(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 231 985 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
13.03.2019 Bulletin 2019/11

(21) Application number: **08856611.2**

(22) Date of filing: **03.12.2008**

(51) Int Cl.:
E06B 7/02 *(2006.01)* ***E06B 7/06*** *(2006.01)*
F24F 13/18 *(2006.01)*

(86) International application number:
PCT/DK2008/050285

(87) International publication number:
WO 2009/071087 (11.06.2009 Gazette 2009/24)

(54) **FRESH AIR VALVE**

FRISCHLUFTVENTIL

CLAPET D'AIR FRAIS

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(30) Priority: **03.12.2007 DK 200701723**

(43) Date of publication of application:
29.09.2010 Bulletin 2010/39

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EP 2 231 985 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The present invention relates to a fresh-air valve of the kind which comprises a housing for building into a slot-shaped opening in walls or frames, for example a window frame, and comprising an elongated ventilation flap with ends which are connected with pressure-releasable snap couplings disposed at the ends of the housing, and which can be activated between an open and a closed position for the ventilation flap.

[0002] Examples of such fresh-air valves are known from WO 90/10777, i.e. a valve with an elongated ventilation flap/plate which at both ends is connected with opposing sides of a flat channel bush by means of respective pressure-operated snap couplings in such a manner that the ventilation flap/plate, from an open position at a distance in front of the channel bush opening, can be pressed in to a self-retaining closed position, from which it can be opened by spring pressure after a subsequent, brief further pressing-in effect. The valve can appear completely without operating elements, and since the ventilation flap/plate is in longitudinal tipping connection with the snap couplings, it is without significance whether it is tipped obliquely during the movement inwards or outwards.

[0003] An improved version of the fresh-air valve, where the pressure operated snap couplings are housed in closed wells outside the flow opening of the channel bush, and where the sealing strip between the ventilation flap/plate and the channel bush is placed in a recess in the flow opening in the channel bush, is known from WO 2006/131125 A1. The sealing strip is hereby protected against unnecessary clamping and wear during use of the valve in the half-open position, and the pressure-operated snap couplings are to some degree protected against soiling. The ventilation flap/plate consists of a hollow metal profile, typically of aluminium, in the open ends of which protruding tongues on the pressure-operated snap couplings can be engaged by being pressed in, which has led to the metal look on the surface of the valve, which is desired by the purchasers. The construction of the fresh-air valve disclosed in WO 2006/131125 A1 further makes possible a relatively small building-in depth, which is preferred by many manufacturers of doors and windows into which the fresh-air valve is built.

[0004] The use of a metal profile as ventilation flap/plate has, however, proved to be problematic, in that as a result of the temperature differences between the side surfaces, combined with differences in humidity, drops of condensate water are formed on the ventilation flap/plate, which finally become large enough for these to drip down from the flap/plate on to underlying surfaces, which is naturally a great disadvantage. This disadvantage is pronounced namely in rooms with skylights which comprise the fresh-air valve of the kind disclosed.

[0005] This problem could be solved by adding an isolating layer on the side of the flap/plate adjacent to the flow through opening of the valve. However, adding such insulating layer on the flow through side of the valve would reduce the free flow through area of the valve, which is not preferable, and would apply for an extension of the movement of the snap couplings to which the flap/plate is attached.

[0006] Another solution of the problem could be to manufacture the flap/plate in a non metallic, insulating material, but this would eliminate the desired genuine metal look preferred by the purchasers.

[0007] The object of the invention is thus to provide a fresh-air valve of the kind disclosed which offers a solution to the above-mentioned problem regarding condensate water. Another object of the invention is to reduce the number of individual parts of which the fresh-air valve consists.

[0008] This object is achieved with a fresh-air valve of the kind which comprises an elongated channel bush with a substantially slot-shaped through-flow opening for building into a slot.-shaped opening in walls or frames, for example a window frame, and further comprising an elongated ventilation flap with ends which are connected with pressure-releasable snap couplings disposed in wells near each end of the housing, outside the through-flow opening, where said pressure-releasable snap couplings can be activated between an open and a closed position for the ventilation flap, where the upper side of this is on a level with the facing side of the channel bush, and where between the channel bush and the ventilation flap there is a sealing strip disposed in an annular recess along the edge of the through-flow opening of the channel bush, which is characterised in that oriented towards the through-flow opening the ventilation flap comprises an insulating casing, the side limits of which comprise parallel-extending, upstanding lobes on the side facing away from the channel bush, and oriented in the longitudinal axis of the casing a track with spaced, protruding lugs intended for engagement with and locking of protruding side edges on protruding locking parts, or a locking tongue which extends along the centre axis of a cover plate associated with the ventilation flap which is intended for pressing-in into contact with the parallel protruding lobes, with at the same time locking of the protruding side edges on the locking parts/locking tongue between the spaced lugs in the track.

[0009] The forming of condensate water on the ventilation flap associated with the fresh-air according to the fresh-air valve disclosed in WO 2006/131125 A1 is hereby counteracted, in that the flap/plate of the fresh air valve consists of an assembled two-part body comprising an insulating casing closest to the flow through opening of the channel bush of the fresh air valve which is affected by colder air from the outride, and the preferred metal plate on the inside of the fresh air valve. Further, that between the insulating casing and the cover plate there is formed a space with static air, due to the protruding lobes on the side facing the cover plate, which creates a distance between the insulating casing and the cover plate. This, combined with a very modest contact area

between the protruding side edges on the locking parts/locking tongue, strengthens the insulating effect of the casing, and shields the internal side/cover plate against the forming of condensate under-cooling. The construction makes it possible to use any kind of material for the configuration of the cover plate, whether be it metal/aluminium, plastic or other material which for aesthetic reasons is desired to be used out of regard for the overall impression of the door or window frame in which the fresh-air valve according to the invention is incorporated. A further advantage of this construction of the fresh-air valve is that its insulating properties are improved in comparison with the known valves with a solid cover plate or ventilation flap e.g. as the one disclosed in WO 2006/131125 A1. It will be obvious that the insulating casing is configured in at least a poor heat-conducting material. However, it is preferred that the insulating casing is made of a plastic material.

[0010] The problem of forming of condensate water known from the fresh air valve disclosed in WO 2006/131125 A1 is by the fresh air valve according to the invention with an assembled two-part flap/cover of which the one is made of insulating material, solved in an manner which should not considered to be obvious for a skilled person, as the solution meets more requirements than just adding an insulating layer on the side og the flap/cover plate adjacent to the flow through opening of the fresh air valve, which would reduce the size of the free opening of the fresh air valve. Further the fresh air valve according to the invention also allows for the election of a lot of different materials for the inside part of the flap/cover.

[0011] All also being equal, the introduction of an insulating casing in connection with the ventilation flap will have the result that the number of individual parts of which the assembled fresh-air valve consists will be increased, providing that this is constructed in accordance with the known fresh-air valves, which conflicts with the desire to reduce the number of individual parts, whereby the fresh-air valve herewith becomes easier and quicker to assemble.

[0012] With the aim of achieving the object regarding the least possible number of individual parts in the fresh-air valve according to the invention, the insulating casing can at the ends comprise a protruding part oriented in the direction of the through-flow opening, said protruding parts forming a part of the pressure-releasable snap couplings.

[0013] The number of individual parts of which the fresh-air valve consists is hereby reduced by a single part in relation to the fresh-air valve disclosed in WO 2006 131125.

[0014] The fresh-air valve's ventilation flap is supported substantially by the pressure-operated snap couplings, which are vulnerable to transversely-directed pressure forces, which means that these can be ruined by excessive operation with an obliquely transverse pressure force, with subsequent costs of repair.

[0015] With the object of strengthening the ability of the ventilation flap to withstand transversely-directed pressure forces, this can comprise an end stop for the ventilation flap in its open position.

[0016] The ventilation flap is hereby stabilised so that it can better withstand transversely-directed pressure forces, which is achieved by the end stops to some degree absorbing the effect of said pressure forces, together with the load on the snap couplings being correspondingly reduced.

[0017] In a preferred embodiment of the end stops, on the side of the insulating casing facing towards the through-flow opening these can consist of a number of pairs of bluntly extending elastically-resilient elements oriented in the direction of the through-flow opening, the free ends of said elements on the sides facing away from each other comprising barbs in the form of transversely-directed projections, with a plane side facing towards the insulating casing and an opposing wedge-shaped side surface, said bluntly extending elements cooperating with standing-out parts in the through-flow opening of the channel bush for locking of the ventilation flap in the open position.

[0018] With the pairs of bluntly extending elements there is achieved good stability of the ventilation flap against transversely-directed forces. Moreover, the wedge-shaped side surfaces opposite the plane sides of the barbs enable an easy and trouble-free assembly of the fresh-air valve, where with the insertion of the insulating casing in the channel bush, the barbs yield slightly towards each other during the contact of the wedge-shaped surfaces against the standing-out parts in the channel bush, and thereafter during continued insertion of the insulating casing are displaced to the start position, whereby the plane surfaces are locked behind the channel bush's standing-out parts.

[0019] With the object of achieving a reduced building-in height, and herewith depth of the channel bush, it has proved to be an advantage that the pressure-operated snap couplings are arranged so that the protruding parts are cooperating with and displaceable in the coupling wells, in that the extending parts comprise protruding guide lugs which cooperate with guide tracks in at least in two opposing and facing towards the end parts sides of respectively the first and the second coupling well, and that extending parts further comprise a space for receiving a compression spring in which there is housed the first leg of a substantially U-shaped snap element, so that the compression spring rests against the bottom of the U-profile, and said U-shaped snap element in extension of the bottom of the U-profile further comprises a protruding retaining lug for engagement in a cooperating recess/hole in the sides of the coupling wells, and where the U-shaped snap element's second leg comprises a protruding retaining lug element which is oriented towards and accommodated in a track system in the extending parts, comprising tracks extending parallel with the longitudinal axes of the extending parts, the one end

of which comprises a labyrinth comprising a V-shaped switch point, the first track of which is deeper than the second track, and in the middle of which there are upstanding retaining parts with a pointed extent oriented towards the track oriented parallel with the extending parts, and where the opposite ends comprise a stepped seating cooperating with the retaining lug element, and where the track depth in the first track between the pointed extent and the stepped seating is decreasing, and by pressing-in of the extending parts to a bottom position the retaining element is inserted in the stepped seating, whereby the ventilation flap is provisionally locked in the active closed position, pressed against the sealing strip, and where a repeated pressure effect on a relevant end part will result in the release of the retaining element from the stepped seating and is guided sideways into the second track of the V-shaped switch point, the bottom of which is lying lower, and is led via the second track, the depth of which is decreasing, towards the track oriented parallel with the longitudinal axis of the extending part during the displacement of the part(s) to an open passive position for the ventilation flap.

[0020] With the object of protecting the tracks in the pressure-operated snap couplings against dirt/soiling when the ventilation flap/plate is open, the extending parts can comprise end-protection caps which extent between the cover plate and are oriented towards the coupling wells, at least to a level with the retaining lug element, said end-protection caps covering at least the upstanding parts which comprise the track system which at any time extend out over the edge or the channel bush.

[0021] The track system of the pressure-operated snap couplings is hereby safeguarded against soiling, which results in long operational reliability and in practice eliminates all maintenance of the pressure-operated snap couplings.

[0022] With the object of placing the sealing strip as closely as possible on the outer side of the valve, the lip ring can with advantage be moulded together with the channel bush by two-component injection moulding. There is hereby achieved the advantage that the necessary open height is reduced with the height of the sealing strip, in that the sealing strip is disposed in the recess in the channel bush. With the two-component moulding, there is also achieved the advantage that one hereby saves the operation which is connected with the adhering/mounting of the sealing strip.

[0023] With the object of ensuring optimal flow conditions for the air which passes the insulating casing, and of providing the greatest possible through-flow area through the ventilation flap's insulating casing and the through-flow opening, on the side facing the through-flow opening the insulating casing can have a double concave cross-section between the longitudinal axis and the side edges of the casing.

[0024] With the object of ensuring a good seal between the coupling wells and the through-flow opening in the channel bush, the sides of the coupling wells facing towards the through-flow opening can have an extent which corresponds to the facing side of the insulating casing, and over which extent the sealing strip extends.

[0025] The channel bush in the fresh-air valve is typically made of injection moulded plastic, and is a relatively thin-walled construction which, during the pressing into a window frame or windowsill, can break. With the object of providing the channel bush with adequate stability, a number of transverse bridges can be provided in the through-flow opening.

[0026] In the cases where the extent of the bridges in the channel bush is desired to be of maximum breadth, the end parts of the bridges facing towards the ventilation flap can be formed with an extent which corresponds to the facing side of the insulating casing.

[0027] In the following, the invention will be explained in more detail with reference to the drawing, where

Fig. 1 is a perspective view of a fresh-air valve for building into a slot-shaped opening in walls or frames, for example a window frame, according to the invention.

Fig. 2 shows the same as fig. 1, but as a line drawing where the ventilation flap is half open.

Fig. 3 shows the same as fig. 2, where the ventilation flap is fully open

Fig. 4 is an exploded perspective view of the fresh-air valve shown in fig. 1, fig. 2 and fig. 3.

Fig. 5 is a plan view of fig. 4.

Fig. 6 is a perspective, longitudinal sectional view of the one end of the fresh-air valve shown in fig. 1 - fig. 5, where the ventilation flap is in the open position.

Fig. 7 is a perspective, longitudinal sectional view of the one end of the fresh-air valve shown in fig. 1 - fig. 5, where the ventilation flap is in the closed position.

Fig. 8 is a sectional view of the fresh-air valve shown in fig. 1-7, along the line A-A in fig. 3, where the ventilation flap is in the open position, and

Fig. 9 shows the same as fig. 8, but where the ventilation flap is in the closed position.

[0028] In fig. 1 there is shown a perspective view of an embodiment of a fresh-air valve 2 according to the invention. As will immediately appear from fig. 1, 2, 3, 4 and 5, the fresh-air valve 2 consists of a channel bush 4, a ventilation flap 6 which comprises an insulating casing 76, and a cover plate 88. Oriented In the longitudinal axis 80, the insulating casing 76 comprises a track 82 with protruding lugs 84 intended for engagement, pressing-in and locking of protruding side edges 83, 85 on protruding locking tongues 86 along the centre axis 87 of the cover plate 88, see also fig. 8 and fig. 9. The cover plate 88 can consist of a suitably stiff material, for example aluminium.

[0029] As appears more clearly in fig. 8 and fig. 9, the insulation casing 76 also comprises upstanding lobes 95

along with the parallel side edges 94 on the side facing the cover plate 88. The depth of the track 82 is slightly deeper than the extent of the locking tongue 86 on the cover plate 88, which means that there is air between the locking tongue 86 and the insulation casing 76, which is thus only in contact with the locking tongue's protruding side edges 83, 85 at contact points at the spaced lugs 84. Moreover, the effect of the presence of the protruding lobes 95 on the parallel side edges 94 of the insulating casing is that the side of the cover plate 88 facing towards the insulating casing 76 is only in contact with the protruding lobes 95, and further that there is space between the cover plate 88 and the remaining part of the insulating casing 76. These conditions result in an effective insulating effect which counteracts the formation of condensate on the ventilation flap 6 associated with the fresh-air valve, and further that in the closed position the ventilation flap works in a better insulating manner than the ventilation flaps which are disclosed in said known fresh-air valves.

[0030] In each end, the insulating casing 76 comprises extending parts 42, 42' which constitute a part of the pressure-releasable snap couplings 9, 9', which connect the ventilation flap 6 and the channel bush, with the extending parts 42, 42' being disposed in coupling wells 10, 10' at the ends of the channel, bush 4.

[0031] In the embodiment shown, the fresh-air valve 2 comprises two end stops 97 for the ventilation flap in its open position, as will appear most clearly in fig. 6 and fig. 9.

[0032] In the shown embodiment of the fresh-air valve 2, on the side 90 of the insulating casing 76 facing towards the through-flow opening 22, the end stops 97 consist of a number of pairs of spaced, bluntly extending elements 96 which are oriented in the direction of the through-flow opening 22. The free ends 98 of the bluntly extending elements have barbs in the form of transversely-directed projections 102 on the sides 100 facing away from each other. The projections 102 have a plane side 104 facing towards the insulating casing 76, and an opposing wedge-shaped side surface 106. The bluntly extending elements 96 cooperate with extending part 108 in the channel bush's through-flow opening 22 for locking and stabilising of the ventilation flap 6 in the open position. The wedge-shaped side surface 106 serves to ease assembly of the fresh-air valve 2 during the placing of the ventilation flap 6, by pressing the insulating casing 76 into the channel bush 4, where the extending parts 42, 42'are inserted in the coupling wells 10, 10, at the same time that the bluntly extending elements are led into the through-flow opening 22. Here, the effect of the wedge-shaped side surfaces will be that the projections 102 can more easily pass the protruding parts 108 in the channel bush 4, so that the plane sides hereof can cooperate with facing side surfaces of the protruding parts 108 for locking and stabilising of the ventilation flap 6 in its open position.

[0033] Extending from the outer side 12, the channel bush 4 also comprises toothed locking lobes 14 for the retention of the fresh-air valve 2 in the walls of a relevant slot-shaped opening (not shown) in which the fresh-air valve is placed. The locking lobes 14 are formed by a piece of resilient material, which is secured to the channel bush 4, oriented transversely to the through-flow opening 22, as will appear more clearly from fig. 8 and fig. 9.

[0034] As will appear from fig. 4 and fig. 5, the fresh-air valve 2 also consists of an annular sealing strip 16 comprising a lip ring which is placed in a recess 18 along the edge 20 of the through-flow opening 22. As appears more clearly from fig. 4 and fig. 5, cooperating with the protruding parts 42, 42'the fresh-air valve also comprises substantially U-shaped snap elements 24, 24', and cooperating with these spring elements 26, 26'in the form of coil springs.

[0035] In the through-flow opening 22 of the channel bush 4 there are also a number of bridges 28 for strengthening of the channel bush.

[0036] As appears from fig. 8 and fig. 9, on the side 90 facing towards the through-flow opening 22 the insulating casing 76 has a double concave cross-section between the longitudinal axis 80 of the casing and its side edges 94.

[0037] As also appears from fig. 4, 5, 6, 7, 8 and 9, the side edges of the coupling wells 10, 10' facing towards the through-flow opening 22 have a concave extent which corresponds approximately to the double concave cross-section of the insulating casing, and where the sealing strip 16 extends.

[0038] At the ends, the insulating casing 76 comprises extending parts 42, 42'which constitute a part of the pressure-releasable snap couplings for the ventilation flap 6. The extending parts 42, 42'can be displaced inwards and cooperate with the coupling wells 10, 10,' and the extending parts 42, 42' comprise protruding guide lugs 44 which cooperate with guide tracks 46, 46' (cf. fig. 5) in two opposing and towards the end parts facing sides of the first and the second coupling well 10, 10' respectively. The extending parts 42, 42'further comprise a space 43 for the accommodation of the compression spring (26) and the first leg 47 of the U-shaped snap elements 24, 24', so that the one end of the spring rests against the bottom 48 of the U.-shaped snap elements 24, 24'. In extension of the bottom 48 of the U-shaped snap elements 24, 24', at the foot of the U-shaped element's second leg 49, there is a protruding retaining lug intended for engagement in a herewith cooperating hole 52 in the side of the coupling wells 10, 10'.

[0039] The second leg 49 of the U-shaped snap elements 24, 24'further comprises a holding element 54 which is oriented towards and accommodated in a track system 56 in the side 58 of the extending parts 42, 42'facing towards the walls of the coupling wells, cf. fig. 6 and 7. The track system 56 comprises a track 60 which opens out in a labyrinth 62 with a V-shaped track switch point 64, the first track 66 of which is deeper than the second 68, and in the middle of said labyrinth there is an upstanding holding part 77 with a pointed extent oriented

towards the track 60. The opposite end of the holding part 70 comprises a stepped seating 72 cooperating with the holding element 54, where the track depth is decreasing between the pointed extent and the stepped seating 72, and in which the holding element 54, by pressing-in of the parts 42, 42'to a bottom position, is guided in to the stepped seating 72, whereby the holding element 54 is locked, as will appear from fig. 7, and under the force of the compression spring 26 is maintained in this position, so that the ventilation flap 6 is provisionally locked in a position where the insulating casing is pressed against the sealing strip, until a repeated pressure on a relevant part 42, 42', alternatively both parts, will result in the holding element 54 being released and guided out from the stepped seating 72, and by the part(s) 42, 42' under the force of the compression spring 26 is guided out sideways and into the V-shaped switch point's second track 74, the bottom of which is lying lower than the bottom of the stepped seating, and is led by outwards displacement of the part(s) 42, 42', via the second track 64 back to the track 60.

[0040] With the introduction of the protruding holding element 50 into the hole 42 in connection with the mounting of the pressure-operated snap couplings, there occurs a locking of the parts 42, 42'so that these, in combination with the holding element 54 and its seating in the track system 56, are retained in the coupling wells 10, 10'.

[0041] As will appear from fig. 4,5, 6 and 7, the fresh-air valve 2 according to the invention, in the embodiment shown, comprises end protection caps 110 on the protruding parts 42, 42' which extend between the cover plate 88 and are oriented towards the coupling wells 10, 10', at least to a level with the holding element 54, said end protection caps 110 at least covering upstanding parts of the extending parts 42, 42' which comprise the track system 56 which at any time protrude out over the edge 20 of the channel bush. The end protection caps 110 serve to protect the track system 56 on the extending parts 42, 42'against soiling with dirt and dust, which results in good operational stability of the pressure releasable snap couplings 9, 9'.

[0042] The assembly of the fresh-air valve 2 according to the invention takes place by pressing the locking tongue 86 into the track 82 in the insulating casing 76, so that the protruding side edges 83, 85 of the locking tongue are locked behind the protruding lugs 84 in the track 82. Hereafter, the end protection caps 110 are mounted, after which a spring element 26, 26' is placed on the first leg 47 of each of the U-shaped snap elements 24, 24', which are then inserted into the spaces provided for this purpose in the extending parts 42, 42 on the insulating casing 76, at the same time that the holding element 54 on the second leg 49 of the U-shaped snap element 24 is placed in the track system 56 on the outer side of the extending parts 42, 42', after which the end parts are introduced into the coupling wells 10, 10' until the holding elements 50 on the U-shaped snap element 24 are engaged in the holes 53 in the coupling wells, at the same time that the transversely-directed projections 102 on the bluntly extending elements 96 on the insulating casing 76 are pressed in for locking behind the protruding parts 108 in the through-flow opening 22 of the channel bush, after which the fresh-air valve is assembled.

[0043] With the invention there is thus provided a fresh-air valve which with its construction counteracts the formation of condensate water on the internal side of the ventilation flap 6 by the introduction of an insulating casing 76 between the ventilation flap's cover plate 88 and the through-flow opening 22 of the fresh-air valve. Moreover, there is provided a fresh-air valve which comprises fewer individual parts than the earlier known fresh-air valves, which means that it becomes easier to assemble.

[0044] Finally with the invention there is also provided a fresh-air valve 2 which continues to permit a reduced building-in depth. Furthermore, there is provided a fresh-air valve which is considerably cheaper to produce, and which has pressure releasable snap couplings which are considerably easier to assemble.

Claims

1. Fresh-air valve (2) comprising an elongated channel bush (4) with a substantially slot-shaped through-flow opening (22) for building into a slot-shaped opening in walls or frames, for example a window frame, and further comprising an elongated ventilation flap (6) with ends which are connected to pressure-releasable snap couplings (9, 9') disposed in wells (10, 10') close to each end of the housing, outside the through-flow opening (22), where said pressure-releasable snap couplings can be activated between an open position for the ventilation flap (6) and a closed position for the ventilation flap (6), where the top side of this is plane with the facing side of the channel bush (4), and where between the channel bush (4) and the ventilation flap (6) there is provided a sealing strip (16) disposed in an annular recess (18) along the edge of the through-flow opening (22) of the channel bush (4), **characterised in, that** oriented towards the through-flow opening (22) the ventilation flap (6) comprises an insulating casing (76), the side edges (94) of which comprise parallel-extending, upstanding lobes (95) on the side (78) facing away from the channel bush, and oriented in the longitudinal axis (80) of the casing and wherein the ventilation flap (6) further comprises a track (82) with spaced protruding lugs (84) intended for engagement with and locking of protruding side edges (83, 85) of protruding locking parts, or a locking tongue (86) which extends along the centre axis (87) of a cover plate (88) associated with the ventilation flap, said cover plate (88) is configured for pressing-in for contact with the parallel upstanding lobes (95)

with simultaneous locking of the protruding side edges (83, 85) on the locking parts/locking tongue (86) between the spaced lugs (84) in the track (82).

2. Fresh-air valve (2) according to claim 1, **characterised in that** at the ends the insulating casing (76) comprises an extending part (42, 42') oriented opposite the through-flow opening (22), said extending parts (42, 42') forming a part of the pressure-releasable snap couplings (9, 9').

3. Fresh-air valve (2) according to claim 1 or 2, **characterised in that** it comprises a number of end stops (97) for the ventilation flap (6) in its open position.

4. Fresh-air valve (2) according to claim 3, **characterised in that** on the side (90) of the insulating casing (76) facing towards the through-flow opening (22), the end stops (97) consist of a number of pairs of spaced, bluntly protruding elements (96) oriented in the direction of the through-flow opening (22), the free ends (98) of said protruding elements on the sides (100) facing away from each other comprising barbs in the form of transversely-directed projections (102) with a plane side (104) facing towards the insulating casing (76) and an opposing wedge-shaped side surface (106), said bluntly protruding elements (96) cooperating with extending parts (108) in the through-flow opening in the channel bush for locking of the ventilation flap (6) in the open position.

5. Fresh-air valve (2) according to any of the claims 2-4, **characterised in that** the extending parts (42, 42') are cooperating with and displaceable in the coupling wells (10, 10'), **in that** the extending part (42, 42') comprises protruding guide lugs (44, 44') which cooperate the guide tracks (46, 46') in at least two sides opposite and facing towards the end parts of respectively the first and the second coupling well (10, 10'), and that the extending parts (42, 42') further comprise a space for receiving a compression spring (26) in which there is disposed the first leg (47) of a substantially U-shaped snap element (24), so that the compression spring (26) rests against the bottom (48) of the U-profile, and where in extension of the bottom (48) of the U-profile said U-shaped snap element (24) further comprises a protruding holding lug (50) for engagement in a herewith cooperating recess/hole (52) in the sides of the coupling wells (10, 10'), and where the second leg (49) of the U-shaped snap element comprises a protruding holding lug element (54) which is oriented towards and engaged in a track system (56) in the extending parts (42, 42') comprising a track (60) oriented parallel with the longitudinal axis of the extending parts, the one end of said track comprising a labyrinth (62) comprising a V-shaped switch point (64), the first track (66) of which is deeper that the second track (68), and in the middle of which there is an upstanding retaining part (70) with a pointed extent (60) oriented parallel towards the longitudinal axis of the extending parts, the opposite end of which comprises a stepped seating (72) cooperating with the retaining lug element (54), and where the track depth in the first track (66) between the pointed extent and the stepped seating (72) is decreasing, and in which the retaining lug elements (54) by the pressing-in of the extending parts (42, 42') to a bottom position are guided into the stepped seating (72), whereby the ventilation flap (8) is provisionally locking in the active closed position, pressed against the sealing strip (16), and where a repeated pressure effect on a relevant end part (8, 8') will result in the retaining lug element (54) being released from the stepped seating (72) and guided sideways and into the second track (68) of the V-shaped switch point, the bottom of which is lower-lying, and led via the second track (68), the depth of which is decreasing towards the track (60) oriented parallel with the longitudinal axis of the extending parts, during the displacement of the part(s) (42, 42') to an open passive position for the ventilation flap.

6. Fresh-air valve (2) according to claim 5, **characterised in that** the extending parts (42, 42') comprise end protection caps (110) which extend between the cover plate (88) and are oriented towards the coupling wells (10, 10'), at least to a level with the retaining lug element (54), said end protection caps (110) at least covering parts of the extending parts (42, 42'), which comprise the track system (56), which at any time extend up over the edge of the channel bush.

7. Fresh-air valve (2) according to any of the claims 1-6, **characterised in that** the sealing strip (16) is moulded together with the channel bush (4) by two-component injection moulding.

8. Fresh-air valve (2) according to any of the claims 1-7, **characterised in that** the side (90) of the insulating casing (76) facing towards the through-flow opening (22) has a double concave cross-section between the longitudinal axis (80) of the casing and its side edges (94).

9. Fresh-air valve (2) according to any of the claims 1-8, **characterised in that** the sides of the coupling wells (10, 10') facing the through-flow opening (22) have an extent which corresponds to the facing side (90) of the insulating casing (76), and over which extent the sealing strip (16) extends.

10. Fresh-air valve (2) according to any of the claims 1-9, **characterised in that** a number of transverse bridges (28) are provided in the through-flow opening

(22) in the channel bush.

Patentansprüche

1. Frischluftventil (2) mit einer länglichen Kanalbuchse (4) mit einer im Wesentlichen schlitzförmigen Durchflussöffnung (22) zum Einbau in eine schlitzförmige Öffnung in Wänden oder Rahmen, beispielsweise einen Fensterrahmen, und ferner mit einer länglichen Lüftungsklappe (6), deren Enden mit durch Druck lösbaren Schnappkupplungen (9, 9') verbunden sind, die in Vertiefungen (10, 10') nahe jedem Ende des Gehäuses außerhalb der Durchflussöffnung (22) angeordnet sind, wobei die durch Druck lösbaren Schnappkupplungen zwischen einer geöffneten Position für die Lüftungsklappe (6) und einer geschlossenen Position für die Lüftungsklappe (6) aktiviert werden können, wobei deren Oberseite mit der gegenüberliegenden Seite der Kanalbuchse (4) in einer Ebene liegt und wobei zwischen der Kanalbuchse (4) und der Lüftungsklappe (6) ein Dichtstreifen (16) vorgesehen ist, der in einer ringförmigen Aussparung (18) entlang der Kante der Durchflussöffnung (22) der Kanalbuchse (4) angeordnet ist, **dadurch gekennzeichnet, dass** die Lüftungsklappe (6) in Richtung der Durchflussöffnung (22) ein isolierendes Gehäuse (76) umfasst, dessen Seitenkanten (94) parallel verlaufende, aufrechte Ansätze (95) auf der der Kanalbuchse abgewandten Seite (78) aufweisen und in der Längsachse (80) des Gehäuses ausgerichtet sind, und wobei die Lüftungsklappe (6) ferner eine Schiene (82) aufweist, die beabstandete, vorstehende Ansätze (84) umfasst, die zum Eingriff mit vorstehenden Seitenkanten (83, 85) von vorstehenden Verriegelungsteilen und zu deren Verriegelung vorgesehen sind, oder eine Verriegelungszunge (86) sich entlang der Mittelachse (87) einer der Lüftungsklappe zugeordneten Abdeckplatte (88) erstreckt, wobei die Abdeckplatte (88) zum Eindrücken zum Kontakt mit den parallelen aufrechten Ansätzen (95) bei gleichzeitiger Verriegelung der vorstehenden Seitenkanten (83, 85) an den Verriegelungsteilen/der Sperrzunge (86) zwischen den beabstandeten Ansätze (84) in der Schiene (82) ausgebildet ist.

2. Frischluftventil (2) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Isoliergehäuse (76) an seinen Enden einen der Durchflussöffnung (22) gegenüberliegenden, verlängerten Teil (42, 42') aufweist, wobei die verlängerten Teile (42, 42') einen Teil der durch Druck lösbaren Schnappkupplungen (9, 9') bilden.

3. Frischluftventil (2) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** es in seiner geöffneten Position eine Anzahl von Endanschlägen (97) für die Lüftungsklappe (6) aufweist.

4. Frischluftventil (2) nach Anspruch 3, **dadurch gekennzeichnet, dass** auf der der Durchflussöffnung (22) zugewandten Seite (90) des Isoliergehäuses (76) die Endanschläge (97) aus einer Anzahl von Paaren von beabstandeten, frei vorstehenden Elementen (96) bestehen, die in Richtung der Durchflussöffnung (22) ausgerichtet sind, wobei die freien Enden (98) der vorstehenden Elemente auf den voneinander abgewandten Seiten (100) Rasthaken in Form von quergerichteten Vorsprüngen (102) mit einer ebenen Seite (104) aufweisen, die dem Isoliergehäuse (76) zugewandt sind, und eine gegenüberliegende keilförmige Seitenfläche (106) aufweisen, wobei die frei vorstehenden Elemente (96) mit vorstehenden Teilen (108) in der Durchflussöffnung in der Kanalbuchse zusammenwirken, um die Lüftungsklappe (6) in der offenen Position zu verriegeln.

5. Frischluftventil (2) nach einem der Ansprüche 2-4, **dadurch gekennzeichnet, dass** die verlängerten Teile (42, 42') mit den Koppelvertiefungen (10, 10') zusammenwirken und in diesen verschiebbar sind, dass der verlängerte Teil (42, 42') vorstehende Führungsnasen (44, 44') umfasst, die mit den Führungsschienen (46, 46') in mindestens zwei gegenüberliegenden Seiten zusammenwirken und zu den Endteilen der ersten bzw. zweiten Koppelvertiefung (10) gerichtet sind, und dass die verlängerten Teile (42, 42') ferner einen Raum zur Aufnahme einer Druckfeder (26) umfassen, in dem der erste Schenkel (47) eines im Wesentlichen U-förmigen Schnappelements (24) angeordnet ist, so dass die Druckfeder (26) an der Unterseite (48) des U-Profils anliegt, und wobei das U-förmige Schnappelement (24) in Verlängerung des Bodens (48) des U-Profils ferner eine vorstehende Haltenase (50) zum Eingriff in ein hiermit zusammenwirkende/s Vertiefung/Loch (52) in den Seiten der Koppelvertiefungen (10, 10') umfasst, und wobei der zweite Schenkel (49) des U-förmigen Schnappelements ein vorstehendes Haltenasenelement (54) umfasst, das in den verlängerten Teilen (42, 42') auf ein Schienensystem (56) ausgerichtet ist und in dieses eingreift, wobei dieses eine Schiene (60) umfasst, die parallel zur Längsachse der verlängerten Teile ausgerichtet ist, wobei das eine Ende der Schiene ein Labyrinth (62) umfasst, das einen V-förmigen Schaltpunkt (64) umfasst, wobei die erste Schiene (66) tiefer als die zweite Schiene (68) ausgebildet ist, und in deren Mitte sich ein aufrecht stehendes Rückhalteteil (70) mit einer spitzen Erstreckung (60) befindet, die parallel zur Längsachse der verlängerten Teile ausgerichtet ist, deren gegenüberliegendes Ende einen abgestuften Sitz (72) umfasst, der mit dem Haltenasenelement (54) zusammenwirkt, und wobei die Schienentiefe in der ersten Schiene (66) zwischen der spitzen Erstre-

ckung und dem gestuften Sitz (72) abnimmt und wobei die Haltenasenelemente (54) durch das Eindrücken der verlängerten Teile (42, 42') in eine untere Position in den gestuften Sitz (72) geführt sind, wobei die Lüftungsklappe (8) in der aktiven Schließstellung, gegen die Dichtleiste (16) gedrückt, provisorisch verriegelt ist und wobei eine wiederholte Druckeinwirkung auf ein entsprechendes Endteil (8, 8') dazu führt, dass das Haltenasenelement (54) aus dem gestuften Sitz (72) gelöst und seitlich und in die zweite Schiene (68) des V-förmigen Schaltpunkts geführt wird, dessen Boden tiefer liegt und über die zweite Schiene (68) geführt wird, deren Tiefe in Richtung der Schiene (60) abnimmt, während des Verschiebens der Teile (42, 42'), welche parallel zur Längsachse der verlängerten Teile in eine offene passive Position für die Lüftungsklappe, ausgerichtet ist.

6. Frischluftventil (2) nach Anspruch 5, **dadurch gekennzeichnet, dass** die verlängerten Teile (42, 42') Endschutzkappen (110) umfassen, die sich zwischen der Abdeckplatte (88) erstrecken und zu den Koppelvertiefungen (10, 10') ausgerichtet sind, zumindest bis zu einer Höhe mit dem Haltenasenelement (54), wobei die Endschutzkappen (110) wenigstens Teile der verlängerten Teile (42, 42') abdecken, die das Schienensystem (56) umfassen, das sich zu jeder Zeit über den Rand der Kanalbuchse erstreckt.

7. Frischluftventil (2) nach einem der Ansprüche 1-6, **dadurch gekennzeichnet, dass** das Dichtungsband (16) zusammen mit der Kanalbuchse (4) durch Zweikomponenten-Spritzguss geformt wird.

8. Frischluftventil (2) nach einem der Ansprüche 1-7, **dadurch gekennzeichnet, dass** die der Durchflussöffnung (22) zugewandte Seite (90) des Isoliergehäuses (76) zwischen der Längsachse (80) des Gehäuses und seinen Seitenkanten (94) einen doppeltkonkaven Querschnitt aufweist.

9. Frischluftventil (2) nach einem der Ansprüche 1-8, **dadurch gekennzeichnet, dass** die der Durchflussöffnung (22) zugewandten Seiten der Koppelvertiefungen (10, 10') eine Ausdehnung aufweisen, die der gegenüberliegenden Seite (90) des Isoliergehäuses (76) entspricht, und über die sich das Dichtungsband (16) erstreckt.

10. Frischluftventil (2) nach einem der Ansprüche 1-9, **dadurch gekennzeichnet, dass** in der Durchflussöffnung (22) in der Kanalbuchse eine Anzahl von Querbrücken (28) vorgesehen ist.

Revendications

1. Clapet d'appel d'air frais (2) comprenant une garniture d'étanchéité pour canal (4) oblongue avec une ouverture d'écoulement sensiblement en forme de fente (22) à intégrer au sein d'une ouverture en forme de fente dans des parois ou des encadrements, par exemple un encadrement de fenêtre, et comprenant en outre un volet de ventilation (6) oblong avec des extrémités qui sont reliées à des raccords rapides libérables par pression (9, 9') disposés dans des puits (10, 10') à proximité de chaque extrémité du boîtier, à l'extérieur de l'ouverture d'écoulement (22), où lesdits raccords rapides libérables par pression peuvent être activés entre une position ouverte du volet de ventilation (6) et une position fermée du volet de ventilation (6), où le côté supérieur connexe est plan avec le côté opposé de la garniture d'étanchéité pour canal (4), et où, entre la garniture d'étanchéité pour canal (4) et le volet de ventilation (6), est prévue une bande d'étanchéité (16) disposée dans un évidement annulaire (18) le long du bord de l'ouverture d'écoulement (22) de la garniture d'étanchéité pour canal (4), **caractérisé en ce que**, orienté vers l'ouverture d'écoulement (22), le volet de ventilation (6) comprend un boîtier isolant (76), dont les bords latéraux (94) comprennent des lobes verticaux (95) s'étendant parallèlement sur le côté (78) opposé à la garniture d'étanchéité pour canal, et orienté dans l'axe longitudinal (80) du boîtier, et dans lequel le volet de ventilation (6) comprend en outre un rail (82) avec des ergots en saillie espacés (84) destinés à venir s'en prise avec, et à verrouiller, des bords latéraux en saillie (83, 85) de parties de verrouillage en saillie, ou une languette de verrouillage (86) qui s'étend le long de l'axe médian (87) d'une plaque de recouvrement (88) associée au volet de ventilation, ladite plaque de recouvrement (88) étant configurée pour être enfoncée afin d'entrer en contact avec les lobes verticaux parallèles (95) avec un verrouillage simultané des bords latéraux en saillie (83, 85) sur les parties de verrouillage / la languette de verrouillage (86) entre les ergots espacés (84) dans le rail (82).

2. Clapet d'appel d'air frais (2) selon la revendication 1, **caractérisé en ce que**, aux extrémités, le boîtier isolant (76) comprend une partie d'extension (42, 42') orientée à l'opposé de l'ouverture d'écoulement (22), lesdites parties d'extension (42, 42') faisant partie des raccords rapides libérables par pression (9, 9').

3. Clapet d'appel d'air frais (2) selon la revendication 1 ou 2, **caractéris é** en ce qu'il comporte un nombre de butées d'extrémité (97) pour le volet de ventilation (6) dans sa position ouverte.

4. Clapet d'appel d'air frais (2) selon la revendication

3, **caractérisé en ce que**, sur le côté (90) du boîtier isolant (76) orienté vers l'ouverture d'écoulement (22), les butées d'extrémité (97) sont constituées d'un nombre de paires d'éléments espacés franchement en saillie (96) orientés dans la direction de l'ouverture d'écoulement (22), les extrémités libres (98) desdits éléments en saillie sur les côtés (100) s'éloignant mutuellement comprenant des ardillons sous la forme de parties saillantes orientées transversalement (102) avec un côté plan (104) orienté vers le boîtier isolant (76) et une surface latérale cunéiforme opposée (106), lesdits éléments franchement en saillie (96) coopérant avec des parties d'extension (108) dans l'ouverture d'écoulement dans la garniture d'étanchéité pour canal pour verrouiller le volet de ventilation (6) dans la position ouverte.

5. Clapet d'appel d'air frais (2) selon l'une quelconque des revendications 2 à 4, **caractérisé en ce que** les parties d'extension (42, 42') coopèrent avec, peuvent être déplacées dans, les puits d'accouplement (10, 10'), **en ce que** la partie d'extension (42, 42') comprend des ergots de guidage (44, 44') en saillie qui coopèrent avec les rails de guidage (46, 46') dans au moins deux côtés opposés et orientés vers les parties d'extrémité, respectivement, du premier et du second puits d'accouplement (10, 10'), et **en ce que** les parties d'extension (42, 42') comprennent en outre un espace destiné à recevoir un ressort de compression (26) dans lequel est disposée la première branche (47) d'un élément de pression (24) sensiblement en U, de sorte que le ressort de compression (26) repose contre le fond (48) du profil en U, et où, dans le prolongement du fond (48) du profil en U, ledit élément de pression en forme de U (24) comprend en outre un ergot de retenue en saillie (50) destiné à venir en prise dans une cavité / un trou (52) coopérant avec lui sur les côtés des puits d'accouplement (10, 10'), et où la seconde branche (49) de l'élément de pression en forme de U comprend un élément d'ergot de retenue en saillie (54) qui est orienté vers et en prise dans un système de rails (56) dans les parties d'extension (42, 42') comprenant un rail (60) orienté parallèlement à l'axe longitudinal des parties d'extension, ladite une extrémité dudit rail comprenant un labyrinthe (62) comprenant un point de commutation en V (64), dont le premier rail (66) est plus profond que le second rail (68), et au milieu duquel se situe une partie de retenue verticale (70) avec une étendue pointue (60) orientée parallèlement à l'axe longitudinal des parties d'extension, dont l'extrémité opposée comprend un portage étagé (72) coopérant avec l'élément d'ergot de retenue (54), et où la profondeur de rail dans le premier rail (66) entre l'étendue pointue et le portage étagé (72) diminue, et dans lequel les éléments d'ergots de retenue (54), par l'enfoncement des parties d'extension (42, 42') vers une position inférieure, sont guidés dans le portage étagé (72), moyennant quoi le volet de ventilation (8) se verrouille provisoirement dans la position fermée active, en appui contre la bande d'étanchéité (16), et où un effet de pression répété sur une partie d'extrémité pertinente (8, 8') aura pour effet de libérer l'élément d'ergot de retenue (54) du portage étagé (72) et de le guider latéralement et dans le second rail (68) du point de commutation en V, dont le fond est situé en contrebas et est dirigé par l'intermédiaire du second rail (68), dont la profondeur diminue vers le rail (60) orienté parallèlement à l'axe longitudinal des parties d'extension, lors du déplacement de la ou des parties (42, 42') vers une position ouverte passive pour le volet de ventilation.

6. Clapet d'appel d'air frais (2) selon la revendication 5, **caractérisé en ce que** les parties d'extension (42, 42') comprennent des capuchons de protection d'extrémité (110) qui s'étendent entre la plaque de recouvrement (88) et sont orientés vers les puits d'accouplement (10, 10'), au moins jusqu'à un niveau avec l'élément d'ergot de retenue (54), lesdits capuchons de protection d'extrémité (110) couvrant au moins des parties des parties d'extension (42, 42'), qui comprennent le système de rails (56), qui s'étendent à tout moment au-dessus du bord de la garniture d'étanchéité pour canal.

7. Clapet d'appel d'air frais (2) selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** la bande d'étanchéité (16) est moulée conjointement avec la garniture d'étanchéité pour canal (4) par un moulage par injection à deux composantes.

8. Clapet d'appel d'air frais (2) selon l'une quelconque des revendications 1 à 7, **caractérisé en ce que** le côté (90) du boîtier isolant (76) orienté vers l'ouverture d'écoulement (22) présente une double section transversale concave entre l'axe longitudinal (80) du boîtier et ses bords latéraux (94).

9. Clapet d'appel d'air frais (2) selon l'une quelconque des revendications 1 à 8, **caractérisé en ce que** les côtés des puits d'accouplement (10, 10') orientés vers l'ouverture d'écoulement (22) présentent une étendue qui correspond au côté opposé (90) du boîtier isolant (76) et sur laquelle étendue s'étend la bande d'étanchéité (16).

10. Clapet d'appel d'air frais (2) selon l'une quelconque des revendications 1 à 9, **caractérisé en ce qu'**un nombre de ponts transversaux (28) est prévu dans l'ouverture d'écoulement (22) de la garniture d'étanchéité pour canal.

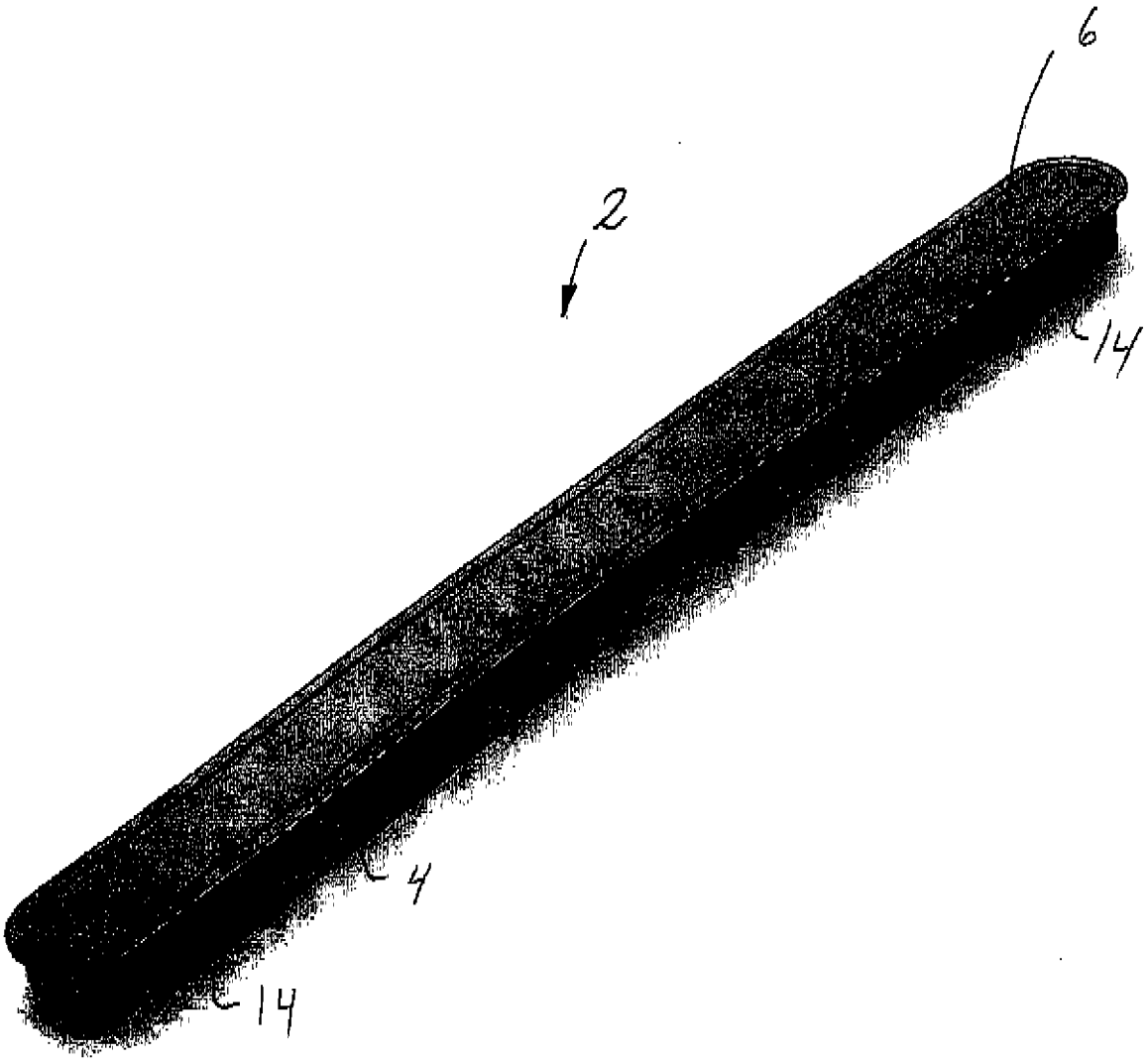

Fig. 1

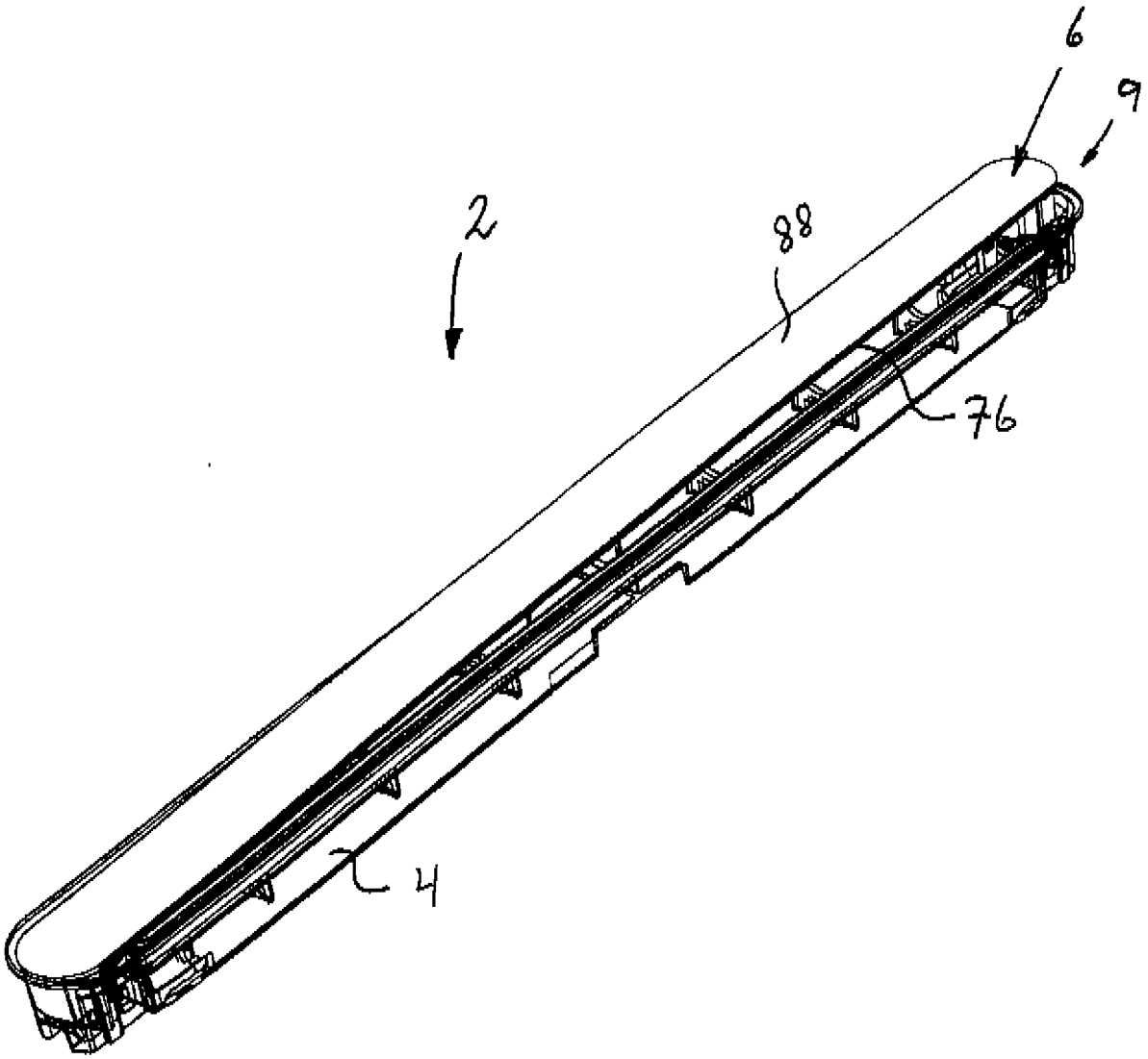

Fig.2

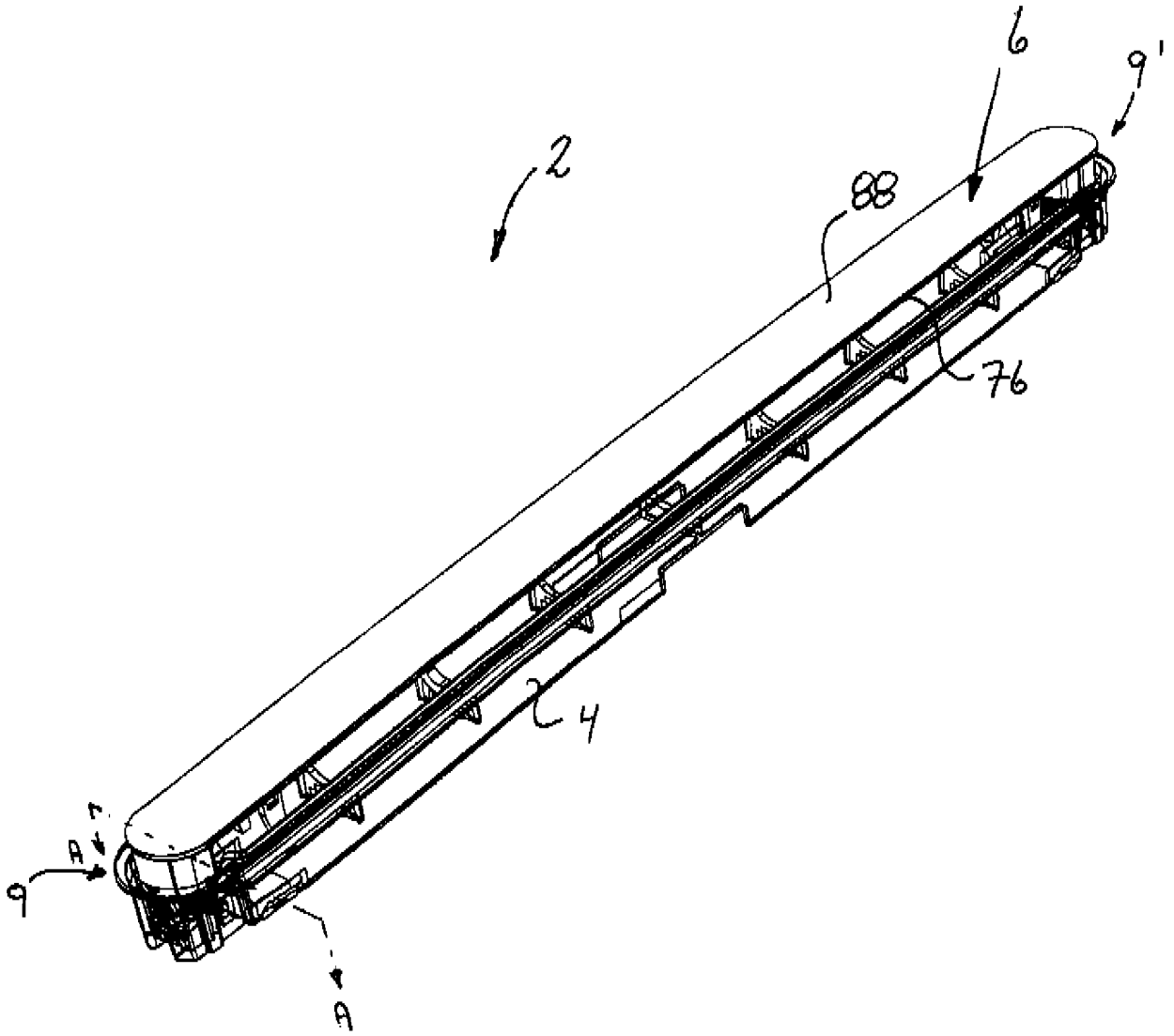

Fig. 3

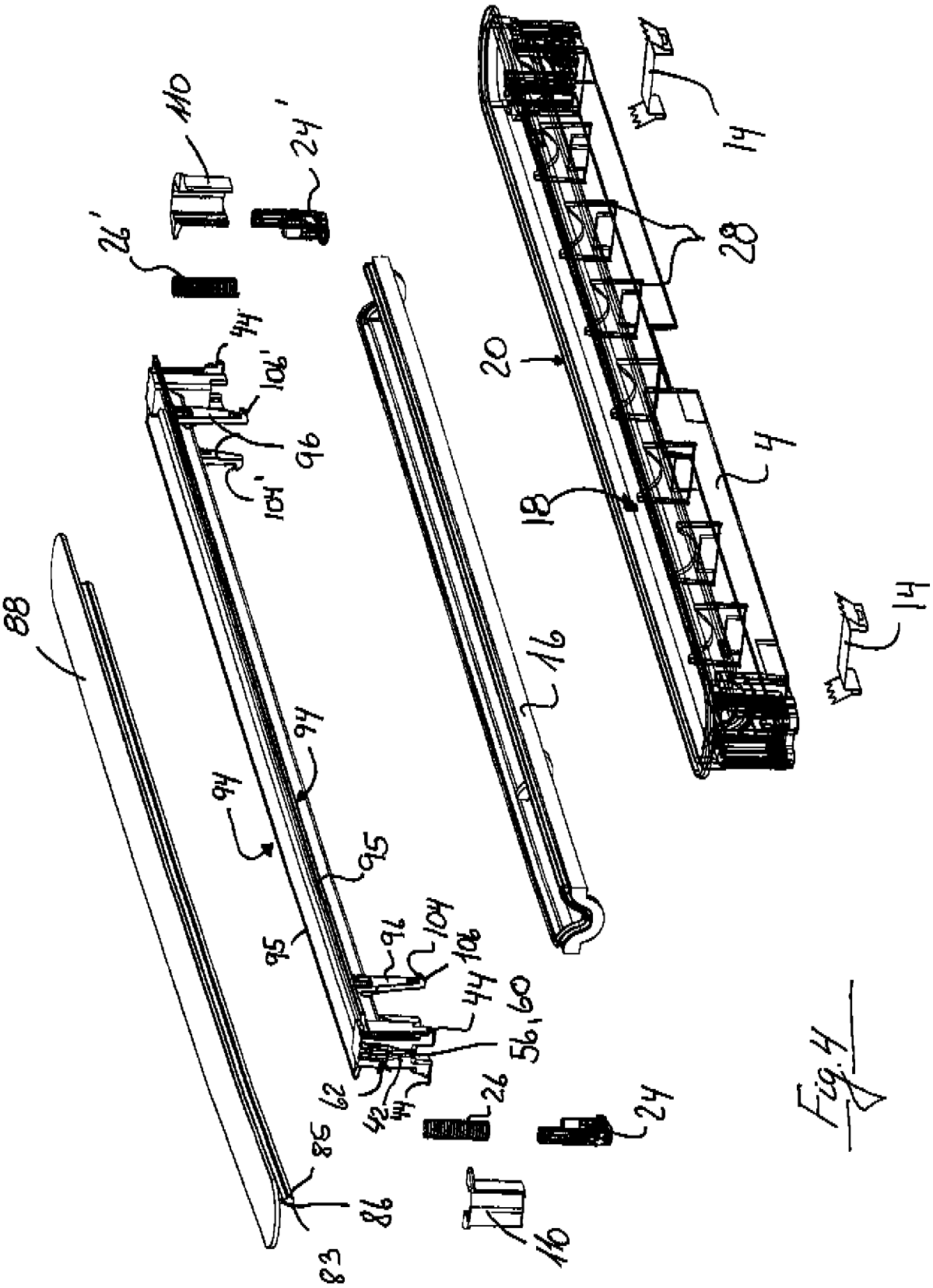
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Fig. 4

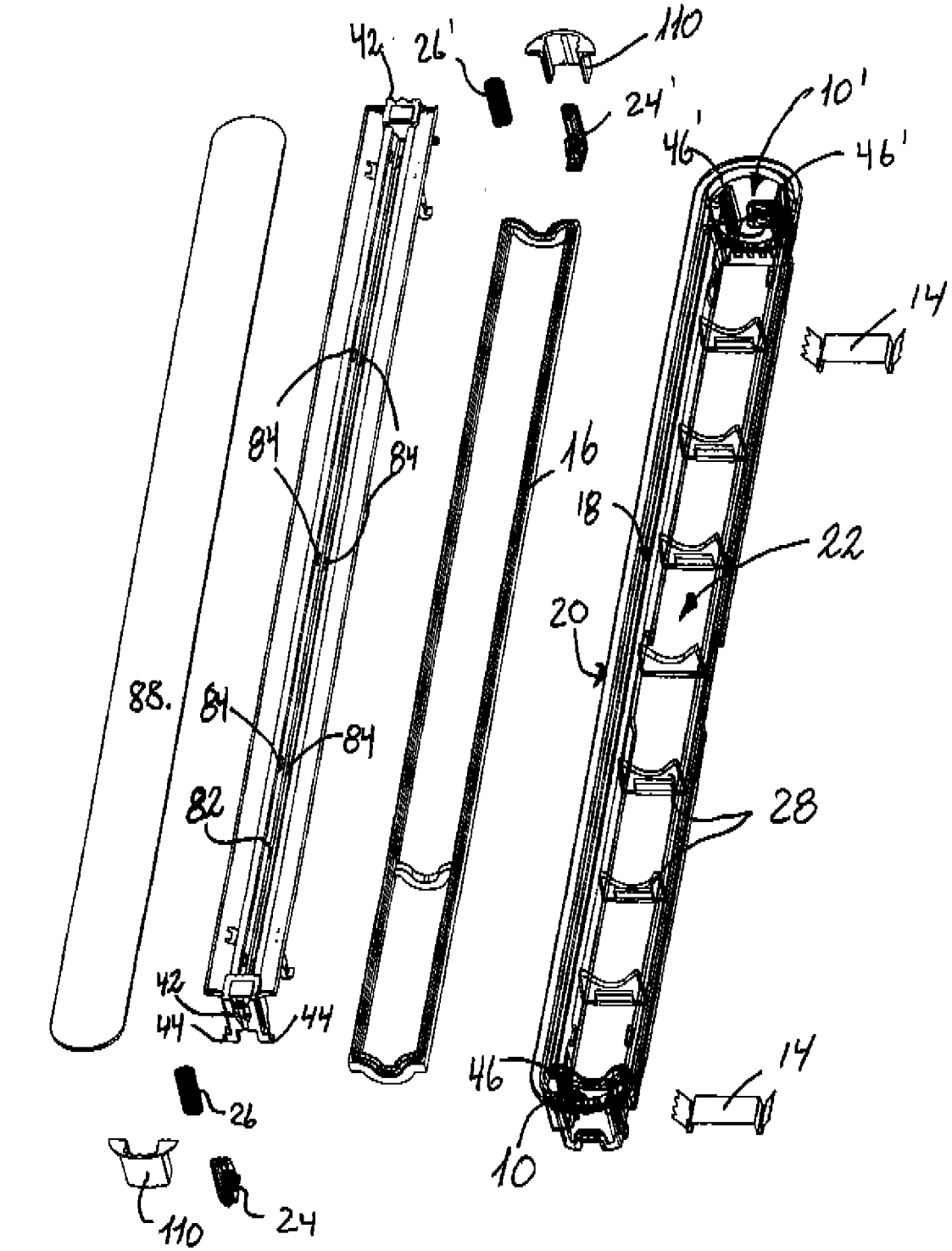
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Fig. 5

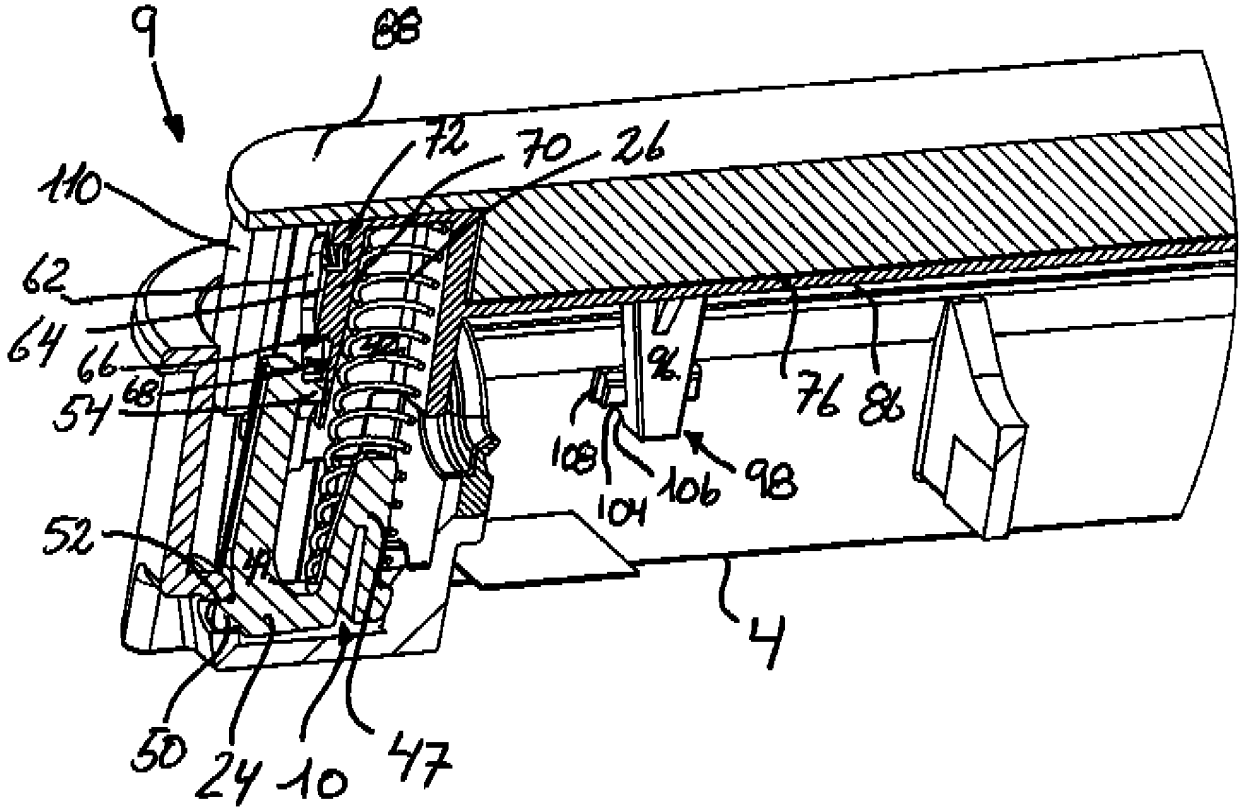

Fig.6

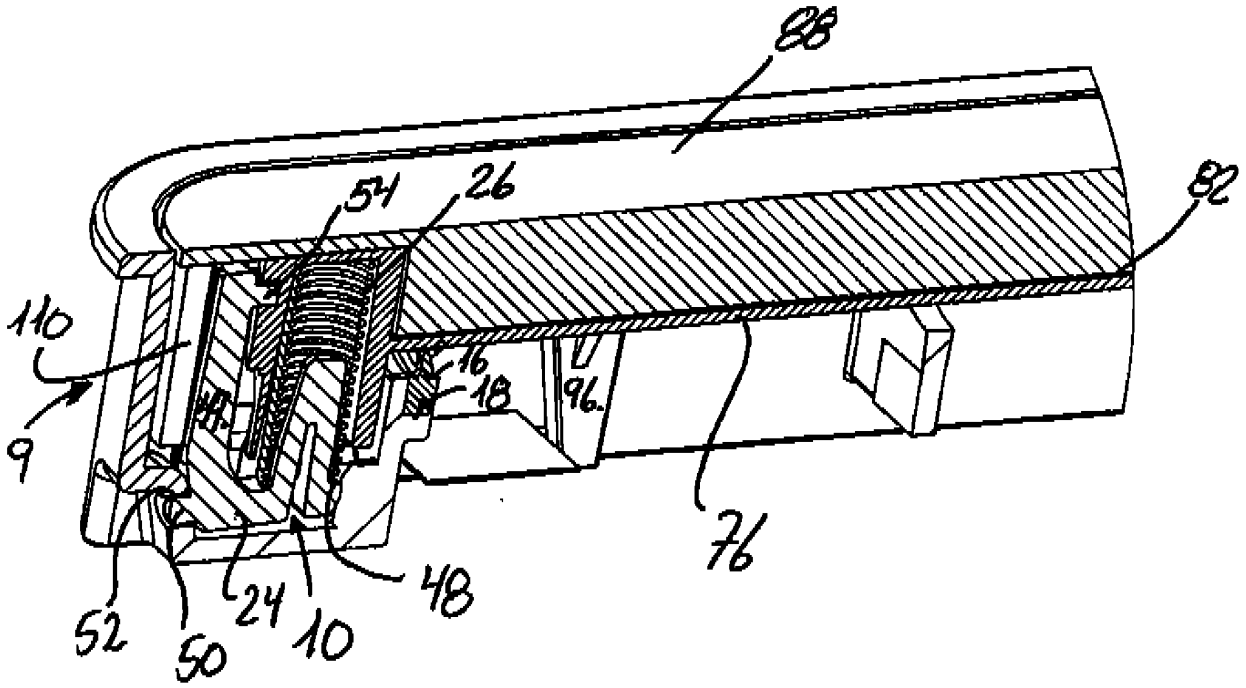

Fig. 7

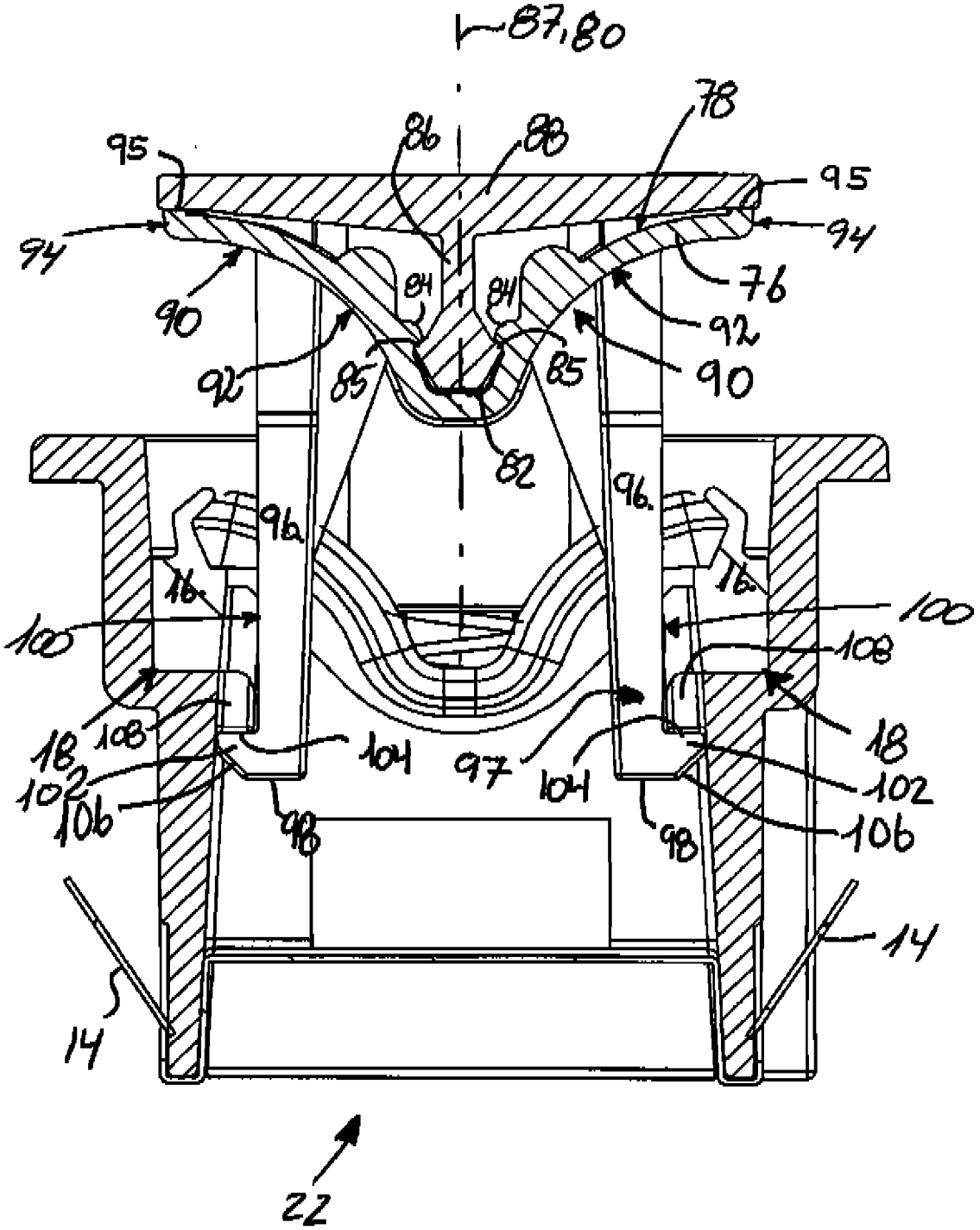
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Fig. 8

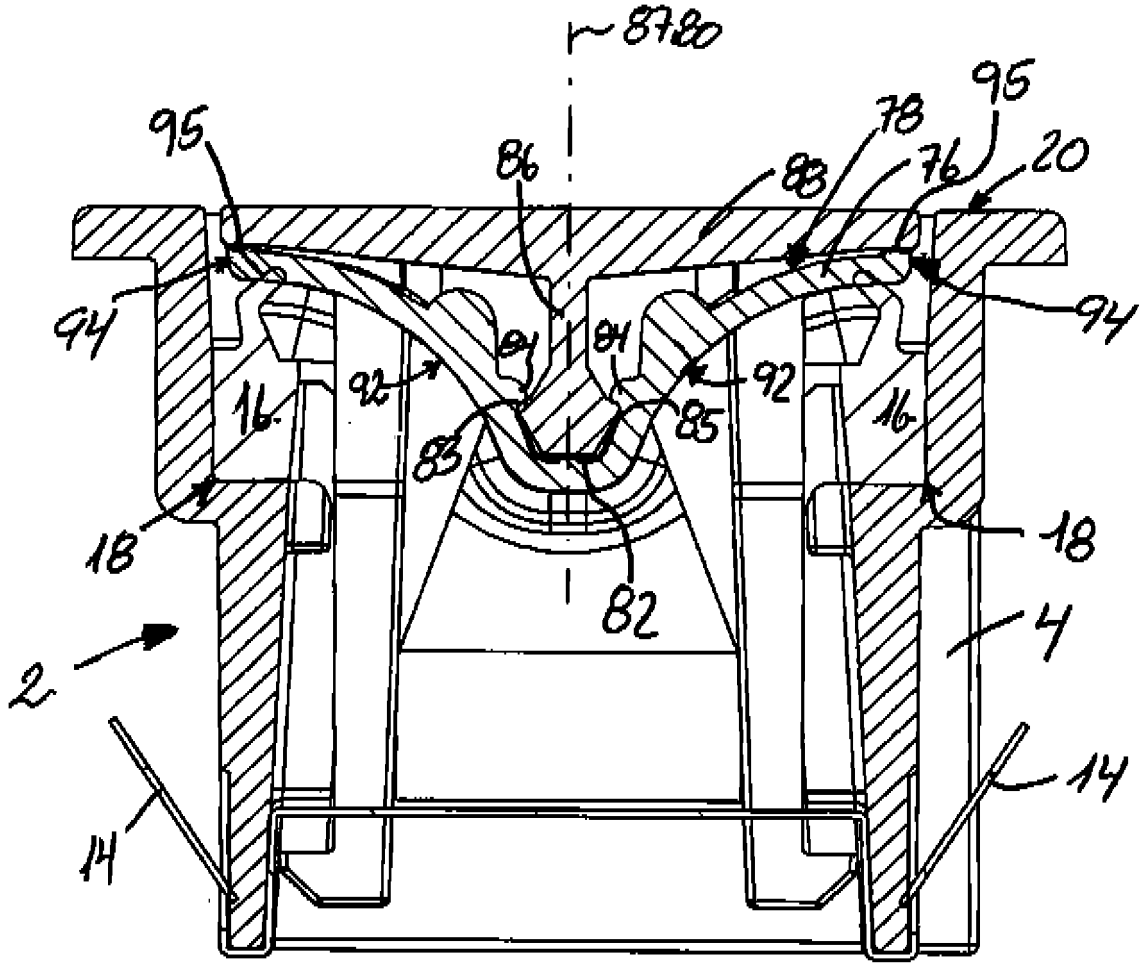
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Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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