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(continued on next page)

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GB 2301621 A

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UK CL (Edition X) **E2F**
INT CL **E05C, E05D**
Other: **ONLINE: EPODOC, WPI, TXTE**

(54) Abstract Title: **Egress hinge including first slider with retainer and second slider with greater frictional resistance**

(57) An egress hinge (10) for mounting a closure member on a fixed frame said hinge comprising:

- a track (11);
- a first slider (12);
- a second slider (13);
- a linkage (17); and
- a releasable retainer (18) coupled with the first slider (12) and engageable with the track (11) in order to define a fixed position of the first slider (12) during opening and closing movement of the closure member, whereby the first slider (12) determines the location of the plane of the closure member in a fully opened position which is near to one of the frame members of the fixed frame so as to define a large egress opening between the closure member and an opposite frame member of the fixed frame, and in which the retainer (18) is selectively operable to release the first slider (12) from the track 11 and allow the first slider (12) and the vent arm (17) to move along the track (11) to a cleaning position of the closure member;

in which the second slider (13) has greater frictional resistance than the first slider (12) such that, upon movement from the cleaning position and toward the closed position, the lesser frictional contact resistance of the first slider (12) with the track (11) results in the first slider (12) being moveable along the track while, by virtue of the geometry of the hinge, the second slider (13) remains immovable, such that the retainer 18 is automatically reset as the closure member approaches the closed position.

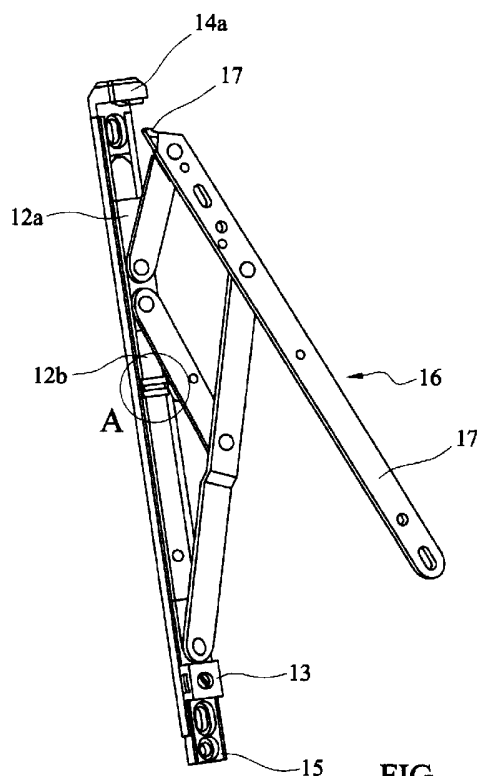


FIG. 2

GB 2 425 150 A

GB 2425150 A continuation

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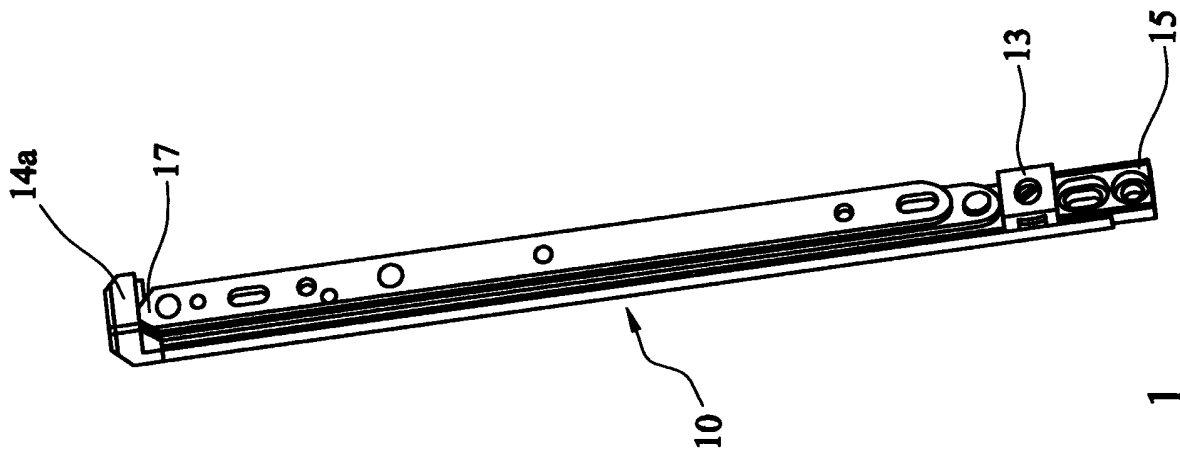


FIG. 1

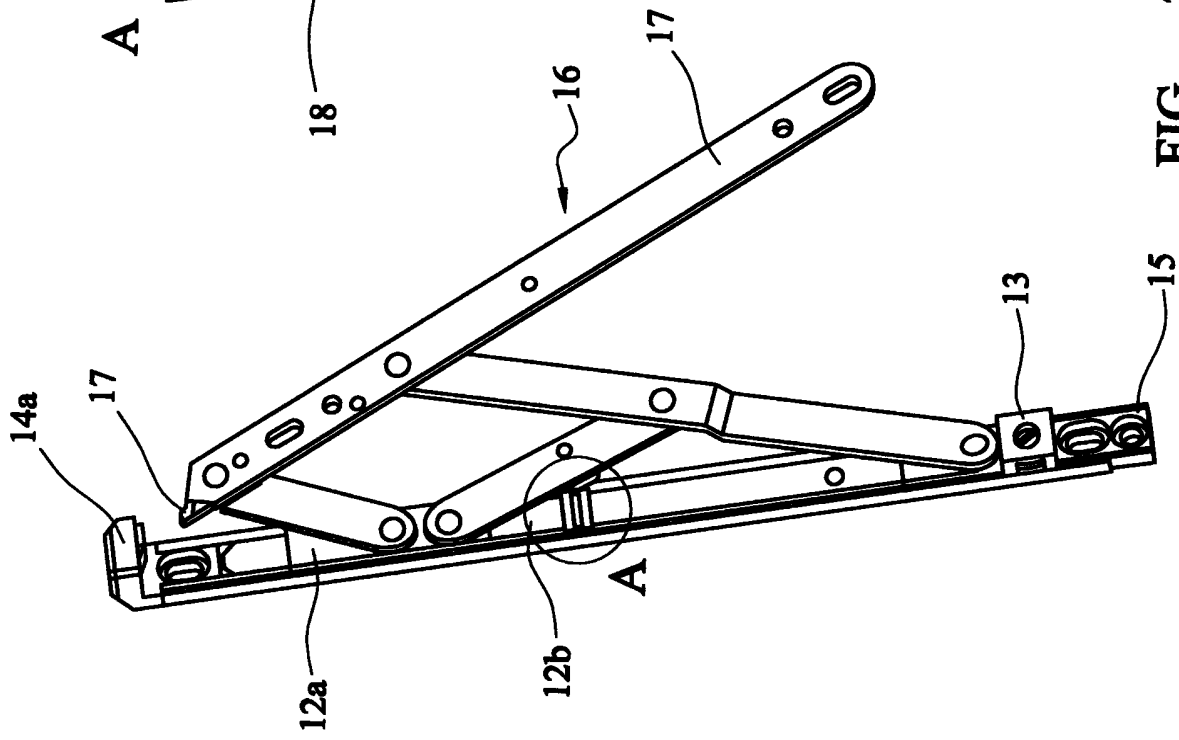


FIG. 2

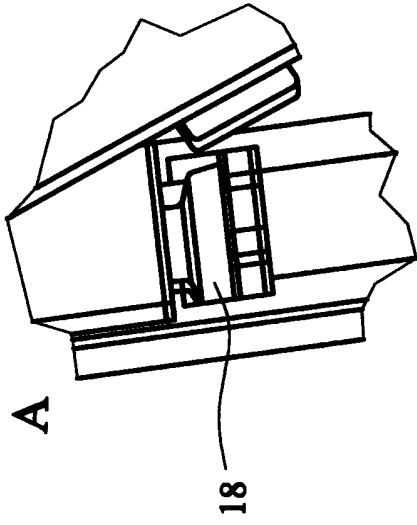


FIG. 2a

303341

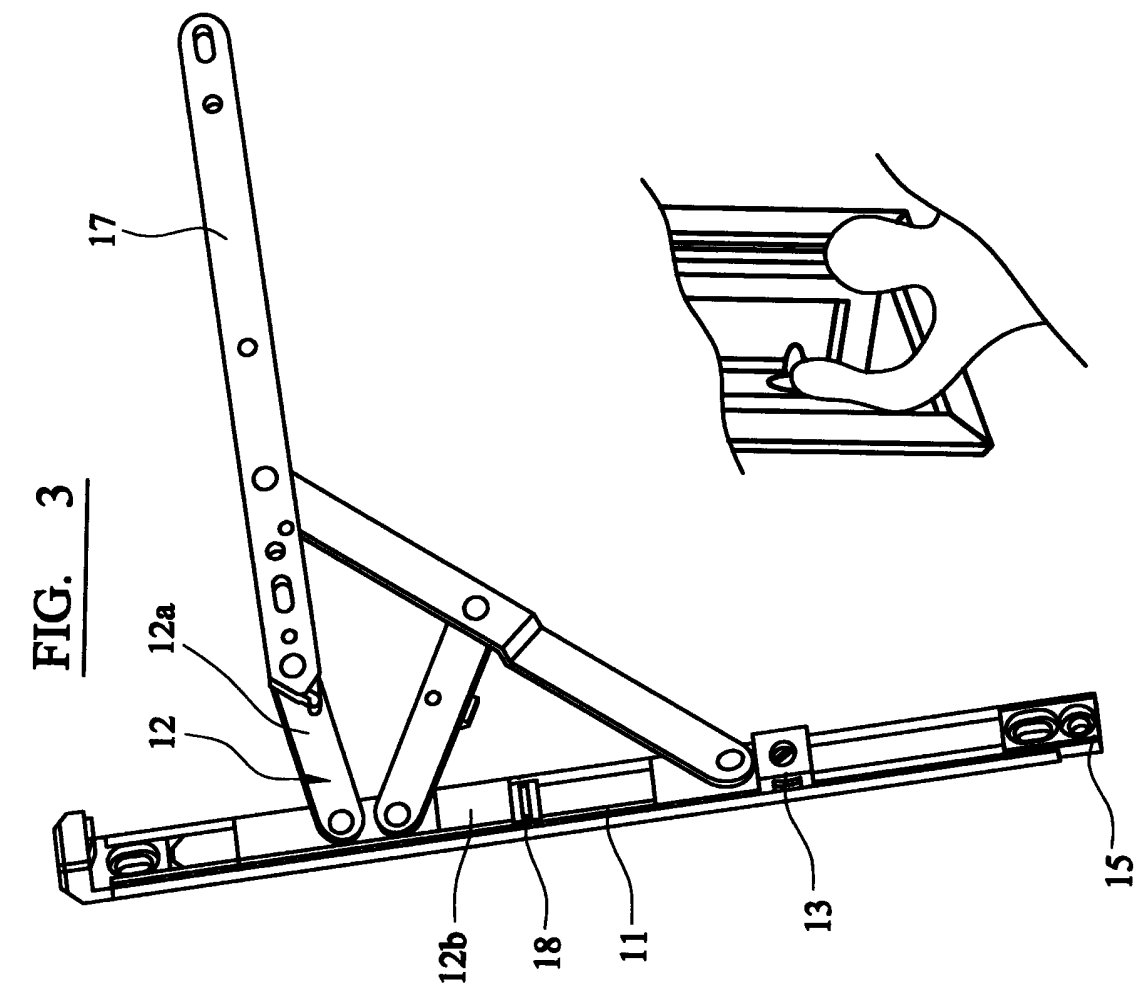


FIG. 3

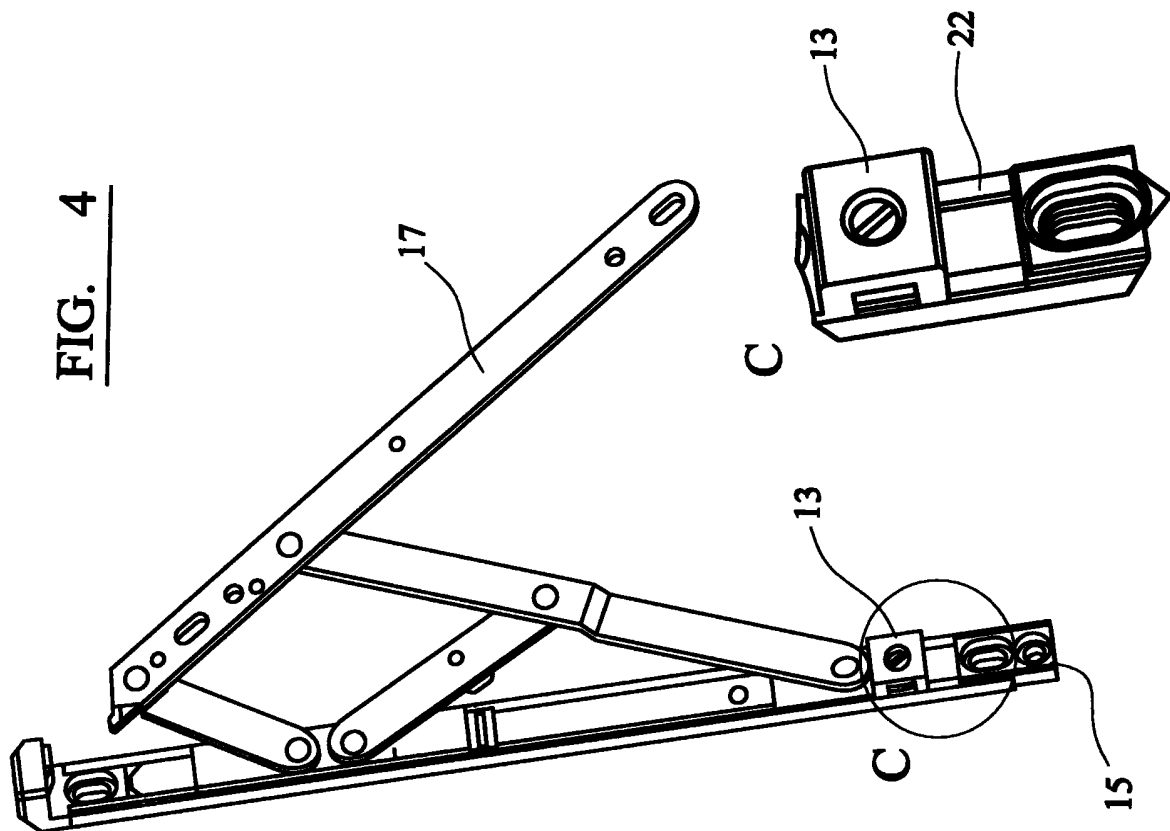


FIG. 4

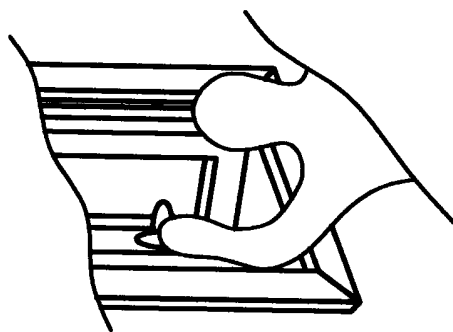
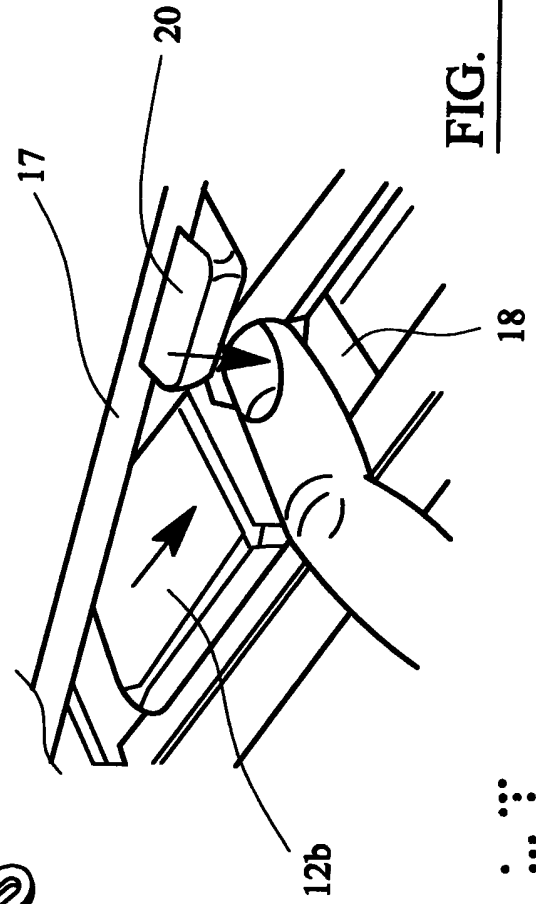
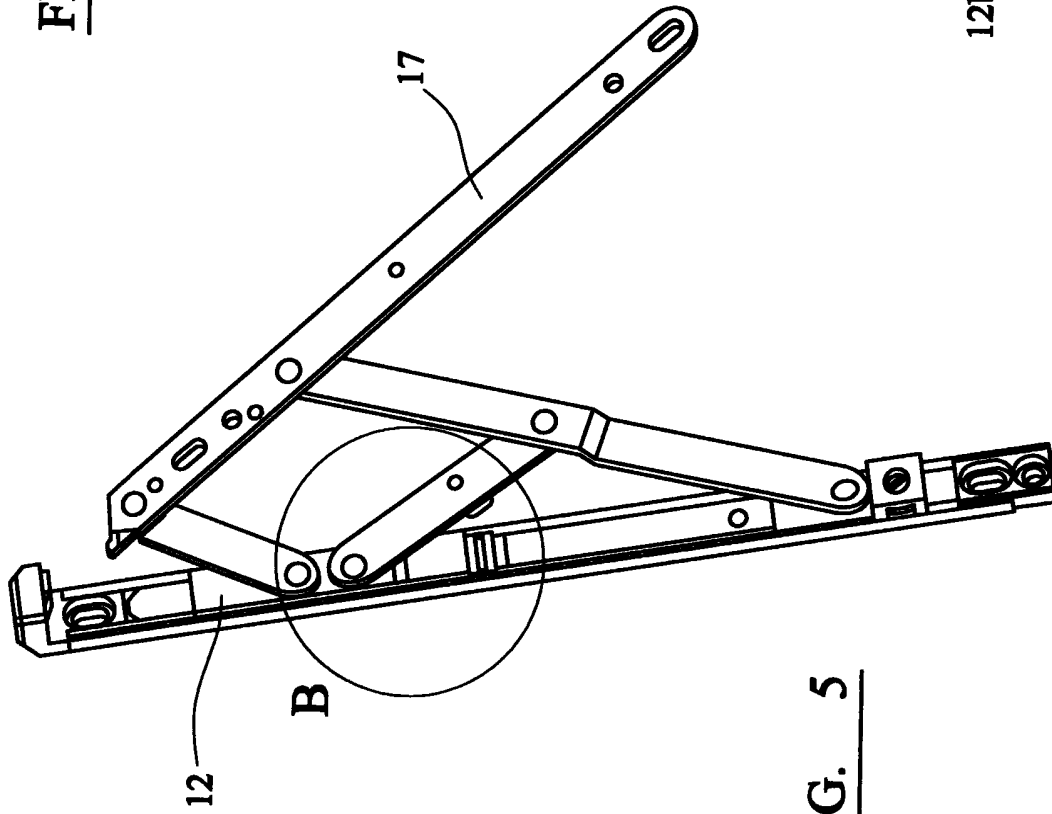
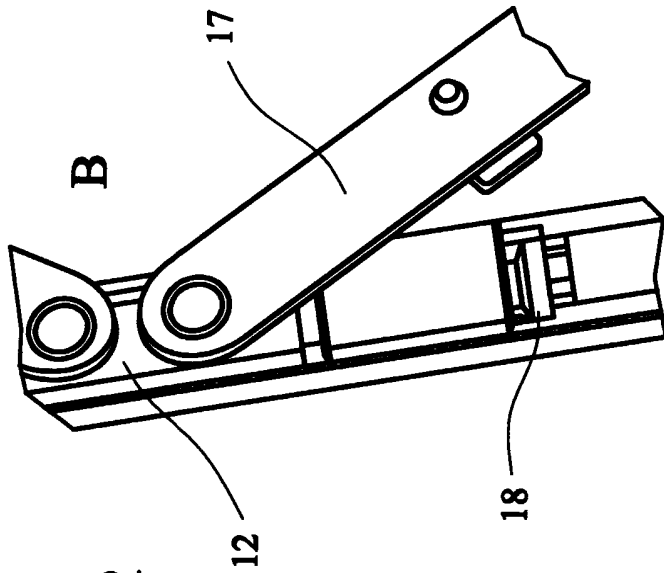


FIG. 3a

FIG. 4a



303141

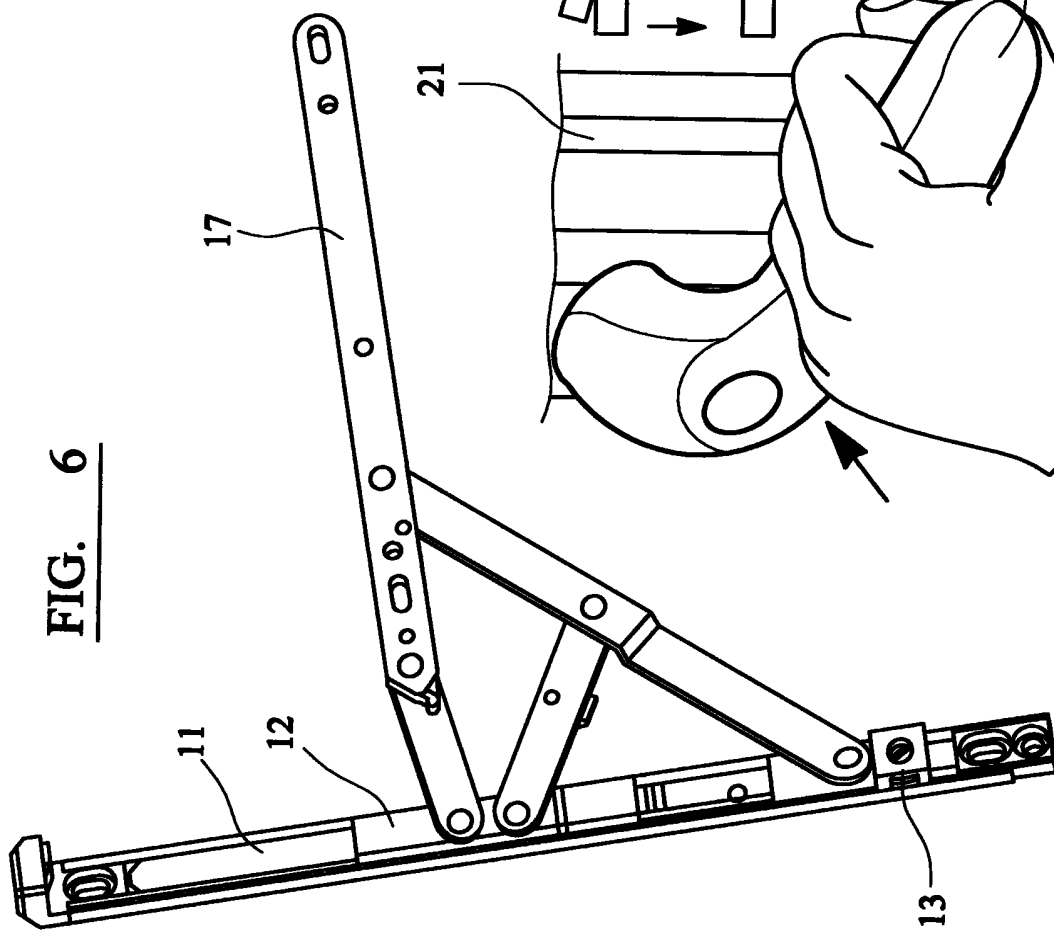


FIG. 7a

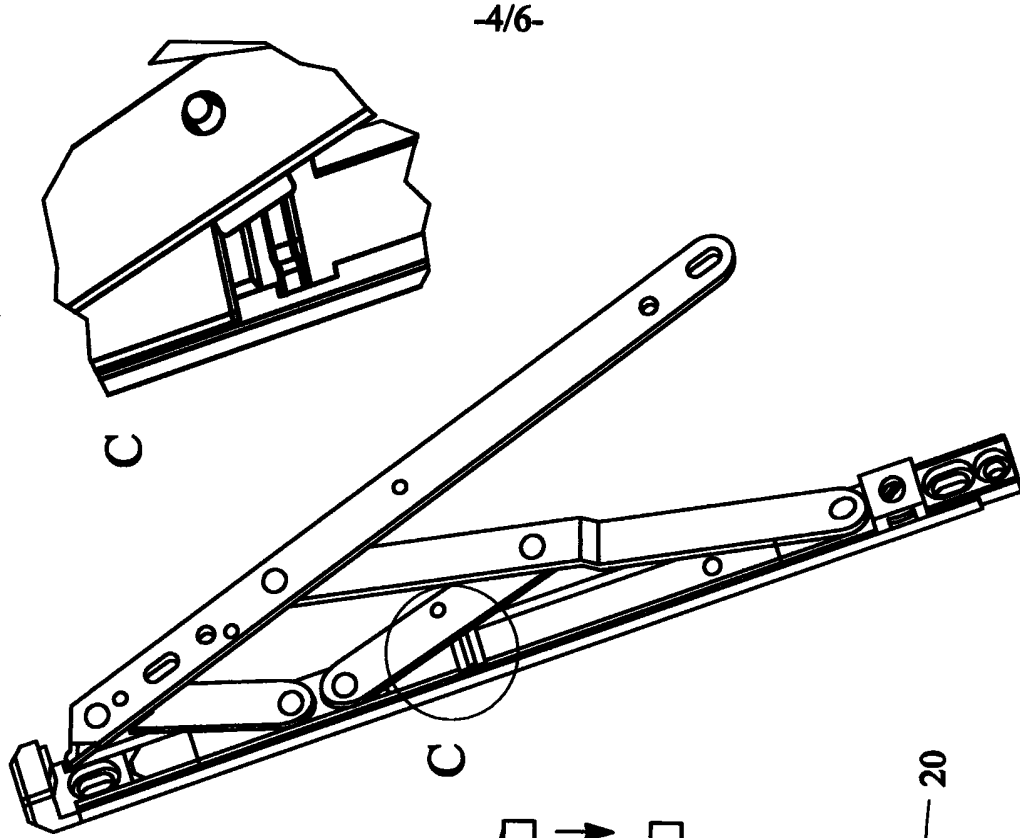
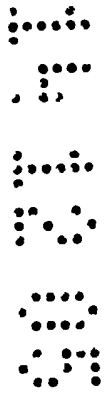


FIG. 7

FIG. 6a



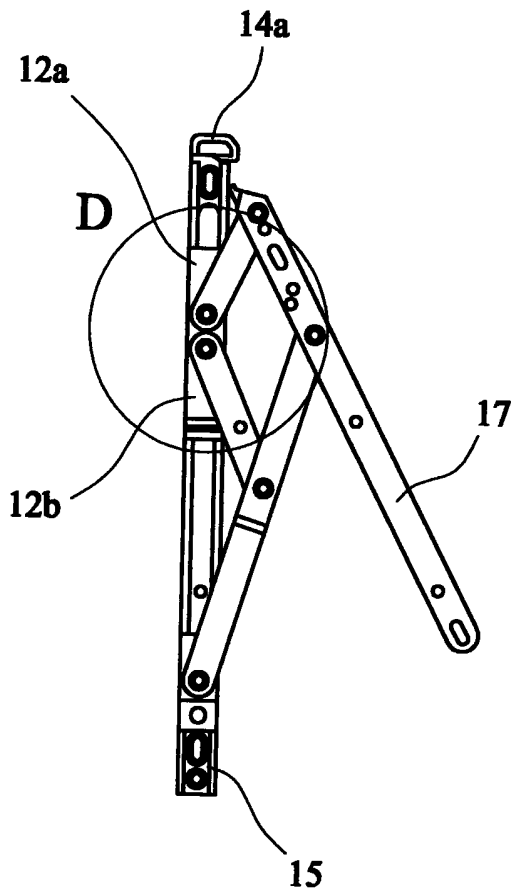


FIG. 8

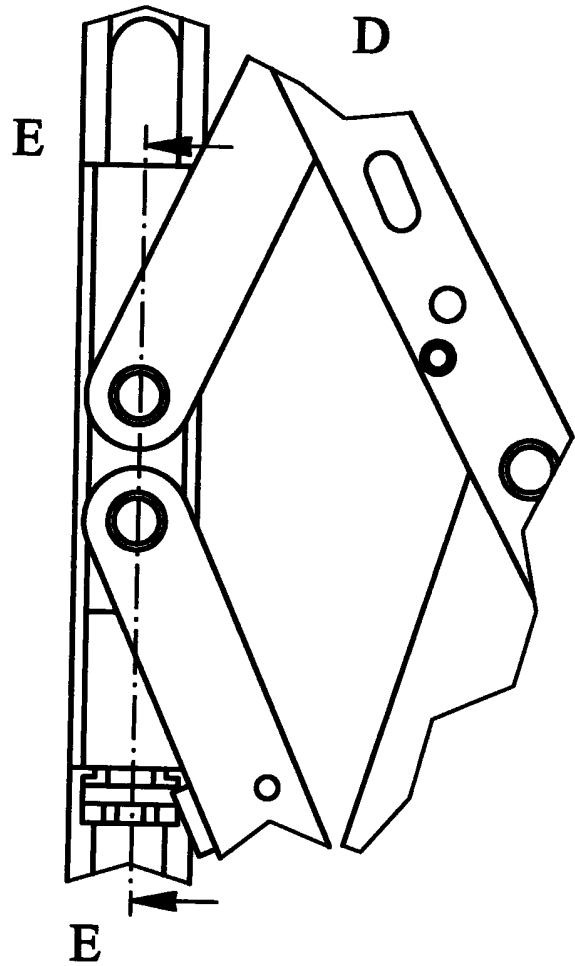


FIG. 8a

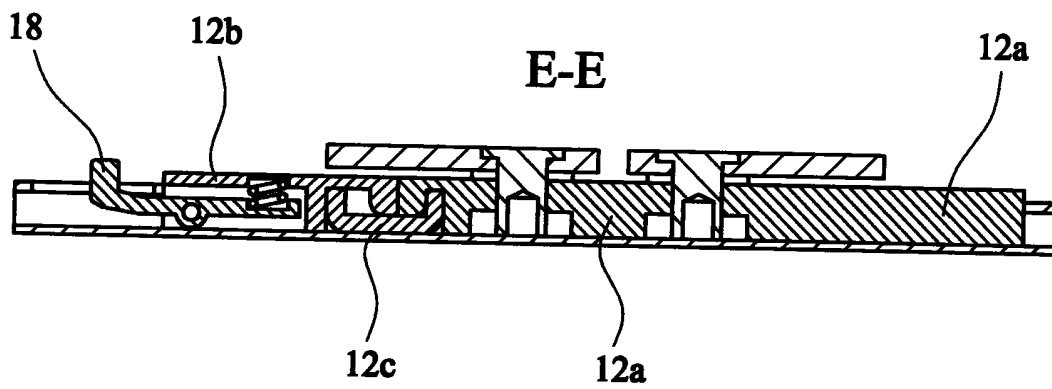
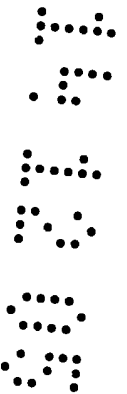


FIG. 8b



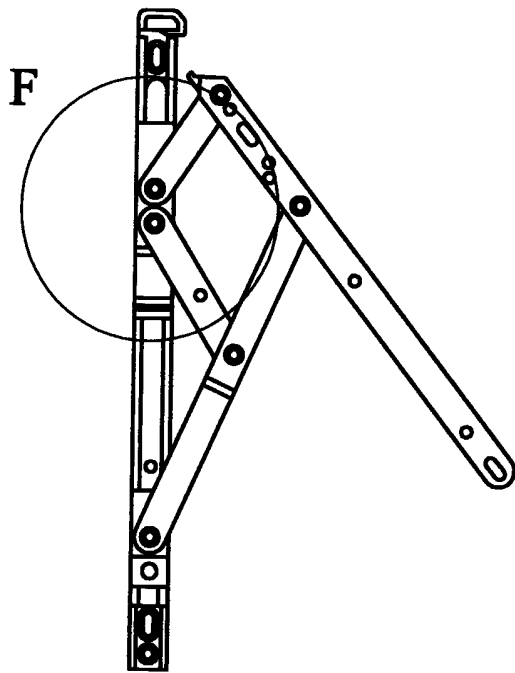


FIG. 9

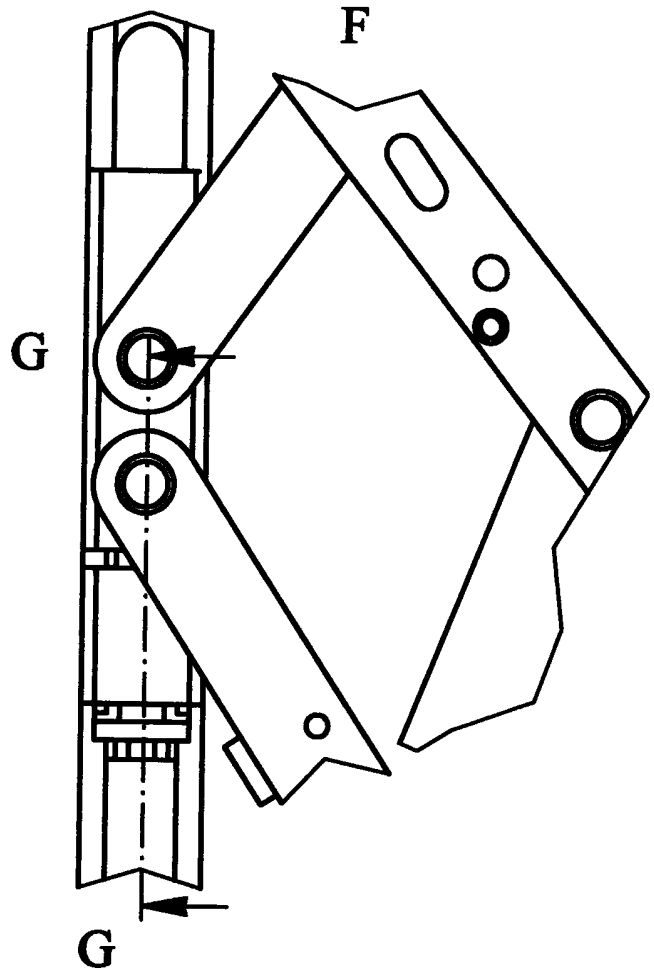


FIG. 9a

G-G

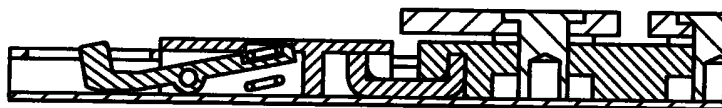
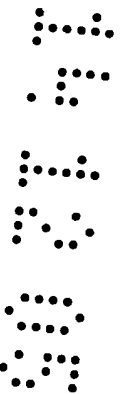


FIG. 9b



**STAY FOR HINGEDLY MOUNTING
AN OPENABLE CLOSURE MEMBER**

This invention relates to a stay for hingedly mounting an openable closure member, such as a door or window.

5 Window stays are usually provided in pairs, and which are mounted on opposed vertical frame members of a fixed window frame in the case of "top hung" windows, and on opposed horizontal frame members of the fixed frame in the case of "side hung" windows.

Typically, a window stay comprises a linkage (usually a four bar or five bar linkage) which is mounted on a track, in which the linkage includes a vent arm which is secured to a frame member of an openable window unit, and the track is mounted on the fixed window frame in order that the window stay can mount the window unit hingedly on the fixed frame.

10 The linkage is usually mounted on the track via a pair of sliders, and each of which is located near to one end of the track when in the closed position of the window unit, and at least one of which carries out slidable movement along the track as the window unit is moved to an open position.

15 It is desirable that the linkage should be of such a geometry that the window unit can be opened outwardly to a position in which it extends substantially perpendicular to the track to provide maximum ventilation. Also, in the case of so-called "egress hinges", the arrangement is such that the vent arm, and therefore also the plane of the window unit, is located near to one end of the track so as to allow an occupant to escape via the exit opening defined between the open window unit and the fixed frame.

20 This is usually achieved by keeping a first one of the sliders fixed relative to the track, near to one end of the track, and thereby determining the location of the vent arm relative to the track as the window unit is moved to the fully open position with the second of the sliders moving along the track. One example of such a construction is known from GB 2,262,308A.

25 A further desirable feature in an egress hinge is to facilitate cleaning of both sides of the window unit from internally of the fixed window frame. Evidently, when the window unit is fully open and the mounting of the vent arm is located near to one end of the track, it follows that the window unit will also be located close to one of the vertical frame members of the fixed frame, and therefore there will only be a small space available to gain access to what is normally the outer face of the window unit for cleaning purposes.

In the known construction of egress stay, this problem is overcome by arranging for the first slider to be capable of being released from its fixation to the track, so that the entire assembly of the vent arm, the window unit, the first slider, the entire linkage, and also the second slider can be moved along the track until the window unit (still extending generally perpendicularly outwardly of the track) reaches an approximate mid-position on the track. This then allows easy access for cleaning purposes to both faces of the window unit.

In order to return the window unit to the closed position, and also re-set the mechanism which holds the first slider fixed relative to the track during normal opening of the window unit, a fixed stop or abutment is provided on the track, and which lies in the path of return movement of the second slider. The second slider bears against this fixed stop, and the linkage then reacts by causing the first slider to move towards its track end.

A releasable retaining mechanism is therefore provided, which holds the first slider fixed to the track during normal opening and closing movement of the window unit, but which can be operated to release the first slider when it is required to adjust the window unit from the fully open position to a cleaning position. Upon completion of cleaning, the window unit is adjusted to the closed position, whereby the second slider engages its fixed stop and the first slider then moves along the track and causes the retaining mechanism to be re-set to its normal retaining mode ready for a subsequent normal opening and closing sequence of operations.

The present invention seeks to provide an alternative solution to the problem of how best to permit adjustment of an egress hinge between a normal opening/closing mode of operation and a window cleaning mode, and in a simple and easy to operate manner.

According to the invention there is provided an egress hinge for mounting an openable closure member on a fixed frame so as to be movable between a closed position in which the closure member lies substantially within the plane of the fixed frame, and a fully open position in which the closure member extends substantially perpendicularly outwardly of the fixed frame and with the general plane of the closure member located close to one of the frame members of the fixed frame so as to define a large egress opening between the closure member and an opposite one of the frame members of the fixed frame, and said hinge comprising:

- a track 11 securable to the fixed frame;
- a first slider 12 mounted on the track 11 and having a closed position at or near one end 14 of the track 11 which corresponds to the closed position of the closure member;

a second slider 13 mounted on the track 11 and having a closed position at or near an opposite end 15 of the track;

a linkage coupled with the first and second sliders 12,13 and having a vent arm 17 which is securable to one edge of the closure member; and

5 a releasable retainer 18 coupled with the first slider 12 and engageable with the track 11 in order to define a fixed position of the first slider 12 relative to the track 11 during opening and closing movement of the closure member, whereby the first slider 12 determines the location of the plane of the closure member in the fully opened position which is near to one of the frame members of the fixed frame so as to define a large egress opening between
10 the closure member and an opposite frame member of the fixed frame, and in which the retainer 18 is selectively operable to release the first slider 12 and allow the first slider 12 and the vent arm 17 to move along the track 11 to a cleaning position of the closure member which allows access to both faces of the closure member for cleaning purposes:

in which the second slider 13 has greater frictional resistance to slidable movement
15 along the track 11 than the first slider 12 such that, upon movement of the closure member from the cleaning position and towards the closed position, the lesser frictional contact of the first slider 12 with the track 11 results in the first slider 12 being moveable along the track while, by virtue of the geometry of the hinge, the second slider 13 remains immovable, such that the retainer 18 is automatically reset as the closure member approaches the closed
20 position.

An egress hinge according to the invention therefore provides a fixed position of the first slider which determines the location of the plane of the closure member in the fully open position (when the retainer is in its retaining mode), so as to provide maximum size egress opening for use in emergency, and in which the second slider moves along the track during
25 normal opening and closing movement.

The hinge further defines a fixed position of the second slider during adjustment of the hinge from the cleaning position to the closed position, and during which the first slider moves along the track from its cleaning position to its closed position when the retainer automatically re-sets itself.

30 Preferred aspects of the egress hinge are set out in the dependent claims.

A preferred embodiment of egress hinge according to the invention will now be described in detail, by way of example only, with reference to the accompanying drawings, in which:

figures 1, 2 and 3 show successive stages in the adjustment in the hinge between a closed position and a fully open position;

figure 2a is a detail view of portion A in figure 2;

figure 3a is a detail view of a closure member adjusted to a fully open egress position under operation of a single operating handle on an upright frame member of the frame of the closure member, such closure member having upper and lower egress hinges as disclosed herein;

figure 4 shows an initial stage of adjustment of the hinge from a closed position to a cleaning position;

figure 4a is a detail of part C of figure 4;

figure 5 illustrates a successive stage in the adjustment to the cleaning mode;

figure 5b is a detail of part B of figure 5;

figure 5c is a detail showing manipulation of a spring loaded catch retainer to release a first slider of the hinge for free movement along the track of the hinge to move the entire closure member to a cleaning position;

figure 6 shows the hinge fully adjusted to the cleaning position;

figure 6a is a detail showing manual operation of a single handle in order to adjust top and bottom egress hinges of the closure member to the cleaning position;

figure 7 illustrates an intermediate stage in the return movement of the hinge and the closure member from the cleaning position to the fully closed position, also under the control of the single operating handle;

figure 7c is a detail on part C in figure 7;

figure 8 is an illustration of the egress hinge in a partly open position, as it moves from the closed position towards initiation of adjustment to the cleaning mode;

figure 8a is a detail view, to an enlarged scale, of part referenced D in figure 8;

figure 8b is a longitudinal sectional view taken on section line E-E in figure 8a;

figure 9 is a view, similar to figure 8, showing the hinge after initiation of adjustment to the cleaning mode;

figure 9a is a detail view, to an enlarged scale, of part referenced F in figure 9; and

figure 9b is a longitudinal sectional view taken on section line G-G in figure 9a.

Referring now to the drawings, an egress hinge according to the invention is designated generally by reference 10, and serves to mount an openable closure member (not shown), preferably a window unit, on a fixed frame so as to be movable between a closed position in which the closure member lies substantially within the plane of the fixed frame, and a fully open position in which the closure member extends substantially perpendicularly outwardly of the fixed frame and with the general plane of the closure member located close to one of the frame members of the fixed frame so as to define a large egress opening between the closure member and an opposite one of the frame members of the fixed frame.

Essentially, the hinge 10 comprises a track 11 securable to the fixed frame; a first slider 12 mounted on the track 11 and having a closed position at or near one end 14 of the track which corresponds to the closed position of the closure member; and a second slider 13 mounted on the track 11 and having a closed position at or near an opposite end 15 of the track.

A four bar linkage designated generally by reference 16 is coupled with the first and second sliders 12, 13, and has a vent arm 17 which is securable to one edge of the closure member.

A releasable retainer 18 is coupled with the first slider 12 and is engageable with the track 11 in order to define a fixed position of the first slider 12 relative to the track 11 during opening and closing movement of the closure member, whereby the first slider determines the location of the plane of the closure member in the fully opened position, which is near to one of the frame members of the fixed frame so as to define a large egress opening between the closure member and an opposite frame member of the fixed frame.

The slider 12 comprises two separate slide portions 12a and 12b which are coupled together for joint movement by a connecting element 12c, as shown in figure 8.

The retainer 18 takes the form of a spring-loaded catch mounted on slide portion 12b and which automatically latches to the track 11 in order to define the fixed position of the first slider 12.

The retainer 18 is selectively operable to release the first slider 12 and allow the first slider and the vent arm 17 to move along the track 11 to a position of the closure member which allows access to both faces of the closure member for cleaning purposes, while the second slider 13 remains fixed to the track 11 (see figure 3a).

The retainer 18 is automatically released as the first slider 12 moves along the track 11 during adjustment of the hinge from the cleaning position to the closing position of the closure member.

5 If required, one or both sliders 12, 13 may have its frictional engagement with the track increased to any required extent, in order to function as a friction stay which can withstand reasonable wind loadings without movement of the sliders and thereby allowing any adjusted positions of the closure member to be stable positions.

10 The fixed position of the first slider 12 on the track 11 is located a short distance only from its end position 14, and the vent arm 17 has a cam surface or other release actuator 21 (see figure 5) which is engageable with the spring-loaded catch 18 to release the first slider 12 as the vent arm 17 approaches its closed position, thereby allowing the first slider 12 and a nose 17a of the vent arm to move towards the end of the track during which the nose 17a engages snugly and firmly within an end retainer cap 14a on the track 11 to provide a secure closed position of the closure member.

15 The first slider 12 and the second slider 13 are slidable components which are capable of slidable movement longitudinally of the track 11, although the sliders do have frictional contact with the guides provided in the track 11 which they engage. The geometry of the hinge is such that if the motion of either one of the sliders along the track is arrested, during opening or closing movement of the closure member, such a slider which has its motion arrested
20 effectively acts as a fixed pivot point, and the remaining pivoted components of the linkage between the vent arm 17 and the other slider is controlled by the sliding movement of the other slider.

25 In the case of the first slider 12, it is free to move a short distance from its end position adjacent to end cap 14a, during movement from the fully closed position, until such time as the spring-loaded catch retainer 18 latches with the track 11, and thereby prevents any further linear movement of the first slider 12. Further opening movement of the closure member continues until such time as the vent arm 17 extends substantially perpendicularly of the track 11, as shown in figure 3. During this opening movement of the hinge, the first slider 12 is fixed relative to the track 11, and the second slider 13 moves from its end position
30 adjacent to end 15 as shown in figure 1 to a longitudinally displaced position as shown in figure 3.

When it is desired to return the closure member to the fully closed position, initially the first slider 12 remains fixed to the track while the second slider 13 returns towards the end 15 of the track 11. However, during the closing movement of the hinge, the vent arm 17 engages the retainer catch 18 via its actuator element 20 attached to the vent arm 17, which
5 depresses the catch 18 against its spring-loading, thereby freeing the first slider 12 which is then able to move towards the end cap 14a as the vent arm completes its movement to the closed position shown in figure 1.

Evidently, during the initial stage of opening movement of the vent arm 17, the actuator 21 remains in engagement with the catch 18 to disable it. However, as the vent arm
10 17 pivots further outwardly, the actuator 21 becomes disengaged from the catch 18 which then latches to the track 11 and thereby defines the fixed position of the first slider 12 which is no longer able to move.

In order to initiate adjustment of the hinge to the cleaning mode, it can be adjusted, either from the fully open position shown in figure 3, or from the closed position of figure 1.
15 The adjustment is initiated by manual disengagement of the retainer catch 18, as shown in figure 5c. Thereafter, under operation of the single operating handle 20, the handle 20 is operated in order to adjust the entire closure member to the cleaning position, which causes adjustment of both the upper and lower egress hinges which mount the closure member in the fixed frame.

Upon disengagement of the retainer catch 18 from the track 11, the first slider 12 is
20 free to move lengthwise of the track 11, and in a direction towards the end 15 of the track 11. The ideal position of the egress hinge for manipulation of the catch 18 is shown in figures 4 and 4a, in which it will be noted that second slider 13 has moved a predetermined distance 22 from the end 15 of the track. Desirably, a marking is provided on the track which will be
25 visually apparent to the user to indicate preferred adjustment of the hinge for manipulation of the catch 18.

It should be noted that, as mentioned above, first slider 12 is now free to move lengthwise of the track 11, by virtue of disabling of the spring-loaded catch 18. However, in the further adjustment of the hinge, it is now the second slider 13 which is temporarily
30 immovable relative to the track 11, so that the second slider 13 functions as a fulcrum or pivot point, relative to the remaining pivoted components of the hinge, and further movement of the first slider 12 now controls the unfolding of the hinge to the cleaning position in which

the vent arm 17 is located approximately midway along the track 11, thereby providing easy access to both sides of the closure member for cleaning purposes.

The second slider 13 is rendered temporarily immovable by virtue of the fact that it is deliberately arranged to have a greater frictional resistance to linear sliding movement along the track 11 than the frictional contact of the first slider 12 with the track 11. However, when the linear motion of the first slider 12 is arrested (by engagement of retainer catch 18 with the track 11) the second slider 13 is still able to function as a slide, despite the fact that it has greater frictional contact with the track 11.

The preferred embodiment of the invention therefore provides, by very simple means, an egress hinge which can be adjusted easily a) between closed and open positions and b) to and from a cleaning position. This is achieved quite simply by arranging for second slider 13 to have a greater frictional resistance to movement lengthwise of the track 11 than that provided by the slidable engagement between first slider 12 and track 11.

The required extent of frictional resistance of each slider may be pre-set during initial manufacture in the factory, or may be adjusted on site during installation. Suitable adjustment may be incorporated within each slider, to allow the frictional resistance to be varied, e.g. when required by the customer or during routine servicing.

Therefore, the opening and closing (and moving to and from the cleaning position) of the closure member is via manual manipulation of a single operating handle 20 located on one of the upright frame members 21 of the closure member, and preferably mounted about mid-height of the frame member, as shown in figure 6a.

Usually, a pair of egress hinges, as disclosed, will be provided for use with each closure member, and which preferably is a "side hung" window unit.

A significant advantage of the illustrated embodiment is that a normal operating handle for the closure member (e.g. an openable window) can be used to carry out all the adjustments of the closure member (and the hinge) between closed position, partly open position, fully open egress position and the cleaning position. This compares favourably with known egress hinges in which the upper and lower parts of the frame of the window have to be engaged manually to carry out some of these adjustments, and which tends to be a somewhat jerky adjustment, and difficult to adjust both hinges at the same time, through the same steps of adjustment.

Further advantages are as follows:

1. ease of use, in that the release of the catch can be performed with one hand, whereas other known arrangements require both hands on to release the catch;
2. use of normal latching/unlatching or locking/unlocking handle to manoeuvre the window into the cleaning position, compared with known arrangements which require the user to "shuffle" the window to the cleaning position;
3. uniform opening of the top and bottom window hinges, compared with known systems which require the top and bottom hinges to be manually manipulated non-simultaneously;
4. automatic re-engagement of the catch to provide the fixed pivot of the first slider during adjustment;
5. the design of the stay such that it can be operated by one hand means that there is less strength required to operate compared with existing hinge stays on the market.

CLAIMS

1. An egress hinge (10) for mounting an openable closure member on a fixed frame so as to be movable between a closed position in which the closure member lies substantially within the plane of the fixed frame, and a fully open position in which the closure member extends substantially perpendicularly outwardly of the fixed frame and with the general plane of the closure member located close to one of the frame members of the fixed frame so as to define a large egress opening between the closure member and an opposite one of the frame members of the fixed frame, and said hinge comprising:

a track (11) securable to the fixed frame;

a first slider (12) mounted on the track (11) and having a closed position at or near one end (14) of the track (11) which corresponds to the closed position of the closure member;

a second slider (13) mounted on the track (11) and having a closed position at or near an opposite end (15) of the track;

a linkage coupled with the first and second sliders (12,13) and having a vent arm (17) which is securable to one edge of the closure member; and

a releasable retainer (18) coupled with the first slider (12) and engageable with the track (11) in order to define a fixed position of the first slider (12) relative to the track (11) during opening and closing movement of the closure member, whereby the first slider (12) determines the location of the plane of the closure member in the fully opened position which is near to one of the frame members of the fixed frame so as to define a large egress opening between the closure member and an opposite frame member of the fixed frame, and in which the retainer (18) is selectively operable to release the first slider (12) from the track 11 and allow the first slider (12) and the vent arm (17) to move along the track (11) to a cleaning position of the closure member which allows access to both faces of the closure member for cleaning purposes;

in which the second slider (13) has greater frictional resistance to slidable movement along the track (11) than the first slider (12) such that, upon movement of the closure member from the cleaning position and toward the closed position, the lesser frictional contact resistance of the first slider (12) with the track (11) results in the first slider (12) being moveable along the track while, by virtue of the geometry of the hinge, the second slider (13)

remains immoveable, such that the retainer 18 is automatically reset as the closure member approaches the closed position.

2. An egress hinge according to claim 1, in which the first slider (12) comprises a slide portion (12a) to which the vent arm (17) is coupled, and a further slide portion (12b) to which
5 releasable retainer (18) is coupled.

3. An egress hinge according to claim 2, in which the retainer (18) comprises a spring-loaded catch mounted on said further slide portion (12b).

4. An egress hinge according to any one of claims 1 or 3, in which a reference marking is provided on the track (11) to give visual indication of the required distance (22) of
10 movement of the second slider (13) at which manual disengagement of the retainer (18) is required, to initiate adjustment of the hinge to the cleaning mode.

5. An egress hinge according to any one of the preceding claims, in which the frictional contact resistance of each of the first and second sliders (12,13) with the track (11) is adjustable.

Application No: GB0507432.3

Examiner: Catherine Jones

Claims searched: 1-5

Date of search: 23 February 2006

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
X	1-5	GB 2301621 A (NICO) - see whole document

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^X :

E2F

Worldwide search of patent documents classified in the following areas of the IPC

E05C; E05D

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

EPODOC, WPI, TXTE