in this embodiment the hinges are butt hinges, but in other embodiments the hinges are friction stays or another suitable hinge mechanism). The latch and lock which would ordinarily be fitted so as to secure the window panel in the closed position are not shown in this drawing.

**[0018]** The safety catch 10 comprises a channel mem-

ber 22 and a stay 24. In this embodiment the channel member 22 is secured (by screws 26) to the window panel 14. The end of the stay 24 which is not visible in Fig.1 carries a pivoting plate which is secured (as by screws also) to the frame 16, so that the stay can pivot relative to the frame 16, but cannot otherwise move relative thereto. The positions of the channel member 22 and stay 24 may be reversed if desired.

**[0019]** Also, in the embodiment shown the window 12 is a plastic window, and the channel member 22 is adapted to lie within the "Euro-groove" in the profile of the window panel 14, such a groove being present in almost all plastic windows, and being of substantially standard dimensions. However, the material from which the window is made is not part of the present invention, and the invention can be used for example with windows of other materials, and can be adapted to be secured to exposed surfaces of the window panel and frame, if desired or required in a particular application.

**[0020]** The end of the stay 24 which is visible in Fig.1 carries a slider 30, which in this embodiment is a substantially circular boss rivetted at the end of the stay (see also Fig.7). The channel member 22 has a channel section 32 which is sized to receive and locate the slider 30.

**[0021]** It will be understood from Fig.1 that as the window is closed the slider 30 moves towards the free end 34 (Fig.2) of the channel section 32, the slider 30 being relatively free to slide along the channel section 32 as the window is opened and closed.

**[0022]** As will be seen from Figs. 2 and 4 in particular, the channel member 22 also carries a stop member 36 which lies within the channel section in its active position (as shown in Figs. 2 and 4). As the window is opened the stay 24 is caused to pivot and the slider 30 moves along the channel section 32 until it engages the stop member 36.

**[0023]** The channel member 22 and the stay 24 are fitted to the window in relative positions in order to restrict the opening movement of the window as desired, it being understood that the further the channel member 22 and stay 24 are fitted away from the hinged edge of the window panel 14, the more restricted will be the window opening. Also, the relative lengths of the channel section 32 and stay 24 are chosen to ensure that the slider 30 lies within the channel section 32 when the window is fully closed.

**[0024]** In normal use, the stop member 36 will remain in its active position and the opening movement of the window panel 14 will be restricted to the angle of opening movement at which the slider 30 engages the stop member 36, as is shown in Fig. 1.

**[0025]** However, when it is desired to release the safety catch 10, the stop member 36 can be moved to its inactive position as shown in Figs. 3 and 5, whereupon the slider 30 can move to (and in this embodiment beyond) the end 40 of the channel section 32, permitting full window opening. Thus, in the embodiment shown, the channel section 32 is of a length, and is fitted in a

position upon the window panel 14, whereby when the window panel 14 is full opened the slider 30 leaves the channel section 32 altogether and the stay 24 becomes separated from the channel member 22. Fig.7 shows a condition in which the window panel 14 (albeit perhaps not fully opened) has been opened sufficiently to release the slider 30 from the channel section 32.

**[0026]** Figs. 4, 5 and 6 show more detail of the channel member 22, and the components thereof.

**[0027]** The stop member 36 comprises a raised abutment upon the periphery of a wheel 42, the wheel 42 being mounted for rotary movement upon an axle 44. The axle 44 also carries a torsion spring 46, which serves to bias the wheel 42 in an anticlockwise direction as shown in Figs. 4-6, and thereby to bias the stop member 36 to its active position.

**[0028]** The channel member 22 also carries an electrically-operated actuator 50, which has a projecting plunger 52, the plunger 52 engaging the peripheral surface of the wheel 42 (see Figs. 4 and 5). The peripheral surface of the wheel 42 has a flat 54, and in the active position of the stop member 36 the plunger 52 engages the flat 54, as shown in Fig.4.

**[0029]** The electrically-operated actuator preferably includes or comprises a solenoid, and the plunger 52 is normally locked in its extended position as shown in Figs. 4 and 6. Upon receipt of an appropriate electrical signal, however, the plunger 52 is released and can be depressed into its housing.

**[0030]** Referring to the active position shown in Fig.4, when the slider 30 is present within the channel section 32 and the window is opened, the slider engages the stop member 36 and seeks to rotate the wheel 42 clockwise as drawn. However, since the central axis of the axle 44 lies between the stop member 36 and the point of engagement of the plunger 52 with the flat 54, clockwise rotation of the wheel 42 is resisted by the plunger 52. The wheel 42 cannot therefore rotate clockwise whilst the plunger 52 is locked in its extended position as shown, and the movement of the slider 30 in the channel section 32 is limited by the stop member 36, and the opening movement of the window is thereby restricted.

**[0031]** However, when the appropriate signal is received by the actuator and the plunger 52 is released, the wheel 42 is able to rotate clockwise allowing the stop member 36 to move from its active position in Fig.4 to its inactive position of Fig.5. In this position, the stop member presents no limit to the slider 30 and the slider can move to (and out of) the end 40 of the channel section 32.

**[0032]** It will be understood that the wheel 42 does not rotate on its own, and it is only the slider 30 which drives the stop member 36 to move to its inactive position. This is preferred since in an emergency not all of the windows may be opened, and those windows which are not opened do not need to be checked or reset as described below, but instead will automatically resume their normal locked restricting condition when the plunger 52 is again locked in its extended position. Also, if a false alarm is

issued by a smoke or fire alarm there will be no need to reset the safety catch unless a window has been fully opened. Clearly, however, in other less preferred embodiments the stop member may be positively moved to its inactive position.

**[0033]** A suitable electrically-operated actuator is available from Servocell Limited, of 1 Astra Centre, Harlow, Essex, CM20 2BN, England, and is sold under the trade name "Active Latch", model number "AL2". This actuator uses a piezo-electric solenoid which uses very little energy, so that it can suitably be powered by a battery. Such an actuator uses a plunger 52 which is spring-biased towards its extended position, and an appropriate electrical signal unlocks the plunger and allows it to be depressed. Discontinuance of the electrical signal locks the plunger in its extended position.

**[0034]** Though not shown in the drawings, the actuator 50 is connected to a radio receiver (which may be fitted into the channel member 22 or elsewhere upon the glazing panel 14), and an operating signal can be transmitted to the actuator 50 to release the plunger 52. The operating signal can arrive directly from a smoke or fire alarm, or from a dedicated control facility. Suitable radio receivers are in widespread use and available from electronics suppliers such as Maplin and the like, and are also of very low power consumption, so that both the actuator and the radio receiver can be powered by battery. There is therefore no need to connect the safety catch to mains electricity.

**[0035]** It is a requirement in the UK that a safety catch must be able to withstand a force seeking to open the window of 600 N at the locking edge (i.e. the edge of the window panel opposite to the hinges 20). The geometry of the safety catch 10 is such that a force upon the locking edge of 600 N is reduced to a lower force seeking to rotate the wheel 42. The "Active Latch AL2" can withstand a force of 1000 N seeking to depress the locked plunger 52 so that the mandatory requirements upon the safety catch 10 are easily met.

**[0036]** It will be noted from Fig.7 that in this preferred embodiment the stay 24 becomes separated from the channel section 32 when the window is opened sufficiently. It is furthermore desirable that if an attempt is made to close the window panel 14 from the position of Fig.7 it will not be possible to do so because the slider 30 and stay 24 will foul the channel member 22. It is thus immediately apparent which of the windows has been fully opened, and which of the safety catches 10 requires resetting to its restricting condition.

**[0037]** Resetting of the safety catch 10 requires replacement of the slider 30 into the end 40 of the channel section 32. Also, since the stop member 36 will automatically have returned to its active position under the bias of the spring 46, the stop member 36 will need to be depressed to allow the slider 30 to pass along the channel section 32. It may be necessary to trigger the actuator 50 to release the plunger 52 during this resetting, and a suitable control signal can allow the plunger to be de-

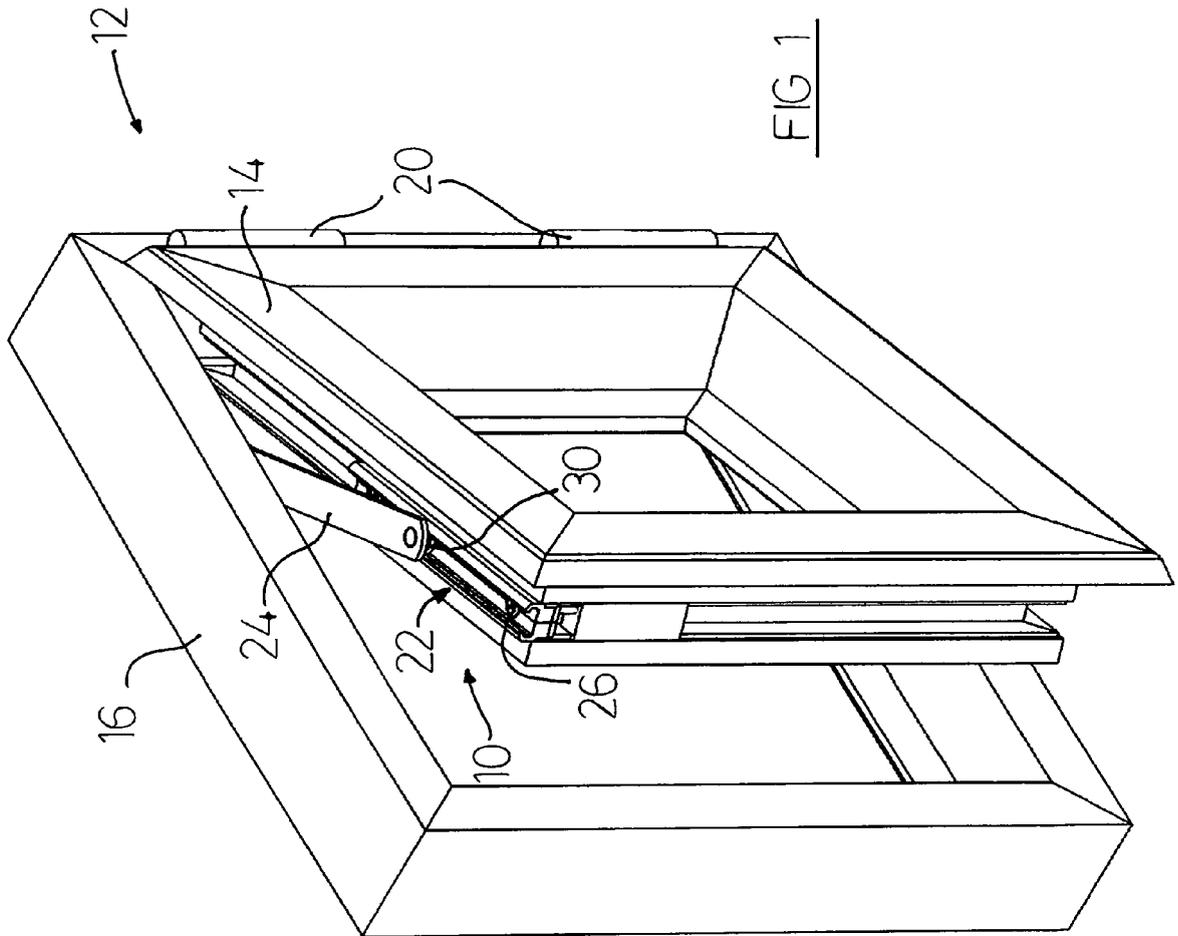
pressed. Alternatively (but less preferably) the actuator 50 may remain in its unlocked condition until a resetting signal is received (after the slider 30 has been returned to the channel section 32 and the window fully closed) whereupon the plunger 52 once again become locked in its extended position.

**[0038]** It will be understood that no key is required to release the safety catch 10, and since an electrical signal can be issued remotely to several safety catches at the same time, the present invention is suited to public or commercial buildings having a large number of hinged windows.

**[0039]** In a large public or commercial building for example, if the building has a central fire alarm system it can be arranged that the safety catches on the windows of all parts of the building be released together, whereas if the building has separate fire alarm systems for separate parts of the building it can be arranged that each fire alarm system is linked only to the safety catches on the windows of that part of the building.

### Claims

1. A safety catch (10) for restricting the opening movement of a hinged window panel (14) relative to its frame (16), the safety catch comprising a channel member (22) and a stay (24), the channel member being adapted for securement to one of the window panel and frame, and the stay being adapted for securement to the other of the window panel and frame, the stay having a slider (30) which can move relative to the channel member, the safety catch having a stop member (36) which is movable between active and inactive positions, the stop member in its active position being engageable by the slider so as to limit the movement of the slider relative to the channel member, movement of the stop member between its active and inactive positions being controlled by an electrically-operated actuator (50). 5
2. A safety catch according to Claim 1 in which the stop member is biased into its active position by a resilient biasing member (46). 10
3. A safety catch according to Claim 1 or Claim 2 in which the electrically-operated actuator (50) is connected to a receiver adapted to receive a radio control signal. 15
4. A safety catch according to any one of Claims 1-3 in which the electrically-controlled actuator (50) has a first (secured) condition in which it holds the stop member in its active position, and a second (unsecured) condition in which the stop member is released and can be moved from its active position to its inactive position. 20
5. A safety catch according to Claim 4 in which the electrically-controlled actuator (50) will remain in its second (unsecured) condition only whilst a control signal is being received, and will return to its first (secured) condition when the control signal is no longer being received. 25
6. A safety catch according to any one of Claims 1-5 in which the channel member (22) has a channel section (32) within which the slider 30 can move, the channel section having a first end (34) and a second end (40), the stop member (36) in its active position lying between the first and second ends, the stop member when held in its active position limiting movement of the slider (30) towards the second end (40) of the channel section, the stop member in its inactive position allowing the slider to move to the second end. 30
7. A safety catch according to Claim 6 in which the second end (40) is open to allow the egress and entry of the slider (30). 35
8. A safety catch according to any one of Claims 1-7 in which the stop member (36) is an abutment surface of a wheel member (42) which is mounted for partial rotation upon an axle (44). 40
9. A safety catch according to Claim 8 in which the stop member (36) projects into the path of the slider (30) through an opening in a channel section (32) of the channel member (32). 45
10. A safety catch according to any one of Claims 1-9 in which the electrically-controlled actuator engages a flattened part (54) of the periphery of the wheel member (42). 50



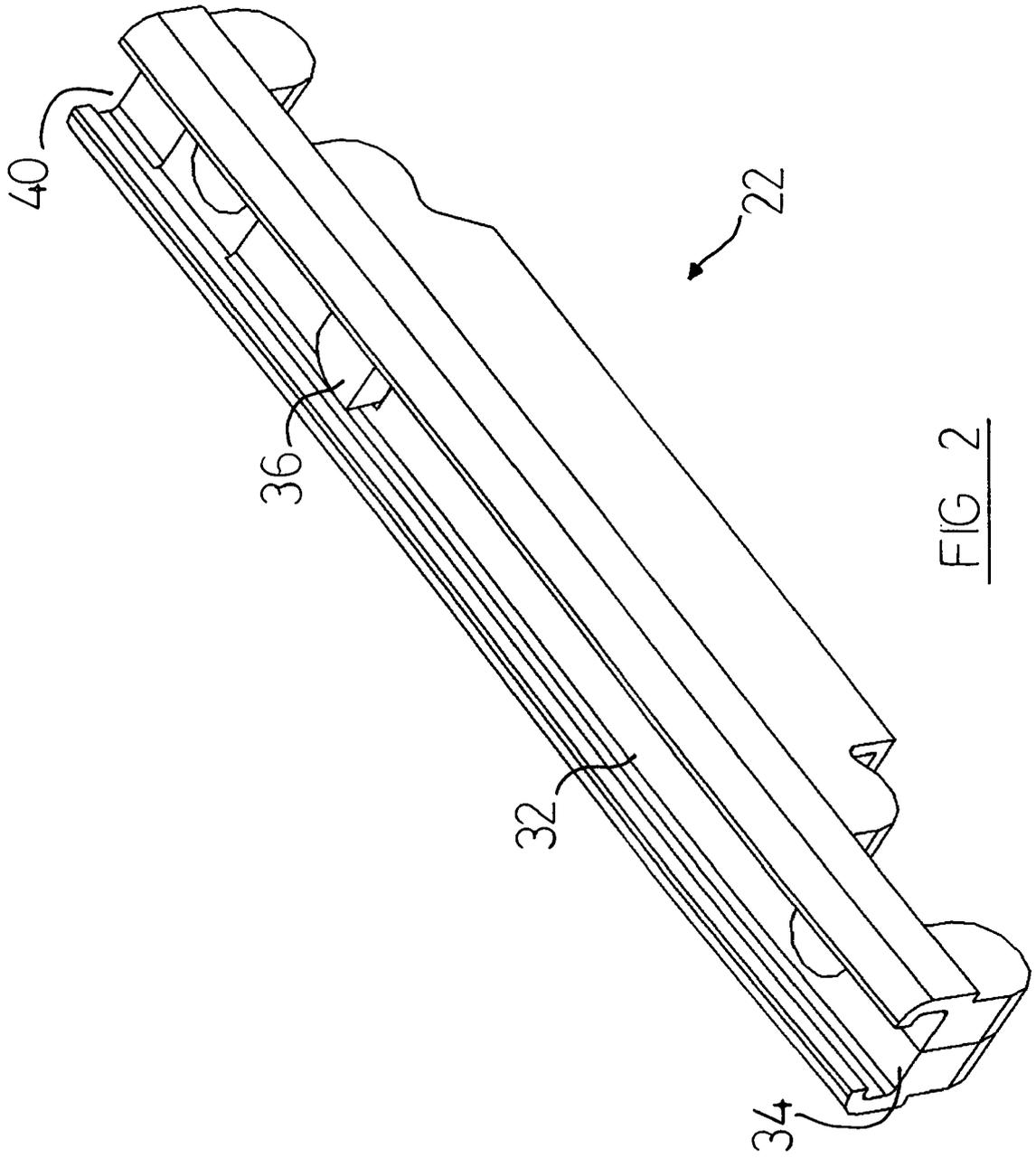


FIG. 2

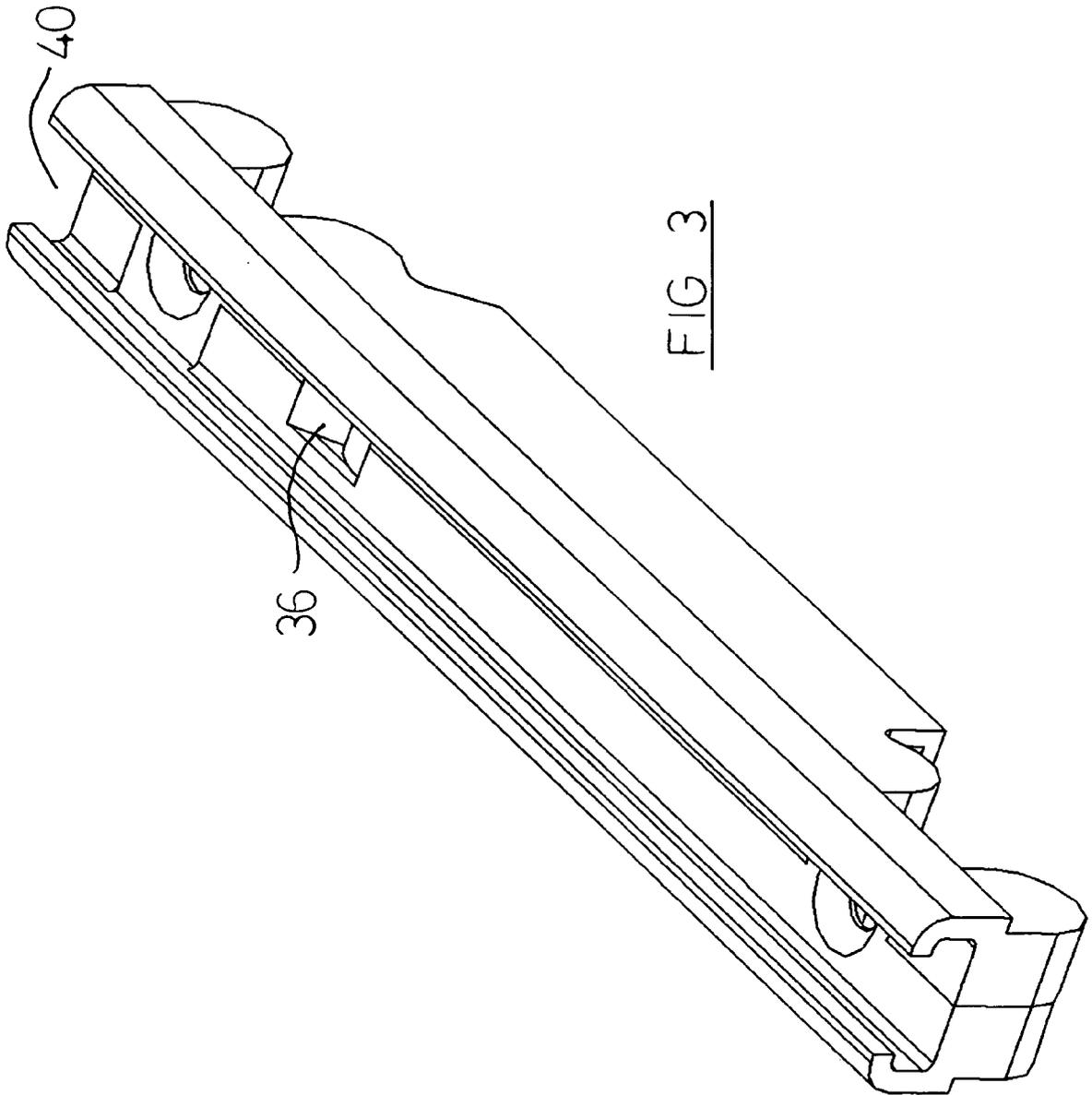


FIG. 3

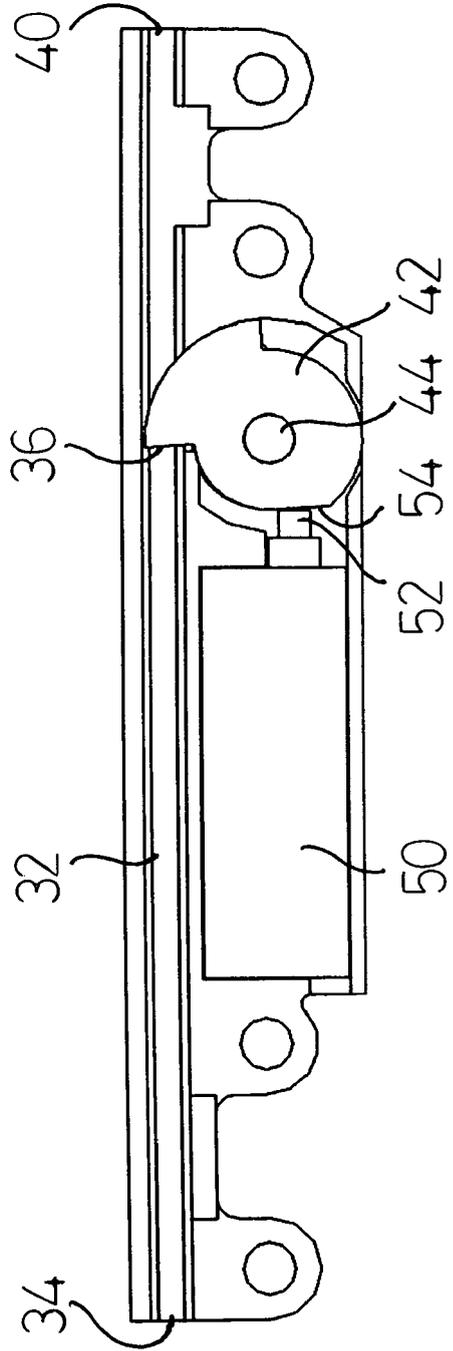


FIG 4

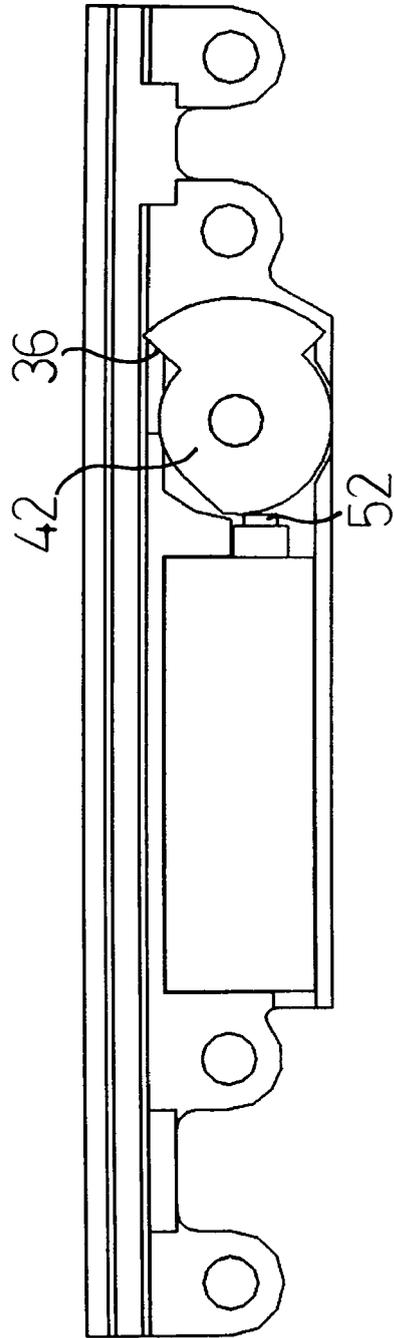


FIG 5

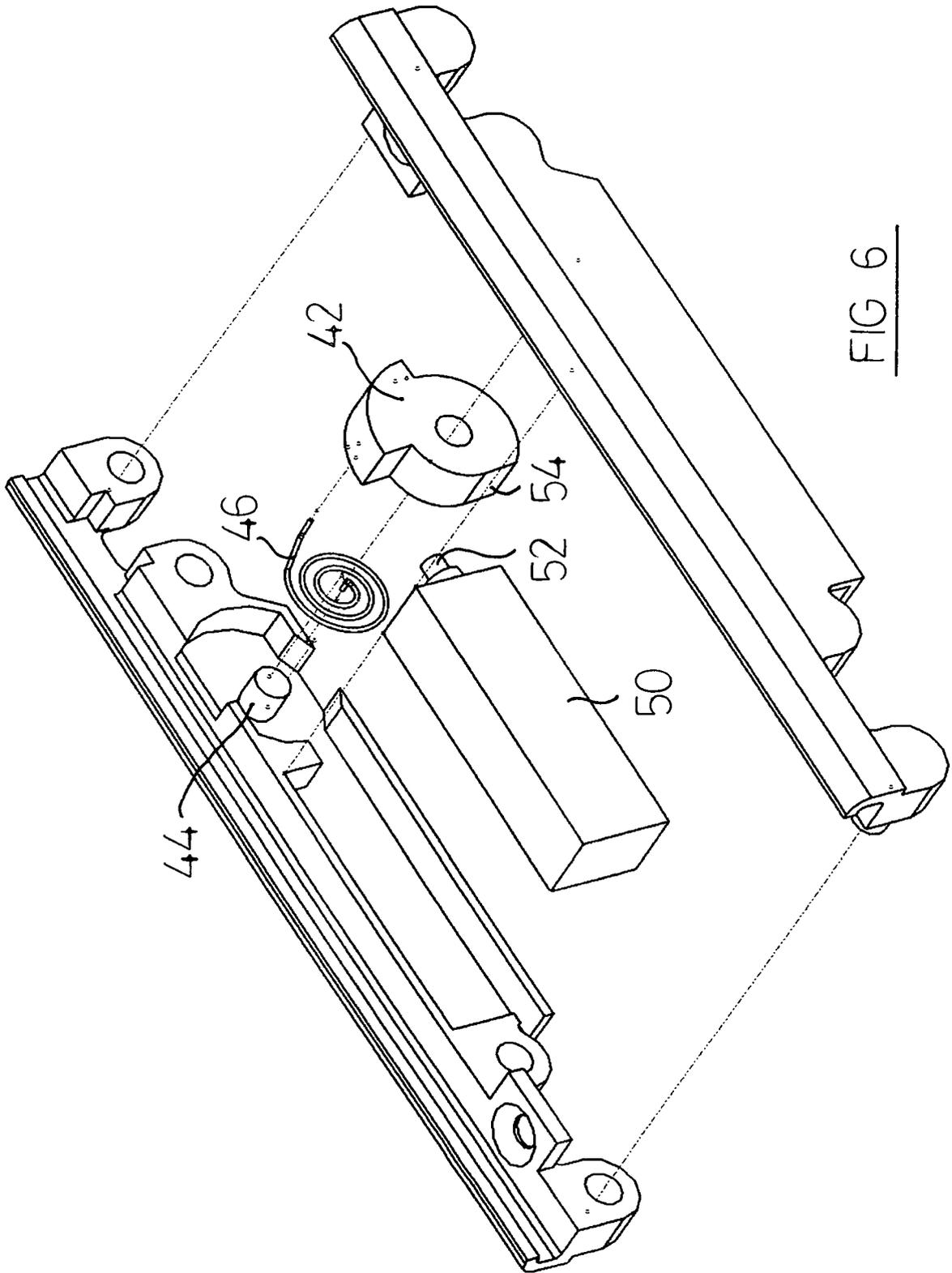
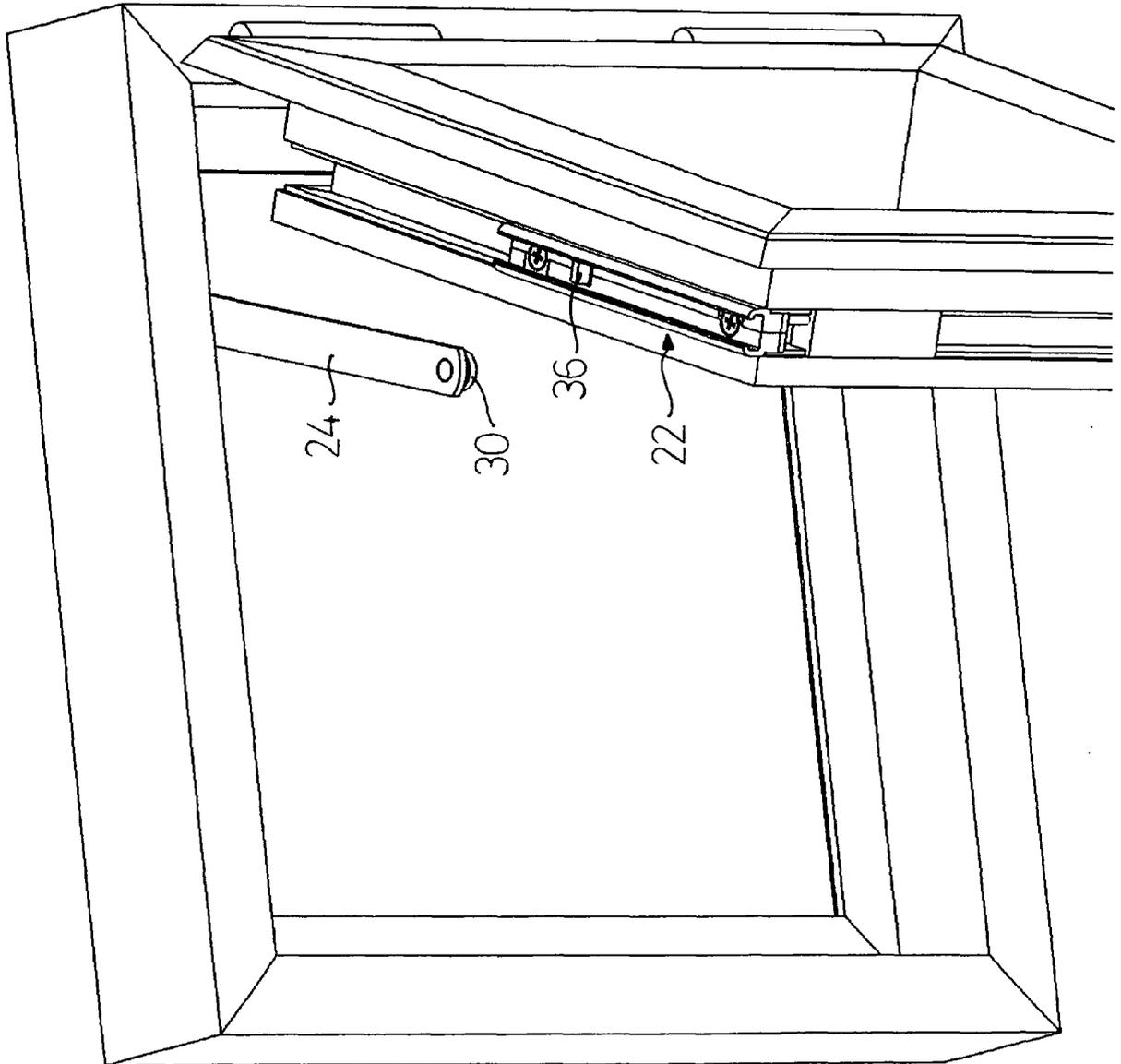


FIG 6

FIG 7





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2006/105790 A (LEO LAURSEN APS [DK]; LAURSEN HENRIK LEO [DK]) 12 October 2006 (2006-10-12) * abstract; figures 1-12 *	1-10	INV. E05B65/08 E05C17/16 E05F11/00
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E05B E05C E05F
Place of search		Date of completion of the search	Examiner
Munich		20 June 2008	Friedrich, Albert
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 25 0719

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20-06-2008

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**REFERENCES CITED IN THE DESCRIPTION**

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