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(54) **FIREPROOF PANEL CONSTRUCTION FOR BUILDINGS AND FIREPROOF GLASS CLAMP APPLIED THEREBY**

FEUERFESTE PLATTENKONSTRUKTION FÜR GEBÄUDE UND DAFÜR VERWENDETE
FEUERFESTE GLASKLAMMER

STRUCTURE DE PANNEAU IGNIFUGE POUR BÂTIMENTS ET PINCE EN VERRE IGNIFUGE
APPLIQUÉE PAR LADITE STRUCTURE

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Description

[0001] The present invention relates to a fireproof panel construction.

[0002] Such panel constructions which are applied in windows, doors or walls of a building and are constructed from a frame composed of aluminium profiles in which a panel from glass or the like is mounted are already known.

[0003] The invention more specifically relates to panel constructions with aluminium profiles which are composed of an inner shell made from aluminium on the inside of the building and of an outer shell made from aluminium on the outside of the building, whereby the inner shell and the outer shell are connected by so-called insulating bars which extend in the width direction of the profile to form a thermal break and are made from a heat insulating material for this.

[0004] The profiles are provided with a rebate which forms a seat for the edges of the panel and which is delimited by a supporting wall which extends over the width of the profile around the panel with a certain clearance between the peripheral edge of the panel and the supporting wall.

[0005] The panel is clamped in the rebate by means of glass supports which along the contour of the panel are spread at a distance from each other and which are mounted between the peripheral edges of the panel and the supporting wall of the profiles of the frame.

[0006] The rebate is further delimited by an abutment lip on the outer shell which extends transversely to the supporting wall of the rebate and behind which the edges of the panel are hidden viewed from the outside.

[0007] From the inside the edges of the panel are covered by glazing beads in the form of profiles which are attached from the inside of the building on the inner shells in a mounting groove in the supporting wall provided for this purpose.

[0008] Along the edges of the panel, the panel construction is provided with an inner seal and an outer seal, which are mounted on either side of the panel, respectively between the glazing bead and the inner surface of the panel and between the abutment lip and the outer surface of the panel, for which purpose the abutment lip is provided with a sealing groove.

[0009] The specific feature of a fireproof panel construction is that in case of fire the panel must not come loose for a certain period of time when the heat melts and/or deforms the aluminium inner and/or outer shell and/or the insulating bars.

[0010] Such fire-resistant constructions are already known whereby extra glass clamps made from a fireproof material are attached at a distance from each other around the panel to the supporting wall of the rebate, whereby said glass clamps are provided with two legs of a U-shaped piece between which the panel extends with an edge such that, even in the event of fire causing damage to the profiles, the panel is kept in place by

the glass clamps at least for a certain period of time.

[0011] In the known fireproof panel constructions, the glass clamps are executed as two piece clamps with a base piece containing one of the legs and attached to the supporting wall and a clamp piece containing the other leg and is slid and clipped on the base piece upon assembly thus enclosing the panel between said legs. Such glass clamps are disclosed in DE102015118156A and DE202006004606U1.

[0012] For attaching the base piece, holes are drilled in the supporting wall in advance, typically two holes per glass clamp, and the base piece is attached to the supporting wall by means of screws which are screwed into the drilled holes.

[0013] A disadvantage of this is that assembling a panel in the frame of such fireproof panel construction is relatively time-consuming and labour-intensive because two holes need to be drilled per glass clamp which subsequently need to be sealed with silicones before screwing the screws in the holes to attach the base piece.

[0014] Another disadvantage is that every drilled hole in the supporting wall, no matter how well it is sealed, contains a potential hazard for leaks and unwanted water infiltration in the profiles with all related risks.

[0015] In some known cases the base piece is attached or clamped in a groove of the supporting wall additionally included in the design of the profiles specifically to that end.

[0016] Such extra groove naturally has a negative impact on the cost price of the profiles.

[0017] Moreover, water may accumulate in such extra groove, for which it is necessary to provide drainage, for example by locally interrupting a part of the walls of the groove, which again involves a time-consuming extra operation.

[0018] It is also known that in fireproof panel constructions, swelling tape is mounted around the panel on the supporting wall in the rebate which swells up when exposed to heat in case of fire and thus seals the gap between the panel and the supporting wall of the profiles to stop heat and flames being able to spread from one side of the panel construction to the other side.

[0019] The disadvantage of the current panel constructions is that the swelling tape must be interrupted on the level of the glass clamps to mount the glass clamps, resulting in extra work and assembly time.

[0020] The purpose of the present invention is to provide a solution to one or more of the aforementioned and other disadvantages.

[0021] To this end, the invention relates to a fireproof panel construction, constructed from a frame and a panel attached therein, whereby the frame is composed of aluminium profiles which are composed of an outer shell and an inner shell which are connected to each other by means of insulating bars and which are provided with a rebate which is delimited by a supporting wall which extends in the width direction of the profiles and by an abutment lip which is provided on the outer shell and

extends transversely to the supporting wall, whereby along the contour of the panel glass clamps made from a fireproof material are provided at a distance from each other which are attached to the profiles and are provided with a U-shaped piece with two legs between which the panel is enclosed along an edge, whereby the glass clamps are composed of a base piece containing one said leg and attached to a supporting wall and of a clamp piece containing the other leg and attached to the base piece, whereby the abutment lip along the rebate side is provided with an undercut system groove, characterised in that the base piece is executed with a clip part with which one end of the base piece is attached to the inner shell and that the glass clamp is provided with a separate anchoring part which is mounted in said system groove of the abutment lip of the outer shell and with which the other end of the base piece is attached to the abutment lip of the outer shell.

[0022] An advantage of the invention is that for mounting the glass clamps in the rebate of the profiles, putting holes and screws in the profiles is completely unnecessary and consequently the disadvantages connected to holes and screws in the profiles can be completely excluded.

[0023] Moreover, for clipping the base piece on the inner shell, a profile detail can be used with which the inner shell of the known profiles is standard equipped, such that in the design of the profiles no extra attention needs to be paid to this.

[0024] Moreover, all the applicant's profiles are by design already standard equipped with an abutment lip with said system groove with fixed dimensions on the rebate side and this regardless of the application of the profiles for wings of windows or doors or sliding doors or fixed glass panels or other applications.

[0025] This means that for the envisaged fireproof panel constructions no special profile needs to be developed and therefore the existing profiles for conventional panel constructions of windows, doors etc. can be used.

[0026] Typically, conventional profiles are provided with one or more ribs with a bent free end on the inner shell, for example to delimit one or more undercut grooves. Preferably, the base piece is clipped to such rib with a clip part.

[0027] Preferably, the anchoring part is executed with a base with two opposite edges with which the anchoring part is attached to the abutment lip behind the undercut edges of the system groove.

[0028] Such anchoring part therefore uses the existing system groove of the applicant's standard profiles such that no special profile for fireproof panel constructions needs to be provided.

[0029] According to a preferred embodiment the base of the anchoring part, viewed in the width direction, possesses a narrow dimension which is narrower than the width of the opening of the system groove on the abutment lip and on the level of said opposite edges possesses a wide dimension which is wider than said

opening and is sized such that the base can be inserted with its narrow dimension in the longitudinal direction of the system groove and subsequently by rotation over a certain angle can be attached with its opposite edges behind the undercut edges of the system groove.

[0030] This makes it very simple to attach the attachment piece to the abutment lip by a simple rotational movement.

[0031] Preferably, said opposite edges of the base of the anchoring part are connected by a bridge which in a mounted condition of the anchoring part together with the abutment lip delimits a channel in the longitudinal direction of the system groove and the base piece of the glass clamps is provided with a hook-shaped protrusion which in said channel hooks behind the anchoring part.

[0032] Thus, the base piece with the opposite end of the clip part can be easily attached without screws or holes in the rebate of the profiles by hooking into the channel behind the attachment part.

[0033] Preferably, the hook-shaped protrusion is provided with a bent free end with which the protrusion in the longitudinal direction of the system groove is secured behind a side edge of the anchoring part. Thus it is prevented that the base piece of the attachment part would unintentionally come loose in the longitudinal direction of the system groove.

[0034] According to a practical embodiment, the hook-shaped protrusion is part of the lip of the base piece or is formed by it such that no extra equipment is needed for the hook-shaped part.

[0035] Preferably, the base piece is provided with two supports with which it rests on the supporting wall of the rebate, bridging the swelling tape on the supporting wall with one support resting on the inner shell and the other leg resting on the outer shell.

[0036] This offers the advantage that the swelling tape in the rebate does not have to be removed on the level of the glass clamps before said glass clamps are mounted.

[0037] The base piece can advantageously be made in one piece from a slit-shaped fireproof material such as stainless steel, for example by folding and punching a strip made from this material.

[0038] The invention also relates to a fireproof glass clamp for use in a fireproof panel construction according to the invention with a rebate for a panel which is delimited by a supporting wall and by an abutment lip transverse thereto, whereby the glass clamp is provided with a U-shaped piece with two upright legs and is composed of a base piece containing one said leg and a clamp piece containing the other leg and can be attached to the base piece, characterised in that the base piece is executed with a downward facing clip part at one end with which said end of the base piece can be clipped to a rib of the abutment lip without screws or holes in the abutment lip and that the glass clamp is further provided with an anchoring part with which the other end of the base piece can be attached to the abutment lip.

[0039] With the intention of better showing the char-

acteristics of the invention, a preferred embodiment of a fireproof panel construction according to the invention and a fireproof glass clamp applied thereby is described hereinafter, by way of an example without any limiting nature, with reference to the accompanying drawings wherein:

figure 1 schematically shows a perspective view of a fire-resistant panel construction according to the invention in the form of a leaf of a window;
figure 2 schematically shows a view according to arrow F2 in figure 1;
figure 3 shows a cross-section according to line III-III in figure 2;
figure 4 shows a glass clamp according to the invention mounted in a section of the frame shown without panel and glazing beads on a larger scale ;
figure 5 shows the section of figure 4 in disassembled condition;
the figures 6 to 10 illustrate the consecutive steps of the assembly of the glass clamp in the frame;
figure 11 shows a rear view of the section indicated in figure 10 with arrow F11;
figure 12 shows a bottom view of the section shown in figure 11.

[0040] By way of example a fireproof panel construction 1 according to the invention in the form of a leaf of a window is shown in figures 1 to 3.

[0041] The panel construction 1 is constructed from a frame 2 and a panel attached therein, whereby the frame 2 is composed of hollow aluminium profiles 4 which are composed of an inner shell 4a and an outer shell 4b which are connected to each other by means of insulating bars 4c made from synthetic material or the like, whereby the outer shell is provided with an abutment lip 4d to delimit a rebate 5 for the edges 3a of the panel 3.

[0042] The rebate 5 is delimited by a supporting wall 4e which extends in the width direction of the profiles 4 and by said abutment lip 4d which extends transversely to said supporting wall 4e.

[0043] Along its contour, the panel 3 is enclosed between two seals, respectively:

- an outer seal 6 on the outside 3c of the panel 3, said outer seal 6 in a sealing groove 7 being attached to the side of the abutment lip 4d facing the rebate 5; and,
- an inner seal 8 which is mounted on a glazing bead 9 which is itself attached from the inside 3b of the panel 3 to the inner shell in an undercut mounting groove 10 on the abutment 4e of the inner shell 4a, said mounting groove 10 being delimited on one side by a T-shaped rib 11 at a distance from the interior edge of the abutment 4e.

[0044] Apart from the sealing groove 7, the abutment lip 4d along the rebate side 5 is also provided with an

undercut system groove 12, the opening of which is delimited in a width direction by two undercut edges 13 in the form of two ribs oriented towards one another.

[0045] The panel 3 is enclosed in the rebate 5 by a series of glass supports 14 which are mounted along the contour of the panel 3 at a distance from each other to support the panel 3 with a gap 15 between the panel 3 and the supporting walls 4e of the rebate 5 of the frame 2.

[0046] Swelling tape 16 is mounted around the panel 3 on the supporting walls 4e on the level of the insulating bars 4c which in case of fire are to seal the gap 15 by swelling under the influence of the heat to prevent that heat and/or flames could penetrate from one side of the panel construction 1 to the other side.

[0047] In addition to the glass supports 14, glass clamps 17 according to the invention are also mounted between the frame 2 and the panel 3 which are bridgingly attached across the swelling tape 16 to the frame 2 and which contain a U-shaped piece 18 with legs on either side of the panel 3, respectively a leg 18a between the inside 3b of the panel 3 and the glazing beads 9 of the frame 2 and a leg 18b between the outside 3c of the panel 3 and the abutment lip 4d.

[0048] The glass clamps 17 are made from a fireproof material, such as stainless steel, which in case of fire lasts longer than the materials from which the profiles 4 of the frame 2 are made, such as aluminium for the inner and outer shell 4a and 4b and heat-insulating synthetic material for the insulating bars 4c.

[0049] The glass clamps 17 according to the invention are composed of three separate pieces, i.e.:

- a base piece 19 containing one said leg 18b of the U-shaped piece 18 and attached to the supporting wall 4e;
- a clamp piece 20 containing the other leg 18a and attached to the base piece 19; and,
- an anchoring part 21 which can be attached in said system groove 12 of the abutment lip 4d of the outer shell 4b and with which the base piece 19 can be attached in the rebate 5 with an end against the abutment lip 4d.

[0050] The base piece 19 is made of a strip of sheet material, for example steel, and is mounted across the swelling tape 16 and to this end is provided with two supports 19a and 19b with which the base piece 19 supports on the abutment 4e in the rebate 5, respectively a first support 19a at a first end with which the base piece 19 supports on the inner shell 4a and a second support 19b supporting on the abutment 4e of the outer shell 4b.

[0051] At a short distance from the first support 19a a downward facing clip part 19c is provided with a barb 19d oriented toward the first support 19a which together with the first support 19e forms a clip with which the first end of the base piece 19 can be hooked over the T-shaped rib 11 without having to screw or drill holes.

[0052] The second end of the base piece 19 is bent

right-angledly in the direction away from the supports 19a and 19b to form said leg 18b of the U-shaped piece 18 between the panel 3 and the abutment lip 4d.

[0053] This bent end 18b is detached over a certain width of the base piece 19 from the rest of the base piece 19 to form a hook-shaped protrusion 19f with which the base piece 19 can be or is hooked behind the anchoring part 21 as shown in the figures 3 and 4 and figure 11.

[0054] The free end 19f of the hook-shaped piece 19e is bent along a small length in the direction of the first support 19a of the basic element 19.

[0055] The anchoring part 21 contains a base 21a with two opposite edges 21b with which the anchoring part 21 can be, or is, attached behind the undercut edges 13 of the system groove 12.

[0056] Viewed in the width direction, said base 21a of the anchoring part 21 possesses a narrow dimension 3 which is narrower than the width A of the opening of the system groove 12 on the abutment lip 4d and possesses a wide dimension C on the level of said opposite edges 21a which is wider than said opening.

[0057] The anchoring part 21 is sized such that the base 21a can be inserted with its narrow dimension B in the longitudinal direction of the system groove 12 as shown in figure 6 and subsequently, as shown with arrow R in figure 6, by rotation over a certain angle can be attached with its opposite edges 21b behind the undercut edges 13 of the system groove 12 as shown in figure 7.

[0058] The body of the anchoring part 21 is formed by a bridge 21c which connects said edges 21b to each other and which in a mounted condition of the anchoring part 21 together with the base of the system groove 12 on the abutment lip 4e delimits a channel 22 which extends in the longitudinal direction of the system groove 12.

[0059] The anchoring part 21 is provided with a seal 21d at the side facing away from the abutment lip 4e.

[0060] The base piece 19 shown in the example is made in one piece, based on a slat made from a fireproof material.

[0061] The first support 19a is obtained by double folding an end of the slat along a certain length downwards.

[0062] The leg 18b of the U-shaped piece 18 that is part of the basic element 19 is formed by folding the other end of the slat upward.

[0063] The second support 19b is realised by making an L-shaped incision in the slat along the folding line of said leg 18b and further connecting right-angledly thereon in the longitudinal direction of the slat to form a tongue which is subsequently folded down double and in the example has a width which is approximately half the width of the slat.

[0064] The clip part 19c is formed by an incision for delimiting a lip-shaped part which is folded downward along its base and the free end of which is folded over to form said barb 19d.

[0065] The clamp piece 20 is also formed in one piece from plate material and possesses U-shaped folded side

edges 20a with which said clamp piece 20 is slideably mounted over the side edges of the base piece 19.

[0066] The clamp piece 20 is provided with locking means in the known way in the form of a downward angled lip 20b which when sliding the clamp piece 20 on the base piece 19 elastically clicks in a groove 19g of a series of grooves which to this end are provided in different click positions in the base piece 19.

[0067] The assembly of a fireproof glass clamp 17 according to the invention is very simple and as follows.

[0068] First, for every glass clamp 17 to be mounted an anchoring part 21 is mounted in the system groove 12 on the inside of the abutment lip 4e of the frame 2 by screwing in as shown in the figures 6 and 7.

[0069] Subsequently, as shown in figure 8, a base piece 19 in an upwardly sloping position with the hook-shaped protrusion 19e in the direction of arrow P is hooked behind the anchoring part 21, to subsequently, as shown with arrow Q in figure 9, let the base piece 19 hinge around the hook-shaped protrusion 19e to clip the clips 19a-19d at the other end over the T-shaped rib 11 as shown in figure 10.

[0070] The base piece 19 is now anchored to the frame 2, on the one hand with one end to the inner shell 4a and, on the other hand, with the other end to the outer shell 4b and this without drilling or screwing and without having to interrupt the swelling tape 16.

[0071] When base pieces 19 of all glass clamps 17 are mounted in this way, the panel 3 can be mounted in the frame 2 and fixed in the rebate 5 by means of the glass supports 14.

[0072] Now the clamp pieces 20 of the glass clamps 17 can be slid from the inside of the frame on the mounted base pieces with enclosure of the panel 3 between the legs 18a and 18b of the U-shaped piece 18 of the glass clamps 17.

[0073] Subsequently, the glazing beads 9 with the inner seals 7 can be mounted to finish the fireproof panel construction 1 according to the invention.

[0074] In case of fire on the inside or the outside of the panel construction or the like, there is a chance the inner shells or the outer shells and/or the insulating bars melt away or deform such that the frame loses its structural properties to hold the panel 3 in place.

[0075] However, the fireproof glass clamps 17 prevent that the panel 3 can fall out of the frame 2 because it is still held by the glass clamps 17 which remain anchored to the inner shell or to the outer shell on the other side of the fire and which last longer than the shells on the side of the fire.

[0076] Thus, in case of fire the panels 3 can be held in place for a certain period of time without coming loose from the frame 2.

[0077] The present invention is by no means limited to the embodiments described as an example and shown in the figures, but a fireproof panel construction according to the invention and a fireproof glass clamp 17 applied thereby can be realised in all kinds of forms and dimensions without departing from the scope of the invention.

Claims

1. Fireproof panel construction (1), constructed from a frame (2) and a panel (3) attached therein, whereby the frame (2) is composed of aluminium profiles (4) which are composed of an inner shell (4a) and an outer shell (4b) which are connected to each other by means of insulating bars (4c) and which are provided with a rebate (5) which is delimited by a supporting wall (4e) which extends in the width direction of the profiles (4) and by an abutment lip (4d) which is provided on the outer shell (4b) and extends transversely to the supporting wall (4e), whereby along the contour of the panel (3) glass clamps (17) made from a fireproof material are attached to the profiles (4) at a distance from each other and which are provided with a U-shaped part (18) with two legs (18a, 18b) between which the panel (3) is enclosed along an edge, whereby the glass clamps (17) are composed of a base piece (19) containing one said leg (18b) and attached to the supporting wall (4e) and of a clamp piece (20) containing the other leg (18a) and attached to the base piece (19), whereby the abutment lip (4d) along the rebate side (5) is provided with an undercut system groove (12), **characterised in that** the base piece (19) is executed with a clip part (19c-19d) with which the base piece (19) is attached to the inner shell (4a) with one end and that the glass clamp (17) is further provided with a separate anchoring part (21) which is separate from the base piece (19) and which is mounted in said system groove (12) of the abutment lip (4d) of the outer shell (4b) and with which the other end (18b) of the base piece (19) is attached to the abutment lip (4d) of the outer shell (4b).
2. Fireproof panel construction according to claim 1, **characterised in that** the inner shell (4a) is provided with one or more ribs (11) with a bent free end, and that the base piece (19) with its clip part (19c-19d) is clipped on such rib (11).
3. Fireproof panel construction according to claim 1 or 2, **characterised in that** the anchoring part (21) contains a base (21a) with two opposite edges (21b) with which the anchoring part (21) is attached behind the undercut edges (13) of the system groove (12).
4. Fireproof panel construction according to claim 3, **characterised in that** the base (21a) of the anchoring part (21) viewed in the width direction possesses a narrow dimension (B) which is narrower than the width (A) of the opening of the system groove (12) on the abutment lip (4d) and on the level of said opposite edges (21b) possesses a wide dimension (C) which is wider than said opening and is sized such that the base (21a) can be inserted with the narrow dimension (B) in the longitudinal direction of the system groove (12) and subsequently by rotation over a certain angle with the opposite edges (21b) can be attached behind the undercut edges (13) of the system groove (12).
5. Fireproof panel construction according to claim 3 or 4, **characterised in that** the edges (21b) of the base (21a) of the anchoring part (21) are connected with each other by a bridge (21c) which in a mounted condition of the anchoring part (21) together with the abutment lip (4d) delimits a channel (22) in the longitudinal direction of the system groove (12).
6. Fireproof panel construction according to claim 5, **characterised in that** the base piece (19) of the glass clamps (17) is provided with a hook-shaped protrusion (19e) which hooks behind the anchoring part (21) in said channel (22).
7. Fireproof panel construction according to claim 6, **characterised in that** the hook-shaped protrusion (19e) is provided with a bent free end (19f) with which the protrusion (19e) in the longitudinal direction of the system groove (12) hooks behind a side edge of the anchoring part (21).
8. Fireproof panel construction according to claim 6 or 7, **characterised in that** the hook-shaped protrusion (19e) is part of the lip (18b) of the base piece (19) or is formed by it.
9. Fireproof panel construction according to any one of the previous claims, **characterised in that** the anchoring part (21) is provided with a seal (21d) at the side facing away from the abutment lip (4d).
10. Fireproof panel construction according to any one of the previous claims, **characterised in that** on the supporting wall (4e) of the rebate (5) swelling tape (16) is provided around the peripheral edge of the panel (3) on the level of an insulating bar (4c).
11. Fireproof panel construction according to claim 10, **characterised in that** the base piece (19) is provided with two supports (19a, 19b) with which it rests on the supporting wall (4e) of the rebate (5), bridging the swelling tape (16), with one support (19a) resting on the inner shell (4a) and the other leg (19b) resting on the outer shell (4b).
12. Fireproof panel construction according to claim 11, **characterised in that** the base piece (19) is rotatable around its hook-shaped protrusion (19e) with the hook-shaped protrusion (19e) hooked behind the anchoring part (21).
13. Fireproof panel construction according to any one of

the previous claims, **characterised in that** the base piece (19) is made from one piece from a slat made from fireproof material.

14. Fireproof panel construction according to any one of the previous claims, **characterised in that** the clamp piece (20) is mounted slideably in the width direction of the profile. 5
15. Fireproof panel construction according to claim 14, **characterised in that** the clamp piece (20) is mounted slidingly lockable in one or more click positions on the base piece (19). 10
16. Fireproof glass clamp (17) for use in a fireproof panel construction (1) according to any one of the previous claims, for the attachment in a rebate (5) which is delimited by a supporting wall (4^e) and by an abutment lip (4d) transverse thereto, whereby the glass clamp (17) is provided with a U-shaped piece (18) with two upright legs (18a, 18b) and is composed of a base piece (19) containing one said leg (18b) and a clamp piece (20) containing the other leg (18a) and can be attached to the base piece (19), **characterised in that** the base piece (19) is executed at one end with a downward facing clip part (19c-19d) with which said end can be clipped to the abutment (4e) and that the glass clamp (17) is further provided with a separate anchoring part (21) which is separate from the base piece (19) and with which the other end of the base piece (19) can be attached to the abutment lip. 15 20 25 30

Patentansprüche

1. Konstruktion eines feuerfesten Paneels (1), die aus einem Rahmen (2) und einem darin befestigten Paneel (3) besteht; wobei der Rahmen (2) aus Aluminiumprofilen (4) besteht, die aus einer inneren Schale (4a) und einer äußeren Schale (4b) bestehen, die jeweils mittels Isolierstegen (4c) miteinander verbunden sind, und die mit einem Falz (5) versehen sind, der von einer Stützwand (4e), die sich in Breitenrichtung der Profile (4) erstreckt, und einer als Anschlag fungierenden Lippe (4d) begrenzt wird, die an der Außenschale (4b) vorgesehen ist und sich in Querrichtung zur Stützwand (4e) erstreckt; wobei entlang der Kontur des Paneels (3) Glasklemmen (17), die aus einem feuerfesten Material hergestellt sind, an den Profilen (4) in einem Abstand voneinander befestigt sind und die mit einem U-förmigen Element ausgestattet sind, das zwei Schenkel (18a, 18b) besitzt, zwischen denen das Paneel (3) entlang einer Kante eingeschlossen ist; wobei die Glasklemmen (17) aus einem Basisteil (19), das einen der Schenkel (18b) enthält und an der Stützwand (4e) befestigt ist, und einem Klemmteil (20), 35 40 45 50

das den anderen Schenkel (18a) enthält und an dem Basisteil (19) befestigt ist, bestehen; wobei die als Anschlag fungierende Lippe (4d) entlang der Seite, an der sich der Falz (5) befindet, mit einer vom Hinterschnitttyp System-Nut (12) versehen ist; **dadurch gekennzeichnet dass** das Basisteil (19) mit Hilfe eines klammerförmigen Elements (19c-19d) hergestellt ist, mit dem das Basisteil (19) an einem Ende an der inneren Schale (4a) befestigt ist, und dass die Glasklemme (17) ferner mit einem separaten Verankerungselement (21) ausgestattet ist, das von dem Basisteil (19) getrennt ist und das in der oben genannten System-Nut (12), der als Anschlag fungierenden Lippe (4d) der Außenschale (4b), angebracht ist, und mit dem das andere Ende (18b) des Basisteils (19) an der als Anschlag fungierenden Lippe (4d) der Außenschale (4b) befestigt ist.

2. Konstruktion eines feuerfesten Paneels nach Anspruch 1, **dadurch gekennzeichnet, dass** die innere Schale (4a) mit einer oder mehreren Rippen (11) ausgestattet ist, die ein gefaltetes freies Ende umfassen, und dass das Basisteil (19) mit seinem klammerförmigen Element (19c-19d) durch Einrasten auf der Rippe (11) angebracht ist. 20 25
3. Konstruktion eines feuerfesten Paneels nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Verankerungselement (21) eine Basis (21a) enthält, die zwei gegenüberliegende Kanten (21b) umfasst, mit denen das Verankerungselement (21) hinter den hinterschnittenen Kanten (13) der System-Nut (12) befestigt ist. 30
4. Konstruktion eines feuerfesten Paneels nach Anspruch 3, **dadurch gekennzeichnet, dass** die Basis (21a) des Verankerungselements (21) in der Breite gesehen einen schmal dimensionierten Abschnitt (B) besitzt, der schmaler ist als die Breite (A) der Öffnung der System-Nut (12) an der als Anschlag fungierenden Lippe (4d) und an den gegenüberliegenden Kanten (21b), einen breit dimensionierten Abschnitt (C) besitzt, der breiter ist als die Öffnung und der so dimensioniert ist, dass die Basis (21a) mit dem schmal dimensionierten Abschnitt (B) in Längsrichtung der System-Nut (12) eingeführt werden kann und dann durch Drehung, die einen Winkel mit den gegenüberliegenden Kanten (21b) bildet, hinter den hinterschnittenen Kanten (13) der System-Nut (12) befestigt werden. 35 40 45 50
5. Konstruktion eines feuerfesten Paneels nach Anspruch 3 oder 4, **dadurch gekennzeichnet, dass** die Kanten (21b) der Basis (21a) des Verankerungselements (21) durch eine Brücke (21c) miteinander verbunden sind, die in einem angebrachten Zustand des Verankerungselements (21) zusammen mit der als Anschlag fungierenden Lippe (4d) einen Kanal 55

- (22) in der Längsrichtung der System-Nut (12) begrenzen.
6. Konstruktion eines feuerfesten Paneels nach Anspruch 5, **dadurch gekennzeichnet, dass** das Basisteil (19) der Glasklemmen (17) mit einem Vorsprung (19e) versehen ist, der eine hakenförmige Ausbildung besitzt, die hinter dem Verankerungselement (21) in den Kanal (22) eingreift. 5
 7. Konstruktion eines feuerfesten Paneels nach Anspruch 6, **dadurch gekennzeichnet, dass** der Vorsprung (19e), der eine hakenförmige Ausbildung besitzt, mit einem gebogenen freien Ende (19f) versehen ist, mit dem der Vorsprung (19e) in Längsrichtung der System-Nut (12) hinter einer Seitenkante des Verankerungselements (21) einhakt. 10
 8. Konstruktion eines feuerfesten Paneels nach Anspruch 6 oder 7, **dadurch gekennzeichnet, dass** der Vorsprung (19e), der eine hakenförmige Ausbildung besitzt, Teil der Lippe (18b) des Basisteils (19) ist oder durch dieses gebildet wird. 15
 9. Konstruktion eines feuerfesten Paneels nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Verankerungselement (21) mit einer Dichtung (21d) auf der Seite gegenüber der als Anschlag fungierenden Lippe (4d) ausgestattet ist. 20
 10. Konstruktion eines feuerfesten Paneels nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** an der Stützwand (4e) des Falzes (5) ein Quellband (16) um die Umfangskante des Paneels (3) an einem Isoliersteg (4c) vorgesehen ist. 25
 11. Konstruktion eines feuerfesten Paneels nach Anspruch 10, **dadurch gekennzeichnet, dass** das Basisteil (19) mit zwei Schenkeln (19a, 19b) ausgestattet ist, mit denen es auf der Stützwand (4e) des Falzes (5) aufliegt, wobei es den Quellstreifen (16) überragt; wobei ein Schenkel (19a) auf der inneren Schale (4e) aufliegt und der andere Schenkel (19b) auf der äußeren Schale (4b) aufliegt. 30
 12. Konstruktion eines feuerfesten Paneels nach Anspruch 11, **dadurch gekennzeichnet, dass** das Basisteil (19) um seinen eine hakenförmige Ausbildung besitzenden Vorsprung (19e) drehbar ist; wobei der eine hakenförmige Ausbildung besitzende Vorsprung (19e) hinter dem Verankerungselement (21) einhakt. 35
 13. Konstruktion eines feuerfesten Paneels nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Basisteil (19) aus einer Latte, die aus einem feuerfesten Material hergestellt ist, in einem Stück gefertigt ist. 40

14. Konstruktion eines feuerfesten Paneels nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Klemmstück (20) gleitend in Breitenrichtung des Profils angebracht ist. 45
15. Konstruktion eines feuerfesten Paneels nach Anspruch 14, **dadurch gekennzeichnet, dass** das Klemmstück (20) so angebracht ist, dass es durch Verschieben in eine oder mehrere Rastpositionen an dem Basisstück (19) verriegelt werden kann. 50
16. Feuerfeste Glasklemme (17) zur Verwendung in einer Konstruktion eines feuerfesten Paneels (1) nach einem der vorhergehenden Ansprüche, zur Befestigung in einem Falz (5), der durch eine Stützwand (4e) und eine als Anschlag fungierende Lippe (4d) begrenzt ist, die in einer Richtung quer dazu angebracht ist; wobei die Glasklemme (17) mit einem Element ausgestattet ist, das eine U-förmige Konfiguration (18) besitzt, das zwei vertikal aufgerichtete Schenkel (18a, 18b) besitzt und das aus einem einen der Schenkel (18b) enthaltenden Basisteil (19) und einem den anderen Schenkel (18a) enthaltenden Klemmteil (20), besteht, und das an dem Basisteil (19) befestigt werden kann; **dadurch gekennzeichnet, dass** das Basisteil (19) an einem Ende mit einem nach unten gerichteten, klammerförmigen Element (19c-19d) ausgeführt ist, mit dem dieses Ende durch Einrasten an dem Anschlag (4e) befestigt werden kann, und dass die Glasklemme (17) ferner mit einem separaten Verankerungselement (21) versehen ist, das von dem Basisteil (19) getrennt ist und mit dem das andere Ende des Basisteils (19) an der als Anschlag fungierenden Lippe befestigt werden kann. 55

Revendications

1. Construction de panneau ignifugé (1), réalisée à partir d'un cadre (2) et d'un panneau (3) fixé dans ce dernier ; dans laquelle le cadre (2) se compose de profilés en aluminium (4) qui se composent d'une enveloppe interne (4a) et d'une enveloppe externe (4b) qui sont respectivement reliées l'une à l'autre au moyen de barres d'isolation (4c) et qui sont équipées d'une feuillure (5) qui est délimitée par une paroi de support (4e) qui s'étend dans le sens de la largeur des profilés (4) et par une lèvre faisant office de butée (4d) qui est prévue sur l'enveloppe externe (4b) et qui s'étend dans la direction transversale par rapport à la paroi de support (4e) ; dans laquelle, le long du contour du panneau (3), des pinces à verre (17), qui sont réalisées à partir d'un matériau ignifugé, sont fixées aux profilés (4) à une certaine distance l'une de l'autre, et qui sont équipées d'un élément qui possède une configuration en forme de U (18) qui comprend deux branches (18a, 18b) entre lesquelles 40

- les le panneau (3) est renfermé le long d'un bord ; dans laquelle les pinces à verre (17) se composent d'une pièce de base (19) qui contient une desdites branches (18b) et qui est fixée à la paroi de support (4e) et d'une pièce de serrage (20) qui contient l'autre branche (18a) et qui est fixée à la pièce de base (19) ; dans laquelle la lèvre faisant office de butée (4d), le long du côté où se trouve la feuillure (5), est équipée d'une rainure du système en biseau (12) ; **caractérisée en ce que** la pièce de base (19) est réalisée à l'aide d'un élément en forme de pince (19c-19d) avec lequel la pièce de base (19) est fixée à l'enveloppe interne (4a) par une extrémité, et **en ce que** la pince à verre (17) est en outre équipée d'un élément d'ancrage distinct (21) qui séparé de la pièce de base (19) et qui est monté dans ladite rainure du système (12), de la lèvre faisant office de butée (4d) de l'enveloppe externe (4b) et avec lequel l'autre extrémité (18b) de la pièce de base (19) est fixée à la lèvre faisant office de butée (4d) de l'enveloppe externe (4b).
2. Construction de panneau ignifugé selon la revendication 1, **caractérisée en ce que** l'enveloppe interne (4a) est équipée d'une ou de plusieurs nervures (11) qui comprennent une extrémité libre pliée, et **en ce que** la pièce de base (19) avec son élément en forme de pince (19c-19d) est disposée par encliquetage sur ladite nervure (11).
 3. Construction de panneau ignifugé selon la revendication 1 ou 2, **caractérisée en ce que** l'élément d'ancrage (21) contient une base (21a) qui comprend deux bords opposés (21b) avec lesquels l'élément d'ancrage (21) est fixé derrière les bords en biseau (13) de la rainure du système (12).
 4. Construction de panneau ignifugé selon la revendication 3, **caractérisée en ce que** la base (21a) de l'élément d'ancrage (21), lorsqu'on regarde dans le sens de la largeur, possède une partie de dimension étroite (B) qui est plus étroite que la largeur (A) de l'ouverture de la rainure du système (12) sur la lèvre faisant office de butée (4d) et, au niveau des bords opposés (21b), possède une partie de dimension large (C) qui est plus large que ladite ouverture et qui est dimensionnée d'une manière telle que la base (21a) peut être insérée avec la partie de dimension étroite (B) dans la direction longitudinale de la rainure du système (12) et ensuite, par rotation en formant un certain angle avec les bords opposés (21b), peut venir se fixer derrière les bords en biseau (13) de la rainure du système (12).
 5. Construction de panneau ignifugé selon la revendication 3 ou 4, **caractérisée en ce que** les bords (21b) de la base (21a) de l'élément d'ancrage (21) sont reliés l'un à l'autre par un pont (21c) qui, dans un état monté de l'élément d'ancrage (21), de manière conjointe avec la lèvre faisant office de butée (4d), délimitent un canal (22) dans la direction longitudinale de la rainure du système (12).
 6. Construction de panneau ignifugé selon la revendication 5, **caractérisée en ce que** la pièce de base (19) des pinces à verre (17) est équipée d'une saillie (19e) qui possède une configuration en forme de crochet qui vient s'accrocher derrière l'élément d'ancrage (21) dans ledit canal (22).
 7. Construction de panneau ignifugé selon la revendication 6, **caractérisée en ce que** la saillie (19e) qui possède une configuration en forme de crochet est équipée d'une extrémité libre pliée (19f) avec laquelle la saillie (19e), dans la direction longitudinale de la rainure du système (12), vient s'accrocher derrière un bord latéral de l'élément d'ancrage (21).
 8. Construction de panneau ignifugé selon la revendication 6 ou 7, **caractérisée en ce que** la saillie (19e) qui possède une configuration en forme de crochet fait partie de la lèvre (18b) de la pièce de base (19) ou est réalisée par l'intermédiaire de celle-ci.
 9. Construction de panneau ignifugé selon l'une quelconque des revendications précédentes, **caractérisée en ce que** l'élément d'ancrage (21) est équipé d'un joint d'étanchéité (21d) sur le côté opposé à la lèvre faisant office de butée (4d).
 10. Construction de panneau ignifugé selon l'une quelconque des revendications précédentes, **caractérisée en ce que**, sur la paroi de support (4e) de la feuillure (5), un ruban gonflant (16) est prévu autour du bord périphérique du panneau (3) au niveau d'une barre d'isolation (4c).
 11. Construction de panneau ignifugé selon la revendication 10, **caractérisée en ce que** la pièce de base (19) est équipée de deux supports (19a, 19b) avec lesquels elle repose sur la paroi de support (4e) de la feuillure (5), en surplombant la bande de gonflement (16) ; dans laquelle un support (19a) vient s'appuyer sur l'enveloppe interne (4e) et l'autre branche (19b) vient s'appuyer sur l'enveloppe externe (4b).
 12. Construction de panneau ignifugé selon la revendication 11, **caractérisée en ce que** la pièce de base (19) est rotative autour de sa saillie qui possède une configuration en forme de crochet (19e) ; dans laquelle la saillie qui possède une configuration en forme de crochet (19e) vient s'accrocher derrière l'élément d'ancrage (21).
 13. Construction de panneau ignifugé selon l'une quelconque des revendications précédentes, **caractéri-**

sée en ce que la pièce de base (19) est réalisée en une seule pièce à partir d'une latte fabriquée à partir d'un matériau ignifugé.

14. Construction de panneau ignifugé selon l'une quelconque des revendications précédentes, **caractérisée en ce que** la pièce de serrage (20) est montée en coulissement dans le sens de la largeur du profilé. 5
15. Construction de panneau ignifugé selon la revendication 14, **caractérisée en ce que** la pièce de serrage (20) est montée de manière à pouvoir à être verrouillée par coulissement dans une ou plusieurs positions d'encliquetage sur la pièce de base (19). 10
16. Pince à verre ignifugée (17) pour son utilisation dans une construction de panneau ignifugé (1) selon l'une quelconque des revendications précédentes, pour sa fixation dans une feuillure (5) qui est délimitée par une paroi de support (4e) et par une lèvre faisant office de butée (4d) qui est disposée dans une direction transversale par rapport à cette dernière ; dans laquelle la pince à verre (17) est équipée d'un élément qui possède une configuration en forme de U (18) qui comprend deux branches dressées à la verticale (18a, 18b) et qui se compose d'une pièce de base (19) qui contient une desdites branches (18b) et d'une pièce de serrage (20) qui contient l'autre branche (18a) et qui peut être fixée à la pièce de base (19), **caractérisée en ce que** la pièce de base (19) est réalisée, à une extrémité, avec un élément en forme de pince (19c-19d) orienté vers le bas, avec lequel ladite extrémité peut être fixée par encliquetage à la butée (4e) et **en ce que** la pince à verre (17) est en outre équipée d'un élément d'ancrage distinct (21) qui est séparé de la pièce de base (19) et avec lequel l'autre extrémité de la pièce de base (19) peut être fixée à la lèvre faisant office de butée. 20 25 30 35

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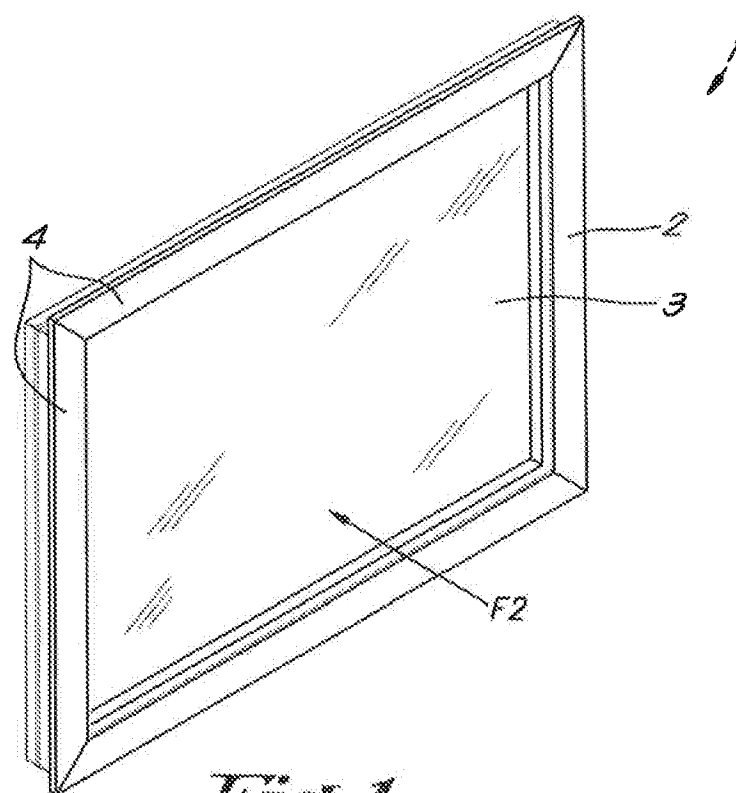


Fig. 1

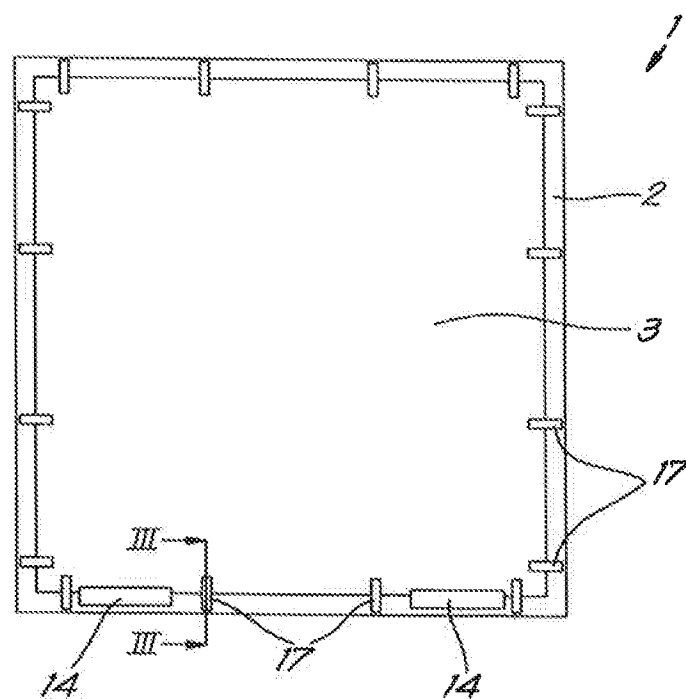


Fig. 2

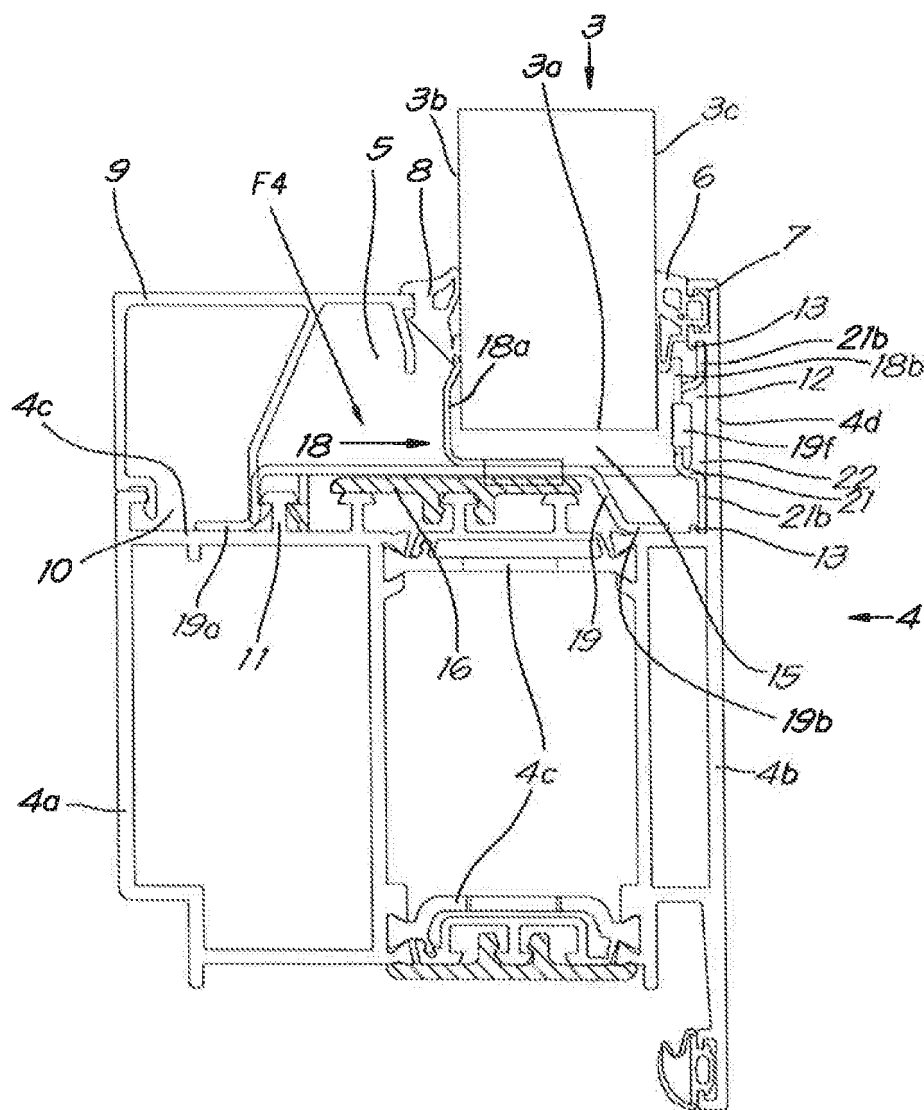


Fig.3

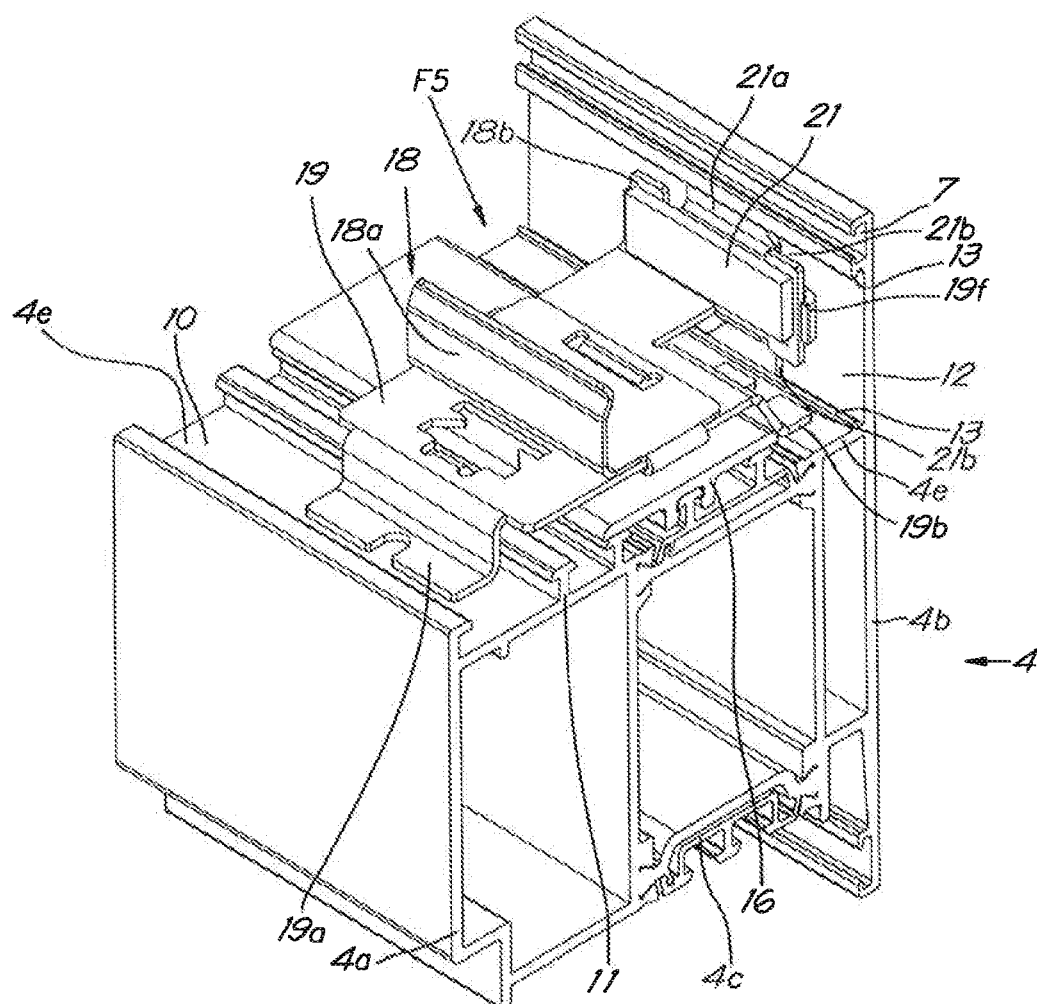


Fig.4

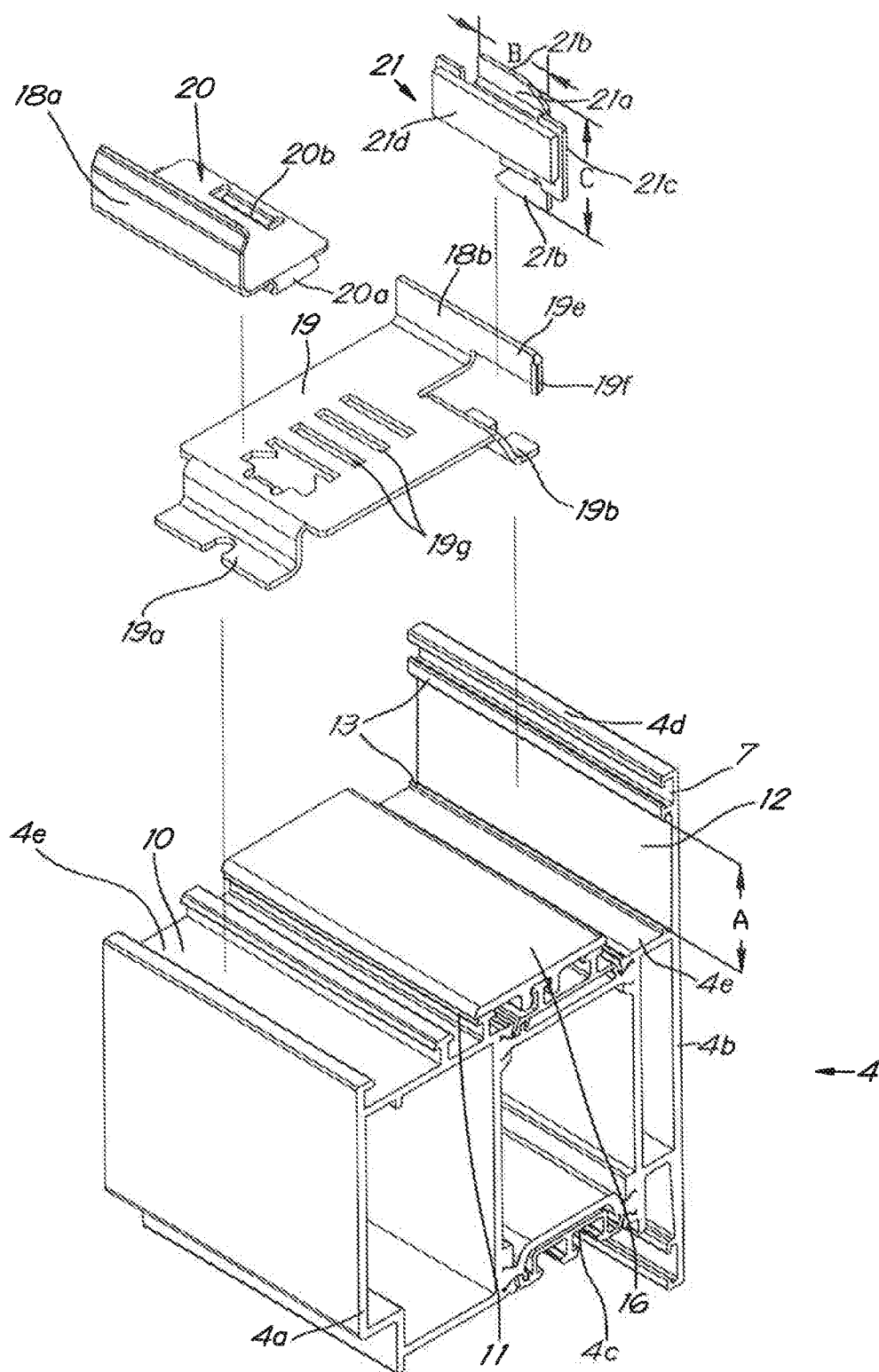


Fig. 5

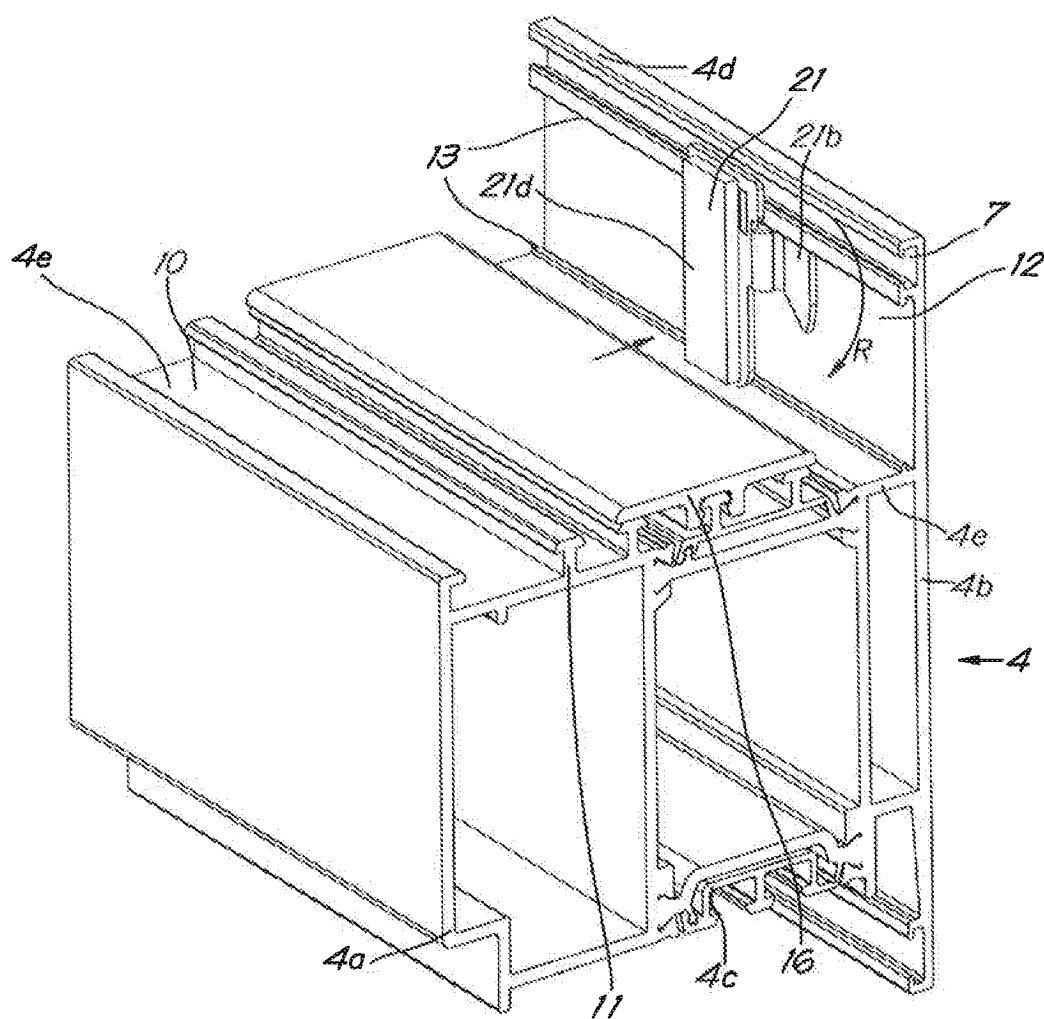


Fig.6

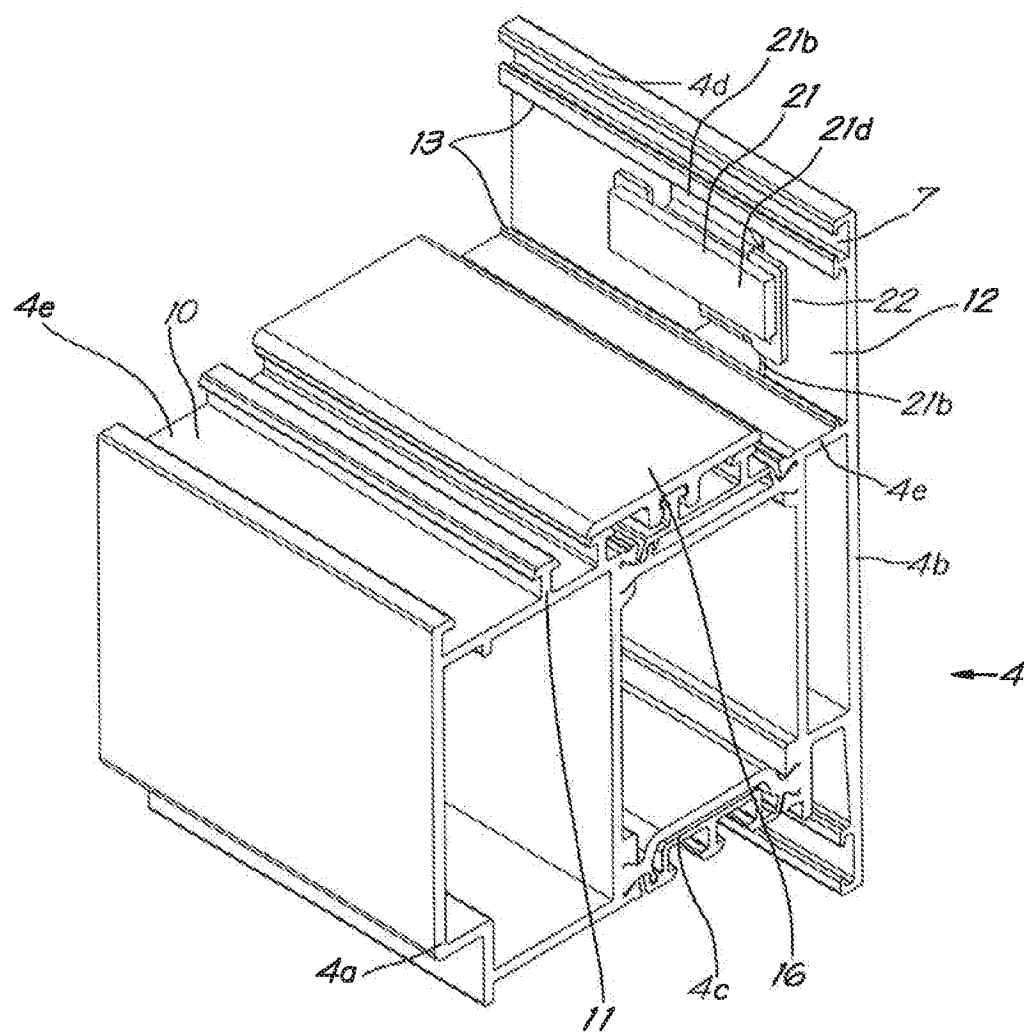


Fig. 7

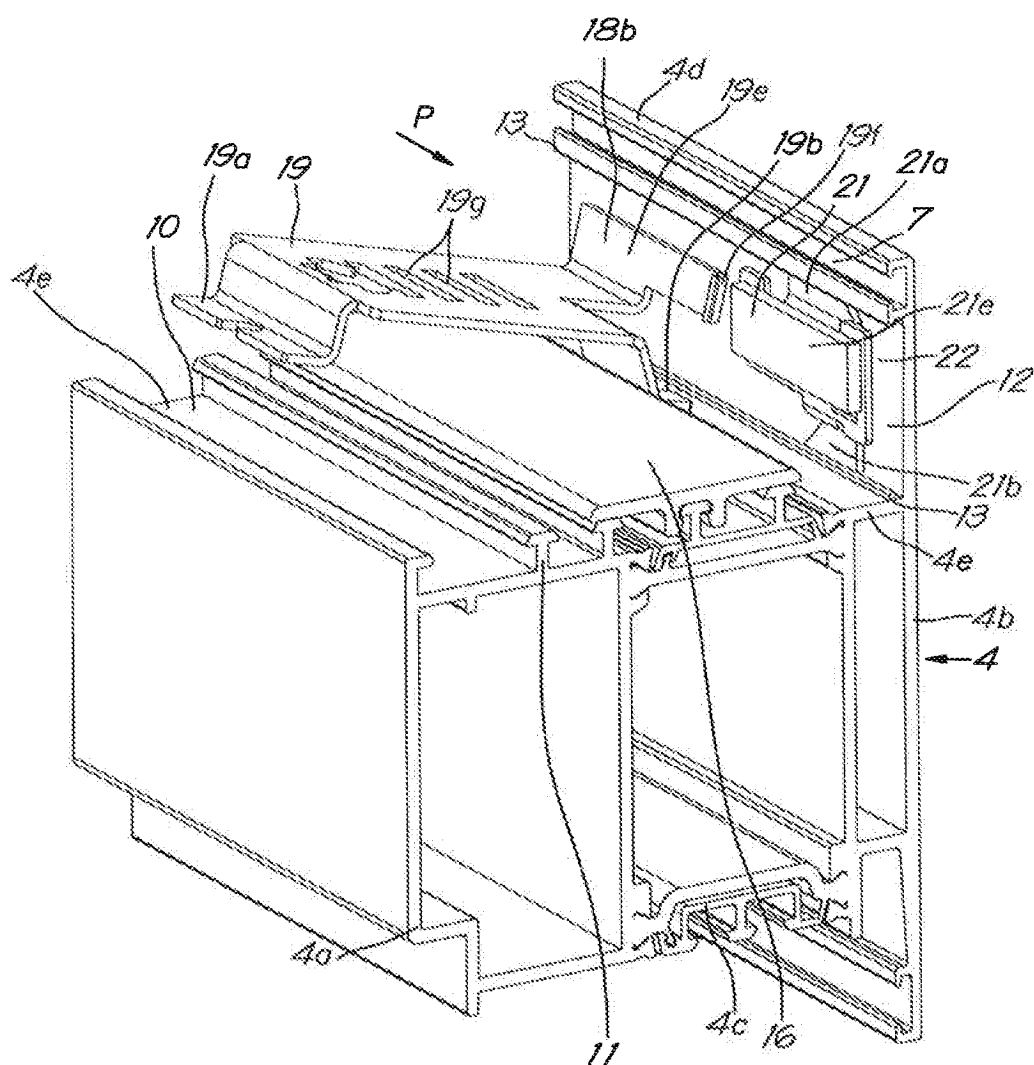


Fig. 8

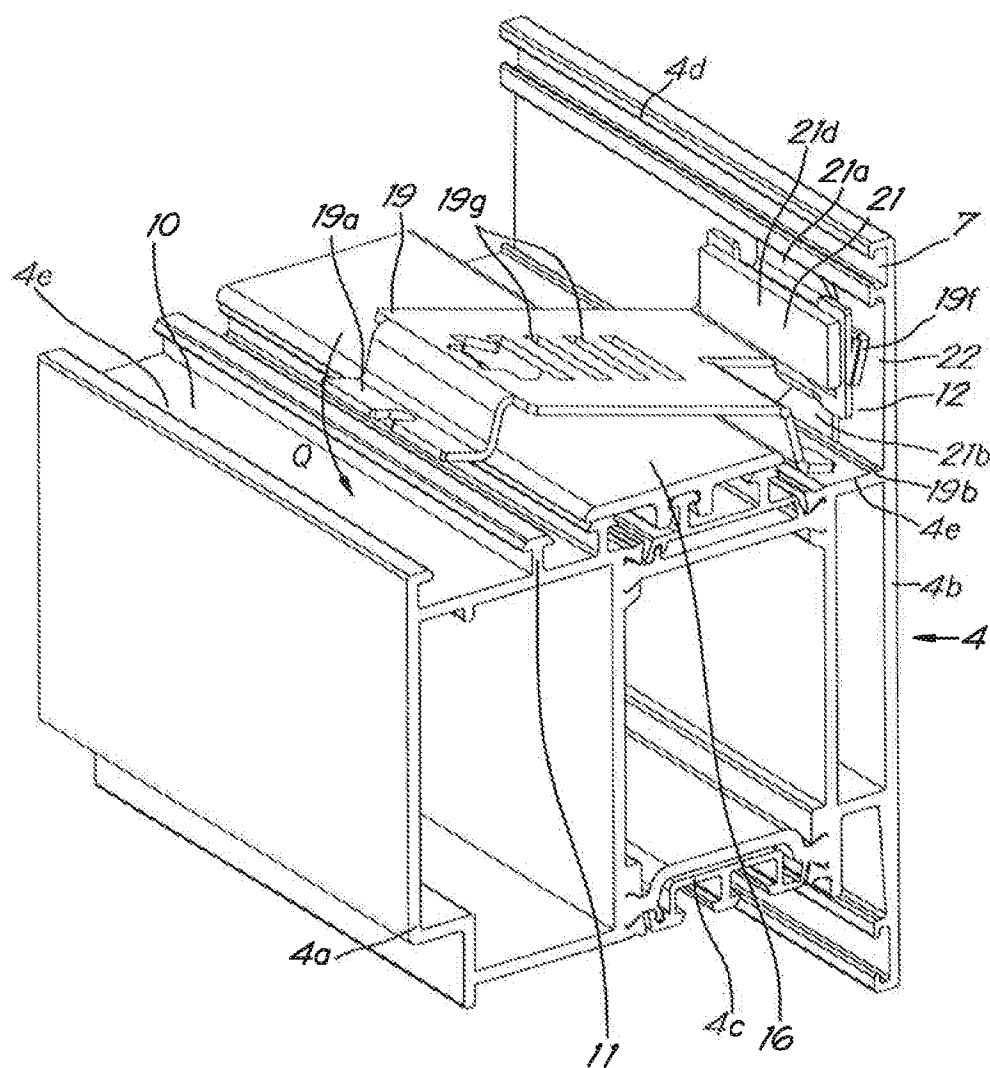


Fig. 9

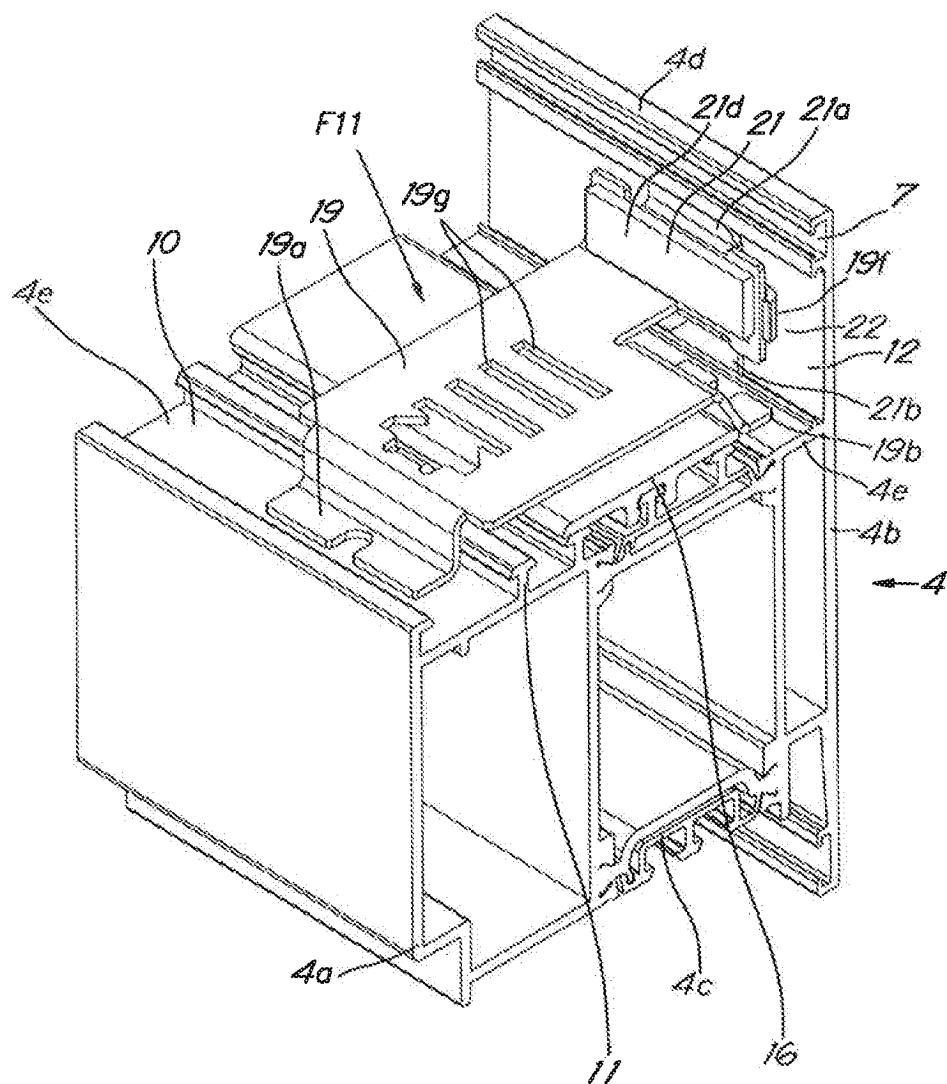
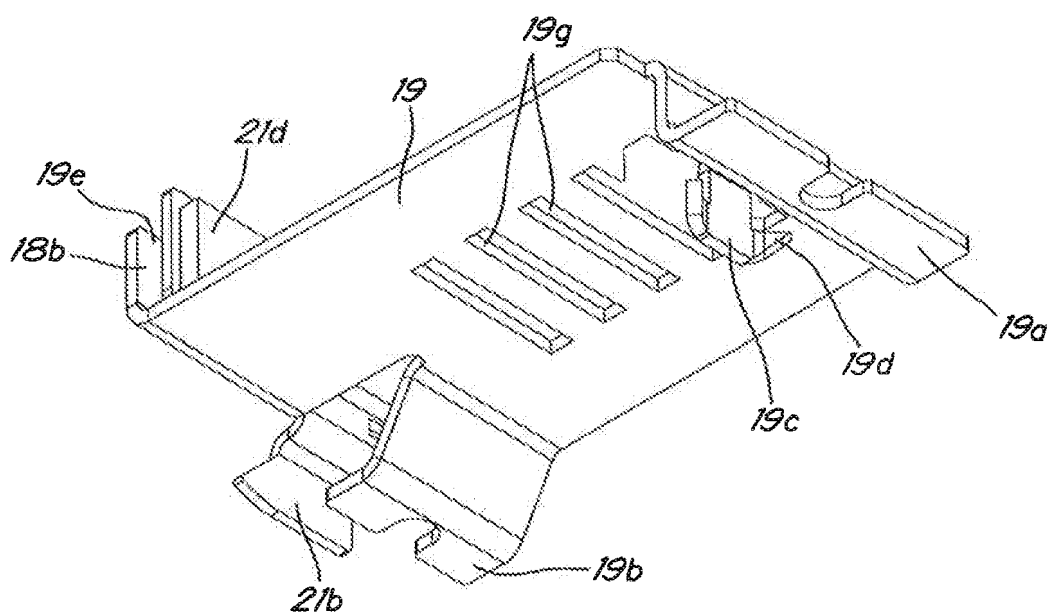
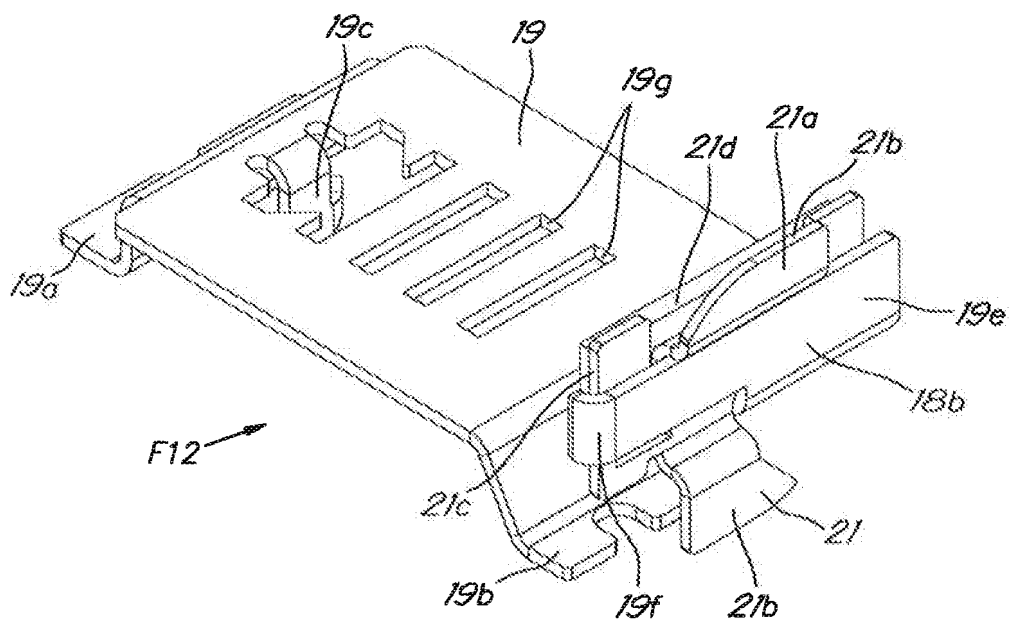


Fig. 10



REFERENCES CITED IN THE DESCRIPTION

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