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(54) **Door with closing profile and integrated ventilation**

(57) Door system comprising two opposite members (1, 8, 9, 10, 11), at least one of which being a rotatable door, and a closing system (3, 4, 5) which is provided for being mounted to one of the opposite members, the closing system comprising engaging means (4) for engaging a complementary edge part (6, 7) on the opposite member to maintain the door in closed position, the engaging means (4) being at least partly elastically deformable to

enable opening of the door in at least one direction, and the closing system comprising optional blocking means (5) with which the opening of the door can be optionally prevented in one direction or the other. The engaging means and blocking means are formed by mutually exchangeable strips (4, 5) which are to different extents compressible and which are releasably mountable to a holder profile (3) of the closing system.

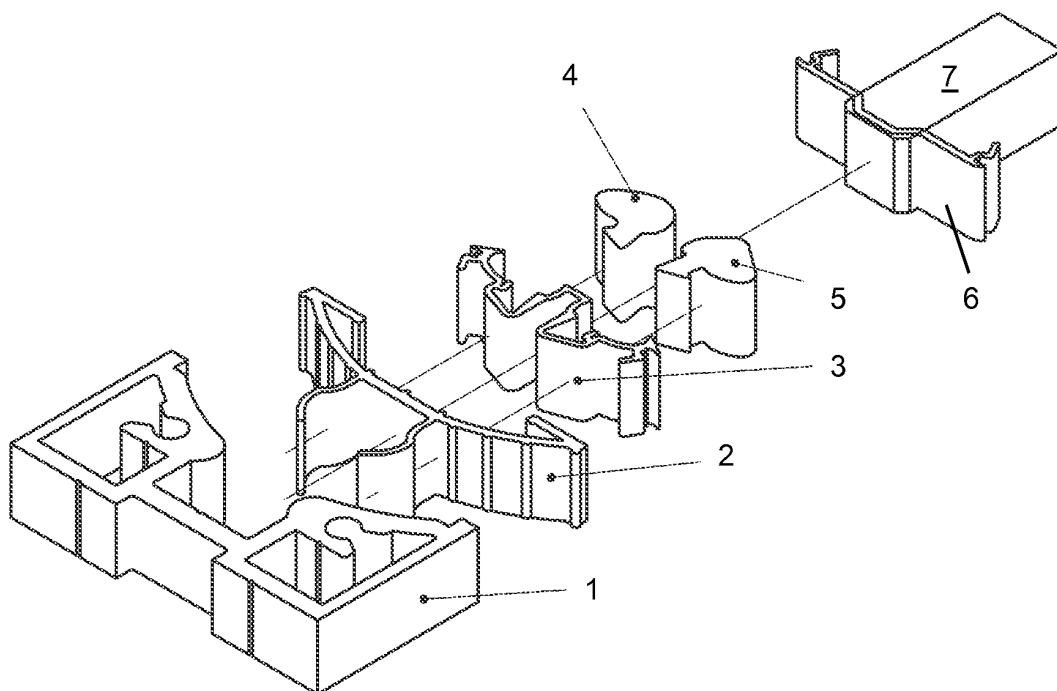


FIG. 1

Description

[0001] This invention relates to a door system comprising two opposite members, at least one of which is a rotatable door, and a closing system which is provided for being mounted to one of the opposite members, according to the preamble of claim 1.

[0002] A door system with such a closing system is for example known from WO-A-2008043859. The known door system comprises two opposite members, at least one of which is a rotatable door, and a closing profile which is provided with a mounting part for being mounted to one of the opposite members. The closing profile is provided with engaging means for engaging a complementary edge part on the opposite member for maintaining the door in the closed position, more particularly a flexible member comprising two independently moveable wings, which are elastically deformable to enable opening of the door. Opening the door in one of both directions can be prevented by placement of a blocking member in the hollow space behind one of the wings.

[0003] It is an aim of the invention to provide a door system with such a closing system which can be more easily adapted to different circumstances.

[0004] This aim is achieved according to the invention with the door system showing the characteristics of claim 1.

[0005] In the door system according to the invention the engaging means and blocking means, respectively for engaging the complementary edge part on the opposite member to maintain the door in closed position and for preventing the opening of the door in one direction or the other, are provided by mutually exchangeable strips which are to different extents compressible and which are releasably mountable to a holder profile of the closing system. This means that there is a predetermined difference in compressibility of the mutually exchangeable strips, so that the closing system is adaptable by exchanging on or more strips. In this way it suffices to for example remove a highly compressible strip, which is intended only for engagement, and replace it with another, less compressible strip, which is intended for blocking, to convert a door which can be opened in two directions into a door which can only be opened in one direction. In order to change the direction in which the door opens at a later point in time, it is sufficient to simply switch the two strips present.

[0006] The closing system according to the invention furthermore has the advantage that one or more strips can be easily and quickly replaced in case of wear. Further it is possible to provide a variety of strips with different extents of compressibility for different circumstances, for example to adjust the closing force.

[0007] In a preferred embodiment of the invention, the holder profile comprises a middle part with holding parts on opposite sides thereof for releasably holding a complementary holding part of each time one of the exchangeable strips, such that in closed position the com-

plementary edge part is located in between the exchangeable strips. Preferably, the holding parts of the holder profile and the complementary holding parts of the strips together form a snap connection, so that the exchange becomes very simple.

[0008] In a preferred embodiment of the invention, the holding parts are formed by recesses in the holder profile and the complementary holding parts are formed by teeth on the exchangeable strips, which snap into the recesses.

[0009] In a preferred embodiment of the invention, the exchangeable strips comprise each a protrusion, which protrudes with respect to the holder profile.

[0010] Preferably, at least one of the strips comprises a protruding part in a highly compressible material, such as for example polyurethane foam in a polyethylene coating, so that this strip forms an engaging strip for maintaining the door in closed position and enabling opening of the door by compression of the protruding part.

[0011] Preferably, at least one of the strips comprises a protruding part in a lightly compressible material, so that this strip forms a blocking strip for preventing opening of the door in one direction. By constructing the blocking strip in a lightly compressible material, such as for example rubber, one obtains the advantage that this strip is to a certain extent deformable and a soft engagement edge is achieved which dampens the closing movement of the door.

[0012] In a preferred embodiment of the invention, the mutually exchangeable strips comprise at least one engaging strip and a blocking strip, the engaging strip protruding less with respect to the holder profile than the blocking strip and the engaging strip being more compressible than the blocking strip.

Figure 1 shows a perspective view of a preferred embodiment of the door system according to the invention.

Figure 2 shows a cross-section of a preferred embodiment of the door system according to the invention.

Figure 3 shows a cross-section of a preferred embodiment of the door system according to the invention.

Figure 4 shows a detail of figure 3.

Figure 5 shows a cross-section of the holder profile of a preferred embodiment of the door system according to the invention.

Figure 6 shows a perspective view of the holder profile of a preferred embodiment of the door system according to the invention.

Figure 7 shows a detail of figure 5.

Figure 8 shows a detail of figure 5.

Figure 9 shows a cross section of a blocking strip of a preferred embodiment of the door system according to the invention.

Figure 10 shows a perspective view of a blocking strip of a preferred embodiment of the door system

according to the invention.

Figure 11 shows a cross section of an engaging strip of a preferred embodiment of the door system according to the invention.

[0013] The door system shown in figures 1 and 2 comprises a door frame profile 1, an intermediate profile 2 which snaps into the door frame profile 1, a holder profile 3 which snaps into the intermediate profile 2, an engaging strip 4 and a blocking strip 5 which respectively snap into first and second recesses 31, 32 of the holder profile, and a complementary edge part which is either part of an opposite profile 6 or a unitary, for example glass door blade 7 (in figure 1 these are drawn on top of each other).

[0014] The door system shown in figures 3 and 4 comprises two opposite members 8, 9 or 10, 11 which form part of a door system with a double door. In this door system the same holder profile 3, opposite profile 6 and strips 4 and 5 are applicable as in the door system of figures 1 and 2. the holder profile 3, the strips 4 and 5 and the complementary edge part 6/7 together form a closing system which is adapted to maintain the door in closed position and enable opening of the door when the user pushes against the door, by elastic deformation of a part of the closing system, in this case the engaging strip 4.

[0015] Figures 5 and 6 show the holder profile 3. This has a middle part 30 with respectively the first recess 31 and the second recess 32 on opposite sides thereof. The recesses 31, 32 are shaped for accommodating a tooth-shaped part 41, 51 of the engaging and blocking strips 4, 5 which are hereby releasably mountable to the holder profile 3 by means of a snap connection. A detail of the recesses 31, 32 is shown in figure 8. At the extreme ends, side recesses 33, 34 are provided for accommodating teeth or complementary parts of the intermediate profile 2 or the opposite members 8, 9 or 10, 11, by which the holder profile is also releasably mountable in these profiles by means of a snap connection. A detail of the side recesses 33, 34 is shown in figure 7. it is clear that these holding means - teeth and recesses 31-32, 33-34 - can be switched places in alternative embodiments of the invention.

[0016] The recesses 31 and 32 have the same shape, just like the tooth-shaped parts 41, 51 of the strips 4, 5. As a result, the strips are exchangeable.

[0017] The blocking strip 5, shown in detail in figures 9 and 10, comprises the tooth-shaped part 51 with which it is releasably mountable in the recesses 31, 32 of the holder part and also a protruding part 52. This protruding part 52 shows an engagement plane 53 which is oriented parallel to a slanting edge on the complementary edge part (see figure 2). The blocking strip 5 is a unitary body constructed in a lightly compressible material, so that a soft engagement edge is achieved which dampens the closing movement of the complementary edge part 6, 7 against the blocking strip. The size of the protruding part 52 and the compressibility of the material are chosen

such, that the strip 5 prevents the opening of the door in that direction, in other words that the complementary edge part cannot pass by the blocking strip.

[0018] The engaging strip 4, shown in detail in figure 11, comprises the tooth-shaped part 41 with which it is releasably mountable in the recesses 31, 32 of the holder part and also a protruding part 42. This protruding part 42 has a rounded shape, of which the size is chosen such that the engaging strip 4 comes into contact with the complementary edge part and maintains the door in the closed position together with the blocking strip 5 (or a second engaging strip 4 in the other recess). The strips 4, 5 on opposite sides of the complementary edge part 6, 7 in closed position are preferably dimensioned such, that they form a double sealing. The engaging strip 4 is constructed in a highly compressible material of which the compressibility is chosen such, that the strip can deform elastically to enable opening of the door in this direction, in other words that the complementary edge part can effectively pass by the engaging strip.

[0019] The lightly compressible material for the blocking strip is preferably EPDM rubber, but other natural or synthetic rubbers or lightly compressible plastic materials are also possible.

[0020] The highly compressible material for the engaging strip is preferably polyurethane foam in a polyethylene coating, but other highly compressible materials are also possible. Especially suitable for this purpose are the Q-LON-strips which are put on the market by manufacturer Schlegel (solely) as sealing strips. Surprisingly, these Q-LON strips appear to be also very suitable as elastically deformable engaging strip to maintain a rotatable door in closed position. In figure 11 the Q-LON-strip with reference QL9112 is shown. In the tooth-shaped part a hard element 43 is provided which provides the snap connection.

[0021] The door systems shown are rotatable doors which can be opened in only one direction. In order to convert these door systems to rotatable doors which can be opened in both directions, one can simply exchange the blocking strip 5 for an engaging strip 4. Further, it is possible within the framework of the invention to provide an array of engaging strips which are compressible to different extents and/or of different sizes, to be able to accurately adapt the closing system to the circumstances, such as for example the distance between the complementary edge part and the holder part.

[0022] As shown in figure 5, the holder profile 3 is symmetrical with respect to the middle part 30. As a result of this and the fact that the holder profile 3 is snap-fitted to the intermediate profile 2 (or another profile of the door system), the user can also change the direction in which the door can be opened by removing the holder profile 3 with the strips 4 and 5 as a whole and repositioning it in opposite direction.

[0023] As shown in figures 3 and 4 the opposite profile 6 has the same width and the same side recesses as the holder profile 3. As a result, these two profiles are mutu-

ally exchangeable if desired.

[0024] The other profiles of the door system shown in the figures correspond to profiles described in WO-A-2008043859 and therefore need no further explanation here.

Claims

1. Door system comprising two opposite members (1, 8, 9, 10, 11), at least one of which being a rotatable door, and a closing system (3, 4, 5) which is provided for being mounted to one of the opposite members, the closing system comprising engaging means (4) for engaging a complementary edge part (6, 7) on the opposite member to maintain the door in closed position, the engaging means (4) being at least partly elastically deformable to enable opening of the door in at least one direction, and the closing system comprising optional blocking means (5) with which the opening of the door can be optionally prevented in one direction or the other, **characterised in that** the engaging means and blocking means are formed by mutually exchangeable strips (4, 5) which are to different extents compressible and which are releasably mountable to a holder profile (3) of the closing system.
2. Door system according to claim 1, **characterised in that** the holder profile (3) comprises a middle part (30) with holding parts (31, 32) on opposite sides of the middle part for releasably holding a complementary holding part (41, 51) of each time one of the exchangeable strips (4, 5), such that in closed position the complementary edge part (6, 7) is located between the exchangeable strips.
3. Door system according to claim 2, **characterised in that** the holding parts (31, 32) of the holder profile and the complementary holding parts (41, 51) of the exchangeable strips together form a snap connection.
4. Door system according to claim 3, **characterised in that** the holding parts are formed by recesses (31, 32) in the holder profile and that the complementary holding parts are formed by teeth (41, 51) on the exchangeable strips, which snap into the recesses.
5. Door system according to any one of the previous claims, **characterised in that** the exchangeable strips (4, 5) each comprise a protruding part (42, 52), which protrudes with respect to the holder profile (3).
6. Door system according to claim 5, **characterised in that** at least one of the strips (4) comprises a protruding part (42) in a highly compressible material, so that this strip forms an engaging strip for maintaining the door in closed position and enabling opening of the door by compression of the protruding part (42).
7. Door system according to claim 6, **characterised in that** the highly compressible material is polyurethane foam in a polyethylene coating.
8. Door system according to claim 5 or 6, **characterised in that** at least one of the strips (5) comprises a protruding part (52) in a lightly compressible material, so that this strip forms a blocking strip for preventing opening of the door in one direction.
9. Door system according to claim 8, **characterised in that** the lightly compressible material is EPDM rubber.
10. Door system according to any one of the previous claims, **characterised in that** the mutually exchangeable strips comprise at least one engaging strip (4) and a blocking strip (5), the engaging strip protruding less with respect to the holder profile than the blocking strip and the engaging strip being more compressible than the blocking strip.

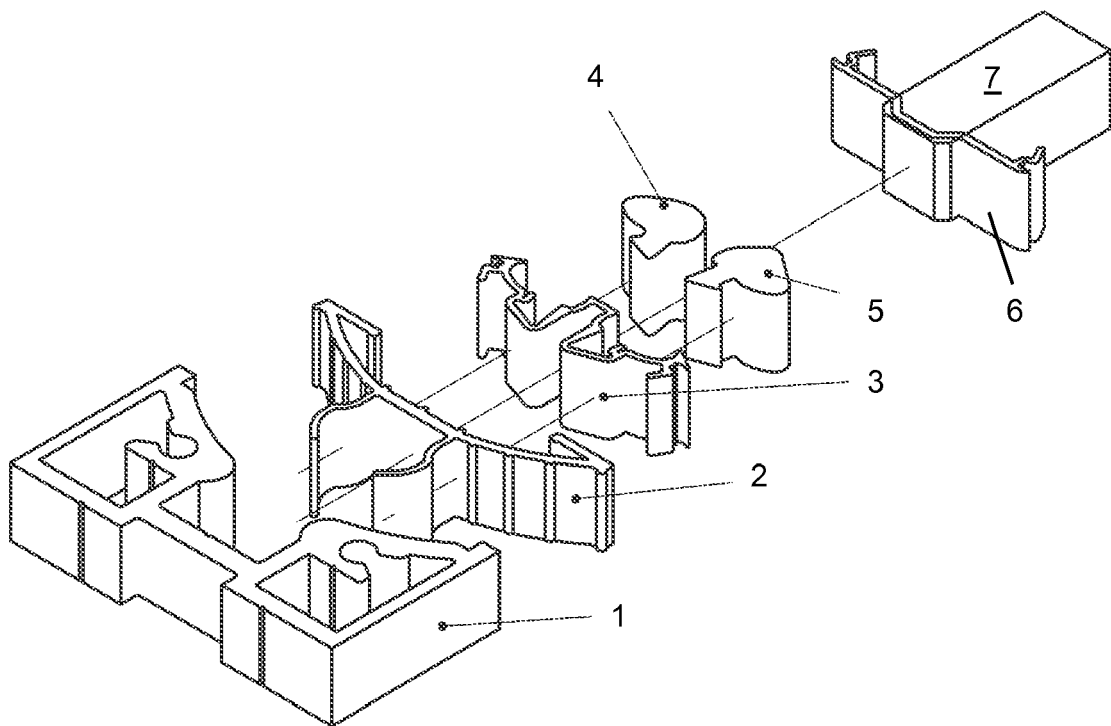


FIG. 1

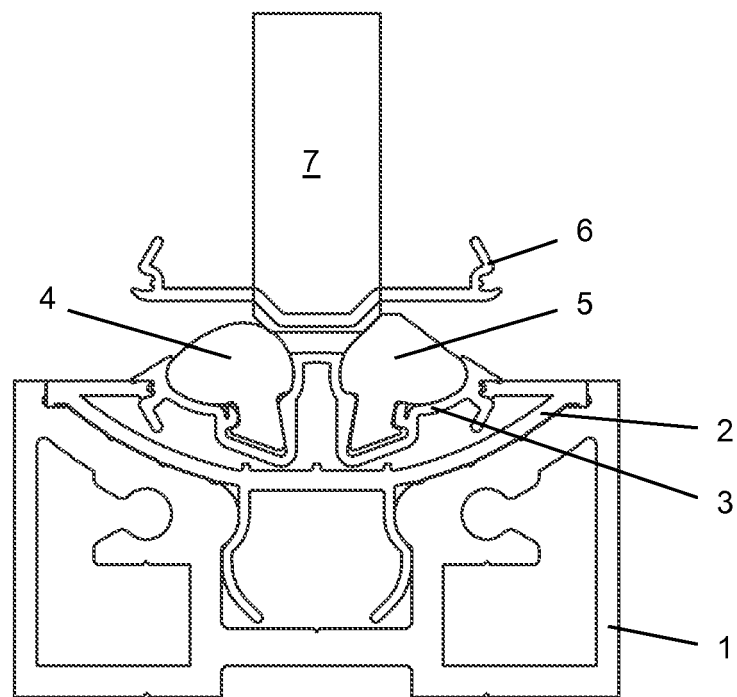


FIG. 2

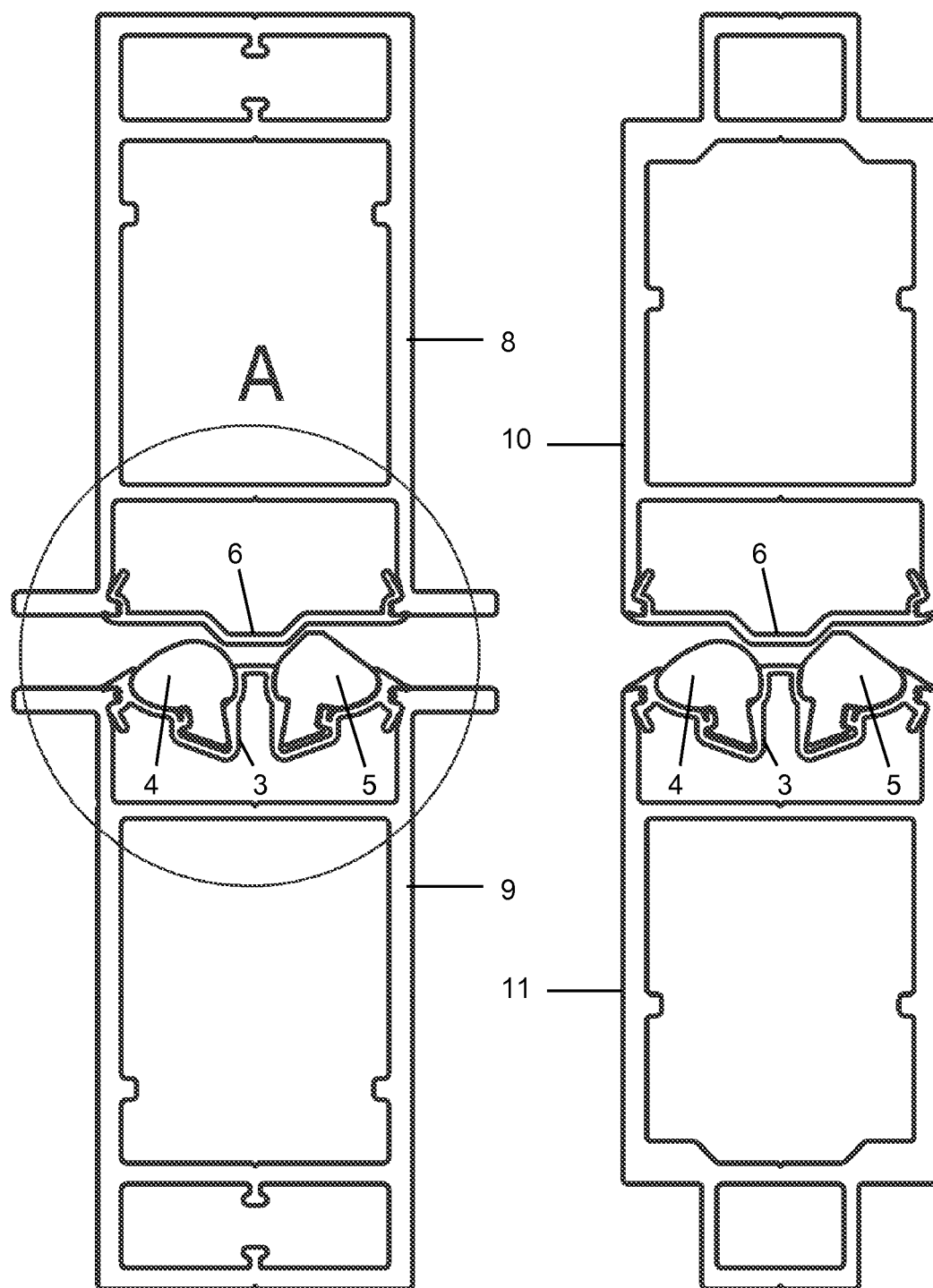


FIG. 3

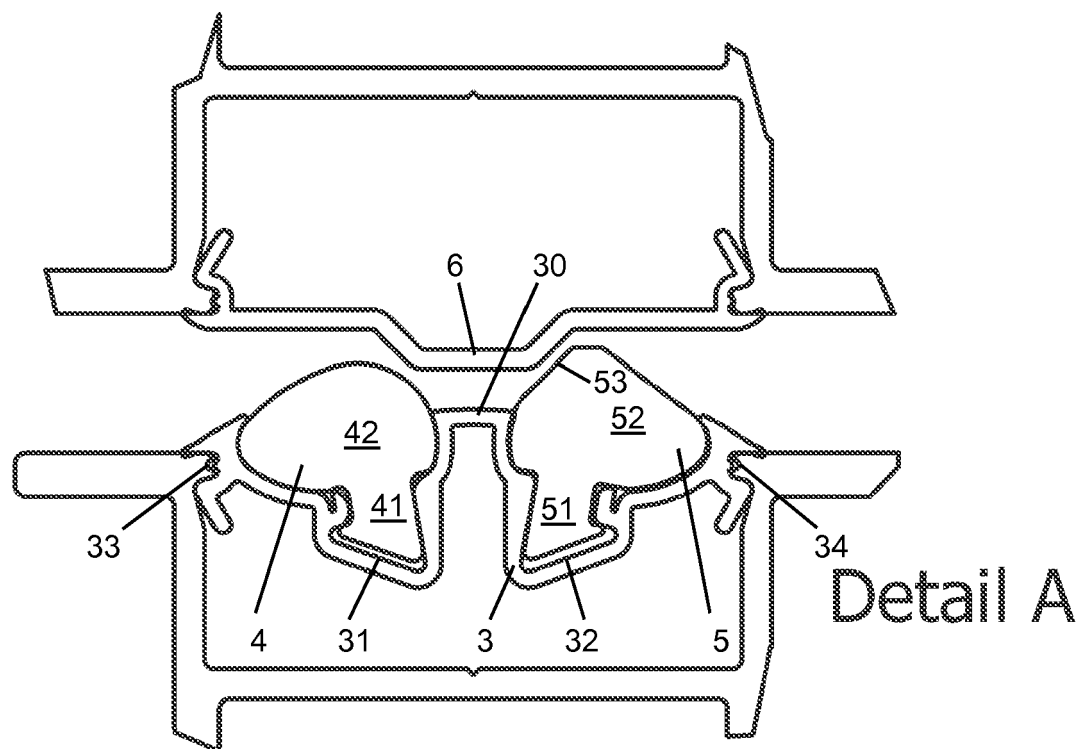


FIG. 4

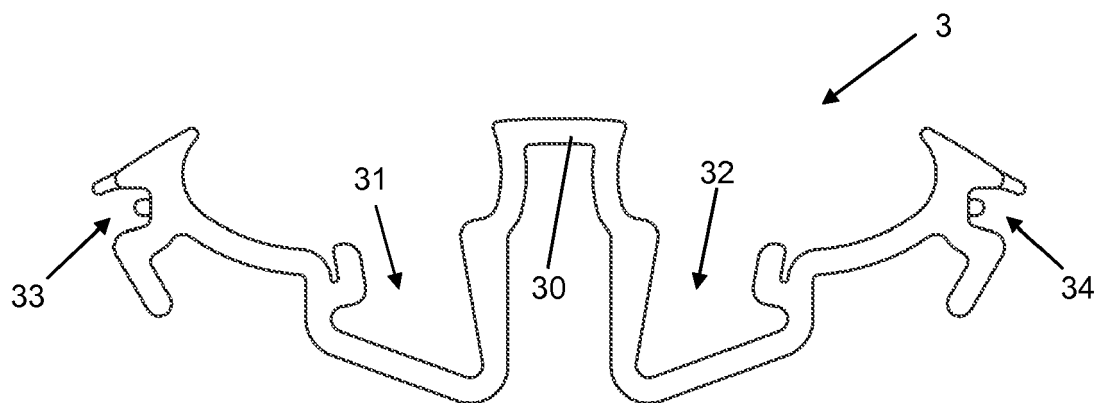


FIG. 5

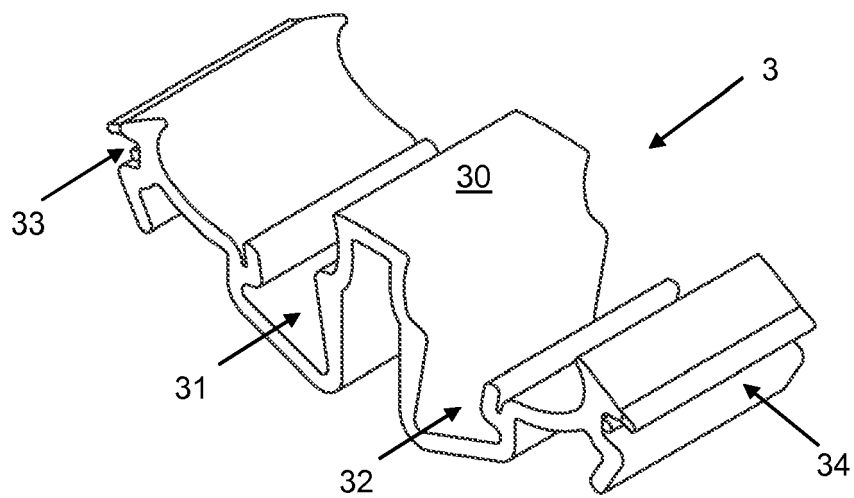


FIG. 6

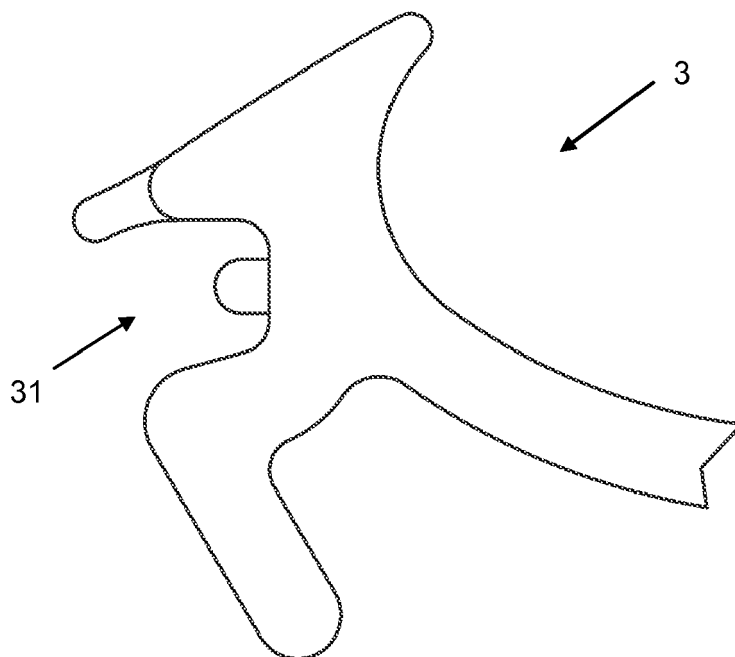


FIG. 7

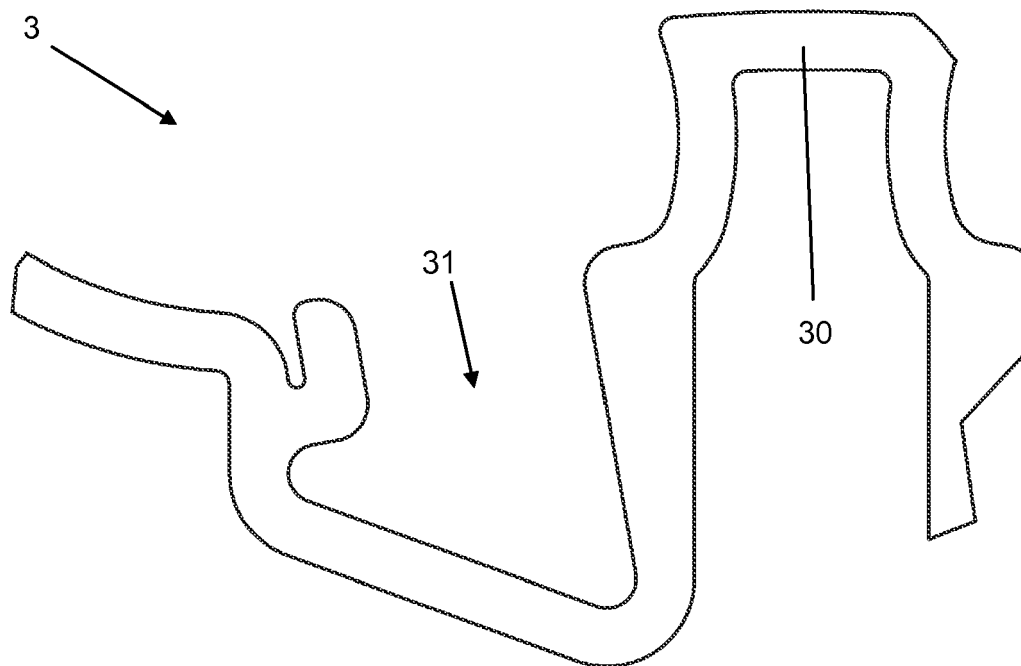


FIG. 8

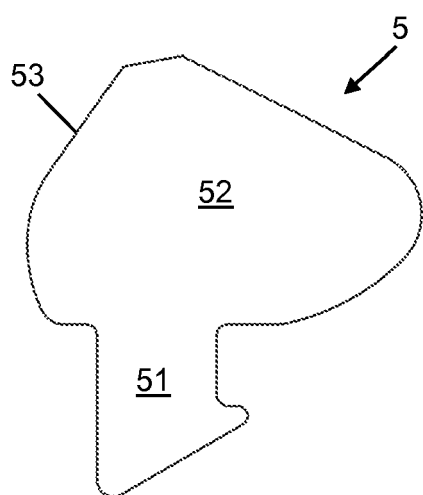


FIG. 9

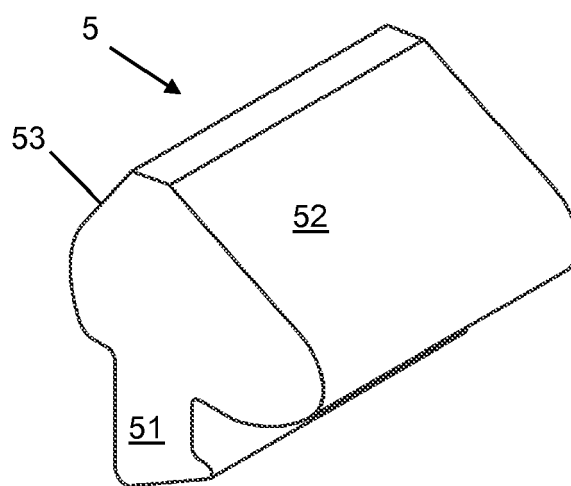


FIG. 10

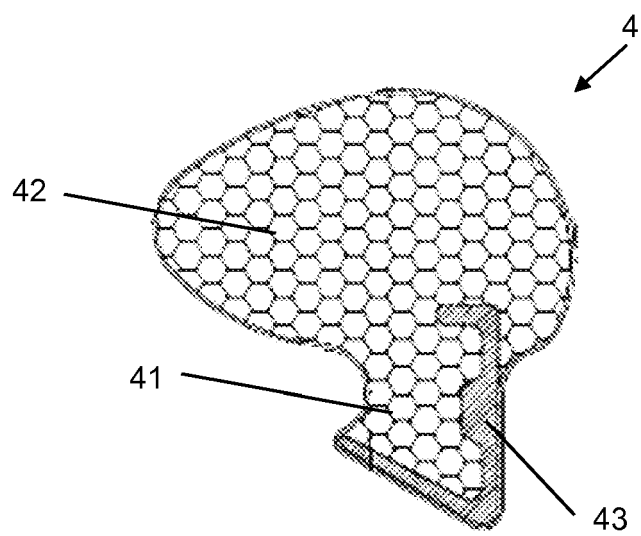


FIG. 11



EUROPEAN SEARCH REPORT

Application Number
EP 10 15 4823

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	WO 2008/043859 A2 (LIEXCO SA [LU]; DRIES RUDI [BE]) 17 April 2008 (2008-04-17) * the whole document * -----	1	INV. E06B7/22 E06B1/04
			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 29 July 2010	Examiner Geivaerts, Dirk
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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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2008043859 A [0002] [0024]