

AN EGRESS HINGE

This invention relates to hinges, and in particular to an egress hinge for supporting a vent between a closed position in which it lies within a fixed frame and an open position in which it extends substantially perpendicularly to the fixed frame.

US-4364201 discloses an egress hinge comprising a vent arm supporting a vent. As the hinge is opened, the vent moves from a closed position within a fixed frame to a fully open position in which the vent extends substantially perpendicularly to the fixed frame. Further, the vent, when in its fully open position, is held by the hinge at one edge of the fixed frame, thereby providing the largest possible unhindered opening for egress (i.e. when rapid exiting from a building or the like is necessary).

Although a hinge as disclosed in US-4364201 achieves its objective, it is very difficult to clean the outside surface of a vent, such as a window, mounted on the vent arm of the hinge. This is a particularly important consideration when access to the outside of the vent is impossible, such as in high rise buildings or the like.

US-4571776 discloses an improved egress hinge based on the hinge of US-4364201. The improvement disclosed in US-4571776 is that the vent arm, together with the links and struts of the hinge, can be released to slide along a support track when the hinge is open. By moving the vent arm in this way, a large access gap is provided between the vent and the fixed frame to allow cleaning of the outside of the vent. Although this arrangement is a marked improvement over the hinge of US-4364201, it can prove difficult to reset the hinge of US-4571776 into its normal position relative to the support track after the outside of the vent has been cleaned. The problems associated with resetting the hinge will be appreciated moreover when it is remembered that a vent is normally supported by two egress hinges, both of which must be reset at the same time to allow the vent to be closed.

In the light of the foregoing, it will be understood

that there is a clear demand for an improved egress hinge, which provides the advantages of the prior art, but which further includes a simple facility to enable the vent arm and associated links to be relocated into their normal
5 functional positions relative to the support track. An egress hinge according to the present invention satisfies this demand.

Accordingly, the present invention provides an egress hinge for supporting a vent between a closed position in
10 which it lies within a fixed frame and an open position in which it extends substantially perpendicularly to the fixed frame, the egress hinge comprising:

a first slider and a second slider mounted in a support track,

15 a vent arm attached to the first slider via a thrust link and to the second slider via a control link and

a brace joining the first slider to a midpoint of the control link,

wherein restricting means act between the first slider
20 and the support track to limit motion of the first slider along the support track during opening of the hinge, thereby dictating the position of the vent arm in relation to the support track when the hinge is fully open, the restricting means being releasable, when the hinge is in an open
25 position, to allow the first slider and hence the vent arm to move relative to the support track to a position for cleaning a vent mounted, in use, on the vent arm, and

wherein stop means are provided against which the second slider bears as the hinge is closed from a cleaning
30 position such that the restricting means automatically relocates in its active position.

Preferably the restricting means is attached to the first slider and moves along the support track therewith. More preferably, the restricting means is formed integrally
35 with the first slider. The restricting means and the first slider may be formed as a one piece moulding from plastics material.

The restricting means may include ears which engage the

support track during limiting of the motion of the first slider. If the support track includes a bottom, two side walls and a pair of inwardly facing flanges, the inwardly facing flanges preferably include cut-out regions for
5 receiving the ears of the restricting means.

The stop means is preferably formed integrally with the support track. The stop means may take the form of a crack-stop extending into the support track. Other suitable stop means, such as a fixed block in the track, could also be
10 used.

Preferably at least one of the sliders includes a friction adjusting device to control the movement of the slider along the support track. In this way, the speed at which the vent, vent arm and links move along the support
15 track when the restricting means is released can be more easily controlled.

Preferably a reinforcing link is provided between the brace and the vent arm. Such a link provides additional strength to the egress hinge.

20 The vent arm may include an asymmetric tip which engages in a corresponding end cap on the support track when the hinge is closed. Such a tip and end cap arrangement is known in the prior art and assists in pulling the vent into the fixed frame as the vent is closed.

25 Cut-outs may be provided in one or more of the links so that clash can be avoided between the or each link and a screw head mounted on the vent arm. In this regard, a vent is normally attached to the vent arm via screws, the heads of which can be a hindrance to the full opening of the
30 hinge. The cut-outs help to avoid this problem.

A specific embodiment of the present invention is now described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a plan view of an egress hinge according to
35 the present invention in a partly open position;

Figure 2 is a plan view of the hinge of figure 1 in a fully open position, the restricting means having been released to allow the vent arm to be moved to a cleaning position; and

Figure 3 is a plan view of the hinge of figures 1 and 2 in a partly closed position.

With reference to the drawings, an egress hinge according to the present invention comprises a support track 1, a first slider 3, a second slider 5 and a vent arm 7. An end of the vent arm 7 is pivotally attached via a thrust link 9 to the first slider 3. A midpoint of the vent arm 7 is pivotally attached via a control link 11 to the second slider 5. A brace 13 joins the first slider 3 to a midpoint of the control link 11 via pivots 15, 17. For additional strength, reinforcing link 19 joins the vent arm 7 to the brace 13 via pivot pins 21, 23.

The support track 1 comprises a bottom wall 25, two side walls 27 and two inwardly facing flanges 29 at the tops of the two side walls 27. The first and second sliders 3, 5 are shaped to be received in the support track 1 and to be held therein by means of the flanges 29 in known manner.

Restricting means 31 formed integrally with the first slider 3 comprises a neck region 33 and two ears 35 extending perpendicularly thereto. The neck 33 extends from a region of the first slider 3 near to the bottom 25 of the support track 1 towards the flanges 29. In this way, the ears 35 of the restricting means 31 are continuously biased against the undersides of the flanges 29.

Two cut-out regions 37 in the flanges 29 of the support track 1 are shaped to receive the ears 35 of the restricting means 31. When the ears 35 are received in the cut-out regions 37, the first slider 3 is held in position in the support track 1. The second slider 5 is, however, still free to move along the support track 1, thereby moving the vent arm 7 between its open and closed positions. In this regard, when the second slider 5 is moved to a position adjacent the restricting means 31, the vent arm 7 is substantially perpendicular to the support track 1 and the vent (not shown) mounted thereon is in its fully open position.

On opening the egress hinge from its closed position, the second slider 5 moves along the support track 1 towards

the restricting means 31 whilst the first slider 3 is held in a fixed position by means of the ears 35 of the restricting means 31 engaging the cut-out regions 37 of the support track 1. Thus, the vent arm 7 moves outwardly
5 towards its fully open position.

When the egress hinge is fully open, the vent mounted on the vent arm 7 is supported at one side of the fixed frame (to which the support track 1 is attached) and does not hinder entry or exit through the frame. If, however, it
10 is desired to clean the outside surface of the vent, the restricting means 31 needs only to be depressed into the support track 1. The ears 35 then disengage from the cut-out regions 37 and the first slider 3 is free to move along the support track 1. Indeed, the vent arm 7, the first
15 slider 3 and the second slider 5, together with all the links 9,11,19 and the brace 13, can be moved relative to the support track 1. When the vent arm 7 is positioned somewhere near the middle of the support track 1, as shown in figure 2, access is readily available to both sides of
20 the vent.

When cleaning of the vent has been achieved, if the hinge is once again closed, the first and second sliders 3, 5 will begin to move in opposite directions along the support track 1. Relatively soon, however, the second
25 slider 5 engages a stop means 39 in the support track 1. In the embodiment shown, the stop means 39 is a crack-stop formed by punching a crack in the bottom 25 of the support track 1 from below, thereby producing a raised portion within the track 1 itself.

30 When the second slider 5 strikes the stop means 39, its motion is halted. The only possible motion then is for the first slider 3 to continue in the opposite direction along the support track 1. Eventually, when the hinge is fully closed, the ears 35 of the restricting means 31 engage the
35 cut-out regions 37 in the support track 1. Due to the biased nature of the restricting means 31, the ears 35 engage automatically with the cut-out regions 37. Thus, when the hinge is once again opened, the first slider 3 is

held in its normal position towards one end of the support track 1.

As will be appreciated, if the stop means 39 is not present, as in the prior art case, the restricting means 31 does not automatically relocate in its active position, but requires considerable effort on behalf of the user of the hinge to re-engage the restricting means before the hinge can be closed. This can often prove very difficult, especially when one considers that a vent will be supported by two such hinges.

An asymmetric end point 41 is provided on the end of the vent arm 7 for engaging with a corresponding asymmetric end cap 43 on the end of the support track 1. Such end points and caps are well known in the art and help to pull-in a vent as it closes. Further, cut-outs 45 are provided in the control link 11 and reinforcing link 19. These cut-outs allow the various links to cooperate more closely in the fully open position of the hinge by avoiding clash between the links 11, 19 and mounting screws (not shown) which pass through the vent arm 7 and into the vent (not shown) mounted thereon. Four cut-outs 45 are provided on the reinforcing link 19, thereby making this link multi-handed.

A grub-screw 47 passes through the second slider 5 to bear against the bottom 25 of the support track 1. By adjusting the grub screw 47, the friction between the second slider 5 and the support track 1 can be varied, thereby enabling the opening and closing of the hinge to be more easily controlled.

Furthermore, a locking device (not shown) could be included either on one of the sliders or in the support track 1 itself, thereby enabling the opening of the hinge to be limited as required.

It will of course be understood that the present invention has been described above purely by way of example, and that modifications of detail can be made within the scope of the invention.



CLAIMS

1. An egress hinge for supporting a vent between a closed position in which it lies within a fixed frame and an open position in which it extends substantially perpendicularly to the fixed frame, the egress hinge comprising:

a first slider and a second slider mounted in a support track,

a vent arm attached to the first slider via a thrust link and to the second slider via a control link and

a brace joining the first slider to a midpoint of the control link,

wherein restricting means act between the first slider and the support track to limit motion of the first slider along the support track during opening of the hinge, thereby dictating the position of the vent arm in relation to the support track when the hinge is fully open, the restricting means being releasable, when the hinge is in an open position, to allow the first slider and hence the vent arm to move relative to the support track to a position for cleaning a vent mounted, in use, on the vent arm, and

wherein stop means are provided against which the second slider bears as the hinge is closed from a cleaning position such that the restricting means automatically relocates in its active position.

2. A hinge as claimed in claim 1, wherein the restricting means is attached to the first slider and moves along the support track therewith.

3. A hinge as claimed in claim 2, wherein the restricting means is formed integrally with the first slider.

4. A hinge as claimed in claim 3, wherein the restricting means and the first slider are formed as a one piece moulding from plastics material.

5. A hinge as claimed in any preceding claim, wherein the

restricting means include ears which engage the support track during limiting of the motion of the first slider.

6. A hinge as claimed in claim 5, wherein the support track includes a bottom, two side walls and a pair of inwardly facing flanges, the inwardly facing flanges including cut-out regions for receiving the ears of the restricting means.
- 10 7. A hinge as claimed in any preceding claim, wherein the stop means is formed integrally with the support track.
8. A hinge as claimed in claim 7, wherein the stop means is a crack-stop extending into the support track.
- 15 9. A hinge as claimed in any preceding claim, wherein at least one of the sliders includes a friction adjusting device to control the movement of the slider along the support track.
- 20 10. A hinge as claimed in any preceding claim, further including a reinforcing link between the brace and the vent arm.
- 25 11. A hinge as claimed in any preceding claim, wherein the vent arm includes an asymmetric tip which engages in a corresponding end cap on the support track when the hinge is closed.
- 30 12. A hinge as claimed in any preceding claim, wherein at least one of the links includes a cut-out to avoid clash between the link and a screw head mounted on the vent arm, during use.
- 35 13. An egress hinge substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

