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(54) **Process for making casings by means of metal structural shapes.**

(57) In the production of casings by means of surface-treated structural shapes (1), especially of the type in aluminum alloys or equivalent, in order to avoid the presence of sharp edges at the casing corners, a cut (1F) is operated for removing the end of flanges projecting from the structural shapes (1) converging into said corners; and rounded-off angle elements (7) are used, which are solid to square brackets (5) for the mutual centering of said sections, so that said angle elements (7) are positioned into the space defined by said cuts (1F) to complete the casing with rounded-off corners.

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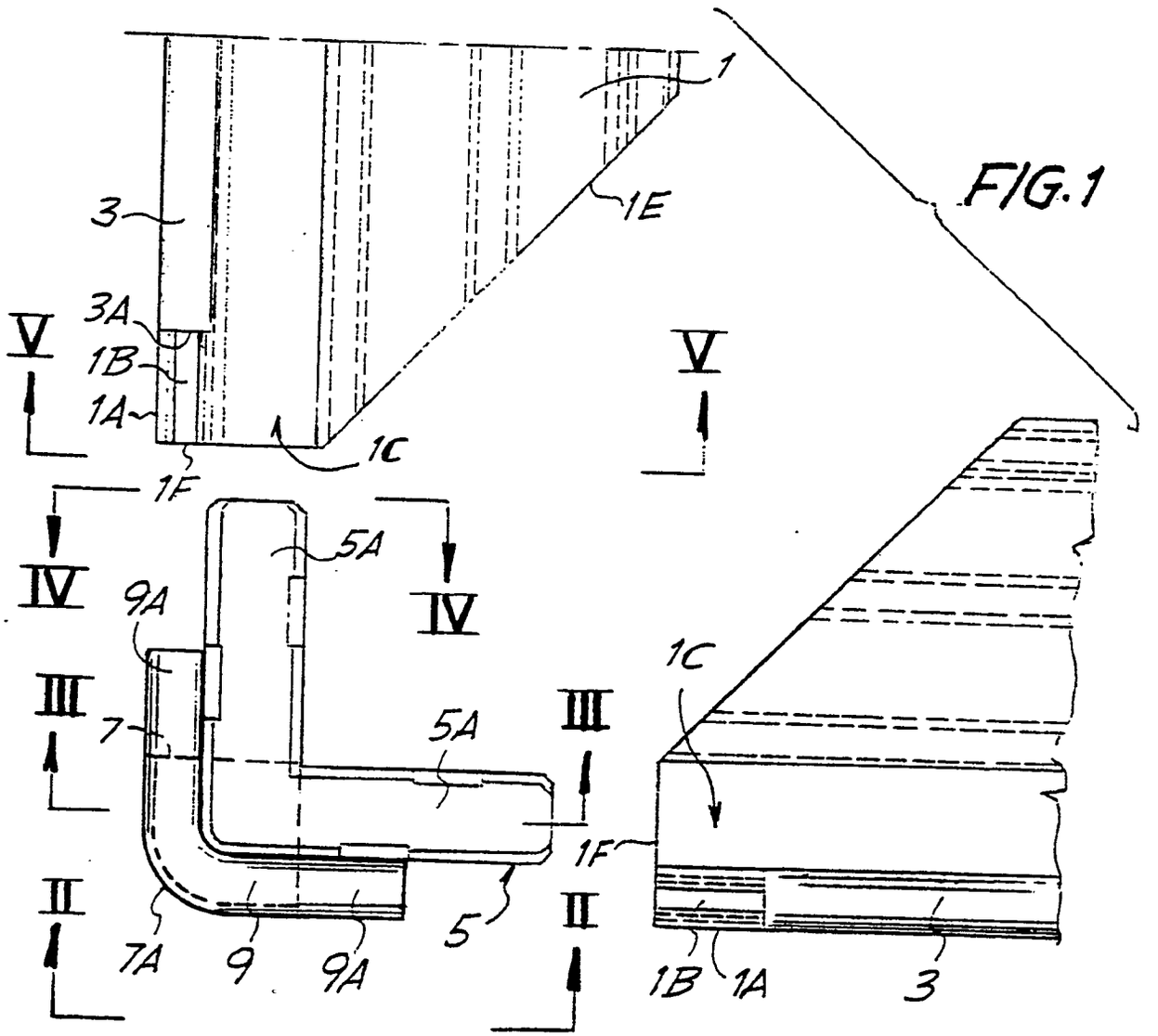

1
1E
3
3A
1B
1A
1C
1F
V
V
IV
IV
9A
5A
III
III
7
5A
1C
1F
II
II
7A
9
9A
5
1B
1A
3

FIG.1

The invention relates to the production of metal casings or frames for windows and the like by means of structural shapes, for example extruded shapes, which are usually made in aluminum or aluminum alloys and usually surface-treated. When these structural shapes are machined for the formation of a casing, the ends of the structural shapes converging into a corner are cut to form a miter, that is to say an angle of 45°, and either joined by various kinds of devices of known type, or welded together. Square brackets may also be provided which are designed so as to be received within channels formed by structural shapes in order to exactly center the converging, mitered structural shapes. Soft sealing strips are also usually provided which are received within channels suitably provided for in the structural shapes to cooperate with fixed structural shapes of the frame of the sash. The drawback of these casings in that they have very sharp corners formed by the projecting flanges of the structural shapes and which cannot be rounded because the sides of the casing are made up of shaped sections and, moreover, because the surfaces of these sections are usually subjected to oxidation or other surface treatment in order to achieve certain aesthetical effects. Accordingly, rounding of the corners cannot be performed and they made remain, in any case, very stiff insofar as they are made of metal.

An object of this invention is to provide a casing which overcomes these drawbacks. Other objects and advantages will be evident from a reading of the following description.

According to the invention, there is provided a process for making a casing by means of surface-treated structural shapes, especially of aluminum alloys or equivalent type, for the indicated purposes, which comprises: the cutting of flanges projecting from the structural shapes converging into said corners; and the use of rounded angle elements which are positioned within the space defined by said cuts to complete the casing, with corners having a rounded profile.

The process may advantageously include the use of square brackets for the mutual centering of said structural shapes, said brackets being received within channels formed by said structural shapes. In this case, the positioning of said angle elements may be obtained by making them solid to said square brackets.

The cutting of the projecting flanges is performed mostly at right angle to the structural shapes, in order to remove the external corner of the mitered end (at 45°).

A flexible sealing strip may be provided along the outer perimeter of the angle element; said strip is advantageously prolonged beyond said element for its insertion within the strip-receiving channel of the structural shapes converging into the corner.

The angle element may be so shaped and/or formed with suitable material, so as to result elastically yielding.

A further object of the invention is a casing formed with structural shapes, wherein the structural shapes converging into a corner, or into each of a plurality of corners, are chamfered at their outer ends, and said casing comprising an angle element disposed within the space formed by the chamfers and which completes the rounded profile of the corner.

The casing may comprise section-centering square brackets which are received within the channels of the said structural shapes; in this case, the said angle element is advantageously made solid to said centering square bracket and the latter is able to position said angle element when it is engaged into the channels of the converging structural shapes. The square bracket with the angle element may be made of metal and provided with a sealing strip.

The end cuts of the structural shapes may be orthogonal to the said structural shapes.

Still another object of the invention is an angle element having convex profile, suitable to be used in the above mentioned process, for forming a rounded off corner in a casing made up of metal structural shapes. Such angle element may be solid to a square bracket which is used for the centering of mitered structural shapes converging into a corner, the external flanges of said structural shapes being cut off.

The invention will be better understood by a reading of the following description and attached drawing, which shows a practical, not limiting exemplification of the same invention. In the drawing:

Fig. 1 shows the components forming a rounded off corner (the connection means being excluded), in an exploded view;

Figs. 2, 3, 4 and 5 show the angle element in views and partial sections according to lines II-II, III-III and IV-IV, and the structural shape in a view on line V-V in Fig. 1;

Figs. 6 and 7 show an assembled angle in two opposite views;

Fig. 8 shows a perspective view of the angle element; and

Fig. 9 shows an alternative embodiment of the angle element.

According to what is shown in the attached drawing, for the formation of an angle of a casing made up of structural shapes there are used two metal structual shapes 1 of a type known per se, which in particular are provided with an outer flange 1A intended to form the protruding external profile of the casing. In particular, the structural shape forms a channel 1B in the flange 1A for receiving a relatively soft sealing strip 3. A second channel 1C is formed sideways and internally to the channel 1B in correspondence of the flange 1A, for the purposes to be indicated hereinafter. The two channels 1B and 1C are provided with

undercuts allowing the use of elements to be received therein. Usually housed inside the channel 1B is the sealing strip 3, while inside the channel 1C a corresponding projection 5A of a square bracket 5 may be engaged, the other projection 5A of which is engaged in the channel 1C of the other structural shape 1 which cooperates to the formation of a corner. For the formation of the corners, the structural shapes 1 are usually mitered, that is to say cut at an angle of 45° as indicated by 1E in the drawing. The mitered cut forms very sharp angles of 45°, in the end part of the outwardly projecting flange 1A which, in turn, determine the formation of very sharp and dangerous edges at the corners of the formed casing. The elimination of said dangerous edges is the object of the present invention.

As it can be seen in the drawing, according to the invention, the end of each of the two structural shapes 1 converging at a corner to be chamfered, and which are mitered in 1E, is transversely cut at 1F, to remove the angular end of the flange 1A; the cuts 1F extend mostly in the region of the two channels 1B and 1C of each structural shape 1. The removal of the angular ends of the flanges 1A by means of the cut 1F determines, when the two structural shapes 1 are joined together, the formation of a space in correspondence of the angle formed by the miter. In this space there is inserted an angle element 7 which has an outer rounded off profile 7A and a thickness corresponding to that of the flange 1A, whose end has been removed. According to what is shown in the drawing, the angle element 7 is solid to the angled part of the square bracket 5 from which the two flanges 5A are made to project beyond the angle element 7. The angle element 7 may be made of the same material as the square bracket 5, that is to say a synthetic, relatively rigid moulded material, or it may be applied to the square bracket 5, 5A, or it may be formed with known techniques to achieve a difference between the physical characteristics of the angle element 7 and those of the square bracket 5, in order to have the element 7 at least slightly softer than the rigid material which forms the square bracket 5. The two components 5 and 7 may also be assembled after their respective formation.

When assembling the casing, the two structural shapes 1 are joined by clamps of a commercially known type and connected one to the other by screw means or by calking or other, or are directly welded. A properly defined position of the two structural shapes is achieved through the square bracket 5, 5A which is inserted into the two converging channels 1C of the two converging structural shapes 1. The same square bracket 5, 5A, which is provided with the angle element 7, places the latter in correspondence of the space defined by the cuts 1F, so that said angle element 7 takes up the space defined by the two cuts 1F and forms the corner of the casing with the convex profile 7A. The latter is not provided with the sharp corner, which is typical of the known casings and which is responsible for the injury suffered from those who inadvertantly hit such corner. On the contrary, with the rounding-off 7A of the angle element 7 there is obtained a finishing of the casing which overcomes these drawbacks of the known casings. The angle element 7 provide also a particularly good-looking appearance for the said casing.

Advantageously, the angle element 7 defines a channel-shaped seat along the convex profile 7A, between the rounded-off edge of the profile 7A and the projection formed by the square bracket 5, 5A. In this channel-shaped seat a sealing strip 9 may be received. Said strip 9 projects with its two ends 9A from the seat and can be housed in the adjacent channels of the two structural shapes 1, the sealing strip 3 being shorter, that is to say placed behind the edge formed by the transversal cut 1F, as indicated in 3A. In this way, the end 9B of the sealing strip 9 carried by the angle element 7 is received within the channel 1B and forms an extension of the sealing strip 3. Accordingly, a sealing strip is made to develop throughout the perimeter of the corner region of the casing. Alternatively, the sealing strip 9, 9A may be formed together with the piece 7 or sealed thereto to provide the desired physical characteristics.

According to the equivalent solution of Fig. 9, the sealing strip 9,9A,9A is omitted and, in the inner part of the angle element 7 a cavity 7B is formed wherein a spongy shim may be glued; this shim is able to substantially complete the sealing in the length between the two sealing strips 3 of the casing.

By operating a simple cut along the lines 1F, transversely to the structural shape 1 and in correspondence of the mitered corners 1E, there is obtained the seat for the angle element 7 which is easily mounted with the same operation necessary for assembling the square brackets 5, 5A during mounting of the two structural shapes converging into the same mitered corner. The operations are thus extremely simple and without rise of costs, while the angle element ensures the desired shape of the corner of the casing and the continuity of the sealing strip as well, in order to meet both aesthetical and operational requirements.

Claims

1. Process for making a casing formed by structural shapes joined in correspondence of the corners of the casing, characterized by: cutting the flanges which project from the structural shapes converging into the corners in correspondence of said corners; and placing rounded-off angle elements in the space defined by said cuts thereby completing the casing by forming a rounded off corner profile.

2. Process according to claim 1, comprising the use of square brackets for the mutual centering of said converging structural shapes, said square brackets being housed within channels formed by said structural shapes, characterized in that said angle elements are solid to said square brackets and are thus positioned by the latter.

3. Process according to claim 1 or 2, characterized in that the cut of the projecting flanges is performed perpendicularly to the structural shapes to remove the outer angle of the mitered (cut at 45°) end.

4. Process according to any preceding claim, characterized in that a flexible sealing strip is provided along the outer perimeter of the angle element and is extended and inserted into the channels for housing the sealing strips provided for in the converging structural shape.

5. Process according to any preceding claim, characterized in that the angle element may be so shaped and/or formed with such a material as to be elastically yielding.

6. A casing formed by structural shapes joined to each other, characterized in that the structural shapes converging into a corner are cut out in correspondence of their outer ends, and that an angle element is inserted in the space formed by the cuts, said angle element completing the corner with a rounded off profile.

7. Casing according to claim 6, comprising a square bracket for the centering of the structural shapes which is housed within channels of the said structural shapes, characterized in that said angle element is solid to said centering square bracket which allows the positioning of the angle element when the square bracket becomes engaged into the channels of the converging structural shapes.

8. Casing according to claim 6 or 7, characterized in that the cutting edges of the structural shapes are orthogonal to the longitudinal development of said structural shapes.

9. An angle element to be used in the formation of casings made up of structural shapes, shaped with a convex and rounded-off profile to complete the corner formed by the converging structural shapes, said angle element being housed within a space defined by cutting the ends of said structural shapes.

10. An angle element according to claim 9, characterized in that it is solid with the angled part of a square bracket provided for the mutual centering of the two structural shapes convering into the corner.

11. An angle element according to claim 9 or 10, characterized in that it is made of semirigid material.

12. An angle element according to claim 9, 10 or 11, characterized in that it comprises a seat for a sealing element.

13. An angle element according to claim 9, 10, 11 or 12, characterized in that it comprises a soft sealing strip which extends along the convex profile and is able to project from the element to be housed within the terminal length of a strips-receiving channel provided in said structural shapes forming the case.

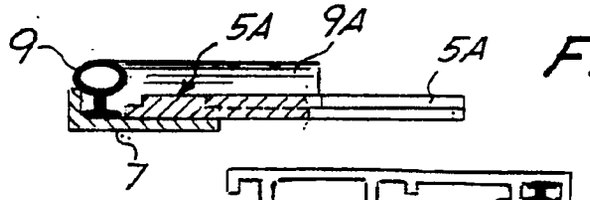


FIG. 3

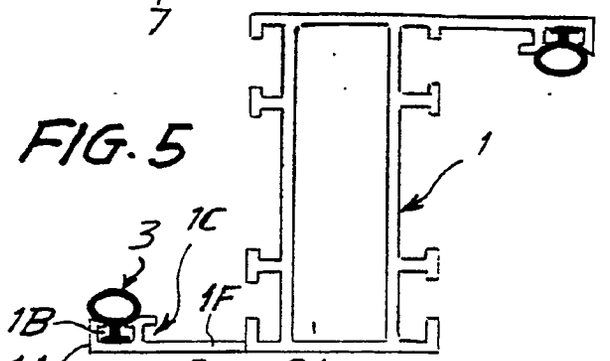


FIG. 5

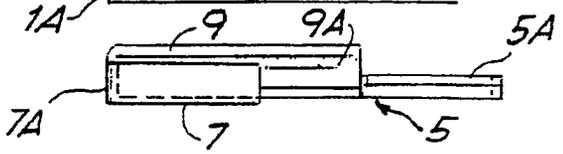


FIG. 2

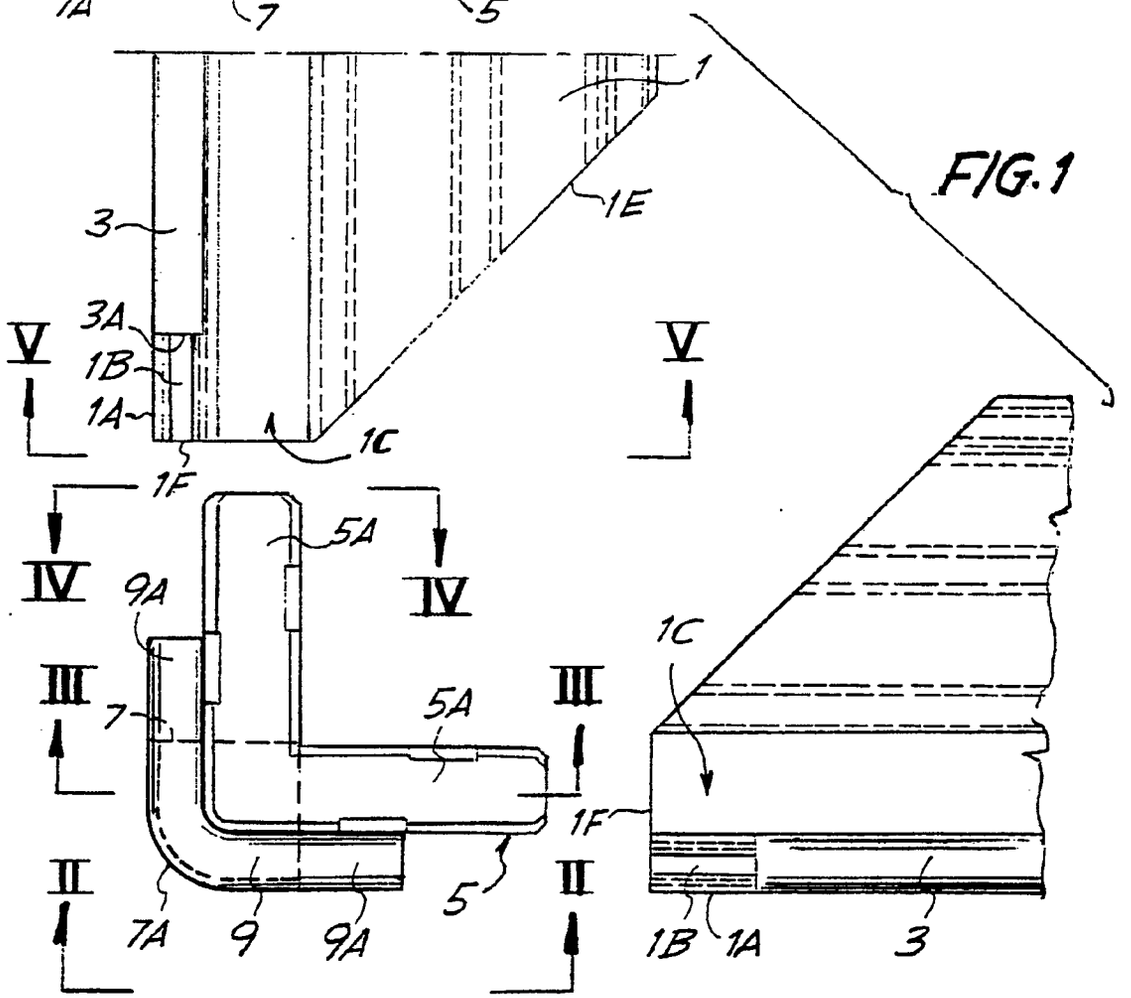


FIG. 1

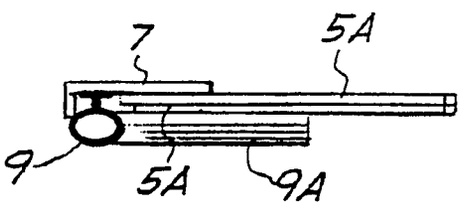


FIG. 4

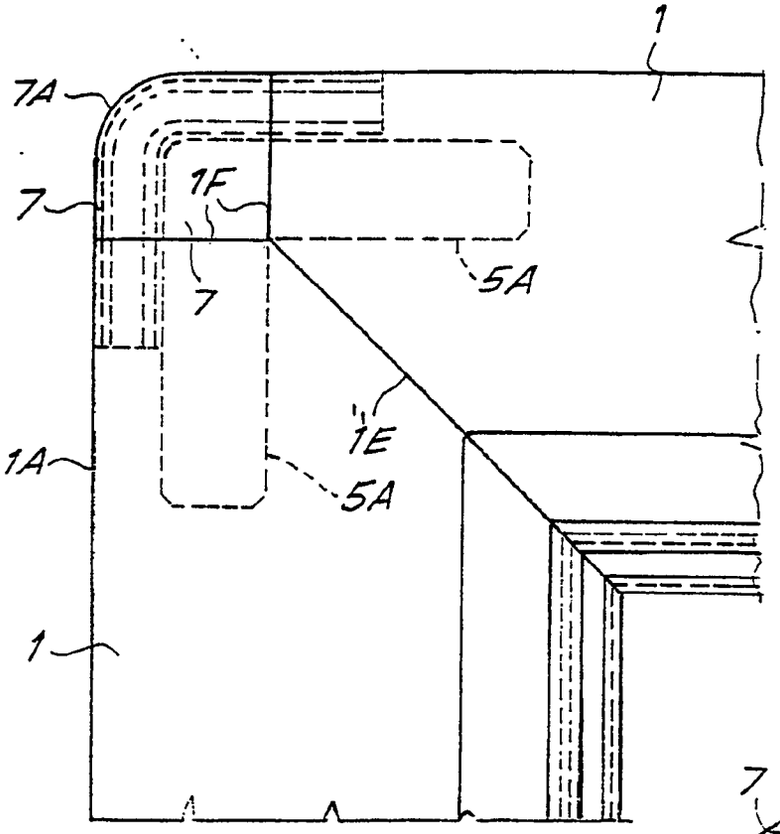


FIG. 6

FIG. 8

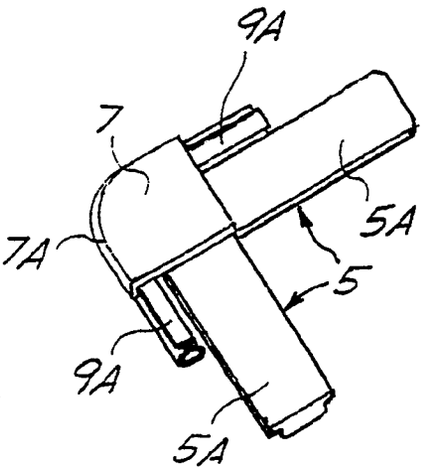


FIG. 7

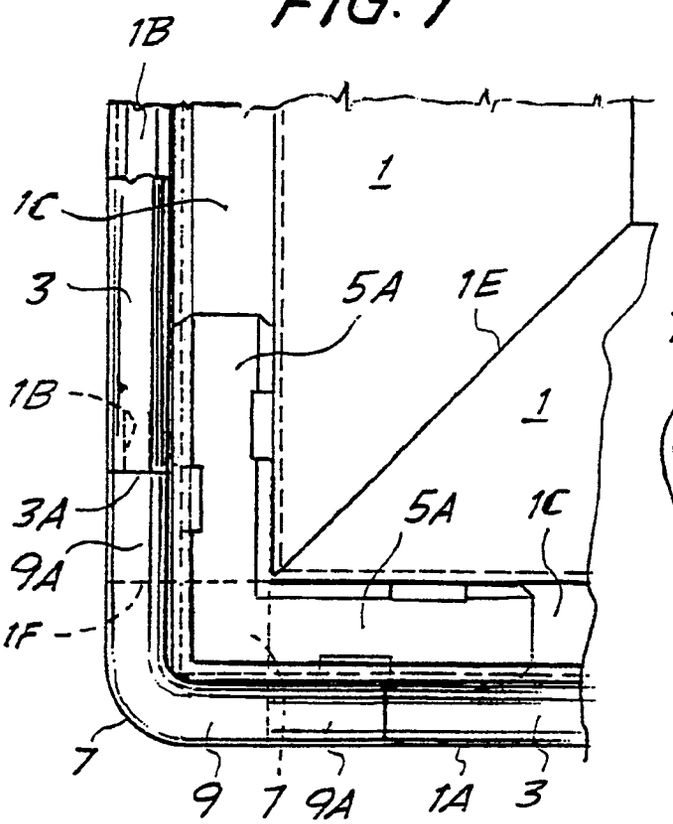
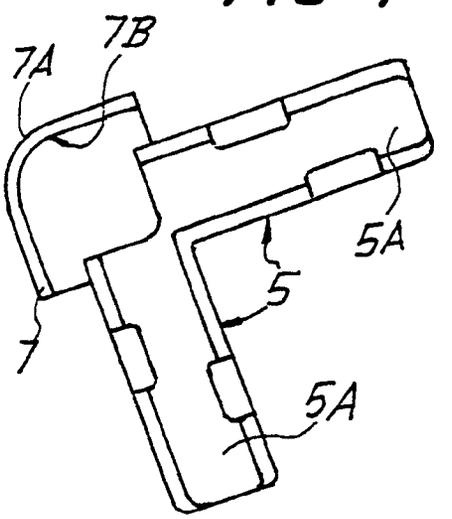


FIG. 9



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EUROPEAN SEARCH REPORT

Application Number

EP 91 83 0076

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	DE-U-8 905 422 (ROTT)	1,3,6,8, 9	E06B3/96
Y	* page 3, line 32 - page 7, line 16 * * page 8, line 1 - line 27 * * page 9, line 4 - line 14; figures *	5,11	
X	US-A-3 728 833 (GROSSMAN)	1,2,6-10	
Y	* column 2, line 52 - column 6, line 30; figures *	4,12,13	
Y	GB-A-2 140 853 (NORMAN VERNON (ENGINEERING))	4,12,13	
A	* page 2, line 2 - page 3, line 71; figures *	1,2,6-10	
Y	GB-A-2 198 173 (ANTHONY BRITEL) * page 4, line 18 - page 6, line 5; figures *	5,11	
A	FR-A-2 384 093 (IP INDUSTRIA CHIMICA)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14 JUNE 1991	DEPOORTER F.

CATEGORY OF CITED DOCUMENTS

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