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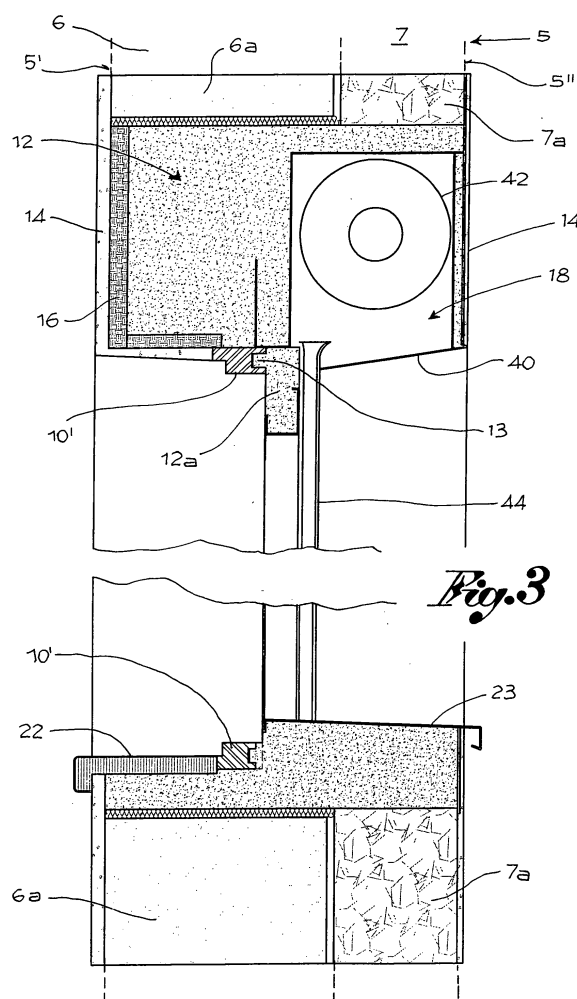
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(54) **Prefabricated door or window frame unit with an insulating surround**

(57) The invention concerns a counter-frame structure for door/window frames, suitable for insertion in an opening in an external wall (5) or roof of a building, consisting of a counter-frame (10) for a door/window frame and an insulating surround (12) in a heat insulation material which encloses the counter-frame (10) at least on the sides facing the said wall (5) and towards the exterior of the building, where the said counter-frame (10) and insulating surround (12) are interconnected in such a way as to form a single block to be inserted in the opening in the wall (5).



Description

[0001] This invention regards a counter-frame structure for a window, a French window or a skylight to be inserted in an opening in a wall or roof, separating the interior and exterior of a building.

[0002] With view to optimising the building's heat insulation the frames are made with special attention to the selection of materials, inserting suitable insulation materials into the sections comprising the frames, for example a polystyrene or a polyurethane foam, and/or envisaging appropriate gaskets between the mobile and fixed parts of the frames. In this way it is sought to increase the frame's thermal cut-off and thus increase its insulation coefficient.

[0003] However it is well known that there are considerable thermal bridges - hence sources of heat dispersion - at other points of the frame, in particular with regard to the counter-frame, i.e. in the zone of anchorage of the counter-frame to the wall, the sills, the box shutter etc.

[0004] Reducing these thermal bridges results in a considerable increase in the overall insulation coefficient of the frame.

[0005] The attempt to limit this heat dispersion has, to date, been limited to connecting any external protective skin of the building's wall to the door or window frame. This however calls for considerable modification of the wall and requires the presence of the architect and building contractor, with a consequent increase in installation time and costs.

[0006] The purpose of this invention is to propose a counter-frame structure that gives the entire frame system greater thermal efficiency while at the same time obviating the installation drawbacks mentioned above.

[0007] For a better understanding of the invention and appreciation of its advantages, some forms of its implementation are described below, by way of example and not limitative, with reference to the attached drawings in which:

[0008] figure 1 is a frontal view of a window counter-frame structure in accordance with the invention;

[0009] figure 2 is a frontal view of a window and French window counter-frame structure in accordance with the invention;

[0010] figure 3 is a section view along the line A-A in figure 1;

[0011] figure 4 is a section view analogous to figure 3 but with the frame mounted;

[0012] figure 5 is a vertical section view of the counter-frame structure for a French window;

[0013] figure 6 is a section view along line B-B in figure 1;

[0014] figure 7 is a section view along line B-B in figure 2;

[0015] figure 8 is a vertical section view of another example of a counter-frame structure for a window;

[0016] figure 9 is a horizontal section view of the frame structure in figure 8;

[0017] figure 10 is a vertical section view of a counter-frame structure for a window with an adjustable slats blind device;

[0018] figure 11 is a view analogous to the previous one but for a French window;

[0019] figure 12 is a horizontal section view of the frame structure in figure 10;

[0020] figure 13 is a vertical section view of a counter-frame structure for sliding French windows;

[0021] figure 13a is a view analogous to the previous one but with structure including blind element;

[0022] figure 14 is a horizontal section view of the counter-frame structure in figure 13a;

[0023] figure 15 is a vertical section view of the frame structure of a window with fixed glazing; and

[0024] figure 16 is a horizontal section view of the frame structure in figure 15.

[0025] With reference to the figures (where equivalent elements are indicated with the same numerical references), in accordance with a general embodiment, the counter-frame structure of the present invention comprises a counter-frame 10 for door and window frames and an insulating surround 12, in heat insulation material, which surrounds counter-frame 10 at least on the sides facing wall 5 in which it is to be placed and facing the exterior of the said wall. Counter-frame 10 and insulating surround 12 are connected in such a way as to form a single block 1, 2 to be inserted in an opening in wall 5.

[0026] An example of heat insulation material is a thermoplastic polymeric material, in particular a polystyrene.

[0027] In accordance with one embodiment, the insulating surround 12 is of such thickness as to extend between internal side 5' and external side 5" of wall 5 in which the structure is inserted. As will be better exemplified below, such a thickness of insulating surround 12 permits, in the upper part, incorporation of a recess or other containing and guiding devices for the blind elements of the frame and, in the lower part, the creation of a support base for the internal and external window sills.

[0028] It should be noted that in the examples illustrated the frame structure 1, 2 is suitable for insertion in a wall 5 consisting of a part in masonry 6 and an external protective facing 7 known as "skin". Most favourably, the insulating surround 12 extends frontally to the level of skin 7 in such a way as to create a continuous insulation between the heat insulation material of the surround and that of skin 7.

[0029] To this end surround 12 comprises a frontal portion 7a with the same thickness and in the same material as skin 7, and a rear portion 6a, also in insulating material, corresponding to the thickness of the masonry part 6. In this way, whatever the sizes of the space in the wall and of the counter-frame, thanks to the perimeter insulation parts 6a and 7a the counter-frame structure can be adapted to the size of the space and therefore inserted in the wall with extreme precision, connecting it up with insulating materials to the elements comprising the wall itself.

[0030] Most favourably, the internal and external sur-

faces of insulating surround 12, meaning those facing the interior and exterior of the building, are covered with a layer of rendering 14 which extends to conceal counter-frame 10. In other words, the rendering operation, usually carried out with the counter-frame installed, takes place at building phase, thus avoiding soiling or damaging the counter-frame at the door/window installation phase.

[0031] More precisely, on the surface facing the exterior a pre-rendering operation is carried out in such a way that, having mounted the frame, the builders then carry out a final rendering that connects the external surface of the counter-frame structure with the wall of the building.

[0032] In accordance with one embodiment, the coat of rendering or pre-rendering 14 is laid on scrim or template 16 which covers the internal and external surfaces of insulating surround 12.

[0033] In accordance with a favoured embodiment, insulating surround 12 is profiled in such a way as to define at least one housing 18 for a blind element (as will be better specified below in the description of examples of implementation).

[0034] Moreover, the insulating surround 12 integrates, or is equipped to integrate, at least certain functional elements of the door/window-frame such as guides for sliding parts and sealing elements against water or dust.

[0035] Most favourably, the guides for rolling or sliding elements are created in insulating surround 12 at a distance from the elements of counter-frame 10 in such a way as to interpose layer 12" of heat insulation material. This results in avoiding or reducing the effect of any thermal bridge that would be created by contact between the said guides and counter-frame 10.

[0036] In the case of a counter-frame for a window, the insulating surround 12 includes lower element 20 which can be covered by at least one plate in such a way as to create at least one between internal sill 22 and external sill 23 of the window-frame.

[0037] In accordance with one embodiment, the insulating surround 12 extends in such a way as to at least partially overlap frame 30 which is fixed, or will be fixed upon installation, to counter-frame 10. At least partial overlapping is understood as being at least from the part facing the exterior. In fact in this way the external side of frame 30 is covered by insulating surround 12 and therefore benefits from greater thermal protection. Having thus limited cooling of the exposed surface of frame 30, heat dispersion from interior to exterior by way of the frame is therefore avoided from the start.

[0038] According to one embodiment, the insulating surround 12 actually extends also to overlap the opening window-frame 32 in such a way that only the glazed part is visible from outside. In this case, over and above the aesthetic result, external surface cooling of both frame 30 and opening window 32 is avoided, thus reducing overall heat dispersion.

[0039] Given that especially in the cases described above - in which insulating surround 12 overlaps the

frame and the opening window - parts of the upright and parts of the jamb of insulating surround 12 in practice visually delimit the opening in the wall, these parts may be advantageously faced with the respective profiles 34, for example U-shaped and also including angle-joints in metal or plastic material, thus giving a pleasing aesthetic effect.

[0040] Furthermore, the use of a surround 12 in heat-insulation material that extends to the external surface of the wall, with the possibility of easily forming the surround elements according to taste, means that the frame structure can be connected to the said external surface with special lines, for example with inclined surfaces 36 that open towards the exterior. This among other things means maximising the entry of light through the door/window-frame, especially when the surround overlaps the frame. It should be noted that to date the same result has been sought by breaking the wall or the external protective skin, with considerable negative consequences in terms of time and costs.

[0041] In accordance with one embodiment, insulating surround 12 is formed by a plurality of elements 12', for example in the form of square bars or blocks, closely coupled in such a way as to leave no interstices through which heat could be propagated.

[0042] These elements 12' of surround 12 are coupled by means of flat and extended contact surfaces or, even more favourably, are linked with a geometrical or jointed coupling.

[0043] In any case, at least some of the elements 12' of surround 12 are fixed to counter-frame 10 of the door/window-frame. In accordance with preferred embodiments, said elements 12' of surround 12 are fixed to the counter-frame by gluing and/or by screwing and/or by means of clamps or profiled sheet metal.

[0044] In particular, and most favourably, the elements 10', 10" that define the sides of counter-frame 10, and the adjacent elements of surround 12, are profiled to be coupled geometrically or by a joint. For example, the said elements 10', 10" of counter-frame 10 have a longitudinal channel 11 in which a corresponding longitudinal projection 13 of the surround elements is inserted.

[0045] Figures 1 and 2 illustrate two counter-frame structures 1, 2 of a window and a French window respectively, in accordance with the invention, seen from the interior. The said figures show the counter-frame 10 (including upper and lower horizontal sides 10' and vertical sides or uprights 10") with the insulating surround 12, formed by elements 12', 20. Moreover there is also a housing 40 for a roller blind 42 (figures 3 and 4), also inserted in surround 12 and, in figure 1, an internal sill 22.

[0046] The latter rests on the base element 20 of surround 12.

[0047] In the embodiment for French window 2 (figures 2 and 5) no base element 20 is provided as support for sills 22, 23, but the surround terminates in any case with a lower horizontal bar or profiled section 20' suitable for setting into the floor to prevent the passage of heat from

the lower part of the frame. To this end it should be noted that lateral elements 12' of insulating surround 12 extend in the lower part to the level of the lower extremity of bar 20'.

[0048] Most favourably, therefore, in the case of both window and French window, the whole perimeter of counter-frame 10 is surrounded and enveloped by insulating surround 12.

[0049] Figures 3 and 4 illustrate a vertical section of counter-frame structure 1 for a window, before and after fixing of the actual door/window-frame 30, 32 to counter-frame 10. The internal and external sills 22 and 23 can be seen resting on base element 20. The upper horizontal element of surround 12 has, frontally, towards the exterior of the door/window-frame, a box structure suitable for delimiting housing 18 for a box 40 containing a roller blind element 42. It may moreover be seen that insulating surround 20 comprises, as well as the upper element mentioned above that rests on the jamb of the counter-frame, a further profiled section indicated as 12a which covers the frontal side of counter-frame 10 and also extends to overlap frame 30. As mentioned previously, profile 12a of surround 12 and the jamb of the counter-frame are coupled geometrically with a male (13)-female (11) type joint. An analogous arrangement of the elements of the counter-frame and the insulating surround are found in the lower part of the counter-frame structure. Figures 3 and 4 moreover show guide 44 for movement of roller blind element 42.

[0050] Figure 5 moreover shows a horizontal element 10a for fixing surround 12 to counter-frame 10. This horizontal element 10a, for example a wooden bar, is sunk into upper transversal element 12' of surround 12 to connect the latter, e.g. by means of screws, to the horizontal element below 10' of counter-frame 10.

[0051] In the horizontal sections of figures 6 and 7, with regard to window 1 and the window/French window combination 2, it is possible to note the side profiles 12' of surround 12 that accompany uprights 10" of the counter-frame. Note the presence of inclined surfaces 36 obtained in the said profiles. In these figures it can moreover be observed how guide 44 for blind element 42 is part of profiles 12' and distanced from the counter-frame 10, with the interposition of a layer 12" of heat insulation material.

[0052] Figures 8 and 9 illustrate a simpler counter-frame structure for a window 1, e.g. for a window with shutters, therefore without an integrated blind element. In this case, the upper part of surround 20 is limited to profile 12a which is joint-coupled frontally with jamb 10' of counter-frame 10. Note in figure 9 the presence of a pair of vertical bars 46 set in insulating profiles 12', e.g. in the same material as counter-frame 10, which serve as supports for the shutter hinges.

[0053] Moreover, note how horizontal element 12a of surround 12 partially covers window frame 30 while vertical elements 12' of surround 12, which are joint-coupled with uprights 10" of the counter-frame, completely cover frame 30.

[0054] Figure 10 is a vertical section view of a counter-frame structure 1 for a window with an adjustable slats blind device 48. Apart from the different blind element the structure of the counter-frame block-insulating surround is substantially the same as that of figures 3 and 4.

[0055] Figure 11 illustrates a counter-frame structure analogous to the previous one but for a French window 2. The lower part of the structure features a lower bar 20' of the surround, set in the floor and in any case fixed to counter-frame 10.

[0056] In the corresponding view in horizontal section of figure 12, note how also in this case guide 49 for the adjustable slats is obtained in the centre of side profiles 12' of surround 12, well spaced from counter-frame 10. Also note in this case the presence of insulating perimeter elements 6a and 7a of the wall connection which is fixed, e.g. by gluing, to counter-frame 10 and vertical uprights 12' of surround 12. Said vertical uprights 12' of surround 12 completely cover window frame 30 and are joint-coupled to vertical uprights 10" of counter-frame 10.

[0057] Figure 13 is a vertical section view of counter-frame structure 2 for a sliding French window without blind. Note lower bar 20' set in the floor and fixed to lower element 10' of counter-frame 10. In the upper part insulating surround 12 includes the wall connection elements 6a and 7a and a frontal crosspiece 12a that partially covers the sliding frame, joint-coupled to jamb 10' of counter-frame 10.

[0058] Figure 13a, again referring to a counter-frame structure for sliding doors, differs from the previous one inasmuch as we have housing 18 for a blind element. Note how housing 18 is obtained from the bringing together of frontal profile 12a, which in this case extends below to a greater extent, completely protecting the window frame, with upper horizontal profile 12' and thus creating the necessary thickness to obtain housing 18.

[0059] The horizontal section of figure 14 shows two side insulation profiles 12' which also integrate guide 49 for the blind element and further vertical insulation profiles 12b that fill the empty space between frame and sliding door.

[0060] Figures 15 and 16 concern a further example of application of the invention. More precisely a counter-frame structure 1 for a window with fixed glazing 50, which can be shaded with adjustable slats element 48, of which it can be noted the housing 18, provided in the upper part of insulating surround 12, and sliding guides 49 integrated in vertical insulation profiles 12'. Most favourably, the glazing 50 is directly fixed to counter-frame 10, completely enclosed by insulating surround 12. Also at the level of the vertical uprights of the structure, surround 12 extends both forward and rearward with regard to counter-frame 10.

[0061] So from the exterior and the interior only glazing 50 is visible.

[0062] In brief, one innovative feature common to all the embodiments of the proposed counter-frame structure is the fact that it is created as a single block com-

prising a counter-frame and an insulating surround, ready for installation in the opening of a wall or roof and such as to obtain immediate and optimal heat insulation without the need for further intervention.

[0063] The other functional elements of the frame structure, such as the frame itself with accessories and blinds, can be assembled at the time of installation since the structure is adaptable to any type of frame and blind or - most favourably - can be supplied to the building contractor already mounted on the structure.

[0064] In particular, it is extremely advantageous to be able to supply the builder with a single block, already cement rendered (or pre-rendered) and equipped, in the case of windows, with sills. In this way building intervention on the frame is reduced to a minimum.

[0065] It should moreover be underscored that the structure is suitable for installation in any kind of wall with any thickness whatever of external protection.

[0066] In particular, the structure is conceived for mounting prior to application of the insulating skin, taking into account the thickness thereof in such a way that subsequently any discontinuity between frame and wall can be eliminated. Insulation of inclined external surfaces or reveals can be carried out at various angulations.

[0067] In any case, the structure in accordance with the invention reduces, if it does not eliminate, the thermal bridges still found in state of the art frames, in particular between wall and counter-frame, between wall and reveals insulation and between wall and skin, all of this without burdensome building work. In other words, once installed the frame is already completely insulated.

[0068] The structure is conceived in such a way that various types and sizes of insulation may be used, e.g. up to 400 mm thickness.

[0069] A further advantage is that the customer can deal with one single supplier for counter-frame, frame insulation, blinds and internal/external sills.

[0070] Lastly, it should be noted that the counter-frame structure is applicable to frames in any material whatsoever, e.g. wood, aluminium, PVC or combinations thereof, and can be used in various types of buildings such as prefabs, traditional buildings in masonry and concrete and also in renovations.

[0071] Clearly, variants of and/or additions to what has been above described and illustrated may be implemented without going beyond the scope of the invention itself as defined in the attached claims.

Claims

1. Counter-frame structure for door/window frames, suitable for insertion into an opening in an external wall or roof of a building and comprising:

- a counter-frame (10) for a door/window frame;
- an insulating surround (12) in a heat insulation material, which encloses the counter-frame at

least on the sides facing said wall and the exterior of the building,

said counter-frame and insulating surround being interconnected in such a way as to form a single block (1; 2) to be inserted in the opening in the wall.

2. Structure in accordance with claim 1, in which said insulating surround (12) is of such a thickness as to extend between the internal side and the external side of the wall in which the structure is inserted.

3. Structure in accordance with claim 2, in which the internal and external surfaces of the insulating surround are covered by a coat of rendering or pre-rendering (14) that extends to conceal the counter-frame.

4. Structure in accordance with claim 3, in which the internal and external surfaces of the insulating surround are covered by a scrim or template (16) on which the coat of rendering or pre-rendering is applied or may be applied.

5. Structure in accordance with any preceding claim, in which said insulating surround is profiled in such a way as to define at least a housing (18) for a box or a guide of a blind.

6. Structure in accordance with claim 5, in which the insulating surround incorporates a housing for a roller blind (42) or an adjustable slats blind (48).

7. Structure in accordance with any of the previous claims, in which the insulating surround incorporates or is suitable for incorporating at least some functional elements of the frame, such as guides (44; 49) for sliding parts, and waterproofing/dust-proofing sealing elements.

8. Structure in accordance with claim 7, in which the guides for roller and sliding elements are incorporated in the insulating surround at a distance from the elements of the counter-frame in such a way as to leave an interposed space for a layer (12") of heat insulation material.

9. Structure in accordance with any of the previous claims, in which the insulating surround includes a base element (20) on which at least one plate is set in such a way as to create at least one between the internal sill (23) and the external sill (22) of the frame.

10. Structure in accordance with any of the previous claims, in which the said insulating surround includes parts of upright and parts of jamb covered by respective section (34) in metal or plastic material suitable for being left visible.

11. Structure in accordance with any of the previous claims, in which the insulating surround is suitable for at least partial overlapping of the frame (30) and at least from the part facing the exterior. 5
12. Structure in accordance with claim 11, in which the insulating surround is also suitable for overlapping the door frame (32) in such a way that from the exterior only the glazing of the frame is visible. 10
13. Structure in accordance with any of the previous claims, in which the insulating surround is connected to the external surface of the wall by way of inclined surfaces (36) in such a way as to maximise the entry of light through the frame. 15
14. Structure in accordance with any of the previous claims, in which said surround comprises a plurality of closely coupled elements (12', 12a, 12b), at least some of which said elements are fixed to the counter-frame (10). 20
15. Structure in accordance with claim 14, in which said elements of the insulating surround are interconnected with a geometrical or joint coupling. 25
16. Structure in accordance with claim 15, in which said elements of the surround are fixed to the counter-frame with a joint coupling and/or by gluing and/or by screws and/or by clamps or profiled sheet metal. 30
17. Structure in accordance with any of the previous claims, in which the frame is a French window, and wherein the insulating surround includes a lower section (20') suitable for insertion into a housing in the floor. 35
18. Structure in accordance with any of the previous claims, in which the insulating surround includes a frontal portion (7a) of the same thickness and in the same material as the protective skin of the wall, and a rear portion (6a) corresponding to the thickness of the part of the wall in masonry. 40
19. Structure in accordance with any of the previous claims, including a door/window frame (30) fixed to the counter-frame. 45
20. Structure in accordance with claim 19, including a complete frame (30, 32) fixed to the counter-frame. 50
21. Method of production and installation of a door/window frame in an opening of an external wall or roof of a building, comprising the steps of: 55
- realizing a counter-frame;
 - realizing a surround in a heat insulation material;
- enveloping the counter-frame with said surround in such a way that it covers at least the sides of the counter-frame facing the wall in which it is to be set and towards the exterior of the building;
 - fixing the surround to the counter-frame in such a way as to form a single block,
 - inserting said block in the aperture of the wall or roof.
22. Method in accordance with claim 21, in which, before insertion in the opening, the block is cement rendered or pre-rendered.
23. Method in accordance with claim 22 in which, after the block is rendered and before insertion in the wall or roof, the frame is mounted on said block.
24. Method in accordance with any of claims 21-23, in which, before insertion in the opening, a blind element and its accessories are mounted.

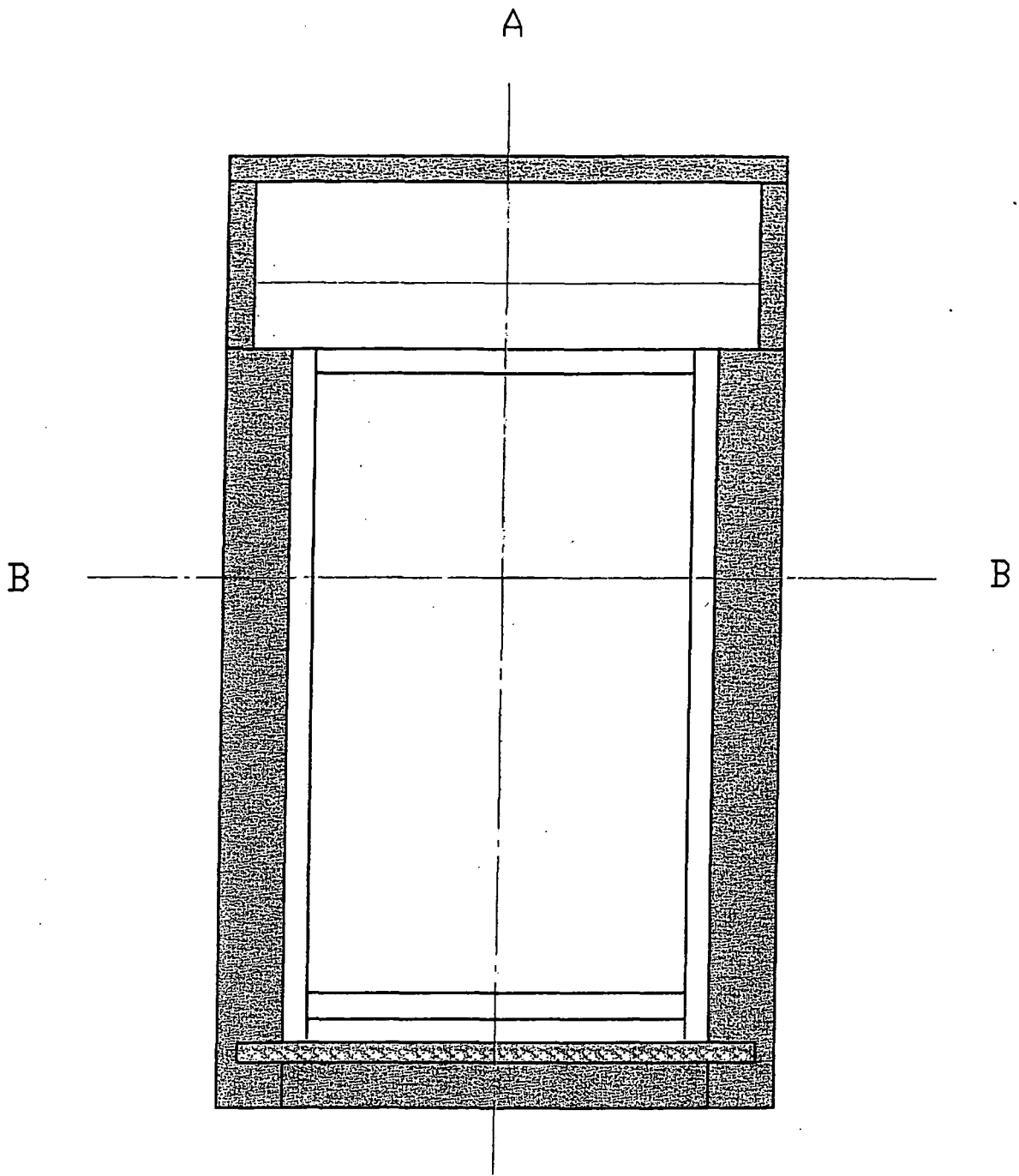


Fig. 1

A

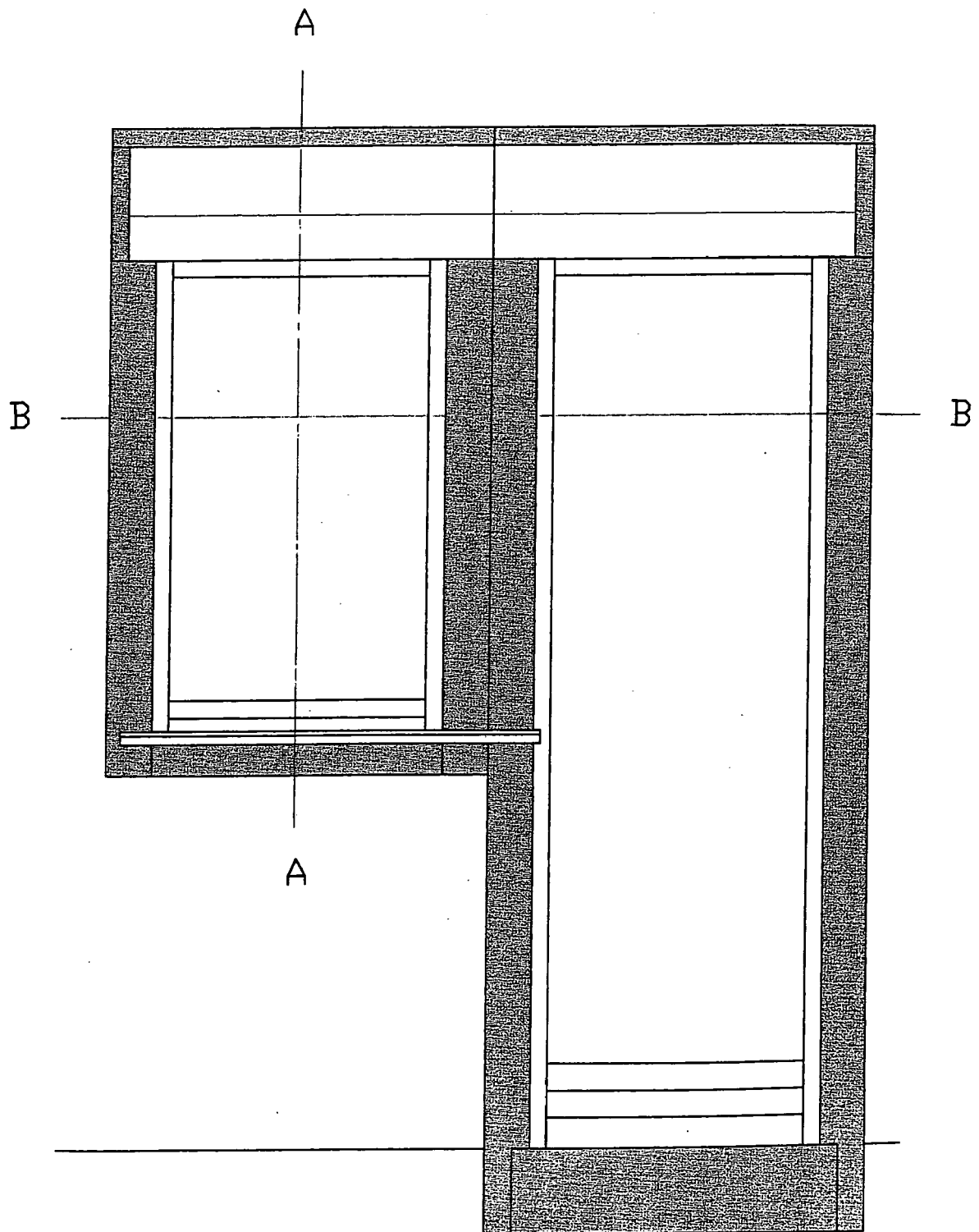


Fig. 2

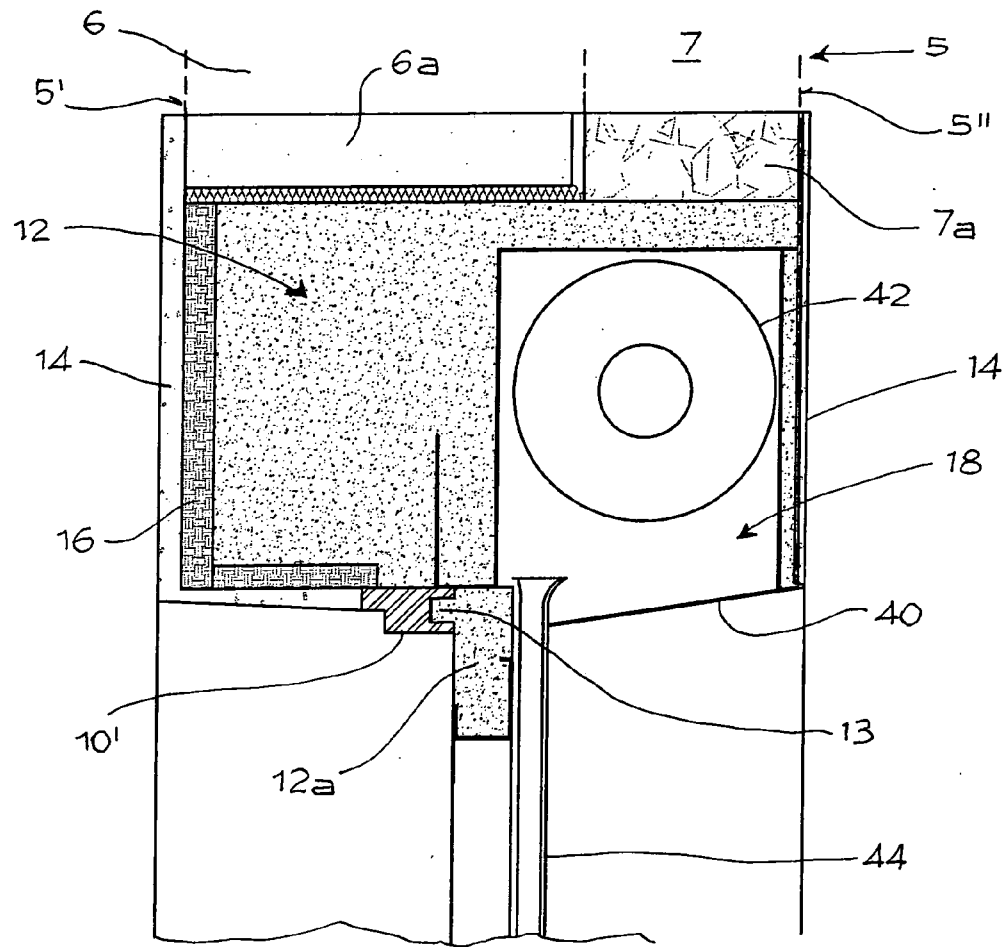
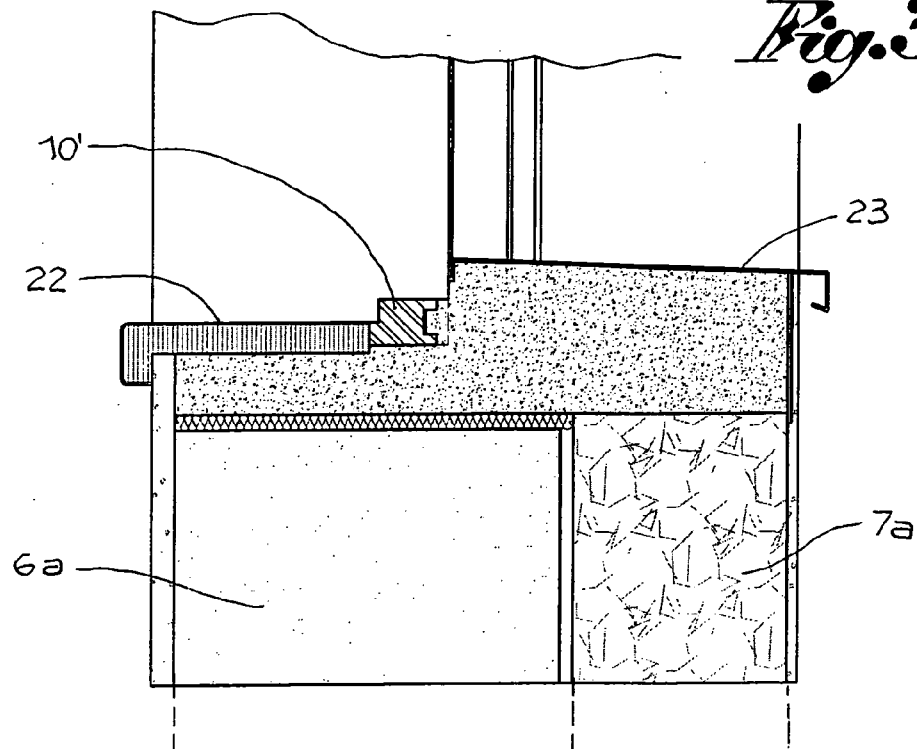
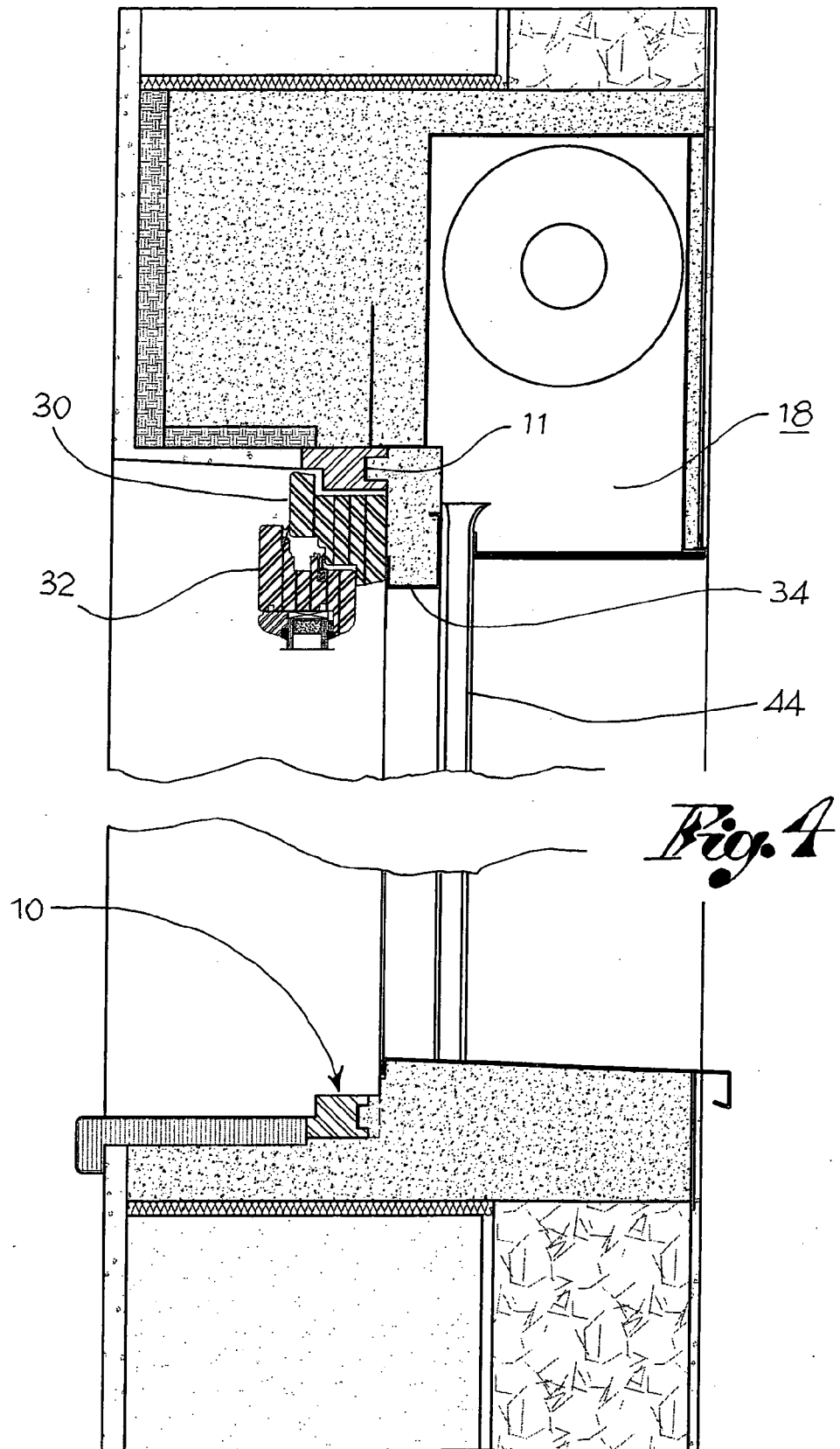


Fig. 3





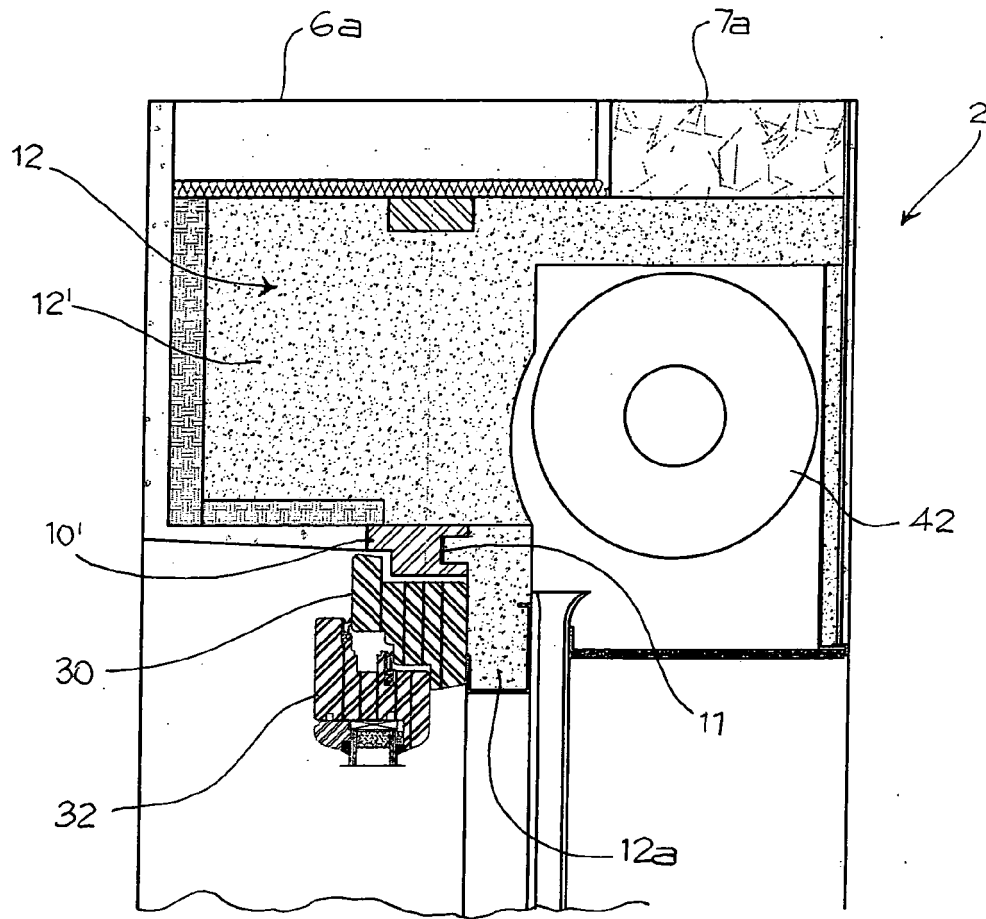
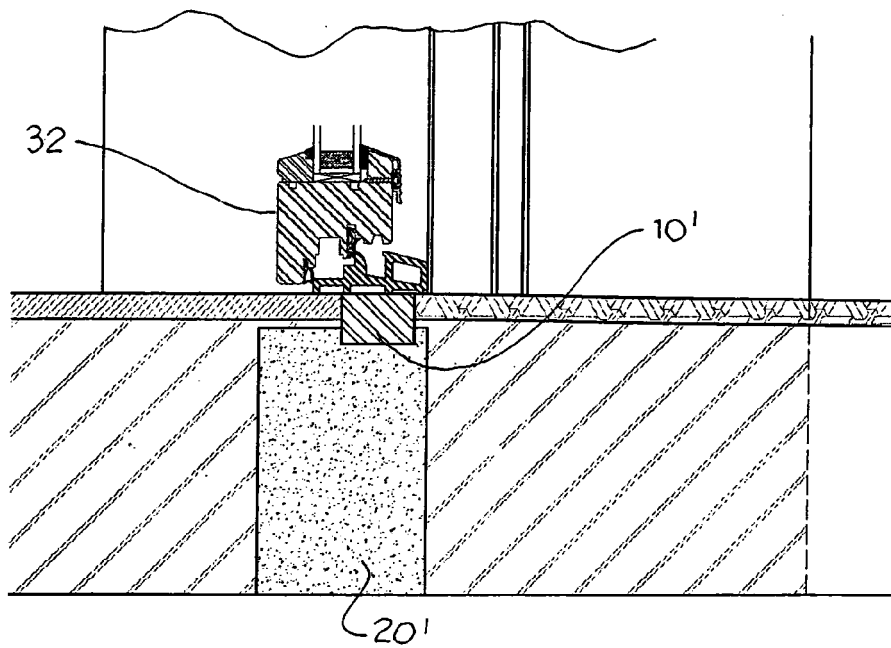
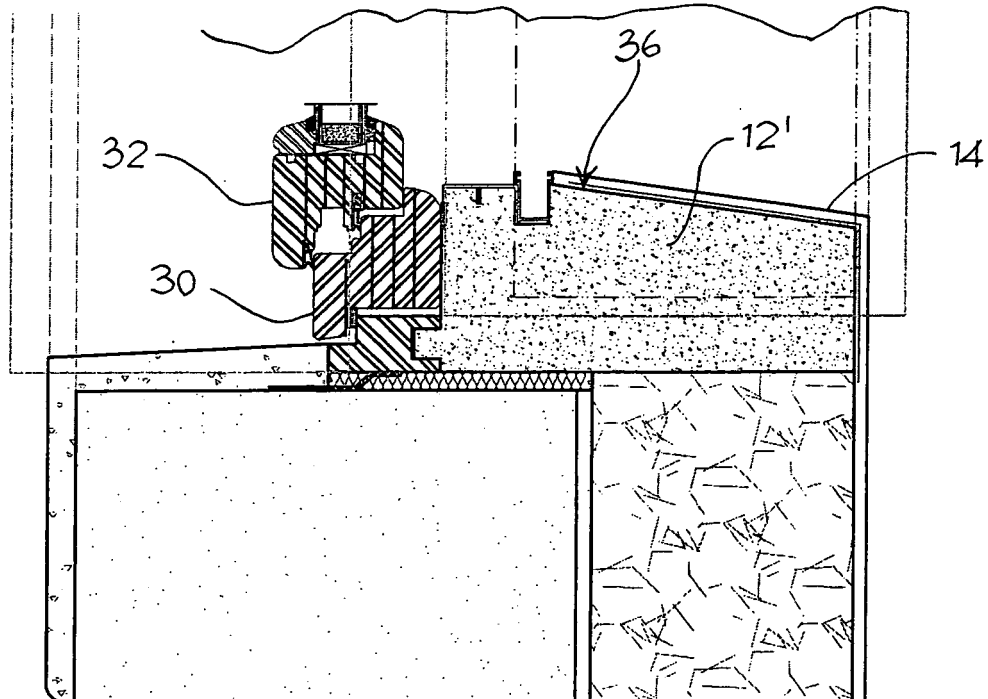
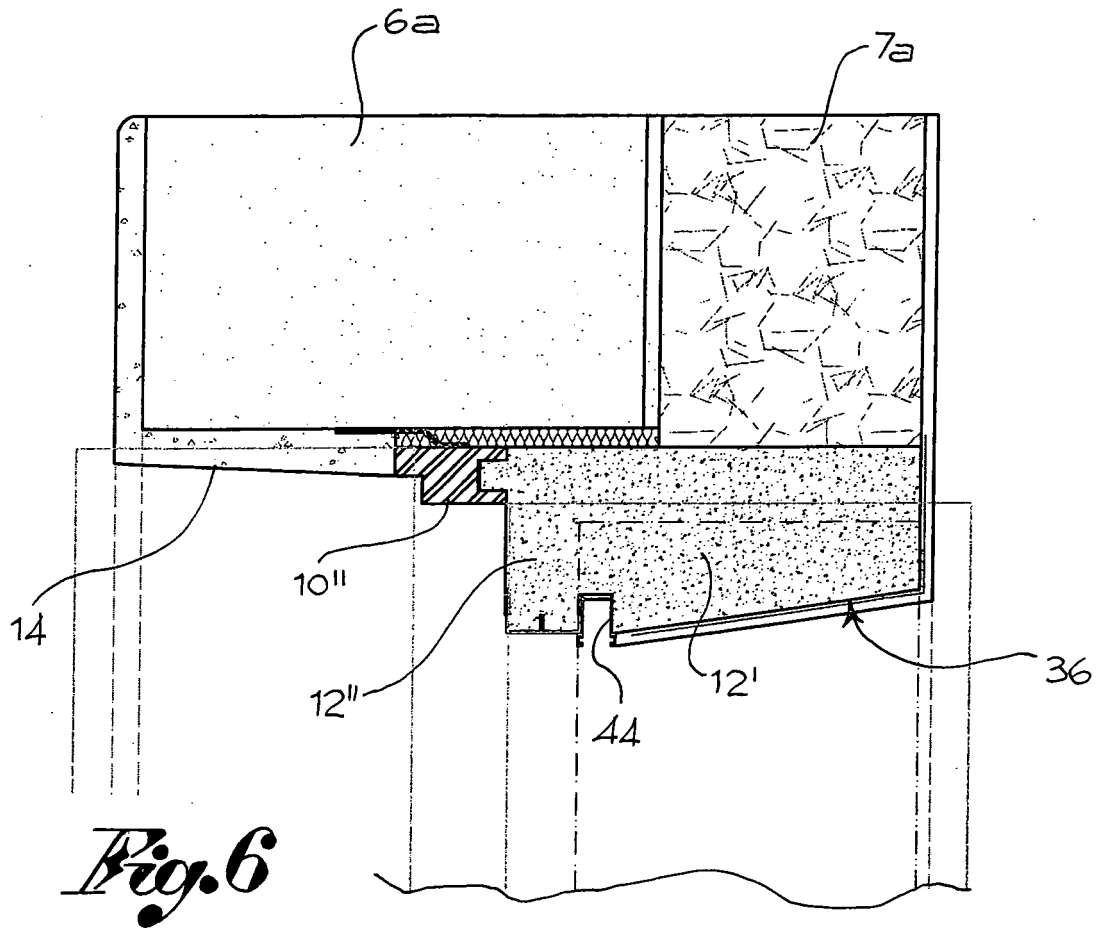


Fig. 5





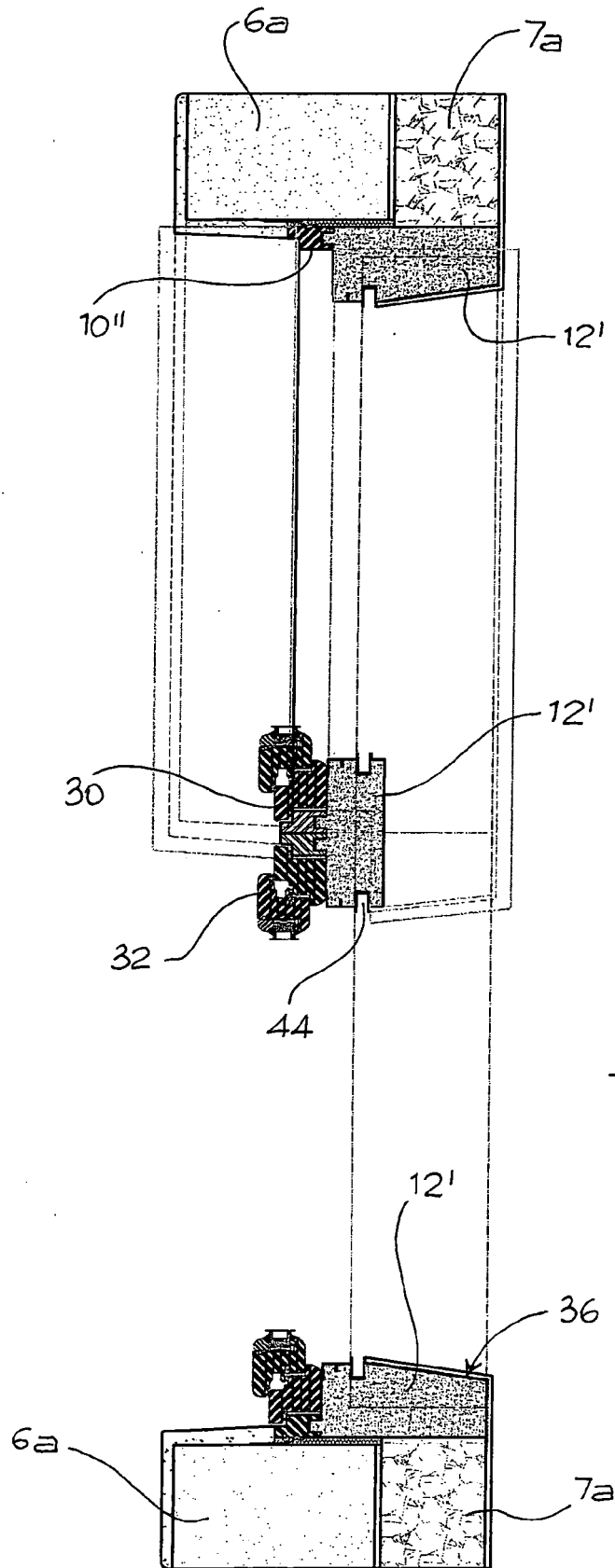


Fig. 7

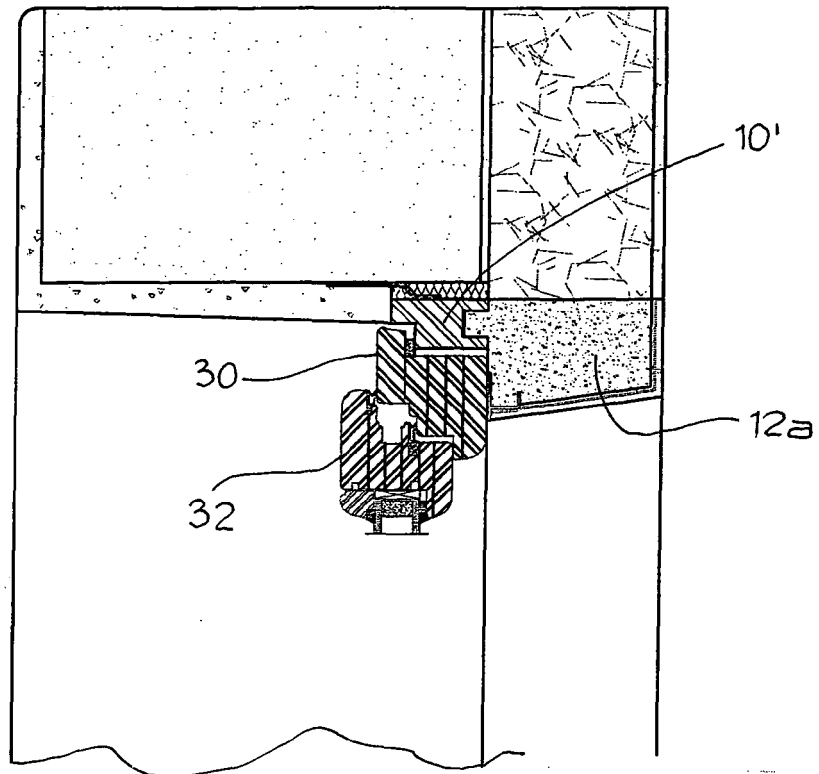
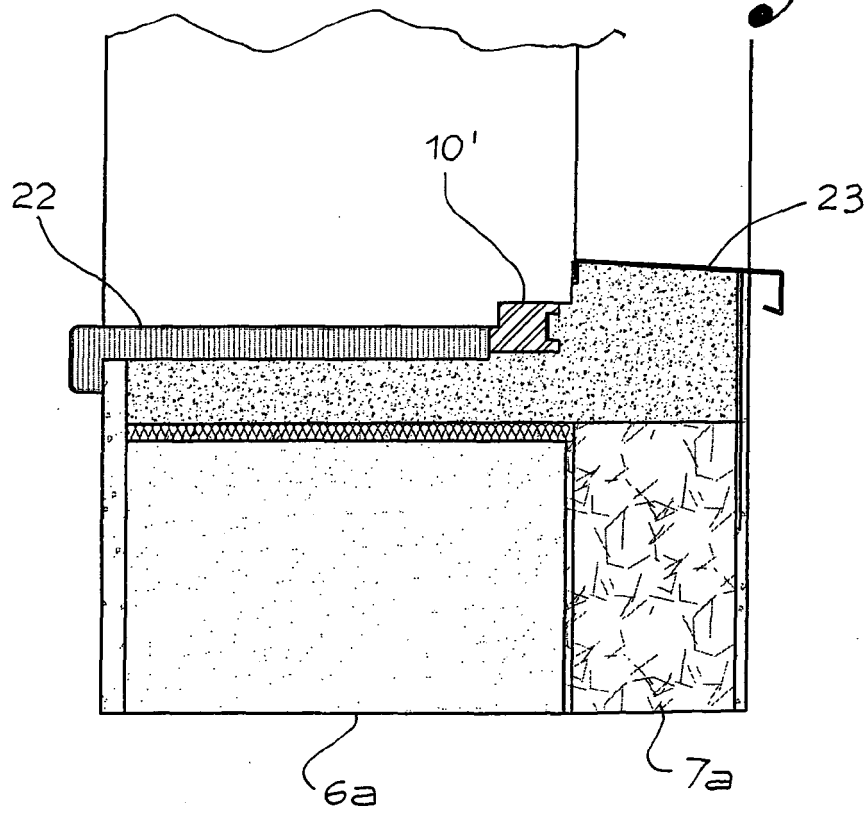
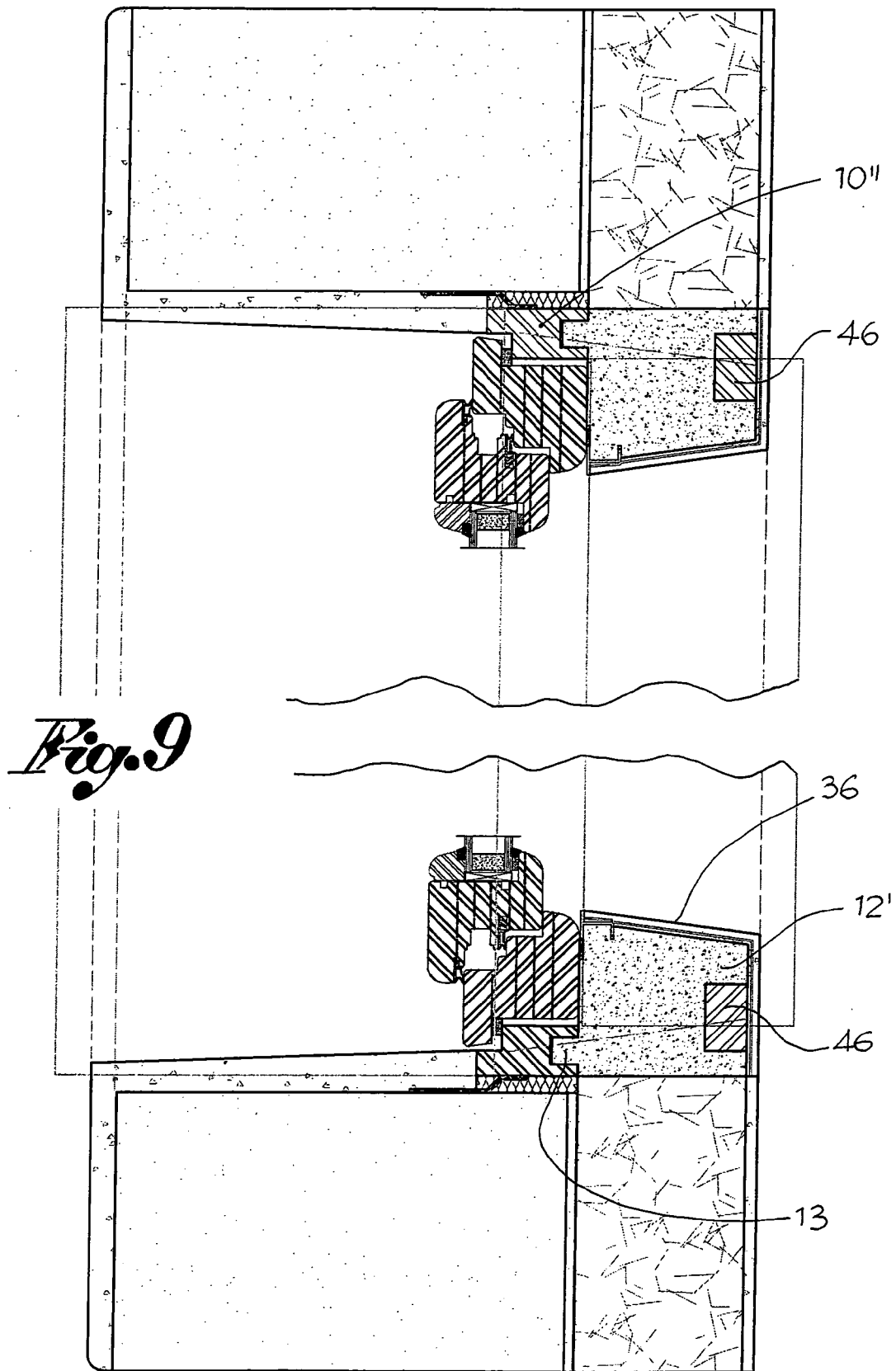


Fig. 8





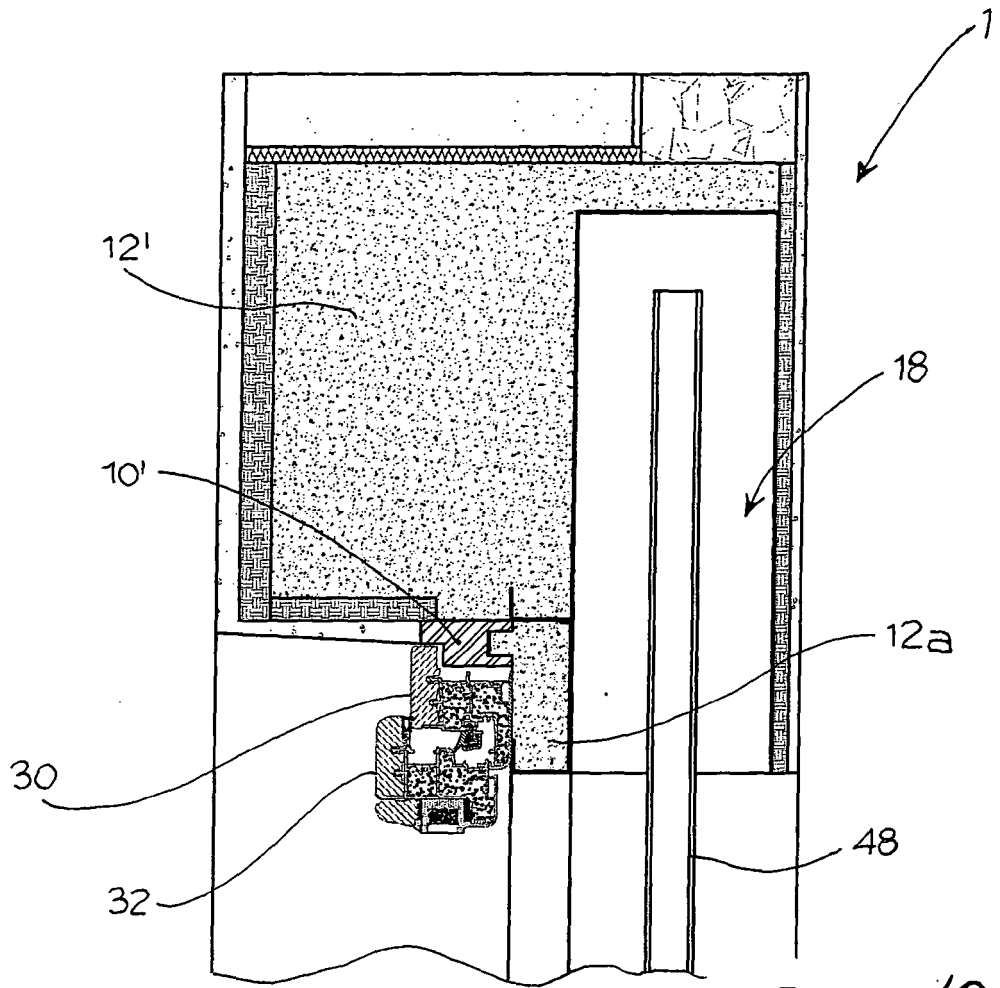
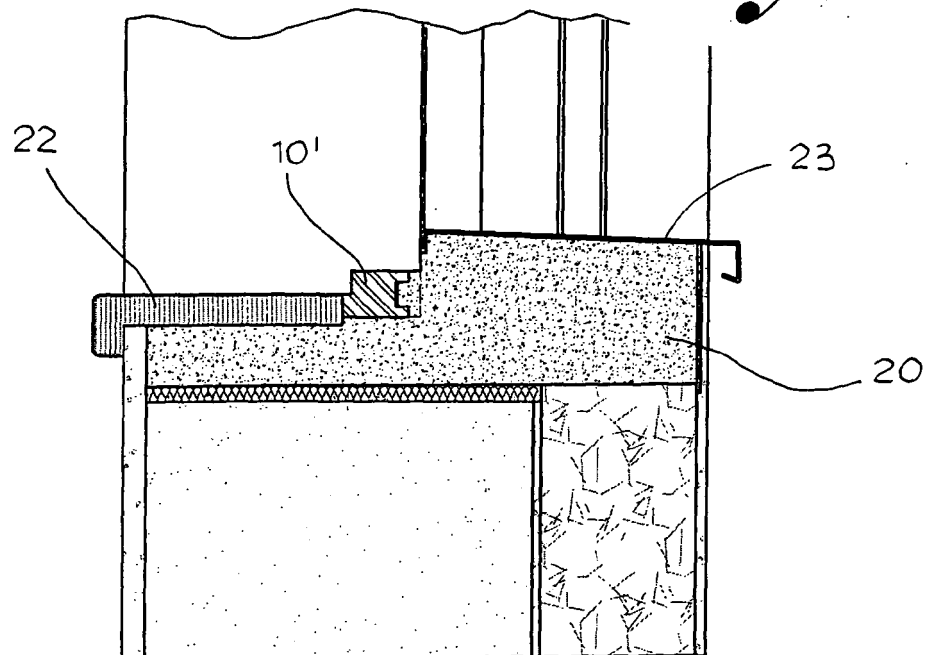
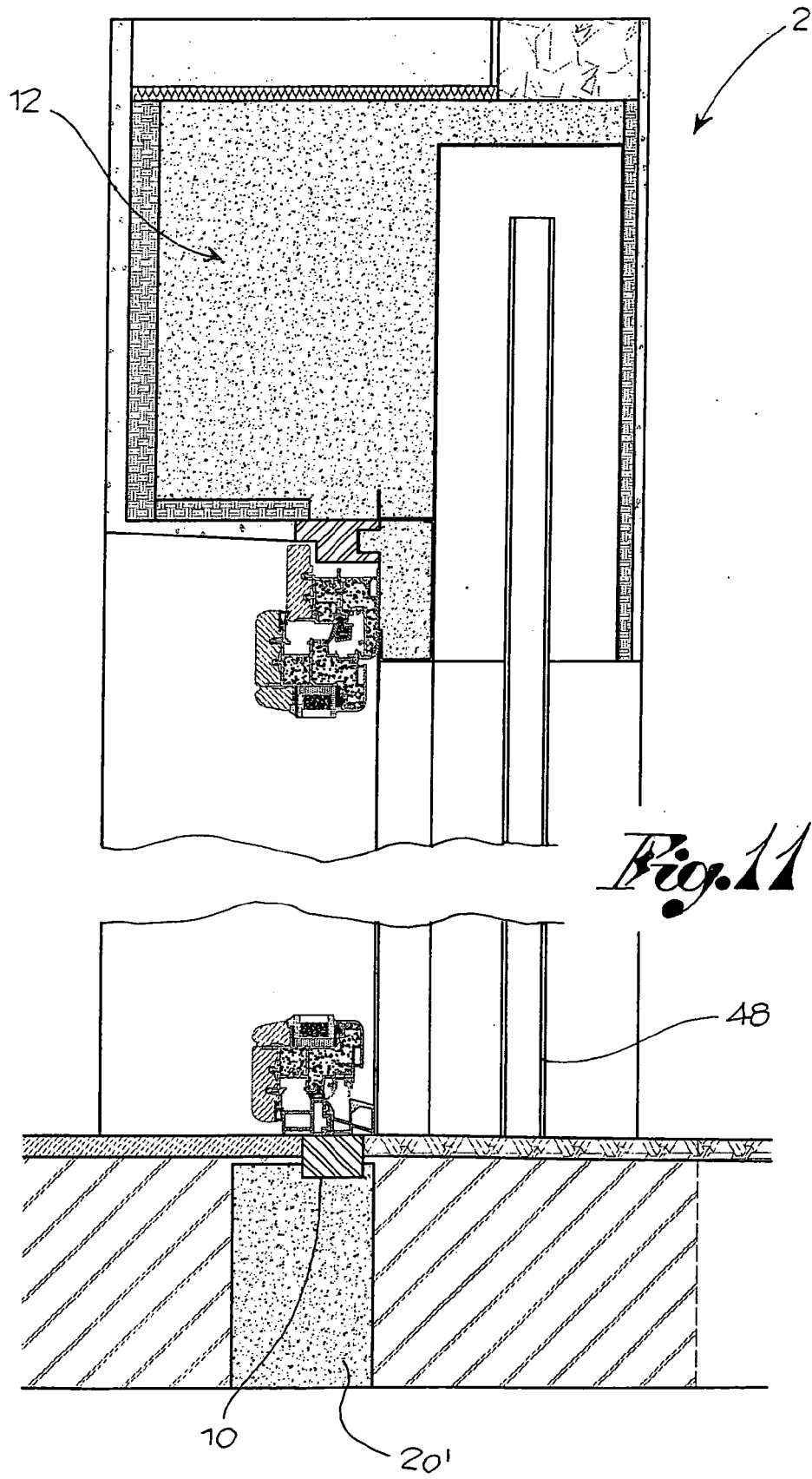
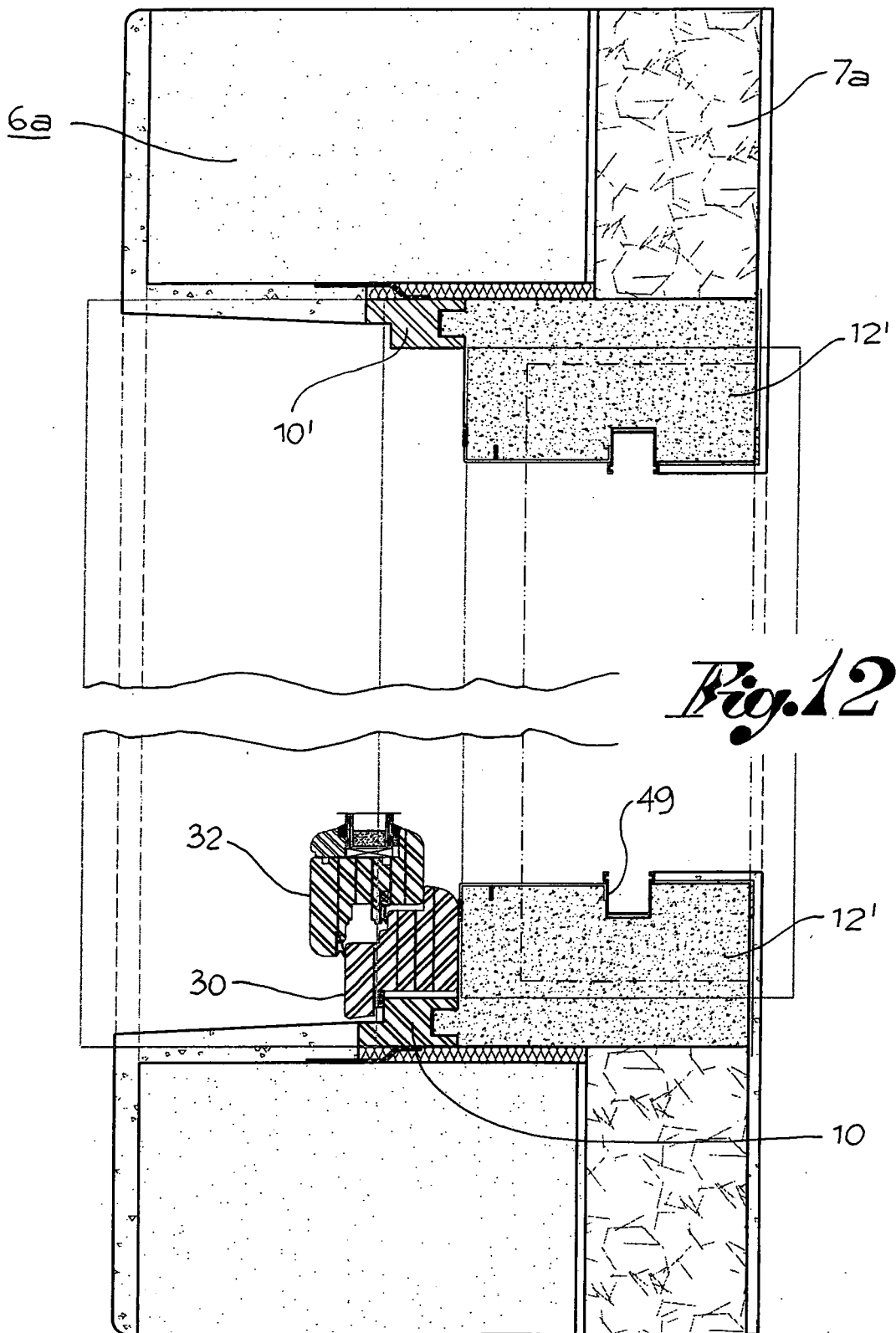


Fig. 10







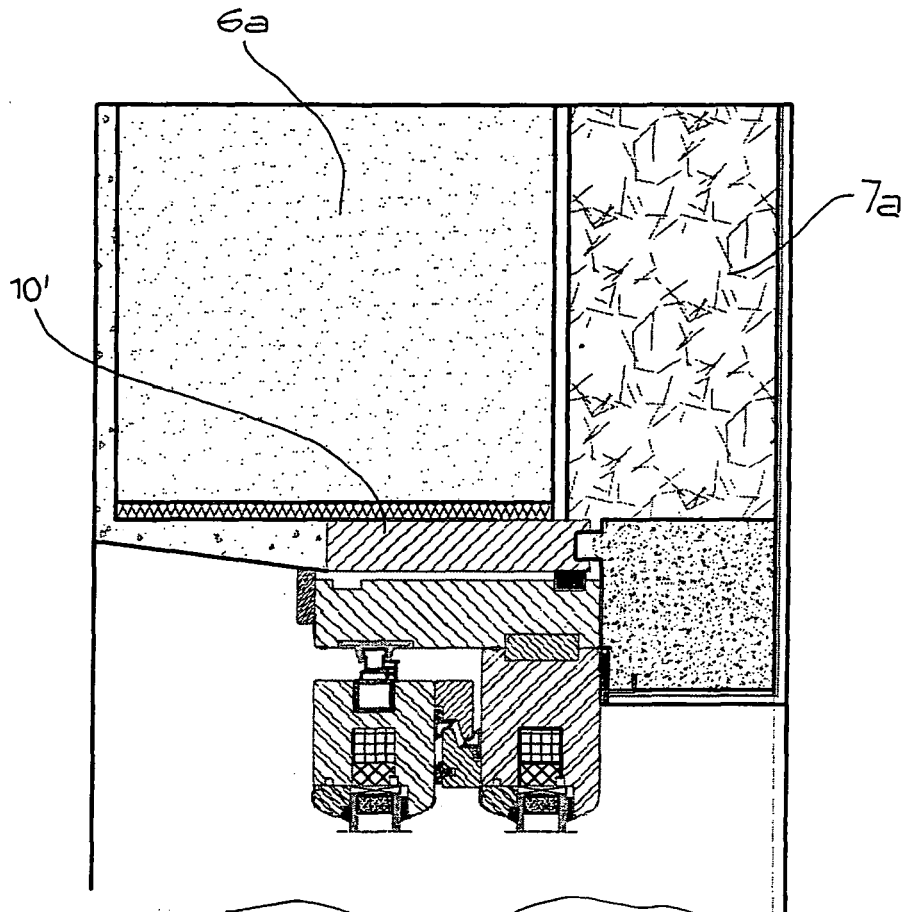
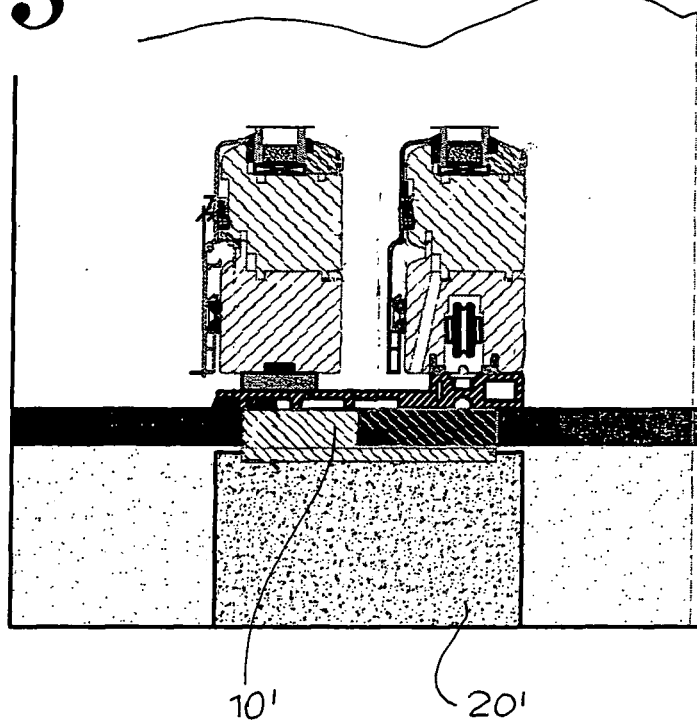


Fig. 13



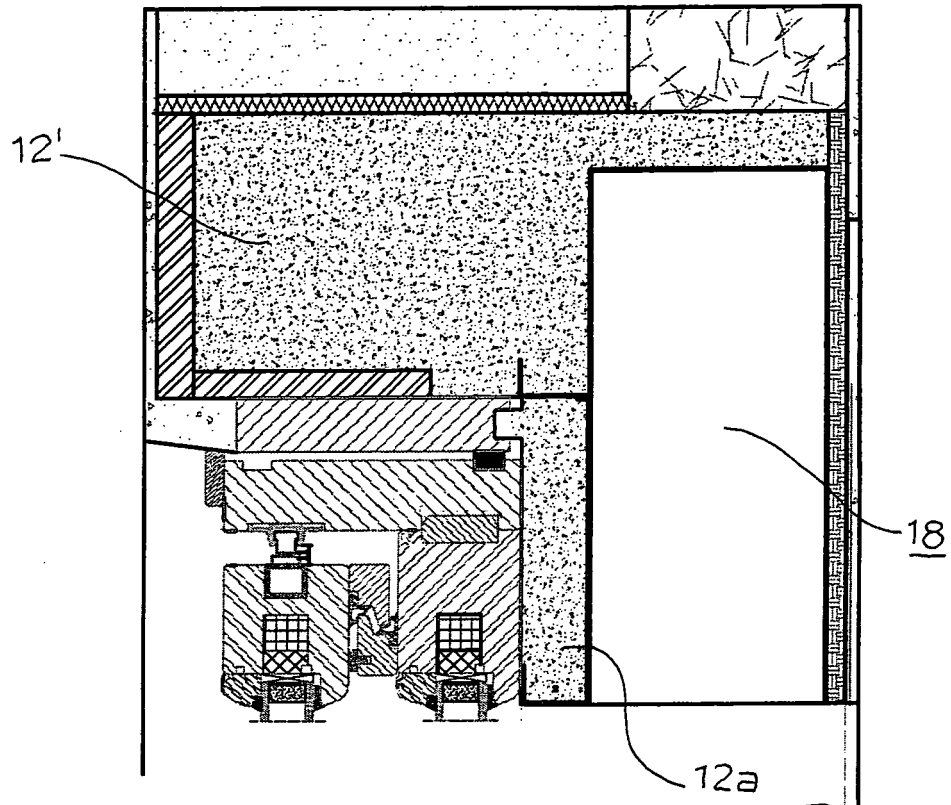
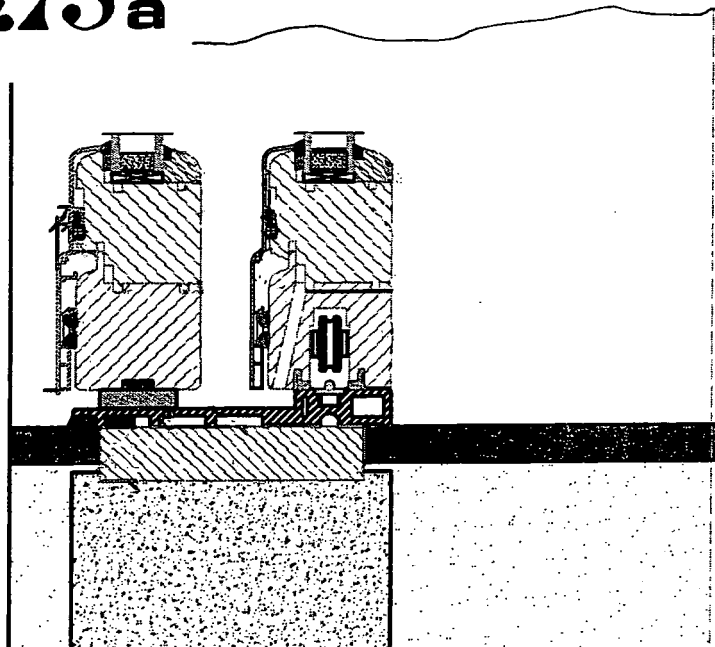


Fig. 13a



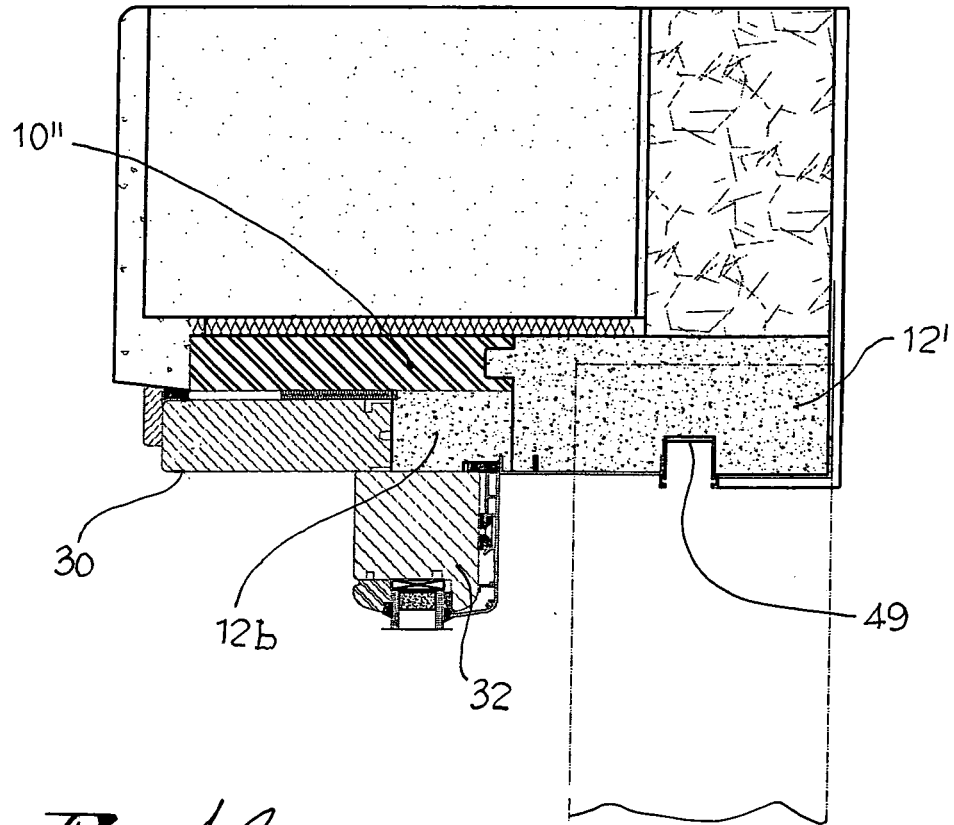
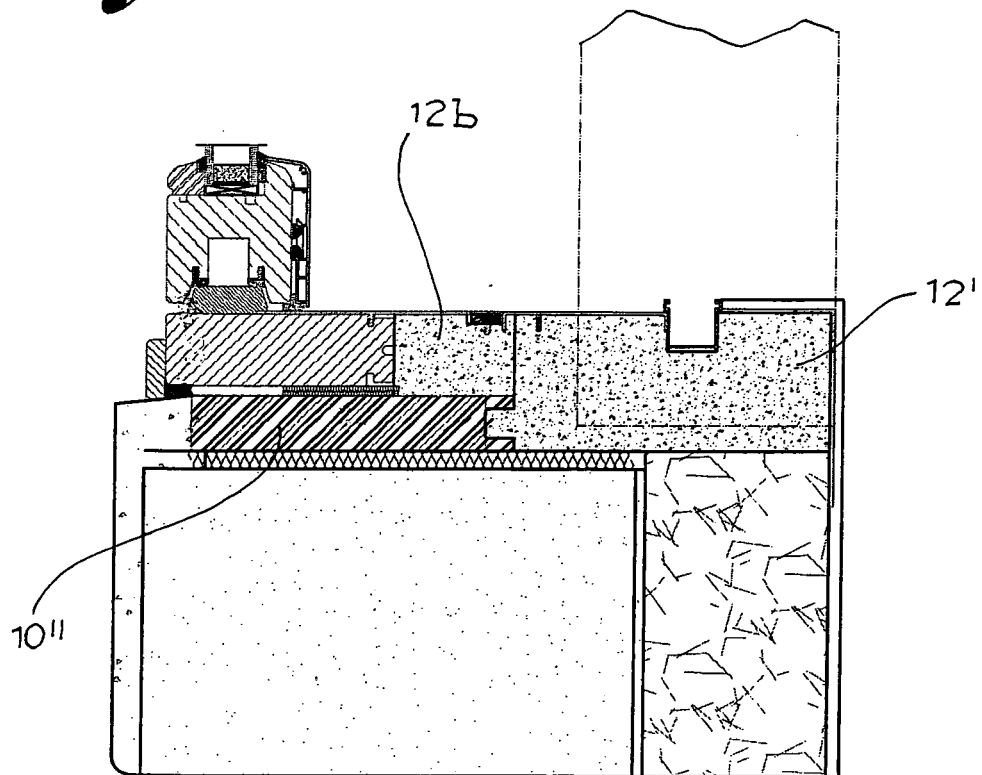
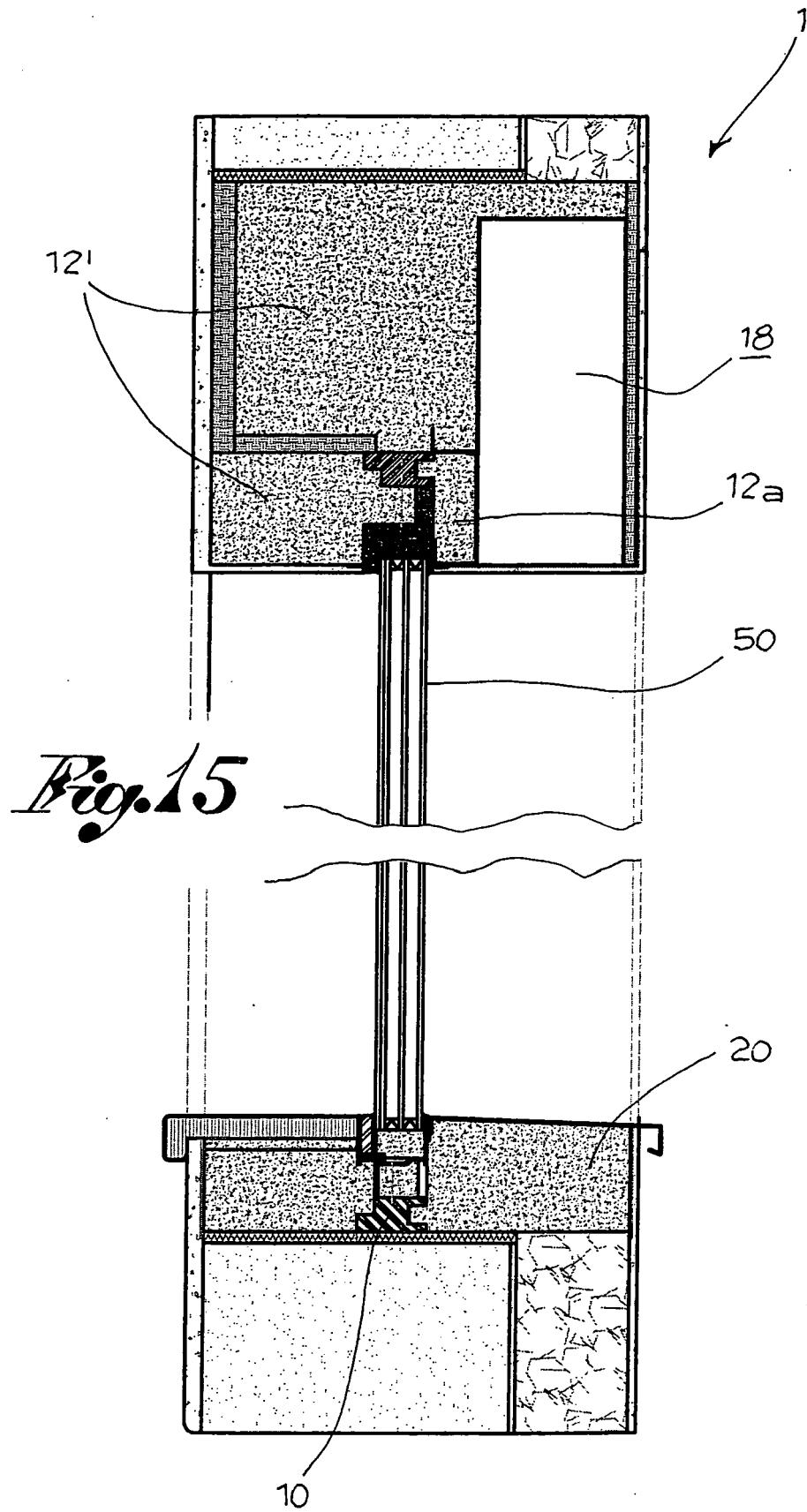
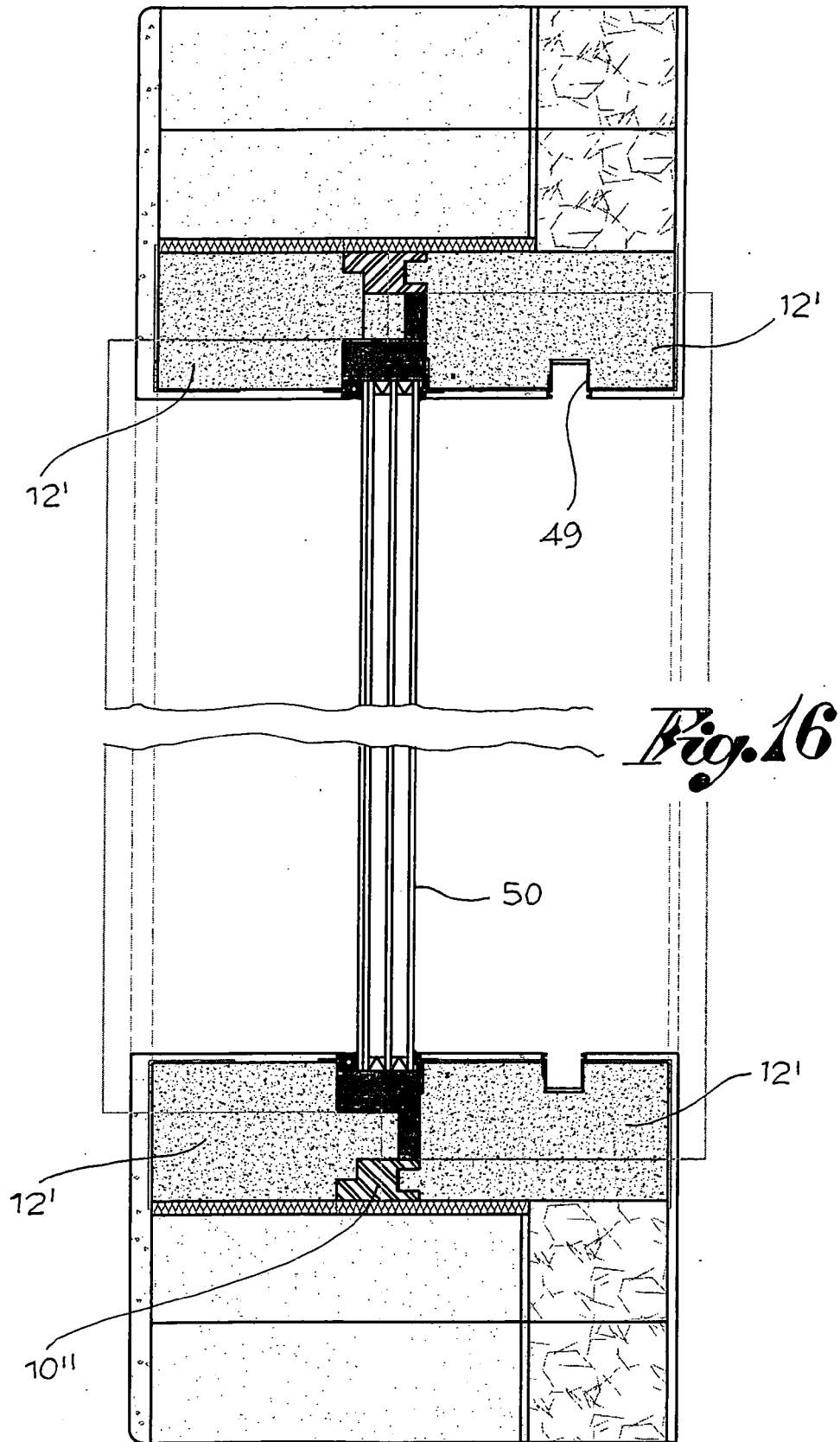


Fig. 14









EUROPEAN SEARCH REPORT

Application Number
EP 08 42 5591

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