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(54) **Door or window assembly with glass inserts**

(57) A door or window assembly with glass inserts having the advantage of easier installation and without the need of partly hollow door skins comprises a top rail-frame (30), a left stile-frame (40), a bottom rail-frame (50), a right stile-frame (60), four pieces of glaze beads (70) and one or more glass inserts (80) all adapted to assem-

ble together as a sliding patio door, a swing door, a sliding window or a casement window, wherein the surface structure of the door or window assembly with glass insert is constituted by assembling each surface (fl) of the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) and the right stile-frame (60) together through scarfing joint.

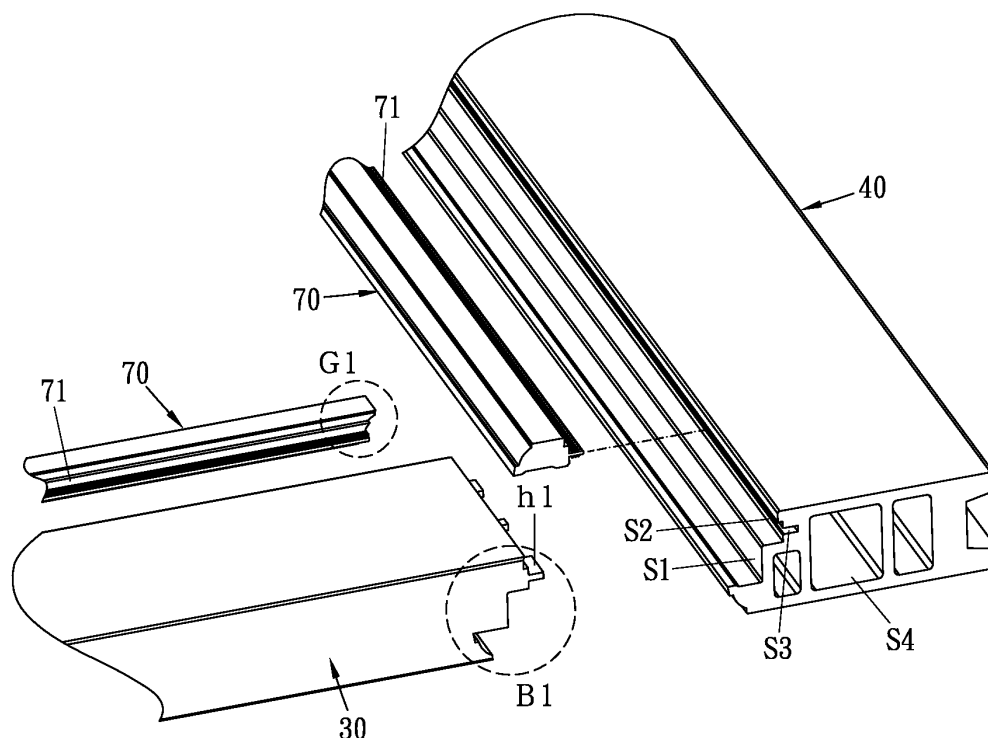


Fig. 8

Description

FIELD OF THE PRESENT INVENTION

[0001] The invention relates to a door or window assembly with glass inserts, particularly, the door or window assembly with glass inserts formed without using a pair of partly hollow door skins.

DESCRIPTION OF PRIOR ART

[0002] As shown in Fig. 1, a conventional door or window assembly 10 with one or more glass inserts 80 has a structure formed with a pair of partly hollow door skins 11 and 12, an outer quadrilateral frame 13 formed of a top rail, a bottom rail, a right stile and a left stile joined together along outer edges of the partly hollow door skins 11 and 12, and an inner quadrilateral frame 14 for mounting the glass inserts 80 along inner edges of the partly hollow door skins 11.

[0003] After the outer quadrilateral frame 13, the inner quadrilateral frame 14 and the partly hollow door skins 11 and 12 are bond together, the space between the partly hollow door skins 11 and 12 are filled with rigid polyurethane (PU) to increase the strength of the door or window assembly 10. And then, the inner quadrilateral frame 14 can be set the glass inserts 80 and fixed by four pieces of glaze beads 15 to form the conventional door or window assembly 10 with glass inserts 80.

[0004] However, the drawback of this conventional door or window assembly 10 with glass inserts 80 is that a pair of partly hollow door skins 11 and 12 must be employed which result in more parts required and more complicated assembling procedure. These are also considered of uneconomical if based on the cost spent by the consumer.

SUMMARY OF THE PRESENT INVENTION

[0005] The major purpose of the invention is to disclose a door or window assembly with glass inserts which provides the advantage of easier installation and without the need of partly hollow door skins.

[0006] The structure of the door or window assembly with glass inserts of the invention comprises a top rail-frame, a left stile-frame, a bottom rail-frame, a right stile-frame, four pieces of glaze beads and one or more glass inserts, wherein the top rail-frame, the left stile-frame, the bottom rail-frame and the right stile-frame all have an integrated structure formed by extrusion forming technique. The structure of the cross-section of the frames has a first connecting slot and a second connecting slot, wherein the glass insert is installed in the first connecting slot of the top rail-frame, the left stile-frame, the bottom rail-frame and the right stile-frame, and the four pieces of glaze beads are fixed in the second connecting slot of the top rail-frame, the left stile-frame, the bottom rail-frame and the right stile-frame, also both ends of the top

rail-frame and bottom rail-frame are connected to the first and the second connecting slot of the left stile-frame and right stile-frame to form scarfing joint, by this way the top rail-frame, left stile-frame, bottom rail-frame and right stile-frame can be connected together to form a complete door or window assembly with glass inserts.

[0007] The door or window assembly with glass inserts of the invention can be employed on a sliding patio door, a swing door, a sliding window and casement window etc., particularly, the surface of the top rail-frame, the left stile-frame, the bottom rail-frame and the right stile-frame can be made into a smooth surface with single color or dual color or into a surface of simulated wood grain to obtain different surface design of the door or window assembly with glass inserts only formed by the top rail-frame, the left stile-frame, the bottom rail-frame and the right stile-frame.

BRIEF DESCRIPTION OF THE DRAWING

[0008]

Fig. 1 is a partially enlarged cross-sectional view from a conventional door or window assembly with one or more glass inserts.

Fig. 2 is a schematic drawing of the door or window assembly with glass inserts of the invention.

Fig. 3 is the enlarged cross-sectional view from the region marked "A" in Fig. 2.

Fig. 4 is a disassembly view of parts of the door or window assembly with glass insert of the invention.

Fig. 5 is an enlarged cross-sectional view of the top rail-frame, the left stile-frame, the bottom rail-frame and the right stile-frame shown in Fig. 4.

Fig. 6 is an enlarged structural drawing of another practical embodiment of the top rail-frame, the left stile-frame, the bottom rail-frame and the right stile-frame of the invention.

Fig. 7 is a description drawing of scarfing joint connection between the end portion of the top rail-frame and the first and second connecting slot of the left stile-frame of the invention.

Fig. 8 is another drawing with different angle of view from the Fig. 7 to show that both ends of a glaze bead and the top rail-frame must be cut into specific form and appearance for being installed with the corresponding glaze bead and the left stile-frame of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] As shown in Figs. 2 to 5, the door or window assembly 20 with one or more glass inserts 80 of the present invention is directly constituted by four modularized frame members including a top rail-frame 30, a left stile-frame 40, a bottom rail-frame 50 and a right stile-frame 60 for setting the glass inserts 80 without need of

a pair of partly hollow door skins.

[0010] Accordingly, the structure of the door or window assembly 20 with one or more glass inserts 80 of the invention comprises the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50, the right stile-frame 60, four pieces of glaze beads 70 and the glass insert 80 which are by way of scarfing joint to assemble together the door or window assembly 20 with glass inserts 80 of the invention.

[0011] The top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 all have a modularized structure produced by extrusion forming technique, respectively.

[0012] Besides, the surface f1 of the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 can be made into a smooth surface with single color or dual color or into a surface of simulated wood grain.

[0013] The material of the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 of the invention can be of thermoplastic foam material or thermoplastic material, or the thermoplastic foam material or the thermoplastic material mixed with wood powder, wood chips or glass fiber.

[0014] As shown in Fig. 6, one of the extrusion surfaces f1 of the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 of the invention can be coated with a hard PVC (polyvinyl chloride) shell f2 to form a waterproof surface with the same color or different color with the frame material by way of co-extrusion coating method.

[0015] As shown in Fig. 5, for setting the glass inserts 80 and fixing the glass inserts 80 by the glaze beads 70, the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 all have the same cross-section structure provided with a first connecting slot S1, a second connecting slot S2 and a mortise slot S3 being further formed in the second connecting slot S2.

[0016] Wherein the first connecting slot S1 is shaped for setting and aligning the glass inserts 80, and the second connecting slot S2 is for mounting and aligning the glaze bead 70 for fixing the glass inserts 80. Particularly, the glaze bead 70 can be further shaped to provide a soft tenon 71 which can be inserted into the mortise slot S3 in the second connecting slot S2 to enable the glaze bead 70 to be more firmly installed in the second connecting slot S2.

[0017] Besides, as shown in Fig. 5, for reducing the weight the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 may be arranged to have one or more hollowed grooves S4 through extrusion technique.

[0018] Another practical embodiment of the present invention is shown in Fig. 6, according to the requirement of practical condition of use, a wooden reinforcing member 90a or a metal reinforcing member 90b can be respectively inserted into the hollowed groove S4 of the

top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 to increase the bending strength and load carrying capacity of the frame member, so that no deformation shall be produced even after long period of use of the door or window assembly 20 with glass inserts 80 of the invention.

[0019] As shown in Figs. 4, 6 and 7, both ends B1 and B2 of the top rail-frame 30 and bottom rail-frame 50 must be cut into proper form and size for being inserted into the first connecting slot S1 and the second connecting slot S2 of the left stile-frame 40 and right stile-frame 60. Particularly each ends B1 and B2 of the top rail-frame 30 and right stile-frame 50 can be cut to form a tenon portion h1 for being inserted into the mortise slot S1 in the second connecting slot S2 on the left stile-frame 40 and the right stile-frame 60 to increase the strength of connection.

[0020] When two glaze beads 70 are respectively fixed on the left stile-frame 40 and the right stile-frame 60, and when the other glaze bead 70 is prepared to be assembled together with the glaze beads 70 having been fixed on the top rail-frame 30 and bottom rail-frame 50, both ends G1 and G2 of the glaze bead 70 prepared to fix on the top rail-frame 30 and bottom rail-frame 50 must be cut into proper form and size for being tightly installed and assembled together with the glaze beads 70 fixed on the left stile-frame 40 and right stile-frame 60 of the invention, respectively.

[0021] As mentioned above, the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 can be mutually scarfed together by way of scarfing joint to form the basic structure of the door or window assembly 20 with glass insert 80 of the invention, and then, one or more glass insert 80 can be set into the first connecting slot S1 on the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 and fixed by the four glaze beads 70 to obtain the door or window assembly 20 with glass insert 80 of the invention.

[0022] Further, as shown in Figs. 2 and 5, since the surface structure of the door or window assembly 20 with glass inserts 80 of the invention is directly constituted by assembling each surface f1 of the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 together, the surface f1 of the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 can be arranged into a smooth surface with single color or dual color or into a surface of simulated wood grain.

[0023] Therefore, the door or window assembly 20 with glass insert 80 of the invention provides the advantage of easier installation and without the need of partly hollow door skins. Particularly, the door or window assembly with glass inserts of the invention can be employed in application on a sliding patio door, a swing door, a sliding window and casement window etc.

[0024] Take a sliding patio door as an example, if the top rail-frame 30, the left stile-frame 40, the bottom rail-frame 50 and the right stile-frame 60 of the invention as

shown in Fig. 5 are going to be assembled together to form a sliding patio door, the bottom rail-frame 50 of the invention can be further arranged to have a recession 51 for mounting a sliding wheel, and after then, a sliding patio door without the need of partly hollow door skins is completely assembled.

Claims

1. A door or window assembly with glass inserts without need of partly hollow door skins comprising a top rail-frame (30), a left stile-frame (40), a bottom rail-frame (50), a right stile-frame (60), four pieces of glaze beads (70) and one or more glass inserts (80), **characterized in that** each cross-sectional structure of the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) and the right stile-frame (60) respectively has a first connecting slot (S1) for setting the glass inserts (80) and a second connecting slot (S2) for mounting the glaze beads (70) to fix the glass inserts (80), and both ends (B1, B2) of the top rail-frame (30) and the bottom rail-frame (50) are respectively through scarfing joint connected to the first connecting slot (S1) and the second connecting slot (S2) of the left stile-frame (40) and the right stile-frame (50) to form a surface structure of the door or window assembly with glass insert constituted by assembling each surface (f1) of the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) and the right stile-frame (60) together.
2. The door or window assembly with glass inserts according to claim 1, **characterized in that** a mortise slot (S3) is provided in the second connecting slot (S2) of the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) and the right stile-frame (60), and a tenon portion (h1) is provided on both ends (B1, B2) of the top rail-frame (30) and the bottom rail-frame (50), wherein the tenon portion (h1) of the top rail-frame (30) and the bottom rail-frame (50) is inserted into the correspond mortise slot (S3) in the second connecting slot (S2) of the left stile-frame (40) and the right stile-frame (60).
3. The door or window assembly with glass inserts according to claim 1, **characterized in that** a mortise slot (S3) is provided in the second connecting slot (S2) of the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) and the right stile-frame (60), wherein the corresponding glaze bead (70) further has a soft tenon portion (71) firmly inserted into the corresponding mortise slot (S3) in the second connecting slot (S2) of the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) and the right stile-frame (60).
4. The door or window assembly with glass inserts ac-

cording to claim 2 or 3, **characterized in that** the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) and the right stile-frame (60) are made from thermoplastic foam material, or thermoplastic material, or thermoplastic foam material or thermoplastic material mixed with wood powder, wood chip or fiber glass.

5. The door or window assembly with glass inserts according to claim 4, **characterized in that** each surface (f1) of the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) and the right stile-frame (60) are made into a smooth surface with single color or dual color or into a surface of simulated wood grain.
6. The door or window assembly with glass inserts according to claim 4, **characterized in that** one of the extrusion surfaces (f1) of the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) and the right stile-frame (60) coated with a hard PVC shell (f2) to form a waterproof surface.
7. The door or window assembly with glass inserts according to claim 4, **characterized in that** the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) or the right stile-frame (60) all have one or more hollowed grooves (S4) for reducing weight.
8. The door or window assembly with glass inserts according to claim 7, **characterized in that** the hollowed groove (S4) of the top rail-frame (30), the left stile-frame (40), the bottom rail-frame (50) or the right stile-frame (60) has a wooden reinforcing member (90a) or a metal reinforcing member (90b) inserted inside for increasing bending strength.
9. The door or window assembly with glass inserts according to claim 4, **characterized in that** the door or window assembly is assembled as a sliding patio door, a swing door, a sliding window or a casement window.

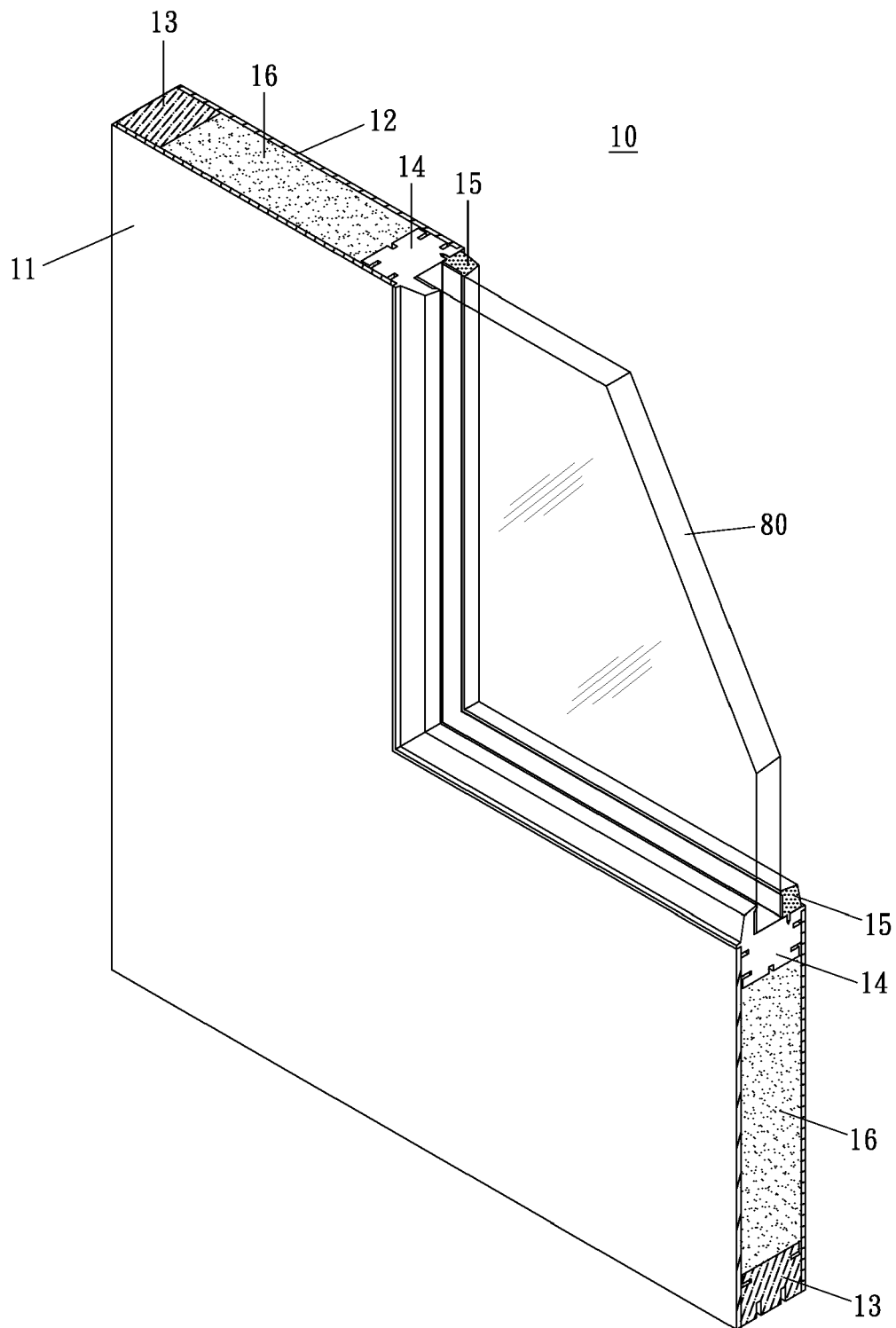


Fig. 1
(prior art)

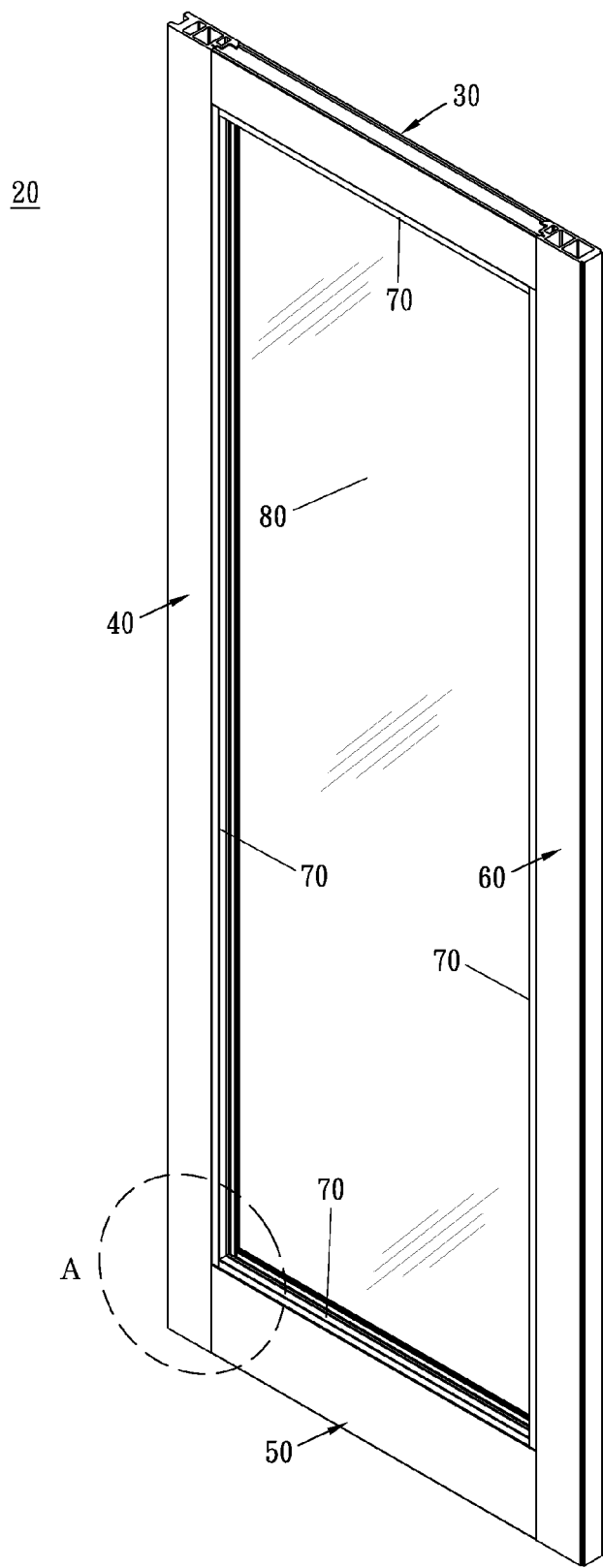


Fig. 2

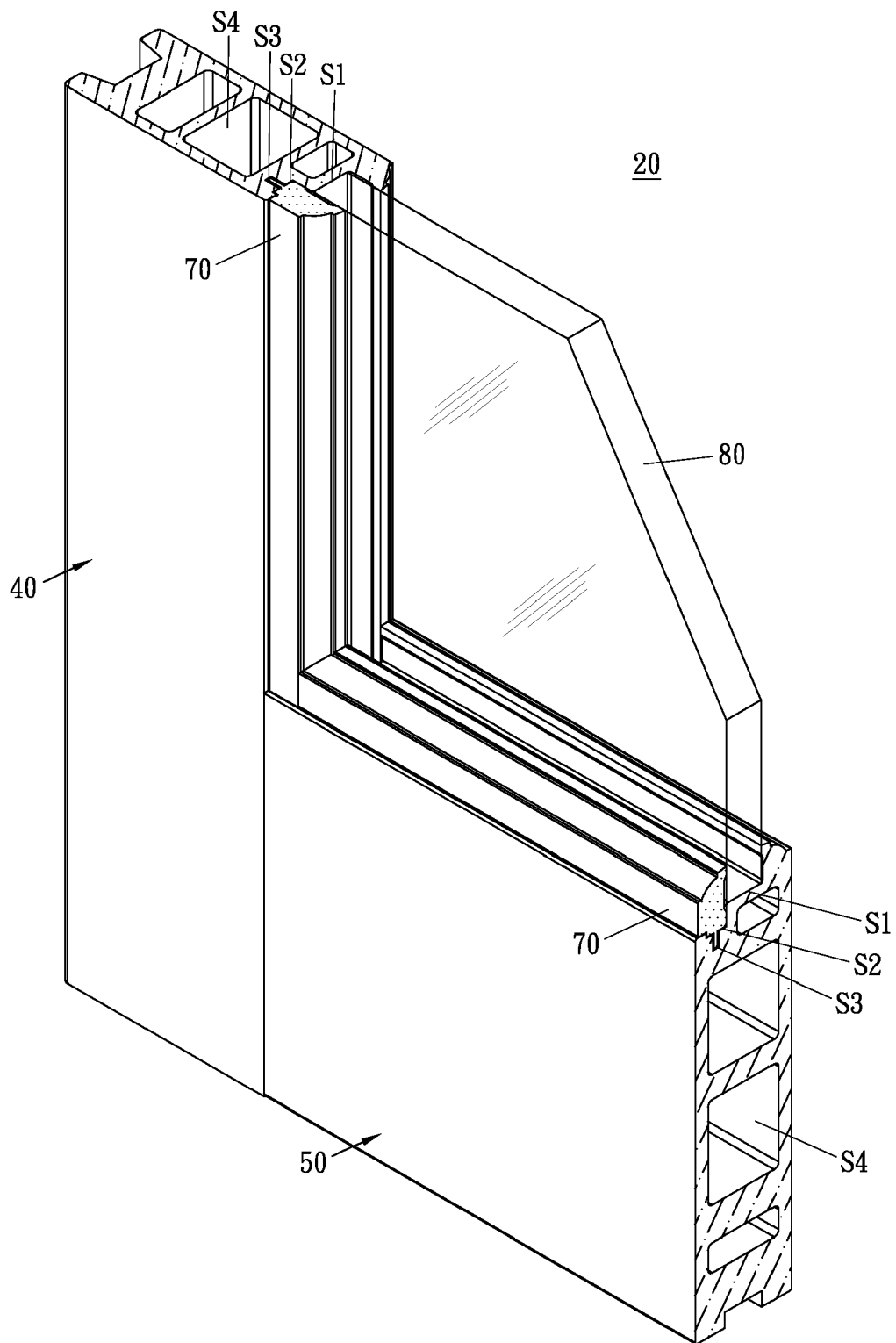


Fig. 3

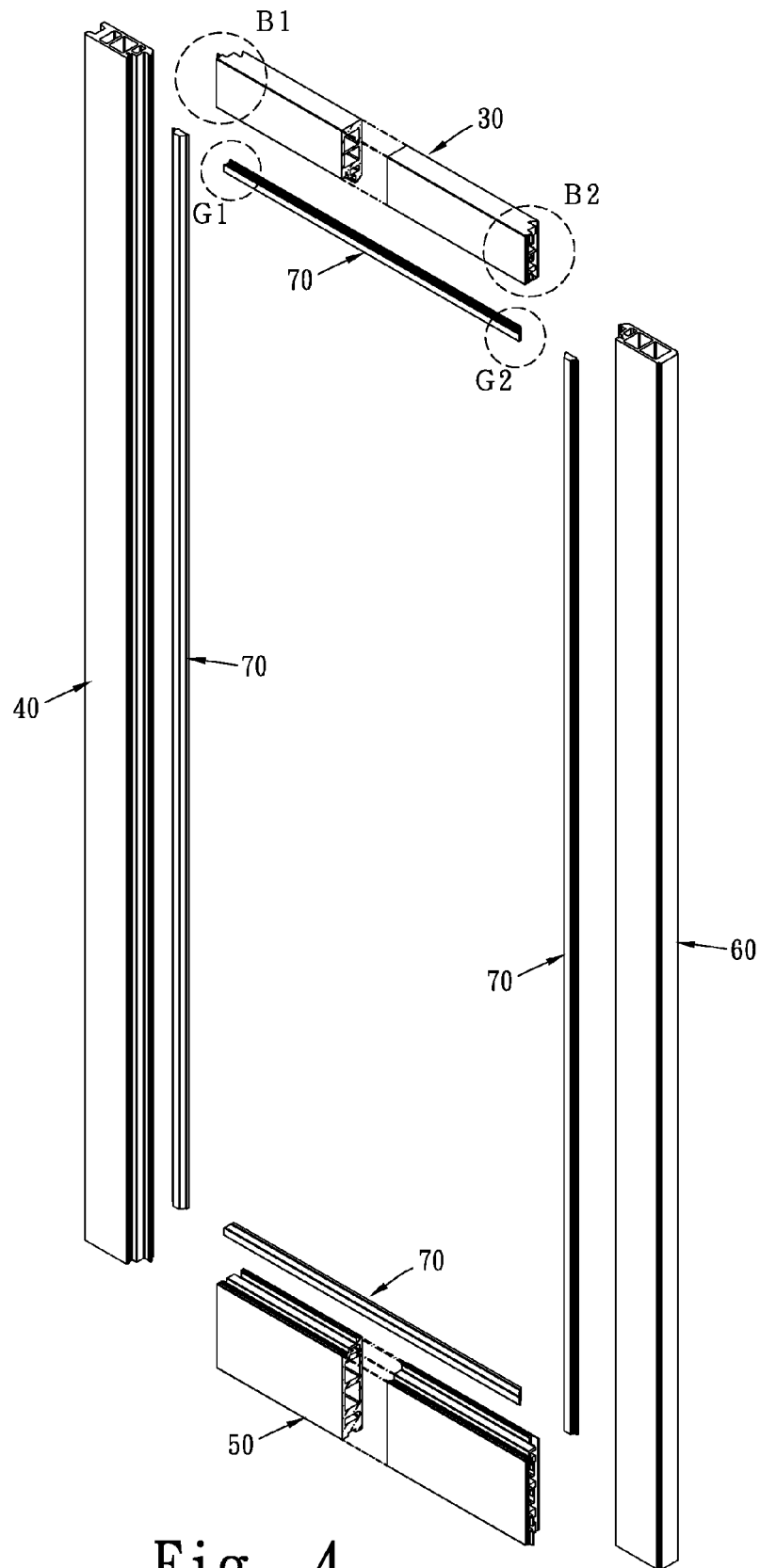


Fig. 4

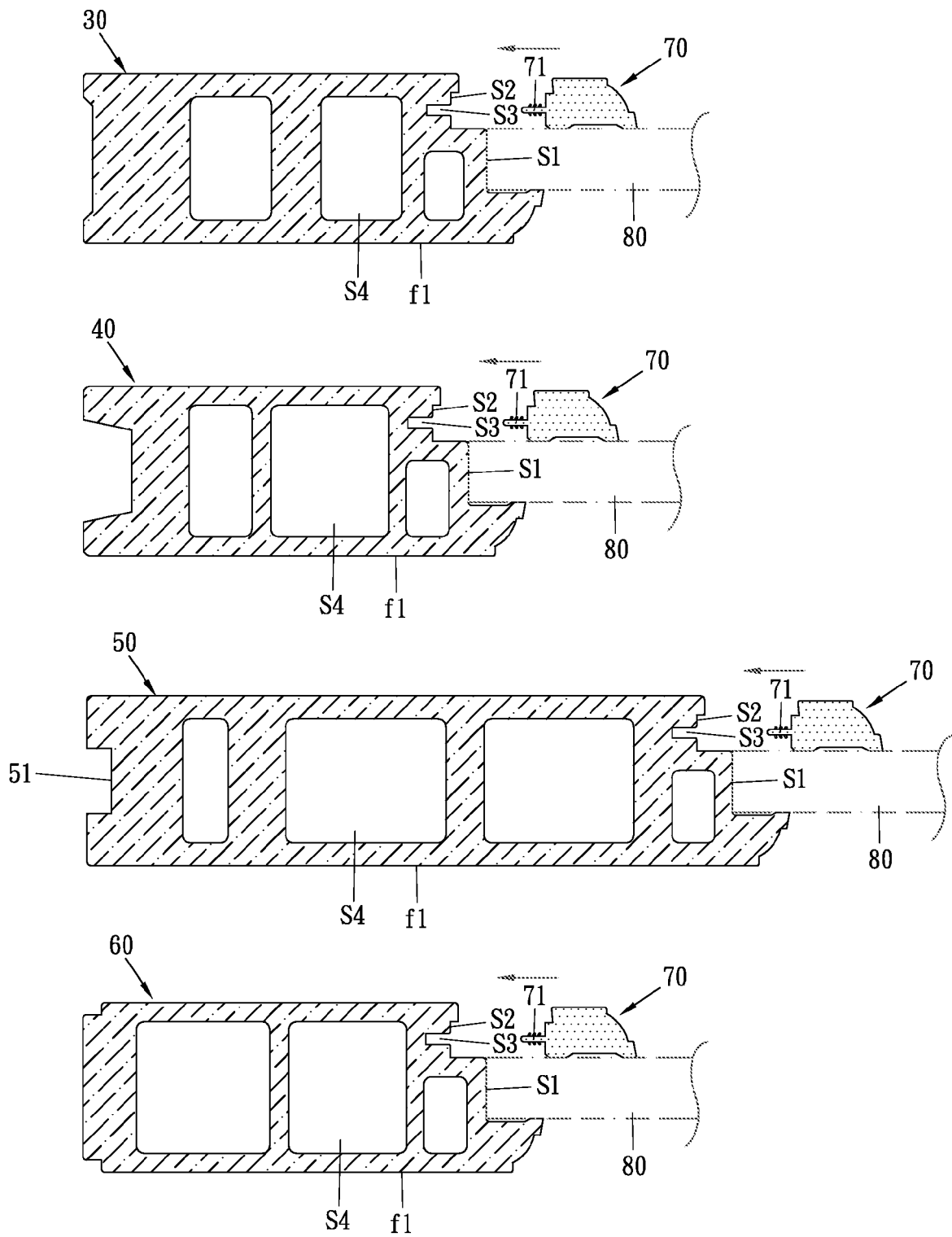


Fig. 5

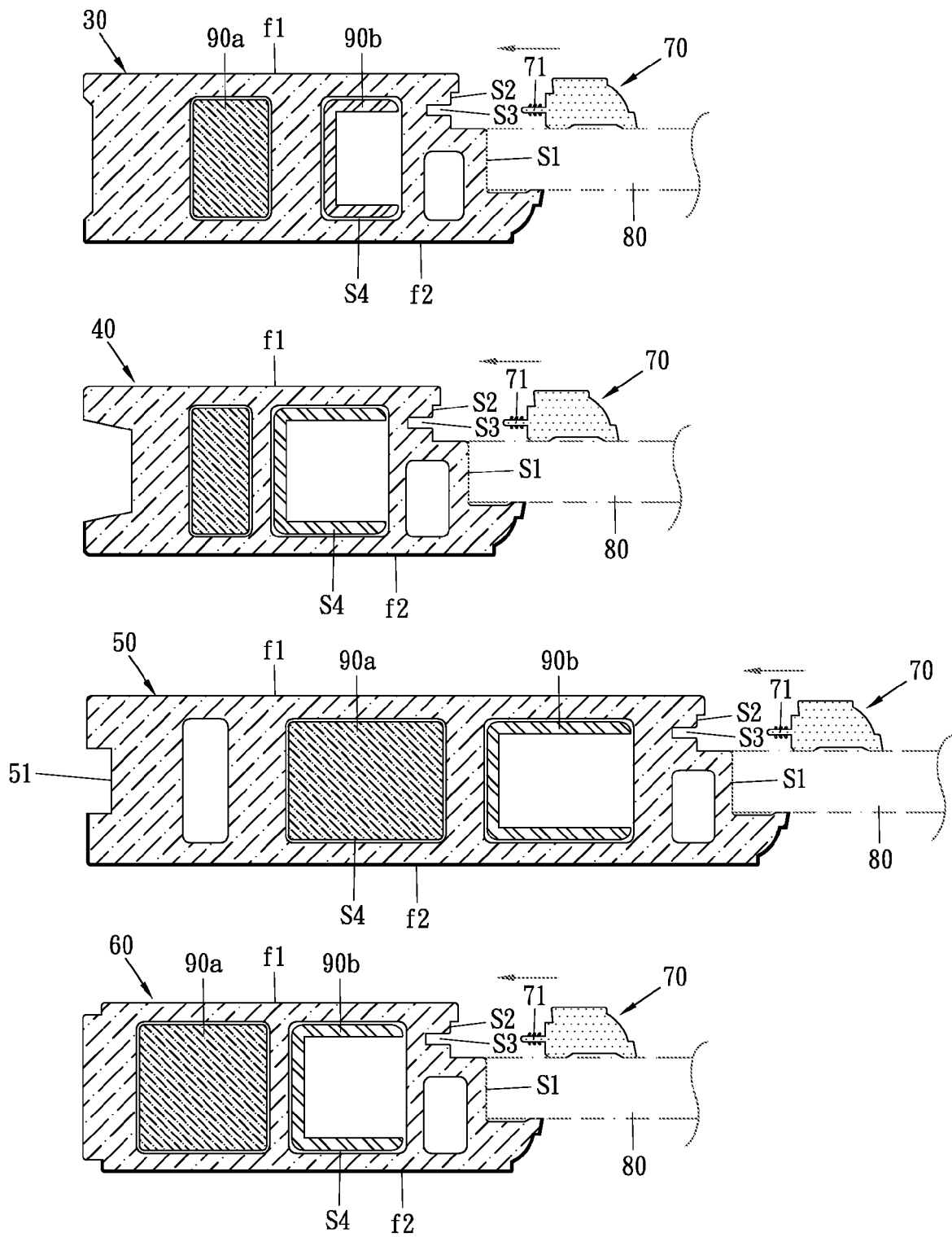


Fig. 6

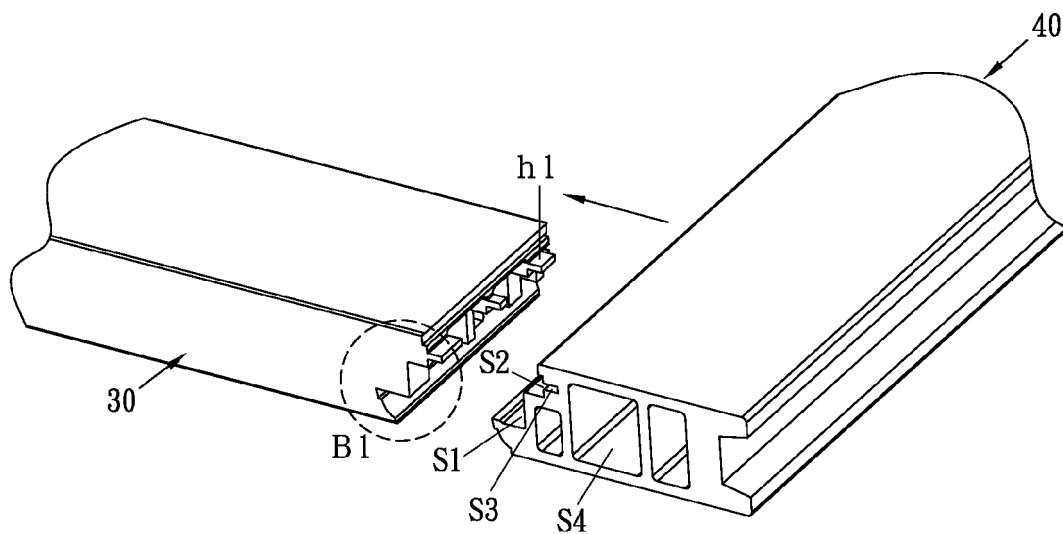


Fig. 7

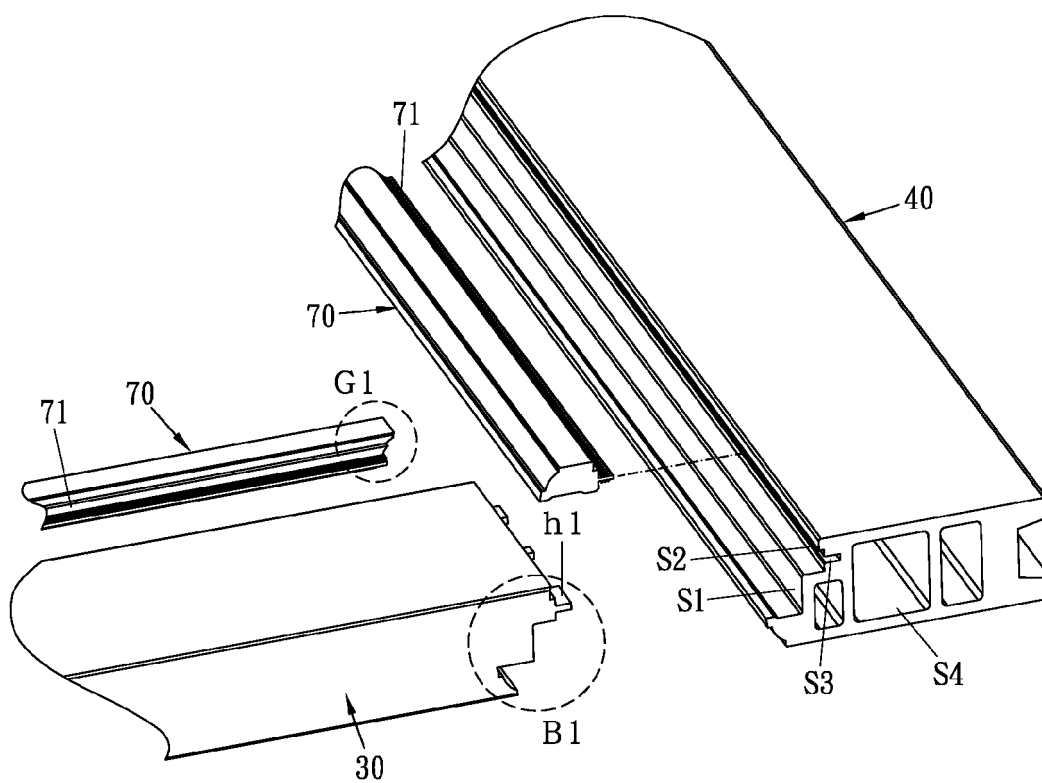


Fig. 8



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 11 7458

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 252 999 A (QUALITY ROW FITTED BEDROOMS LI [GB]) 26 August 1992 (1992-08-26) * figures 1-3,10 * * page 3, line 5 - page 4, line 18 * * page 4, line 32 - page 5, line 2 * -----	1	INV. E06B3/96
X	EP 1 039 152 A (SFS IND HOLDING AG [CH] SFS INTEC HOLDING AG [CH]) 27 September 2000 (2000-09-27) * figures 1-3 * * paragraph [0001] * * paragraph [0016] * -----	1	
X	EP 1 055 796 A (DECEUNINCK PLASTICS IND NV [BE]) 29 November 2000 (2000-11-29) * figures 14,15,17,18 * * claims 1,3,7-10,14,15 * * paragraphs [0001], [0016] * -----	1	
A	FR 2 541 355 A (AUDRAIN DENYS [FR]) 24 August 1984 (1984-08-24) * figures 1,2 * * claim 3 * -----	3	TECHNICAL FIELDS SEARCHED (IPC) E06B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 March 2008	Examiner Blancquaert, Katleen
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 11 7458

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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19-03-2008

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