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(71) Applicant: **V.E.PR.AL. srl.**
84014 Nocera Inferiore (SA) (IT)

(72) Inventor: **Ruggiero, Andrea**
84010 S. Marzano sul Sarno (SA) (IT)

(54) **Wood simulating shape of an aluminium profile section**

(57) The present invention concerns a series of extruded section in aluminum for windows and door frames that near by improved mechanical performances they simulate in realistic way the wood effect.

This is due to the act that on one of the two wings (arms) that extend outwards from the shorter upper side of the hollow quadrangular body, which is a part of the section itself, grooves and folds have been created to give a bas and high relief effect, thus simulating a moulded wood effect; each of the upper sides of the hollow quadrangular body can have a convex (sections A and C), concave (section B) or rectilinear (section D) shape

and the two wings (arms) that emerge from one of the upper sides of the hollow quadrangular body follow the same concave, convex or rectilinear form until, towards the extremity, they curve downwards until they run parallel to the longer side of the section; the hollow quadrangular body can be of larger dimensions than the amount given by the portion included between the distancing teeth inside the hollow body and its shorter upper side (sections A, C and D); therefore the part of the section would have greater height in order to simulate the effect of the depth of the wood and consequently increased mechanical inertia.

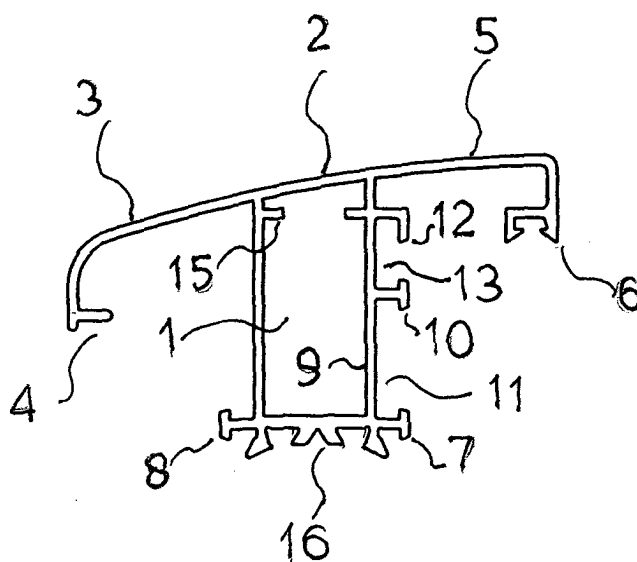


FIG.1

Description

Technical field

[0001] The present invention concerns a series of extruded section in aluminum for windows and door frames that near by improved mechanical performances they simulate in realistic way the wood effect.

State of the technique

[0002] As it is known they have been being by now for a lot of time known and employed composite frames aluminum-wood gotten also joining in removable way extruded sections of aluminum with ledge in wood ingot, sets on the inside façade of the frame. Windows ena door frames of this type has found favorable reception on the market because they allow to be able to exploit the advantages offered by the extruded metallic section what for instance the mechanical resistance, the long duration in the time to forehead of a scarce request of maintenance and the advantages offered by the wood of a recognized aesthetical merit with a high quality of the finishing touch and the typical sensation of environmental confort.

[0003] These windows and door frames however are not lacking from drawbacks that they are not only translated operationally in a tall cost but also in a waste of greater time of that normally anticipated and predictable for a simple joining of the extruded section in aluminum and of wood, the one place to the outside characterized for his ownerships of resistance to the action of the atmospheric agents the other one set to the inside characterized for his decorative aesthetical qualities.

[0004] Among the problems that all the builders of these composite frames have to face and to resolve there is that principal to find systems of connection that allow the two profiles of different material to slide the one in comparison to the other so that to avoid the to rise up of due inside tension to their different coefficient of thermal expansion. Many are the systems of connection wood-aluminum proposed and used, for instance, through foams that are injected and made to consolidate within undercut grooves drawn on both the interfaced walls of the extruded section in aluminum and of the ledge in wood ingot; or with the use of nylon blocks fixed with grapevines to the wood profiles and inserted to the chamber of the aluminum sections; or still with the forced insertion on both the sides of the composed section, of a couple contrasted of cuneiform elements, every consistent in an rigid section continuous extruded in synthetic resin aving form and such dimensions to be able to be hammered in the special longitudinal interspace left among the two faces contrasted of the extruded section in aluminum and of that in resin, applied on the inside of the ledge in wood.

[0005] As it is noticed, these solutions and others not mentioned, are hard-working to perform and therefore

they have a cost, and not always result reliable in as for strenght and accuracy. The problem of the positioning of the gaskets for instance exists among the profiles wood-aluminum, that during the fixing can also suffer very small moves that determine however an unacceptable off-centre to the point that the "job" must have made again with consequent loss of time and money.

[0006] Would be therefore liked a technological solution that allowed to directly get an realistic wood effect with the aluminum profile without the use of wood ledges. Such solution has been tried painting the actual aluminum profiles with particular superficial texture and a notable range of superficial both shiny and opaque colorations to imitation of the wood.

[0007] Only that the plain surface that characterizes the aluminum frames prevents that effects of depth and attenuates the clear dark color that are typical of the wood.

[0008] It would be besides advantageous to realize a profile that further to give a realistic wood effect practically resulted monolithic without the possibilities of movement that is relatively verified to the parts component wood-aluminum, decreasing the costs of realization of it, of assemblage, of maintenance and increasing the mechanical resistance.

Purposes and advantages of the invention

[0009] Purpose of the present invention and to obviate to the drawbacks of the preceding technique and to propose a new series of extruded sections in metallic with which it will be possible to realize fittings with a warm aspect, typical of the wood, with particular superficial texture and hollows with pleasant aesthetical effects and a notable range of superficial both shiny and opaque colorations, combined with technical characteristics so that to satisfy all the demands of a good thermal isolation, to avoid undesirabled acoustic bridges, to have a perfect tight joint avoiding infiltrations of water and air.

[0010] Other purpose in accord with the preceding understanding is that to realize a new series of extruded section in metallic that to finishes to simulate the wood most realistic and accurate, practically result monolithic so that to have a superior structural resistance, to assure the max stability eliminating the mass in work of devices of block of the wood ledges to everything advantage of a more rapid and economic working for the construction of the fitting and to rationalize the more possible the operations of assemblage for a rapids starting, with less elevated costs in virtue really of a constructive simplification and of assemblage.

[0011] The assignments, the purposes and others that will be underlined subsequently better are reached by a series of extruded sections in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, each section composed of a hollow quadrangular body with at least two wings

emerging from one of the narrower sides of the section itself, and equipped with various types of projections and/or grooves capable of receiving sealing strips and rabbet seals and which also constitute a means for anchoring the various sections and accessories to each other, characterised by the fact that:

- a) on one of the two wings (arms) that extend outwards from the shorter upper side of the hollow quadrangular body, which is a part of the section itself, grooves and folds have been created to give a bas and high relief effect, thus simulating a moulded wood effect;
- b) each of the upper sides of the hollow quadrangular body can have a convex (sections A and C), concave (section B) or rectilinear (section D) shape;
- c) the two wings (arms) that emerge from one of the upper sides of the hollow quadrangular body situated within the section itself follow the same concave, convex or rectilinear form until, towards the extremity, they curve downwards until they run parallel to the longer side of the section;
- d) the hollow quadrangular body can be of larger dimensions than the amount given by the portion included between the distancing teeth inside the hollow body and its shorter upper side (sections A, C and D);
- e) therefore the part of the section would have greater height in order to simulate the effect of the depth of the wood and consequently increased mechanical inertia.

Description of the drawings and way of realizing the invention

[0012] These and other characteristics as well as advantages will result evident from the following description and from the enclosed drawings furnished to only indicative purpose and not limitative in which:

the fig.1 shows in a sight in section the profile in a first form preferred of realization according to the present invention;
 the fig.2 shows in a sight in section a variation of the preceding profile according to the present invention;
 the fig.3 shows in a sight in section the profile assembled with the other elements to realize a fitting in a first form preferred of realization;
 the fig.4 shows in a sight in general section a variation of the preceding profile;
 the fig.5 shows in a sight in section the profile assembled with the other elements to realize a fitting, in a second preferred form of realization;
 the fig.6 shows in a sight in general section a variation of the preceding profile;
 the fig.7 shows in a sight in section the profile assembled with the other elements to realize a fitting

in a third form preferred of realization;
 the fig.8 shows in a sight in general section a variation of the preceding profile;
 the fig.9 shows in a sight in section the profile assembled with the other elements to realize a fitting in a fourth grade preferred form of realization.
 The fig. 10 shows an application as stop glass.

[0013] With reference to the drawings in a first form preferred of realization of the present invention, the profile "A" is conformed according to a hollow quadrangular body that presents a trapezoid-rectangular cross-section (1) with a sloping upper (2) side that extends outwards in opposite directions, each continuing the same inclined slope to form in the outer, slightly more downward pointing branch, the arm (3) that curves sharply downwards at approximately two thirds of its length to become rectilinear, at the extremity of which is a pronounced orthogonal rib (4) that faces inwards toward the hollow quadrangular body itself; the upwardly sloping branch forms the arm (5) which changes direction at approximately three quarters of its length to form an orthogonal curve which, with the help of a suitable connector, forms a C-shaped groove (6) at its extremity, directed towards the interior of the section to form the seat for a seal; below, extending horizontally from the lower corners of the two hollow bodies with the trapezoid-rectangular cross-sections (1) two T-shaped connecting elements (7) and (8) are formed; on one of the longer sides (9) a T-shaped connecting element (10) is situated in such a way that, when interfaced with element (7), it creates an undercut groove (11), while the rib bent into an L-shape (12) interfaced with the respective T-shaped element (8) forms another undercut groove (13) that creates the seat for the insertion of accessories or, for example, another section (14); inside the chamber of the hollow trapezoid-rectangular body (1) two small delimitation teeth (15) are set facing each other; outside the shorter lower side of the body (1) a series of indentations (16) have been created to form a swallow-tail cross-section, in such a way as to create a site for the insertion of connecting bars (17), with and without appendages (18), which have low thermal conductivity (for example, the bars could be made of polyamide reinforced with fibre glass) to interrupt the heat bridge that is normally verified in the frames with metallic loom.

[0014] A variation of this type in profile "A", foresees that approximately to center line of arm (3) creates moulding of folds to give a bas (19) and high relief effect (20).

[0015] In a second preferred form of realization in profile "B" of the present invention the hollow quadrangular body presents a concave shaped upper side (21) that extends similarly in both directions, until it inverts the curvature, curving sharply downwards towards the lower part of the section. Inside the chamber of the body (1), two teeth (22) are positioned side by side on the smaller, upper concave side. The rectilinear length (23)

of the arm (24) it is also characterized for a greater excursion in length in comparison to the described preceding type.

[0016] It is foreseen a variation with the moulding of folds on arm (24) to give a bas (25) and high relief effect (26)

[0017] In a third form preferred of realization "C" profile of the invention the hollow quadrangular body introduces a smaller side with a convex form (27) that prolongs it, with the same form in the two verses, until to reverse the curve and run parallel to longer side of section. Also in this case the rectilinear line (28) of the arm (29) is characterized for a strong excursion in length.

[0018] It is foreseen a variation with the moulding of folds on arm (29) to give a bas (30) and high relief effect (31)

[0019] In a fourth grade preferred form of realization "D" profile of the invention the hollow quadrangular body has a rectangular section and its shorter side (32) extends in a straight line in opposite directions up to a certain point then it forms an orthogonal curve, continuing down towards the lower part of the section. The arm (33) it is characterized for the combination of a greater excursion in length of the rectilinear line (34) and by the presence of the grooves and folds that form the bas (35) and high relief (36) effect.

[0020] The profiles proposed with to increase some height of the section, with the realization of arms variedly bent and with the insertion of the folding aloft and low relief on an arm, allows to get the effect of the undercut with a feeling of fullness and depth, typical of the wood; besides a more elevated load of due inertia to increases him height of the section of the profile and to the care of the particular ones for the insertion of the accessories and the connections, it is translated in best mechanical performances of the window and door frame, such to guarantee the overcoming of the tests of resistance to the mechanical solicitations, to the permeability to the air, the tight joint to the water and the resistance to the load of the wind, foreseen by the normative in force. Says profiles they are applied on fitting with and without thermal cut, they are modular in the sense that they can compose him or to apply on a multiplicity of profiles of different builders.

[0021] It should also be noted that when mounting the window frames, the tubular bodies (37), (38) and (39) were conceived and made in such a way as to give them a continuous exposed surface, with a total absence of pronounced highs and lows between them, something which was not found in sections made with preceding technologies.

[0022] In figure 10 it is shown (40) that the exterior arm in each section A, B, C or D can be an independent element that is connected to the aforesaid sections through L-shaped connections, interlocking teeth or other similar devices, obtaining the same continuity yet avoiding the 90° cut of the pane-holder and also avoiding having to add corner pieces, thus reducing costs.

[0023] From how much previously described and illustrated can be seen that the invention reaches the preceded purposes.

Claims

1. A series of extruded sections in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, each section composed of a hollow quadrangular body with at least two wings emerging from one of the narrower sides of the section itself, and equipped with various types of projections and/or grooves capable of receiving sealing strips and rabbet seals and which also constitute a means for anchoring the various sections and accessories to each other, **characterised by** the fact that:

f) on one of the two wings (arms) that extend outwards from the shorter upper side of the hollow quadrangular body, which is a part of the section itself, grooves and folds have been created to give a bas and high relief effect, thus simulating a moulded wood effect;

g) each of the upper sides of the hollow quadrangular body can have a convex (sections A and C), concave (section B) or rectilinear (section D) shape;

h) the two wings (arms) that emerge from one of the upper sides of the hollow quadrangular body situated within the section itself follow the same concave, convex or rectilinear form until, towards the extremity, they curve downwards until they run parallel to the longer side of the section;

i) the hollow quadrangular body can be of larger dimensions than the amount given by the portion included between the distancing teeth inside the hollow body and its shorter upper side (sections A, C and D);

j) therefore the part of the section would have greater height in order to simulate the effect of the depth of the wood and consequently increased mechanical inertia.

2. A extruded section in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, as in claim 1) **characterized by** the fact that is shaped (section A) into a hollow quadrangular body that presents a trapezoid-rectangular cross-section (1) with a sloping upper (2) side that extends outwards in opposite directions, each continuing the same inclined slope to form in the outer, slightly more downward pointing branch, the arm (3) that curves sharply downwards at approximately two thirds of its length to become rectilinear, at the extremity of which is a pronounced or-

thogonal rib (4) that faces inwards toward the hollow quadrangular body itself; the upwardly sloping branch forms the arm (5) which changes direction at approximately three quarters of its length to form an orthogonal curve which, with the help of a suitable connector, forms a C-shaped groove (6) at its extremity, directed towards the interior of the section to form the seat for a seal; below, extending horizontally from the lower corners of the two hollow bodies with the trapezoid-rectangular cross-sections (1) two T-shaped connecting elements (7) and (8) are formed; on one of the longer sides (9) a T-shaped connecting element (10) is situated in such a way that, when interfaced with element (7), it creates an undercut groove (11), while the rib bent into an L-shape (12) interfaced with the respective T-shaped element (8) forms another undercut groove (13) that creates the seat for the insertion of accessories or, for example, another section (14); inside the chamber of the hollow trapezoid-rectangular body (1) two small delimitation teeth (15) are set facing each other; outside the shorter lower side of the body (1) a series of indentations (16) have been created to form a swallow-tail cross-section, in such a way as to create a site for the insertion of connecting bars (17), with and without appendages (18), which have low thermal conductivity (for example, the bars could be made of polyamide reinforced with fibre glass) to interrupt the heat bridge.

3. A extruded section in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, as in claim 1) and 2) **characterized by** the fact that approximately to center line of arm (3) creates moulding of folds to give a bas (19) and high relief effect (20).
4. A extruded section in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, as in claim 1) **characterized by** the fact that (Section B) the hollow quadrangular body presents a concave shaped upper side (21) that extends similarly in both directions, until it inverts the curvature, curving sharply downwards towards the lower part of the section; inside the chamber of the body (1) two teeth (22) are positioned side by side on the smaller, upper concave side; the rectilinear length of the arm (24) is **characterised by** the width of its excursion.
5. A extruded section in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, as in claim 1) and 4) **characterized by** the fact that the moulding of folds on arm (24) to give a bas (25) and high relief effect (26)
6. A extruded section in aluminium and aluminium alloys whose outer surface is coloured and textured

to create a wood effect, as in claim 1) **characterized by** the fact that (section C) the hollow quadrangular body introduces a smaller side with a convex form (27) that prolongs it, with the same form in the two verses, until to reverse the curve and run parallel to longer side of section; the rectilinear line (28) of the arm (29) is characterized for a strong excursion in length.

7. A extruded section in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, as in claim 1) and 6) **characterized by** the fact that that the moulding of folds on arm (29) to give a bas (30) and high relief effect (31).
8. A extruded section in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, as in claim 1) **characterized by** the fact that (Section D) the hollow quadrangular body has a rectangular section and its shorter side (32) extends in a straight line in opposite directions up to a certain point then it forms an orthogonal curve, continuing down towards the lower part of the section; The arm (33) it is characterized for the combination of a greater excursion in length of the rectilinear line (34) and by the presence of the grooves and folds that form the bas (35) and high relief (36) effect.
9. A series of extruded sections in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, as in previous claims **characterized by** the fact that one of the two wings (arms) that extend outwards from one of the narrower sides of the hollow quadrangular body of the sections of types A, B, C or D can also be an independent element that can be connected, never losing the same continuity, to the aforesaid sections with L-shaped connections, interlocking teeth and other similar devices.
10. A series of extruded sections in aluminium and aluminium alloys whose outer surface is coloured and textured to create a wood effect, as in previous claims **characterized by** the fact that these sections can be applied to window frames with or without heat bridges and they are modular in the sense that they can be composed or applied to a multiplicity of different sections made by different builders.

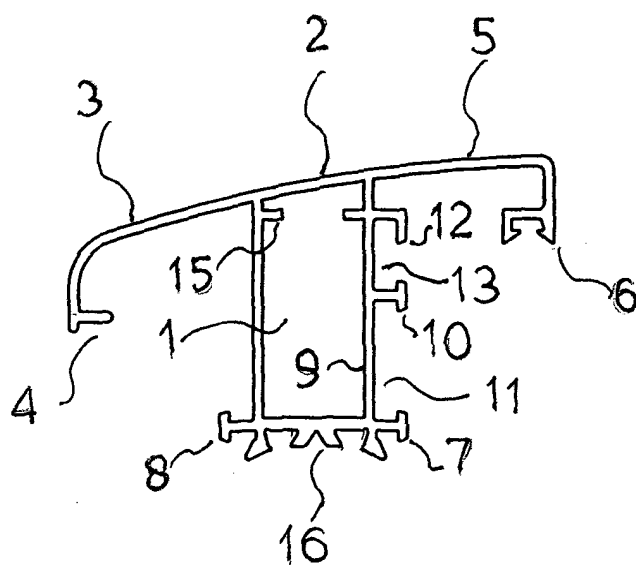


FIG.1

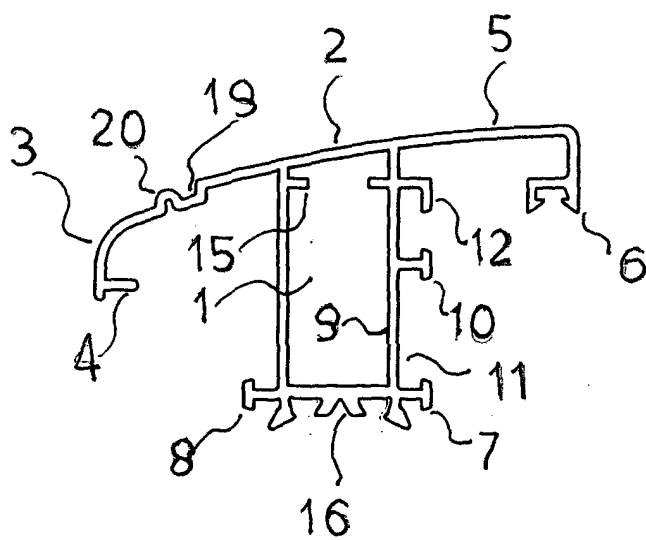
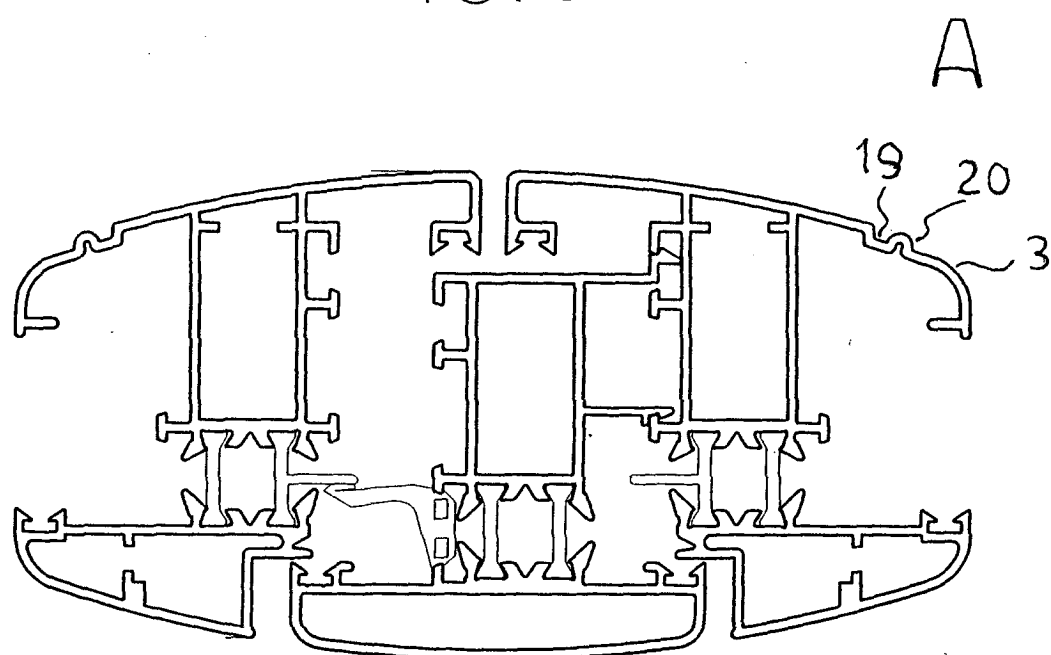
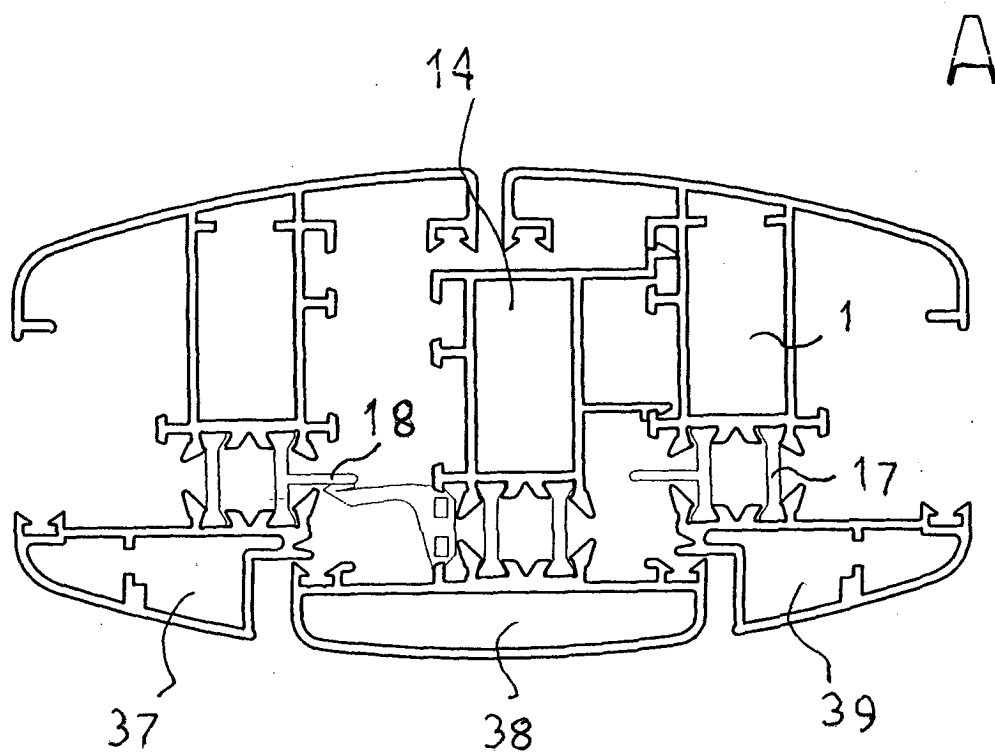


FIG.2



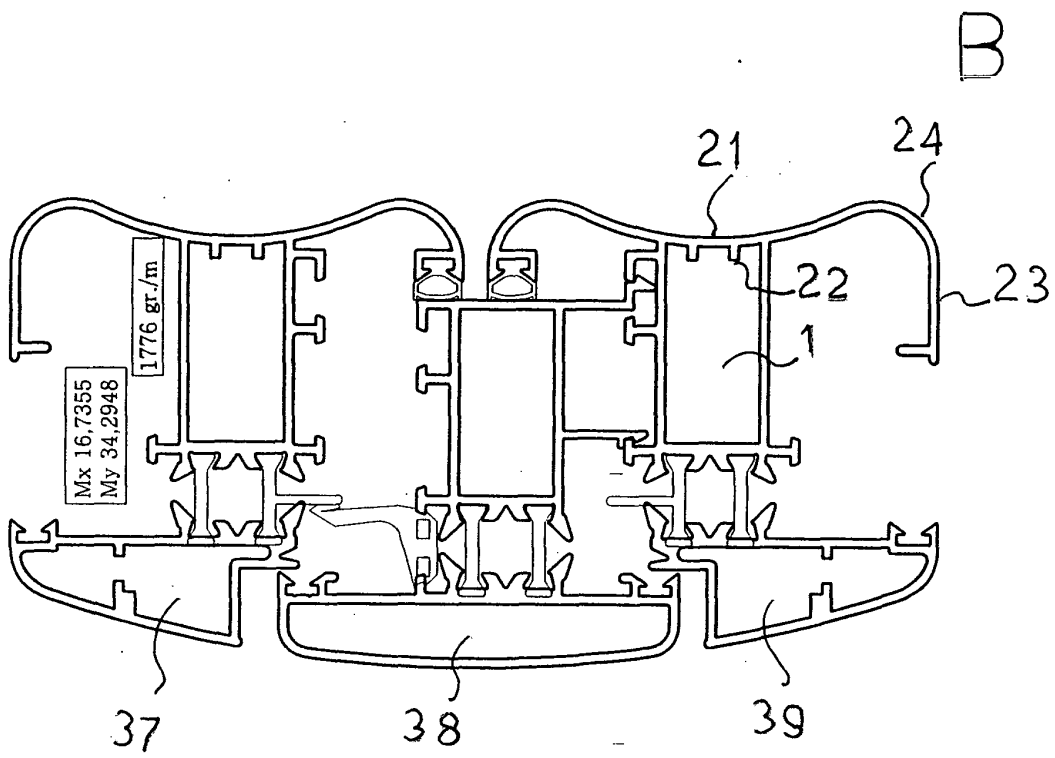


FIG.5

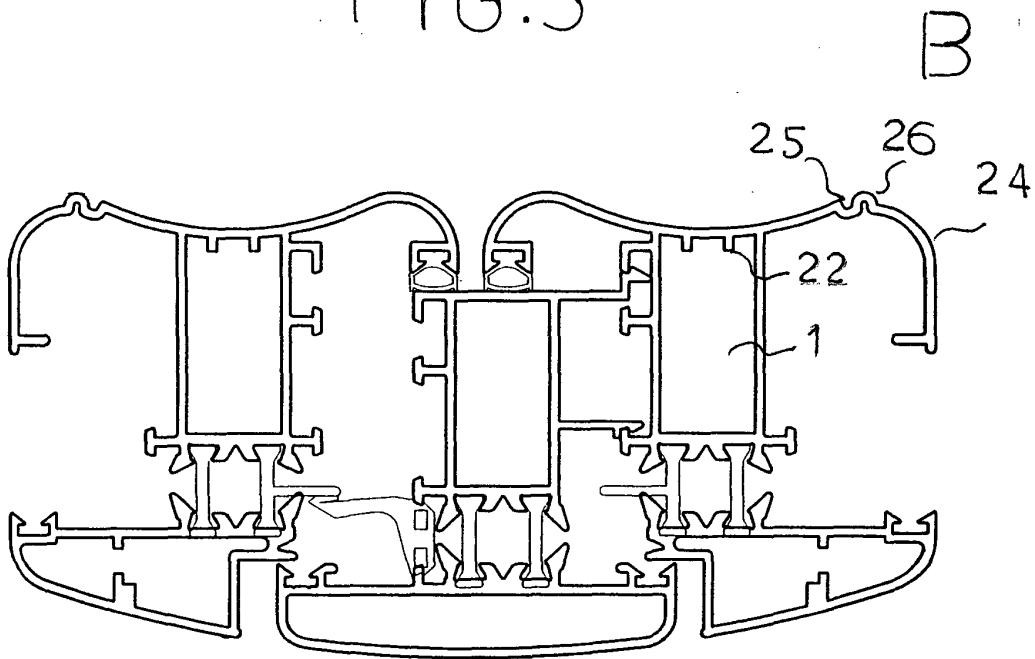


FIG.6

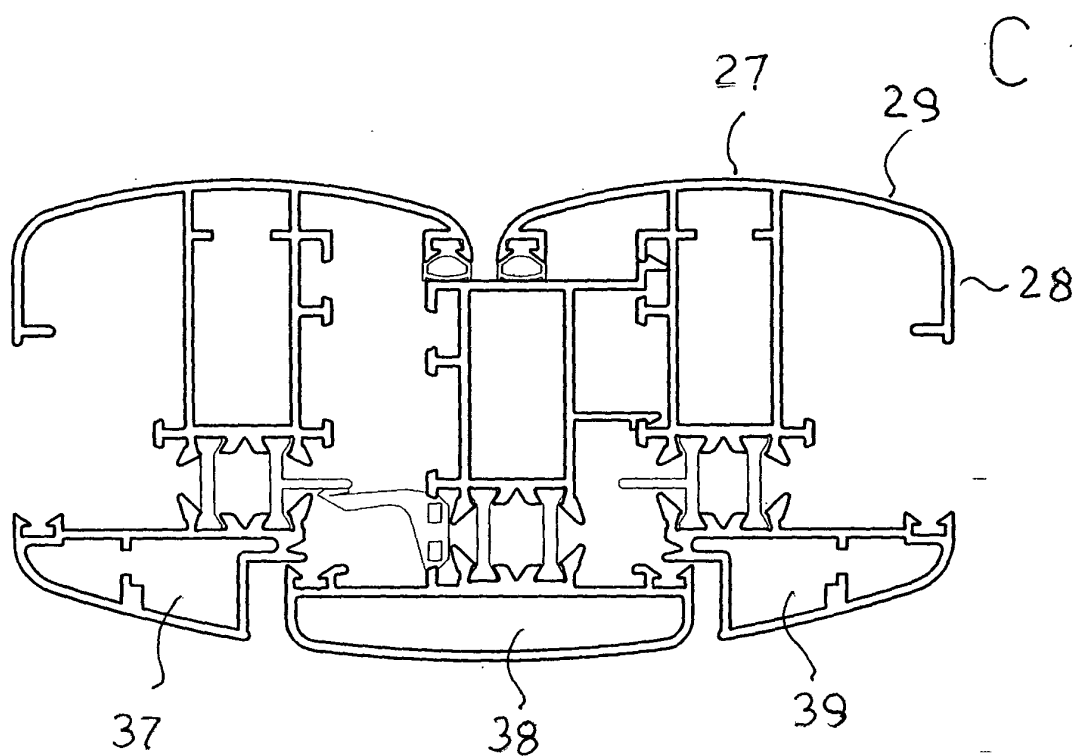


FIG. 7

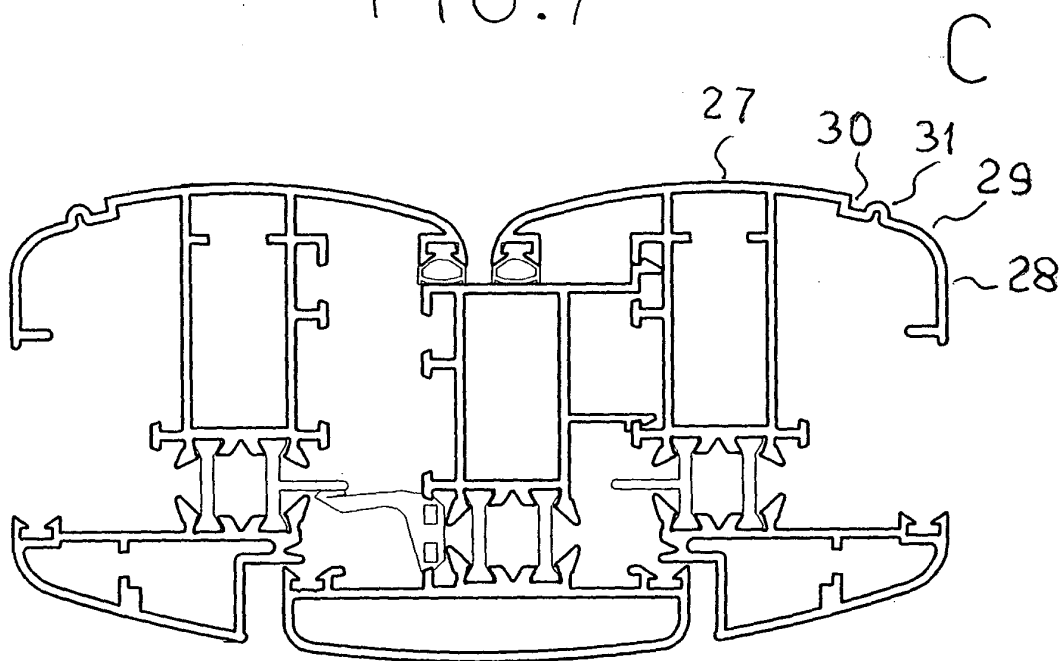


FIG. 8

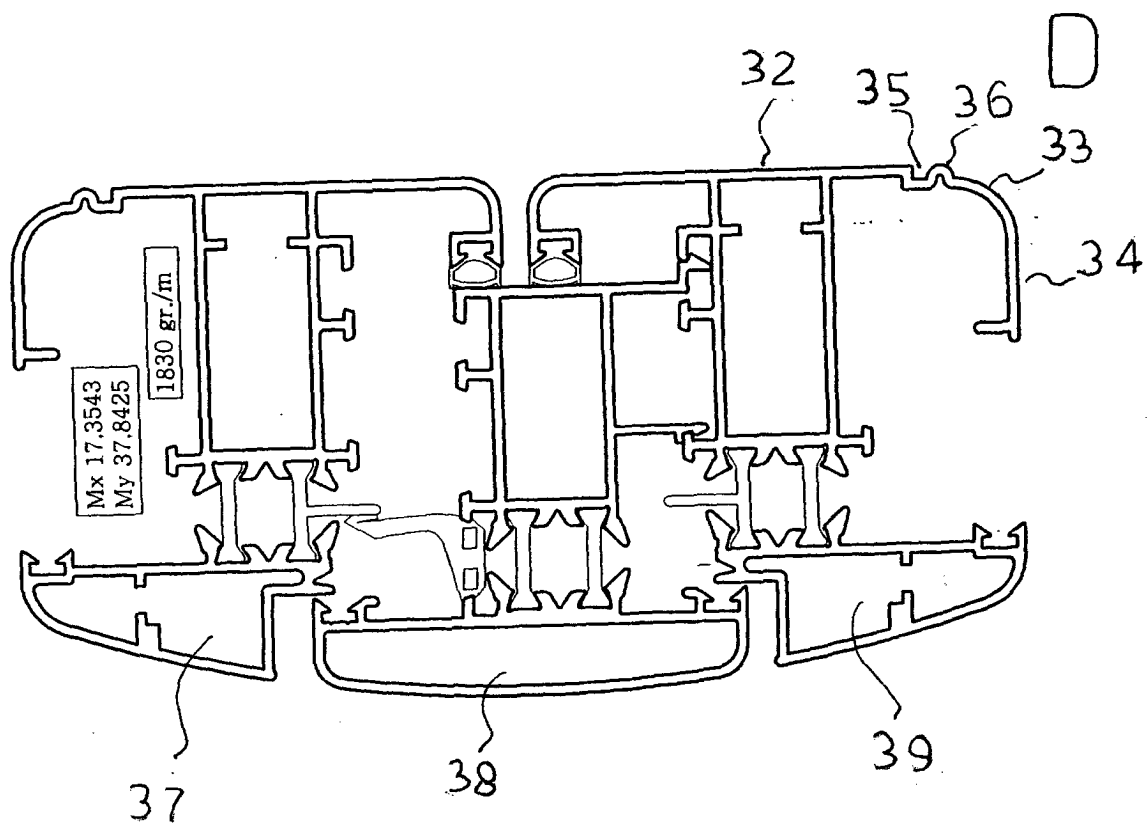


FIG. 9

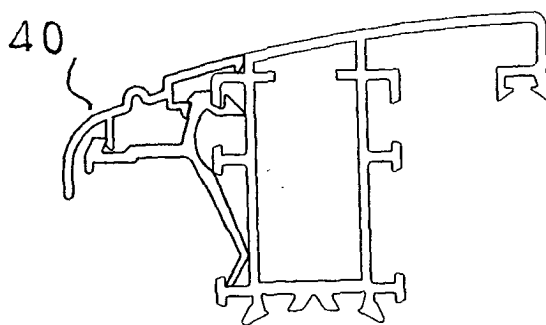


FIG. 10



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EUROPEAN SEARCH REPORT

Application Number
EP 03 42 5523

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		9 January 2004	Verdonck, B
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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09-01-2004

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