



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
11.02.2009 Bulletin 2009/07

(51) Int Cl.:
E06B 7/23 (2006.01)

(21) Application number: **07015807.6**

(22) Date of filing: **10.08.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

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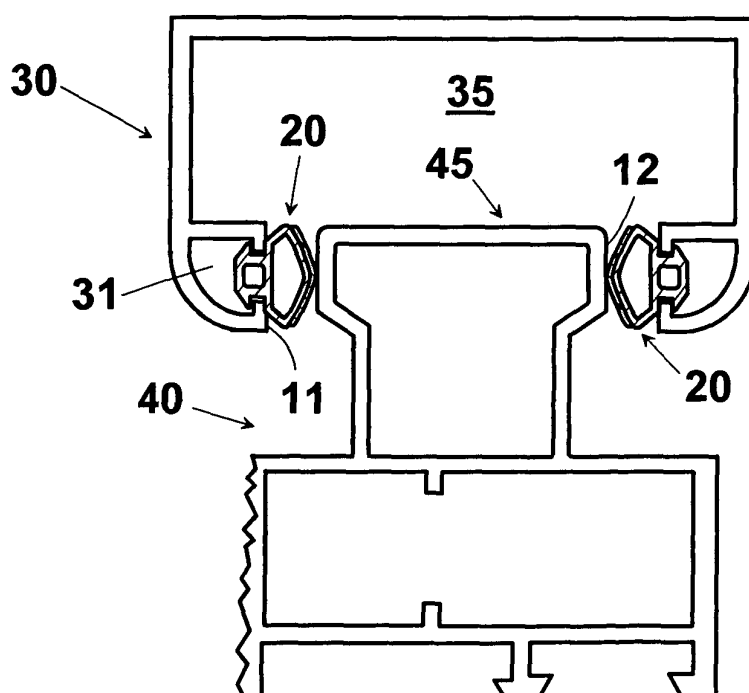
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(54) **Sealing member**

(57) A structure of sliding door or window (1) to which a sealing member (20), according to the invention, can be applied, comprises a support surface (12) located on a first profile (30) coupled slidingly to a second profile (40). The latter has a guiding head (45) at which a sealing surface (11) is made. Between the surfaces (11, 12) the sealing member (20) is arranged comprising a profile of flexible material (21), for example an extruded profile of

EPDM, coupled to a coating layer made of a material with a low friction coefficient (22), for example polyamide. More in detail, the profile (30) comprises a housing (35) in which the guiding head (45) slidingly engages. This can have, for example, a mushroom-like shape formed by a base (27), engaged at a groove (31) of the first profile (30), and a head (24) protruding from the support surface (11) and coupled to the layer of material with a low friction coefficient (22) [Figure 4].

Fig. 4



Description

Field of the invention

[0001] The present invention relates to the field of doors or windows and more precisely it relates to a sealing member for sliding elements, such as doors, windows, panels of closets, etc. of the type capable of moving between a closed configuration and an open configuration.

Description of the prior art

[0002] Sliding doors or windows generally refer to a variety of types of doors, windows and similar items comprising one or more panels that slidably engage on a rectangular fixed frame parallel to each other. Normally, the fixed frame is formed by a profiles bar from whose perimeter protruding guides extend towards the inside. The panels, which are also obtained by profiles elements, engage with the guides by means of grooves or longitudinal housings provided on their outer perimeter. More precisely, the guides provided on two opposite sides of the frame have a function of rail for the panels and a sealing function, whereas the guide provided on the other two opposite sides of the frame have a function of abutment and a sealing function.

[0003] In detail, in the housings of the profile of each panel with which the guides having functions of rail engage, sealing elements and rolling elements are provided, for example bearings, whereas in the other housings sealing elements and abutment elements are provided, for example cushioning flexible material. Between the sealing elements sliding elements are provided that assist adjusting the panels position, have an antidust function and insulate the housing with respect to the outside. The sliding elements can be mounted in the housings of the panels to engage with on the side faces of the guide or, vice-versa, they can be mounted on the side faces of the guide to engage with the inner walls of the housings of the panels.

[0004] In some types of doors and windows, the guide can be made on the sliding panels instead of the fixed frame, which provides in turn grooves or housing, interchanging the respective functions.

[0005] For both cases, they are profiles that engage with a with the other, a having functions of a guide and of a housing, provided respectively on the frame and on the panels or vice-versa.

[0006] There are, furthermore, doors or windows having glass panels sliding on one another. Even here a direct contact occurs between two, with sealing sliding elements therebetween.

[0007] Presently, as sealing sliding elements, strips of textile fibres are used, like felt, or bristles are used, known in the field as brush sealing members.

[0008] Felt, however, is subject to wear and this requires a frequent change that is not easy to carry out.

[0009] Brush sealing members 120, diagrammatically shown in figures 1 and 2, instead, tend to deform with the use. In fact, their alternated movement within profiles 141 and 142, owing to the panel sliding on the frame, causes an alternate bending of the bristles 122 against the guide 145 or an oblique permanent bending thereof, (see figure 2) that with time causes a permanent deformation with high reduction of the sealing properties and require, also in this case, to be changed.

[0010] Furthermore, the sealing sliding elements used up to now do not provide an airtight, a water and acoustic insulation.

Summary of the invention

[0011] It is therefore a feature of the present invention to provide a sealing member for sliding elements, such as doors, windows, sliding panels, with improved features versus airtight, water and acoustic insulation with respect to doors or windows of prior art.

[0012] It is another feature of the present invention to provide a sealing member for sliding doors or windows capable of assuring high quality sliding relative to the parts among which it is arranged.

[0013] These and other features are accomplished with one exemplary sealing member for sliding elements, such as doors, windows, sliding panels, according to the invention, with improved features versus airtight, water and acoustic insulation, said sealing member being connected to a support surface of a door or window and sliding in use against a sealing surface of said door or window, said support surface and said sealing surface slidably engaging with each other having said sealing member sandwiched between them, whose characteristic is that it comprises:

- a profile of flexible material at which said sealing member is connected to said support surface,
- a coating layer with a low friction coefficient having a determined thickness and coupled to said profile of flexible material, said coating layer sliding in use against said sealing surface.

[0014] According to another aspect of the present invention, a sliding element, such as a door, window, sliding panel, is associated with a sealing member with improved features versus airtight, water and acoustic insulation, said sealing member being connected to a support surface of said door or window and sliding in use against a sealing surface of said door or window, said support surface and said sealing surface slidably engaging with each other having said sealing member arranged between them, whose main feature is that said sealing member comprises:

- a profile of flexible material at which said sealing member is connected to said support surface,

- a coating layer with a low friction coefficient having a determined thickness and coupled to said profile of flexible material, said coating layer sliding in use against said sealing surface.

[0015] In particular, the support surface can be determined on a first profile and the sealing surface on a second profile, said first and second profile slidingly engaging with each other.

[0016] For example, the sealing surface can be made on the first profile at a guiding head and the support surface at the second profile, said second profile comprising a housing where said guiding head slidingly engages, between said guiding head and said housing being arranged said sealing member.

[0017] Alternatively, the support surface is made on the first profile at a guiding head and the sealing surface is made on the second profile, said second profile comprising a housing where said guiding head slidingly engages.

[0018] In another exemplary embodiment, the support surface can be made at a first panel, for example of a door or window a piece of furniture, and the sealing surface at a second panel, said first and said second panel sliding relative to each other.

[0019] In a further exemplary embodiment, the support surface is made at a fixed frame of a door or window, said sealing surface being arranged on an element that slides with respect to said fixed frame. Alternatively, the sealing surface is made on the fixed frame and the support surface is arranged on an element that slides with respect to said fixed frame.

[0020] In particular, the profile of flexible material has a projection adapted to snap engage with a groove made on said support surface.

[0021] Alternatively, the profile of flexible material is constrained to the support surface by an adhesive surface, for example an adhesive tape, a layer of glue, etc.

[0022] Preferably, the flexible material is selected from the group comprised of:

- EPDM (ethylene-propylene rubber),
- EPM (ethylene-propylene rubber),
- PVC (polyvinylchloride),
- CR (polychloroprene rubber),
- NBR (nitrile rubber),
- TPV (vulcanized thermoplastic rubber),
- TPE (thermoplastic elastomers),
- PU (polyurethane),
- PP (polypropylene)
- PE (polyethylene),
- TPO (modified polypropylene),

or a combination thereof.

[0023] In particular, the material with a low friction coefficient is selected from the group comprised of:

- polyester,

- polyamide,
- nylon,
- non woven fabric,
- woven fabric.

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[0024] Preferably, the profile of flexible material is obtained through an extrusion process.

[0025] Advantageously, the layer with a low friction coefficient, having also a high resistance against the wear, is made by an electrostatic deposit process of a plurality of fibres of a material with a low friction coefficient on a substrate.

[0026] In this case, said substrate is connected to said flexible material by gluing, heat pressing, rolling, coextrusion, etc.

[0027] Alternatively, the layer with a low friction coefficient is made by an electrostatic deposit process of a plurality of fibres of a material with a low friction coefficient directly on the profile of flexible material.

[0028] Alternatively, the layer with a low friction coefficient is obtained by arranging a layer of varnish having a low friction coefficient on the profile of flexible material. Said layer being applied by a spraying, rolling, coextrusion step.

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Brief description of the drawings

[0029] The invention will be now shown with the following description of an exemplary embodiment thereof, exemplifying but not limitative, with reference to the attached drawings wherein:

- Figures 1 and 2 show diagrammatically a cross sectional view of a sealing member for doors or windows of traditional type;
- Figure 3 shows a perspective elevational side view of a structure of sliding door or window using a sealing member, according to the invention;
- Figure 4 shows a cross sectional view of a possible exemplary embodiment of the structure of sliding door or window of figure 3 which also uses a sealing member, according to the invention;
- Figure 5 shows a cross sectional view of the sealing member used in the structure of sliding door or window of figure 4;
- Figures from 6 to 8 show a perspective elevational side view of some possible exemplary embodiments of sealing member, according to the invention;
- Figures from 9 to 10 show some possible applications of the sealing member, according to the invention.

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Description of preferred exemplary embodiments

[0030] With reference to figure 3, a first exemplary embodiment is shown of a structure of sliding element 1, for example a door, a window, a sliding panel of a piece of furniture, to which a sealing member according to the

invention can be applied.

[0031] In particular, the sliding door or window 1 of figure 3 comprises a support surface 11 made on a fixed frame 25 and a sealing surface 12 made on a door 15 slidably mounted on the fixed frame 25. More in detail, between the support surface 11 of frame 15 and the sealing surface 12 of door 25 sealing member 20 is arranged. It comprises a profile of flexible material 21, for example an extruded profile of EPDM, coupled to a coating layer made of a material with a low friction coefficient 22, for example less than 0.5.

[0032] In particular, the coating layer 22 can be obtained by an electrostatic deposit process of a plurality of fibres of a material with a low friction coefficient, for example polyamide, on a substrate. Alternatively, the coating layer 22 can be obtained by arranging a layer of varnish characterized by a low friction coefficient on the profile of flexible material 21.

[0033] The profile of flexible material 21 can be indifferently connected to frame 15, as shown in figure 3, or alternatively, to door 25. In the first case, the sealing member 20 remains still on frame 15, door 25 slides and the layer of material with a low friction coefficient 22 moves against the surface 12 of door 25. In the latter case, instead, the sealing member 20 is connected to door 25 and when sliding the layer of material with a low friction coefficient 22 slides against surface 11 of frame 15.

[0034] In both embodiments, in any case, the sealing member 20 thus obtained, of which in figures from 6 to 8 some possible exemplary embodiments are shown, allows to limit the friction when surfaces 11 and 12, among which it is arranged, slide on each other and to make, furthermore, a high airtight and insulation to water, in addition to a good acoustic insulation.

[0035] In figure 4, another possible application is shown of sealing member 20, according to the invention. In this case, support surface 12 is arranged on a profile 30 slidably coupled to a profile 40. The latter has a guiding head 45 at which the sealing surface 11 is made.

[0036] More in detail, profile 30 comprises a housing 35 in which the guiding head 45 slidably engages. Like what described with reference to figure 3, also in this case the sealing member 20 is arranged between surfaces 11 and 12. It can have, for example, a mushroom-like shape, as shown in the cross sectional view of figure 5, for being equipped with a base 27 engaged at a groove 31 of profile 30, and a head 24 protruding from the support surface 11 and coupled to the layer of low friction coefficient material 22.

[0037] Alternatively, sealing member 20 can be connected to the guiding head 45 by an adhesive layer 23 (figure 9). In this case, then, the support surface 11 is made on the guiding head 45, and sealing surface 12 defines the housing 35 of the profile 30 coupled slidably with head 45.

[0038] In a further exemplary embodiment, diagrammatically shown in figure 10, a support surface 11 can

be made at a first panel 51, for example of a closet 50, and the other sealing surface 12 at a second panel 52 that slides with respect to panel 51. The panels 51 and 52, for example can be arranged sliding between a couple of uprights 53 and 54 of closet 50. Even in this case the use of the sealing member 20 reduces the friction between the two panels 51 and 52 when they slide relative to each other.

[0039] The foregoing description of a specific embodiment will so fully reveal the invention according to the conceptual point of view, so that others, by applying current knowledge, will be able to modify and/or adapt for various applications such an embodiment without further research and without parting from the invention, and it is therefore to be understood that such adaptations and modifications will have to be considered as equivalent to the specific embodiment. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Claims

1. Sealing member for sliding elements, such as doors, windows, sliding panels, with improved features versus airtight, water and acoustic insulation, said sealing member being connected to a support surface of a door or window and sliding in use against a sealing surface of said door or window, said support surface and said sealing surface slidably engaging with each other having said sealing member arranged between them **characterised in that** it comprises:

- a profile of flexible material at which said sealing member is connected to said support surface,
- a coating layer of a material with a low friction coefficient, having a determined thickness and coupled to said profile of flexible material, said coating layer sliding in use against said sealing surface.

2. Sliding element, such as a door, window, a sliding panel, associated with a sealing member with improved features versus airtight, water and acoustic insulation, said sealing member being connected to a support surface of said door or window and sliding in use against a sealing surface of said door or window, wherein said support surface and said sealing surface that slidably engage with each other have said sealing member arranged between them **characterised in that** said sealing member comprises:

- a profile of flexible material at which said sealing member is connected to said support sur-

- face,
 - a coating layer with a low friction coefficient having a determined thickness and coupled to said profile of flexible material, said coating layer sliding in use against said sealing surface. 5
3. Sealing member for sliding elements, according to claim 1 or 2, wherein said profile of flexible material has a projection adapted to engage with a groove made in said support surface. 10
4. Sealing member for sliding elements, according to claim 1 or 2, wherein said profile of flexible material is constrained to said support surface by an adhesive surface. 15
5. Sealing member for sliding elements, according to claim 1 or 2, wherein said flexible material is selected from the group comprised of: 20
- EPDM (ethylene-propylene rubber),
 - EPM (ethylene-propylene rubber),
 - PVC (polyvinylchloride),
 - CR (polychloroprene rubber),
 - NBR (nitrile rubber),
 - TPV (vulcanized thermoplastic rubber),
 - TPE (thermoplastic elastomers),
 - PU (polyurethane),
 - PP (polypropylene)
 - PE (polyethylene), 30
 - TPO (modified polypropylene),
- or a combination thereof.
6. Sealing member for sliding elements, according to claim 1 or 2, wherein said material with a low friction coefficient is selected from the group comprised of: 35
- polyester,
 - polyamide, 40
 - nylon,
 - non woven fabric,
 - woven fabric,
 - a combination thereof. 45
7. Sealing member for sliding elements, according to claim 1 or 2, wherein said layer with a low friction coefficient is made by an electrostatic deposit process of a plurality of fibres of a material with a low friction coefficient on a substrate, said substrate being such that it can be fixed to said profile of flexible material, or it can be a part of said profile of flexible material. 50
8. Sealing member for sliding elements, according to claim 1 or 2, wherein said layer with a low friction coefficient is effected by arranging a layer of varnish with a low friction coefficient on said profile of flexible material. 55
9. Sealing member for sliding elements, according to claim 2, wherein said support surface is arranged on a first profile and said sealing surface is arranged on a second profile, said first and second profile being slidingly engaged and said sealing member is arranged between them.
10. Sealing member for sliding elements, according to claim 9, wherein said sealing surface is made on said profile at a guiding head and said support surface at said second profile, said second profile comprising a housing where said guiding head slidingly engages, wherein said sealing member is arranged between said guiding head and said housing, or said support surface is made on the first profile at the guiding head and the sealing surface is made at said second profile.
11. Sealing member for sliding elements, according to claim 2, wherein said support surface is made at a first panel and said sealing surface at a second panel, said first and said second panel sliding relative to each other.
12. Sealing member for sliding elements, according to claim 2, wherein said support surface is made at a fixed frame of a door or window and said sealing surface is arranged on an element that slides with respect to said fixed frame, or vice-versa.

Fig. 1
(prior art)

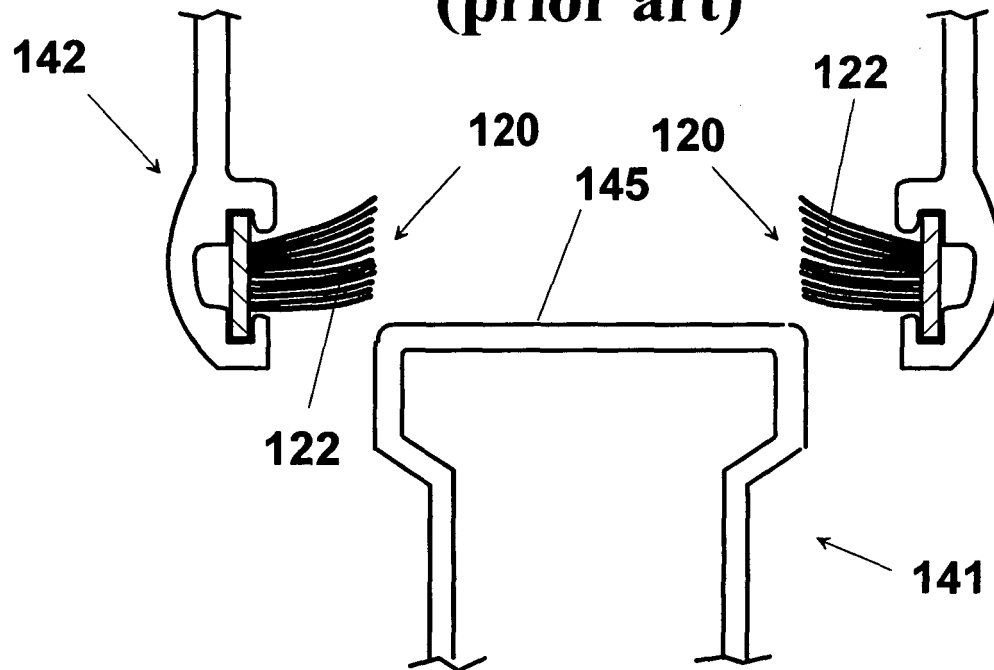


Fig. 2
(prior art)

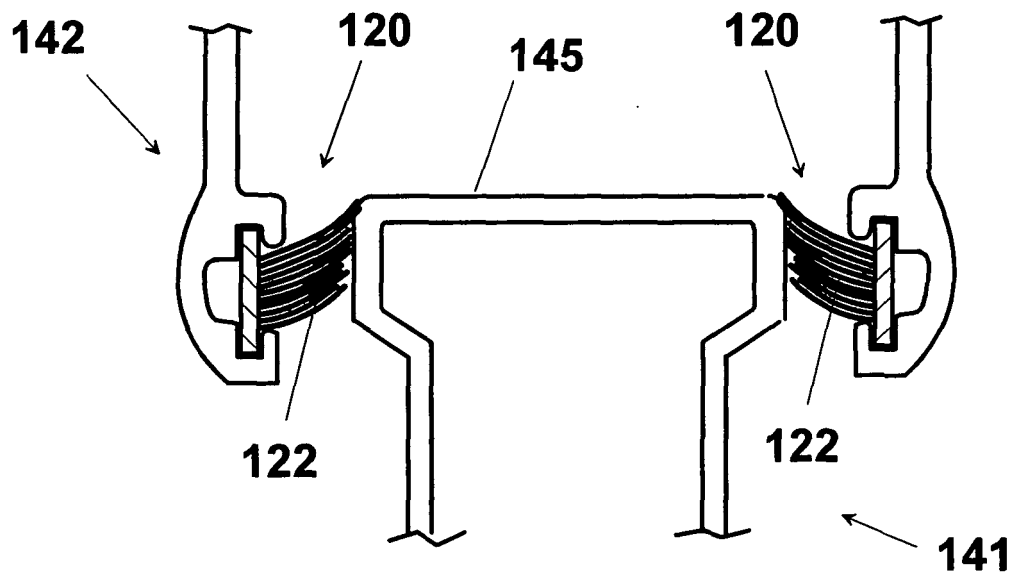


Fig. 3

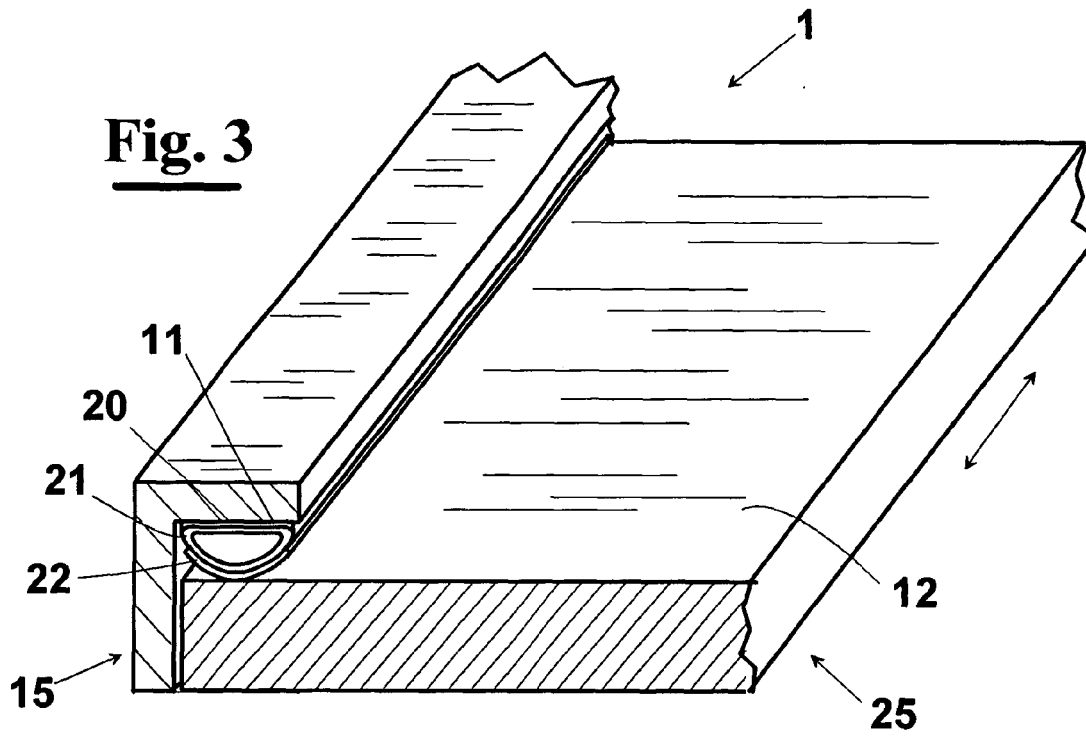


Fig. 4

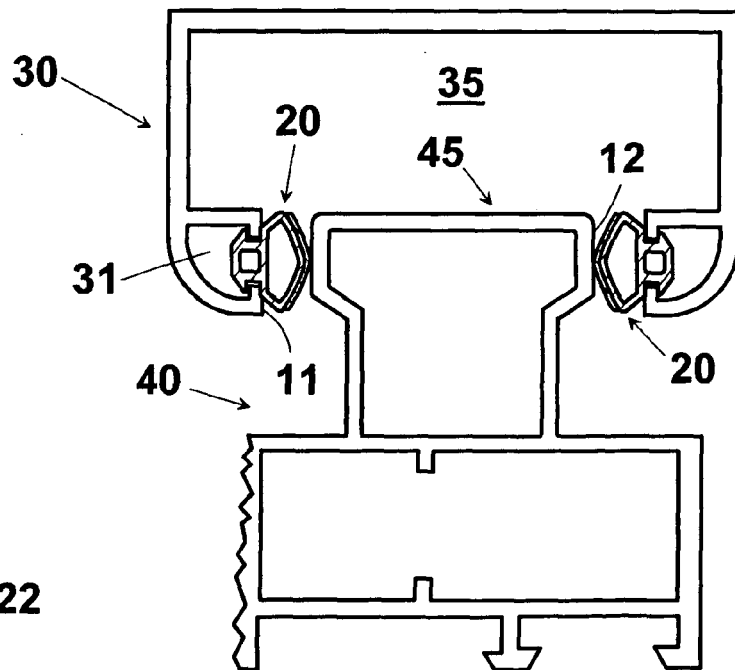


Fig. 5

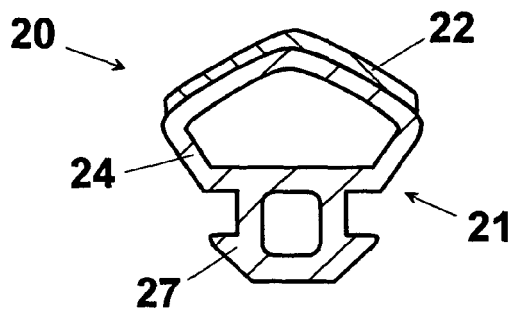


Fig. 6

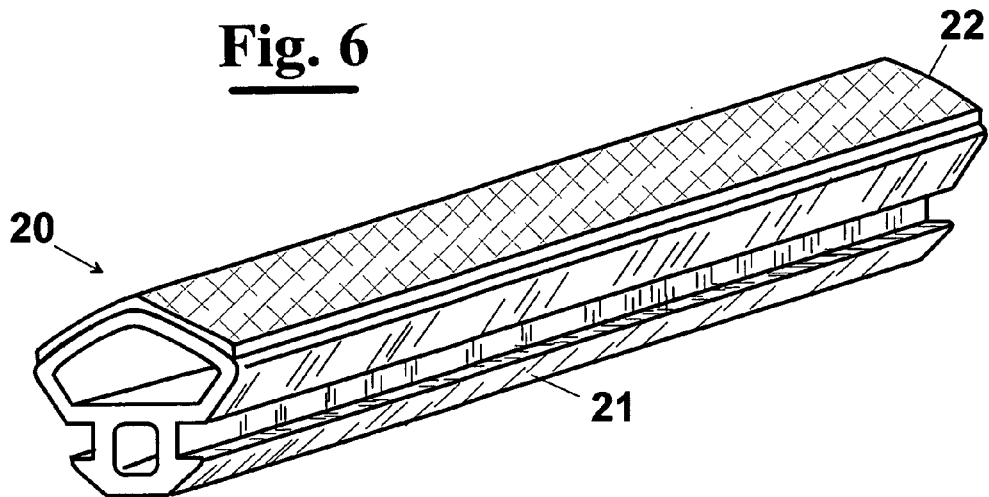


Fig. 7

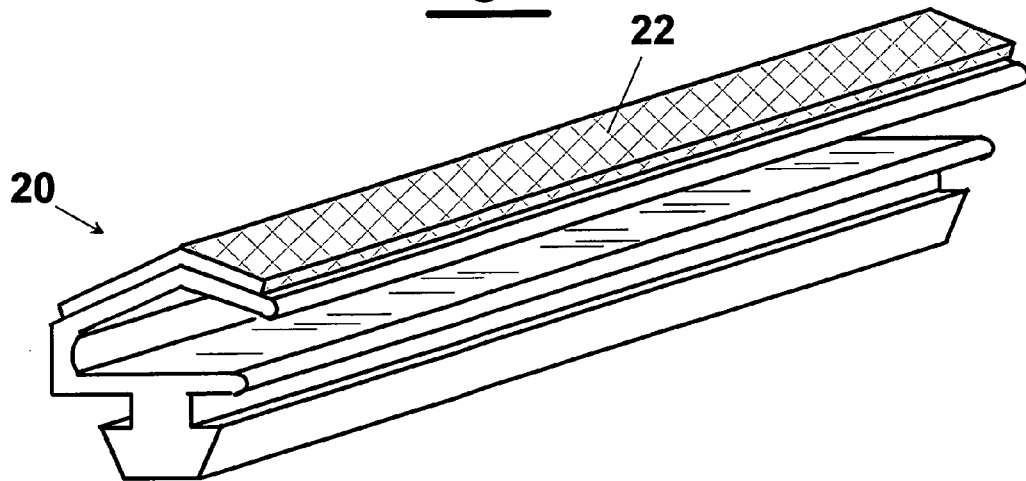


Fig. 8

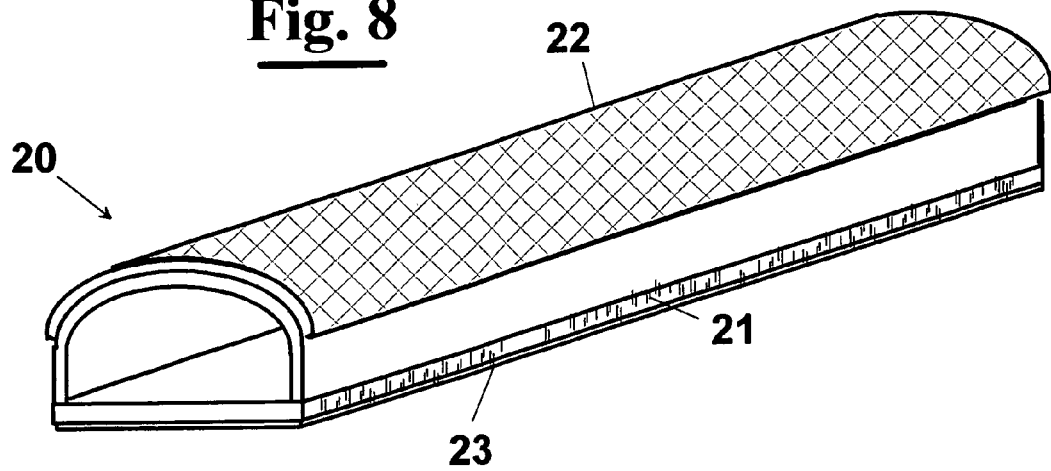


Fig. 9

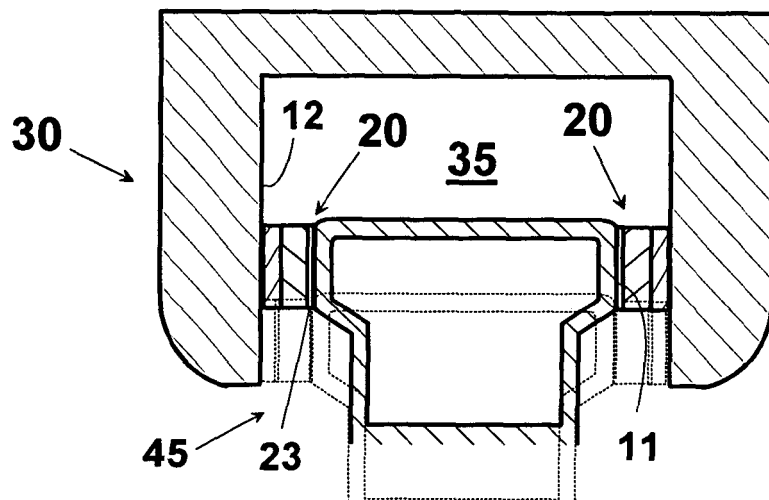
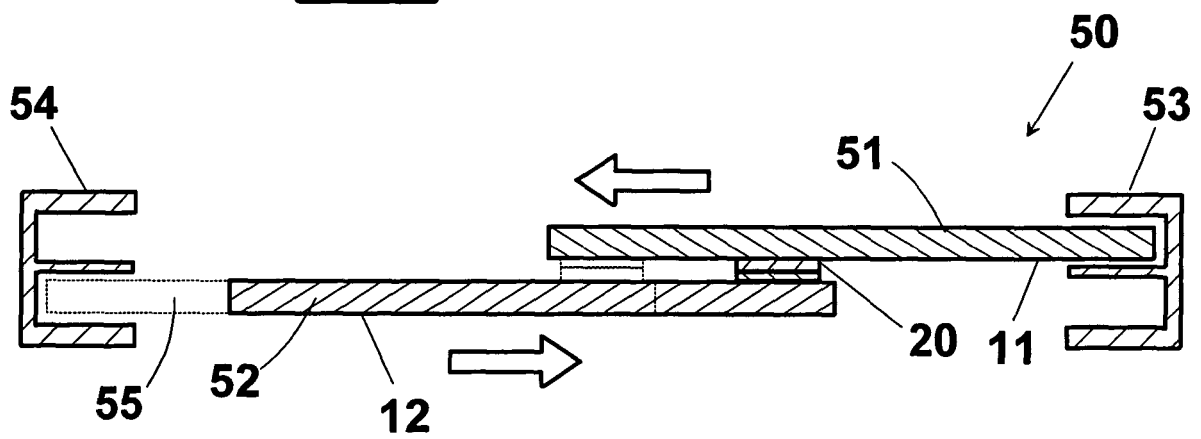


Fig. 10





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 01 5807

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	DE 35 10 463 A1 (CONTINENTAL GUMMI WERKE AG [DE]) 25 September 1986 (1986-09-25) * the whole document *	1-12	INV. E06B7/23
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			TECHNICAL FIELDS SEARCHED (IPC)
			E06B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 17 January 2008	Examiner Geivaerts, Dirk
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EPO FORM 1503 03/82 (P04C01)

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

EP 07 01 5807

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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17-01-2008

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