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(71) Applicant: **Schlegel Limited**
Henlow Camp, Bedfordshire SG16 6DS (GB)

(72) Inventors:
• **Smith, John Colin**
Letchworth, Hertfordshire SG6 1ED (GB)
• **Speirs, Samuel**
Shefford, Bedfordshire SG17 5HS (GB)

(74) Representative:
Tebbit, Antony Hugh Edward
Barker Brettell
138 Hagley Road
Edgbaston
Birmingham B16 9PW (GB)

(54) **Improvements in seals for windows and other framed closures**

(57) A sealing strip (1) is disclosed which comprises a retaining web (2) adapted to be secured into a slot (14) in a frame member, which retaining web (2) is sealingly attached to an elongate sealing lip (6) formed so as to give rise to no more than a small sprue on welding thereof. A closure frame incorporating an extruded closure frame member (10) having an elongate slot (14) retaining such a sealing strip (1) is also disclosed. Such sealing strip (1) may comprise a flanged retaining web (2) which is inserted into the slot (14) in the frame member (10) with its flanges (4,5) overlapping the face of the frame member (10) to either side of the slot (14). The sealing strip (1) may be inserted into the frame slot (14) before the frame member (10) is cut to length and welded.

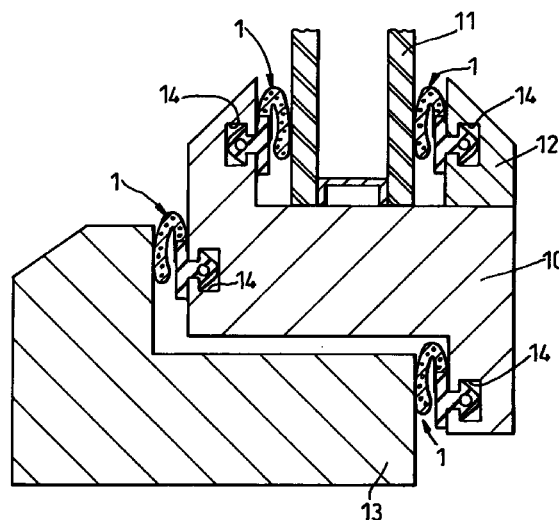


Fig. 1

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Description

[0001] This invention relates to sealing strips for framed closures, and in particular to those whose frames are formed from extruded profiles of thermoplastic material which are mitred and thermally bonded (welded) at their ends to form the frame. A casement window closure comprising a glazing panel held in a frame of extruded unplasticised polyvinylchloride is a typical example of such a closure.

[0002] In order to make a typical rectangular frame for such a closure, four lengths of hollow extruded thermoplastics material are taken and their ends are cut at 45° so that they may form mitred joints. The ends of the various extrusions are heated and they are pressed together in a jig so that the four frame members become welded together. Any ancillary components such as seals are fitted to the frame to form for example a window unit after the frame has been welded together. The task of inserting sealing strips around the frame is performed manually and this can add significantly to the cost of the frame.

[0003] In order to avoid this manual step after the welding operation, it has previously been proposed to install the sealing strip into the thermoplastics extrusion, for example as that extrusion is formed. The sealing strip is then in place during the mitring and welding operations. This however gives rise to certain further problems.

[0004] When UPVC or other thermoplastic material is welded by a process involving the application of heat and pressure, a sprue is formed at the weld interface. If any sealing strip present is formed of a weldable material that will also form a sprue. Any such sprue can form a mechanical stop at the corner of the frame which prevents proper closure of the window. It is accordingly necessary to remove the weld sprue and this has been a common practice in the past. Unfortunately, if there is a seal already in place, this sprue is not easily accessed at the corner and in order for its proper removal, if there is a seal present, such removal must be performed manually. This negates the advantage of pre-positioning the seal. Furthermore, if the seal sprue is of a soft sealing material this does not lend itself to easy removal. Again a manual operation is required to remove the seal sprue.

[0005] If the sprues at the corners of the frame are not removed, this can lead to a lack of sealing along the entire length of an edge of the closure.

[0006] It is an object of the present invention to provide a sealing strip and a framed closure in which the above problems are alleviated.

[0007] According to the present invention there is provided a sealing strip comprising a retaining web adapted to be secured into a slot in a frame member, which retaining web is sealingly attached to an elongate sealing lip formed so as to give rise to no more than a small sprue.

[0008] In order to avoid the need for removal of a sprue due to welding of a sealing lip of a sealing strip, sprue formation due to the sealing lip must be kept as low as possible. Such sprue formation is a function of the mass per unit length of the material of which the sealing lip is made. One way of minimising such sprue formation is to use a thin lip. This can, however, give rise to difficulties in effecting a reliable weld between different sealing lips at a frame corner due to their inherent flexibility and problems in obtaining proper registration of the two lip ends as the mitred frame ends are offered up to one another, and it is accordingly preferred that such a sealing lip comprises a foamed material.

[0009] The retaining web is preferably of barbed form, so that its retention in the slot is promoted. In the most preferred embodiments of the invention the retaining web of the sealing strip incorporates flanges which project to each side of its retaining web so that they are adapted to overlie the face of a frame member to either side of its slot.

[0010] The invention extends to an extruded closure frame member incorporating an elongate slot retaining a sealing strip wherein the sealing strip comprises a flanged retaining web which is inserted into said slot with its flanges overlapping the face of the frame member to either side of the slot and which is sealingly attached to an elongate sealing lip formed so as to give rise to no more than a small sprue.

[0011] The invention also includes a method of manufacturing a frame for a closure which frame comprises extruded frame members incorporating sealing strips, such method comprising the steps of:

extruding frame material with a slot for receiving a sealing strip;
inserting into said slot a retaining web of a said sealing strip which retaining web is sealingly attached to an elongate sealing lip formed so as to give rise to no more than a small sprue;
cutting the frame material and the incorporated sealing strip to length with mitred ends to form frame members; heating the mitred ends of the frame members and welding them together; and subsequently removing any hard sprue material.

[0012] In the most preferred embodiments of the invention the retaining web is thermally stable at temperatures at which the frame material can be welded. The retaining web is suitably of a thermosetting plastic material for example an ethylene propylene co-polymer rubber.

[0013] It is desirable that the foamed material of the sealing lip should be of a thermoplastic material which is weldable at temperatures at which the frame members are weldable. We have found that a polyurethane foam material is especially suitable. The foam material of the sealing lip is preferably encased in a skin. Such a skin may be formed from polyethylene.

[0014] The use of an appropriately shaped sealing strip in accordance with this invention has the effect of inhibiting sprue formation on welding of the frame members in the immediate vicinity of the sealing strip. This avoids or substantially avoids the disadvantage or difficulty in removing any sprue material in the immediate vicinity of such a sealing strip, and in particular from beneath such a strip.

[0015] A preferred embodiment of the invention will now be described in detail and by way of example with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a cross-sectional view through a window closure and its frame constructed in accordance with the invention,

Figures 2a, 2b, 2c, and 2d represent different stages in the construction of a window frame, and

Figure 3 is a cross-sectional view through an embodiment of sealing strip constructed in accordance with the invention.

[0016] Referring first to Figure 3, a sealing strip generally indicated at 1 comprises a retaining web 2 which is provided with a barbed head 3 for insertion into and retention by the walls of a slot in a window or other closure frame member. The retaining web 2 also has lapping flanges 4 and 5 which will overlie portions of the frame member when the sealing strip is assembled to that member. A sealing lip 6 is formed by a skin 7 filled with foam material 8. The sealing lip skin 7 is secured to the upper and lower faces of one of the lapping flanges 5 in order to secure the lip to the retaining web 2. The sealing lip 6 may be formed continuously on the retaining web 2 by in situ blowing of the foam 8 in which case the foam material may be used to adhere the skin 7 to the lapping flange 5.

[0017] The retaining web is most preferably of a thermosetting material. Synthetic rubbers such as EPDM are suitable.

[0018] In Figure 1, an opening light of a casement window comprises an opening frame 10 and a double glazing panel 11 secured in it by a lath 12. The window has a fixed outer frame 13.

[0019] Sealing between the opening frame 10 and the glazing unit 11 is effected by a pair of sealing strips 1 which are inserted into undercut slots 14 in the frame 10 and lath 12. Sealing between the opening frame 10 and the fixed frame 13 is likewise effected by two sealing strips 1, fitted into undercut slots 14 in the opening frame.

[0020] Figures 2 illustrate various stages in the manufacture of a frame for a closure such as a window or door. Figure 2a shows the end of a length of extruded thermoplastic frame-forming material which has been cut at 45° for forming a mitre at a corner of a finished frame. It will be seen that a sealing strip 1 having a sealing lip 6 and a lapping flange 4 has been inserted into

the frame member 1 so that it is mitred at the same time as the frame member 10.

[0021] Figure 2b illustrates a stage in heating the end of a frame member 10 preparatory to welding it to a second like member. End portions 101 become melted and shrink back as shown in Fig 2c to leave end portions of the sealing strip retaining web 2 standing proud. The retaining web 2 of the sealing strip 1 is formed of a material which can withstand the heat applied to soften and melt the frame member for welding.

[0022] In Fig 2c, the mitred ends of two frame members are brought face to face. First contact is between the ends of the two retaining webs 2 held thereby. As the frame members are brought closer together, the ends of those sealing strip retaining webs 2 are compressed and pressed back along their respective slots, and as further pressure is exerted, the ends of the frame members come into contact, are pressed together and the still soft ends of those frame members are welded together and a sprue 102 is formed. That sprue 102 formed of the hard frame material will require removal, as is conventional, for aesthetic and practical reasons. If the sprue formed is higher than the sealing lip, it can prevent any sealing contact between the frame member 10 and some other member, e.g. a glazing panel or another frame member, and this is plainly not to be desired. Removal of the sprue is facilitated because sprue formation beneath lapping flanges such as 4 of the retaining web is inhibited.

[0023] By incorporating a foamed material in the sealing strip it is possible to give it a cross-sectional area which is high in relation to its mass per unit length. As a result, and because only a thin skin of polyethylene is incorporated, two lips can be brought into register as the frame ends are offered up to one another, so they can be reliably welded with minimal sprue formation at the same time as the frame members themselves are welded together.

Claims

1. A sealing strip comprising a retaining web adapted to be secured into a slot in a frame member, which retaining web is sealingly attached to an elongate sealing lip formed so as to give rise to no more than a small sprue on welding thereof.
2. A sealing strip according to claim 1, wherein the retaining web is of barbed form.
3. A sealing strip according to claim 1 or 2, wherein the retaining web is of a thermosetting plastic material for example an ethylene propylene co-polymer rubber.
4. A sealing strip according to any one of the preceding claims, wherein said sealing lip comprises a foamed material.

5. A sealing strip according to claim 4, wherein the foamed material of the sealing lip is a polyurethane foam.
6. A sealing strip according to claim 5, wherein the foam material of the sealing lip is encased in a skin. 5
7. A sealing strip according to any one of the preceding claims, wherein the retaining web of the sealing strip incorporates flanges projecting to each side of the retaining web. 10
8. A closure frame incorporating an extruded closure frame member incorporating an elongate slot retaining a sealing strip according to claim 7, wherein the sealing strip comprises a flanged retaining web which is inserted into said slot with its flanges overlapping the face of the frame member to either side of the slot and which is sealingly attached to an elongate sealing lip formed so as to give rise to no more than a small sprue. 15 20
9. A frame, according to claim 8, wherein the retaining web is thermally stable at temperatures at which the frame material can be welded. 25
10. A frame according to claim 8 or 9, wherein the foamed material of the sealing lip is of a thermoplastic material which is weldable at temperatures at which the frame members are weldable. 30
11. A method of manufacturing a frame for a closure which frame comprises extruded frame members incorporating sealing strips, such method comprising the steps of: 35
 - extruding frame material with a slot for receiving a sealing strip;
 - inserting into said slot a retaining web of a said sealing strip which retaining web is sealingly attached to an elongate sealing lip formed so as to give rise to no more than a small sprue;
 - cutting the frame material and the incorporated sealing strip to length with mitred ends to form frame members; heating the mitred ends of the frame members and welding them together; and subsequently removing any hard sprue material. 40 45

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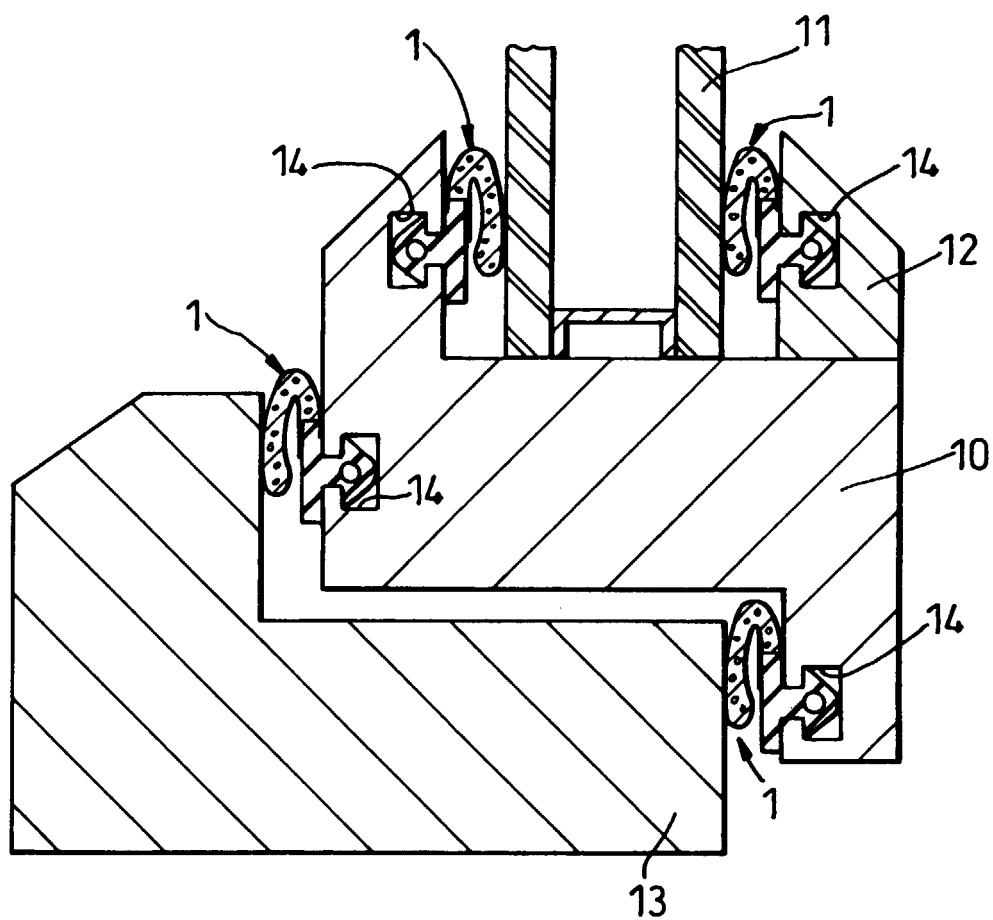


Fig. 1

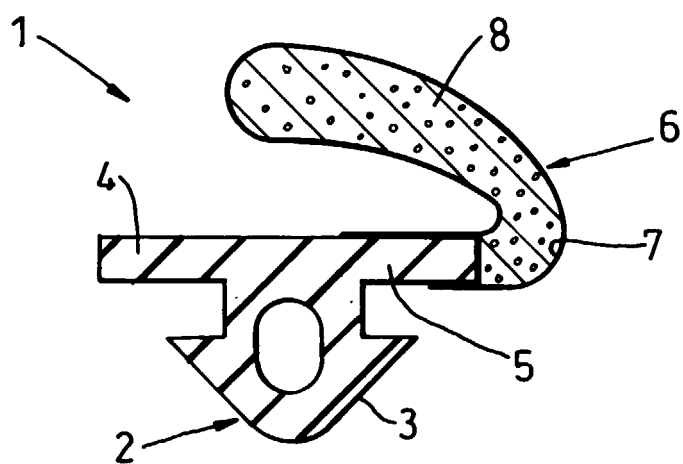


Fig. 3

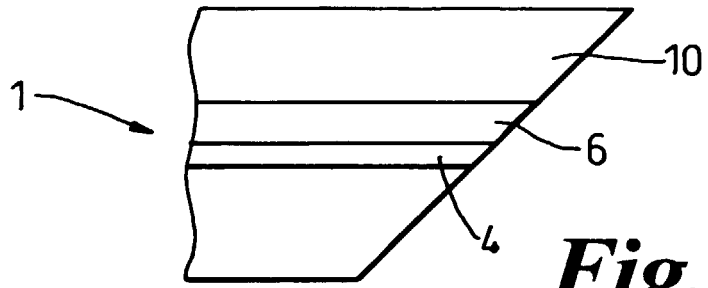


Fig. 2a

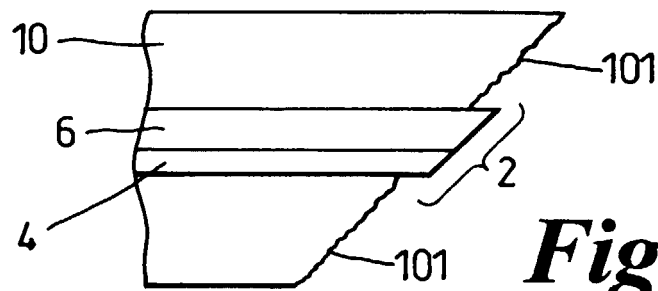


Fig. 2b

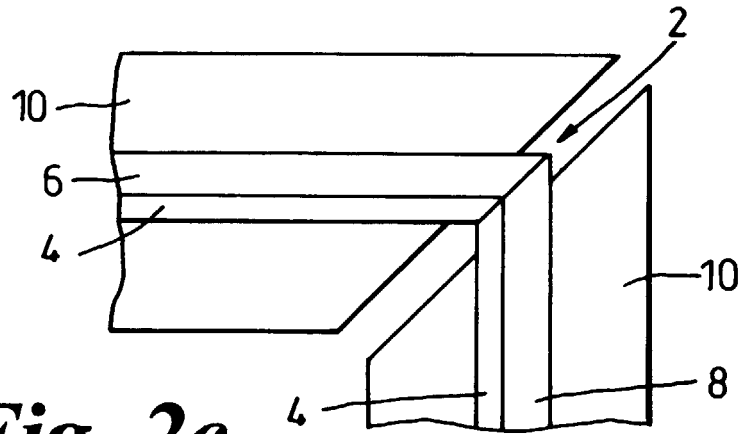


Fig. 2c

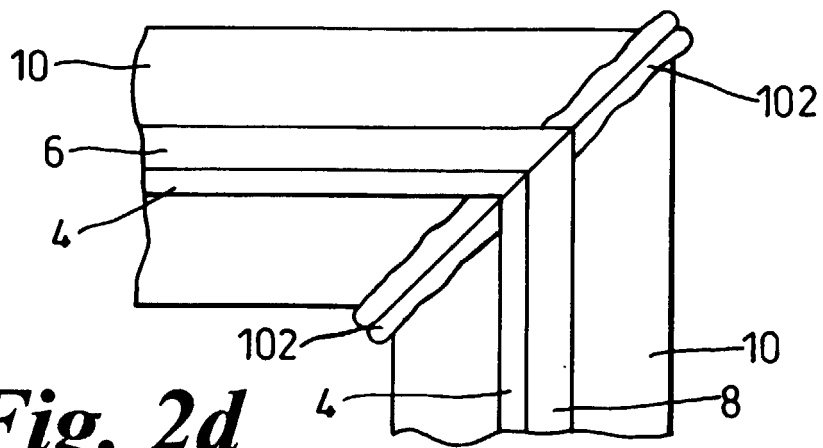


Fig. 2d



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EUROPEAN SEARCH REPORT

Application Number
EP 00 30 2456

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 195 29 622 A (SCHWEIZER AG E METALLBAU) 13 February 1997 (1997-02-13) * the whole document *	1-4,7,8	E06B3/62
X	DE 195 06 246 A (SAAR GUMMIWERK GMBH) 29 August 1996 (1996-08-29) * the whole document *	1,2,4, 6-8	
X	DE 94 15 923 U (SCHLEGEL GMBH) 14 December 1995 (1995-12-14) * the whole document *	1-3,7-11	
A	DE 94 15 383 U (SCHLEGEL GMBH) 6 July 1995 (1995-07-06) * the whole document *	1,2,7	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E06B F16J
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 12 July 2000	Examiner Endler
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 30 2456

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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12-07-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 19529622 A	13-02-1997	NONE	
DE 19506246 A	29-08-1996	CA 2188570 A	29-08-1996
		WO 9626345 A	29-08-1996
		DE 29521977 U	24-12-1998
		EP 0757743 A	12-02-1997
		US 5932312 A	03-08-1999
DE 9415923 U	14-12-1995	NONE	
DE 9415383 U	06-07-1995	NONE	