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(54) Fire-resistant casing/panel structure.

(57) The invention concerns a fire-resistant casing/panel structure comprising a panel (1), outer and inner posts (3,4) made of aluminium, connected to one another by means insulating bridges (5), and local anchors (10,11) made of a material with a higher failure temperature than aluminium, divided over the length of the posts (3,4). A number of anchors are fixed to an inner post (3), and have a leg which is situated between one part (4') of an outer post (4) and the panel (1) with one end. A number of anchors (11) are fixed to an outer post (4), situated with one leg (24) between the panel (1) and a mounting post (8) made of aluminium fixed on the inner post, and comprise two anchor parts (17,18) which can be coupled to one another, one anchor part of which is fixed to the outer post (4), and the other part of which comprises the above-mentioned leg (24).

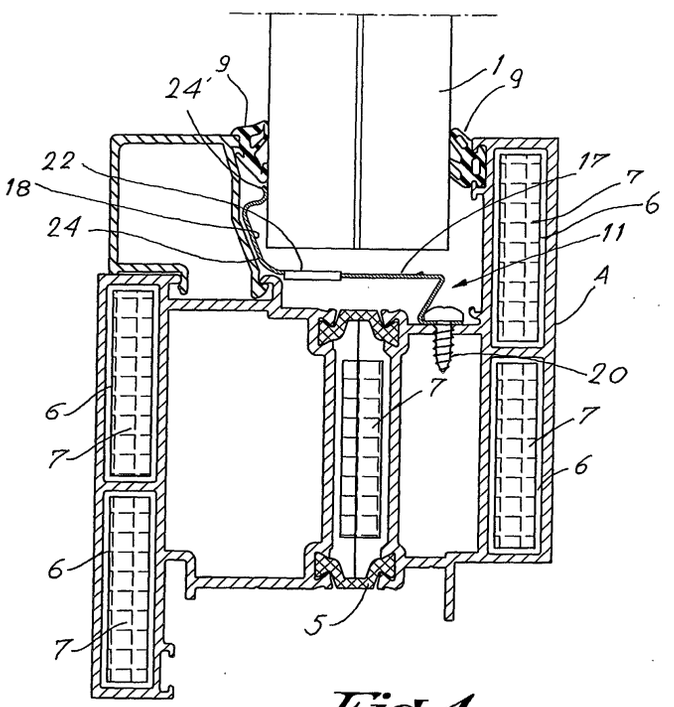

Fig.4

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Description

[0001] The present invention concerns a fire-resistant casing/panel structure comprising a panel, outer and inner posts made of aluminium, connected to one another by means insulating bridges to enclose the panel, and local anchors made of a material with a higher failure temperature than aluminium, divided over the length of the posts and fixed to one of the posts so as to retain the panel in relation to said post when fixed.

[0002] Such structures are used to prevent fire from spreading from one room to another room or a floor situated on top of it through holes formed in an outer wall or inner wall as the casing/panel structure collapses. The panels are made for example of fire-resistant glass, or provided with a material on their edges forming foam in case of fire, so that the danger of openings being formed is mainly due to aluminium posts collapsing or the connection between the posts collapsing, which is usually made of insulating plastic. In case of fire, the temperature may rise to over 900°C, and aluminium is not resistant to such temperatures.

[0003] Thus, the anchors are meant to retain the panel in case of fire in relation to one of the posts, after the post has collapsed or has become detached because the connection between the posts has broken down.

[0004] Such a casing/panel structure is known from European patent No. 0.704.596. However, the anchors are always designed to hold the inner posts and the outer posts together in case of fire.

[0005] In one embodiment of this known structure, only one sort of anchors is used which are anchored in the inner post, and they retain the outer post, and indirectly also the panel in case the outer post collapses. The panel is not retained when the inner post collapses.

[0006] In another embodiment according to said patent application, two types of anchors are used placed opposite to one another in pairs. A plate-shaped anchor is anchored to an inner post, and a profiled anchor is anchored on the outer post. In both cases, this anchoring is carried out by means of a screw fixing the outer post to an inner post. No glazing beads are used in this embodiment to retain the glass panel on the inside. The profiled anchor can be either or not screwed to the outer post.

[0007] In the first embodiment, the panel is only retained on the outside by the anchors in case of fire, but not when the inner post or the connection between the posts collapses, whereas in the second embodiment, the inner posts and outer posts have to be fixed together by means of screws, and the mounting of the anchors is relatively complex.

[0008] The present invention aims a casing/panel structure which has been improved in relation to the above-mentioned structure in many regards, and which allows for a relatively simple mounting, and which retains the panel when the outer post collapses as well as when the inner post or the connection between the posts collapses, and which can be used when the posts are not connected by screws.

[0009] To this aim, the invention consists of a casing/panel structure according to the first paragraph, whereby it contains a number of anchors fixed to an inner post, for example by means of screws, and which have a leg which is situated between one part of an outer post and the panel with one end, and a number of anchors fixed to an outer post, for example by means of screws, and situated with one leg between the panel and a mounting post made of aluminium fixed on the inner post, whereby the latter anchors comprise two anchor parts which can be coupled to one another, one anchor part of which is fixed to the outer post, and the other anchor part of which comprises the above-mentioned leg.

[0010] In this manner, the panel can be easily mounted in the casing/panel structure. Before the panel is provided, the first-mentioned anchors are fixed on the inner post, for example by means of screws, and a clamping part of the last-mentioned anchors is fixed on the outer post, for example by means of screws.

[0011] After the panel has been mounted, each fixed anchor part is coupled to the other anchor part of the last-mentioned anchors, and the mounting post is fixed on the inner post.

[0012] The above-mentioned anchors are preferably spring clamps.

[0013] According to a preferred embodiment, the above-mentioned anchors in two parts can be adjusted for several panel thicknesses.

[0014] Thus, identical anchors can be used for different panel thicknesses.

[0015] Preferably, the anchors which are fixed on an inner post do not get into contact with an outer post, whereas the anchors which are fixed on an outer post do not get into contact with an inner post.

[0016] Thus, the anchors do not form heat bridges between the inner and outer posts.

[0017] In order to better explain the characteristics of the invention, the following preferred embodiment of a casing/panel structure according to the invention is described as an example only without being limitative in any way, with reference to the accompanying drawings, in which:

figure 1 schematically represents a casing/panel structure according to the invention;
figure 2 represents a section according to line II-II in figure 1 to a larger scale;
figure 3 represents the anchor from the section according to figure 2 in perspective;
figure 4 represents a section according to line IV-IV in figure 1 to a larger scale;
figure 5 represents the anchor from the section according to figure 4 in perspective;
figure 6 schematically represents the anchor in two possible positions.

[0018] Figure 1 represents a casing/panel structure which, for clarity's sake, comprises only one panel 1 which is held in a casing 2.

[0019] It is clear that the casing 2 can be part of a front or roof construction comprising several panels 1 which are each held between four composite posts which, as represented in figures 2 and 4, mainly comprise an aluminium inner post 3 and an aluminium outer post 4 which are connected to one another by means of insulating bridges formed of two strips 5 made of thermally insulating plastic.

[0020] On the outside, the inner post 3 forms two chambers 6 filled with a fire-resistant material 7, whereas the outer post 4 also forms two chambers 6 on the outside filled with fire-resistant material 7. In the chamber, formed between the inner post 3 and the outer post 4 and between the strips 5, is also provided fire-resistant material 7.

[0021] The panel 1, in the given example, is a fire-resistant glass consisting of at least two layers with a foil in between which swells under the influence of the heat.

[0022] The panel 1 enclosed between the composite posts 3-5 is held with its edges between a part 4' forming an edge of an outer post 4 and an assembly lath 8 which is snapped in on the inside of the inner post 3.

[0023] Between the panel 1 and the edge 4', the assembly lath 8 respectively, are provided seals 9, for example made of rubber.

[0024] In order to retain the panel 1 in case of fire, the casing/panel structure contains two types of local anchors, actually consisting of spring clamps 10 and 11, and which are divided over the length of the posts.

[0025] As is represented in figures 2 and 3, a clamp 10 is predominantly L-shaped. A leg 12 is provided with an opening 13 on its far end through which a screw 14 is provided with which said leg is screwed to an inner post 3. The leg 12 extends up to the other side of the panel 1, whereas the other leg 15 extends along the edge 4' up to opposite the panel 1, where its far end is clamped against the outside of the panel 1 in a springy manner with an edge 15'.

[0026] This clamp 10 may for example be formed of rustproof spring steel and have a thickness of 0.5 mm.

[0027] As the screws 14 are situated under the assembly lath 8, this assembly lath is provided with recesses 16 to let the fixed legs of clamps 10 through.

[0028] The clamps 11 consist of two parts of spring steel, namely a base 17 and a feed part 18, which can be pushed over one another and coupled to one another, as is represented in figures 4 to 6.

[0029] The base 17 and the feed part 18 are made of rustproof spring steel, and have a thickness of for example 0.5 and 0.4 mm respectively.

[0030] The base 17 is provided with an opening 19 on one far end through which extends a screw 20 with which this base 17 is screwed to an outer post 4.

[0031] Two strips of this base 17, extending crosswise, have been pushed through so as to form two springy beards 21 which are situated near the far ends of this base 17 respectively.

[0032] The feed part 18 is predominantly L-shaped. One of its legs mainly consists of a flat ring 22 which can be pushed over the base 17 and which is provided with two longitudinal, crosswise directed openings 23 in which fits a springy beard 21. The other leg 24 is provided with a folded edge 24' on its far end.

[0033] The feed part 18 is pushed over the base 17 until either of the two beards 21 snaps into either of the openings 23. Together with the openings 23, the beards 21 thus form blocking means to block the feed part 18 in relation to the base 17 in the slide-out direction. As there are two beards 21 and two openings 23, the feed part 18 can thus be snapped-in in four positions in relation to the base 17 and be thus blocked. This makes it possible to adjust the clamp 11 to different thicknesses of the panel 1, as is represented in figure 6.

[0034] Before a panel 1 is provided in the casing 2, the clamps 10 are screwed to the inner posts 3 of said casing 2 by means of the screws 14. Also the bases 17 of the clamps 11 are fixed to the outer posts 4 by means of the screws 20.

[0035] The panel 1 is put in place, against the seals 9 provided on the edges 4' of the outer posts 4, and thus also against the edges 15' of the clamps 10, and fixed in the usual manner by means of keys.

[0036] Next, the feed parts 18 of the clamps 11 are pushed over the bases 17 which have already been provided until their edge 24' connects in a springy manner to the inside of the panel 1, while either of the two beards 21, depending on the thickness of the panel 1, simultaneously snaps into either of the openings 23. After the bases 17 and the feed parts 18 have thus been blocked in relation to one another, the assembly laths 8, whose section depends on the thickness of the panel 1, are snapped on the inner posts 3.

[0037] One leg 15 of the clamps 10 is thus situated between the edges 4' and the panel 1, whereas another leg 24 of the clamps 11 is situated between the panel 1 and the assembly laths 8.

[0038] The clamps 10 and 11 are shaped such that, when fixed, they only make contact with the post 3 or 4 upon which they are fixed, and not with the other post, so that the clamps 10 and 11 do not form thermal bridges.

[0039] If there are flames on the outside, the outer posts 4 can melt away or become detached as the strips 5 collapse. The panel 1 is still retained on the inner posts 3 by the clamps 10 which, as they are made of a material having a higher failure temperature than aluminium, resist the fire longer.

[0040] In case of fire on the inside, the inner posts 3 can melt away or become detached as the strips 5 collapse. However, the panel 1 is still retained on the outer posts 4 by the clamps 11 which, as they are made of spring steel, i.e. a material having a higher failure tem-

perature than aluminium, resist the fire longer.

[0041] Due to the fire, the panel 1 will swell in both cases. As the clamps 10 and 11 are springy, they can absorb said swelling. When there is a foil in the panel, this swelling may amount to 2 cm.

[0042] In any case, the panel 1 is retained and prevented from falling out of the casing 2, thus preventing the fire to spread.

[0043] The above-mentioned casing 2 does not necessarily need to be fixed. It may be a leaf, for example a window casement in a front construction.

[0044] The number of beards 21 and/or openings 23 must not necessarily be two. The beards 21 must not be provided on the base 17. They may be provided on the feed part 18, while the openings 23 are then provided in the base 17.

[0045] Moreover, the feed parts 18 must not necessarily be blocked on the bases 17 by means of beards 21 or openings 23 as represented in the figures. Other forms of beards 21 or openings 23 are possible, and even other locks.

[0046] The invention is by no means limited to the above-described embodiment represented in the accompanying drawings; on the contrary, such a casing/panel structure can be made in all sorts of shapes and dimensions while still remaining within the scope of the invention.

Claims

1. Fire-resistant casing/panel structure comprising a panel (1), outer and inner posts (3,4) made of aluminium, connected to one another by means of insulating bridges (5) to enclose the panel (1), and local anchors (10,11) made of a material with a higher failure temperature than aluminium, divided over the length of the posts (3,4) and fixed to one of the posts (3,4) so as to retain the panel (1) in relation to said post (3,4) when fixed, **characterised in that** it contains a number of anchors (10) fixed to an inner post (3), and which have a leg (15) which is situated between one part (4') of an outer post (4) and the panel (1) with one end, and a number of anchors (11) fixed to an outer post (4), and situated with one leg (24) between the panel (1) and a mounting post (8) made of aluminium fixed on the inner post, whereby the latter anchors (11) comprise two anchor parts (17,18) which can be coupled to one another, one anchor part (17) of which is fixed to the outer post (4), and the other anchor part (18) of which comprises the above-mentioned leg (24).

2. Fire-resistant casing/panel structure according to claim 1, **characterised in that** the above-mentioned anchors are springy clamps (10,111).

3. Fire-resistant casing/panel structure according to claim 2, **characterised in that** the anchors (10,11) are made of spring steel, for example of rustproof spring steel.

4. Fire-resistant casing/panel structure according to any of the preceding claims, **characterised in that** the above-mentioned anchors (10,11) in two parts can be adjusted for several panel (1) thicknesses.

5. Fire-resistant casing/panel structure according to any of the preceding claims, **characterised in that** the anchors in two parts comprise a base (17) and a feed part (18), and **in that** the coupling means are also blocking means (21,23) for blocking the base (17) and the feed part (18) in the slide-out direction in relation to one another.

6. Fire-resistant casing/panel structure according to claim 5, **characterised in that** the blocking means (21,23) comprise at least one beard (21) provided on an anchor part (17), for example on the base (17), and co-operating with openings (23) in the other anchor part (18), provided for example on the feed part (18).

7. Fire-resistant casing/panel structure according to claims 4 and 6, **characterised in that** the blocking means have several beards (21) and several matching openings (23), so that the feed part (18) can be blocked in several positions in relation to the base (17).

8. Fire-resistant casing/panel structure according to any of the preceding claims, **characterised in that** the anchors (10,11) fixed on an inner or outer post (3,4) do not make contact with the other post (4,3).

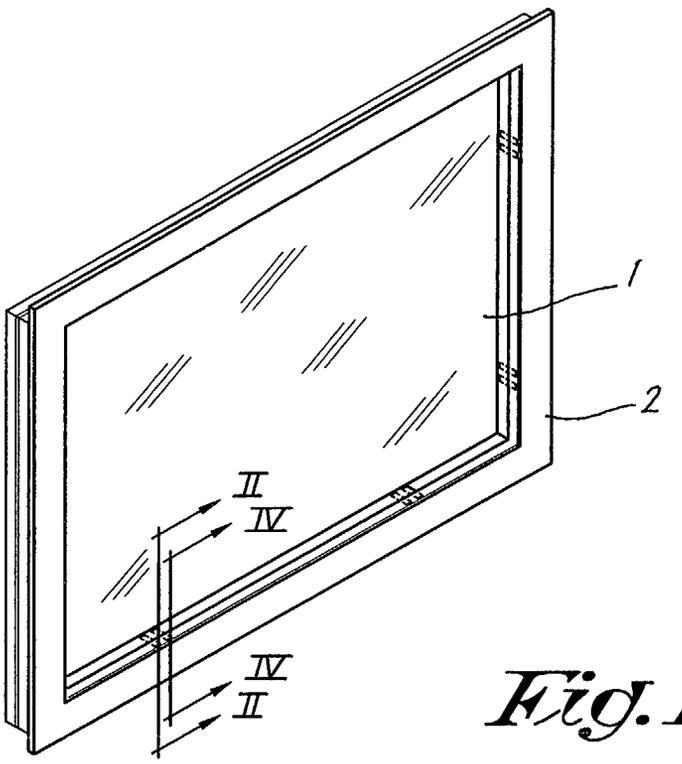


Fig.1

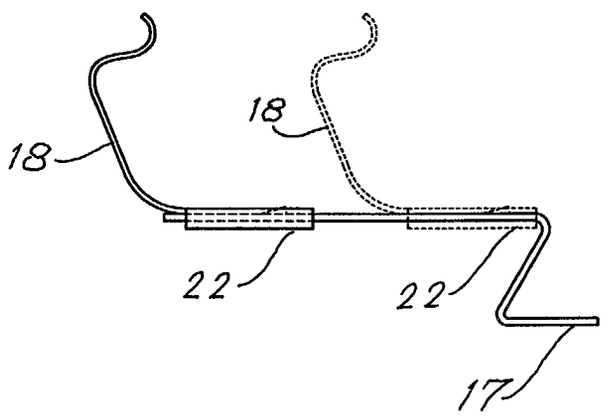


Fig.6

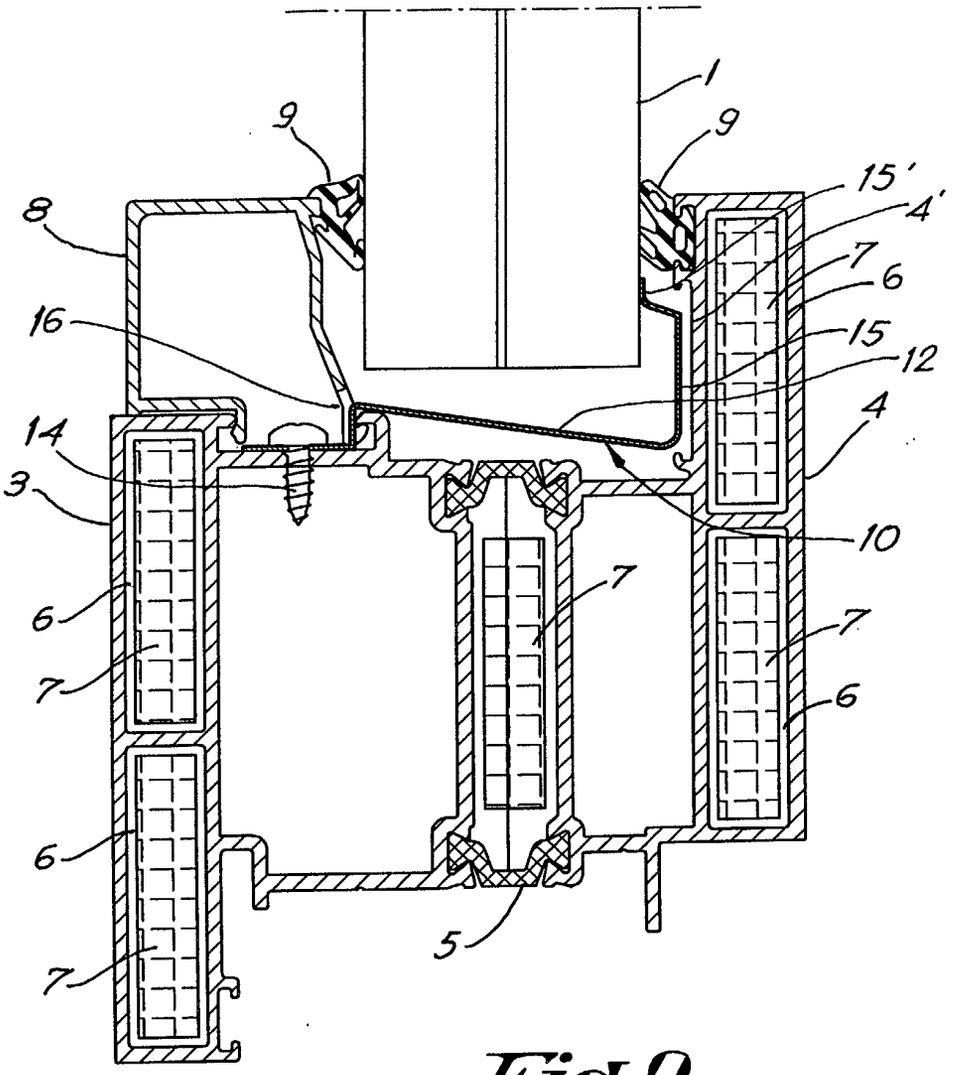


Fig.2

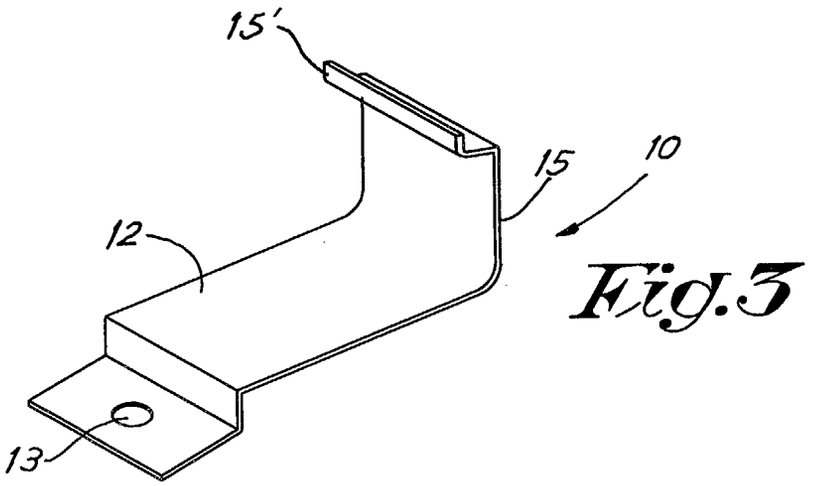
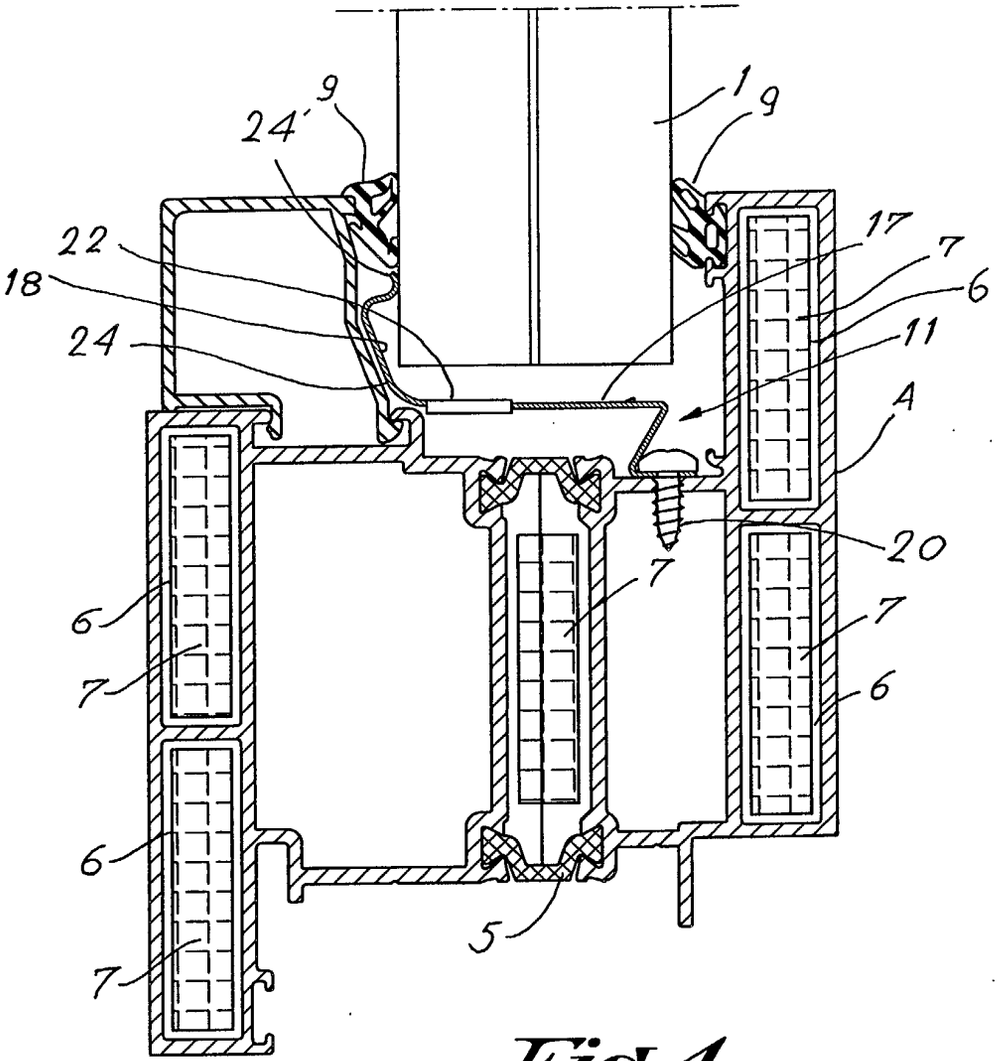


Fig.3


24'
9
1
9
17
7
6
22
18
11
24
A
20
7
6
7
7
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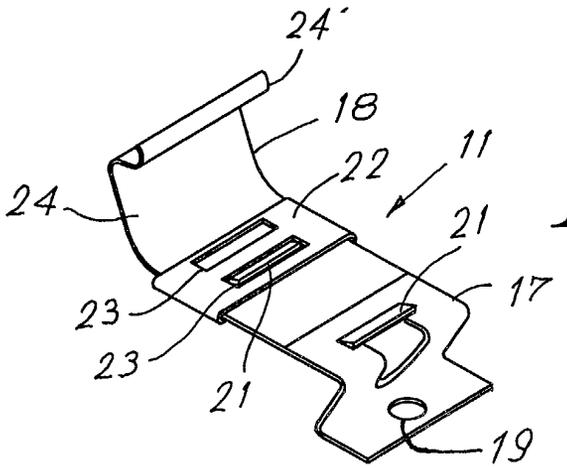
5
7

Fig.4


24'
18
11
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24
21
17
23
23
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19

Fig.5

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EUROPEAN SEARCH REPORT

Application Number
EP 02 07 8552

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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	3 December 2002	Depoorter, F

CATEGORY OF CITED DOCUMENTS

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