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(54) EDGE FITTING FOR A LOUVRED WINDOW

(71) We, KRIS OVERSEAS LTD., a Corporation organised and existing under the laws of Hong Kong, care of P.H. Sin & Co. of Hang Seng Bank Buildings, 7th Floor, 77 Des Voeux Road, Central, Hong Kong, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an edge fitting for a louvred window.

According to the invention there is provided an edge fitting for a louvred window, comprising a frame member for securement to an edge of a window opening, and a plurality of pane holders each adapted to receive an edge portion of a window pane, the holders being rotatably mounted on the frame member and coupled together by a rack co-acting with a pinion carried by each pane holder so that all the pane holders extend substantially parallel to one another in all angular positions of the pane holders, one of the pinions bearing an operating handle so as to permit adjustment of the angular positions of the pane holders.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:—

Figures 1 and 2 are respectively a front and a rear view of one form of edge fitting for a louvred window.

Figure 3 is a cross-sectional view through a pane holder.

Figure 4 shows how each holder is pivotally mounted on a channel member.

Figures 5 and 6 are respectively front and side views of a rack for rotating the pane holder, and

Figures 7 and 8 illustrate a locking arrangement for the edge fitting shown respectively in the closed and open positions of the louvred window.

Referring to the drawings in general, the edge fitting comprises an elongate frame

member in the form of a channel member 1 of aluminium which, as the cross-section of Figure 4 shows, comprises a base wall 2 and two side walls 3, these walls 3 being parallel to one another and having their edge portions remote from the base wall 2 turned inwardly so as to form edge flanges 4 parallel to the wall 2 for abutment against an edge of a window opening.

The edge fitting further comprises a plurality of elongate pane holders 5 each adapted to receive an edge portion of a window pane. The holders are nylon mouldings and they are formed at their mid point with a stub 6, providing a journal 7 and each positioned within a bearing hole 8 provided in the channel member 1 so that each pane holder 5 is rotatably mounted on the channel member. The member can be extruded in the localities of the bearing holes so as to provide an additional bearing surface for each of the rotatably mounted pane holders.

The edge fitting is secured to the edge of the window opening in any convenient manner, for example by fixing screws. Normally two edge fittings are secured to the two upright edges respectively of the window opening but it is possible for them to be fixed to the top and and bottom edges, in which case the individual glass panes of the louvred window extend vertically.

As shown in Figure 4, when the pane holder 5 is correctly mounted on the channel member, snap-in legs 9 protrude beyond the inner free edge of the bearing hole. To prevent each pane holder from being removed from the channel member 1 and so as to enable the pane holders to be rotated, a pinion 10, preferably of moulded nylon, formed with a central rectangular hole 11, is pushed over the snap-in legs which are caused to deflect inwardly by angled guide portions 13 on the legs pressing against the edges of the hole 11 until the guide portions 13 are clear of the hole, whereupon the legs spring outwardly to engage behind

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(11) the edges of the hole and prevent the pinion from being removed from the pane holder. Because of the rectangular shape of the hole 11 and the fact that the legs 9 have planar outer surfaces to co-operate with the hole 11, rotation of each pinion causes its pane holder to rotate too.

Referring to Figures 1, 5 and 6, a rack 14, again of moulded nylon, is arranged within a channel in the member 1, defined by part of the base wall 2, one side wall 3 and the associated edge flange 4. The rack is formed at intervals along its length on its longitudinal surface facing the pinions with respective sets of teeth, the teeth of each of which sets co-act with a respective pinion 10. By sliding the rack lengthwise of itself within the channel, the pinions, and therefore also the pane holders, are caused to rotate. Because all the pane holders are substantially parallel to one another, when the rack is slidably displaced to rotate the pane holders to a new position, the pane holders remain in substantially parallel disposition when they arrive at their new position. As is indicated in Figure 2, the fully closed position of the window is one in which the various pane holders are arranged almost vertically with each glass pane overlapping one of the adjacent panes and being overlapped by the other adjacent glass pane. Recesses 12 provided at the ends of the pane holders 5 enable a draught-proof seal to be made between the panes. In the fully open position, the pane holders are displaced through approximately 85°—100° from the fully closed position.

For relatively high window openings, the rack may be required to have a length of as much as six feet and, for practical reasons, it may be difficult to manufacture a rack of such length. To simplify manufacture, the rack may comprise a number of rack sections 15 (see Figures 5 and 6) which are releasably connected together by snap-in connections 123 at the ends of the sections. By fitting together a number of rack sections in this way, a six foot long rack can, for example, be made from twelve 6-inch rack sections. By virtue of the snap-in connections 123, the need for screws or other means of clamping the rack sections together is avoided.

For the purpose of displacing the rack, the handle mechanism illustrated in Figures 1, 7 and 8 is employed. The mechanism is in the form a single-part nylon moulding comprising an operating handle 17 formed integrally with one of the pinions 10. A neck part 16 of the moulding, connecting the handle to the pinion, allows limited resilient movement of the handle relative to the pinion for the purpose of locking the pane holders in their closed position, as will now be explained. A nylon locking plate 18,

secured in any suitable manner to the channel member, for example by means of a spigot 19, has a projection 20 with which a catch 21 of the handle engages to lock the pane holders in the closed position. To open the louvred window, the handle 17 is resiliently displaced about the neck 16 to release the catch 21 from the projection 20, whereupon by pulling the handle downwardly, the rack causes the pane holders to turn and open the louvred window. To prevent the neck 16 from being deformed beyond its elastic limit or possibly to the point of breaking, a shoulder 24 on the pinion is arranged so as to be brought into engagement with a shoulder 25 of the handle 17 at the instant that the catch 21 becomes clear of the projection 20.

Referring to Figure 3, each pane holder comprises a channelled member whose lateral walls 22 as viewed in cross-section are inclined towards one another in the direction away from the base wall of the holder. The spacing between the closest portions of the lateral walls is chosen to be less than the thickness of the window pane which is to be accommodated by the pane holder, but the largest spacing dimension needs to be greater than the pane thickness. Because of the nature of the moulded nylon walls 22, the pane of glass can be pushed in between the lateral walls until the edge of the pane of glass abuts with the base wall of the holder, whereupon the pane is firmly gripped by the holder. The advantages of this arrangement are that a perfect weather seal with the pane of glass is ensured, the holders are non-corrosive, and they can accommodate different thicknesses of glass, for example from 0.16 inch to 0.25 inch which is the standard range of glass thicknesses normally used.

Referring to Figure 3, the surface of the base wall of each pane holder facing the channel member 1 can be formed with sealing lips 23 running along the longitudinal edges of the pane holder. These lips, when the pane holders are in their closed position, are slightly compressed and press sealingly against the channel member to provide a weatherproof seal, in particular making it impossible for water or dust to enter between the pane holders and channel member.

Figure 4 illustrates an advantage of the section shape employed for the channel member 1. Where two louvred windows are to be arranged directly side-by-side, two channel members 1 are required to be positioned back-to-back. Because of the provision of the edge flanges 4, an adequate seating area is provided for the channel members, whereas, if the edge flanges had not been provided, additional means would be required to ensure the correct location

of the channel members. Furthermore, the section shape of the channel member increases its strength and, as discussed previously, provides a channel in which to accommodate the rack.

Although it is preferred for the pane holders to be of moulded nylon, it is possible for them to be made from other semi-rigid materials, that is to say materials which are not so rigid that the lateral walls are unable to "give" sufficiently to allow the pane of glass to be pushed into the channel but which, at the same time, exhibit a degree of rigidity sufficient to grip the pane of glass firmly.

WHAT WE CLAIM IS:—

1. An edge fitting for a louvred window, comprising a frame member for securement to an edge of a window opening, and a plurality of pane holders each adapted to receive an edge portion of a window pane, the holders being rotatably mounted on the frame member and coupled together by a rack co-acting with a pinion carried by each pane holder so that all the pane holders extend substantially parallel to one another in all angular positions of the pane holders, one of the pinions bearing an operating handle so as to permit adjustment of the angular positions of the pane holders.

2. An edge fitting according to claim 1, wherein the operating handle is formed integrally with the said one pinion.

3. An edge fitting according to claim 2, wherein the operating handle is formed as a one-part moulding of plastics material with the said one pinion.

4. An edge fitting according to any preceding claim, wherein a locking plate secured to the frame member has a locking projection with which a catch of the handle can engage to lock the pane holders in their closed positions.

5. An edge fitting according to claim 4, wherein the handle is carried by the said one pinion by means of a neck part which allows limited resilient movement of the handle relative to the said one pinion so that said catch can engage said projection and lock the pane holders in their closed positions, the handle having a shoulder which is brought into engagement with a shoulder of the said one pinion, as said catch is disengaged from said projection during unlocking, so as to prevent the said neck part from being deformed beyond its elastic limit.

6. An edge fitting according to any preceding claim, wherein the pane holders have sealing lips which provide a weatherproof seal between the holders and the frame member when the holders are in their closed position.

7. An edge fitting according to claim 6, wherein each pane holder has two said sealing lips running along longitudinal edges of the said holder.

8. An edge fitting according to any preceding claim, wherein each pane holder comprises a channelled member of semi-rigid material as hereinbefore defined whose two lateral walls as viewed in cross-section are inclined towards one another in the direction away from the base wall of the channelled member.

9. An edge fitting according to any preceding claim, wherein the frame member is in the form of a channel with the base wall of the channel facing the pane holders and with two side walls being parallel to one another and having their edge portions remote from the base wall turned inwardly so as to form edge flanges parallel to the base wall for abutment against the said edge of the window opening.

10. An edge fitting according to any preceding claim, wherein the rack comprises a number of rack sections releasably connected together at the ends thereof.

11. An edge fitting according to claim 10, wherein the rack sections are connected together by snap-in connections.

12. An edge fitting according to any preceding claim, wherein the pane holders are each provided with a stub which is supported in a bearing hole in the frame member and which carries snap-in legs which project beyond the bearing hole and through a rectangular hole in the pinion to engage behind the edges of this rectangular hole with planar outer surfaces of the legs co-operating with the hole.

13. An edge fitting according to any preceding claim, wherein the frame member is made of aluminium.

14. An edge fitting according to any preceding claim, wherein all the parts of the edge fitting apart from the frame member are nylon mouldings.

15. An edge fitting for a louvred window, substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.

of the channel members. Furthermore, the section shape of the channel member increases its strength and, as discussed previously, provides a channel in which to accommodate the rack.

Although it is preferred for the pane holders to be of moulded nylon, it is possible for them to be made from other semi-rigid materials, that is to say materials which are not so rigid that the lateral walls are unable to "give" sufficiently to allow the pane of glass to be pushed into the channel but which, at the same time, exhibit a degree of rigidity sufficient to grip the pane of glass firmly.

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15. An edge fitting for a louvred window, substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.



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