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(71) Applicant *(for all designated States except US)*: V. KANN RASMUSSEN INDUSTRI A/S [DK/DK]; Tobaksvejen 10, DK-2860 Søborg (DK).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: NIELSEN, Elgård, Schandorff [DK/DK]; Kirkegade 6, DK-8752 Østbirk (DK).

(74) Agents: RAFFNSØE, Knud, Rosenstand et al.; Internationalt Patent-Bureau, Høje Taastrup Boulevard 23, DK-2630 Taastrup (DK).

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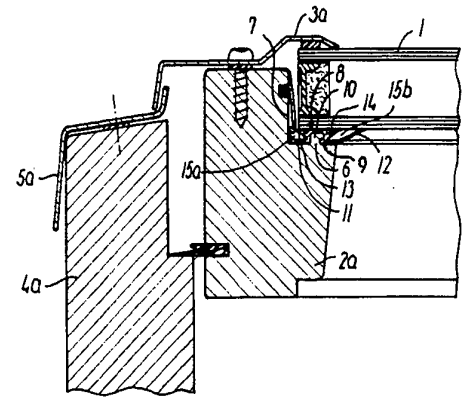
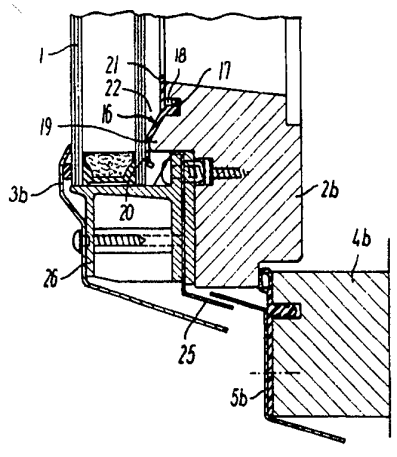
(54) Title: A SEALING ARRANGEMENT FOR A GLASS-CARRYING WINDOW FRAME

(57) Abstract

A sealing arrangement for a glass-carrying window frame comprises sealing profiles of an elastomeric material placed between the inner side of the insulating glass pane (1) and planes on the frame members facing the said inner side. A first sealing profile (8) is placed on the side members (2a) of the frame, and has a drainage channel (15a) facing the light aperture of the window. A second sealing profile (16) is placed in contact with the inner side of the insulating glass pane and together with the insulating glass pane (1) forms a substantially V-shaped drainage channel (22). In the corner joints between the bottom member (2b) and the side members (2a) drainage openings (23) are provided by a depression of the side of the second sealing profile (16) facing the insulating glass pane, such that the said second profile during passage under the first sealing profile (8) is extended out to an exterior wall of the side member (2a), while the first sealing profile (8) is passed over the second sealing profile (16).





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A sealing arrangement for a glass-carrying window frame.

The invention relates to a sealing arrangement for a glass-carrying window frame of the type where an insulating glass pane is kept in contact with a glazing groove in the side members and the top member of the frame and with the bottom member of the frame by means of exterior glazing beads, and where sealing profiles of an elastomeric material placed between the inner side of the insulating glass pane and the surfaces of the frame members facing the inner side of the insulating pane are designed to produce drainage openings in order to drain off the condensed water produced on the inside of the insulating glass pane.

It is well known that dew may occur on the inside of the insulating glass pane of windows and skylights when the outside temperature becomes sufficiently low to cool down the inner side of the glass to a temperature below the dew point of the air in the room. The formation of dew can become great, even to such an extent that condensed water may collect at the bottom member of the frame, which especially in the case of wooden frames or window cases may lead to moisture damage.

From DE-U-8229620.0 a sealing arrangement of the type mentioned above is known, where the said arrangement is utilized in connection with the bottom member of the frame of a skylight to be installed in an inclined roof. This sealing arrangement comprises a triangle-like boss as a support for the insulating glass pane, where the said boss in one or more places is traversed by channels or grooves, such that possible condensed water collected in the overlying slot between the insulating glass pane and the part of the seal serving the purpose of protecting the wood from becoming

wet may be drained off to the outdoors.

In an other embodiment, known from GB-B-2070117, a water absorbent material is provided in a slot between the bottom edge of the insulating glass pane and a sealing flap, where the said sealing flap protects the wood of the bottom member of the frame, and where the water absorbent material furthermore serves the purpose of reducing the flow of air from the outdoors.

For both these structures it is a fact that there in spite of the mentioned precautions remains a risk of condensed water penetrating through to the wood at the corner joints if these are not fully sealed, as the amount of condensed water normally will be greater here than at the middle of bottom member of the frame, since the cooling of the insulating glass pane normally is greatest at the corners.

On this basis it is an aim of the invention to provide a new sealing arrangement by which the problems pertaining to condensed water to a much greater degree are avoided, i.e. by a design, which assures that even large amounts of condensed water can be drained off to the outdoors.

To achieve this the sealing arrangement according to the invention is characterized in that a first sealing profile, which is to be placed on the side members of the frame by attachment to the bottom of the said glazing groove, where the said bottom is facing the insulating glass pane, has a flap facing the aperture of the window, at which flap a longitudinally extending drainage channel is provided, in that a second sealing profile to be placed on the bottom member of the frame partly is placed in contact with the inner side of the insulating glass pane, and partly together with the insulating glass pane forms a substantially V-shaped drainage channel, and in that there at the corner joints

between the bottom member and the side members are provided drainage openings in connection with the said V-shaped channel by a depression of the side of the second sealing profile facing the insulating glass pane, such that this during passage below the first sealing profile is extended outwards to an outer wall of the side member, while the first sealing profile is passed over the second sealing profile for connection of its drainage channel with the drainage opening.

By this embodiment of sealing profiles and corner joints it is assured that even large amounts of condensed water can be drained off to the outdoors through the drainage openings in the corners, while the sealing profiles at the same time are positioned such that they even at the corner joints provide good protection of the wooden parts against the penetration of moisture.

The sealing arrangement according to the invention is furthermore of a relatively simple and inexpensive design, and may be utilized for both skylights and facade windows.

In the following the invention will be described in more detail with reference to the schematic drawing, where

Figure 1 shows a top-hung window seen from the outside;

Figures 2 and 3 are sectional views along the lines II-II and III-III in Figure 3;

Figures 4-7 details of the embodiment of a corner joint;

Figure 8 a detail of a sealing arrangement shown on a larger scale.

The window shown in Figure 1 comprises an insulating glass pane 1 placed in a glass-carrying frame 2, which on the outside in a known manner includes a

glazing bead 3, which serves as both a support for the insulating glass pane and as a weather screen. The frame 2 with the insulating pane 1 is top-hung in a main frame 4, which likewise in a known manner may be provided with an exterior weather screen.

In the sectional view of the side members of the frame and main frame structures shown in Figure 2, the side member of the frame is denoted as 2a, and the side member of the main frame as 4a, while the exterior glazing bead and weather screen on the frame member is denoted as 3a, and the exterior weather screen on the side member of the main frame is denoted as 5a. In order to accommodate the insulating glass pane 1 a glazing groove is provided in the side member of the main frame, where the said glazing groove comprises a bottom 6 and a side wall 7. A first sealing profile 8 is attached to the bottom 6 of the glazing groove, said bottom facing the inner side of the insulating pane 1, which profile in the shown embodiment is fixed in that a track 9 in the underside of the sealing profile engages with an upwardly protruding rib 10 on the bottom of the glazing groove.

The sealing profile 8 covers the bottom 6 of the glazing groove over its entire width, and may, as shown in Figure 8, be designed with outwardly protruding flaps 11 and 12, these being directed towards the side wall 7 of the glazing groove and the aperture of the window, respectively. The flap 11 has such a width that its outer edge is placed in tight contact with the side wall of the glazing groove. Directly connected to the track 9 the profile furthermore has obliquely outwards directed lips 13 and 14, of which the lip 13 together with the flap 11 forms a longitudinally extending drainage channel 15a, while the lip 14 together with the flap 12 forms a drainage channel 15b facing the light

aperture of the window.

The drainage channel 15b mentioned above causes effective drainage during the increasing formation of drops as a result of dew, which is formed first at the edges of the insulation glass pane, as the temperature is lowest here. The stated placement of the drainage channel will in practice have the effect that condensation drops as a result of the formation of dew so to speak are pulled into the drainage channel 15b, which channelizes the drops downwards into the corner joints between the side members of the frame and the bottom member of the frame.

The bottom member of the frame and its corresponding glazing bead and weather screen are in the sectional view shown in Figure 3 denoted as 2b and 3b, while the bottom member of the main frame and its corresponding weather screen are denoted as 4b and 5b. A second sealing profile 16 is placed between the insulating glass pane 1 and the frame bottom member 2b, the said profile being fixed to the frame bottom member by engagement of a boss 17 on the rear side of the profile and a longitudinally extending track 18 in the frame bottom member 2b. The profile is furthermore held in contact with the inner side of the insulation glass pane 1 in the shown embodiment in that the frame bottom member 2b is provided with a protruding nib section 19, which provides support for an outwardly protruding flap 20 of the sealing profile 16, this contact, however, may be achieved in another manner by a suitable variation in the thickness of the sealing profile. On the other side of the boss 17 the wood of the frame bottom member 2b in a direction towards the light aperture is covered by a corresponding outwardly protruding flap 21, such that the sealing profile 16 partly is in close contact with the insulating glass pane, and partly covers the

side of the frame bottom member 2b containing the nib section 19 and facing the insulating glass pane 1.

Together with the insulating glass pane 1 the outwardly protruding flap 20 of the sealing profile 16 forms a substantially V-shaped drainage channel 22, which extends along the entire width of the frame bottom member and out towards the corner joints at the side members of the frame.

The embodiment of the corner joints is most clearly presented in Figures 4-7, and the design of the sealing profile 8 in Figure 8.

In connection with the V-shaped drainage channel 22 in the bottom member of the frame a drainage opening 23 is provided by depression of the side of the sealing profile 16 facing the insulating glass pane, which in the shown embodiment is achieved in that the nib section 19 of the frame bottom member 2b, as is most clearly seen in Figure 4 and 5, is removed at a certain distance away from the side wall 7 of the glazing groove of the frame side member 2a. A profiled strip 24, which forms the side wall 7 of the glazing groove and which belongs to the frame side member 2a, is likewise cut off immediately above the bottom member 2b, as is most clearly apparent in Figures 5 and 6.

As a result of this depression, the sealing profile 16 belonging to the bottom member 2b passes below the sealing profile 8 belonging to the side member 2a and is extended outwards to an exterior wall of the side member 2a, while the sealing profile 8 in turn may be passed over the sealing profile 16, such that the drainage channel 15b in particular is connected to the drainage opening 23.

The extension of the sealing profiles 8 and 16 thus made possible by the overlapped crossing ensures a particularly good protection of the corner joints, and

results in the fact that drops of condensate, which are channelized down through the drainage channel 15b in the profile 8, with certainty are drained off to the outdoors, and that the same is the case with condensed water, which collects in the V-shaped channel 22 in the bottom member.

As is apparent in Figure 3, the draining off of water may take place in that the condensed water, which is led to the corners through the channels 15a, 15b, and 22, is drained off by means of a screen 25, which provides protection on the exterior side of the part of bottom member of the frame 2b lying below the insulating glass pane 1, and which may be fixed by means of glass supports 26, which provide a stop for the insulating glass pane 1 on the underlying frame. The screen 25 may as shown overlap the weather screen 5b on the main frame bottom member 4b, such that a complete protection of the wooden parts of the bottom members of the frame and main frame against weathering and drained off condensation water may be obtained.

C L A I M S

1. A sealing arrangement for a glass-carrying window frame of the type where an insulating glass pane (1) is kept in contact with a glazing groove (6, 7) in the side members (2a) and the top member of the frame and with the bottom member (2b) of the frame by means of exterior glazing beads (3a, 3b), and where sealing profiles of an elastomeric material placed between the inner side of the insulating glass pane (1) and the surfaces of the frame members facing the inner side of the insulating pane are designed to produce drainage openings in order to drain off the condensed water produced on the inside of the insulating glass pane, **characterized** in that a first sealing profile (8), which is to be placed on the side members (2a) of the frame by attachment to the bottom (6) of the said glazing groove, where the said bottom is facing the insulating glass pane (1), has a flap (12) facing the aperture of the window, at which flap a longitudinally extending drainage channel (15b) is provided, in that a second sealing profile (16) to be placed on the bottom member (2b) of the frame partly is placed in contact with the inner side of the insulating glass pane (1), and partly together with the insulating glass pane (1) forms a substantially V-shaped drainage channel (22), and in that there at the corner joints between the bottom member (2b) and the side members (2a) are provided drainage openings (23) in connection with the said V-shaped channel (22) by depression of the side of the second sealing profile (16) facing the insulating glass pane, such that this during passage below the first sealing profile (8) is extended outwards to an outer wall of the side member (2a), while the first sealing profile (8) is passed over the second sealing profile

(16) for connection of its drainage channel (15b) with the drainage opening (23).

2. A sealing arrangement according to claim 1, **characterized** in that the first sealing profile (8) has a flap (11) which is in contact with the side wall (7) of the glazing groove, in which flap (11) an additional drainage channel (15a) is provided.

3. A sealing arrangement according to claims 1 or 2, **characterized** in that the second sealing profile (16) by means of a protruding nib section (19) on the frame bottom member (2b) is held in contact with the inner side of the insulating glass pane (1), and in that the said depression of the sealing profile (16) is provided by a removal of the said nib section (19) at the frame side members (2a).

4. A sealing arrangement according to claims 1, 2, or 3, **characterized** in that the first sealing profile (8) in its underside has a track (9) for engagement with an upwardly protruding rib (10) on the bottom plane (6) of the glazing groove.

5. A sealing arrangement according to claim 3, **characterized** in that the second sealing profile (16) has a boss (17) protruding from its underside for fixing into a key slot (18) in the frame bottom member (2b) within the said nib section (19).

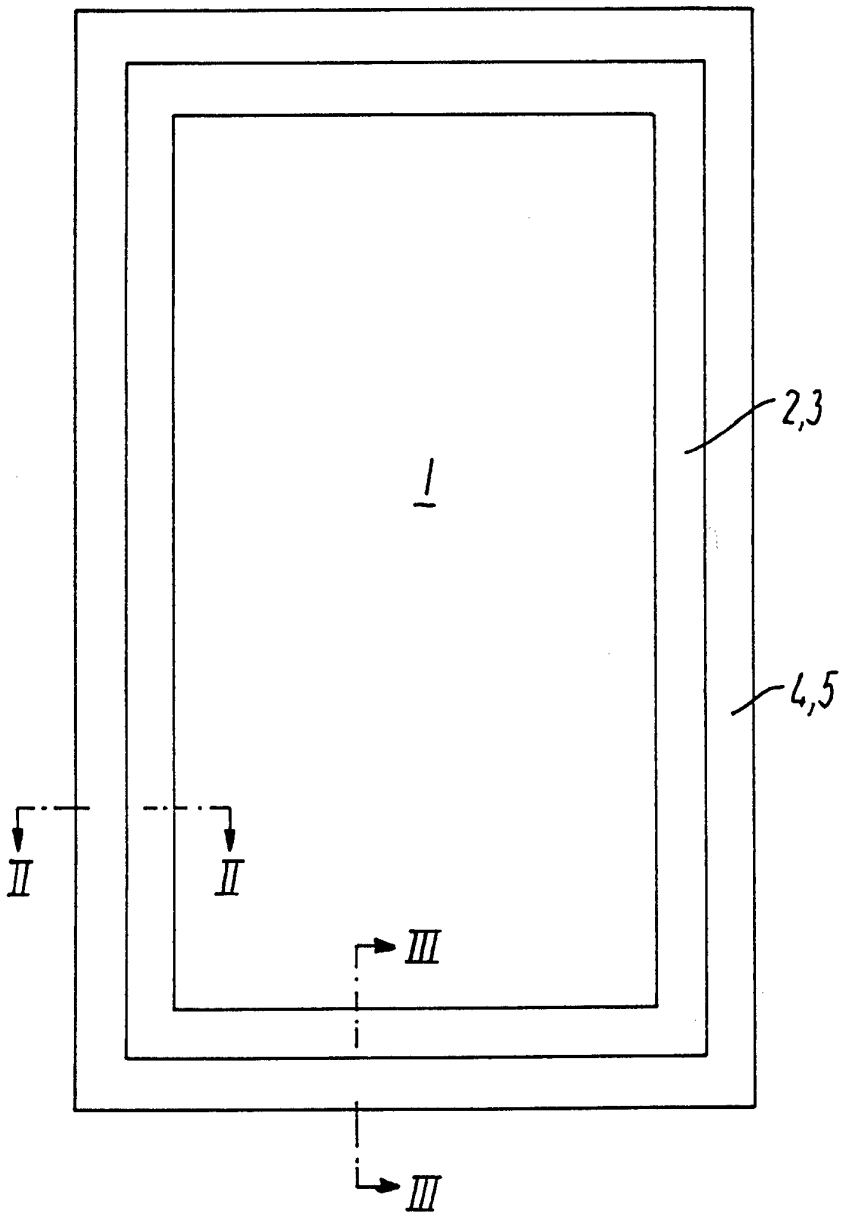

FIG.1

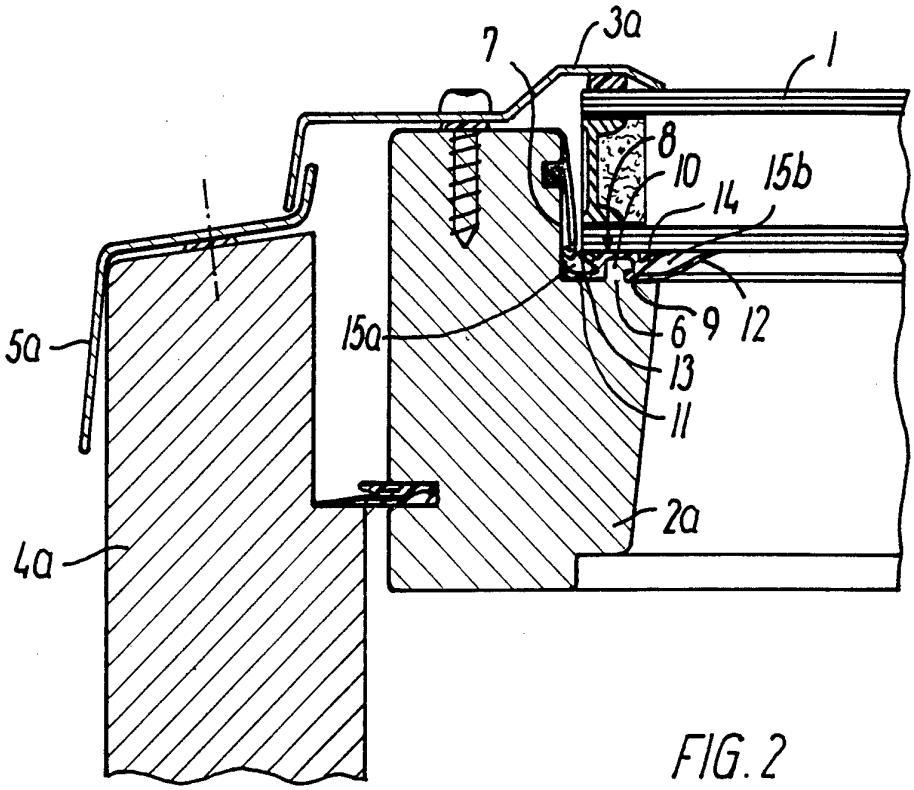
7
3a
1
8
10
14
15b
5a
15a
6
9
12
13
11
2a
4a

FIG. 2

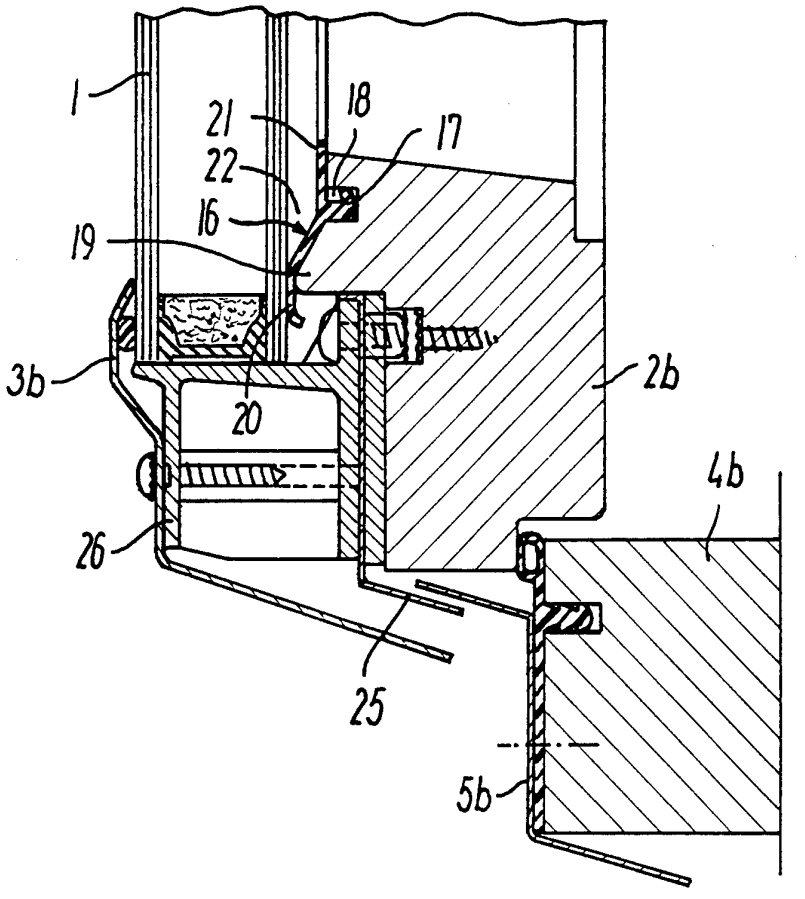
1
21
18
17
22
16
19
3b
2b
20
4b
26
25
5b

FIG. 3

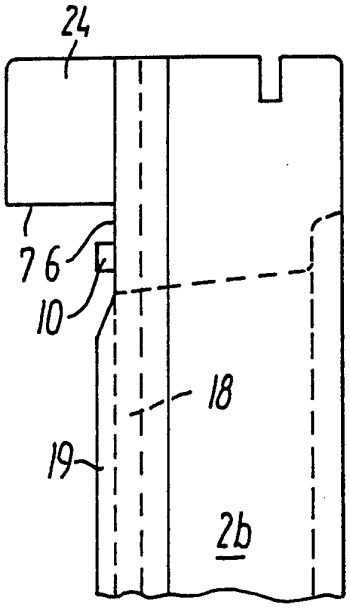

FIG.4

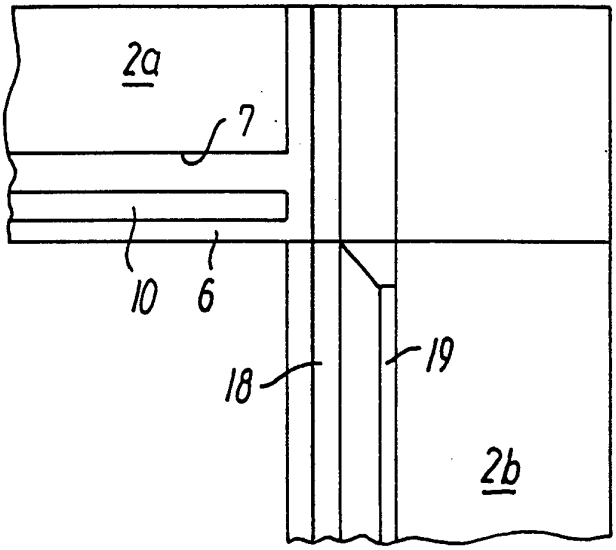

FIG.5

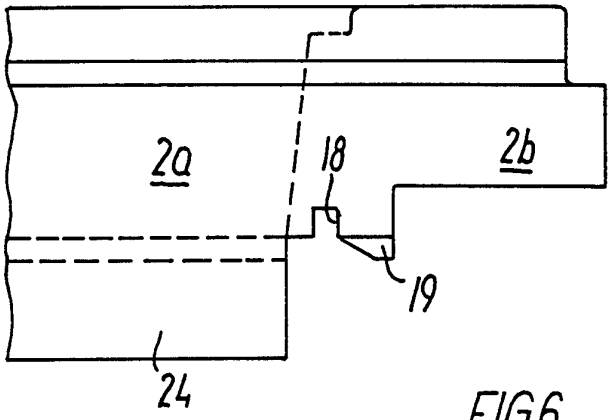

FIG.6

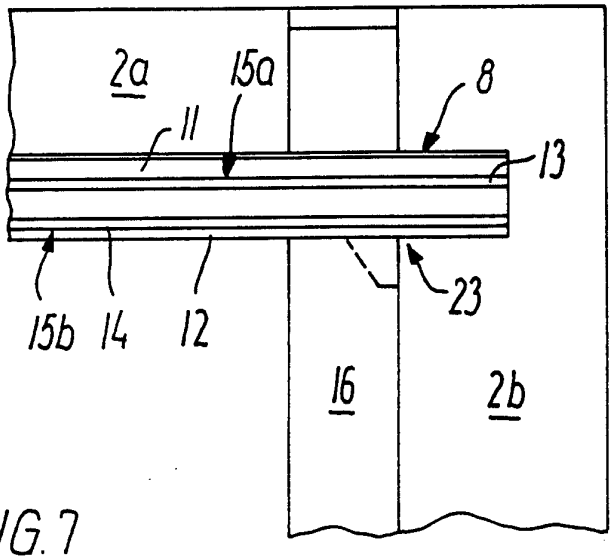

FIG.7

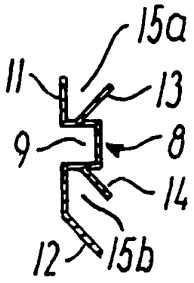

FIG.8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK 93/00391

A. CLASSIFICATION OF SUBJECT MATTER

IPC5: E06B 7/14
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB, A, 2144791 (ALBERT DOUGLAS), 13 March 1985 (13.03.85), page 1, line 59 - line 119, figure 2	1
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A	DE, B, 1066007 (HERMANUS ANNE HEEP), 24 Sept 1959 (24.09.59), figure 1	1
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Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

Information on patent family members

28/01/94

International application No.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB-A- 2144791	13/03/85	NONE	
DE-B- 1066007	24/09/59	NONE	