(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 135 397**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **84306463.5**

(22) Date of filing: **21.09.84**

(51) Int. Cl.⁴: **E 06 B 3/44**
E 06 B 3/28

(30) Priority: **21.09.83 GB 8325323**

(43) Date of publication of application:
27.03.85 Bulletin 85/13

(84) Designated Contracting States:
BE FR NL

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(54) Double glazing.

(57) An assembly for fitting to existing window frames and comprising a vertically sliding sash window arrangement with two panes, e.g. of frameless synthetic resin sheet, has the first pane pressed against the flanges of the side channel members of the assembly by a continuous resilient strip at each side and the second pane is pressed against the back of the first strip at each side by a second resilient strip. Both strips abut against the side frame member by means of disengageable hook formations.

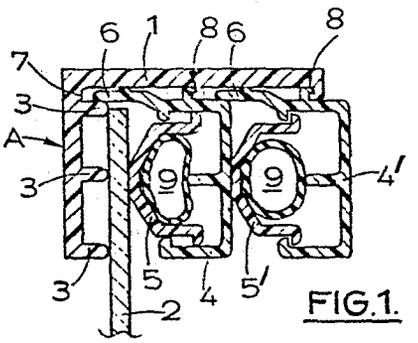

FIG.1.

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DOUBLE GLAZING

In the kind of double glazing which is fitted to existing windows, often as a do-it-yourself operation, it is possible, and indeed known, to fit a framed sheet of transparent material across the entire window opening, securing the frame to the inside face of the existing fixed window frame; however this means that the existing opening windows can no longer be opened. It is therefore more usual to fit around the inside of the existing window opening a double-channelled frame in which are mounted two (or more) separate sheets of transparent material, with or without individual frames of their own, and at least one of these sheets is free to slide horizontally to overlie the other, or others, thereby allowing access to the existing opening windows.

Where the existing opening windows are side-hung hinged lights this is generally satisfactory, although it must be admitted that the horizontal sliding movement has been known to give trouble, especially where the user tends to apply the horizontal force near the bottom edge, causing it to tend to tilt and jam; also the bottom channel is liable to accommodate dust and rubbish that may increase the frictional resistance after a time.

Such horizontally sliding arrangements are also acceptable where the existing windows include top-hung outwardly opening hinged lights. However, where the existing windows are of the sash type, a horizontally sliding inner layer is inconvenient, since at best it only gives access to half the opening window, and at best the direct area which is in communication with the atmosphere outside, with both the sash window and the sliding inner double glazing layer fully open, is only one quarter of the overall area of the window.

Several attempts have been made to produce vertically sliding double glazing. Most of these have tended to be complicated by counterweights, pulleys and cords or ratchet mechanisms, thereby making them expensive, bulky or difficult to operate.

In U.S. Patent Specification No. 4 248 018 of Casamayor there is disclosed a vertically sliding double-glazing arrangement employing extruded plastics framing in which the two sliding panes engage in respective channels of the side frame, and lips on the insides of the channels simultaneously form seals and form friction means to hold the panes in the positions to which they are moved by the user. The profile of the side frame extrusion is complex, in that it comprises partly rigid and partly flexible portions in order to solve the problem of allowing the panes to be mounted and removed with the frame in place. To allow this, the limbs of the double-channel frame are hinged to the bight of the section and have snap-action inter-engaging formations so that they can be swung aside as first the front pane is placed in position, then the central limb is snapped into engagement with the front limb, then the second pane is placed in position and finally the third limb is snapped into engagement with the second one. This is relatively complex and costly, and furthermore the use of the seals as the means to provide frictional resistance to movement results in unsatisfactory performance in practice.

That the problem of inserting the panes after the side frame members have been secured in place is a real one is underlined by the disclosure in another U.S. Patent Specificaiton No. 4 266 594 in which each pane is in some way hinged in the middle to allow its lateral dimension to be reduced for insertion.

The aim of the invention, therefore, is to put forward a practical form of double glazing involving vertically sliding sash windows, in which the individual panes are not only held satisfactorily in the positions to which they are set by the user but are also capable of being mounted and dismounted easily with the side frame members already in place.

According to the invention this is achieved by the provision of a double glazing assembly for fitting to existing window frames and comprising a pair of panes designed to move vertically between vertical channel-like side members, in which a first pane is pressed in a direction perpendicular to its plane against a flange on each side frame member by a respective vertically extending first resilient strip member and a second pane is pressed against the back of the said first strip member by a second resilient strip member, each strip member abutting against a side portion of the side frame member by means of releasable interengaging hook formations.

Thus the two transparent sheets or panes do not have separate respective tracks or channels but on the contrary are arranged in a common channel with the second pressed against the first (through the intermediary of the first strip).

This result is substantially easier to achieve if the transparent sheets are of synthetic material rather than glass, for example 1.75 mm or 2 mm thick plastics sheet, for example acrylic sheet, and without individual frames of their own, so that their weight is very low; one or both of the sheets may be provided with handles, and there may be the usual meeting rails at their

overlapping horizontal edges to seal them to one another in the fully closed position.

Preferably all the components are made as light alloy or plastics extrusions.

The invention will now be described by way of example with reference to the accompanying drawings, in which:-

Figure 1 is a horizontal section through the lower half of one of the side members of the frame;

Figure 2 is a section through the same side member when the window is open and the two panes overlap;

Figure 3 is a section through the upper half of the same side member;

Figure 4 illustrates the installation of one of the resilient members; and

Figure 5 is a vertical section through the structure with the frame members omitted.

Referring to Figure 1, a stout extruded plastics frame 1 of basically L-section, preferably of UPVC, extends round all four sides of the existing window opening (not shown) with the face A secured against the wooden (or other) frame of the existing window, in particular a sash window. A pane in the form of a sheet 2 of transparent acrylic sheet, 2 mm thick, is resiliently pressed against ribs 3 on the frame by a resilient strip member made up of two extrusions 4 and 5; the component 4 is shaped to engage in the side wall of the frame 1 by means of a flange 6 received in a

slot 7 in the frame member 1 and by co-operating hook formations 8 on the side of the component 4 and the adjacent face of the side limb of the frame member 1. The component 5 is of flanged channel section, fitting into the member 4 and urged to the outermost limit of its projection from that member by a resilient rubber tube 9 which serves as a spring distributed throughout the length of the member.

A second strip 4', 5', with a spring 9, is also snapped into the frame 1 behind the first one and presses a second pane of transparent material resiliently against the back of the first strip. A flange 6 on the component 4' engages between the side of the first strip member and the frame 1, and again there are interengaging hook formations 8. This second pane is not visible in Figure 1, which is a section through the lower part of the assembly; in the closed condition of the added window, the pane 2 occupies the lower half of the opening and the other pane (shown at 10 in Figure 5) occupies the upper half.

In Figure 2, which is a horizontal section at a level where the two panes overlap when in the open or partly open condition, it will be seen that the first strip 4, 5 resiliently urges the first pane 2 against the frame and at the same time the second strip 4', 5' urges the second pane 10 directly against the back of the first strip. In the upper part of the window, shown in Figure 3, the first pane is not present in the fully closed position and so the first strip is in direct contact with the frame. As the panes are moved vertically to open the window, the pane 2 forces its way between the first strip 4, 5 and the ribs 3 of the frame, whilst the second pane 10 forces its way between the first and second strips. Each pane is held in the

position in which it is set by the friction between the pane and the components between which it is resiliently gripped.

Figure 4 shows how the strip member 4, 5 is assembled into the frame. After the first pane 2 has been placed in position against the ribs 3 on the side frame member 1 the flange 6 of the strip member 4, 5 is introduced into the slot 7 and then, with the member compressed, the hook formations 8 are engaged. The second pane 10 can then be mounted in a similar manner, followed by the second strip member. Dismounting is achieved by the reverse procedure. It will thus be seen that the panes can readily be mounted and removed after the frame members 1 have been secured permanently in place.

Figure 5 shows how the top edge of the pane 2 and the bottom edge of the pane 10 carry along their full lengths identical extruded sections 11, each having a draughtproofing strip 12 that bears on the other pane, so as to form an effective seal when the window is closed. The top edge of the pane 10 and the bottom edge of the pane 2 are fitted with full-length handles 13, with integral flanges 14; in the closed position of the window the flange 14 on the bottom pane 2 intrudes between the bottom frame member 1 and the associated strip 4, 5, whilst the flange 14 on the other pane 10 fits between the two strips 4, 5 and 4', 5' along the top of the frame.

It will be appreciated that both panes can be slid vertically by the user, making use of the handles 13, and each will remain where it is set, gripped frictionally by the strips 4, 5 and 4', 5'. These strips could take forms other than that shown, the essential feature being

an extended resilient grip on the sheets; for example other forms of spring may be used, and it may be possible to combine the strip and the spring in a single extrusion. Another possibility is to have springs at a number of separate vertically spaced points. Metal springs, for example of flattened Vee or undulating form may be used in place of the tube 9 to urge the two components of the strip apart.

CLAIMS

1. A double glazing assembly for fitting to existing window frames and comprising a pair of panes (2, 10) designed to move vertically between vertical channel-like side members (1), in which a first pane (2) is pressed in a direction perpendicular to its plane against a flange on each side frame member by a respective vertically extending first resilient strip member (4, 5) and a second pane (10) is pressed against the back of the said first strip member by a second resilient strip member (4', 5'), each strip member abutting against a side portion of the side frame member (1) by means of releasable interengaging hook formations (8).

2. A double glazing assembly according to claim 1 in which each strip member comprises two interengaging sections (4, 5) urged apart by internal spring means (9).

3. A double glazing assembly according to claim 2 in which the internal spring means comprise a tube (9) of resilient material.

4. A double glazing assembly according to claim 2 in which the internal spring means comprise a metal spring or springs.

5. A double glazing assembly according to any one of claims 1 to 4 in which each pane (2, 10) is a frameless sheet of synthetic resin material.

6. A double glazing assembly according to any one of claims 1 to 5 in which the releasable interengaging hook formations (8) on the side frame members (1) and the strip members are continuous and are capable of disengagement by compressing the respective strip member

against its own resilience to move that portion of it which carries the respective hook formation (8) in a direction perpendicular to the planes of the panes.

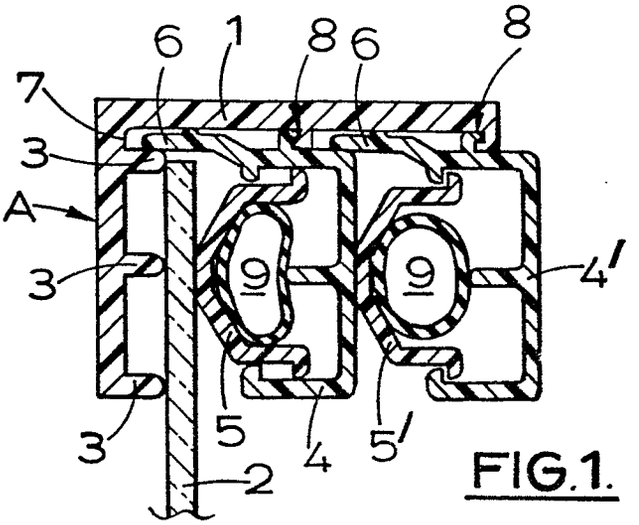

FIG.1.

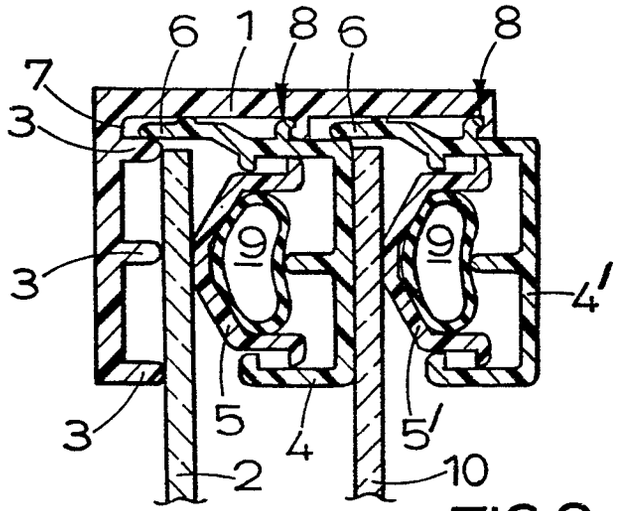

FIG.2.

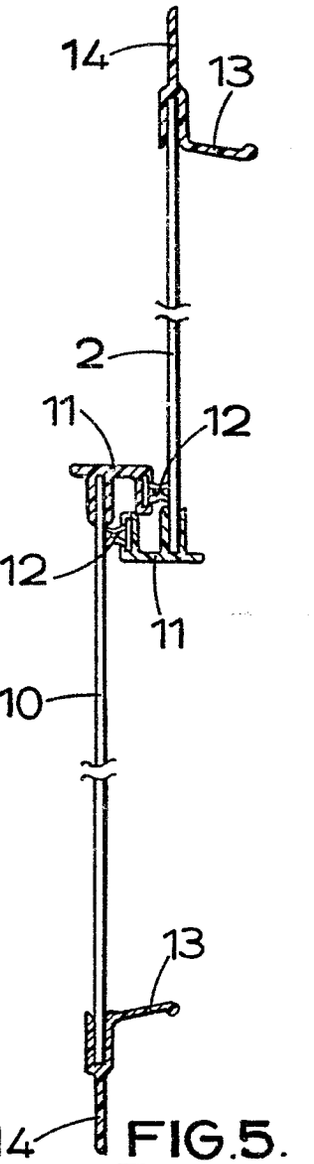

FIG.5.

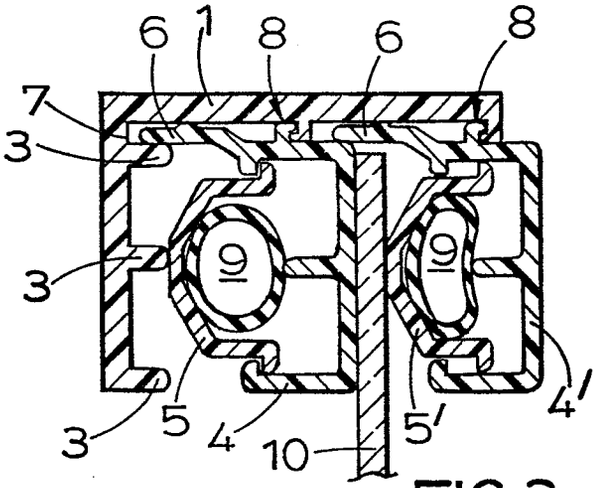

FIG.3.

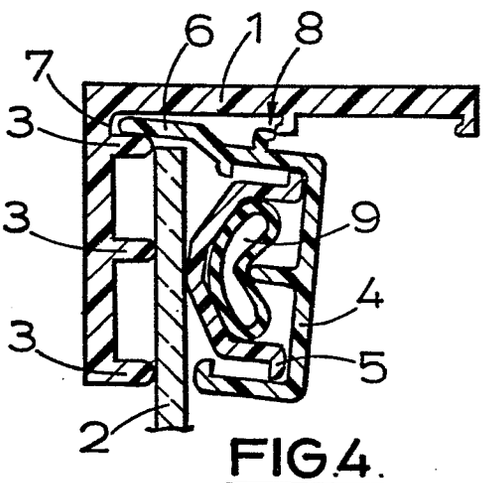

FIG.4.