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Remarks:

Claims 26 and 27 are deemed to be abandoned due to non-payment of the claims fee (Rule 31 (2) EPC).

(54) **A roofing or screening system**

(57) A roofing or screening system has a support comprising a glazing bar (40) and a member (42) that slides longitudinally over part (44) of the glazing bar to be retained thereby. The member then presents hooked profiles (46) to opposite sides of the glazing bar. Hooked

edged portions (28) of panels (22) interengage with those profiles to be retained to the support. A cap (54) is clipped over the glazing bar to shield the joints. End glazing bars (60, 160) and a wall mount (25) are also described.

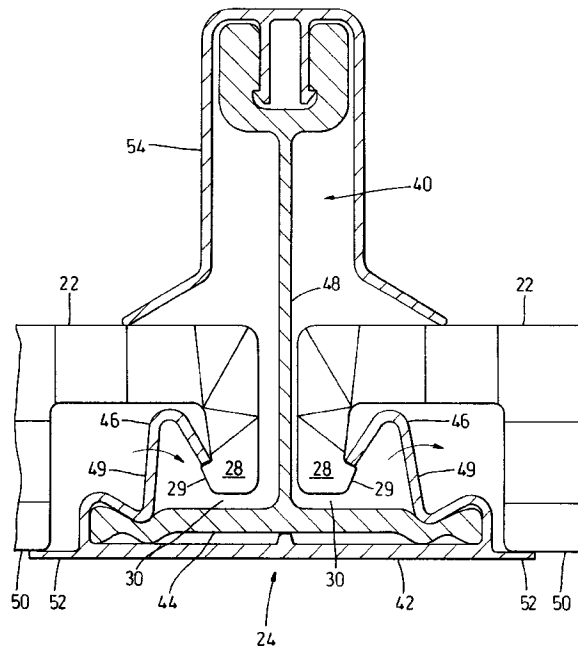


Fig. 3

Description

The present invention relates to a panelling system particularly, but exclusively, a roofing system, and to apparatus for fixing a roof assembly to a wall or like structure.

There is a growing demand for a self-supporting panelling system for use as vertical glazing or screening and roofing in industrial and civil buildings. One such system, produced by Polyu Italiana S.p.A. is illustrated in figure 1. The system comprises triple wall polycarbonate panels 10, 11 which have hook-like profiles 12, 13 along opposing edges. The panels, 10, 11 are supported on a frame work which includes the channel 14. The gauge of the channel 14 is such that the hook-like profiles, 12, 13 are easily inserted into the channel 14.

According to a first aspect of the present invention, there is provided a roofing or screening system comprising a support and a panel, the support and the panel having inter-engaging profiles, wherein the support comprises a glazing bar and a member, the member being carried by the glazing bar and forming the inter-engaging profile of the support.

A two component support enables different materials to be selected to suit the respective functions of the glazing bar and the member. For example, the glazing bar which needs to be rigid may be of aluminium and the member may be of a resilient plastics material such as UPVC. The member may be a sliding fit over one end of the glazing bar. Accordingly, the resilient member may act as cladding to conceal the glazing bar from view. This may be advantageous in structures such as conservatories where the roof panel supports are typically visible from within the conservatory.

Preferably, at least one of the profiles has a substantially hook-like configuration, enabling the profiles to interlock. If one of the profiles is able to flex, the system enables symmetrical panels to be fixed one at a time to a pair of appropriately spaced supports, with the inter-engagement being achieved through a snap-fit action.

The support may include a flange against which one planar surface of the panel abuts when the profiles are inter-engaged. Such an arrangement is advantageous for supporting the panel, particularly in roofing systems. This is because the portion of the panel abutting the flange bears any loading on the panel rather than its respective profile.

The panel profile may be a tight fit against or may even be clamped by the member when the profiles are inter-engaged. Whilst the tight fit and/or clamping action may be desirable to prevent the panel rattling against the support, it is important that any tight fitting or clamping action allows thermal expansion and contraction of the panel if the resulting displacement is significant. Thus, for example, a space between the glazing bar and the member may need to be provided to accommodate expansion or contraction of the panel.

Part of the support may extend proud of the plane

of the panel when the profiles are inter-engaged. The protuberant part of the support may carry a cap which may serve to prevent the ingress of water into the space between the glazing bar and the panel. The cap may also prevent the panel disengaging from the support.

The roofing or screening system may further comprise an end support for supporting the side of the panel - distal side - spaced from the said support, the end support having groove means into which the side of the panel is a snug fit. Preferably, the groove means has a tapered opening to assist in locating the side of the panel in position. The distal side of the panel may have a profile to match that which engages the said support or this may have been removed, possibly with part of the panel, so that the remaining truncated panel fits the space available. Thus, the groove means may comprise a first groove for receiving a distal side of the panel with the profile and a second groove for receiving a distal side without the profile.

If the panel is hollow or has hollow sections, as has four wall polycarbonate panels, a reinforcing member may be introduced between the faces of the panel, particularly if the panel is truncated. The reinforcing member is sized to trap the faces of the panel against the sides of the groove means. The reinforcing member may have a substantially U-shaped cross-section, with the mouth of the U-section preferably adjacent to the end support.

According to a second aspect of the present invention, there is provided apparatus for fixing a roofing assembly to a wall, comprising: a frame having means for attachment to the wall and having means for supporting an end portion of the roofing assembly; and means, spaced from the frame attachment means, for adjusting the inclination of the supporting means relative to the wall.

The apparatus is suitable for fixing a roofing system in accordance with the first aspect of the invention to a wall or like structure. The variations in the inclination of the supporting means relative to the walls may provide for roof assembly pitches in the range 2.5° to 15°.

The adjusting means may comprise a member contacting part of the frame, the member in use determining the separation between the wall and the said contacted part of the frame member by bearing against the wall. The member may threadably engage the frame. The contacted part of the frame may be a flange depending from the supporting means.

The apparatus may further comprise a ridge extending away from the attachment means and away from the supporting means for supporting a cover projecting from the wall. The cover, which may include lead flashing, directs rainwater running down the wall onto the roof assembly, thereby preventing water seepage onto the apparatus. The ridge and supporting means may be arranged to provide a recess for receiving at least part of the end portion of the roof assembly. A seal may be provided between the ridge and the roofing as-

sembly to contain any water driven (e.g. blown) under the cover.

Preferably, the ridge and the supporting means and the attachment means are formed in a unitary construction. In other words, the ridge is part of the frame.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 shows a perspective view of a prior art panelling system;

Figure 2 shows schematically an exploded perspective view of the roofing system embodying the first aspect of the present invention and the mounting apparatus embodying the second aspect of the present invention for fixing it to a wall;

Figure 3 is a cross-sectional view showing detail of the roofing system of Figure 2;

Figures 4a and 4b are cross-sectional views showing end detail of the roofing system of Figure 2;

Figure 5 is a cross-sectional view showing detail of the mounting apparatus of Figure 2; and

Figure 6 shows an alternative end glazing bar arrangement to the one shown in figures 4a and 4b.

Figure 2 shows a roof assembly (20) comprising polycarbonate panels (22), supports (24) and a wall mount (26). The panels (22) have hook-like profiles (28) which clip into recesses (30) in the supports (24). The wall mount (26) comprises a frame, one side (32) of which fits flush against the wall (34) and has a flange (36) which projects away from the wall (34). The frame side (32) and the flange (36) are coupled together through an arcuate section (38). The end of the supports (24) and panels (22), adjacent the wall (34), rest on and are supported by the flange (36). The end of the supports (24) furthest from the wall are supported by conventional means such as posts and the like.

Figure 3 shows the support (24) and the panel profiles (28) in more detail. The support (24) comprises an inverted "T"-shaped aluminium glazing bar (40) and a UPVC cladding (42). The cladding (42) is a sliding but otherwise tight fit over the base (44) of the glazing bar (40). The cladding (42) has crook-like profiles (46) which are upstanding from the base (44), and are symmetrically arranged about the stem (48) of the glazing bar (40). The recesses (30) on each support (24) are thus formed by the spacing between the crook-like profiles (46) and the stem (48), with the tips of the crook-like profiles (46) forming the neck of each recess. The shaft portion (49) of each crook-like profile (46) is able to flex as indicated by the arrows.

The hook-like profiles (28) of the panels (22) snap fit into engagement with the crook-like profiles (46). The supports (24) are spaced such that crown (29) of each hook-like profile (28) sits under the crook-like profiles (46). Before the hook-like profiles (28) ground on the base (44) of the extrusion (40), the faces (50) of the pan-

els (22) abut lateral flanges (52) which thus bear the weight of the panel. Once the panels are clipped into position a cap (54) is attached by a snap fit action to the top of the stem (48). The cap (54) bridges the gap between the panels and is shaped to deflect water away from the glazing bar (24). The cap (54) also prevents any upward movement of the panels (22) relative to the support (24).

The support (24) is for use in the central portion of the roof, in other words it is for use between panels. Either side of the central portion of the roof, end glazing bars (60) are used which are adapted to receive only one panel. The end glazing bar (60) is shown in Figures 4a and 4b in two different configurations arising from the fact that the panels are made in standard widths. If the roof requires a whole number of panels, the end glazing bar (60) will engage a panel having a hook-like profile (see Figure 4a); otherwise, the end glazing bar (60) receives a truncated panel (see Figure 4b).

With reference to Figure 4a, the end glazing bar (60) has a first groove (62) for receiving the hook-like profile (28). The first groove (62) has a tapered opening portion (64) which assists in locating the hook-like profile (28) in position; the profile (28) being a snug fit in the first groove (62). When the hook-like profile (28) is fully located in the first groove (62), the face (50) of the panel (22) sits on flange (66). Again, a top cap (68) is provided to deflect rainwater away from the end glazing bar (60). The top cap (68) is integrally formed with the underside cladding of the end support (60).

With reference to Figure 4b, the end glazing bar (60) has a second groove (72), (wider than the first groove (62)), for receiving a truncated panel (74). The second groove (72) has one side (76) in common with the first groove (62). The other side (78) of the second groove (72) acts as a guide and is tapered, the taper being such that the panel must crumple to fit into the second groove (72). Once part of the panel has crumpled, that part loses some of its rigidity. Thus, a "U"-shaped aluminium reinforcing channel (80) is introduced between the faces of the truncated panel (74), with the channel opening adjacent the end glazing bar (60). The channel (80) is sized to wedge the faces against the sides of the second groove (72).

Figure 5 shows the wall mount (26) in more detail. The frame side (32) is fixed direct to the wall (34) with screw (82). A lug (84) depends from the flange (36) and is threadably engaged by an adjusting screw (86) which bears against the wall (34). Driving the adjusting screw (86) further through the lug (84) causes the spacing between the lug (84) and the wall (34) to increase. As the spacing increases, the wall mount frame tilts altering the orientation of the flange (36) relative to the wall (34). In doing so, the inclination of the flange (36) can be set to match the desired pitch of the roofing assembly as shown by arrow (88), anywhere in the range 2.5° to 15°.

Once the panels (22) are flush against the flange (36) fixing screws (90) are used to hold the panels in

place. UPVC cladding (92) is then clipped over the underside of the flange (36) and lug (84) to conceal the wall mount (26) from view from below. A UPVC end closer (93) covers the end of the panels furthest from the wall (34).

The wall mount (26) has a ridge (94), one part (96) of which projects away from the wall (34) and over the flange (36). The one part (96) and the flange (36) form a channel into which the panels (22), but not the supports (24), extend. A weatherproof seal (98) is provided between the one part (96) and the panels (22). The other part of the ridge (94) protrudes above the supports (22) and carries a cover (100) which, with lead flashing (102), deflects rainwater away from the wall (34) onto the roof.

Figure 6 shows an alternative end glazing bar arrangement to the one illustrated in Figures 4a and 4b. The alternative arrangement comprises an end glazing bar (160) and two-piece cladding consisting of a top cap (168) and L-shaped undercladding (170). The top cap (168) has projections (169) which are a snap fit engagement in recess (162) in the uppermost part of the end glazing bar (160).

The end glazing bar (160) has a single groove (162) for receiving the edge of either a complete panel (22) with hook-like profile (28) or a truncated panel (74). The lower side (164) of the groove (162) extends such that the underside face (150) of either a complete or truncated panel received in the groove (162) is supported. The upper side (165) of the groove (162) is angled away from the lower side (164) so that a wedge gasket may be inserted between the upper side (165) and a panel in the groove (162) to prevent water ingress.

The end glazing bar (160) has a pair of flanges (166) which project away from the groove (162). The flanges (166) engage with corresponding flanges (172) on the L-shaped undercladding (170), providing the means for attaching the latter to the end glazing bar (160).

The top cap (168) and L-shaped undercladding (170) are provided with co-extruded gaskets (180) which in use seal against the upper and lower faces, respectively, of the panel held by the glazing bar (160). The gaskets help prevent the ingress of water into the end glazing bar arrangement. Additional water proofing is provided by the fact that the top cap (168) overlaps the L-shaped undercladding (170) on the side of the glazing bar (160) furthest from the panel, when both are coupled to the glazing bar (160).

Claims

1. A roofing or screening system comprising a support and a panel, the support and the panel having inter-engaging profiles, wherein the support comprises a glazing bar and a member the member being carried by the glazing bar and forming the inter-engaging profile of the support.

2. A roofing or screening system according to claim 1, in which at least one of the inter-engaging profiles has a substantially hook-like configuration.

5 3. A roofing or screening system according to claim 1 or 2, in which the member slidably engages the glazing bar.

10 4. A roofing or screening system according to any of claims 1, 2 or 3, in which the member includes a flange against which one planar surface of the panel abuts when the profiles are inter-engaged.

15 5. A roofing or screening system according to any one of the preceding claims, in which the profiles are elongate, extending substantially along the length of the support and panel.

20 6. A roofing or screening system according to any one of the preceding claims, in which the glazing bar and the member are of different materials

25 7. A roofing or screening system according to claim 6, in which the glazing bar is of aluminium and the member is of plastics material.

30 8. A roofing or screening system according to any one of the preceding claims, in which part of the glazing bar extends proud of the plane of the panel when the profiles are inter-engaged.

35 9. A roofing or screening system according to claim 8, further comprising a cap mounted on the protuberant part of the glazing bar and preventing dis-engagement of the panel and member profiles.

40 10. A roofing or screening system according to any of one of the preceding claims, in which the member has a further profile, adjacent the said profile, for inter-engaging with the profile of an additional panel.

45 11. A roofing or screening system according to any one of the preceding claims, further comprising an end support for supporting the side of the panel spaced from the said support, the end support having groove means into which the side of the panel is a snug fit.

50 12. A roofing or screening system according to claim 11, in which the groove means has a tapered opening.

55 13. A roofing or screening system according to claim 11 or claim 12, further comprising a reinforcing member disposed between the faces of the panel and sized to trap the faces of the panel against sides of the groove means.

14. A roofing or screening system according to claim 13, in which the reinforcing member has a substantially "U"-shaped cross-section.
15. A roofing or screening system according to claim 14, in which the opposing sides of the substantially U-shaped reinforcing member are adjacent the faces of the panel, with the open side adjacent the end support.
16. Apparatus for fixing a roofing assembly to a wall, comprising: a frame having means for attachment to the wall and having means for supporting an end portion of the roofing assembly; and means, spaced from the frame attachment means, for adjusting the inclination of the supporting means relative to the wall.
17. Apparatus according to claim 16, in which the adjusting means comprises a member contacting part of the frame, the member in use determining the separation between the wall and the said contacted part of the frame.
18. Apparatus according to claim 17, in which the member threadably engages the frame.
19. Apparatus according to claim 16 or claim 17, in which the said contacted part of the frame is a flange depending from the supporting means.
20. Apparatus according to any one of claims 16 to 19, in which a portion of the frame between the attachment and supporting means has an arcuate cross-section.
21. Apparatus according to any one of claims 16 to 20, in which the frame is of unitary construction.
22. Apparatus according to any one of claims 16 to 21, further comprising a ridge, extending from the frame and away from the supporting means, for supporting a cover projecting from the wall.
23. Apparatus according to claim 22, in which a portion of the ridge projects over the supporting means, forming a recess for receiving the end portion of the roofing assembly.
24. Apparatus according to claim 23, further comprising a seal provided on the said portion of the ridge to engage the end portion of the roofing assembly.
25. Apparatus according to any one of claims 16 to 22, in which the variations in the orientation of the supporting means relative to the wall provide for roof assembly pitches in the range 2.5° to 15°.
26. A roofing or screening system substantially as hereinbefore described with reference to and as illustrated in, Figures 2,3,4a and 4b.
27. Apparatus for fixing a roofing assembly to a wall substantially as hereinbefore with reference to, and as illustrated in, Figures 2 and 5.
28. A roofing or screening system according to any one of claims 11-15, in which the end support comprises an end glazing bar and cladding mounted on the glazing bar.
29. A roofing or screening system according to claim 28, in which the cladding comprises two parts, at least one of which is a snap fit engagement with the end glazing bar.
30. A roofing or screening system according to claim 28 or 29, in which the cladding has a co-extruded gasket which, in use, engages a face of the panel supported by the end glazing bar.

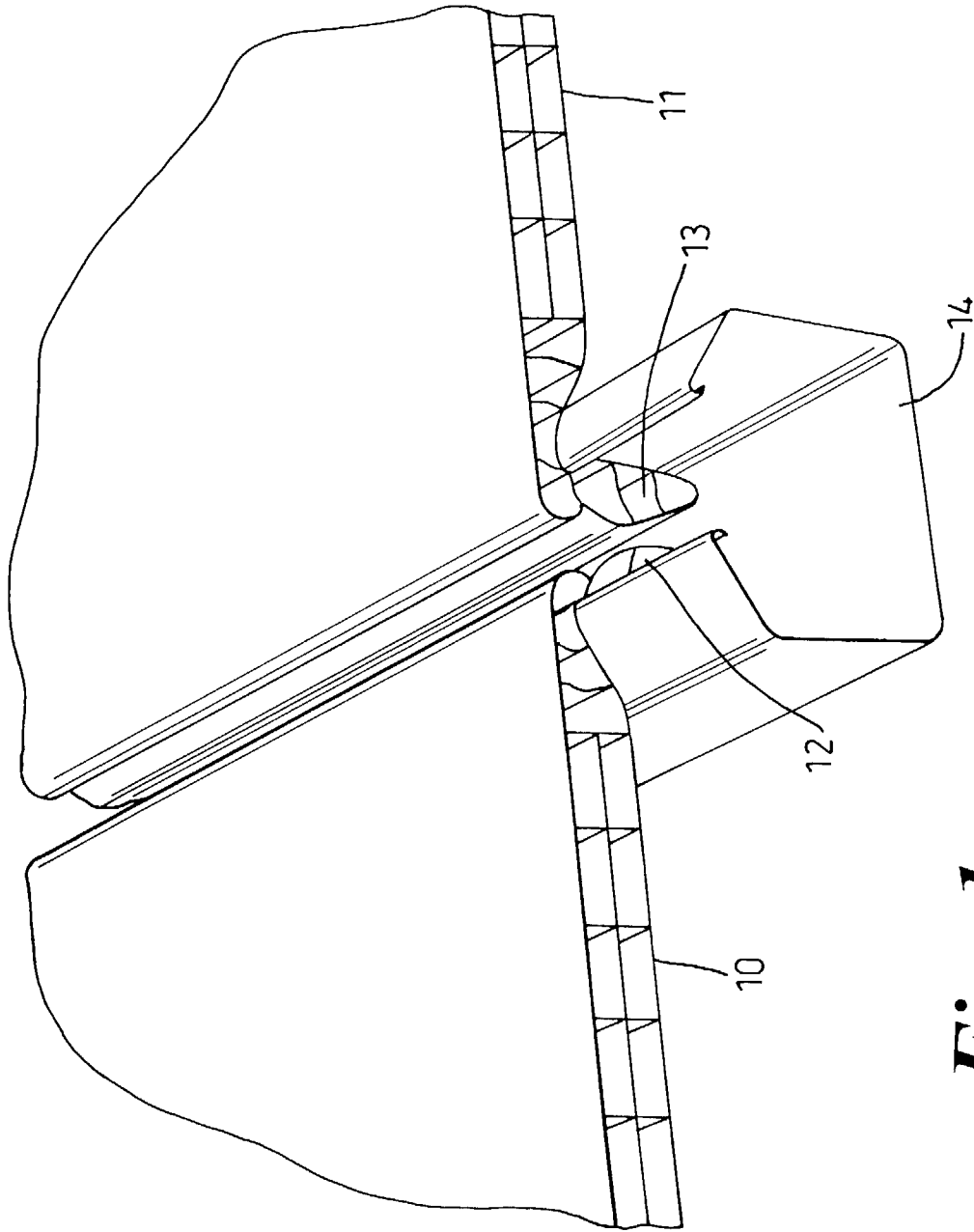


Fig. 1

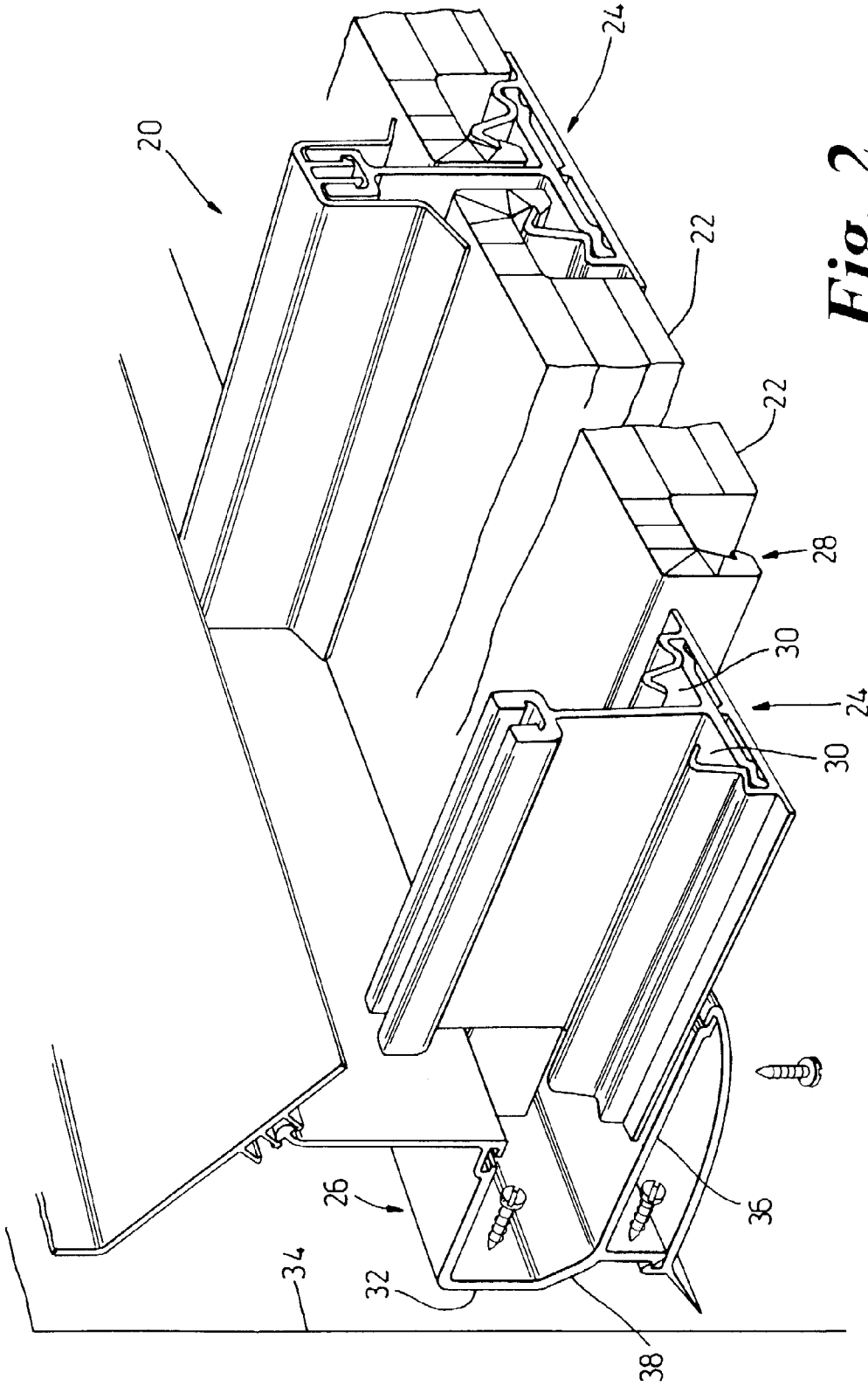


Fig. 2

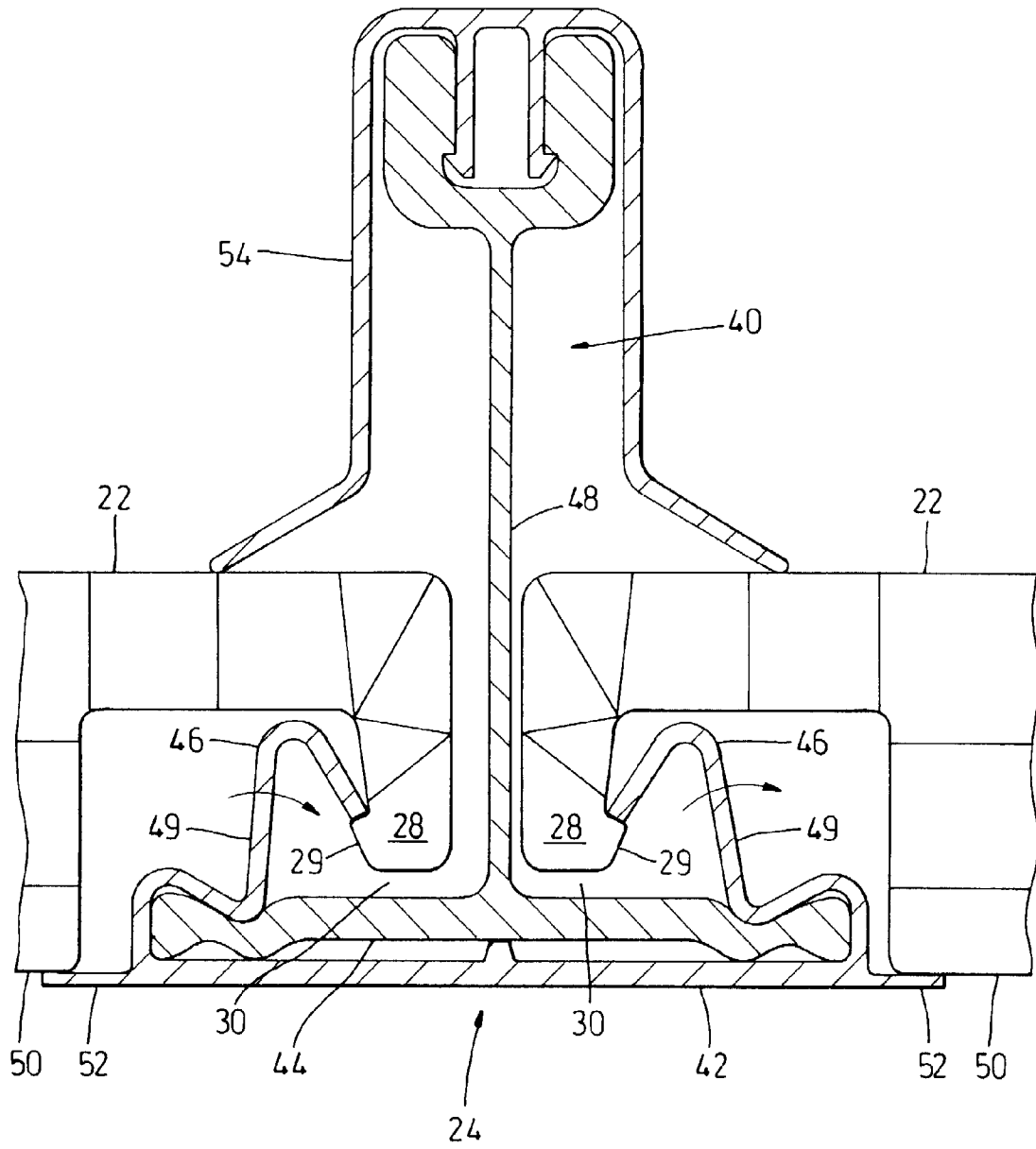


Fig. 3

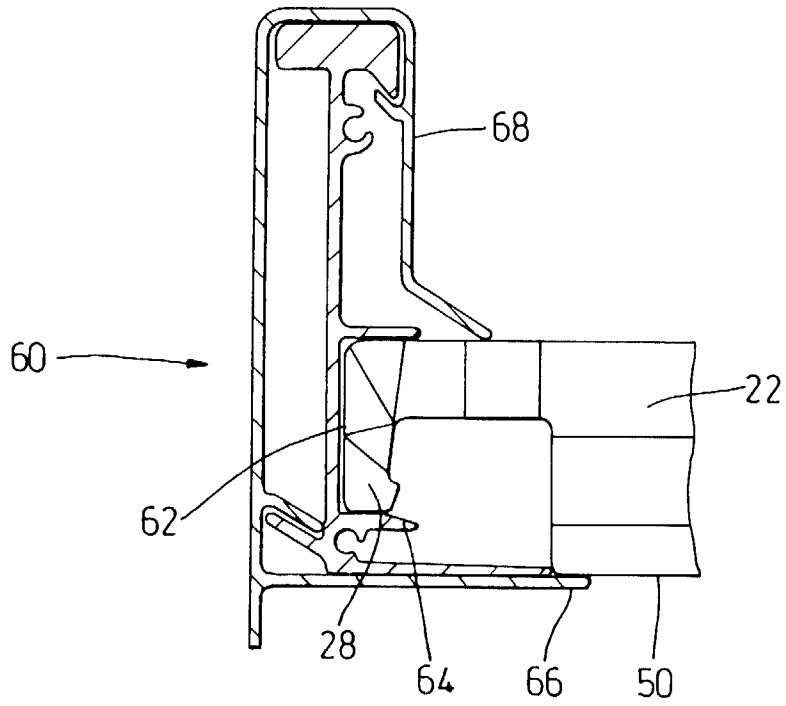


Fig. 4a

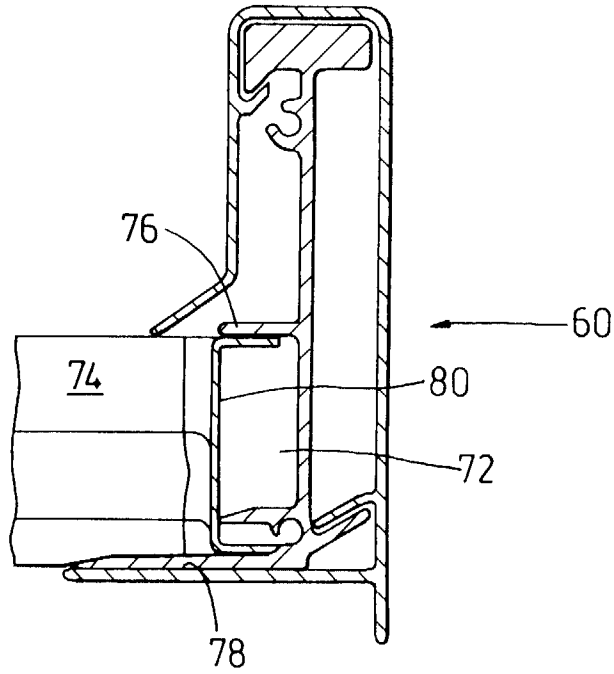


Fig. 4b

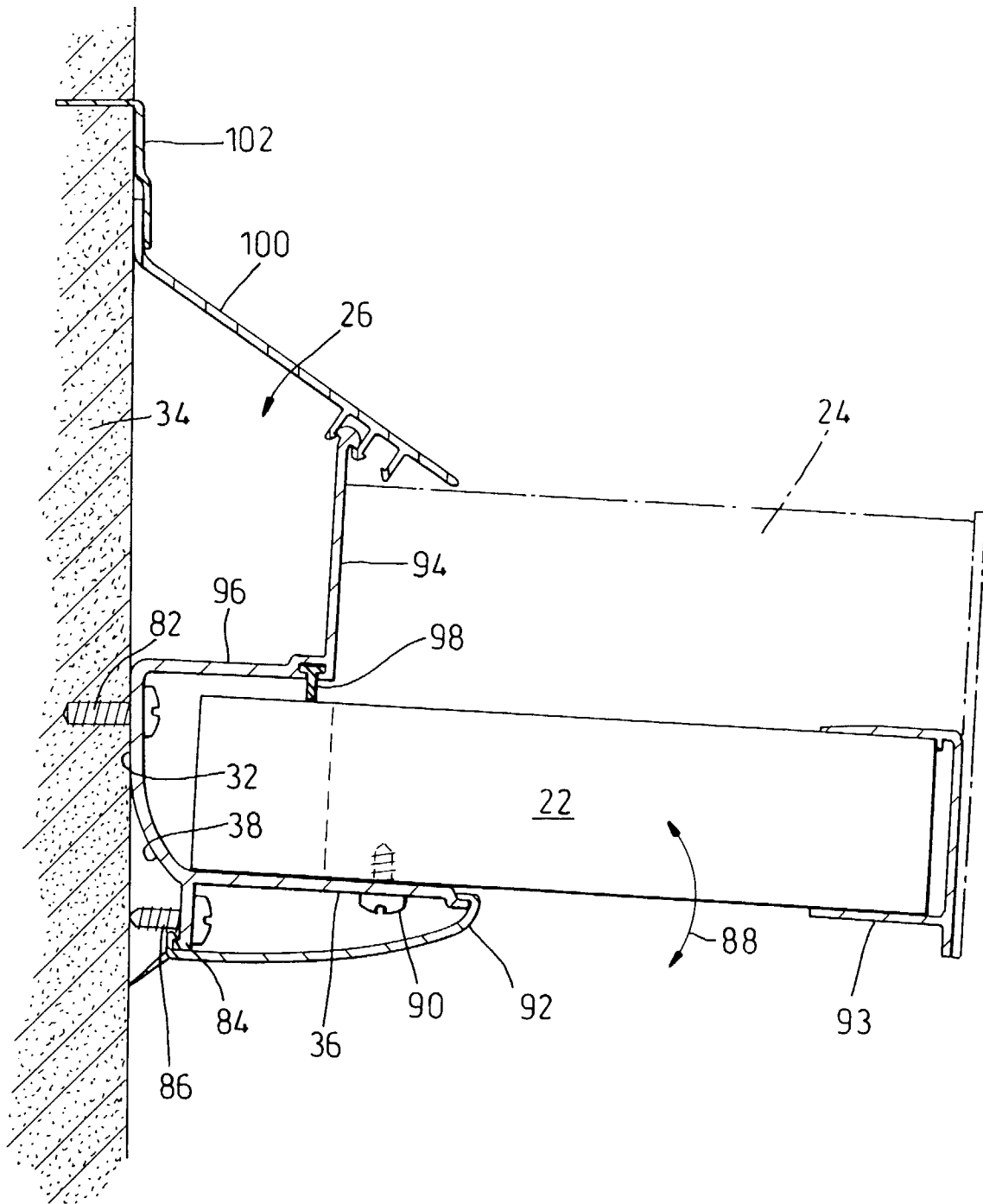


Fig. 5

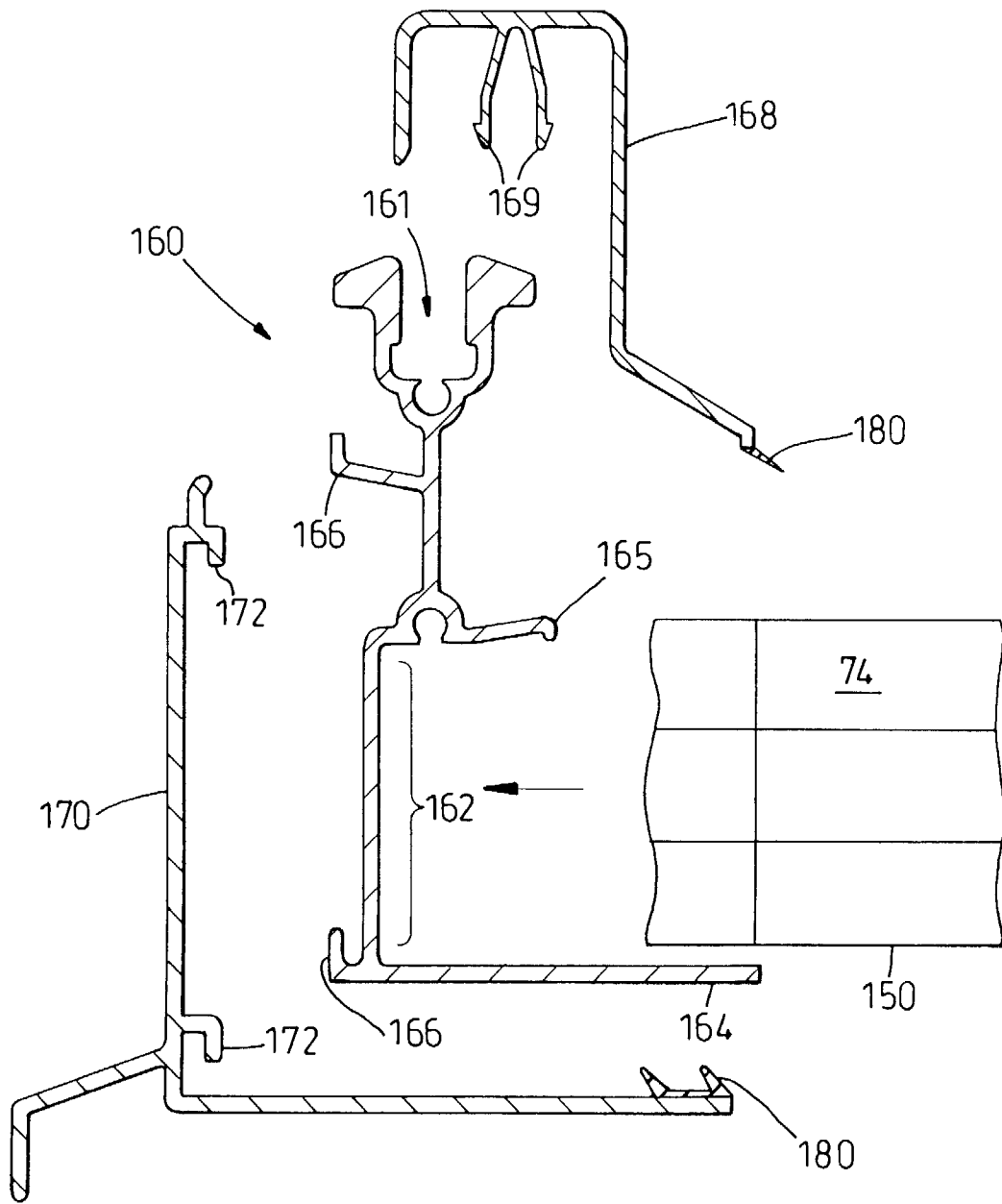


Fig. 6