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(71) Applicant: **METALCASSA SRL**
Via Serenissima, 4
I-36075 Alte di Montecchio Maggiore (VI)(IT)

(72) Inventor: **Briganti, Guido**
Via S. Biagio 89
I-36100 Vicenza(IT)

(74) Representative: **Bonini, Ercole**
c/o STUDIO ING. E. Bonini SAS 8 Corso Fogazzaro
I-36100 Vicenza(IT)

(54) Glass-securing shaped channel.

(57) The invention discloses a glass-securing shaped channel comprising a basic profile (2, 51, 61, 87, 97, 98) presenting in its transversal cross-section an open shape, at least a closing profile (3, 37) consisting of a profile having an open shape in its transversal cross-section, eventually a stopper profile (4, 40) presenting a closed shape in its transversal cross-section, wherein the securing of the glass pane (8, 81, 86, 92) within the glass-securing shaped channel is obtained by the adhesion of the opposed surfaces of the glass pane against the lips (23, 35) belonging to the basic profile (2, 61, 51, 87, 97, 98) and to the closing profile (3, 37), when said closing profile is permanently joined together with the basic profile (2, 61, 51, 87, 97, 98) through a snap junction.

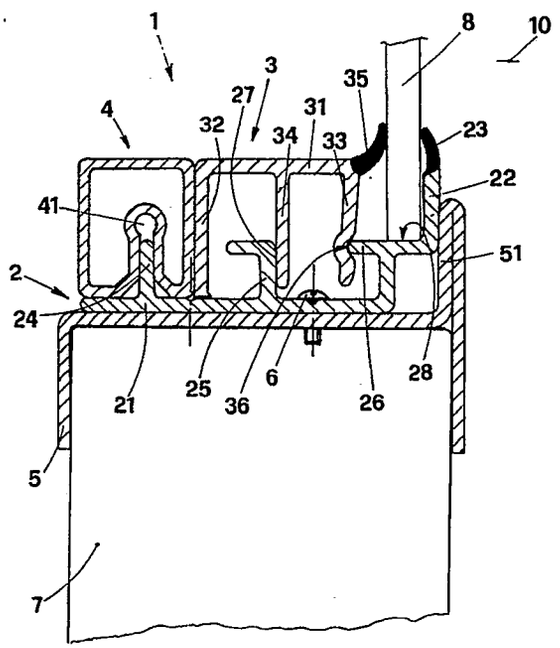

FIG 1

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The invention concerns a glass-securing shaped channel, particularly suited to be used for assemblying glass panes in partition walls inside buildings.

It is a known fact that often mobile partitions walls are used when it is necessary to subdivide the inner volume of a room in order to obtain several rooms. This method is used especially to obtain offices, meeting rooms, hallways or similar spaces in industrial or commercial buildings and, in general, in all those cases where the possibility of later changing the floor plan of the same rooms is foreseen.

Said mobile partition walls usually present spacious glass surfaces, which are obtained by applying to openings made in the walls themselves glass panes of different kinds and/or metal or wooden panels, etc. by means of glass-securing channels. A known type of glass-securing channel consists of a basic shaped channel, which is mounted around the perimeter of the opening in which the glass pane is to be applied, and on which lateral shaped channels are secured by restraint, said lateral shaped channels being equal and arranged at an inclination of 45 degrees and opposed to each other. The glass pane is arranged vertically within a projection which is obtained centrally within the basic shaped channel and it is held in position by the adhesive force exerted against its surfaces by the lateral shaped channels joined to the basic shaped channel.

The glass-securing shaped channels, belonging to the known technique, which have just been described, present some inconveniences, one of the most important of which consists in that, since the lateral shaped channels are applied by restraint on the basic shaped channel, an accidental pressure applied against the surface of the glass pane which they secure can cause the lateral shaped profile which is arranged in the direction of the thrust to become loose, so that the glass pane may fall. Such a situation can be potentiallly very dangerous for the people operating in the immediate vicinity, particularly in those cases where the glass panes are applied to walls placed at a distance from the floor, such as, for instance, on the first floor of a loft.

Another inconvenience consists in that the glass-securing shaped channels belonging to the known technique do not guarantee a sufficient protection against possible attempts to break in from the outside. In fact, the lateral shaped channels and the glass pane can easily be removed and just as easily both the glass pane and the lateral shaped channels can be put back in place, so that no trace of the burglary will remain. Not the least inconvenience presented by the glass-securing channels of the known type is represented by the fact that it is impossible to obtain, with the same glass-securing channel, the securing of glass-panes and/or panels made of other materials presenting differring thicknesses. It is then easy to understand that, whenever it becomes necessary to replace the glass-panes with others having a different thickness, for instance, when replacing panes made of normal glass with double glassing, for instance, it will become necessary to replace all the glass-securing channels as well.

The purpose of the present invention is to eliminate all the mentioned inconveniences by disclosing a glass-securing channel wherein the elements constituting it do not separate the ones from the others and, therefore, do not allow the release of the glass-pane which they secure, when, because of accidental causes the glass is subject to a pressure tending to thrust it out of the space defined by the wall on which it is mounted.

Another purpose of the invention is to disclose a glass-securing channel which, since the elements forming it can not be taken apart, offers a higher degree of guarantee against possible attempts at breaking in from the outside.

Yet another purpose of the invention is to disclose a glass-securing channel into which both glass panes with a standard thickness and glass-panes of a greater thickness, such as double glas-swing and/or panels made of other materials can be mounted. Not the least purpose of the invention is to disclose a glass-securing channel which can also be used as a horizontal transom suited to divide a wall into several sections of any size and to receive different types of curtain walls.

The above-mentioned purposes and others which will be better described hereinafter are reached by a glass-securing shaped channel which, in accordance with the claims, is characterized in that it comprises:

- a basic shaped profile presenting in its cross-section an open shape and being formed by the junction between the terminal end of a horizontal surface, complete with inner longitudinal appendixes and a substantially vertical matching surface supporting the glass-pane and presenting a securing lip;
- at least a closing profile presenting an open shape in its cross-section and being formed by the junction between the terminal ends of a substantially horizontal surface in an essentially central position and three substantially vertical surfaces which are arranged parallel to each other, one of them presenting a securing lip and an indentation at a lower position, wherein the clamping of the glass pane within the glass-securing channel occurs because of the adhesion of the glass-pane against the lipped edges belonging to the

closing shaped profile, said closing profile being solidly joined to the basic profile through the snap insertion of the substantially vertical surfaces of said channel into the appendixes belonging to the basic profile.

According to a preferred embodiment of the invention, the horizontal surface constituting the basic profile of the glass-securing channel is secured by screws to the shaped edge of the opening obtained in the wall in which the glass-pane is to be mounted. The glass-pane is then positioned with its front flush against the substantially vertical surface of the basic profile and it is held in place in this position by the closing profile which is restrained into the basic profile. The glass-securing channel may be completed by a stopper profile positioned beside the closing profile which is also restrained into the same basic profile.

The same glass-securing channel can also be put together, according to another system of composition used when the glass-pane presents a greater thickness, such as a double glassing. In this case the closing profile is restrained into the same basic profile but is arranged further back and is complete, without the addition of the stopper profile.

Advantageously the invention discloses a glass-securing channel which offers, in comparison with the glass-securing channels belonging to the known technique, a higher degree of safety and security, since the danger of the glass pane falling toward the exterior because of the accidental falling apart of the elements constituting the channel is eliminated, as is eliminated the possibility of a break-in from the outside, since no removable part of the channel is accessible from the outside.

Moreover, advantageously, the channel according to the invention permits the mounting of glass panes or other types of panels having differring thicknesses, while always using the same basic channel simply by rearranging the closing profile or by omitting the application of the stopper profile.

Also advantageously, when the channel according to the invention is used as a horizontal transom, it permits to quickly divide a wall into several parts of any size, without having to modify the frame of the wall itself.

Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description and from the drawings, wherein:

- Fig. 1 shows the glass-securing channel of the invention represented in a transversal cross-section, in the case when it supports and secures a glass pane with a standard thickness;
- Fig. 2 shows the glass-securing channel of the invention represented in a transversal cross-section in the case when it supports and secures a glass pane with a more relevant thickness, such as a double glassing;
- Fig. 3 shows a different embodiment of the channel represented in Fig. 1, complete with a drip and suited for glass-panes mounted on the external perimetral walls of a building;
- Fig. 4 shows yet another embodiment of the same glass-securing channel of Fig. 1, wherein the basic profile presents at its bottom a shaped channel suited to mount it on a supporting structure;
- Fig. 5 shows yet another embodiment of the glass-securing channel of Fig. 1, wherein the basic profile presents at its bottom guiding edges which will hook onto a supporting structure;
- Fig. 6 shows the channel of the invention when it is used as a transversal transom to subdivide the opening of the wall into several parts;
- Fig. 7 shows the transversal cross-section of the wall of Fig. 6 with the horizontal subdividing transom.

The glass-securing shaped channel according to the invention is represented in its transversal cross-section in Fig. 1 and it consists of the basic profile 2, on top of which are restrained a closing profile 3 and a stopper profile 4. It will be observed that the glass-securing channel is mounted on the shaped profile 5 constituting the window frame on which the glass pane is to be mounted and that it is fastened by means of through-going screws 6 on to the basic profile 2. It can be observed that said shaped profile 5 can act as the supporting structure for the glass-securing channel and, therefore, for the glass-pane itself, or it can be the profile covering the perimeter of the structure 7 consisting of the wall presenting the opening for the mounting of the glass pane.

It will be observed, in particular, that the basic profile 2 consists of a horizontal surface 21, which, as has already been mentioned, rests against the shaped profile 5, and is attached at one end to the substantially vertical surface 22. The outer part of said surface 22 rests flush against a vertical projection 51 of the shaped channel 5, while its inner surface is in contact with the surface of the glass-pane 8. More specifically, the vertical surface 22 of the shaped profile 2 presents at its upper edge the lip 23 which improves the securing action when it

is made to adhere to the surface of the glass pane 8.

On top of the basic profile 2 is a closing profile 3 consisting of an essentially horizontal surface 31 joined at its ends with the vertical surfaces 32 and 33 respectively and at its center with yet another substantially vertical surface 34. As can be observed, the vertical surface 33 at one of the ends of surface 31 presents at its top and attached to the horizontal surface 31 a lip 35 which will adhere to the surface of the glass pane 8.

Beside the closing profile 3 and on top of the basic profile 2 there is also a stopper profile 4 presenting in its transversal cross-section a closed, substantially square shape and provided in its approximately central position with a blind loop-hole 41.

When the glass-securing channel is formed as has been described and illustrated in Fig. 1, both the blind loop-hole 41 belonging to the stopper profile 4 and the substantially vertical protruding surfaces 32, 33 and 34 belonging to the closing profile 3, interfere against an equal number of matching appendixes belonging to the basic profile 2, so as to obtain the stable junction betwwen the basic profile 2, the closing profile 3 and the stopper profile 4. More specifically, it will be observed that for this purpose the basic profile 2 presents a lateral vertical appendix 24 which is inserted by pressure into the blind loop-hole 41 of the stopper profile 4, and two more angular appendixes, one of which is a central angular appendix 25 interfering against the central vertical surface 34 of the closing profile 3, and an inner angular appendix 26 interfering against the end vertical surface 33 belonging to the same closing profile 3. Concerning in particular the closing profile 3, it can be observed that while the interference between the central vertical surface 34 and the central angular appendix 25 of the basic profile 2 occurs along a contact surface 27, the interference between the inner angular appendix 26 of the same basic profile 2 against the vertical end surface 33 of the closing profile 3 occurs within an indentation 36 obtained in the vertical end surface 33 of the closing profile 3 itself.

When the closing profile 3 is applied by pressure onto the basic profile 2, as represented in Fig. 1, its lip 35 forces the glass pane 8 against the other lip 23 belonging to the vertical surface 22 of the basic profile 2, thereby guaranteeing the tightness and the stable junction of the glass pane 8 itself, which is supported from the bottom by the upper horizontal surface 28 of the inner angular appendix 26 of the basic profile 2. At this point it is also possible to mount the stopper profile 4, so as to completely close the glass-securing channel. It will be remarked here that the stopper profile 4 has esclusively the function of aesthetically completing the glass-securing channel 1, since the function of firmly securing the glass pane is fulfilled exclusively by the application of the closing profile 3 and by the pressure exerted on the glass pane by the lips 35 and 23.

It can then be understood that, contrary to what occurs in the glass-securing channels belonging to the known technique, and in view of the special constructive configuration of the channel according to the invention, the closing profile 3 is not accessible from the outside, indicated with 10, so that the removal of the glass from the outside is not possible. It will also be noted that the surface of the glass pane 8 being in contact with the outside 10 is flush against the vertical surface 22 of the basic profile 2 and that the latter, in turn, is flush against the supporting shaped surface 51. Said surfaces which are rigid and permanently joined together prevent an eventual accidental pressure against the glass pane 8 from the inside toward the outside 10 from causing the falling-off of the glass pane 8, since none of said vertical walls 22 and 51 is removable.

It has also been said that one of the advantages of the glass-securing channel according to the invention is represented by the possibility of replacing the glass pane, if necessary, with another one having a greater thickness , such as for instance, a double glassing, or a panel made of a different material, without having to replace the glass-securing channel itself. This is shown in Fig. 2, wherein it can be observed that the double glassing 81 is applied on the same shaped profile 5, placed over the same supporting structure 7 and employing the same glass-securing channel 1, which has been previously described and represented in Fig. 1, which consists of the same basic profile 2, on top of which the same closing profile 3 is applied by pressure. In particular it will be pointed out that in this case the stopper profile 4 is missing, since the closing profile 3 acts both as a securing element for the glass pane 81 and as an element aesthetically completing the glass-securing channel itself. It will noted more specifically that in this situation the central vertical surface 34 of the closing profile 3 interferes vertically along the surface 29 with the lateral vertical surface 24 belonging to the basic profile 2, while the indentation 36, belonging to the vertical end surface 33 of the same closing profile 3, interferes wiht against the central angular appendix 25 belonging to the basic profile 2. In this case the inner angular appendix 26 of the basic profile 2 fulfils esclusively the function of mechanically supporting the glass pane 81 which rests against the horizontal surface 28, while the other horizontal supporting surface 30 is constituted by the upper part of the central angular

appendix 25, belonging to the same basic profile 2. In this situation, too, the securing of the glass pane is guaranteed by the adhesion of the lips 35 and 23.

It can, therefore, be understood that, if it becomes necessary, on the same supporting structure 7 and on the same shaped channel 5 it is possible to apply, instead of a glass-pane 8 with a standard thickness, a double glassing, or a blind, eventually insulating, panel or a magnetic blackboard, a window, a teller window or similar, having substantially the same thickness, without having to replace the glass-securing channel or any of its parts. It is obvious that in a special embodiment of the basic profile it is possible to foresee the insertion of the closing profile 3 in more than two positions, so as to permit the lodging of a larger number of thicknesses or of panels, or even, by employing several closing profiles, to allow the mounting of several glass panes in the same window.

The solutions represented in the Figs. 1 and 2 can also be obtained with the embodiment represented in Fig. 3, wherein one more lip acting as a drip is applied on the basic profile. Fig. 3 shows in detail said differring embodiment applied to the glass-securing channel represented in Fig.1 and it will be remarked that on the basic profile 61, applied onto the shaped channel 62, positioned over an eventual supporting structure 63, laterally beside the vertical surface 68, there is a lip 64 bent downwards. Said lip 64 covers the tip 65 of the vertical surface 66 of the shaped channel 62 and it prevents water from seeping in if the glass pane 83 belongs to an outside wall. Another embodiment of the glass-securing channel of the invention is represented in Fig. 4, as compared to the glass-securing channel represented in Fig. 1. In this embodient the basic profile 51 presents at its bottom a U-shape, which permits to mount it directly on a suporting structure 71, so that it can be restrained or fastened by means of lag screws 72 directly tightened into the supporting structure 71. In this case, too, the closing profile 37 and the stopper profile 40 are applied by interference against the appendixes 52, 53 and 54 belonging to the basic profile 51. It is obvious that this embodiment, too, permits the mounting of a glass pane with a standard thickness, or of a double glassing or of a blind panel having substantially the same thickness.

Yet another embodiment of the glass-securing channel of Fig. 1 is represented in Fig. 5. In this embodiment the basic profile 87 is provided at its bottom with guiding edges which hook on to a supporting structure 83. In this case, too, the bottom part of the basic profile 87 presents a U-shape which permits to apply it directly on to a supporting structure 83 and, at the same time, thanks to the presence of the lateral hooks 82, it can be fastened by pressure into the indentations 85 suitably prearranged in the supporting structure 83, which can be made, for instance, of wood.

In this case too, the glass pane 86 is fixed between the basic profile 87 and the closing profile 3.

The shaped channel according to the invention, made as just described both in the embodiments represented in the Figs. 1, 2 and 3 and in those represented in the Figs. 4 and 5, can advantageously be manufactured, according to the specific needs, both of plastic material and of aluminium. If the glass-securing channel is made of plastic material, the lips 35 and 23 adhering against the glass, obtained on the closing profile and on the basic profile respectively and the other lip 64 acting as a drip, also obtained on the basic profile, are coextruded. On the other hand, if the elements forming the glass-securing channel are made of aluminium, the lips are attached by restraint.

Moreover, advantageously, whenever the glass-securing channel of the invention is made in the configurations represented in the Figs. 1, 2, 3 and 4, i.e. with a substantially rectangular transversal cross-section, the sides forming the frame to be applied on the window opening can also be united at an angled position, rather than with the usual system of the cut at 45 degres, by a frontal restraint junction by cutting the shaped channels at 90 degrees. This entails considerable advantages during the assemblying operations, besides offering a better aesthetical finish of the window.

On the basis of what has been described, it can be understood how the glass-securing channel according to the invention reaches all the proposed purposes. First of all it insures both the impossibility of the glass falling toward the exterior, and the impossibility of breaking in from the exterior toward the interior of the room by removing the glass, since no removable part is accessible from the exterior.

It has also been seen how, thanks to the special configuration of the elements which form the glass-securing channel of the invention, it is possible to replace a standard glass pane with a double glassing or blind panels having substantially the same thickness, by using the same channel and by performing simple operatios of taking apart and putting together again the parts which form it.

The channel according to the invention in the embodiments represented in the Figs. 1, 2 and 3 can also be usefully employed as a transversal transom for dividing the space of a wall into several parts. An application of this nature is represented in Fig. 6, wherein it can be observed that the opening of a wall 90 is subdivided into three parts and,

more precisely, an upper part 91, a central part 100 and a bottom part 93, in order to insert in the central part 100, for instance, a wall with rotating glass sections 94 or a teller window or a shelf supporting an air conditioner etc. For this purpose, two pairs of channels made according to the invention will be mounted in the space of wall 90 at the desired height and, more precisely, a pair of channels 95 will be mounted at the top and a pair of channels 96 will be mounted at the bottom. For a better understanding the same are also represented in a cross-section in Fig. 7. It will be observed that the channels 95 and 96 are arranged opposed to each other and rest against each other along their basic profiles 97 and 98 respectively. It is not necessary to join together the basic profile, nor to fasten them to the frame, since the glass panes or the panels made of other materials (metal sheet, playwood etc) are absolutely rigid by nature and, therefore, once they have been inserted and blocked within the closing profile along their perimeter, they become solidly joined with the frame.

It is obvious that by proceeding in the same way it is possible to subdivide a wall into any number of sections, without having to operate on the frame of the wall in order to apply the fixed horizontal transoms.

Possible variations of the channels as for the number or the shape of the surfaces of the elements forming it are to be considered within the scope of the present invention.

Claims

1. A glass-securing shaped channel comprising:
   - a basic profile (2, 51, 61, 87, 97, 98) presenting in its transversal cross-section an open shape, consisting of the junction of a horizontal surface (21), complete with inner longitudinal appendixes (24, 25, 26; 52, 53, 54), joined at one end with a substanstially vertical surface (22, 68) supporting the glass pane (8, 81, 86, 92) and presenting a tightening lip (23,35);
   - at least a closing profile (3, 37) presenting in its cross-section an open shape, formed by the junction of a substantially horizontal surface (31) joined at its ends and approximately at its center with three substantially vertical surfaces (32, 33, 34), which are parallel to each other, an external one of them (33) presenting a tightening lip (35) and an indentation (36) at a lower position,

     wherein the securing of the glass pane (8, 81, 86, 92) within the glass-securing shaped channel is obtained because of the adhesion of the glass pane against the lips (23, 35) belonging to the basic profile (2, 61, 51, 87, 97, 98) and to the closing profile (3, 37), said closing profile (3, 37) being permanently joined with the basic profile (2, 61, 51, 87) by the snapping together of the substantially vertical surfaces (32, 33, 34) of said closing profile against the appendixes (24, 25, 26; 52,53, 54) belonging to the basic profile.

2. A glass-securing shaped channel according to claim 1, characterized in that the snap junction of the closing profile (3, 37) against the basic profile (2, 51, 61, 87, 97, 98) occurs because of the insertion of the terminal end of one of the appendixes (26) of the basic profile into a matching indentation (36) belonging to one of the outer vertical surfaces (33) of the closing profile.

3. A glass-securing shaped channel according to claim 2, characterized in that on the basic profile (2, 51, 61, 87, 97, 98) is mounted a stopper profile (4, 40) presenting in its transversal cross-section a closed shape, complete in its approximately central position with a blind loop-hole (41), which shuts because it is penetrated by a projection (24, 52) of the basic profile.

4. A glass-securing shaped channel according to claim 2 or 3, characterized in that the vertical wall (22, 68) of the basic profile (2, 61) cooperates with yet another vertical wall belonging to a shaped channel (5, 62) on which the basic profile (2, 61) is mounted.

5. A glass-securing shaped channel according to claim 2 or 3, characterized in that the basic profile (51) presents at its bottom a U-shaped channel (55) turned toward the outside and suited to guide it and to mount it on a supporting structure (71).

6. A glass-securing shaped channel according to claim 5, characterized in that the basic profile (87) presents at its bottom edges (82) suited to hook into matching indentations (85) obtained laterally in the supporting structure (83).

7. A glass-securing shaped channel according to any one of the preceding claims, characterized in that the elements forming it are made of plastic material.

8. A glass-securing shaped channel according to claim 1, characterized in that the lips (23, 35,

64) attached to the elements forming it are coextruded.

9. A glass-securing shaped channel according to any one of the preceding claims from 1 to 4, characterized in that the elements forming it are made of a light-weight alloy.

10. A glass-securing shaped channel according to claim 9, characterized in that the lips (23, 35, 64) belonging to the elements forming it, are applied and fastened by restraint to the elements themselves.

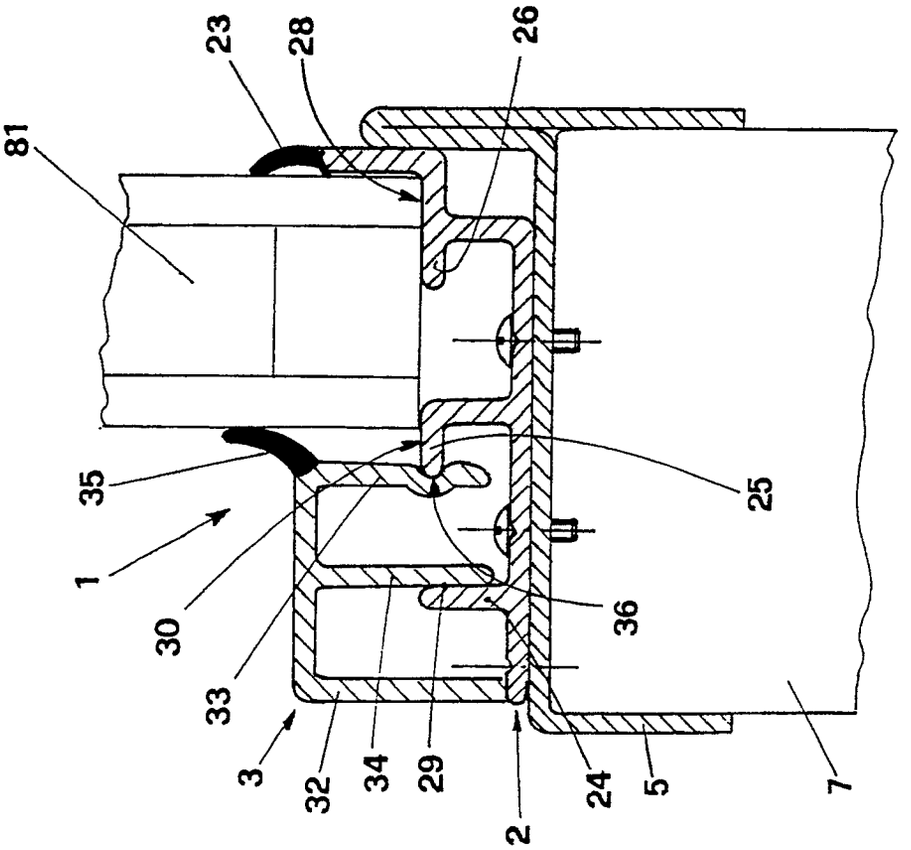
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FIG.2

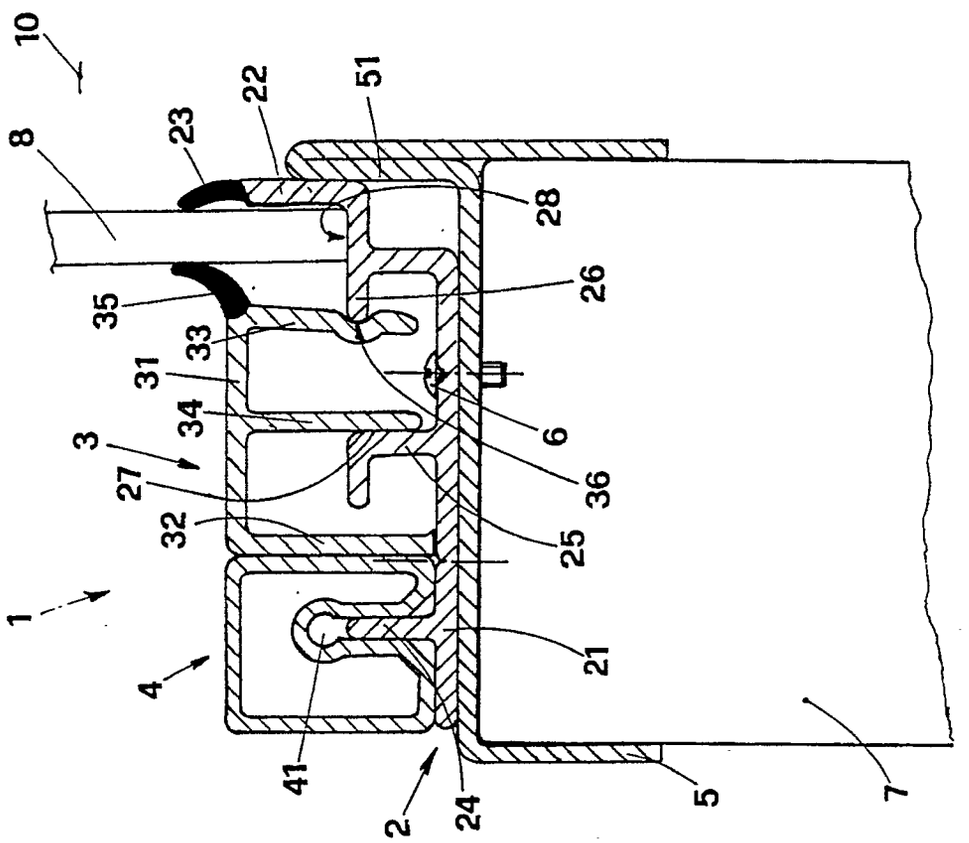
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FIG 1

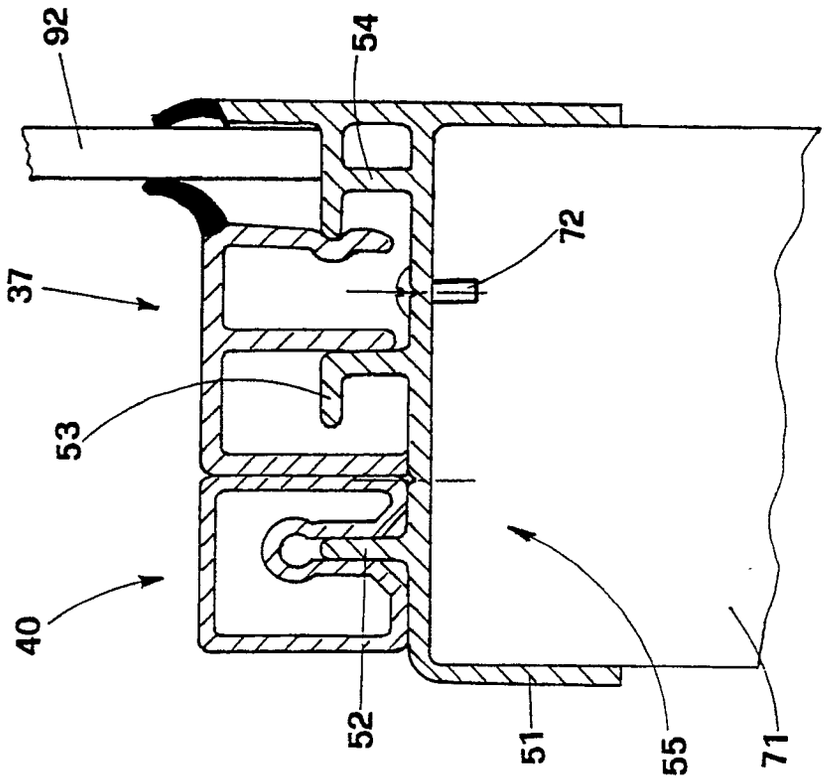

FIG.4

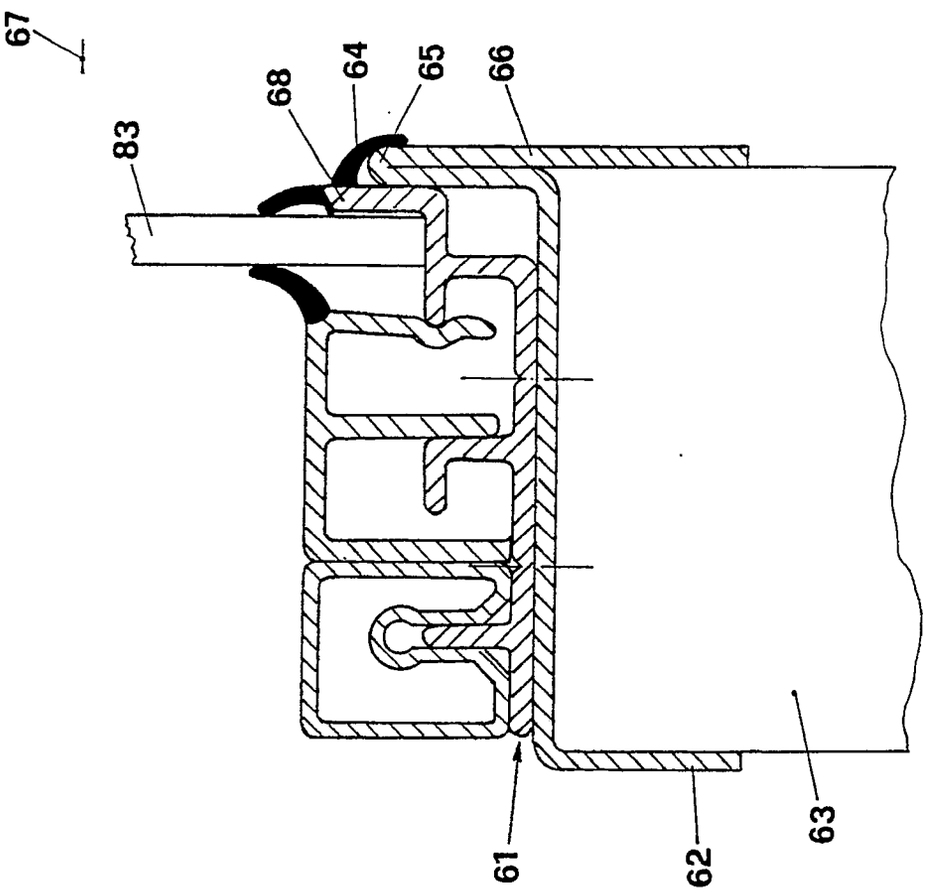

FIG.3

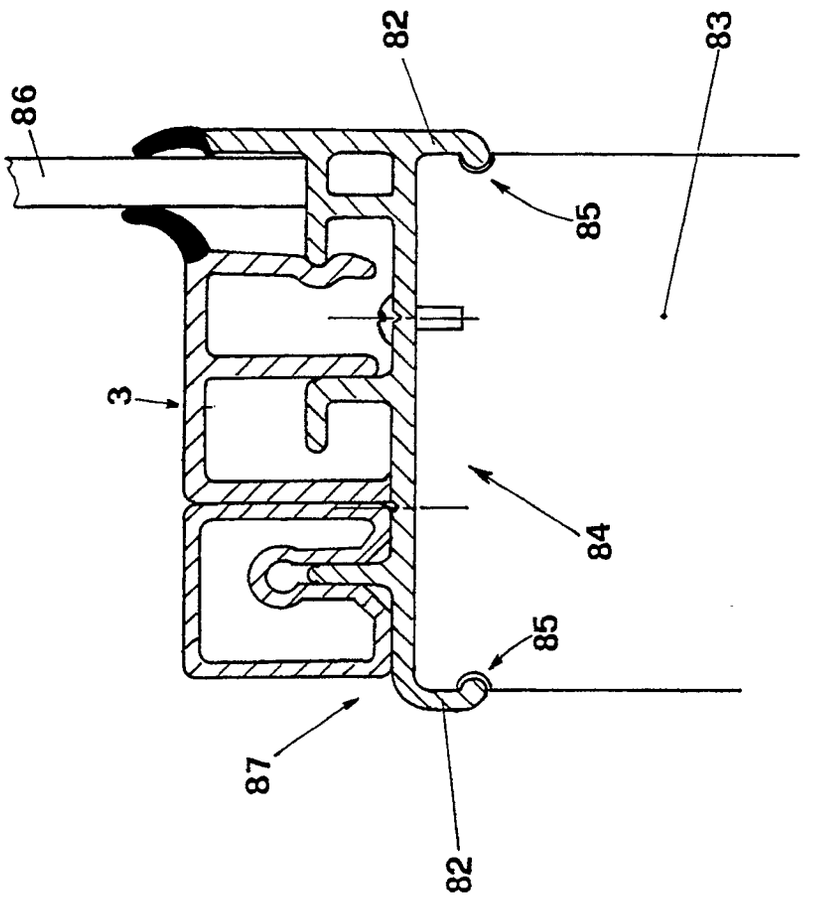

FIG.5

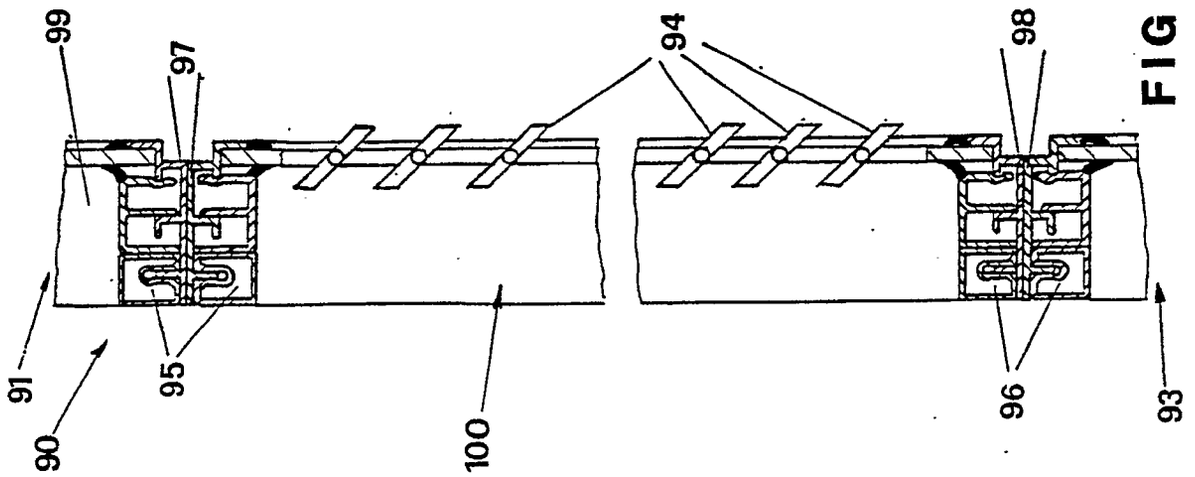

FIG 7

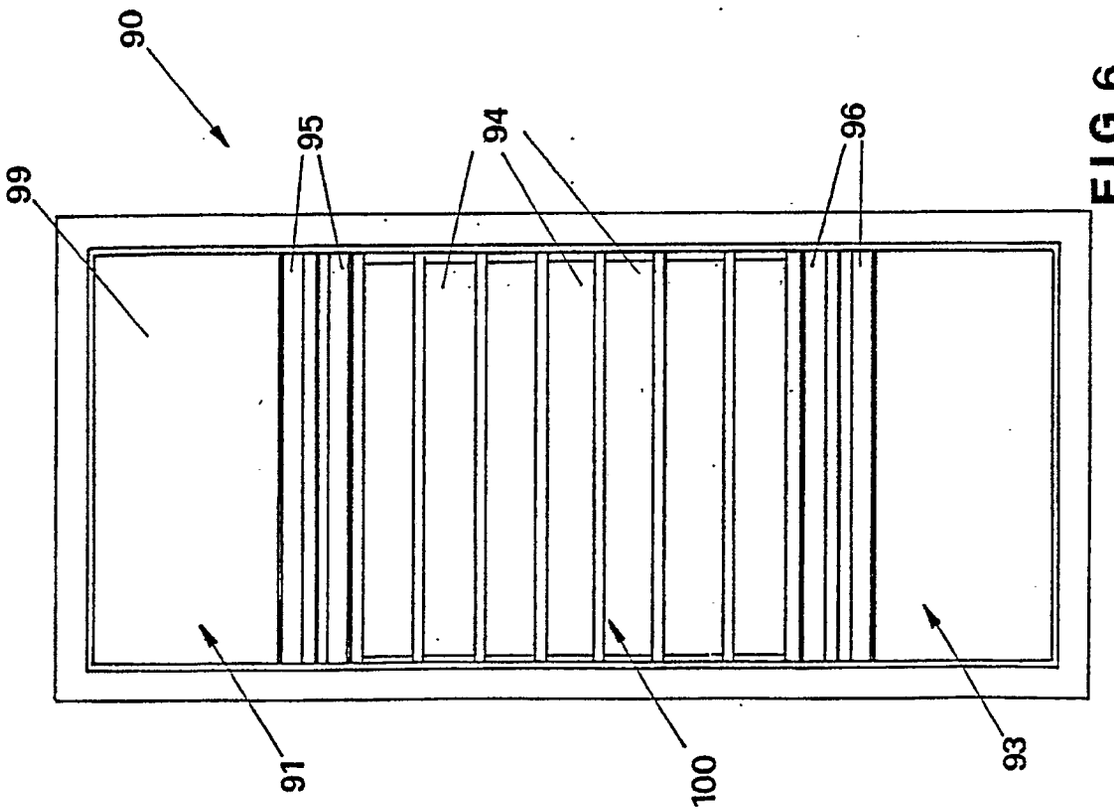

FIG.6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 10 2409

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,Y	DE-A-2 532 172 (GLAS-UND SPIEGEL-MANUFACTUR) * page 8, paragraph 1 -paragraph 2 * * page 9, paragraph 3; figures 1-3,7,9 *	1,2,5,6,7, 8	E 06 B 3/58
X	DE-A-2 157 655 (EMMERICH) * page 6, paragraph 2 - page 7, paragraph 3; figure *	1,2,4,9,10	
X,A	FR-A-2 330 275 (ONGARO) * page 3, line 11 - page 4, line 19; claim 1; figures 1-3 *	1,2,9,10, 5,6	
Y	US-A-1 477 214 (ENGMAN) * page 1, line 30 - line 83; figures 1-3 *	6	
Y,A	US-A-4 621 478 (PHILLIPS ET AL) * column 3, line 47 - column 4, line 32; figure 1 *	7,8,1,2	
A	CH-A-6 613 16 (BISCHOF) * page 2, column 2, line 44 - page 3, column 2, line 40; figures 1-5 *	1,2,5,6,9, 10	
A	FR-A-2 339 050 (YOSHIDA KOGYO) * claim 1; figures 1-5 *	3	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	DE-B-1 184 061 (GARTNER) * column 6, line 25 - line 27; figures 2-4 *	3	E 06 B
A	US-A-4 858 405 (CHRISTIE) * column 4, line 6 - column 5, line 51; figures 1-15 *	3	

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	31 May 91	DEPOORTER F.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same catagory
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