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A BARRIER ASSEMBLY FOR AN OPENING

BACKGROUND OF INVENTION

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This invention relates to a barrier assembly for extending across an opening. The barrier assembly is particularly suitable for use with doorways and window openings or the like and it will be convenient to hereinafter describe the invention in relation to this particular application. It should be appreciated
10 however that the invention has wider application.

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Prior slidable barrier assemblies, such as slidable windows or doors, have generally included at least two panels which are slidable between extended and retracted positions. Where one of the panels is associated with another
15 panel it is common for the panels to be positioned in a parallel relationship, whereby there is substantial overlap of the panels when in a retracted position and a minimal overlap when in the extended position. The panels are generally selectively fixed in the extended position using a locking mechanism, which has been positioned in the area of the minimal overlap.

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Panels are generally relatively substantial in two dimensions and relatively insubstantial in the third dimension. Accordingly panels are relatively strong in all but the third dimension, which is the dimension transverse to the pane of the panel. This characteristic of panels has been exploited in prior barrier
25 assemblies whereby a force applied between the panels, in the area of the overlap, in a direction transverse to the panels can overcome the locking mechanism and permit unauthorised movement of the movable panel from the extended position. It would be advantageous to develop a barrier assembly which reduced the ability to exploit the weaker characteristic of the panel.

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SUMMARY OF INVENTION

It is an object of the this invention to provide a relatively strong barrier



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assembly which alleviates the problems of prior barrier assemblies. It is a further object of this invention for the barrier assembly to be of relatively cheap but aesthetic design.

Accordingly to this invention there is provided a barrier assembly for extending across an opening including a frame associated with the opening, a first panel is preferably retained relative to the frame, a second panel retained relative to the frame and moveable relative to the first panel between a retracted position whereby the first and second panels are substantially parallel and an extended position whereby the first and second panels are substantially coplanar, wherein the second panel is slidable relative to the frame between the retracted and extended positions. The second panel when sliding between the retracted and extended positions is guided by guide means included in the frame wherein the guide means cooperates with at least one edge of the panel to limit the degree of movement of the second panel in a direction perpendicular to the plane of the panel. It should be appreciated that relative deformation of the panels of such a barrier assembly is likely to be more difficult as there is no area of overlap. More specifically any force applied between the panels is likely to be within the plane of the panels and therefore resisted by the more substantial dimension of the panel.

It is preferred that the guide means may include at least one channel cooperable with a top and/or bottom edge of the second panel. These preferred features facilitate the accurate transfer of the second panel between the retracted and extended positions, whilst limiting the out of plane movement of the second panel.

In one preferred embodiment the top/or bottom edge of the second panel includes a plurality of guide members which engage the channel for facilitating guiding the second panel. This arrangement reduces the likelihood of the top and/or bottom edge engaging the channel, reducing the friction between the second panel and the channel, which will facilitate sliding the second panel.

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According to another preferred embodiment each channel includes plurality of pins supporting rollers over which the top and/or bottom edge of the second panel roll when moving between the retracted and extended positions. This arrangement also reduces the friction between the second panel and the
5 channel, facilitating sliding of the second panel.

It is further preferred that the assembly include a converging member associated with the frame which is engageable by the second panel when sliding, urging the second panel into coplanar alignment with the first panel.
10 More specifically the converging member is an angled plate attached to the at least one channel which plate is engages by a leading edge of the second panel when approaching the extended position with a trailing edge of the second panel being manoeuvrable, when approaching the extended position, in a direction transverse to the second panel so that the first and second
15 panels are coplanar. The converging member facilitates coplanar alignment of the first and second panels when sliding the moveable panel.

It is further preferred that each roller includes biasing means which biases the trailing edge of the movable panel in a direction opposite to that caused by the
20 angled plate engaging the leading edge. This preferred feature facilitates moving the second panel from the extended position.

It is further preferred that when the first and second panels are coplanar the leading edge of the second panel abuts an upright member of the frame, and
25 the trailing edge of the second panel abuts a leading edge of the first panel to limit the movement of the second panel in the plane of the second panel. This preferred feature further enhances the barriers ability to avoid unauthorised movement of the second panel from the extended position.

30 It is still further preferred that the barrier include a locking mechanism for locking the second panel in the extended position.

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The invention will be hereinafter described by reference to the accompanying drawings which show two preferred embodiments of the invention. The particularity of the related description is not to be understood as superseding the generally of the broad identification of the invention as given in the claims.

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BRIEF DESCRIPTION OF THE DRAWINGS

The drawings relate to a preferred embodiment of a barrier for an opening according to the present invention, which is illustrated as a window grille assembly in the following description.

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Fig. 1 is a front view of a grille assembly consisting of a frame and attached grilles when in retracted position.

15 Fig. 1A is a sectional view along section line A-A of an assembled window grille when in retracted position.

Fig. 1B is a sectional view along section line B-B of an assembled window grille when in retracted position. It illustrates a runner with rollers that are fitted

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Fig. 2 is a front view of window consisting a frame and an attached grilles when in extended position.

25 Fig. 2A is a sectional view along section line C-C of an assembled window grille when in extended position

Fig. 2B is a sectional view along section line D-D of an assembled window grille when in retracted position. It illustrates a runner with rollers that are fitted

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Figs. 3A, B, C, D and E are the sectional views of the panels in various

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position from a completely retracted to completely extended position.

Fig. 4 is another embodiment of the invention wherein runner-and-guide assemblies are used instead of rollers and runners.

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Fig. 4A is a sectional view along section line G-G as shown in Fig. 4.

Fig. 4B is a sectional view along section line F-F as shown in Fig. 4.

10 DETAILED DESCRIPTION OF THE INVENTION

Figure 1 illustrates a barrier assembly 10 in particular a window barrier assembly. The barrier assembly 10 includes a frame 12 having dimensions which preferably correspond approximately to the dimensions of the opening
15 which it is associated with. The frame 12 retains a first panel 14 and a second panel 16 (as shown in Figure 2). Each panel 14, 16 as shown has interlocking bars 18 forming a grille assembly. These parts are made and finished as required by the use of processes such as cutting, grinding, welding and finishing. Suitable surface finishing may be provided for the frame 12 and the
20 first and second panels 14, 16, e.g. painting, powder coating or other processes may be performed on the frame 12 and panels 14, 16. More specifically the invention is also applicable to solid panels 14, 16 of any material including metal and/or glass, with the grille assembly being merely illustrative of one preferred arrangement.

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A barrier assembly 10 preferably consists of two panels 14, 16 however, this is not essential. The two panels 14, 16 need not be symmetrical as illustrated. Preferably the panels will complement each other so that when in an extended position, adequate partitioning is provided. The frame 12 and panels 14, 16
30 may also be fitted with accessories like locking bolt supports (not shown). The panels 14, 16 would therefore be fitted with complementary parts of a locking mechanism for the purposes of securing the barrier assembly 10 in the

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extended position.

The frame 12 of the barrier assembly 10 is fitted with channels 20a, b at the top and bottom portions of the frame 12. Each channel 20a, b preferably has
5 a width that is equivalent to the combined thickness of the two panels 14, 16.

The assembly of the panels 14, 16 is done with the first sub-panel 14 in the inner channel 20a and the second panel 16 in the outer channel 20b of the frame 12 as shown in Figure 1B.

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The channel 20b at the lower portion of the frame 12 is fitted with a series of rollers 22 upon which the second panel 16 rests. These rollers 22 are equally spaced. They function to guide as well as to locate the second panel 16 in position when sliding the second panel 16 from a retracted to an extended
15 position or vice versa. The rollers 22 within the channel 20b are fixed in their respective positions. However, the rollers outside the channel 20b are mounted on pins 24 perpendicular to the axis of the rolling motion. Biasing means, such as springs (not shown) are mounted on the pins 24 adjacent to the rollers 22 so that the rollers are biased to be in line with the sliding motion
20 of the second panel 16.

The bottom portion of the frame 12 includes a converging member 26 (shown in Figure 1B) affixed at a corner of the base of the frame 12. The converging member 26 forms an incline at an angle extending from a position on the side
25 of the frame adjacent to the second panel 16 to the midpoint of the inner side surface of the bottom of the frame 12.

The top portion of the frame 12 also has a channel, rollers and converging member corresponding and symmetrically opposite to the position of the
30 channels 20a, b, rollers 22 and converging member 26.

When sliding the second panel 16 to the extended position, the first panel 14

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is stationary while the second panel 16 is slid to the opposite end of the barrier assembly 10 as illustrated in Fig. 2. When sliding relative to the channel at the bottom portion of the frame 12, the second panel 16 is guided in a manner such that it is moved in-line with the first panel 14. Before contact with the converging member 26, the second panel 16 is still parallel to the first panel 14. When extended further, the leading edge of the second panel 16 engages the inclined plane of the converging member 26. Once this sliding action is complete and the second panel 16 abuts the other end of the frame 12, to completely close the barrier assembly 10, one must manoeuvre the trailing edge of the second panel 16 inwards so as to complete the closing process. The second panel 16 is then coplanar with the first panel 14 and the panels are locked. The panels are secured in this extended position.

Fig. 3 illustrates the various relative positions of the panels 14, 16 from a completely extended to a completely retracted position. To open the barrier assembly 10, one would have to unlock the panels and push the second panel 16 outwards. Once tilted outwards, the second panel 16 can then slide across the outer channel 20b until it becomes parallel to the first panel 14.

Fig. 4 illustrates another preferred embodiment wherein at least two guides 40 are fitted to the top and/or bottom of each of the panels 14, 16. In this embodiment, there are no rollers in the channels 20a, b as in Fig. 1. The guides 40 function to enable the second panel 16 to slide into the desired position when sliding the second panel from a retracted to an extended position or vice versa.

The guides 40 of each of the panels 14, 16 run along two separate runners 42a, b when sliding the panels from a retracted to an extended position or vice versa. When the second panel is in a substantially extended position, there are passages 44a, b leading from the first runner 42a to the second runner 42b to allow the second panel 16 to move from the first runner 42a to the second runner 42b in the fully extended position.

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Finally, there is further a recess 46 at the edge of the inclined plane 26 for more secure engagement of the second panel 16.

5 A check can be made to ensure that the grille panels are not unduly loose in the extended position. The rest of the accessories like knobs, latches and others can also be installed. These accessories may be installed by each of their own fixing method.

10 It is to be understood that various alterations, modifications and/or additions may be introduced into the arrangement of the barrier assembly as previously described without departing from the spirit or ambit of the invention.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A barrier assembly for extending across an opening including:
 - a frame associated with the opening;
 - a first panel retained relative to the frame;
 - a second panel retained relative to the frame and movable relative to the first panel between a retracted position whereby the first and second panels are substantially parallel and an extended position whereby the first and second panels are substantially coplanar,
 - wherein the second panel is slidable relative to the frame between the retracted and extended positions ; and
 - wherein the frame includes guide means for guiding the second panel when sliding between the retracted and extended positions wherein the guide means cooperates with at least one edge of the panel to limit the degree of movement of the second panel in a direction perpendicular to the plane of the panel.
2. A barrier according to claim 1 wherein the guide means includes at least one channel cooperable with a top and/or bottom edge of the second panel.
3. A barrier according to claim 2 wherein the top and/or bottom edge of the second panel includes a plurality of guide members which engage the channel for facilitating guiding the second panel.
4. A barrier according to claim 2 wherein each channel includes a plurality of pins supporting rollers over which the top and/or bottom edge of the second panel roll when moving between the retracted and extended position.
5. A barrier according to any one of the preceding claims including a converging member associated with the frame which is engageable by the second panel when sliding urging the second panel into coplanar alignment with the first panel.

- 6 . A barrier according to claim 5 when dependent upon claim 3 wherein the converging member is an angled plate attached to the at least one channel which plate is engaged by a leading edge of the second panel when approaching the extended position with a trailing edge of the second panel being manoeuvrable when in the extended position in a direction transverse to the second panel so that the first and second panels are coplanar.
- 7 . A barrier according to claim 6 wherein each roller includes biasing means which biases the trailing edge of the second panel in a direction opposite to that caused by the angled plate engaging the leading edge.
- 8 . A barrier according to claim 7 wherein when the first and second panels are coplanar the leading edge of the second panel abuts an upright member of the frame, and the trailing edge of the second panel abuts a leading edge of the first panel to limit the movement of the second panel to a direction within the plane of the second panel.
- 9 . A barrier according to claim 2, 5 or 6 wherein the panels are fitted with guides which engage the channel for facilitating guiding the second panel.
10. A barrier according to claim 9 wherein a passage is provided from one channel to another to enable the second panel to be manoeuvrable in a direction transverse to the second panel so that the first and second panels are coplanar.
11. A barrier according to any one of the preceding claims including a locking mechanism for locking the second panel in the extended position.