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(54) **Roof window assembly**

(57) Roof window assembly for pitched roofs constructed from a number of prefabricated parts, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall, the upper wall and the

side walls each comprise a window casing, wherein the window casings of the upper wall and of the front wall include an angle of over 90 degrees.

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Description

[0001] The invention relates to a roof window assembly for pitched roofs.

[0002] It is known to provide pitched roofs with roof windows that are positioned in one plane with the roof surface. In that way a considerable quantity of additional light may enter the interior roof space, such as a study, yet no extra space is added.

[0003] It is furthermore known to place dormer windows on pitched roofs, which not only results in additional light but also in additional space. Dormer windows, however, usually are large and expensive objects, which moreover require much effort and expertise to install. Furthermore large and striking dormer windows may infringe on the shape of the roof and on the surroundings.

[0004] It is an object of the invention to provide a roof window assembly that offers an increase of the interior roof space and yet is of an easy construction.

[0005] It is a further object to provide a roof window assembly that offers an increase of the interior roof space and yet forms only a slight disruption of the sloping roof surface.

[0006] A further object is to provide a roof window assembly for pitched roofs that is constructed modularly.

[0007] A further object of the invention is to provide a roof window assembly for pitched roofs that can easily be adjusted to personal wishes.

[0008] Another object is to provide a roof window assembly that reduces the risk of precipitation remaining standing to a minimum.

[0009] At least one of these objects is according to an aspect of the invention achieved by a roof window assembly for pitched roofs constructed from a number of prefabricated parts, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall, the upper wall and the side walls each comprise a window casing, wherein the window casings of the upper wall and of the front wall include an angle of over 90 degrees. The roof window assembly can easily be made and kept in store. Such an obtuse angle can easily effect both the upper wall and the front wall to slope at angles of the same sign (+/-). In case of transparent or translucent walls the light access to the interior roof space is enhanced. Furthermore a sloping upper wall is advantageous to the discharge of precipitation. Moreover vertical and horizontal lines need not be exactly adjusted to.

[0010] In one embodiment the window casings of the front wall and the upper wall have equal dimensions, as a result of which the number of various parts is economised on and the modularity is enhanced. Said ease is increased when according to a preferred embodiment of the invention the side walls comprise mutually identical window casings.

[0011] In such cases two pairs of window casings may suffice for the window casings for the roof window assembly.

[0012] The possibility of making the window casings similar as much as possible is enhanced when the side walls each comprise a substantially isosceles triangular window casing.

[0013] Preferably the small angles of the triangle are smaller than 35 degrees, so that the upper wall slopes down under almost all conditions, which enhances the dewatering and the look. Preferably the small angles of the triangle are approximately 27.5 degrees.

[0014] In a preferred embodiment the roof window assembly according to the invention furthermore comprises a coupling profile for the connection of the window casings of the front wall and the upper wall, wherein the coupling profile is provided with longitudinal channels. The coupling profile may in that way have a double function, or optionally even more functions. For instance the longitudinal channels may be formed by hollow longitudinal cavities having a ventilating function, wherein the coupling profile is provided with ventilating means opening to the roof inner space. Preferably the coupling profile is in that case at at least one end provided with passages for fluid connection between the outside air and the hollow longitudinal cavities. The hollow cavities may also have a function in heat insulation.

[0015] The coupling profile may be provided with longitudinal channels that are adapted for guiding water therealong, to the side walls. In that case the coupling profile may be used for shielding the water guiding means in outward direction by the coupling profile. Preferably the upper wall window casing is provided with one or more passages for water from the outside to the guiding means, in which way water which -for instance as a result of deterioration of the sealing strips between window casing and glass (or other panel)- penetrates between glass and window casing, can be deflected and standing water is counteracted.

[0016] It is also possible at the location of the coupling profile to provide sun protection means for sun protection in the front wall and/or the upper wall.

[0017] In an elaborate embodiment the window casing of the front wall and the window casing of the upper wall may comprise at least one mullion, which preferably is incorporated in the window casing in question.

[0018] For increasing the applications it is preferred that the front wall and/or the upper wall are provided with a leaf, so that an open passage can be created between the interior roof and exterior roof spaces.

[0019] In an advantageous embodiment the leaf is disposed in the window casing of the front wall and designed like a sliding hinge window, in which the advantages of a top hinge window (shielding) is combined with those of a centre pivoted window (outside is easy to clean).

[0020] Access of light is enhanced when the front wall and/or the upper wall are provided with plates of translucent or transparent material, particularly glass.

[0021] In one embodiment the front wall and/or the upper wall are provided with double glass plates in between which the sun protection is disposed, so that no space

occupying, interior roof provisions for that purpose need to be placed.

[0022] In a first further development according to the invention the window casings are manufactured of aluminium. The window casings can easily be assembled from aluminium profiles that may be extruded.

[0023] In a second further development according to the invention the window casings are manufactured of a synthetic material, particularly by injection moulding.

[0024] From a further aspect the invention provides a roof window assembly for pitched roofs constructed from a number of prefab parts, particularly according to any one of the preceding claims, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall and the upper wall are formed by window casings, that have both been provided with plates of translucent or transparent material, particularly glass.

[0025] Preferably the side walls are provided with plates of translucent or transparent material, particularly glass.

[0026] From a further aspect the invention provides a roof window assembly for pitched roofs constructed from a number of prefab parts, particularly according to any one of the preceding claims, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall and the upper wall are formed by window casings, further comprising a coupling profile for the connection of the window casings of the front wall and the upper wall, wherein the coupling profile is provided with hollow cavities.

[0027] Preferably the coupling profile is provided with ventilating means opening from the hollow cavities to the roof inner space.

[0028] Preferably the coupling profile at at least one end is provided with passages for fluid connection between the outside air and the hollow cavities.

[0029] From a further aspect the invention provides a roof window assembly for pitched roofs constructed from a number of prefab parts, particularly according to any one of the preceding claims, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall and the upper wall are formed by window casings, further comprising a coupling profile for the connection of the window casings of the front wall and the upper wall, wherein the coupling profile is provided means for guiding water therealong, to the side walls.

[0030] Preferably the guiding means are shielded by the coupling profile in outward direction.

[0031] Preferably the upper wall window casing is provided with one or more passages for water from the outside to the guiding means.

[0032] From a further aspect the invention provides a roof window assembly for pitched roofs constructed from a number of prefab parts, particularly according to any

one of the preceding claims, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall is formed by a window casing, further comprising an end profile for connection to the bottom edge of the front wall window casing, wherein the end profile is provided with means for guiding water therealong, to the side walls.

[0033] Preferably the guiding means are shielded by the end profile in outward direction.

[0034] Preferably the front wall window casing is provided with one or more passages for water from the outside to the guiding means.

[0035] In case the upper wall window casing and/or the front wall window casing are provided with a window leaf, the window casing of window leaf may in a bottom profile be provided with one or more passages for water to the fixed window casing. In said fixed window casing further discharge may take place via the passages present in there, particularly in its bottom profile (bottom rail).

[0036] The invention will be elucidated on the basis of a number of exemplary embodiments shown in the attached drawings, in which:

Figure 1A shows an exemplary embodiment of a roof window assembly according to the invention, in isometric front view, disposed on a pitched tile roof;

Figure 1B shows a side view of the arrangement of figure 1A;

Figure 1C shows the roof window assembly of figures 1A and 1B without roof, with a slightly altered front side;

Figure 1D shows a single-window embodiment of a roof window assembly according to the invention;

Figures 2A and 2B show details of the upper corner in the roof window assemblies according to the preceding figures;

Figure 3A shows a cut-away detail of a connection at the location of the corner area in roof window assemblies according to the preceding figures; and

Figure 3B shows a cut-away detail of a connection in a bottom edge area of roof window assemblies according to the preceding figures.

[0037] The roof window assembly 1 shown in figures 1A-C is disposed on a pitched roof 2 provided with tiles 3. The angle β of the roof slope to the horizontal is 35-55 degrees, as is usual. The roof window assembly 1 is substantially constructed from an upper window casing 4, forming an upper wall, a front window casing 5, forming a front wall, and two side window casings 6, 7, forming

side walls.

[0038] The side window casings 6, 7 are identical to each other and, as can be seen in figure 1B are formed like isosceles triangles, having acute angles y_1 and y_2 that are both 27.5° in this example. The side window casings are constructed from base part 14a and inclined parts 14b, 14b. The side window casings 6, 7 surround glass plates 6a, 7a.

[0039] The angles α and δ in this case are 55 and 152.5 degrees, respectively. The upper window casing 4 and the front window casing 5 in that case both slope slightly forward and downward.

[0040] The upper window casing 4 is in this example divided into three part window casings 8, each surrounding glass panes 8a. The upper window casing 4 is in this case constructed from stile members 11a and rail members 11b, with at the location of the connection to the roof an upper rail 11b and at the location of a corner area (A, see figure 1B) a bottom rail 11b.

[0041] The front window casing 5 is constructed similarly from stile members 10a and rail members 10b, again having an upper rail 10b at the location of the corner area A and a bottom rail 10b at the location of the connection to the roof.

[0042] In the front window casing 5 of the embodiment according to figure 1A one leaf 12 and two fixed windows 9 are provided, and in the front window casing according to figure 1C three window leaves 12 are provided, each having glass panels 9a, which window leaves preferably form sliding hinge windows.

[0043] The stile members 10a, 11a are covered by finishing covers 13, which in the corner area A due to curved finishing covers 16a smoothly change into finishing covers 13 of the other window casing (upper or front window casing), and at the location of the upper edge area and the bottom edge area extend to the tile roof 3 via curved finishing covers 16b and 16c, respectively.

[0044] At the upper edge, the bottom edge and the side edges of the roof window assembly transition provisions will be present, such as for instance a flashing.

[0045] In the corner area A the rails 11 and 10b situated there will be connected to each other by means of a coupling profile 15, further shown in figures 2B and figure 3A (partially). The attachment to the coupling profile 15 takes place by means that are not shown but which are known to the expert, for instance by screwing or snapping.

[0046] All profiles used in the roof window assembly 1 and of which the window casings and stiles/rails and covers have been assembled have been manufactured from extruded aluminium. The rails and stiles 10a,b and 11a, b may have the same cross-section.

[0047] The roof window assembly 101 shown in figure 1D is a single-window embodiment of the roof window assembly 1 of the figures 1A-C, wherein the side window casings 6, 7 are unaltered and the upper window casing 4 and the front window casing 5 are now designed as a single-window.

[0048] Note that the front window casing 5 can be made having fixed windows therein or a number of windows and windows provided with leaves. The same applies to the upper window casing 4.

[0049] The coupling profile 15 is formed with a number of longitudinal cavities 18, separated from each other by walls 18a. Said longitudinal cavities 18 may on the one side be in connection with the outside air via a grate cover 17b (figure 2B), and on the other side be in connection with the interior roof space via passages that are not shown and can be opened and closed, such as grates. If the ventilating function need not be performed the hollow cavities 18 can be closed off by a cover 17a (figure 2A).

[0050] As can be seen in figures 2A and 3A there are several hollow cavities 18. In addition to a ventilating function the hollow cavities 18 may also perform a heat insulating function, optionally after filling with insulation material. A combination of the functions is also possible.

[0051] The coupling profile 15 may also be used for discharge of water. Said function is more clearly shown in figure 3A.

[0052] In figure 3A a corner area is shown near the coupling profile 15. Other corner areas near the coupling profile 15, to which the upper window casing 4 connects, have a similar construction.

[0053] It can be seen that the bottom rail 11a of window 8 is provided with a glazing bead 40 for the double pane 8a, and thus with a sealing profile 41. As is usual the window casing profile 11b is provided with a number of through cavities, separated by partitions, obtained by extrusion. In one transverse wall 44b, forming the bottom of a glass support channel, a number of passages 42 is provided. At the pane side, the glass support channel is provided with a rubber profile 46 for supporting the pane 8a.

[0054] In the corner the transverse wall 44b connects to transverse wall 44a formed in stile 11a. In transverse wall 44a no passages 42 have been arranged.

[0055] Water may pass through the passages 42, which water originates from precipitation P, and which according to the indicated arrows ends up between the bead 40 and window casing profile 11b or between the sealing 41 and the pane 8a, in the accommodation space for the edge of the double pane 8a, and then ends up on the transverse walls 44a and 44b. The water flows downwards over the transverse walls 44a towards transverse wall 44b. After passing through the passages 42 the water is collected on a discharge channel 32 that is provided by a strip 30 which forms one unity with the coupling profile 15. The discharge channel 32 is bounded at the longitudinal edge 35 of the strip 30 by a sealing profile 31 provided with a number of ribs. The strip 30 is accommodated in a recess 36 in profile 14b.

[0056] The coupling profile 15 is furthermore provided with a number of coextruded grooves 33, which at the ends form holes for fastening means with which an end cover can be attached to the ends of the coupling profile

15. Said end cover (not shown) may be formed such that the water flowing through the channel 32 simply discharges to the outside.

[0057] In figure 3B the dewatering provision is shown at the location of the bottom rail 10b. At the downwardly oriented side of the bottom rail 10b a longitudinal profile 10c is attached, also obtained by extrusion of aluminium. Longitudinal cavities 19 have also been provided in the longitudinal profile 10c, and furthermore the longitudinal profile 10c is provided with grooves 55, for forming holes for fastening end covers (not shown).

[0058] In a manner comparable to the one of the coupling profile 15 the longitudinal profile 10c is provided with a strip 52, having a longitudinal edge 53 in which a rubber sealing strip 54 has been attached. The strip 52 is accommodated in a recess 37 in profile 14b.

[0059] In this case the situation is shown in which there is question of a window leaf 12 having profile members 10d all round. The window leaf 10d is provided with cover profile 40, having rubber sealing strips 41, all according to figure 3A. The pane 9a supports on rubber profile 47, which is attached to strip 45 which forms one unity with the profile member 10d. The profile member 10d supports on rubber strip 47 and is provided with a number of passages 43, through which water originating from precipitation P may pass, in order to end up in gutters 44a, b discussed above of fixed window casing member 10b (and also 10a). At that location it is collected on walls 44a, b and from there it may end up via passages 42 in wall 44b on the discharge channel formed by strip 52, in order to be discharged sideways to a drainage opening that is not further shown.

[0060] It is noted that the various profile members may also be made of synthetic material. When suitably designed the profile members can also be manufactured by injection moulding.

[0061] It is furthermore noted that the used profiles, such as the coupling profile 15, preferably are multi-chamber profiles, optionally with a thermal interruption -that is known per se- in the walls for insulation, in order to prevent a thermal bridge. For instance it can be seen that the profile 10c is an aluminium multi-chamber profile, wherein in the - initially divided side walls the middle chamber longitudinal bodies (caterpillars) of nylon/glass fibre material have been incorporated. Due to the nylon interruption in the assembled aluminium walls a thermal bridge is prevented. Said nylon interruptions are schematically indicated by 60 in figure 3B.

Claims

1. Roof window assembly for pitched roofs constructed from a number of prefabricated parts, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall, the upper wall and the side walls each comprise a window casing,

wherein the window casings of the upper wall and of the front wall include an angle of over 90 degrees.

2. Roof window assembly according to claim 1, wherein the window casings of the front wall and the upper wall have equal dimensions.

3. Roof window assembly according to claim 1 or 2, wherein the side walls comprise mutually identical window casings.

4. Roof window assembly according to claim 1, 2 or 3, wherein the side walls each comprise a substantially isosceles triangular window casing, wherein the small angles of the triangle preferably are smaller than 35 degrees, wherein the small angles of the triangle preferably are approximately 27.5 degrees.

5. Roof window assembly according to any one of the preceding claims, furthermore comprising a coupling profile for the connection of the window casings of the front wall and the upper wall, wherein the coupling profile is provided with longitudinal channels, wherein preferably the longitudinal channels are formed by hollow longitudinal cavities having a ventilating function, wherein the coupling profile is provided with ventilating means opening to the roof inner space, wherein preferably the coupling profile at at least one end is provided with passages for fluid connection between the outside air and the longitudinal channels or hollow longitudinal cavities.

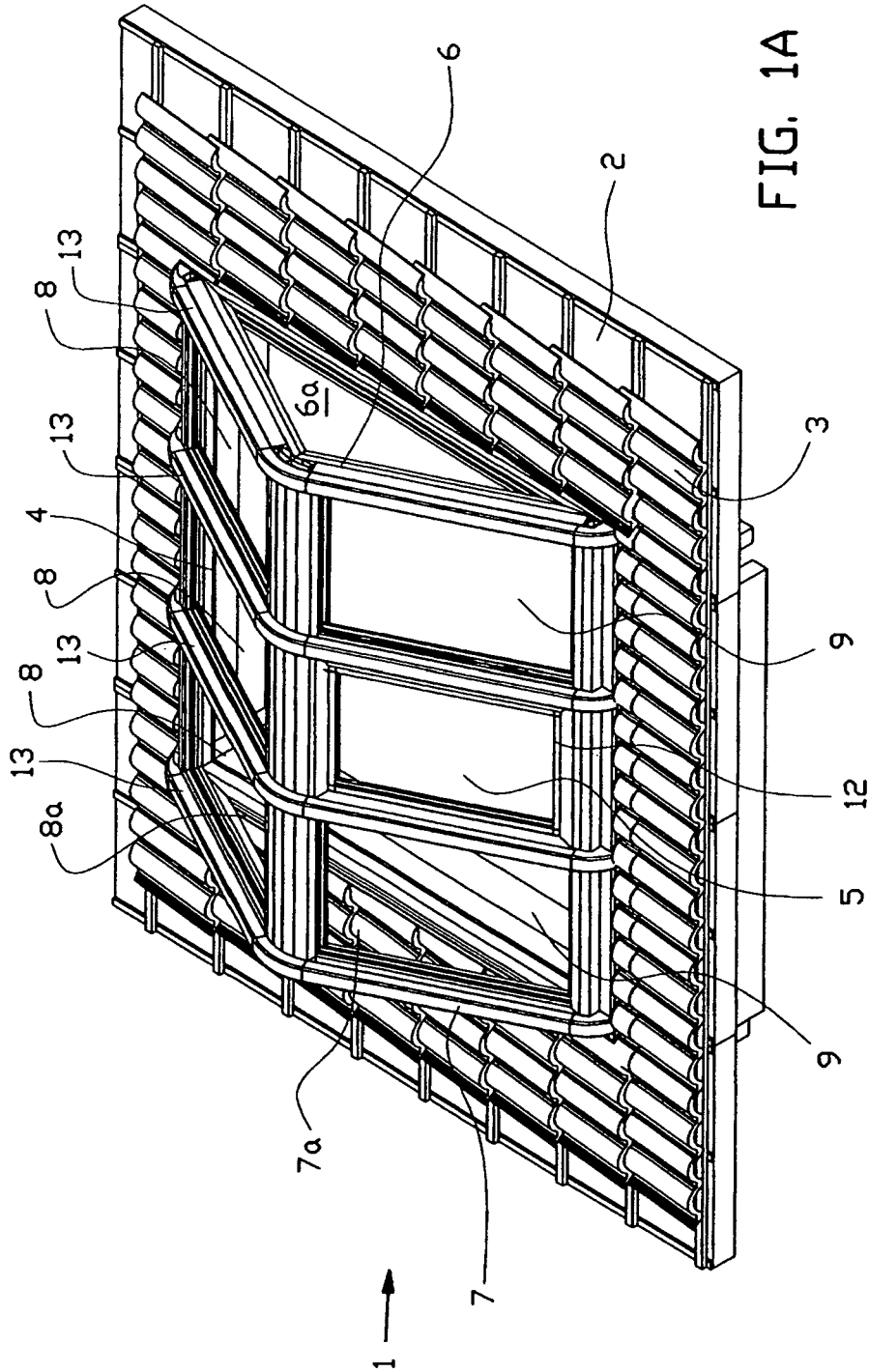
6. Roof window assembly according to claim 5, wherein the coupling profile is provided with longitudinal channels that are adapted for guiding water therealong, to the side walls, wherein the upper wall window casing preferably is provided with one or more passages for water from the outside to the water guiding means.

7. Roof window assembly according to claim 5, wherein at the location of the coupling profile sun protection means for sun protection in the front wall and/or the upper wall are provided.

8. Roof window assembly according to any one of the preceding claims, wherein the window casing of the front wall and the window casing of the upper wall comprise at least one mullion, wherein the window casing in question preferably comprises a main window casing in which the mullion is incorporated.

9. Roof window assembly according to any one of the preceding claims, wherein the front wall and/or the upper wall are provided with a leaf, wherein the leaf preferably is disposed in the window casing of the front wall and is made as a sliding hinge window.

10. Roof window assembly according to any one of the preceding claims, wherein the front wall and/or the upper wall are provided with plates of translucent or transparent material, particularly glass, wherein the front wall and/or the upper wall preferably are provided with double glass plates in between which the sun protection is disposed. 5
11. Roof window assembly according to any one of the preceding claims, wherein the window casings are manufactured of aluminium, particularly from elements obtained through extrusion. 10
12. Roof window assembly according to any one of the claims 1-10, wherein the window casings are manufactured of synthetic material, particularly by injection moulding. 15
13. Roof window assembly for pitched roofs constructed from a number of prefab parts, particularly according to any one of the preceding claims, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall and the upper wall are formed by window casings, further comprising a coupling profile for the connection of the window casings of the front wall and the upper wall, wherein the coupling profile is provided with hollow cavities, wherein the coupling profile preferably is provided with ventilating means opening from the hollow cavities to the roof inner space, wherein the coupling profile preferably at at least one end is provided with passages for fluid connection between the outside air and the hollow cavities. 20 25 30 35
14. Roof window assembly for pitched roofs constructed from a number of prefab parts, particularly according to any one of the preceding claims, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall and the upper wall are formed by window casings, further comprising a coupling profile for the connection of the window casings of the front wall and the upper wall, wherein the coupling profile is provided means for guiding water therealong, to the side walls. 40 45
15. Roof window assembly according to claim 14, wherein the guiding means are shielded by the coupling profile in outward direction. 50
16. Roof window assembly according to claim 14 or 15, wherein the upper wall window casing is provided with one or more passages for water from the outside to the guiding means. 55
17. Roof window assembly for pitched roofs constructed from a number of prefab parts, particularly according to any one of the preceding claims, comprising a front wall, an upper wall and two side walls, which together form a roof extension projecting out of the sloping roof surface, wherein the front wall is formed by a window casing, further comprising an end profile for connection to the bottom edge of the front wall window casing, wherein the end profile is provided with means for guiding water therealong, to the side walls.
18. Roof window assembly according to claim 17, wherein the guiding means are shielded by the end profile in outward direction.
19. Roof window assembly according to claim 17 or 18, wherein the front wall window casing is provided with one or more passages for water from the outside to the guiding means.
20. Roof window assembly according to any one of the claims 13-19, wherein the upper wall window casing and/or the front wall window casing are provided with a window leaf, the window casing of which in a bottom profile being provided with one or more passages for water to the fixed window casing.



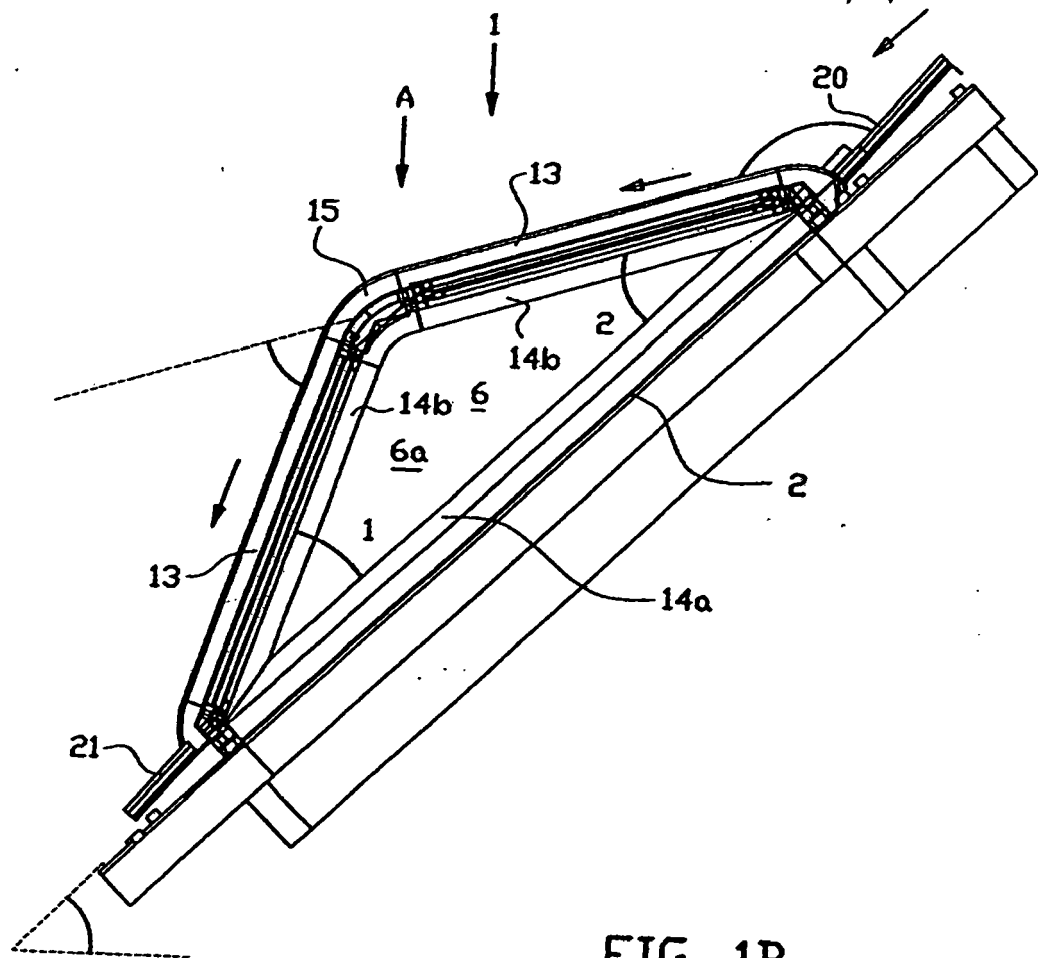


FIG. 1B

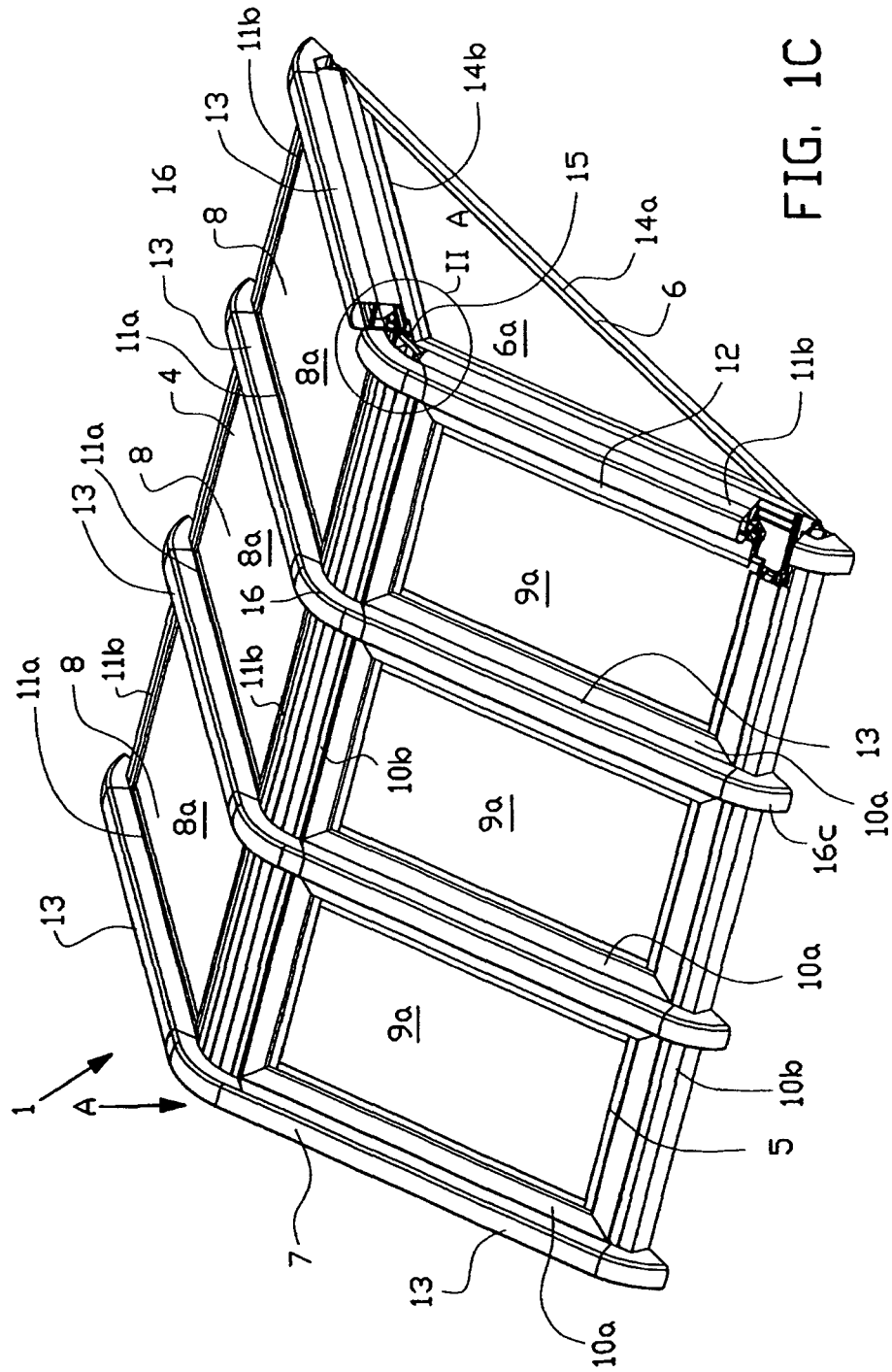


FIG. 1C

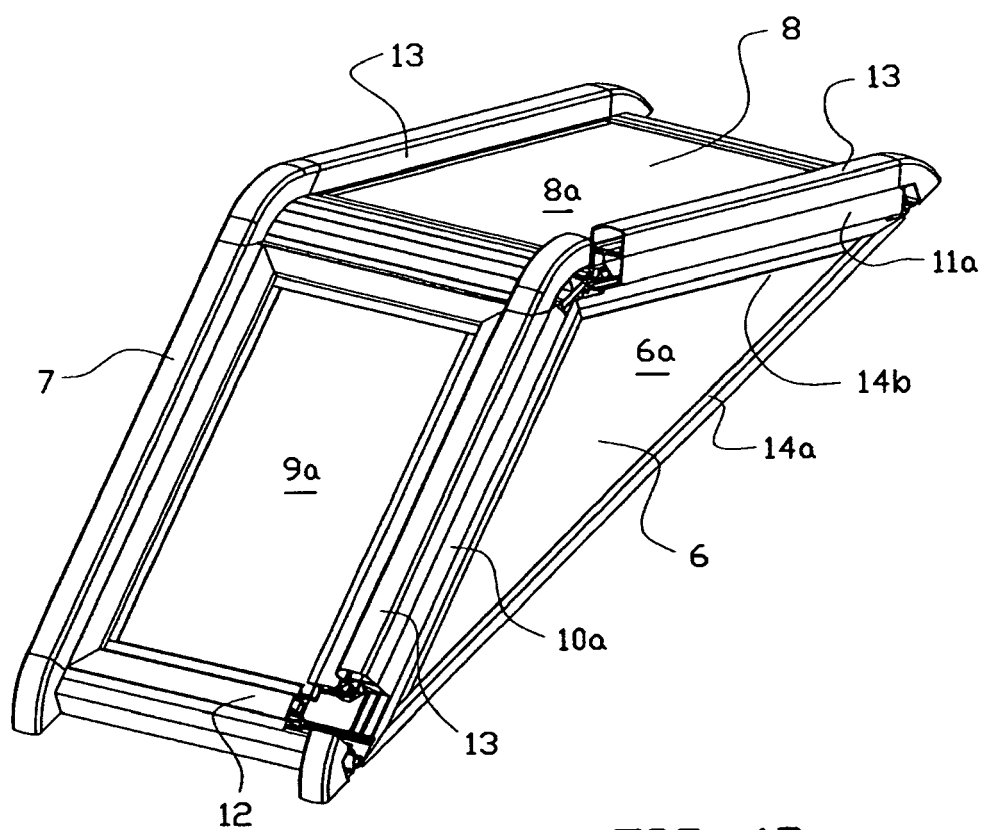
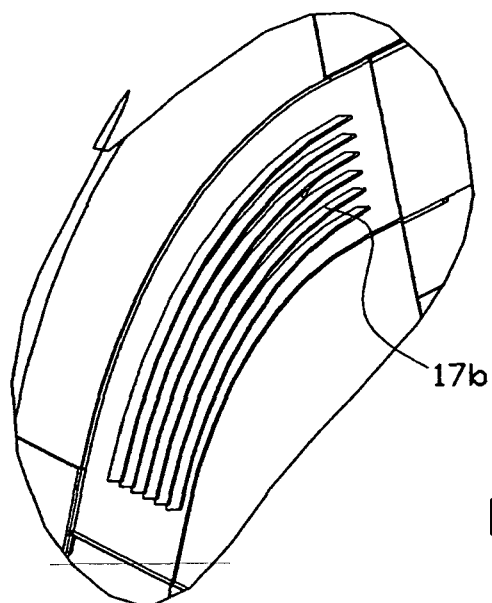
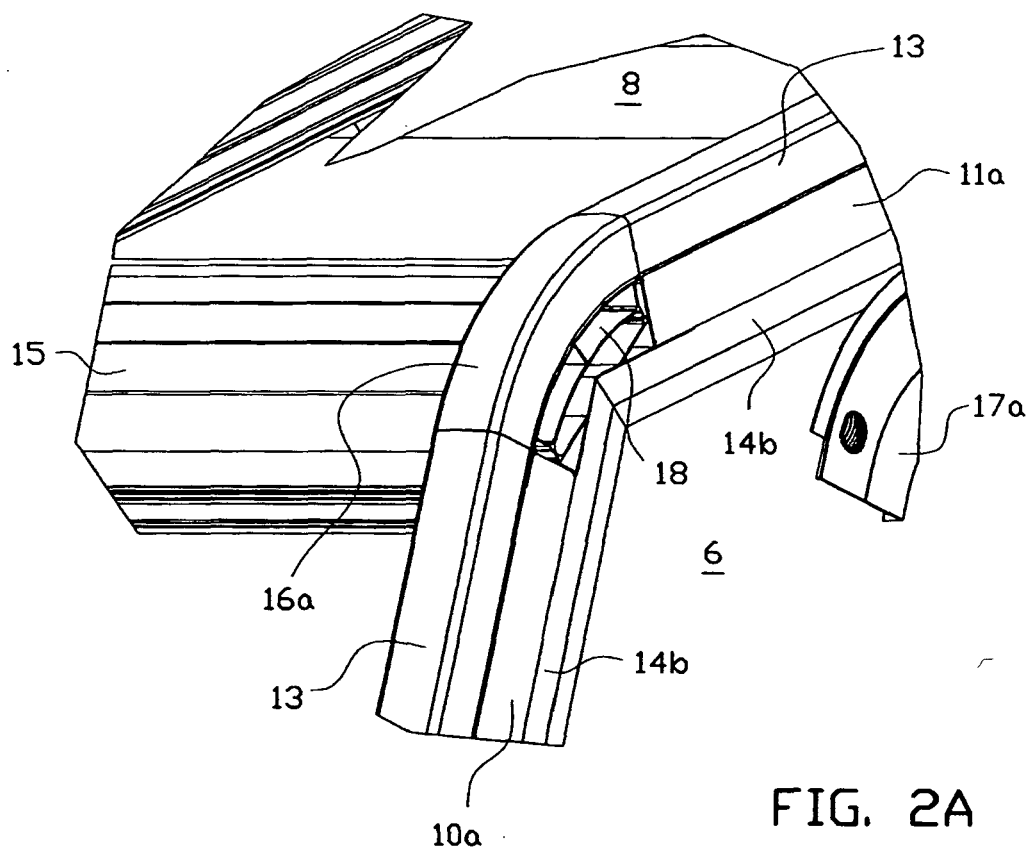


FIG. 1D



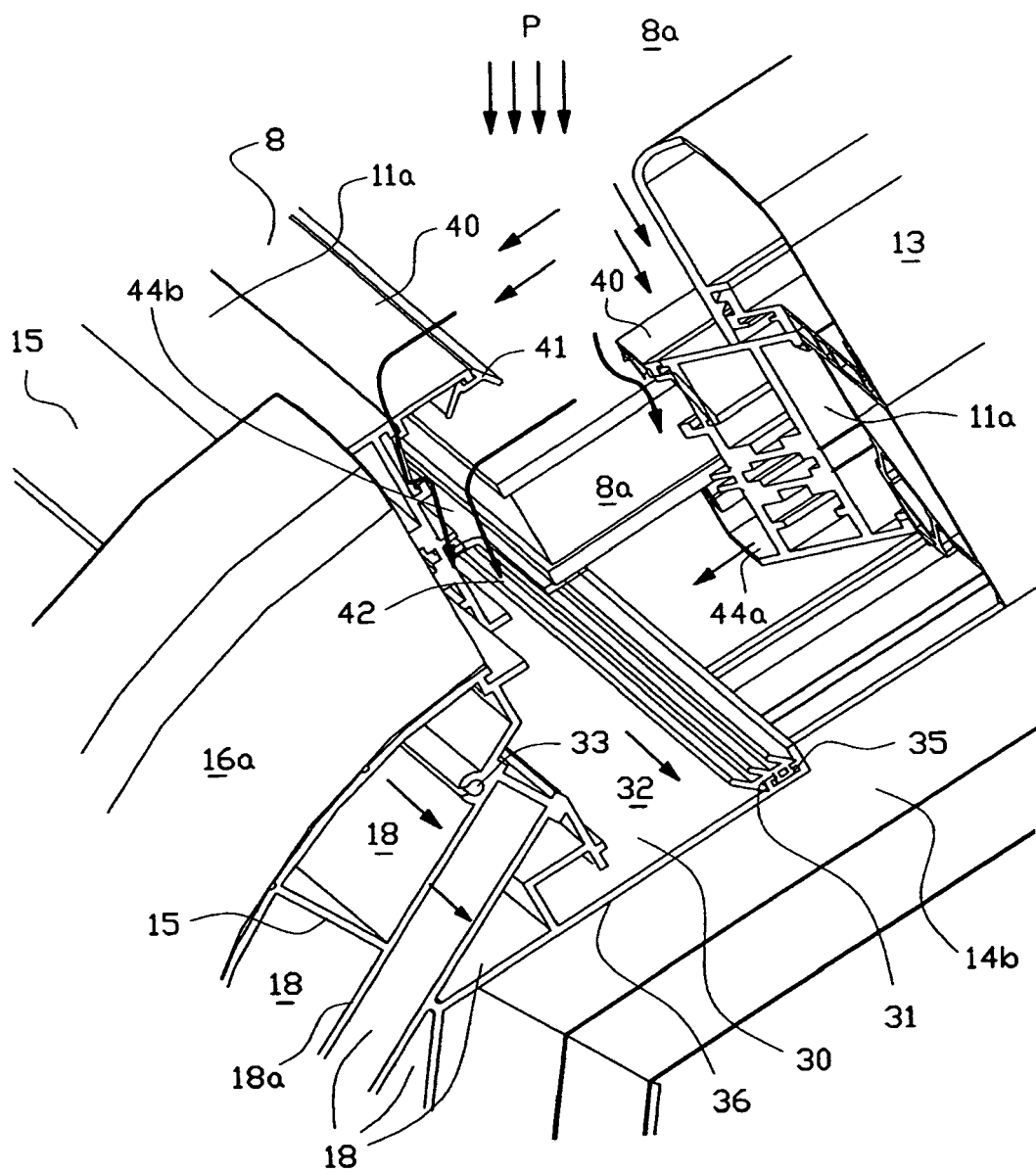


FIG. 3A

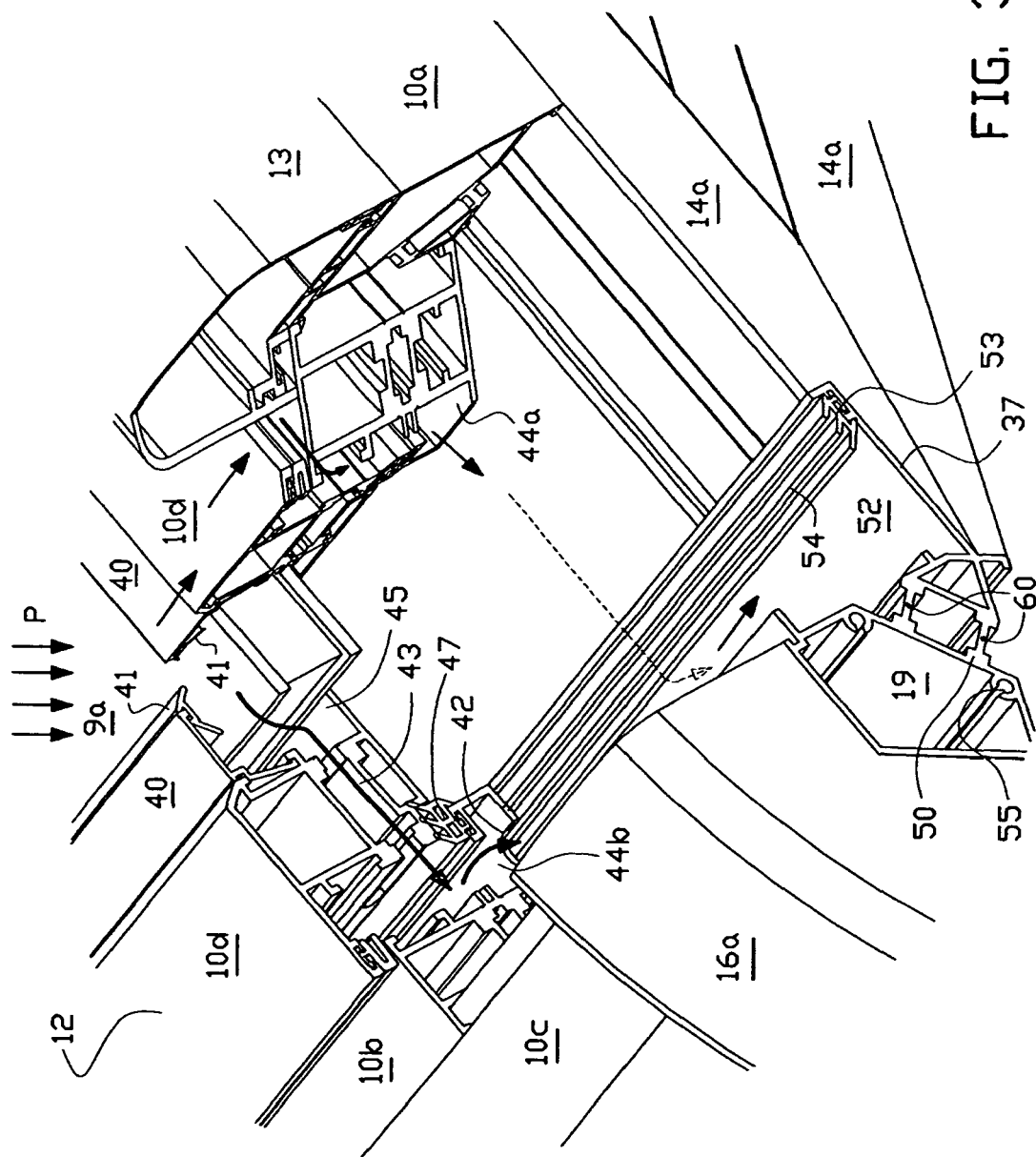


FIG. 3B