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(12) # EUROPEAN PATENT SPECIFICATION

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

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DE-U- 8 905 422
FR-A- 2 384 093
GB-A- 2 140 853
GB-A- 2 198 173
US-A- 3 728 833

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EP 0 448 520 B1

Description

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 is 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 remain, in any case, very stiff insofar as they are made of metal.

DE-U-89 05 422.9 and US-A-3.728.833 disclose casings frames which comprise structural shapes cutted at 90° and angular elements, the latter completing the corners of the frame and remaining visible between the two shapes which converge into the relevant corner. This leads to a not continuous surface of the frame, which is un-desirable from an unaesthetical point of view. Furthermore, some difficulties can possibly arise in connecting the structural shapes and the angular element.

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.

A further object of the invention is a process for making a casing by means of surface treated structural shapes, especially of aluminum alloys or equivalent type, which overcomes the problems of the known processes.

These and other objects are obtained with a process according to claim 1 and with a casing according to claim 6. Further advantageous embodiments of the process and casing according to the invention are set forth in the dependent claims.

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 structural 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 shade 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 edged 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 provides 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 this 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 (1), which have projecting flanges (1A) extending from the structural shapes (1) outside of the casing for carrying of sealing strips (3), wherein
   - two structural shapes (1) converging into a corner are cut at 45° (in 1E) to form abutting surfaces of mutual contact;
   - the two structural shapes (1) are mutually connected together by coupling means to form the corner of the casing;

     characterized in that:
   - the mitred ends of the structural shapes (1) converging into a corner are transversely cut (at 1F) to remove the angular ends of the projecting flanges (1A);
   - and that when the two mitred structural shapes are mutually connected, a rounded-off angle element (7) is placed in the space left by said cut-away angular ends, thereby completing the casing by forming a rounded-off corner profile (7A).

2. Process according to claim 1, characterized by the use of square brackets (5, 5A) for the mutual centering of said converging structural shapes (1), said square brackets being housed within channels (1C) formed by said projecting flanges (1A) of said structural shapes (1), and wherein said angle elements (7) are solid to said square brackets (5, 5A) and are thus positioned by the latter.

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

4. Process according to any preceding claim, characterized by the use of structural shapes (1) provided with channels (1B) for housing sealing strups (3), and wherein a flexible sealing strip (9, 9A) is provided along the outer perimeter (7A) of the angle element (7) and is extended and inserted into the said channels (1B).

5. Process according to claim 1 or 2, characterized in that the angle element (7) is shaped and/or formed with such a material as to be elastically yielding.

6. A casing formed by structural shapes (1) which have flanges (1A) projecting on the outside of the mounted casing, wherein said structural shapes (1) are cut at 45° at their respective ends converging into a corner, and wherein means are provided along the edges (1E) cut at 45° for mechanically connecting said shaped profiles,

   characterized in that said projecting flanges (1A) on the end of the structural shapes converging into a corner are cut out (1F), and that an angle element (7) is housed in the space formed by the cuts (1F), said angle element (7) completing the corner with a rounded-off profile.

7. Casing according to claim 6, characterized in that it comprises a square bracket (5, 5A) for the centering of the structural shapes (1), which is housed within channels (1C) of the said projecting flanges (1A) of the structural shapes (1), and that said angle element (7) is solid to said centering square bracket (5, 5A) which allows the positioning of the angle element (7) when the square bracket (5, 5A) becomes engaged into said channels (1C).

8. Casing according to claim 6 or 7, characterized in that the cut off edges (1F) of said projecting flanges (1A) of the structural shapes (1) are orthogonal to the longitudinal development of said structural shapes (1).

9. An angle element (7) for the formation of a casing according to the process of one or more of claims 1 to 5, including a convex rounded-off external corner (7A), wherein said angle element is solid with the angled part of the square bracket (5, 5A) provided for the mutual centering of two structural shapes converging into a corner, and an edge being provided, projecting from the surface of the angle element along the rounded-off external corner (7A) thereof,

   characterized in that the square bracket (5, 5A) projects from the surface of the angle element, on which said edge projects, and that a sealing strip (9) or a shim is housed into a seat formed by said edge and said square bracket.

Patentansprüche

1. Verfahren zur Herstellung eines Rahmens aus Metallprofilen (1), welche vorstehende Flansche (1A) besitzen, die an den Metallprofilen (1) an der Rahmenaußenseite verlaufen und Dichtstreifen (3) tragen, wobei
   - zwei in einer Ecke zusammenlaufende Metallprofile (1) unter 45° (bei 1E) geschnitten sind, um Stoßflächen mit gegenseitigem Kontakt zu bilden;
   - die zwei Metallprofile (1) gegenseitig über Verbindungsmittel miteinander verbunden sind, um eine Ecke des Rahmens zu bilden;

     dadurch gekennzeichnet,
   - daß die in einer Ecke zusammenlaufenden, eine Gehrung aufweisenden Enden der Metallprofile (1) transversal geschnitten sind (bei 1F), um die schrägen Enden der hervorstehenden Flansche (1A) zu entfernen;
   - und daß zur gegenseitigen Verbindung der beiden eine Gehrung aufweisenden Metallprofile ein außen abgerundetes Winkelelement (7) in den durch die weggeschnittenen winkligen Enden verbleibenden Zwischenraum eingebracht wird, und dabei den Rahmen durch Ausbildung einer außen abgerundeten Profilekke (7A) vervollständigt.

2. Verfahren gemäß Anspruch 1, gekennzeichnet durch den Einsatz von rechteckigen Zapfen (5, 5A) zum gegenseitigen Zentrieren der zusammenlaufenden Metallprofile (1), wobei die rechteckigen Zapfen von Nuten, die durch die vorstehenden Flansche (1A) der Metallprofile (1) gebildet werden, aufgenommen werden, und wobei die Winkelelemente (7) in fester Verbindung mit den rechteckigen Zapfen (5, 5A) sind und durch diese positioniert werden.

3. Verfahren gemäß Anspruch 1 oder 2, dadurch gekennzeichnet, daß der Schnitt (1F) der vorstehenden Flansche (1A) senkrecht zu den Metallprofilen (1) ausgeführt wird, um den äußeren Winkel des mit einer Gehrung versehenen (Schnitt mit 45°) Endes zu entfernen.

4. Verfahren gemäß einem der vorhergehenden Ansprüche, gekennzeichnet durch den Einsatz von Metallprofilen (1), die mit Nuten (1B) zur Unterbringung von Dichtstreifen (3) versehen sind, und wobei ein flexibler Dichtstreifen (9, 9A) entlang des äußeren Umfangs (7A) des Winkelelements (7) angebracht ist und in die Nut (1B) eingefügt wird bzw. sich bis in die Nut erstreckt.

5. Verfahren gemäß der Ansprüche 1 oder 2, dadurch gekennzeichnet, daß das Winkelelement (7) aus einem elastisch nachgebenden Material gebildet und/oder geformt wird.

6. Rahmen aus Metallprofilen (1), welche Flansche (1A) aufweisen, die auf der Außenseite des montierten Rahmens hervorstehen, wobei die Metallprofile (1) an ihren entsprechenden in einer Ecke zusammenlaufenden Enden unter 45° geschnitten sind, und wobei entlang den unter 45° geschnittenen Kanten (1E) Mittel zur mechanischen Verbindung der Formprofile bereitgestellt sind, dadurch gekennzeichnet, daß die vorstehenden Flansche (1A) am Ende der in einer Ecke zusammenlaufenden Metallprofile ausgeschnitten sind (1F), und daß ein Winkelelement (7) im Zwischenraum, der durch die Schnitte (1F) gebildet wird, untergebracht ist, und daß das Winkelelement (7) die Ecke mit einem außen abgerundeten Profil vervollständigt.

7. Rahmen gemäß Anspruch 6, dadurch gekennzeichnet, daß dieser einen rechteckigen Zapfen (5, 5A) zum Zentrieren der Metallprofile (1) umfaßt, der in Nuten (1C) der vorstehenden Flansche (1A) der Metallprofile (1) untergebracht wird, und das Winkelelement (7) in fester Verbindung mit dem zentrierenden, rechteckigen Zapfen (5, 5A) steht, der die Positionierung des Winkelelements (7) gestattet, sobald der rechteckige Zapfen (5, 5A) in die Nuten (1C) eingefügt wird.

8. Rahmen gemäß Anspruch 6 oder 7, dadurch gekennzeichnet, daß die weggeschnittenen Ekken (1F) der hervorstehenden Flansche (1A) der Metallprofile (1) orthogonal zum länglichen Verlauf der Metallprofile (1) sind.

9. Winkelelement (7) zum Aufbau eines Rahmens nach dem Verfahren von einem oder mehreren der Ansprüche 1 bis 5 einschließlich einer konvexen außen abgerundeten Außenecke (7A), wobei das Winkelelement in fester Verbindung mit dem gewinkelten Teil des rechteckigen Zapfens (5, 5A), der zur gegenseitigen Zentrierung der in einer Ecke zusammenlaufenden beiden Metallprofilen vorgesehen ist, steht, und eine Aufkantung vorgesehen ist, die aus der Oberfläche des Winkelelements entlang der außen abgerundeten Außenecke (7A) hervorsteht, dadurch gekennzeichnet, daß der rechteckige Zapfen (5, 5A) aus der Oberfläche des Winkelelements an welcher die Aufkantung

herausragt, hervorsteht und daß ein Dichtstreifen (9) oder ein Füllstreifen in einem Sitz untergebracht ist, der durch die Aufkantung und den rechteckigen Zapfen gebildet wird.

Revendications

1. Procédé pour la fabrication d'un cadre constitué de profilés (1) qui présentent des ailes en saillie (1A) s'étendant à partir des profilés (1) à l'extérieur du cadre pour réaliser des bandes d'étanchéité (3), procédé dans lequel
   - on découpe deux profilés (1) convergents dans un coin à 45° (en 1E) pour former des surfaces de contact réciproque bout à bout;
   - On assemble réciproquement les deux profilés (1) par des moyens d'accouplement pour former le coin du cadre;

   caractérisé en ce que :
   - les extrémités assemblées à mitre des profilés (1) convergents dans un coin sont découpées transversalement (en 1F) pour enlever les extrémités angulaires des ailes en saillie (1A)
   - et en ce que, lorsque les deux profilés sont assemblés réciproquement à mitre, un élément angulaire arrondi (7) est placé dans l'espace laissé par les extrémités angulaires découpées, permettant ainsi de terminer le cadre en formant un profil de coin arrondi (7A).

2. Procédé selon la revendication 1, caractérisée par l'utilisation de bras de support ou consoles carrées (5, 5A) pour le centrage réciproque des profilés convergents (1), ces bras de support étant logés dans des profilés en U (1C) formés par les ailes en saillie (1A) des profilés (1), et dans lequel les éléments angulaires (7) sont solidaires des bras de support carrés (5, 5A), et sont ainsi positionnés par ces derniers.

3. Procédé selon la revendication 1 ou 2, caractérisé en ce que la découpe (1F) des ailes en saillie (1A) s'effectue perpendiculairement au profilé (1) pour enlever l'angle extérieur de l'extrémité assemblé à mitre (découpé à 45°).

4. Procédé selon l'une quelconque des revendications précédentes, caractérisé par l'utilisation de profilés (1) dotés de profilés en U (1B) pour loger des bandes de scellement (3), et dans lequel une bande de scellement souple (9, 9A) est prévue le long du périmètre extérieur (7A) de l'élément angulaire (7) et s'étend, en emboîtement à l'intérieur des profilés en U (1B).

5. Procédé selon la revendication 1 ou 2 caractérisé en ce que l'élément angulaire (7) est formé et/ou réalisé à partir d'un matériau lui conférant une élasticité.

6. Cadre formé par des profilés (1) qui comportent des ailes (1A) faisant saillie sur l'extérieur du cadre monté, dans lequel les profilés (1) sont découpés à 45° sur leurs extrémités respectives convergant dans un coin, et dans lequel des moyens sont prévus le long des bords (1E) découpés à 45° pour relier mécaniquement les profilés formés,
   caractérisé en ce que les ailes en saillie (1A) sur l'extrémité des profilés convergant dans un coin sont découpés (1F) et en ce qu'un élément angulaire (7) est logé dans l'espace formé par les découpes (1F), cet élément angulaire (7) terminant le coin par un profil arrondi.

7. Cadre selon la revendication (6), caractérisé en ce qu'il comprend un bras de support carré (5, 5A) pour le centrage des profilés (1), qui est logé à l'intérieur de profilés en U (1C) des ailes en saillie (1A) des profilés (1) et en ce que l'élément angulaire (7) est solidaire du bras de support carré de centrage (5, 5A) qui permet le positionnement de l'élément angulaire (7) lorsque le bras de support carré (5, 5A) est introduit dans les profilés en U (1C).

8. Cadre selon la revendication 6 ou 7, caractérisé en ce que les bords découpés (1F) des ailes en saillies (1A) des profilés (1) sont orthogonaux par rapport au développement longitudinal des profilés (1).

9. Element angulaire (7) pour la formation d'un cadre selon le procédé de l'une ou plusieurs des revendications 1 à 5, comprenant un coin externe arrondi convexe (7A) dans lequel l'élément angulaire est solidaire de la partie d'angle du bras de support carré (5, 5A) prévu pour le centrage réciproque des deux profilés convergant dans un coin, et un bord étant prévu, faisant saillie à partir de la surface de l'élément angulaire le long de son coin externe arrondi (7A),
   caractérisé en ce que le bras de support carré (5, 5A) fait saillie à partir de la surface de l'élément angulaire sur lequel le bord fait saillie et en ce qu'une bande d'étanchéité (9) ou une cale est logé dans un siège formé par le bord et le bras de support carré.

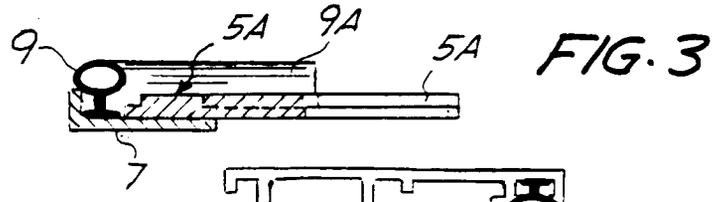

FIG. 3

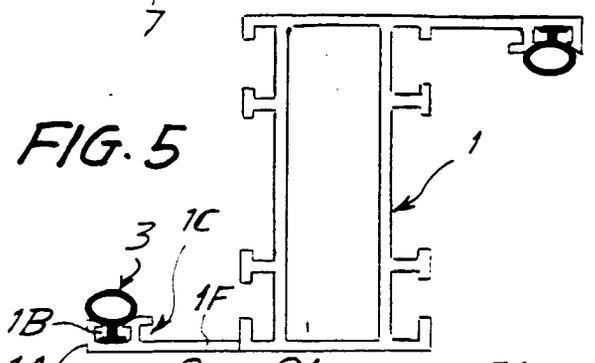

FIG. 5

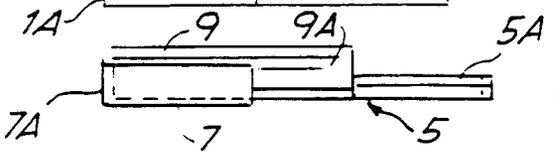

FIG. 2

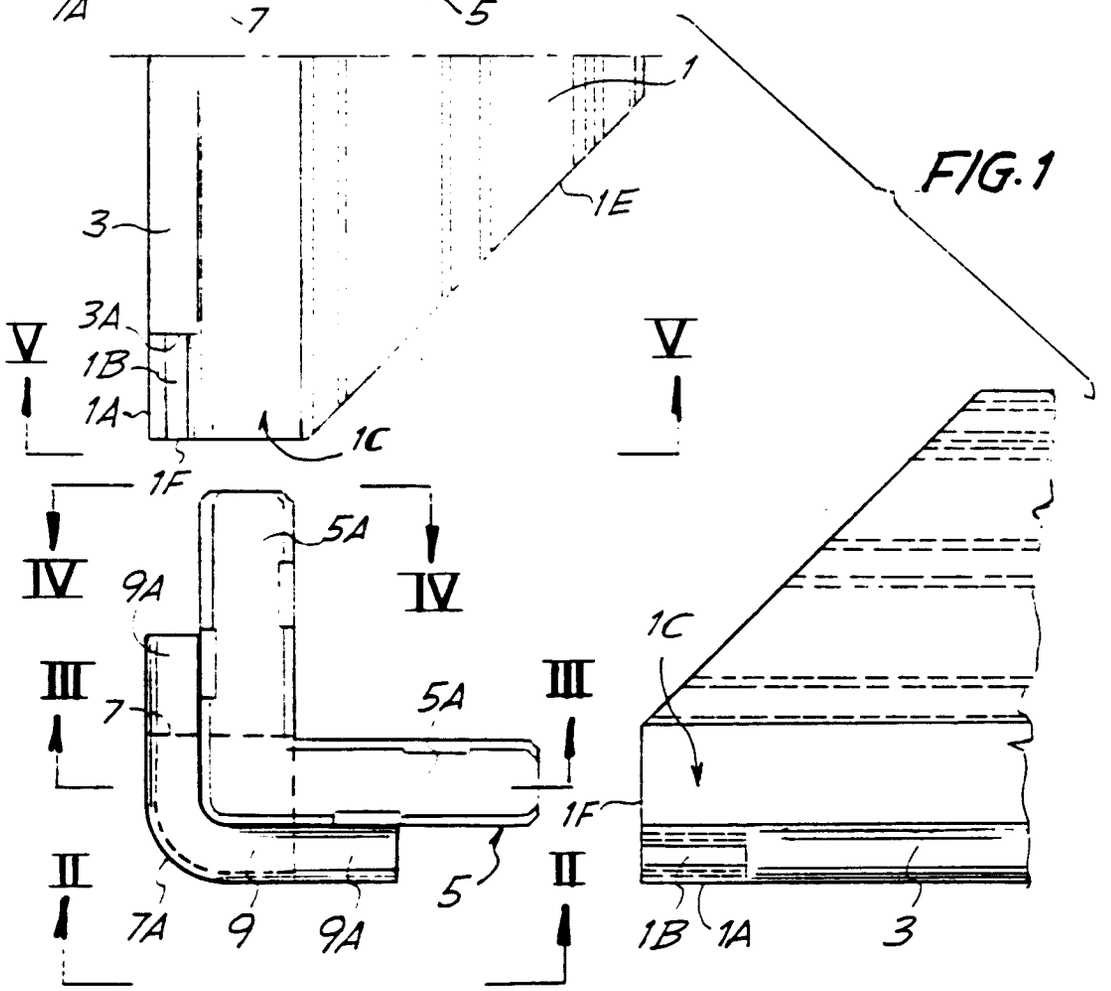

FIG. 1

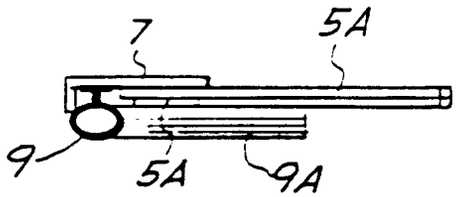

FIG. 4

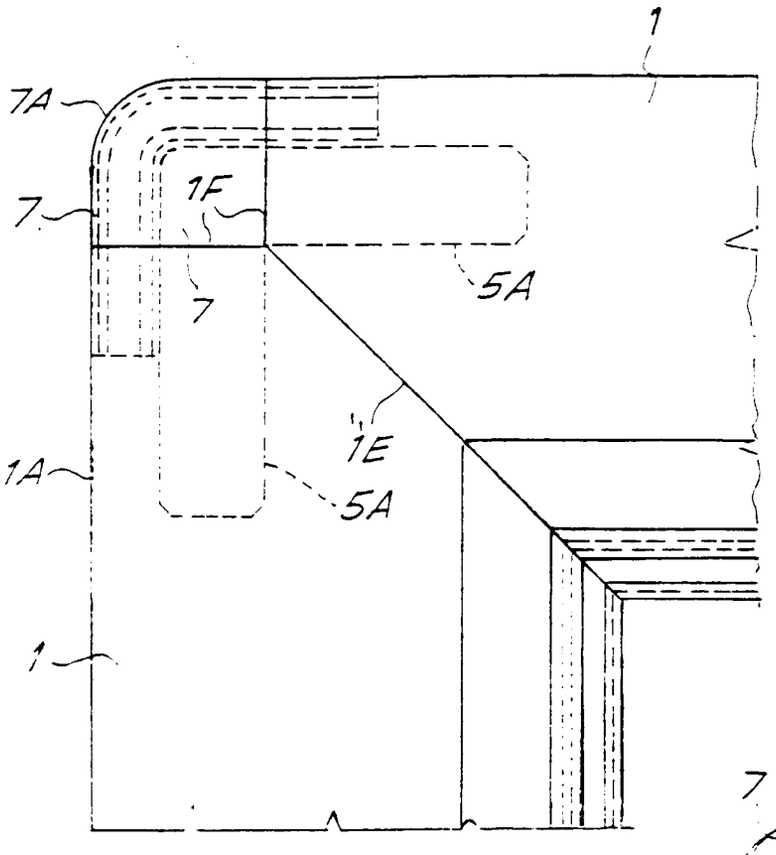

FIG. 6

FIG. 8

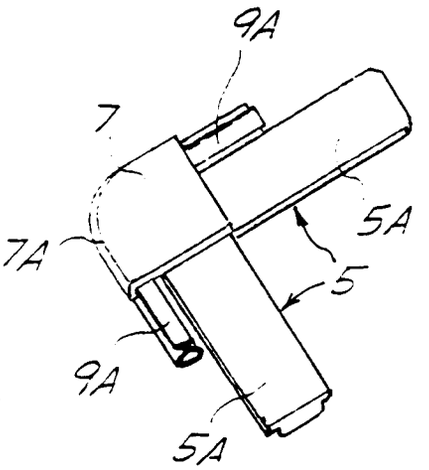

FIG. 7

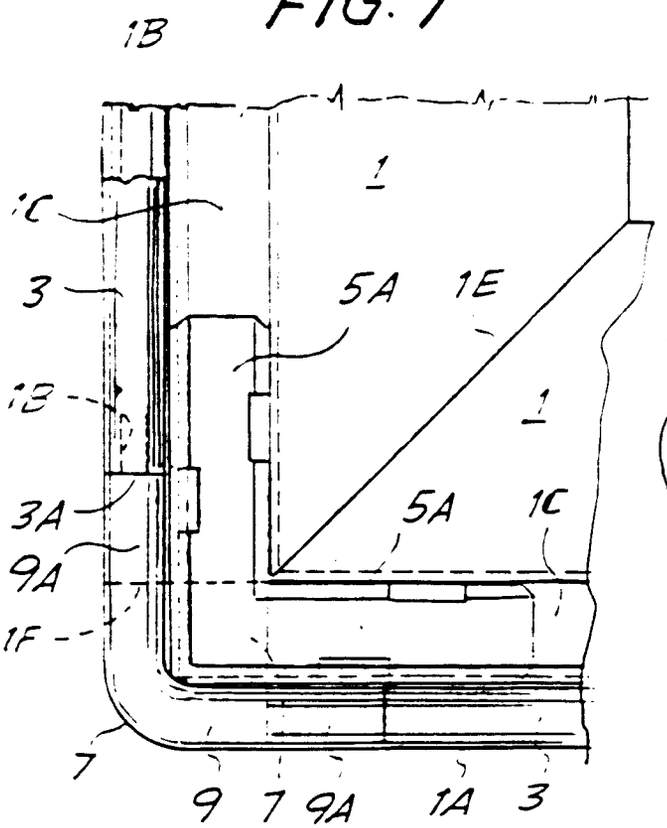

FIG. 9