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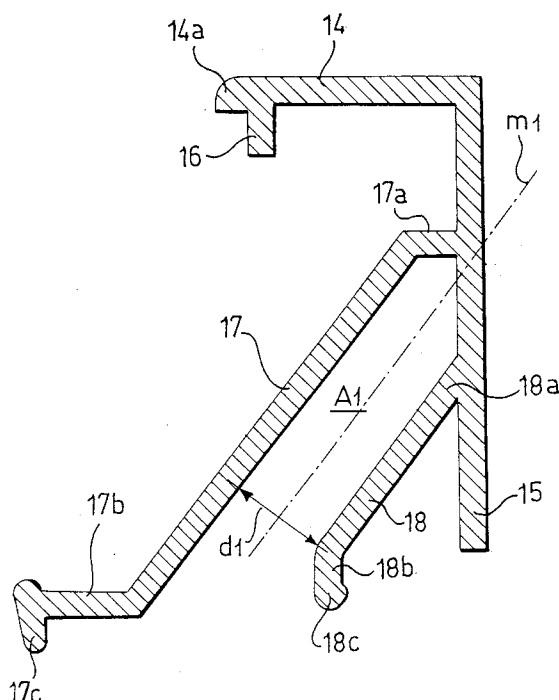
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**AT BE CH DE DK ES FR GB GR IT LI LU NL SE**(71) Applicant: **ALUMINIA S.p.A.****I-09010 Portoscuso (Cagliari)(IT)**(72) Inventor: **Gambirasi, Alessandro, c/o**  
**ALUMINIA S.p.A.**  
**Via dei Sali, 3**  
**I-30175 Porto Marghera, (Venezia)(IT)**(74) Representative: **Perani, Aurelio et al**  
**c/o JACOBACCI-CASETTA & PERANI S.p.A 7,**  
**Via Visconti di Modrone**  
**I-20122 Milano(IT)**(54) **An extruded glass pane holding metal section for metal fixtures.**

(57) An extruded glass pane holding metal section for metal fixtures having a substantially L-shaped cross-section formed by two members (14,15) set at an angle to each other, of which one is provided with means (16) of engagement for a face bearing seal (6) for a glass pane (7), and comprising two side-by-side snap-action wings (17,18) adapted to engage in corresponding coupling means provided on the members which form the fixture frame. The spacing (d1) of the side-by-side snap-action wings (17,18) is constant over at least a major portion of their lengthwise extent. This structure is effective to reduce the risk of breakage of the extrusion dies and warping the extruded metal section.

**FIG.3****EP 0 496 026 A1**

This invention relates to an extruded glass pane holding metal section for fixtures formed by metal sections, having a substantially L-like cross-sectional shape defined by two members at an angle to each other, of which one is provided with means of engagement for a glass pane face bearing seal, and comprising two snap-action wings arranged side-by-side and each extending between a first end joined with one of said members of said section and a second end adapted for engagement in corresponding coupling means provided on the sections which form the fixture frame.

The cross-section of one example of a glass pane holding metal section according to the prior art is shown in European Patent No. 049694 and reproduced in Figure 1 of the accompanying drawings.

In this figure, two snap-action wings 1 and 2 are attached with their respective ends 1a and 2a to the L-shaped portion of the section formed by structural members 3 and 4.

Member 3 has, at the attachment end 1a of wing 1, means, e.g. in the form of a groove 5, of engagement of a bearing seal 6 for a glass pane 7, shown schematically in phantom lines.

Said snap-action wings 1 and 2 have respective free ends 1b and 2b adapted to snap into and engage corresponding coupling means, known per se, 8 and 9 which are provided on section 10 intended for forming the fixture frame in combination with other sections and accessories, not shown.

Along the snap-action wings 1 and 2 of the prior glass pane holding section, a point can be detected where their spacing is least; these points are connected by a segment "d".

Indicated at "A" is the cross-section of the metal section having a perimeter "p" and being included between the segment "d", the wings 1 and 2, and the angle structural members 3 and 4.

The manufacture of such a glass pane holding metal section by an extrusion process involves in the die, the provision of a plug whose cross-sectional shape should correspond to the hollow portion of the metal section to be extruded, which portion is represented by cross-section "A" as far as this invention is concerned.

As can be seen in Figure 2, the plug 11 of the die 12 used for extruding a glass pane holding metal section like the one shown in Figure 1 would be protrudingly mounted to the die through an attachment section or base "B" having spacing "d" for its cross dimension and the thickness "S" of the die 12 for its lengthwise dimension.

For a given thickness "S" of the extrusion die, this plug attachment base "B" will vary with spacing "d".

The last-mentioned dimension will be, in turn,

dependent on the pane holding metal section geometry, which geometry must take into account, for a given positioning of the means 8 and 9 for mounting the pane holding metal section to the frame sectional member 10, the need to accommodate glass panes 7 having different thicknesses.

During the extrusion step the die 12, and especially the plug 11, are notoriously subjected to high stresses.

During that operation, in fact, a metal lingot or billet, being made plastically deformable by the high temperature to which it has been brought, is pushed forward toward the die by an extrusion force F; the amount of metal which is not passed through the die's slit 13 will then develop, across the plug cross-section, a thrust force whose amount is proportional to said extrusion force.

It matters to underline, moreover, that the above-mentioned stresses are also proportional to the perimeter "p" of the cross-section "A" of the metal section being extruded, due to the frictional forces produced by the metal going through the extrusion slit 13, which corresponds to the overall contour profile of the metal section.

Such stresses result in continued risk of the plug 11 breaking at its attachment base "B", the breakage being the more likely to occur the smaller is the area of said cross-section relatively to the cross-section "A" of the hollow in the metal section being processed.

An additional problem encountered in the manufacture of glass pane holding metal sections of the above-specified type by an extrusion process, relates to the asymmetrical pattern of cross-section "A" about a mid-plane "m" perpendicular to the attachment base "B" of the plug 11.

This asymmetry introduces unbalanced extrusion forces and twisting moments on the plug 11. As a consequence, there is an added risk of the extruded metal section becoming warped and dimensional tolerances being not met.

It will be appreciated from the foregoing that an extruded glass pane holding metal section of conventional design involves a series of drawbacks which extend from technological difficulty in making the related extrusion dies robust and durable, to the quality of the metal sections obtained, as well as to cost increase involved, and which will affect the economy aspects of fixtures incorporating such glass pane holding metal sections.

To obviate such drawbacks, the prior art mainly advocated in the past low extrusion rates, thus imposing limitations on production rate and the need for oversize dies of heavy construction.

Accordingly, it is the object of this invention to face and solve the problem of how to remove the drawbacks with which conventional type glass pane holding metal sections are beset by redesigning

the metal section geometry.

This object is achieved by an extruded glass pane holding metal section as indicated being characterized in that the spacing of said snap-action wings laid side-by-side, as measured at successive locations from their ends intended for engagement with the fixture sectional member, is kept unincreased throughout the length of their lengthwise extent.

In particular, and in a preferred embodiment form, this spacing is kept constant over a major section of the lengthwise extent of said snap-action wings.

The invention will be now described in greater detail with reference to the prior art and some preferred embodiments of this glass pane holding metal section, shown by way of example and not of limitation in the accompanying drawings, wherein:

Figure 1 is a sectional view of a glass pane holding metal section of a known type;

Figure 2 is a perspective view showing in section and schematically a die for extruding the glass pane holding metal section of Figure 1;

Figure 3 shows in cross-section a first embodiment of the glass pane holding metal section according to the invention; and

Figures 4 to 6 show in cross-section respective embodiments of the inventive glass pane holding metal section.

With reference to the drawing figures, and specifically to Figure 3, a glass pane holding metal section according to the invention comprises walls 14 and 15 set at an angle to each other into an L-like configuration and corresponding to the walls 3 and 4 of a conventional glass pane holding metal section.

The end 14a of wall 14 is formed with an extension 16 providing an anchor means for a bearing seal for the glass pane. Being conventional structural elements, neither the seal nor the glass pane have been shown in Figure 3.

The glass pane holding metal section also comprises snap-action wings 17 and 18 which lie parallel to each other over a substantial length of their lengthwise extent, in the embodiment illustrated by Figure 3.

Snap-action wing 17 is attached with its end 17a to the wall 15 of the metal section, and has conventional anchor means, e.g. in the form of a rib 17c, provided on its opposite free end 17b.

Its corresponding flanked wing 18 is attached with its end 18a to that same wall 15 of the metal section, while its opposite end 18b is provided with anchor means, similar to the means on wing 17, in the form of a rib 18c.

As may be appreciated in the embodiment shown, with the spacing "d1" of the snap-action wings 17 and 18 kept constant, keeping the value

of said spacing the same as that of the corresponding "d" of the conventional pane holding metal section (Figure 1) and the other design dimensions being the same, the cross-section "A1" included by the snap-action wings will show to be smaller than the corresponding cross-section "A" of the conventional pane holding metal section.

Since it is known from the metal material extrusion technologies that the breakage rate of a die plug depends, other conditions being the same, on the ratio of the area of its cross-section to the width of its attachment base to the die squared, with the metal section of this invention said rate is reduced and strength enhanced accordingly, compared to the conventional metal section, as a result of cross-section "A1" being made smaller than cross-section "A" for the value of "d1" and "d" being the same.

And moreover, with the center of gravity of cross-section "A1" arranged to lie virtually on a plane "m1" perpendicular to the base cross-section of the plug, the risk of twisting moments being applied to the plug and consequent problems is eliminated.

Similar considerations apply to the glass pane holding metal section embodiments shown in Figures 4 to 6.

With reference to Figures 4 and 5, wherein structural elements corresponding to those in Figure 3 are denoted by the same numerals, it is seen that the end 17a of snap-action wing 17 is attached to walls 14 and 15 at the location of the apex of the angle formed therebetween, into the aforesaid L-like configuration.

In particular, wall 14 can have different lengthwise extents.

This feature enables glass pane holding metal sections to be manufactured of a single type capable of accommodating a range of different thicknesses of the glass V, namely large, medium, and small thickness ones.

Finally, Figure 6 shows an embodiment of the glass pane holding metal section according to the invention wherein said snap-action wings 17 and 18 are positioned such that continuations of the lengthwise sections 17d and 18d would converge to a point outside the cross-section of the glass pane holding metal section.

Understandably the invention as described in the foregoing could be implemented in different ways without departing from its scope as set forth in the appended claims.

## Claims

1. An extruded glass pane holding metal section for fixtures formed from metal sections, having a substantially L-like cross-sectional shape de-

fined by two members (14,15) at an angle to  
 each other, of which one is provided with  
 means (16) of engagement for a glass pane (7)  
 face bearing seal (6), and comprising two  
 snap-action wings (17,18) arranged side-by- 5  
 side and each extending between a first end  
 (17a,18a) unitary with one of said rail members  
 and a second end (17b,18b) adapted for en-  
 gagement in corresponding coupling means  
 provided on the sections which form the fixture 10  
 frame, characterized in that,

the spacing (d1) of said snap-action wings  
 (17,18) laid side-by-side, as measured at suc-  
 cessive locations from their ends (17b,18b)  
 intended for engagement with the fixture sec- 15  
 tions, is kept unincreased throughout the  
 length of their lengthwise extent.

2. An extruded glass pane holding metal section  
 according to Claim 1, characterized in that, 20  
 said spacing (d1) of the snap-action wings  
 (17,18) laid side-by-side is a decreasing value.
3. An extruded glass pane holding metal section  
 according to Claim 1, characterized in that, 25  
 said spacing (d1) of the snap-action wings  
 (17,18) laid side-by-side, has a constant value  
 over a major portion of their lengthwise extent.
4. An extruded glass pane holding metal section 30  
 according to Claim 1, characterized in that,  
 continuations of the major lengthwise por-  
 tions (17d,18d) of the extent of said side-by-  
 side snap-action wings (17,18) are convergent  
 to a point outside the cross-section of the 35  
 metal section.

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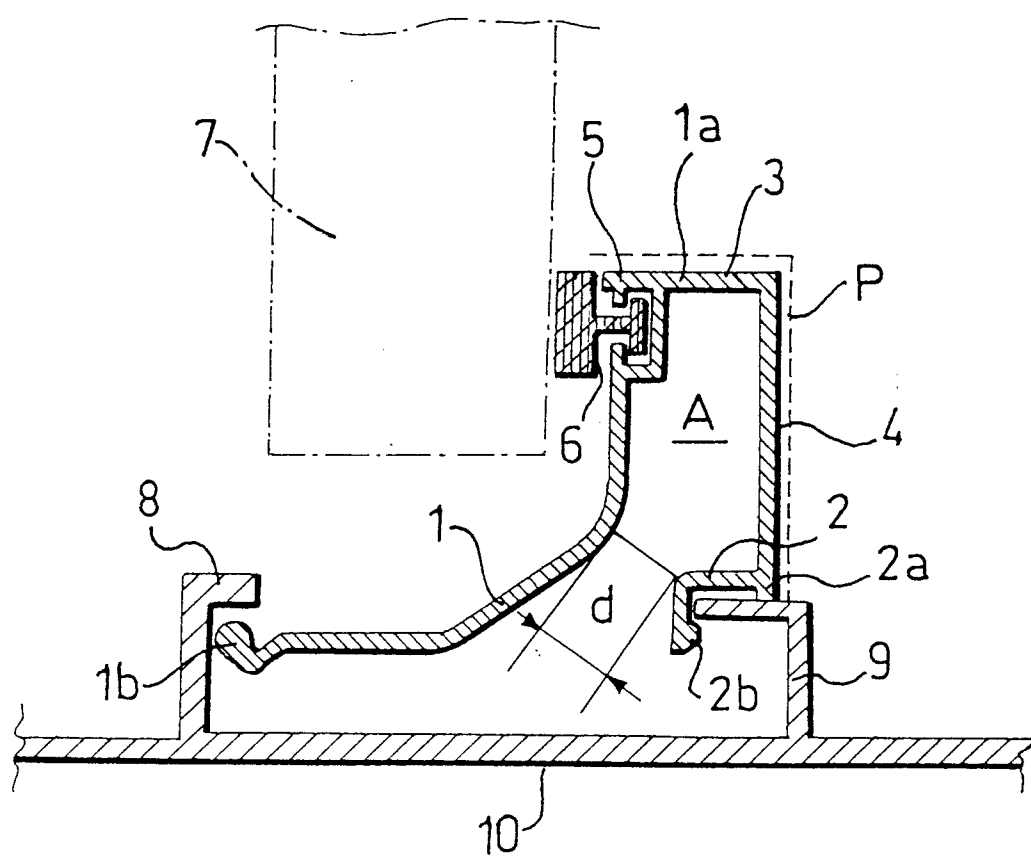


FIG.1

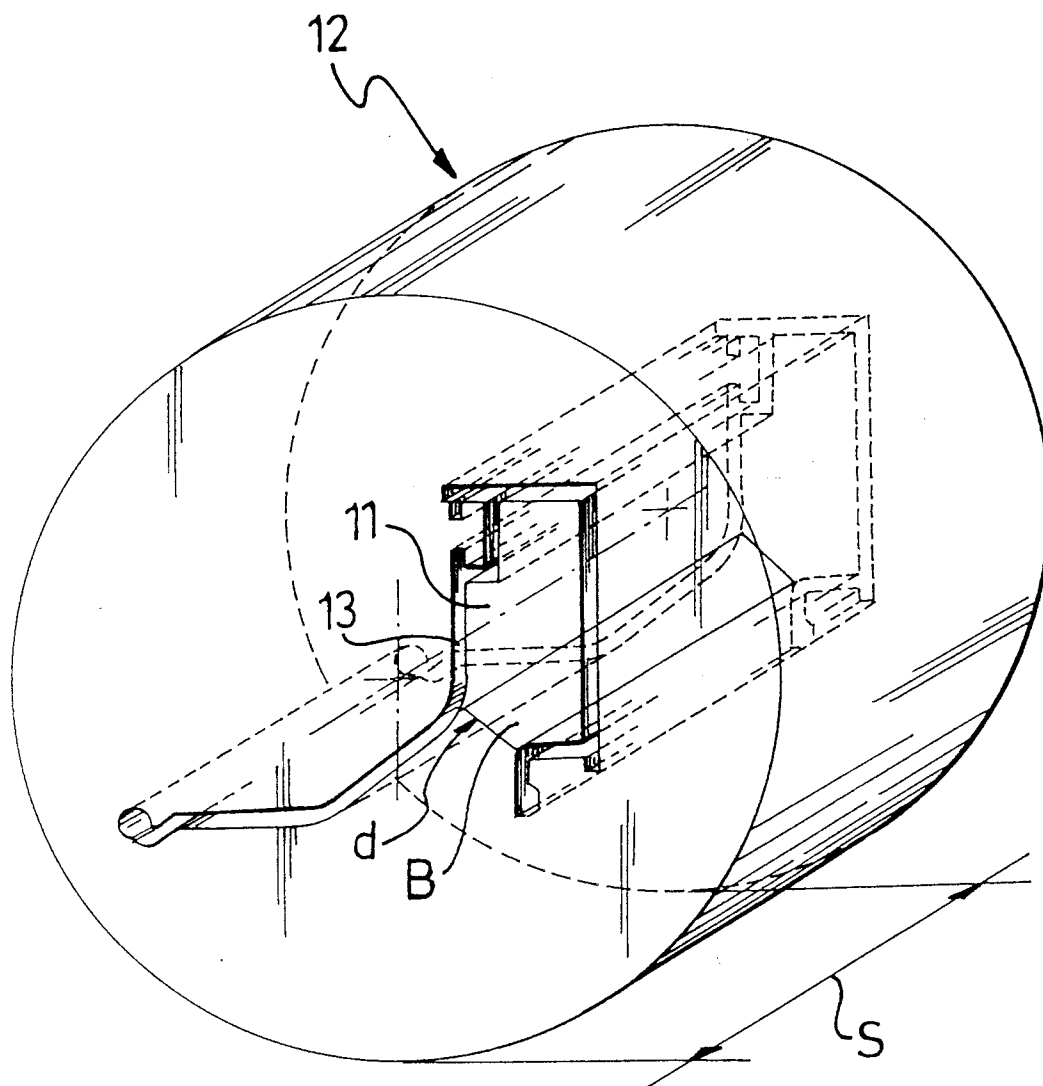


FIG.2

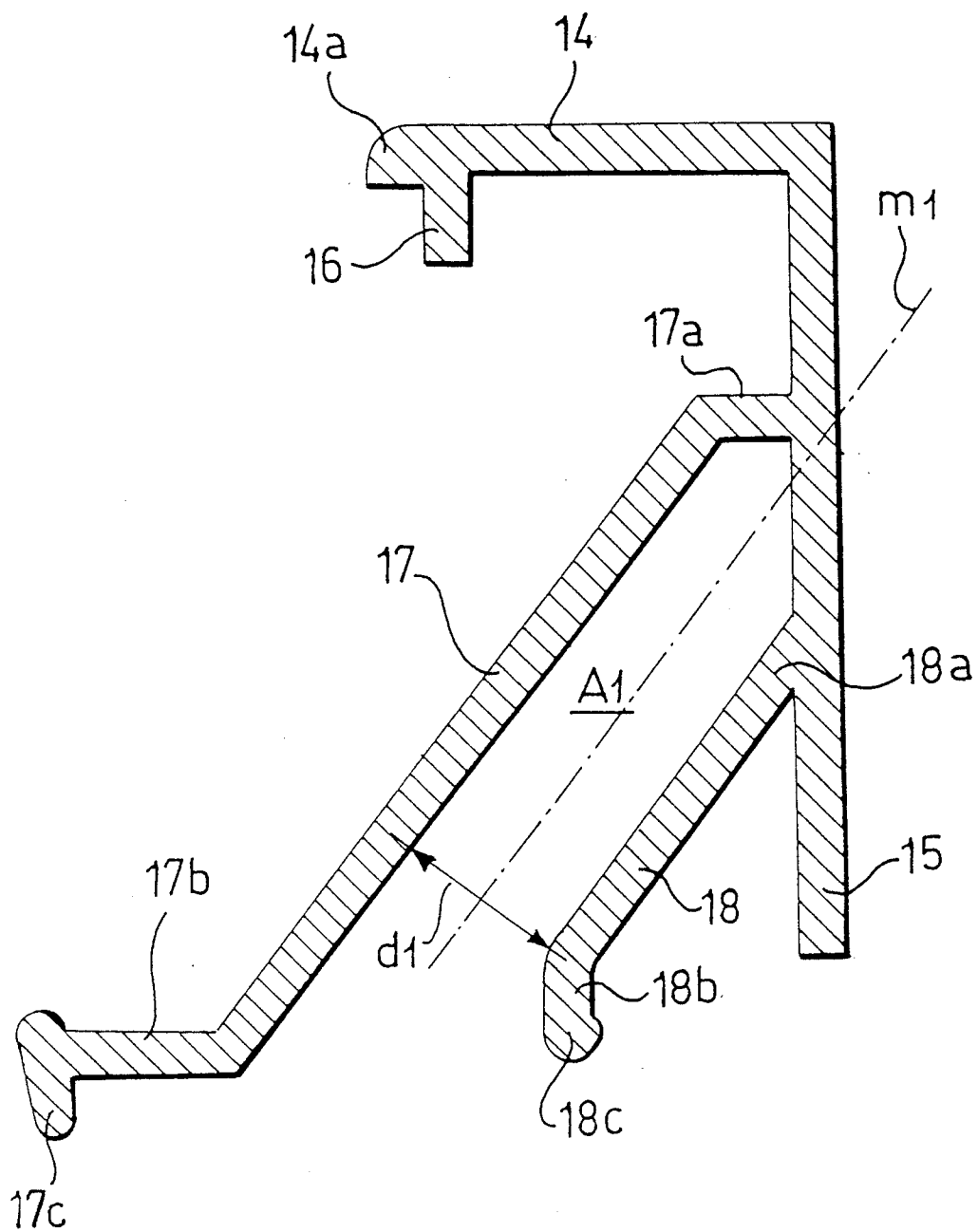


FIG.3

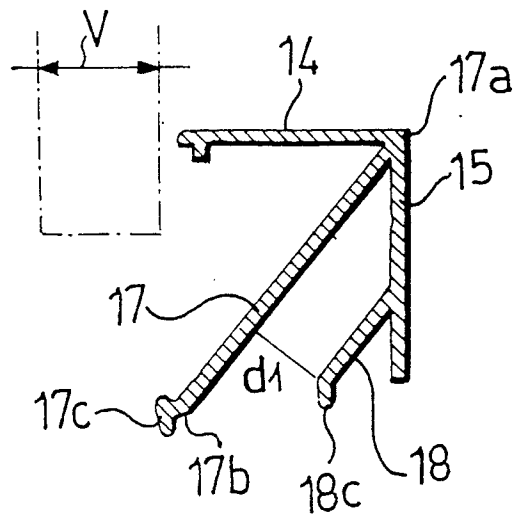


FIG. 4

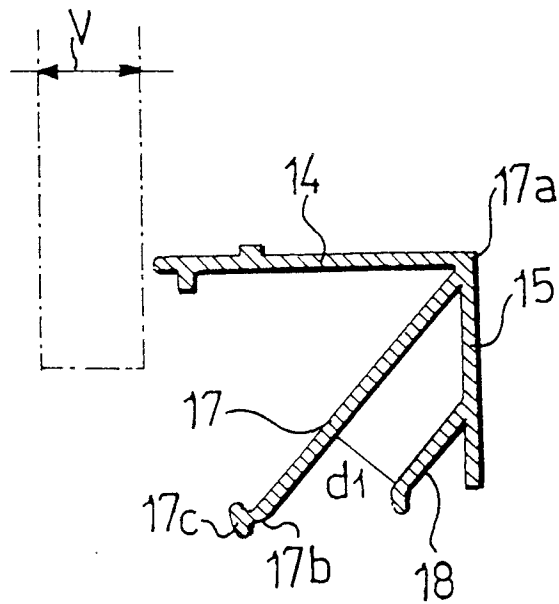


FIG. 5

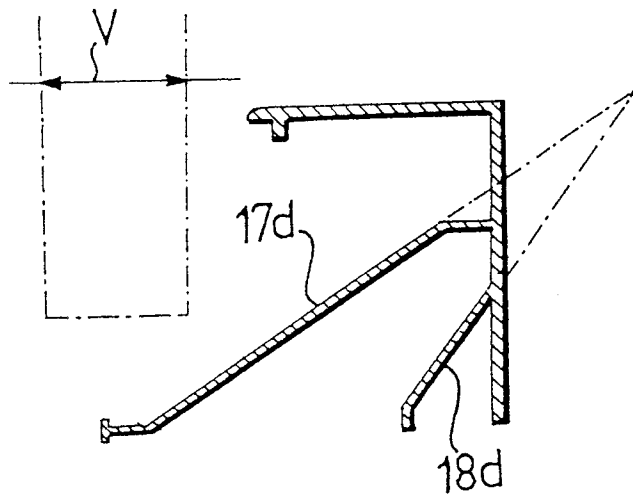


FIG. 6





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## EUROPEAN SEARCH REPORT

Application Number

EP 91 10 9519

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.5)
X	FR-A-2 162 748 (SAINT-MAURICE ENTREPRISE) * page 2, line 31 - page 3, line 10; figures 2,3 *	1-3	E06B3/58
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X	CH-A-552 123 (ELTREVA AG.) * column 1, line 1 - line 8 * * column 2, line 49 - line 54; figures *	1,3	
	---		
A	CH-A-433 672 (WEKA METALLBAU) * column 1, line 12 - line 13 * * column 4, line 45 - column 5, line 23; figure 14 *	1-4	
	---		
A	FR-A-1 393 128 (METALL-WERK MERKUR GMBH.) * page 2, column 1, line 32 - line 53; figures 2,3,3A *	2,4	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E06B
Place of search THE HAGUE		Date of completion of the search 06 MAY 1992	Examiner BLOMMAERT S.
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	