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(54) **Automatic sealing for doors or windows leaves**

(57) An automatic sealing for a window or door leaf comprises a fixed supporting rail (2) with a U-shaped portion defining an internal seat (4), a movable insulating profile (5) housed in the seat (4) and having a sealing member (6) made of a first elastomeric material and designed to selectively press against a floor or threshold, actuating means (7) movable in a vertical direction to move the sealing member (6) between a rest position completely inside the seat (4) and an operating position at least partially projecting out of the seat (4). The insulating profile (5) further comprises an interface member (8) made of a substantially rigid material with an outer side (9) at least partially in constant contact relationship with the sealing member (6) and an inner side (10) susceptible to interact with the actuating means (7) to transfer the translational motion of the actuating means (7) to the sealing member (6).

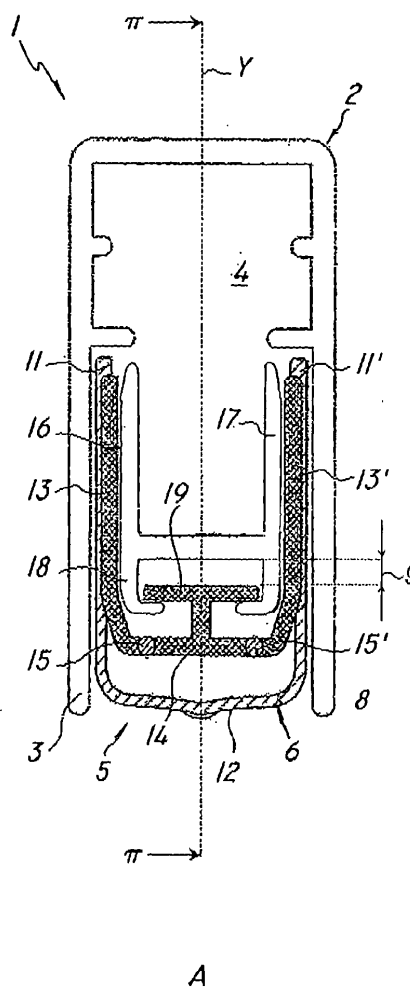


FIG. 1

Description

Field of the invention

[0001] The present invention generally finds application in the field of sound, heat and weather insulating devices for doors and windows, and particularly relates to an automatic sealing for a window or door leaf.

Background art

[0002] Automatic seals for doors or windows are known, which are designed to be inserted in a special channel formed at the lower and/or upper edges of a door or window leaf as a weather strip or for heat and/or sound insulation.

[0003] This kind of sealing is designed to automatically move, as the leaf is closed, from a retracted rest position to an operating position in which the sealing projects out of the channel.

[0004] Typically, automatic seals include a stationary rigid rail that is stably inserted in the channel of the leaf and holds an elastomeric insulating profile therein.

[0005] The upward and downward movement of the insulating profile is generally caused by an intermediate pushing rail, which is also rigid and is acted upon by a control mechanism connected to the door or window.

[0006] The insulating effect is obtained upon contact of the insulating profile with the paving or the upper stile of the door or window opening.

[0007] Similar solutions are very common and disclosed, for instance, in DE29816448, EP0338974, EP1193363, EP1162341, EP1460232.

[0008] In some of these solutions, the elastomeric insulating profile is designed to always contact the inner wall of the fixed rail.

[0009] In other solutions, the side arms of the insulating profile are designed to slightly open apart as they move from the rest position to the operating position, with the profile moving from a so-called "idle" position, i.e. spaced apart from the walls of the fixed rail, to a "drive" position in which it contacts such walls.

[0010] Such movement may be caused by the action of the pushing rail on the resilient profile, i.e. by the particular coupling of these elements.

[0011] For instance, in EP1460232, the pushing rail has a pair of sloping surfaces at its upper ends, which are designed to act upon the lateral arms of the profile as they descend, thereby defining an inclined sliding surface for the latter.

[0012] Nevertheless, this configuration has a rather complex construction, which affects reliability of the device, as well as cost-effectiveness.

[0013] In EP1365098 the spread-apart effect is obtained by the provision of a plurality of weakening portions on the side arms of the profile, which may cause collapse with time.

[0014] A further drawback of all prior art solutions is

that the pushing rail is normally designed to act upon an elastomeric element, like the insulating profile.

[0015] This condition causes the pushing rail to act upon a resilient body, which involves energy dissipation, as well as a delayed response by the insulating profile, and hence, as a whole, a poorer efficiency of the seal.

Disclosure of the invention

[0016] The object of the present invention is to overcome the above drawbacks, by providing an automatic sealing for windows or doors that has a simple construction and is relatively cost-effective.

[0017] A particular object is to provide an automatic sealing for windows or doors that consistently ensures high efficiency and reliability with time, after a relatively great number of cycles of use.

[0018] Another object of the invention is to provide an automatic sealing that has a high structural stability.

[0019] Another important object of the invention is to provide an automatic seal that preserves the elastomeric sealing element, and prevents any structural collapse thereof caused by use.

[0020] These and other objects as better explained hereafter, are fulfilled by an automatic sealing adapted for application to a door or window leaf as defined in claim 1.

[0021] Advantageous embodiments of the seal of the invention are defined in accordance with the dependent claims.

Brief description of the drawings

[0022] Further features and advantages of the invention will become more apparent upon reading of the following detailed description of a few preferred non exclusive embodiments of an automatic sealing of the present invention, which are described by way of a non limiting example with the help of the accompanying drawings in which:

FIG. 1 is a cross sectional view of a sealing of the invention in a first preferred configuration and in a inoperative position;

FIG. 2 is a cross sectional view of the sealing of Fig. 1 in the operative position;

FIG. 3 is an exploded cross sectional view of the sealing of Fig. 1;

FIG. 4 is a cross sectional view of a sealing of the invention in a second preferred configuration and in an inoperative position;

FIG. 5 is a cross sectional view of the sealing of Fig. 4 in the operative position;

FIG. 6 is an exploded cross sectional view of the sealing of Fig. 4;

FIG. 7 is a cross sectional view of a sealing of the invention in a third preferred configuration and in an inoperative position;

FIG. 8 is a cross sectional view of the sealing of Fig. 7 in the operative position;

Detailed description of a preferred embodiment

[0023] Referring to the above figures, the sealing of the invention, generally designated by numeral 1, may be applied to a door or window leaf, not shown.

[0024] In a known manner, the seal 1 may be stably inserted in a longitudinal groove formed at one of the end edges of a door or window leaf to close the clearance between such edge and a floor or a threshold, to ensure its sound, weather or smoke insulating action.

[0025] Namely, the sealing 1 is designed for use in doors and windows having a control mechanism, not shown and known per se, for automatically moving the sealing as the leaf is opened and closed.

[0026] Particularly, the sealing 1 may move between an inoperative position A, corresponding to the open leaf state, in which the sealing 1 is fully held in the groove, and a closed leaf state, in which the sealing 1 or part thereof, at least partially projects out of the groove to contact the floor or threshold.

[0027] The control mechanism that is designed to be associated with the sealing 1 may be selected among those that are currently available on the market, regardless of their types, and will not be described herein in greater detail.

[0028] As shown in the annexed figures, an automatic sealing 1 of the invention comprises a fixed supporting rail 2 that is designed to be inserted in the longitudinal groove of the leaf and be anchored thereto using well-known techniques.

[0029] The supporting rail 2, which is formed of a rigid material of metal, polymeric or composite nature, has a substantially longitudinal outwardly open U-shaped portion 3 to define an internal seat 4.

[0030] As is known, the length of the supporting rail 2 may be selected to engage the end groove of the leaf substantially all along the longitudinal extension thereof.

[0031] The sealing 1 further comprises an insulating profile 5 which is movably housed in the seat 4 and has a sealing member 6 formed of a first elastomeric material and designed to selectively press against a floor or threshold.

[0032] Actuating means 7 are provided, which are movable in a vertical direction Y to move the sealing member 6 between an inoperative position A inside the seat 4 and an operative position B at least partially projecting out of the seat 4.

[0033] In this position, the sealing member 6 will press against the floor or threshold to ensure its insulating action.

[0034] According to a peculiar feature of the invention, the insulating profile 5 further comprises an interface element 8 made of a substantially rigid material.

[0035] The interface element 8 has the outer side 9 integral and at least partially in constant contact with the

sealing member 6.

[0036] However, the inner side 10 of the element 8 is susceptible of interacting with the actuating means 7 for substantially rigid transfer of the translational motion of the actuating means 7 to the sealing member 6.

[0037] As used herein, the term substantially rigid transfer of motion is intended to mean that, upon interaction between the actuating means 7 and the interface means 8, no significant plastic or elastic deformation of the latter will occur.

[0038] As a result, upon contact between the actuating means 7 and the interface element 8, the translational motion t of the former will be transferred with no delay to the elastomeric sealing member 6, substantially without any hysteresis.

[0039] The sealing member 6 and the interface element 8 will preferably have the same longitudinal extension, substantially coinciding with the length of the support rail 2.

[0040] Figs. 1 to 3 show a first preferred non-limiting configuration of an automatic sealing 1 of the invention.

[0041] Particularly, Fig. 1 shows a sealing 1 with the profile 5 in the inoperative position, whereas in Fig. 2 the profile 5 is in the operative position.

[0042] The sealing member 6 may substantially have a U shape, with a pair of first lateral arms 11, 11' susceptible of selectively interacting with the inner walls of the seat 4.

[0043] The first lateral arms 11, 11' may be joined together by a central portion 12 susceptible of being pressed against a floor or threshold, and possibly deform upon contact therewith.

[0044] The interface element 8 may have a pair of substantially vertical second lateral arms 13, 13', associated with and substantially parallel to corresponding first lateral arms 11, 11' of the sealing member 6.

[0045] The second lateral arms 13, 13' may be joined by a substantially horizontal central section 14, which is susceptible of interacting both with the actuating means 7 and with the central portion 12 of the sealing member 6 to transfer the translational motion t of the actuating means 7 to the latter.

[0046] In the particular configuration as shown, the insulating profile 5 may be obtained by coextrusion of the first elastomeric material that forms the sealing member 6 with the rigid polymeric material that forms the interface element 8.

[0047] Advantageously, coextrusion of the two elements 6, 8 may cause integration thereof at the corresponding lateral arms 11, 11', 13, 13'.

[0048] Thus, the thrust of the actuator means 7 on the second lateral arms 13, 13' may cause the first lateral arms 11, 11' of the sealing member 6 to open apart and consequently and simultaneously diverge, to be progressively pushed to contact with the side walls of the seat 4.

[0049] Thus, the overall insulating effect of the profile 5 will be increased, because any passage, even in the seat 4 will be obstructed.

[0050] In a particularly advantageous embodiment of the invention, the second lateral arms 13, 13' may be joined to the central section 14 by respective resilient joints 15, 15'.

[0051] Particularly, the joints 15, 15' may extend all along the longitudinal extension of the profile 5 and may be made of a second elastomeric material, not necessarily the same as the first.

[0052] Conversely, the remaining portion of the interface element 8 may be made of a substantially rigid polymeric material.

[0053] The elastomeric materials and the rigid polymeric material that may be used for the profile 5 may be selected among those that are commonly used in such applications, with no particular limitation.

[0054] Conveniently, the interface element 8 may be obtained by coextrusion of the second elastomeric material that forms the joints 15, 15' with the rigid polymeric material.

[0055] This will ensure high structural cohesion of the second lateral arms 13, 13' with the central section 14, and hence high reliability of the profile 5 with time.

[0056] The actuating means 7 may include a pushing rail 16 that is held in the seat 4 to be completely inside the insulating profile 5.

[0057] The pushing rail 16, which is of substantially known type in these applications, may be made of a rigid material, particularly a metal alloy, and may have several different shapes.

[0058] For instance, as shown, the pushing rail 16 may have a substantially U-shaped upper portion 17 susceptible of interacting with an external control mechanism associated to the leaf, not shown, and a substantially C-shaped lower portion 18 adapted to interact with the central section 14 of the interface element 8.

[0059] Anchor means may be also provided, for securing the pushing rail 16 to the profile 5, that may be associated both to the rail 16 and to the interface element 8.

[0060] For instance, the anchor means may include a substantially T-shaped formation 19 inwardly projecting from the central section 12 of the interface element 8.

[0061] The projection 19 may be inserted with a predetermined transverse clearance *g* into the C-shaped lower portion 18 of the pushing rail 16.

[0062] Thus, the clearance *g* between the T-shaped formation 19 of the interface element 8 and the horizontal appendices 20, 20' of the lower portion 18 of the pushing rail 16 may define a limit stop for the sealing member 6, which is required to avoid collapse thereof.

[0063] According to another advantageous aspect of the invention, the second lateral arms 13, 13' of the interface element 8 may have diverging portions 21, 21', at the joints 15, 15' inclined at a predetermined angle α relative to a vertical centerline *p* of the profile 5.

[0064] The diverging portions 21, 21' will define respective inclined surfaces, which are designed to interact with corresponding horizontal appendices 20, 20' of the C-shaped lower portion 18 of the pushing rail 16.

[0065] Thus, as a result of its movement *t* promoted by the control mechanism, the pushing rail 16 will press on the inclined surfaces thereby causing rotation of the second lateral arms 13, 13' of the interface element 8 about respective joints 15, 15' that will define respective pivot points.

[0066] As the second arms 13, 13' open apart, they will consequently and simultaneously cause the first side arms 11, 11' of the sealing member 5 to also open apart and be hence pushed against the side walls of the seat 4 and slip thereon, thereby increasing the insulating effect.

[0067] Figs. 4 to 6 show a second preferred configuration of the sealing 1 of the present invention.

[0068] In this configuration the supporting rail 2 differs from what is shown concerning the first embodiment, which relates to the upper portion only, designed for attachment of the rail 2 to the groove.

[0069] Nevertheless, the present rail 2 appears to be functionally equivalent to the first rail in view of the purposes of the present invention.

[0070] It will be also understood that, for the purposes of the present invention, the supporting rail 2 may also have configurations other than those as shown herein.

[0071] The configuration of Figs. 4 to 6 differs from the first embodiment, particularly in that the second lateral arms 13, 13' are not coextruded with the first lateral arms 11, 11'.

[0072] In this case, the insulating profile 5 may have means for stable coupling of the sealing member 5 to the interface element 8.

[0073] The coupling means may be associated both with the central portion 12 of the sealing member 5 and to the central section 14 of the interface element 8.

[0074] For instance, the central portion 12 of the sealing member 5 may have a specially shaped projection 23 vertically directed to the interior of the seat 4 and stably inserted, with no clearance, in a corresponding cavity 24 formed in the central portion 14 of the interface element 8.

[0075] Finally, Figs. 7 and 8 show a third preferred configuration of the present invention, in which the interface element 8 consists of a pair of second side arms 13, 13' which are mutually hinged at a vertical centerline *p* of the profile 5.

[0076] For instance, one of the second arms 13' may have one specially shaped end 25' adapted to pivotally engage a corresponding end 25 whose shape mates with that of the other arm 13, thereby defining a mutual pivoting point.

[0077] Thus, as the interface element 8 moves from the inoperative position A to the operative position B, as promoted by appropriately designed actuating means, the second arms 13, 13' will be able to rotate about the pivoting point, thereby allowing the first side arms 11, 11' of the sealing member 5 to open apart as required.

[0078] The above disclosure clearly shows that the invention fulfills the intended objects and particularly meets the requirement of providing an automatic sealing for a

door or window leaf, having improved and consistent reliability even after many cycles of use.

[0079] The sealing of the invention is susceptible of a many changes and variants within the inventive principle disclosed in the annexed claims. All the details thereof may be replaced by other technically equivalent parts, and the materials may vary depending on different needs, without departure from the scope of the invention.

[0080] While the sealing has been described with particular reference to the accompanying figures, the numerals referred to in the disclosure and claims are only used for the sake of a better intelligibility of the invention and shall not be intended to limit the claimed scope in any manner.

Claims

1. An automatic sealing for a window or door leaf, wherein the leaf has at least one substantially horizontal end edge with a longitudinal groove, wherein the sealing comprises:

- a fixed supporting rail (2) insertable in the longitudinal groove of a window or door leaf and having a substantially longitudinal U-shaped portion (3) defining an internal seat (4);
- a movable insulating profile (5) slidably housed into said seat (4) and having a sealing member (6) made of a first elastomeric material and designed for selectively pressing against a floor or threshold;
- actuating means (7) movable along a vertical direction (Y) to move outwardly said sealing member (6) between an inoperative position (A) completely outwardly inside said seat (4) and an operative position (B) at least partially projecting outwardly from said seat (4);

characterized in that said insulating profile (5) further comprises an interface member (8) made of a substantially rigid material with an external side (9) at least partially in constant contact relationship with said sealing member (6) and an internal side (10) susceptible to interact with said actuating means (7) to transmit the translation (t) of said actuating means (7) to said sealing member (6).

2. Sealing as claimed in claim 1, **characterized in that** said sealing member (6) is substantially U-shaped with a pair of first lateral arms (11, 11') designed to selectively interact with the inner sidewalls of said seat (4), said first arms (11, 11') being joined by a central portion (12) susceptible to be pressed against a floor or threshold.
3. Sealing as claimed in claim 2, **characterized in that** said interface member (8) has a pair of second sub-

stantially vertical lateral arms (13, 13') associated to corresponding first lateral arms (11, 11') of said sealing member (6) and joined by a substantially horizontal central section (14) designed to interact with said actuating means (7) and with said central portion (12) of said sealing member (6).

4. Sealing as claimed in claim 3, **characterized in that** said second lateral arms (13, 13') are joined to said central section (14) by means of respective elastically yieldable joints (15, 15').
5. Sealing as claimed in claim 4, **characterized in that** said substantially rigid interface member (8) is made of polymeric material with said joints (15, 15') made of a second elastomeric material.
6. Sealing as claimed in claim 5, **characterized in that** said interface member (8) is realized by co-extrusion of said second elastomeric material of said joints (15, 15') with said rigid polymeric material.
7. Sealing as claimed in any of the preceding claims, **characterized in that** said insulating profile (5) is manufactured by at least partial co-extrusion of the first elastomeric material forming said sealing member (6) with the rigid polymeric material forming said interface member (8).
8. Sealing as claimed in any of the preceding claims, **characterized in that** said insulating profile (5) comprises coupling means (23, 24) for firmly coupling said sealing member (6) to said interface member (8), said coupling means (23, 24) being associated to said central portion (12) of said sealing member (6) and with said central section (14) of said interface member (8).
9. Sealing as claimed in any of the preceding claims, **characterized in that** said second lateral arms (13, 13') are reciprocally hinged at a substantially longitudinal vertical middle plane (π) of said sealing profile (5) to mutually divert as a result of the translation (t) of said actuating means (7) from said rest position (A) to said operating position (B).
10. Sealing as claimed in any of the preceding claims, **characterized in that** said actuating means (7) comprise a pushing rail (16) housed into said seat (4) and having a U-shaped upper portion (17) susceptible to interact with an external control mechanism associated to the leaf and a substantially C-shaped lower portion (18) susceptible to interact with said central section (14) of said interface member (8).
11. Sealing as claimed in claim 10, **characterized in that** said coupling means comprise a substantially

T-shaped formation **(23)** projecting from said central section **(12)** of said interface member **(8)** and inserted with predetermined transverse play **(g)** into said C-shaped lower portion **(18)** of said pushing rail **(16)**.

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- 12.** Sealing as claimed in claim 10 or 11, **characterized in that** said second lateral arms **(13, 13')** have, at said joints **(15, 15')**, diverging portions **(21, 21')** defining respective inclined planes designed to interact with said C-shaped lower portion **(18)** of said pushing rail **(16)** to determine, as a result of the translation (t) of this latter, the diverging of said second lateral arms **(13, 13')** relative to said joints **(15, 15')** and the pushing of said first lateral arms **(11, 11')** towards the internal sidewalls of said seat **(4)**.

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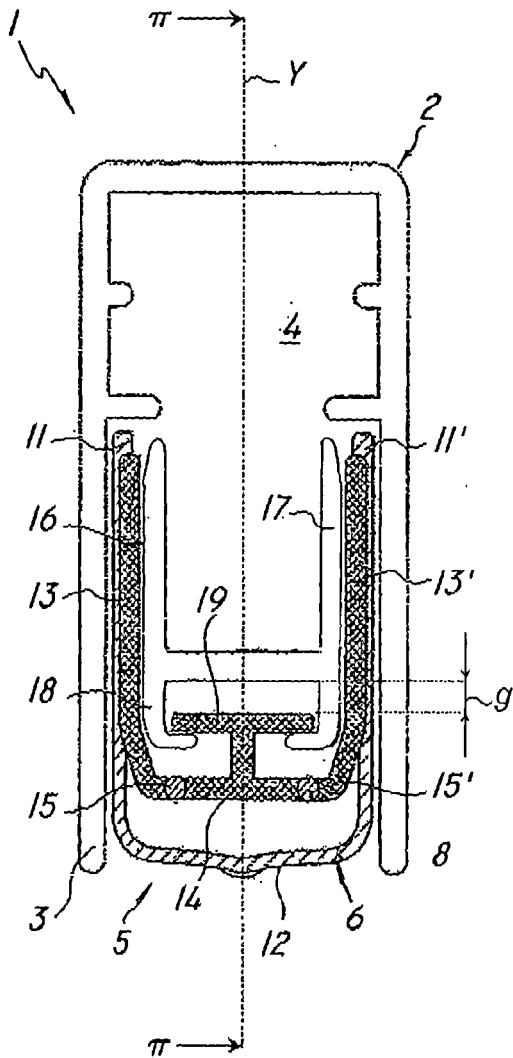
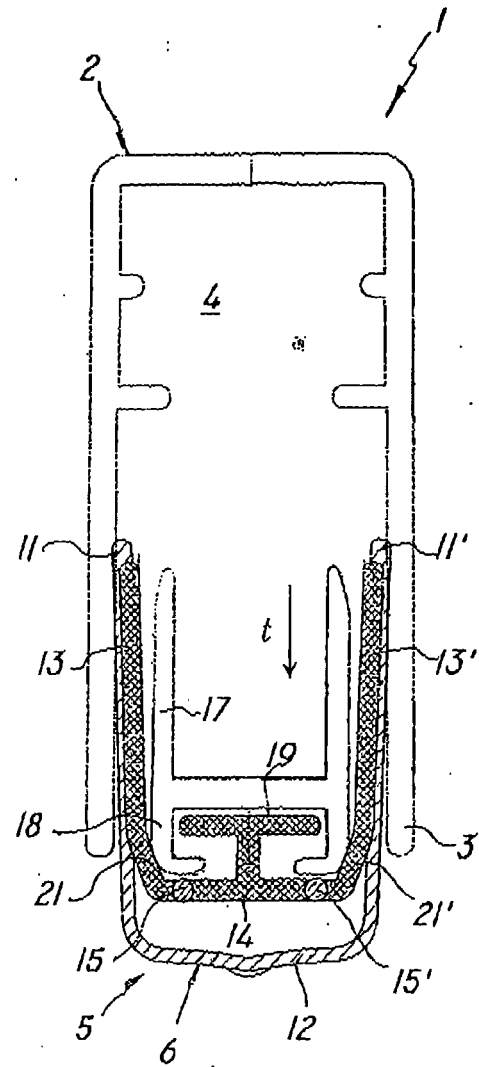
A

FIG. 1



B

FIG. 2

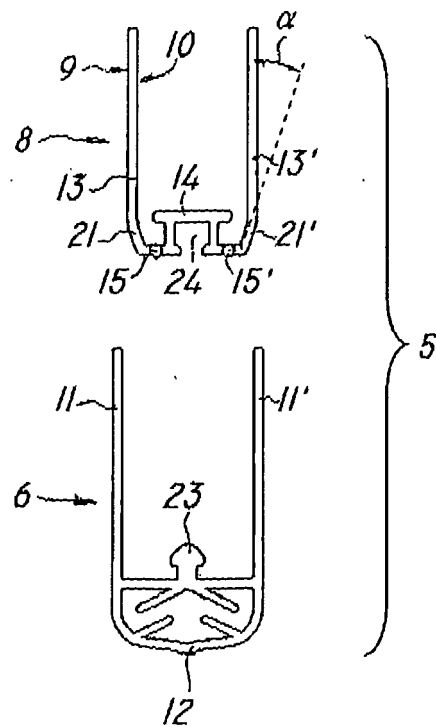
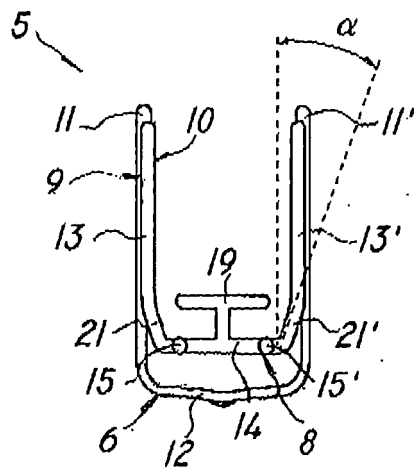
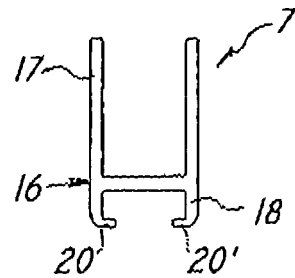
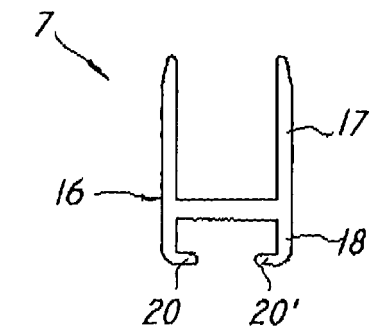
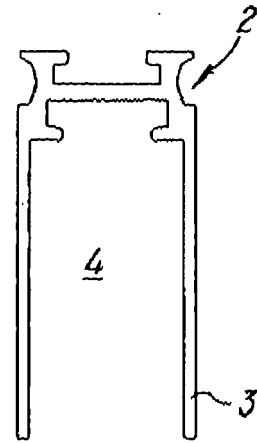
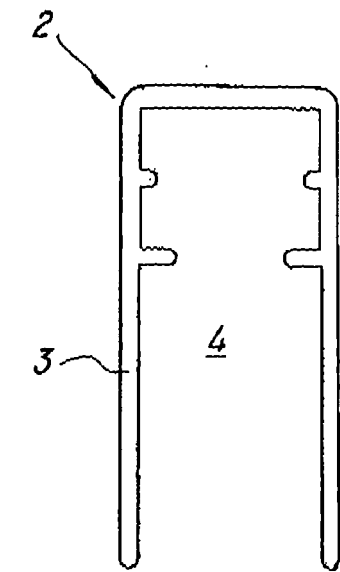
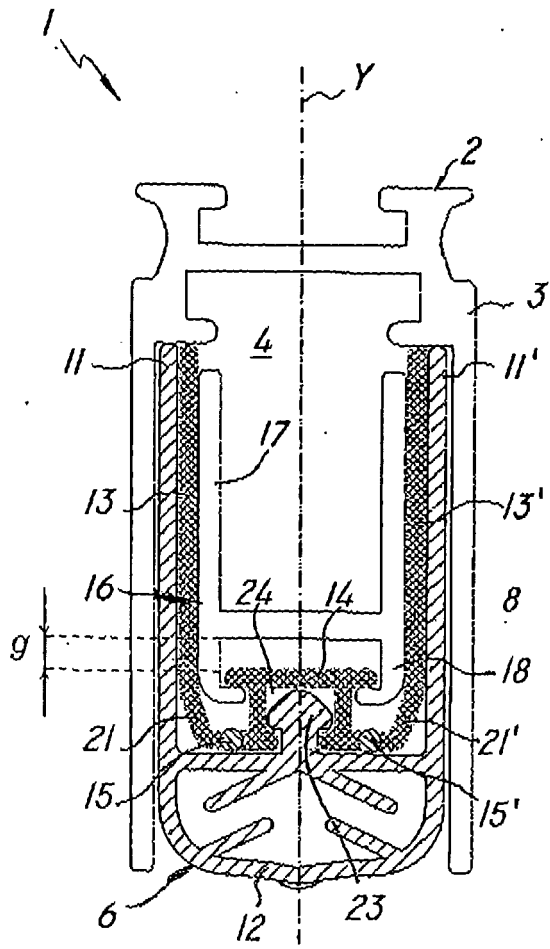


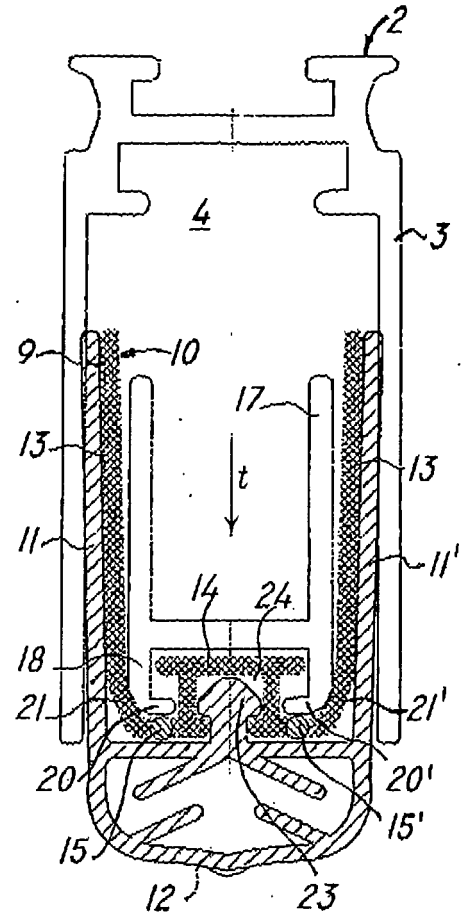
FIG. 3

FIG. 6



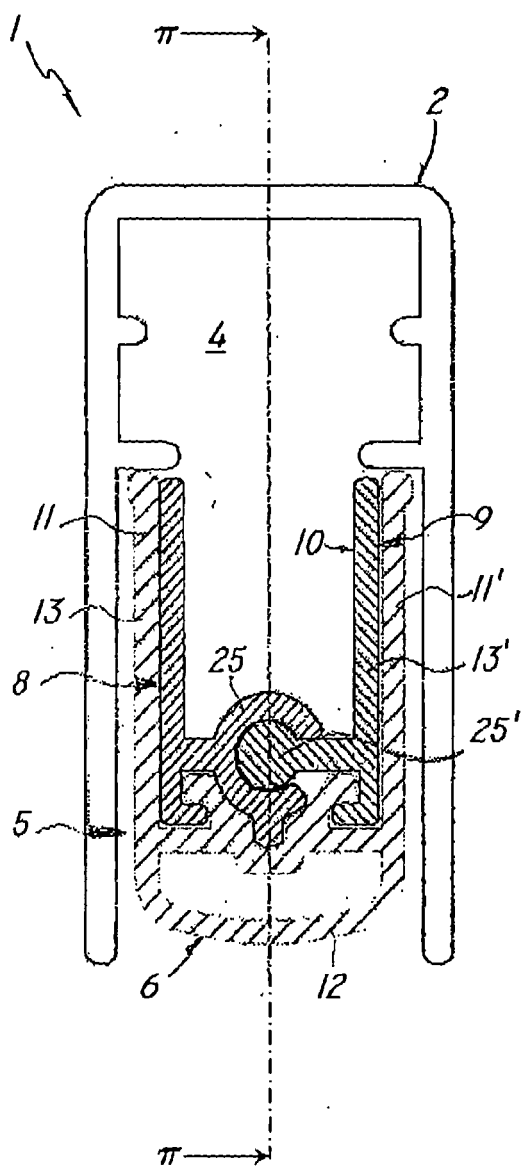
A

FIG. 4



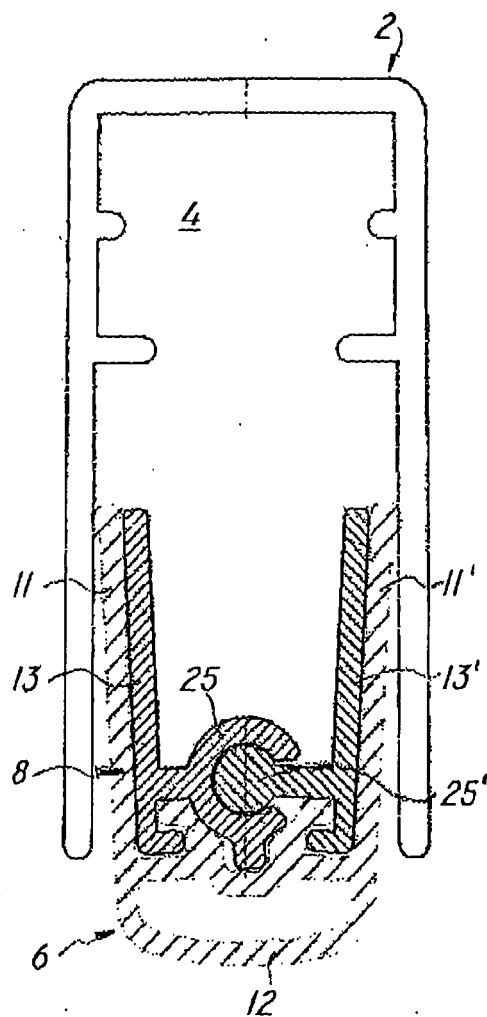
B

FIG. 5



A

FIG. 7



B

FIG. 8



EUROPEAN SEARCH REPORT

Application Number
EP 10 00 4052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	EP 1 193 363 A1 (PLANET GDZ AG) 3 April 2002 (2002-04-03) * abstract; figure 1 * -----	1-3,8	INV. E06B7/21
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 September 2010	Examiner Koulo, G
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 00 4052

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17-09-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1193363	A1	03-04-2002	AT 269932 T 15-07-2004
		DE 50102663 D1 29-07-2004	
		ES 2222326 T3 01-02-2005	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

- DE 29816448 [0007]
- EP 0338974 A [0007]
- EP 1193363 A [0007]
- EP 1162341 A [0007]
- EP 1460232 A [0007] [0011]
- EP 1365098 A [0013]