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54 **PANEL MOUNTING SYSTEM.**

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**AT-B- 382 423**

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## Description

This invention relates to panel mounting systems and particularly although not exclusively to glazing systems such as glazed roofing systems for skylights. It will be convenient to generally describe the invention with particular reference to glazing although the invention is applicable to other panel mounting systems.

One presently known glazing system for glazing of barrel vaults in which glazing panels are arcuate has a mounting arrangement for the lower edges of the glazing panels around the vault opening which requires considerable expertise and time to assemble. The glazing bars which support the curved edges of the glazing panels and which terminate at the peripheral edges of the vault opening are mounted to specially constructed brackets. These brackets are usually manufactured off site and are expensive to manufacture. On site, the brackets must be precisely mounted in the exact positions where the glazing bars will be located. This mounting arrangement does allow a glazing bar to extend upwardly from the bracket at any angle within a range. This feature is needed because the vault may be a full semi-circle in cross section or may form a shallower arc.

This presently known system above is expensive to manufacture, particularly in labour content of the manufacture. Also the system requires considerable skill and expertise to install and the installation is expensive because of the labour costs.

Patent Specification No. AT-B-382 423 shows a number of panels coupled together to enable the panels to fold or hinge relative to the next panel. A curved tongue fits in a complementary curved mouth to enable the joint between panels to be sealed during hinging movement.

It is an object of the present invention to provide a panel edge mounting system which can use mass produced items and which can therefore be fabricated from relatively cheap components.

It is a further object of the present invention to provide a panel edge mounting system which is relatively simple and quick to install so as to minimise or reduce labour costs.

According to the invention there is provided a panel mounting system for mounting a panel to a structure, the mounting system including an anchor piece for fixing to an edge of the panel to be mounted, the mounting system further including a base member for mounting to the structure, the mounting system including a cooperating tongue and mouth arrangement including a tongue provided by the anchor piece and a mouth provided by the base member or vice versa, the tongue being receivable within the mouth for a range of angular positions of the panel so that the anchor piece and the base member can be assembled together at one angular position of the panel and

remain assembled together while the panel is moved towards another angular position being the desired final position of the panel, the mounting system being characterised by an elongated panel edge member for mounting to the panel edge, the edge member having a weather flange extending outwardly therefrom and arranged to cooperate with the base member to form a weather barrier, the weather flange comprising a skirt extending downwardly and arranged to overlap the base member on an outside or exposed side of the base member.

In this system the base member preferably includes a weather-side flange extending up from the base member and arranged to cooperate with the weather skirt of the panel edge member so that water running over the outside of the panel edge member will be inhibited or prevented from penetrating the edge mounting assembly by the weather-side flange. Preferably the weather skirt of the panel edge member is arcuate in cross section and the weather-side flange is complementary so that the weather skirt closely overlaps the weather-side flange for a range of angular positions of the panel member relative to the base member so as to thereby provide weather sealing for a range of angular positions of the panel edge relative to the base member.

The base member may include a downwardly extending skirt integral therewith, the skirt being arranged to overlap a length of flashing for waterproofing purposes.

The anchor piece may include a base support portion for locating and supporting the edge of the panel, the anchor piece further including a side support portion for location at and for overlapping a face of the panel at the edge thereof.

Possible and preferred features of the present invention will now be described with particular reference to the accompanying drawings. However it is to be understood that the features illustrated in and described with reference to the drawings are not to be construed as limiting on the general inventive concept. In the drawings:

Fig. 1 is a side sectional view of a possible arrangement of base member mounted to a perimeter curb, say around a skylight opening to be covered by a barrel vault,

Fig. 2 is a side sectional view showing an anchor member being assembled with the base member of Fig. 1,

Fig. 3 is a side sectional view showing the anchor member generally in desired final position and a glazing mullion positioned preparatory to fastening,

Fig. 4 is a side sectional view showing the final panel edge mounting assembly,

Fig. 5 is a perspective view showing an anchor member assembled with the base member, and Fig. 6 is a side sectional view showing an alter-

native base member in an assembly allowing ventilation through the assembly,

The panel edge mounting system illustrated in Figs 1 to 6 is for mounting a panel 11 to a structure 10. An anchor piece 12 is for fixing to an edge of the panel 11. A base member 13 is mounted to a structural frame member 14. The mounting system includes a tongue 16 provided by the anchor piece 12 and a mouth 17 provided by the base member 13, the tongue 16 being receivable within the mouth 17 for a range of angular positions of the panel 11 so that the anchor piece 12 and the base member 13 can be assembled together at one angular position of the panel 11 and remain assembled together while the panel 11 is moved towards another angular position being the desired final position of the panel 11.

Although the tongue 16 is shown provided by the anchor piece 12 and the mouth 17 by the base member 13, the reciprocal arrangement is also possible.

In the drawings the base member 13 comprises an elongated base member 13 for extending along the line of the panel edge. The mouth 17 provided by the base member 13 is therefore elongated and extends along the base member 13 so that the tongue 16 of the anchor piece 12 can be inserted into the mouth 17 at any longitudinal position. The elongated base member 13 comprises a metal section such as an aluminium alloy extrusion. The elongated mouth 17 opens generally upwardly, when the base section 13 is being used at the peripheral edge of a skylight opening e.g. for covering with a barrel vault, enabling the tongue 16 to be inserted into the mouth 17 from above after the base section 13 has been installed at the edge of the opening to be spanned by the vault.

The base section 13 includes a base web 20 arranged to overlie the structural frame member 14 shown as a perimeter curb provided around the opening spanned by the vault. The base web 20 includes an evaporation tray 21 for enabling evaporation of any moisture penetrating the edge assembly or condensate collected between inner wall 22 at the inner edge of the base web 20 and a wall 23 of the mouth 17. The outer edge of the base member 13 is provided with a downwardly extending skirt 25 arranged to overlap a length of flashing 26 or the like for water proofing purposes.

The anchor piece 12 comprise a length of metal section such as an aluminium alloy extrusion. Any desired length of anchoring section 12 may be used depending for example on the strength of the anchoring force required. In the case of barrel vaults, anchoring section lengths of say 10cm may be used at approximately every metre of panel edge length.

The anchor piece 12 in the illustrated embodiment includes a base support portion 27 for locating and/or supporting the edge of the panel 11. The anchoring section 12 also includes a side support portion 28 for location at and overlapping a face of the

panel 11 at the edge. The base and side support portions 27, 28 are comprised by two flanges, the flanges being arranged at substantially 90° to each other. The tongue 16 of the anchor piece 12 extends from the flanges 27,28 on the opposite side to the V shaped notch 29 defined by the flanges 27, 28.

In the illustrated embodiment the tongue 16 is arcuate in section, and the mouth 17 is of complementary arcuate shape so that as the tongue 16 is inserted deeper into the mouth 17, the anchor piece 12 changes its angular position relative to the base member 13. The tongue 16 and complementary mouth 17 define in cross-section respective segments of a circle. Preferably the tongue 16 is a close fit within the mouth 17 to limit relative rocking or vibrating movement. The centre of curvature 30 of the part circular mouth 17 is preferably the same centre of curvature of the tongue 16 when the anchor piece 12 and base members 13 are assembled together.

The panel edge mounting system further includes an elongated panel edge member 35 for mounting to the panel edge, the edge member 35 having a weather flange 36 extending outwardly therefrom and arranged to co-operate with the base member 13 to form a weather barrier. The weather flange 36 comprises a skirt extending downwardly and arranged to overlap the base member 13 on an outside or exposed side of the base member 13. In the preferred embodiment the skirt 36 extends downwardly to overlap the skirt 25 of the base member 13 which in turn in use overlaps the flashing 26. The base member 13 includes a weather-side flange 37 standing up from the base member 13 and arranged to co-operate with the weather skirt 36 so that water running down the panel 11 and over the outside of the panel edge member 35 will be inhibited or prevented from penetrating the edge mounting assembly by the weather-side flange 37. The weather skirt 36, is arcuate in cross section and the weather-side flange 37 is complementary so that the weather skirt 36 closely overlaps the weather-side flange 37 for a range of angular positions of the panel edge member 35 relative to the base member 13. This will enable the proper weather sealing to be achieved regardless of the angular position of the panel 11.

The panel edge member 35 comprises a panel bead in the form of a channel section 39, e.g. an extruded aluminium alloy section, the channel section 39 being arranged to receive therein the edge of the panel 11 such as a glazing panel 11. The edge of the panel 11 received within the channel section 39 is retained and sealed along its edge by means of a U-shaped sealing gasket 40 which is a tight frictional fit in the channel section 39 and receives the edge of the panel 11 therein. The gasket may be of neoprene or rubber or other suitable material and removal of the gasket 40 from the channel section 39 is inhibited by serrations 41 on the inside surfaces of the channel 39.

As shown in Fig. 6 a barrier strip 43 provides a barrier against penetration of weather/insects/debris. The barrier strip 43 is operatively located in use between the base member 13 and the panel edge member 35. Preferably the barrier strip 43 is located between the weather skirt 36 of the panel edge member 35 and the base member 13. In this arrangement the base member 13 may not be provided with the weather-side flange 37. The barrier strip 43 may comprise a perforated strip mounted to the base member 13 and extending outwardly therefrom and in use pressing against the inner surface of the weather skirt 36 of the panel edge member 35. The perforated strip 43 for example may be riveted at its inner edge to the base member 13 or may be fitted into a pocket 44 formed on the outer side of the base member 13. The outer wall of the pocket 44 may be deformed inwardly to clamp the perforated strip 43 and retain it against removal. With the provision of a perforated barrier strip 43, ventilation can be deliberately permitted through the mounting system in use as shown by arrows C.

In Figs. 1 to 4 the steps of assembling one possible embodiment of a panel edge mounting system are shown in sequence. In Fig. 1 the elongated base section 13 is laid over and secured by a bolt 50 to the perimeter curb 14 provided around the opening to be spanned by a barrel vault. A conventional flashing strip 26 is provided which the downwardly extending skirt 25 of the base section 13 overlaps to provide for water runoff. The evaporation tray 21 is defined between the inner wall 22 and wall 23 defining one side of the mouth 17, the other side of the mouth 17 is defined by the generally S-section wall 51 so that the mouth 17 is of part circular cross section, the centre 30 of the circle being shown by an "X". The highest part of the base section 13 is the top edge 52 of the inner wall 23 of the mouth 17 so that condensation or other moisture reaching any part of the section to the outside of that highest point will preferentially flow to the outside of the assembly.

Base members 13 may be arranged around the entire perimeter of an opening to be spanned by a vault with the ends of the base members 13 along each side of the opening being mitred together.

The anchor piece 12 in Fig. 2 has a part circular section tongue 16 together with a base support flange 27 and side support flange 28 defining a right angled notch 29. As shown in Fig. 2 the anchor piece 12 may be first arranged so that the tip of the tongue 16 is located at the opening to the mouth 17. The anchor piece 12 can then be rotated in the direction of arrow A to the position shown in Fig. 3. In this position the tongue 16 is penetrating the mouth 17 and will inhibit disassembly of the anchor piece 12 from the base section 13 except by reversal of the rotational movement back to the position shown in Fig. 2. The anchor piece 12 in Fig. 3 can adopt any desired angular posi-

tion relative to the base section 13 as exemplified by the range of possible positions indicated with the arrow B in Fig. 3. This allows the panel edge to project vertically upwardly from the anchor piece 12 (as shown in Fig. 4) or the panel 11 can extend from the anchor piece 12 at an angle to the horizontal.

The panel edge mounting system of Figs. 1 to 6 can be used with the panel joining system described later in relation to Figs. 7 to 14. In assembling a barrel vault using the mounting system of Figs. 1 to 5 and the mullion assembly described later in relation to Figs 7 to 14, the support mullion 60 can be placed generally in position with the bottom end of the support mullion being located against the base and side support flanges 27, 28 of the anchor piece 12 (Fig. 3). The support mullion has laterally projecting flanges to which the anchor piece 12 can be secured, e.g. by passing screws through the side support flange 28 into the flanges of the support mullion 60.

In the base support flange 27 there is formed a drainage channel 53 so that water running down the support mullion 60 (which is provided with drainage channels for condensate) can collect in the drainage channel 53 of the anchor piece 12, the water from there falling onto the base member 13 to the outside of the highest point provided at the top edge 52 of the inner wall 23 of the mouth 17.

Fig. 4 shows a glazing panel mounted in position. The bottom edge of the glazing panel 11 has a panel edge member 35 in the form of a metal section. The edge 35 section has a weather flange or skirt 36 which extends downwardly and overlaps the weather-side flange 37 standing up from the outside of the base section 13. As shown, both the weather skirt 36 and the weather-side flange 37 are sections of a circle having the same centre of curvature "X" as the tongue 16 and mouth 17, thus enabling close overlapping of the weather skirt 36 and weather-side flange 37 regardless of the angular position of the panel edge within its range of possible positions.

The panel edge section 35 has a U-shaped channel 39 in which the glazing panel 11 edge is received together with the U-shaped sealing gasket. The panel edge member 35 may be secured to the anchor piece 12 by a rivet 54 or other fastener. The cover mullion 70 is shown as it would be finally assembled over the side edge of the glazing panel 11.

Drainage holes 55 (Fig. 3) can be provided at intervals along the length of the base section 13, the drainage holes 55 being provided through both the bottom edge of the weather-side flange 37 and into the mouth 17 so that any moisture collecting in these low points can be drained to the outside of the assembly.

Fig. 5 shows a perspective view of a length of base section 13 with a short length of say 10cm of anchor section 12 assembled therewith. The support mullion could then be brought downwardly into posi-

tion against the anchor piece 12. The exact position of the anchor piece 12 lengthwise of the base section 13 is not critical.

The line of sight from inside the assembly shown in Fig. 6 by the broken line and indicated by the letter "D" is the "horizon" line for people within a building provided with the glazed vault. Keeping the height of the side support flange 28 of the anchor piece 12 at or below that line will ensure that the anchor piece does not visibly project upwardly from the assembly and possibly spoil the aesthetic finish.

The preferred embodiment of the panel edge mounting system illustrated in Figs 1 to 6 is easy to assemble on site and is therefore believed will result in substantial labour savings. The base section 13, anchor piece 12 and panel edge section 35 can all be extrusions which can be readily manufactured in continuous lengths and cut to size either in the factory or on site. The panel edge sections 35 can be cut to size first in a factory, namely cut to the widths of the glazing panels 11, and the glazing bars or mullion sections will fit together without the need for very close tolerances to be observed. It may only be necessary to cut on site the last one of a number of panel edge sections 35 along a long extent of a vault. The preferred mounting assembly illustrated and described enables all water or condensing moisture to drain to the outside of the assembly. If there is any moisture that penetrates or reaches the inside of the highest point 52 of the base section 13, the evaporation tray 21 is operative to collect and allow evaporation of such moisture.

## Claims

1. A panel mounting system for mounting a panel (11) to a structure (10), the mounting system including an anchor piece (12) for fixing to an edge of the panel (11) to be mounted, the mounting system further including a base member (13) for mounting to the structure (10), the mounting system including a cooperating tongue and mouth arrangement including a tongue (16) provided by the anchor piece (12) and a mouth (17) provided by the base member (13) or vice versa, the tongue (16) being receivable within the mouth (17) for a range of angular positions of the panel (11) so that the anchor piece (12) and the base member (13) can be assembled together at one angular position of the panel (11) and remain assembled together while the panel (11) is moved towards another angular position being the desired final position of the panel (11), the mounting system being characterised by an elongated panel edge member (35) for mounting to the panel edge, the edge member (35) having a weather flange (36) extending outwardly therefrom and arranged to cooperate with the base member (13) to form a weather barrier, the weather flange (36) comprising a skirt extending downwardly

and arranged to overlap the base member (13) on an outside or exposed side of the base member (13).

2. A mounting system as claimed in Claim 1 wherein the base member (13) includes a weather-side flange (37) extending up from the base member (13) and arranged to cooperate with the weather skirt (36) of the panel edge member (35) so that water running over the outside of the panel edge member (35) will be inhibited or prevented from penetrating the edge mounting assembly by the weather-side flange (37).

3. A mounting system as claimed in Claim 2 wherein the weather skirt (36) of the panel edge member (35) is arcuate in cross section and the weather-side flange (37) is complementary so that the weather skirt (36) closely overlaps the weather-side flange (37) for a range of angular positions of the panel edge member (35) relative to the base member (13) so as to thereby provide weather sealing for a range of angular positions of the panel (11) relative to the base member (13).

4. A mounting system as claimed in any one of Claims 1 to 3 wherein the base member (13) includes a downwardly extending skirt (25) integral therewith, the skirt (25) being arranged to overlap a length of flashing (26) for waterproofing purposes.

5. A mounting system as claimed in any one of claims 1 to 4, wherein the anchor piece (12) includes a base support portion (27) for locating and supporting the edge of the panel (11), the anchor piece (12) further including a side support portion (28) for location at and for overlapping a face of the panel (11) at the edge thereof.

## 35 Patentansprüche

1. Anbringungssystem für Paneele zur Anbringung eines Paneels (11) an eine Struktur (10), wobei das Anbringungssystem ein Ankerteil (12) zur Befestigung an einen Rand des Paneels (11), das angebracht werden soll, einschliesst, wobei das Anbringungssystem weiterhin ein Bodenglied (13) zum Anbringen an die Struktur (10) einschliesst, wobei das Anbringungssystem eine zusammenwirkende Zungen- und Öffnungsanordnung einschliesst, die eine Zunge (16) einschliesst, die von dem Ankerteil (12) geliefert wird und eine Öffnung (17), die von dem Bodenglied (13) geliefert wird, oder umgekehrt, wobei die Zunge (16) in der Öffnung (17) für eine Reihe von Winkelstellungen des Paneels (11) aufnehmbar ist, so dass das Ankerteil (12) und das Bodenglied (13) bei einer Winkelstellung des Paneels (11) zusammengefügt werden können und zusammengefügt bleiben, während das Paneel (11) in eine andere Winkelstellung bewegt wird, die die erwünschte Endstellung des Paneels (11) ist, wobei das Anbringungssystem durch ein langgestrecktes Paneelrandglied (35) zur Anbringung an den Paneel-

rand charakterisiert ist, wobei das Randglied (35) einen sich nach aussen davon erstreckenden Wetterflansch (36) hat, und der angeordnet ist, mit dem Bodenglied (13) zusammenzuwirken, um eine Wetterbarriere zu bilden, wobei der Wetterflansch (36) eine sich nach unten erstreckende Kante umfasst, und die angeordnet ist, das Bodenglied (13) an einer Aussenseite oder freigelegten Seite des Bodengliedes (13) zu überlappen.

2. Anbringungssystem nach Anspruch 1, in dem das Bodenglied (13) einen sich nach oben von dem Bodenglied (13) erstreckenden wetterseitigen Flansch (37) einschliesst, und angeordnet ist, mit der Wetterkante (36) des Paneelrandgliedes (35) zusammenzuwirken, so dass Wasser, das über die Aussenseite des Paneelrandgliedes (35) läuft, gehemmt oder verhindert wird, die Randanbringungsanordnung bei dem wetterseitigen Flansch (37) zu durchdringen.

3. Anbringungssystem nach Anspruch 2, in dem die Wetterkante (36) des Paneelrandgliedes (35) im Schnitt gekrümmt ist und der wetterseitige Flansch (37) komplementär ist, so dass die Wetterkante (36) den wetterseitigen Flansch (37) für eine Reihe von Winkelstellungen des Paneels (11) relativ zu dem Bodenglied (13) genau überlappt.

4. Anbringungssystem nach einem der Ansprüche 1 bis 3, in dem das Bodenglied (13) eine sich nach unten erstreckende Kante (25) integral damit einschliesst, wobei die Kante angeordnet ist, eine Länge von Deckstreifen (26) zu überlappen, um es wasserdicht zu machen.

5. Anbringungssystem nach einem der Ansprüche 1 bis 4, in dem das Ankerteil (12) ein Bodenträgereil (27) zum Unterbringen und Tragen des Paneelrandes (11) umfasst, wobei das Ankerteil (12) weiterhin ein Seitenträgereil (28) zum Unterbringen an und zum überlappen einer Fläche des Paneels (11) an seinem Rand einschliesst.

## Revendications

1. Système de pose de panneau permettant le montage d'un panneau (11) sur une charpente (10), le système de pose comportant une pièce de retenue (12) pour la fixation sur un bord du panneau (11) à monter, le système de pose prévoyant aussi un élément de base (13) pour la pose sur la structure (10), le système de pose comportant un agencement à languette et à embouchure prévoyant une languette (16) prévue par la pièce de retenue (12) et une embouchure (17) prévue par l'élément de base (13) ou vice-versa, la languette (16) étant reçue dans l'embouchure (17) pour une gamme de positions angulaires du panneau (11) de telle manière que la pièce de retenue (12) et l'élément de base (13) admettent l'assemblage en une position angulaire du panneau (11) et restent assemblés lors du déplacement

du panneau (11) vers une autre position angulaire représentant la position finale du panneau (11), le système de pose étant caractérisé par un élément allongé de bord de panneau (35) pour la pose sur le bord de panneau, ledit élément de bord (35) ayant une bride (36) contre les intempéries présentée en saillie vers l'extérieur et en agencement fonctionnel avec l'élément de base (13) pour former une entrave aux intempéries, ladite bride-entrave (36) contre les intempéries comportant une jupe allongée vers le bas et agencée pour chevaucher l'élément de base (13) d'un côté extérieur ou exposé de l'élément de base (13).

2. Système de pose tel qu'à la revendication 1, dont l'élément de base (13) prévoit une bride (37) du côté des intempéries qui remonte de l'élément de base (13) en agencement fonctionnel avec la jupe d'exclusion d'intempéries (36) de l'élément de bord de panneau (35) de telle manière que la bride du côté des intempéries (37) condamne ou présente une entrave à la pénétration dans l'ensemble de pose sur le bord, des eaux coulant sur l'extérieur de l'élément de bord de panneau (35).

3. Système de pose tel qu'à la revendication 2, dont la jupe d'exclusion d'intempéries (36) de l'élément de bord (35) prend la forme d'un arc en coupe, la bride du côté des intempéries (37) étant complémentaire de telle manière que la jupe d'exclusion d'intempéries (36) chevauche étroitement la bride du côté des intempéries par rapport à l'élément de base (13) assurant ainsi l'étanchéité contre les intempéries dans une série de positions angulaires du panneau (11) par rapport à l'élément de base (13).

4. Système de pose tel qu'à l'une ou l'autre des revendications 1 à 3 dont l'élément de base (13) comporte une jupe solidaire qui s'étend vers le bas (25), la jupe (25) étant agencée de manière à chevaucher une longueur de rejéteau (26) à l'effet de l'étanchéification.

5. Système de pose tel qu'à l'une ou l'autre des revendications 1 à 4 dont la pièce de retenue prévoit une portion de support de base (27) pour le centrage et le support du bord de panneau (11), la pièce de retenue (12) comportant également une portion de support latéral (28) pour chevaucher et centrer une face du panneau sur son bord.

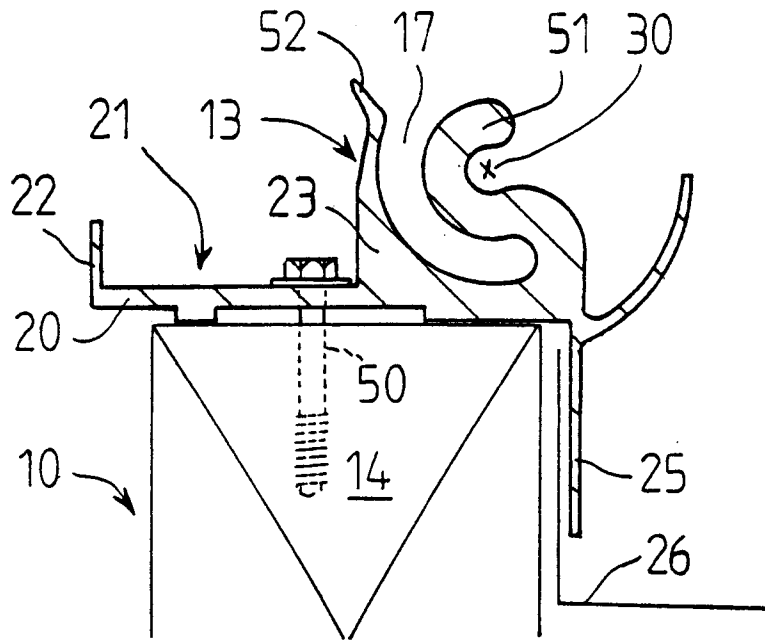


FIG. 1

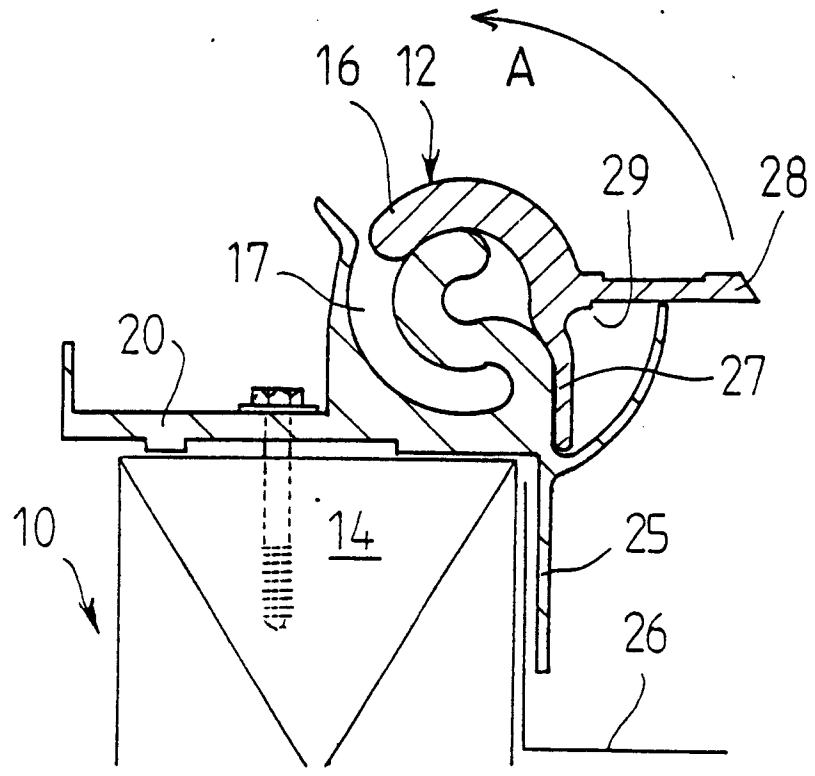


FIG. 2

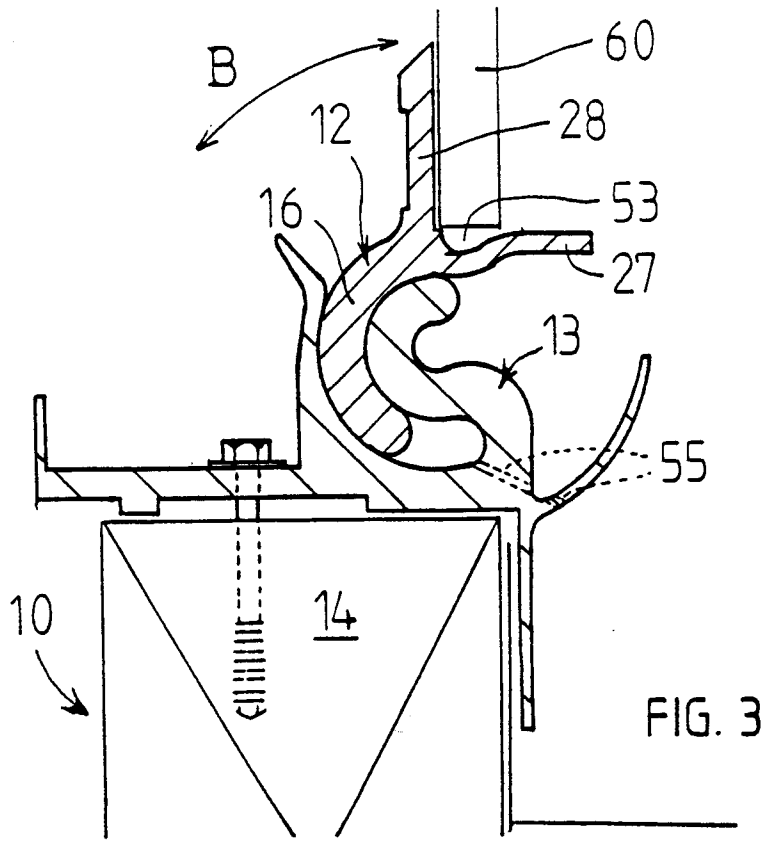


FIG. 3

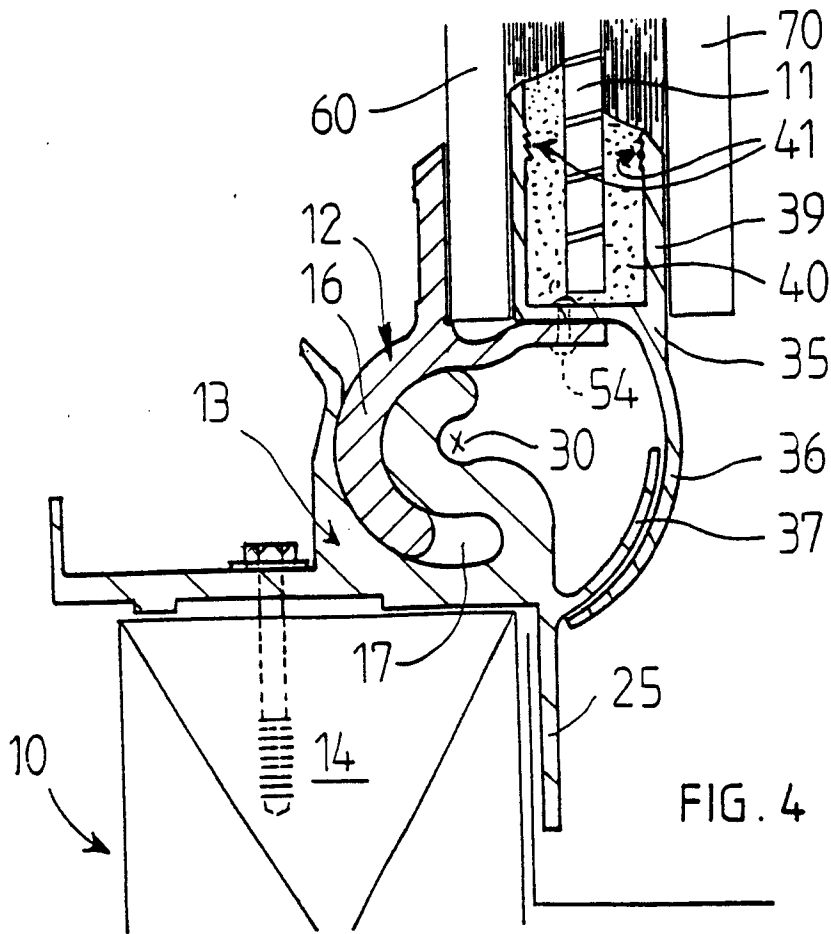


FIG. 4

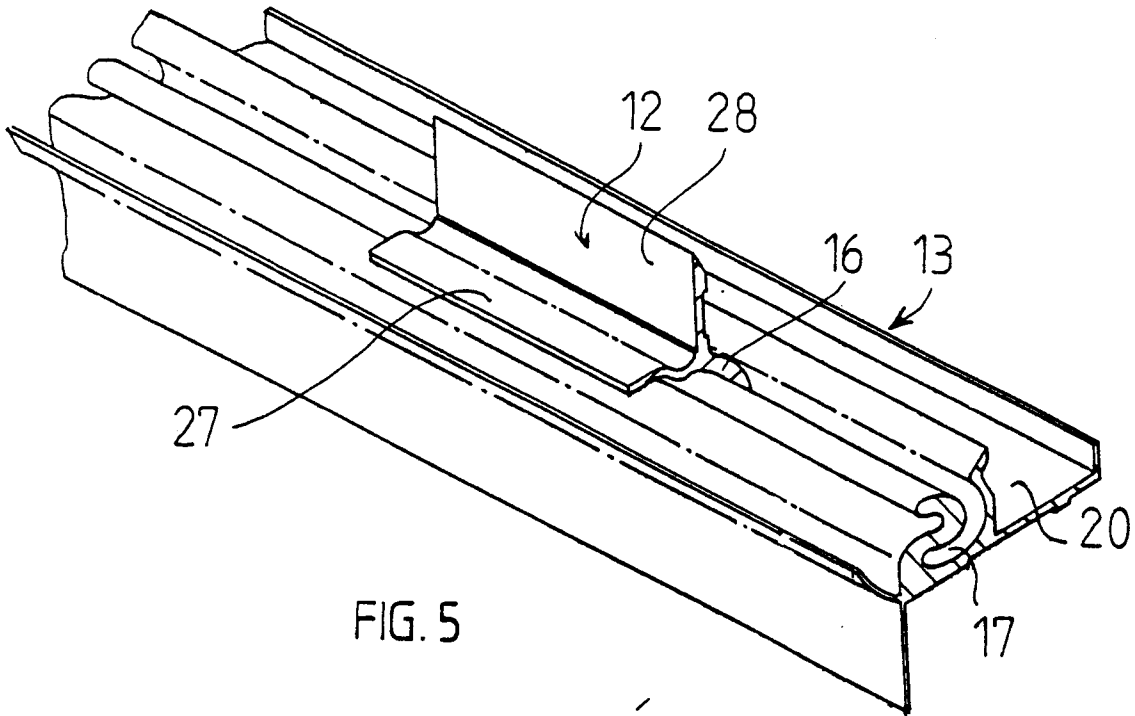


FIG. 5

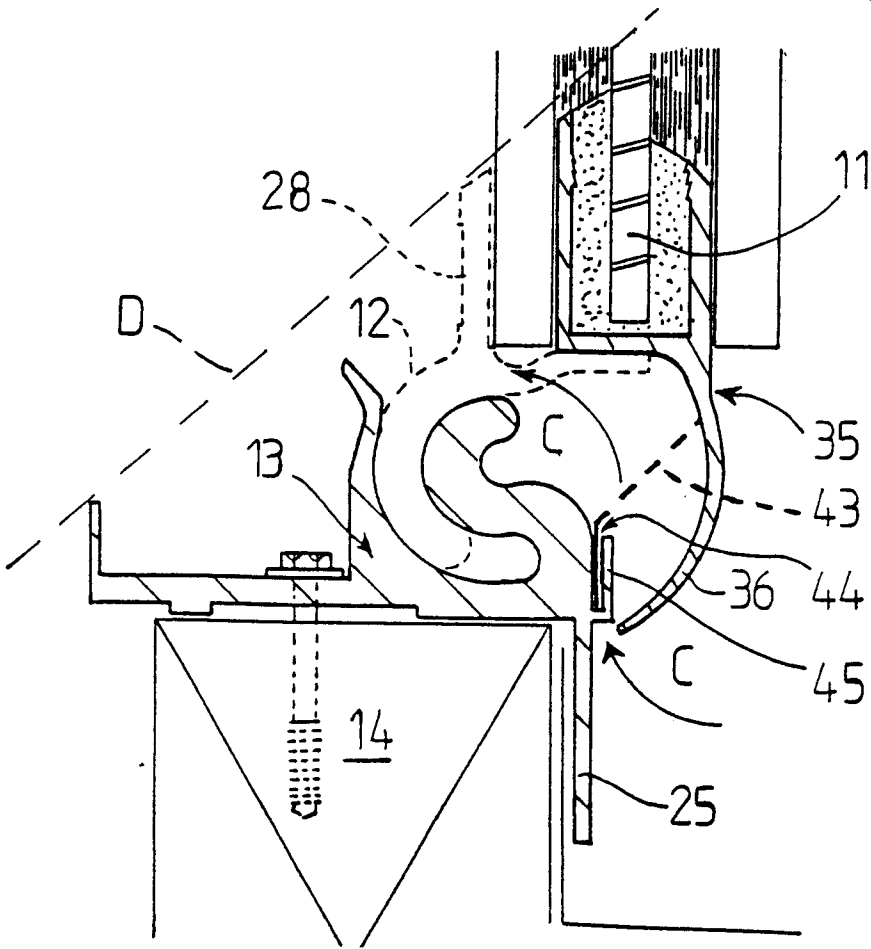


FIG. 6