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(54) **Friction stay**

(57) A friction stay comprising a vent arm 24 moveable relative to a fixed component 10 fixed, in use, to a stationary part of a window frame, the vent arm 24 and the fixed component 10 each having projections 32, 38 associated therewith co-operable with one another when the vent arm 24 occupies a closed position to inhibit

movement of the vent arm 24 in the longitudinal direction thereof. The vent arm 24 further carries a projection 44 co-operable with a stop 46 when the vent arm 24 occupies its closed position, the projection 44 being out of alignment with the fixed component 10 when the vent arm 24 occupies this position.

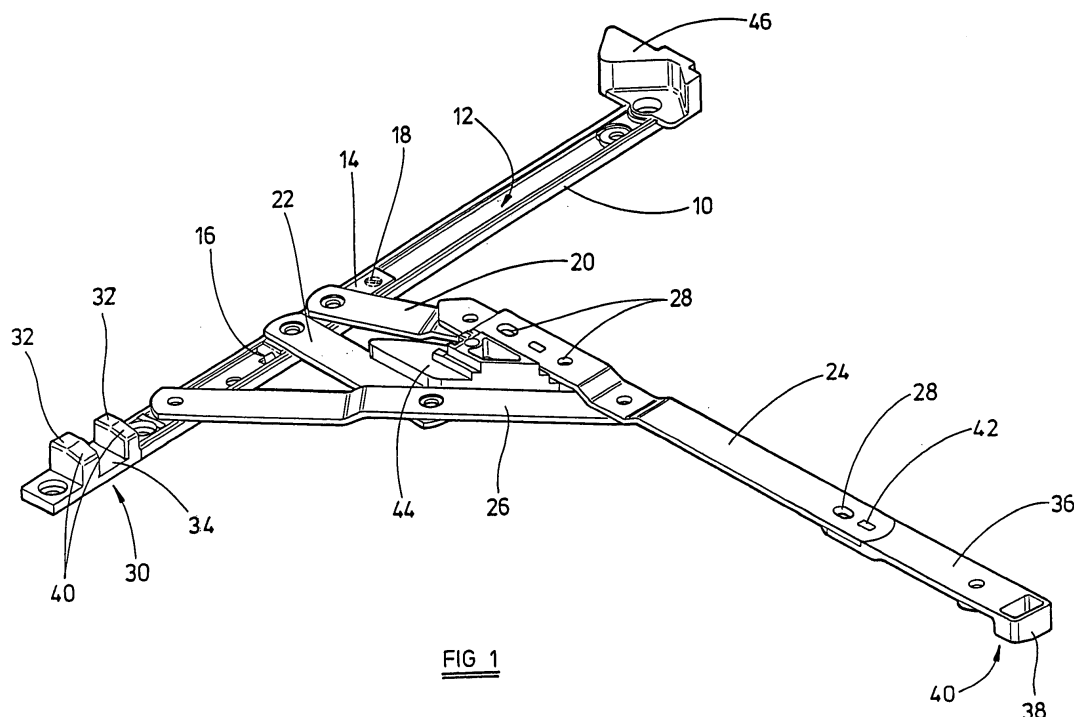


FIG 1

Description

[0001] This invention relates to a friction stay for use in mounting a frame of a movable vent to the remainder of a window frame. The invention relates, in particular, to a friction stay of improved ability to withstand loads applied thereto in an attempt to gain unauthorised access to a building.

[0002] In order to gain unauthorised access to a building, it is known to introduce a suitable tool between the frame of a movable vent and the remainder of a window frame, and to apply a force to the tool to attempt to move the vent frame, and thereby to apply a sufficient load to the friction stay or to the locking mechanism to fail or to be weakened to such an extent that it is relatively easy to open the vent.

[0003] GB 2281346 describes a friction stay of improved security.

[0004] It is an object of the invention to provide a friction stay whereby the risk of unauthorised access to a building can be reduced. A further object is to provide components for use with an existing friction stay whereby the ability of the stay to withstand loads applied thereto is improved.

[0005] According to the present invention there is provided a friction stay comprising a vent arm movable relative to a fixed component fixed, in use, to a stationary part of a window frame, the vent arm being movable between a closed position and an open position, the vent arm carrying a projection which projects from a side thereof such that, when the vent arm occupies its closed position, the projection is out of alignment with the fixed component, the projection co-operating with a stop associated with the fixed component, when the vent arm is in its closed position, to restrain movement of the vent arm in a direction perpendicular to the plane of the vent arm, and characterised in that the projection and stop co-operate with one another as the vent arm is moved towards its closed position to guide the vent arm towards the closed position.

[0006] The projection may further be shaped to act as a stop, the projection abutting at least one further component of the stay when the vent arm occupies an open position.

[0007] Conveniently, the projection is securable to the vent arm.

[0008] The stay is advantageous in that, when occupying its closed position, movement of the vent arm in its longitudinal direction is restrained, thus the vent is able to withstand increased loads, the risk of damage to the locking mechanism is reduced, and hence the risk of unauthorised access to a building through the vent is reduced. Further, levering of the vent to move the vent in a direction perpendicular to the plane of the vent at the "hinged" side of the vent is restrained, again reducing the risk of unauthorised access being gained.

[0009] The invention will further be described, by way of example, with reference to the accompanying drawings, in which:

Figures 1 and 2 are perspective views illustrating a friction stay in accordance with an embodiment of the invention in open and closed positions, respectively;

Figure 3 is a plan view of the stay in its open position; Figure 4 is an enlarged perspective view of part of the stay;

Figures 5 to 8 are perspective views of some of the components of the stay; and

Figures 9 to 14 are perspective views of some alternative components.

[0010] The friction stay illustrated in the Figures 1 to 8 comprises a fixed component in the form of a track 10 arranged to be secured, for example using screws, to a fixed part of a window frame. The friction stay is particularly suitable for use with a window frame constructed from extruded lengths of PVC-U material. It will be appreciated, however, that the friction stay may also be used in other applications, for example window frames constructed from aluminium. The track 10 defines a channel 12 within which a slide member 14 is located, the slide member 14 being slidable axially of the track 10. The lower wall of the track 10 is deformed to define a projection 16 acting as a stop which limits sliding movement of the slide member 14. The slide member 14 may be provided with, for example, an adjustment screw 18 whereby the load resisting sliding movement of the slide member 14 along the track can be adjusted to a desired level.

[0011] First and second linkage arms 20, 22 are pivotally mounted upon the slide member 14. The first arm 20 is pivotally connected, at its end remote from that pivotally mounted upon the slide member 14 to a vent arm 24. The vent arm 24 is pivotally connected to a third linkage arm 26, the end of which remote from the vent arm 24 is pivotally mounted to the track 10. The end of the second linkage arm 22 remote from the end mounted upon the slide member 14 is pivotally connected to the third linkage arm 26. The lengths and positions of the first, second and third linkage arms 20, 22, 26 are chosen to ensure that the vent arm 24 is moveable between a closed position (as shown in Figure 2) in which it overlies the track 10 and an open position (as shown in Figures 1 and 3) in which it extends generally perpendicularly to the track 10.

[0012] In order to accommodate the various connections between the linkage arms 20, 22, 26 and the vent arm 24, these components are bent to define steps lying in different planes.

[0013] As shown in the drawings, the vent arm 24 is provided with a number of openings 28 whereby the vent arm 24 may be secured, for example using screws, to the frame of a moveable vent.

[0014] The friction stay described thus far is of generally conventional form.

[0015] In accordance with the invention, the track 10 has associated therewith a component 30 provided with

a pair of upstanding projections 32 defining therebetween a channel 34. The vent arm 24 has associated therewith a component 36 provided with a projection 38 receivable within the channel 34 when the vent arm 24 occupies its closed position, the projection 38 being cooperable with the projections 32 such that movement of the vent arm 24 relative to the track 10 in its longitudinal direction is restrained. The projections 32, 38 are each provided with a ramped surface 40 arranged to ensure that, as the vent arm 24 is moved towards its closed position, the vent arm 24 is lifted to a position that ensures that the vent frame does not abut part of the fixed window frame in such a manner as to prevent closure of the vent.

[0016] In order to make fitting of the component 30 and the component 36 relatively easy, these components are securing using the same fixing screws as those used to secure the track 10 and the vent arm 24 in position. Additional fixing screws are also used. In order to ensure that the component 36 extends generally coaxially with the vent arm 24, the component 36 is provided with an upstanding tang 42 which engages within a correspondingly shaped opening provided in the vent arm 24.

[0017] In order to further enhance the security attainable using the friction stay, a projection 44 is mounted upon the vent arm 24, the projection 44 being cooperable, as the vent arm 24 is moved towards its closed position, with a stop 46 mounted upon the track 10. The stop 46 conveniently forms part of an end cap shaped to co-operate with an end of the vent arm 24 to further ensure that movement of that end of the vent arm 24 is resisted when the vent arm occupies its closed position.

[0018] As illustrated most clearly in Figure 4, the projection 44 is arranged to protrude from a side of the vent arm 24 to a position in which it is out of alignment with the track 10 when the vent arm 24 occupies its closed position. The projection 44 includes an abutment surface 48 of curved form which cooperates with an abutment surface 50 provided on the stop 46. The abutment surfaces 48, 50 are shaped to ensure that, when the vent occupies its closed position, little or no movement of the vent arm 24 in a direction perpendicular to the plane of the vent is permitted.

[0019] The projection 44 is further shaped such that when the vent arm 24 occupies its fully open position as illustrated most clearly in Figure 3, the projection 44 engages both the second and third linkage arms 22, 26 to further resist movement of the vent in the opening direction, assisting the engagement between the slide member 14 and the stop 16 in resisting such movement. The mounting of the projection 44 is conveniently achieved using at least one of the screws used to secure the vent arm 24 to the vent. In addition, the projection 44 includes an integral tang 52 received within a correspondingly shaped opening provided in the vent arm 24. An additional opening 54 is also provided in the projection 44 whereby an additional mounting screw may be used to secure the projection 44 to the vent.

[0020] In use, mounting of the friction stay is not a sig-

nificantly more complex process than the mounting of a conventional frictional stay, the main difference being that a few additional mounting screws are used to ensure that the various components are secured rigidly in position. Once correctly mounted, opening and closing of the vent in normal use is not impeded in any way. Indeed closing of the vent is assisted to some extent as the co-operation between the projection 44 and the stop 46 as the vent approaches its closed position occurs relatively early and from the commencement of the co-operation between the projection 44 and the stop 46, that part of the vent is guided towards its closed position. Also, once the ramped surfaces 40 move into engagement with the opposing components 30, 36 the vent will be moved to a position in which undesirable abutment between the vent and the window frame can be avoided.

[0021] Once the vent is in its closed position, unauthorised access to the building through the vent by levering of the vent is resisted. In particular, attempts to lever the vent in a direction parallel to the longitudinal axis of the vent arm 24 will be resisted by co-operation between the projection 38 and the projections 32. Levering of the side of the vent adjacent the projection 44 and stop 46 to try and move the vent in a direction perpendicular to its plane will also be resisted by engagement of the abutment surface 48 of the projection 44 with the abutment surface 50 of the stop 46. The abutment surfaces 48, 50 are shaped such that the spacing therebetween when the vent arm 24 occupies its closed position is very small, thus levering of the vent is resisted to an extent better than that of a conventional stay. It will be appreciated that the ability of the friction stay of the invention to withstand such levering, and hence to reduce the risk of unauthorised access to a building being gained is improved.

[0022] If desired, the projection 44 may be omitted, in which case the stop 46 may be replaced by a conventional end cap.

[0023] Figures 9 and 10 illustrate a component 36 of alternative form in which the projection 38 is of increased length. The component 36 of Figures 9 and 10 is intended for use with the component 30 of Figure 11 in which the channel 34 is of increased length to accommodate the projection 38.

[0024] Figures 12 and 13 illustrate an alternative form for the projection 44, Figure 14 illustrating an alternative keep for use with the projection 44 of Figures 12 and 13.

Claims

1. A friction stay comprising a vent arm (24) movable relative to a fixed component (12) fixed, in use, to a stationary part of a window frame, the vent arm (24) being movable between a closed position and an open position, the vent arm (24) carrying a projection (44) which projects from a side thereof, **characterised in that** the projection (44) acts as a stop, the

projection (44) abutting at least one further component (22, 26) of the stay when the vent arm (24) occupies its open position.

2. A stay as claimed in Claim 1 wherein the projection (44) abuts both component (22) and component (26) of the stay when the vent arm (24) occupies its open position. 5

3. A stay as claimed in Claim 2 wherein the shape of the projection (44) is generally trapezoidal. 10

4. A stay as claimed in any of the proceeding Claims wherein when the vent arm (24) occupies its closed position, the projection (44) is out of alignment with the fixed component (12), the projection (44) co-operating with a stop (46) associated with the fixed component (12), when the vent arm (24) is in its closed position, to restrain movement of the vent arm (24) in a direction perpendicular to the plane of the vent arm (24). 15
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5. A stay claimed in Claim 4 wherein the projection (44) and stop (46) co-operate with one another as the vent arm (24) is moved towards its closed position to guide the vent arm (24) towards the closed position. 25

6. A stay as claimed in either Claim 4 or Claim 5, wherein the projection (44) and stop (46) engage one another when the vent arm (24) occupies its closed position. 30

7. A stay as claimed in any of the proceeding Claims, wherein the projection (44) is provided on a component (44) securable to the vent arm (24). 35

8. A stay as claimed in Claim 7 wherein the projection (44) includes an integral tang (52) received within a correspondingly shaped opening provided in the vent arm (24). 40

9. A stay as claimed in any of the proceeding Claims, wherein the projection (44) is provided on a component (44) securable to the vent. 45

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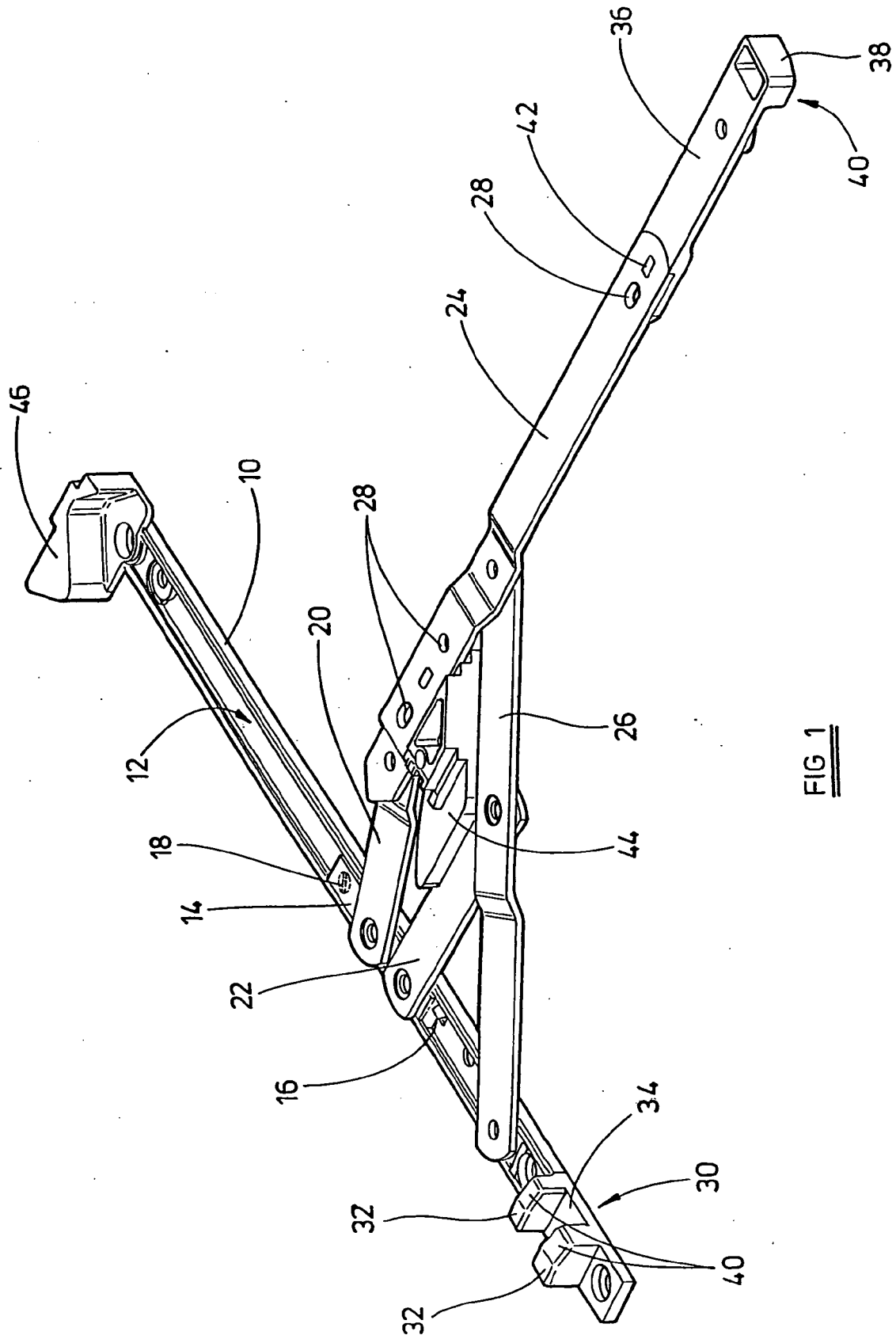
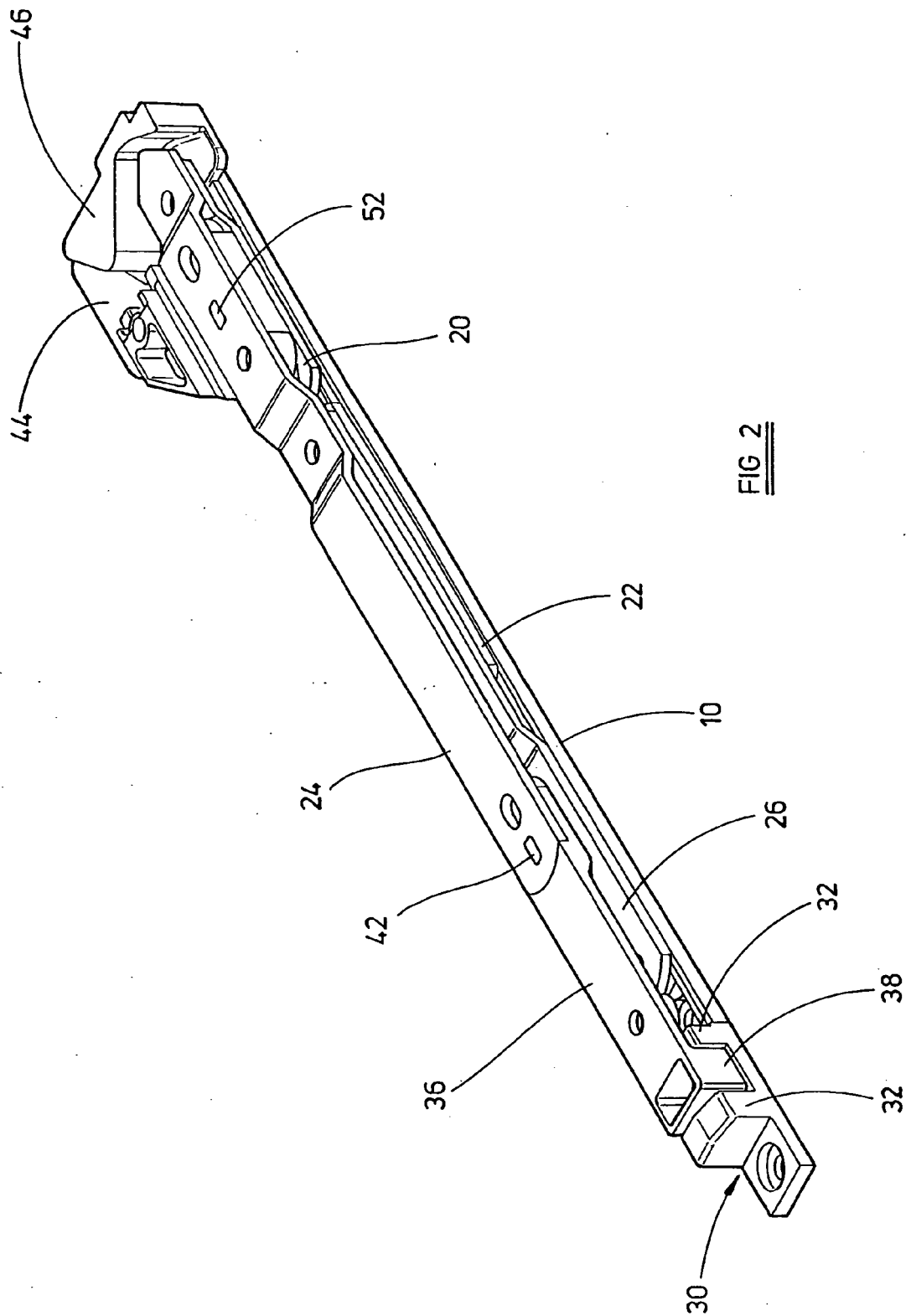


FIG 1



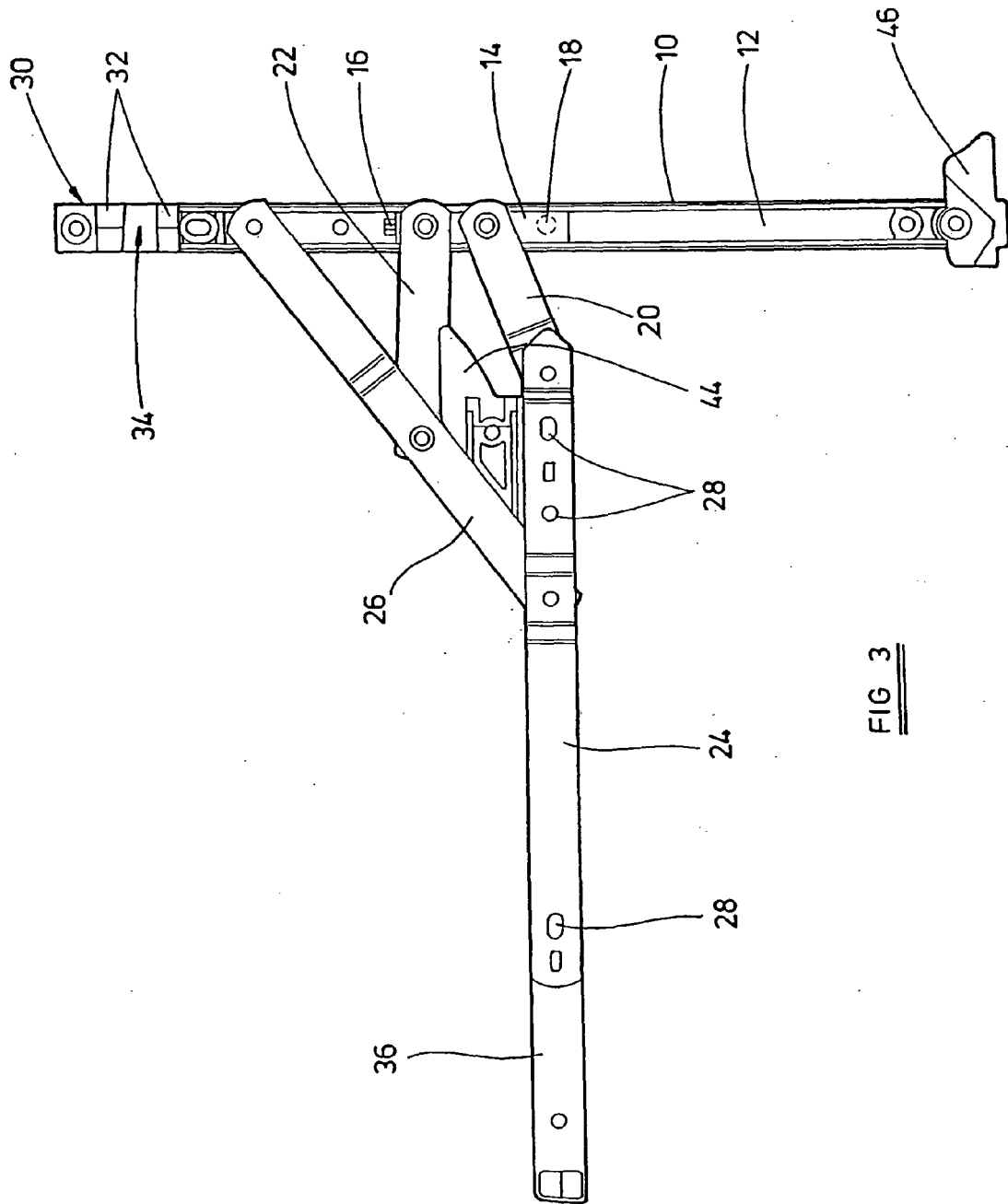
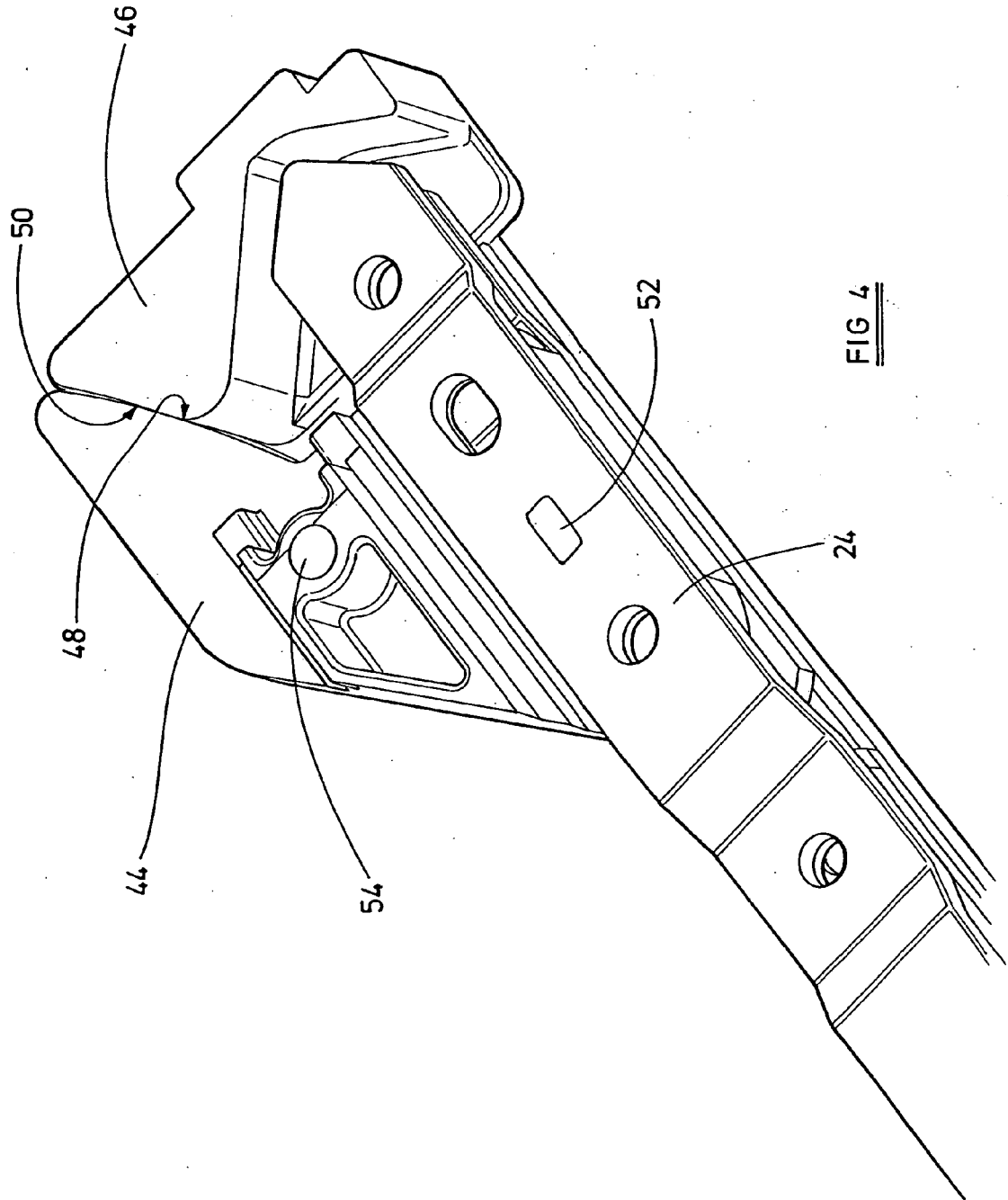


FIG 3



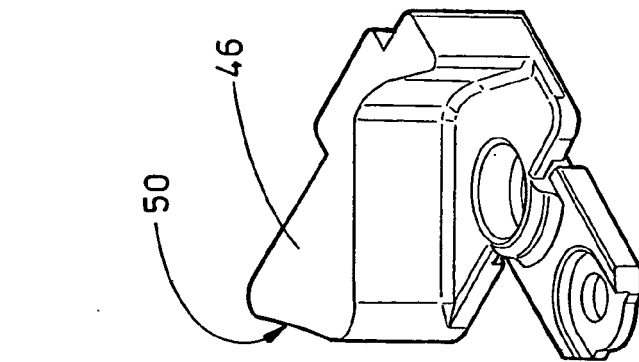


FIG 8

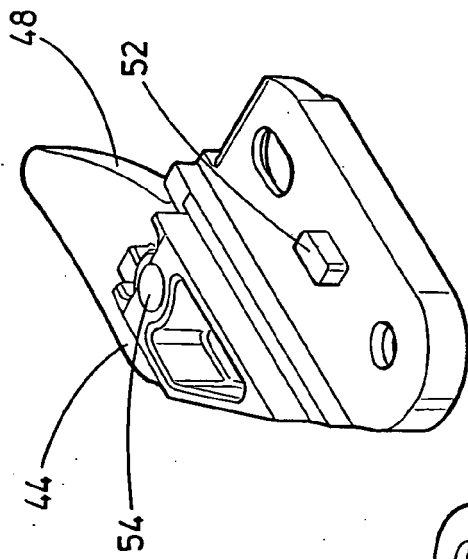


FIG 7

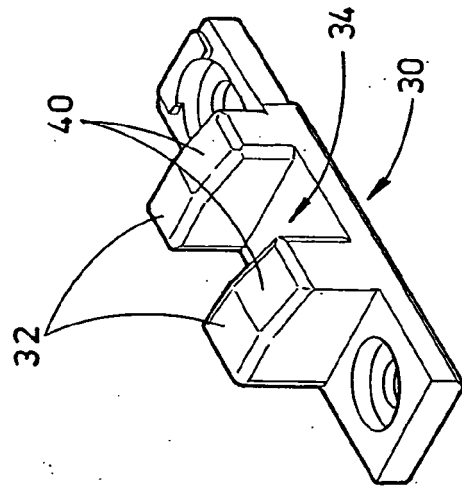


FIG 6

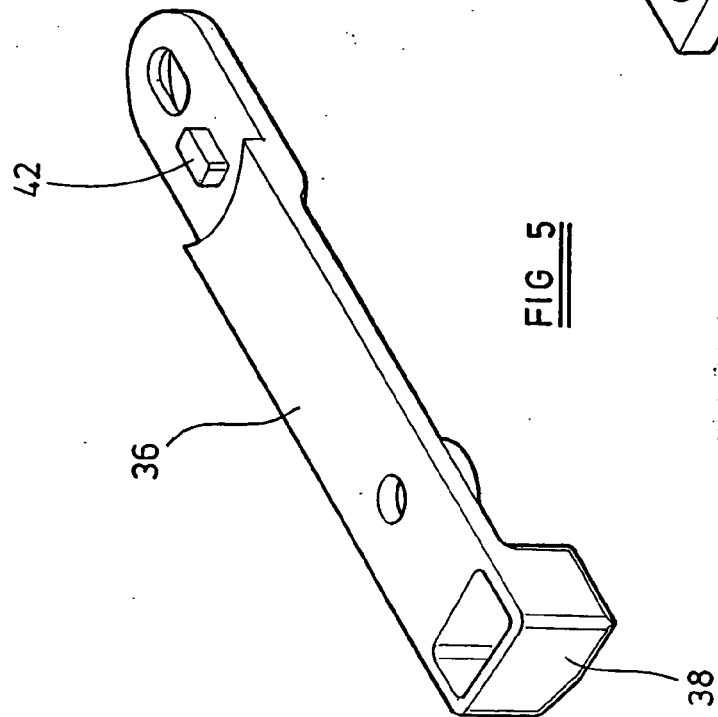


FIG 5

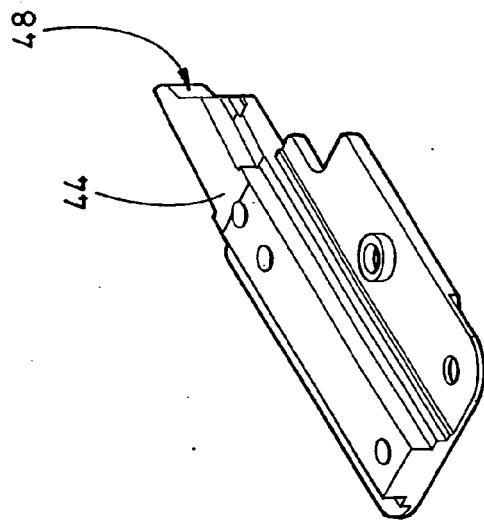


FIG 13

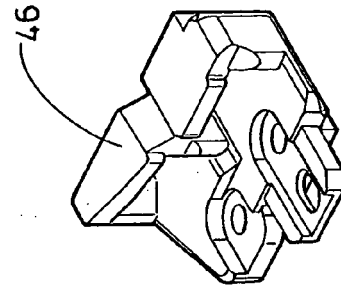


FIG 14

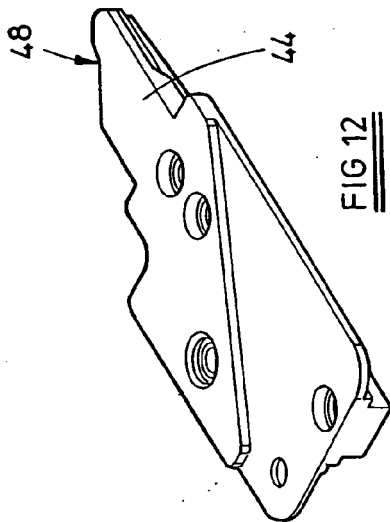


FIG 12

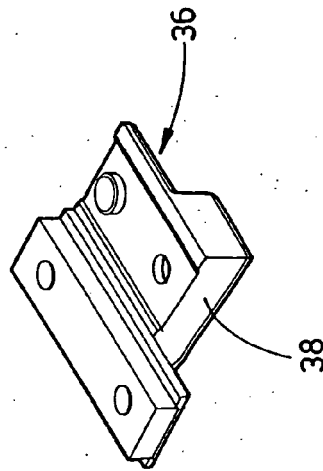


FIG 10

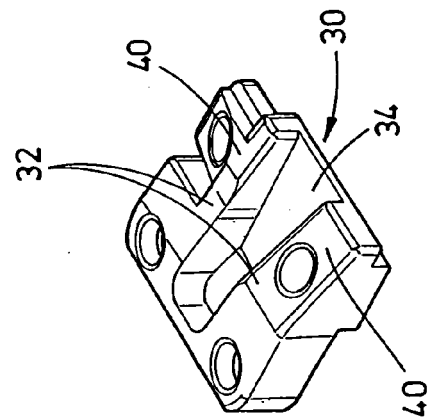


FIG 11

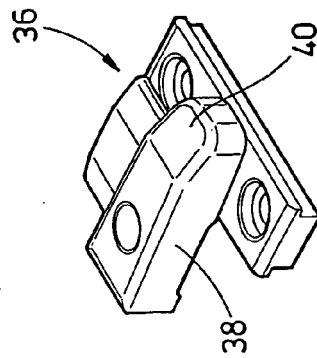


FIG 9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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