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(54) Ventilation device

(57) A ventilation device (1) for the provision of ventilating air to a room comprises a main body structure (2, 3, 4, 5) adapted for location at the edge (4) of a door or window and having an internal air channel (6) whereby air can flow across said edge (4) from an external side (E) to an internal side (I) i.e. within the room. An airflow control serves to control airflow through the channel (6) and comprises a plate-form flap (8) pivotal on a hinge (9) on the body structure so as to be swingable between a closed position (A) and a maximum open position (B). Additionally the hinge (9) is so arranged that when the flap (8) is moved to a predetermined third position (C), specifically slightly away from the closed position (A), the flap (8) can be lifted away from the main body structure, thereby facilitating for example cleaning of the internals of the body structure. An external canopy (15) can be provided, and sound insulating material (17, 20) can be located internally on both the body structure and the canopy (15).

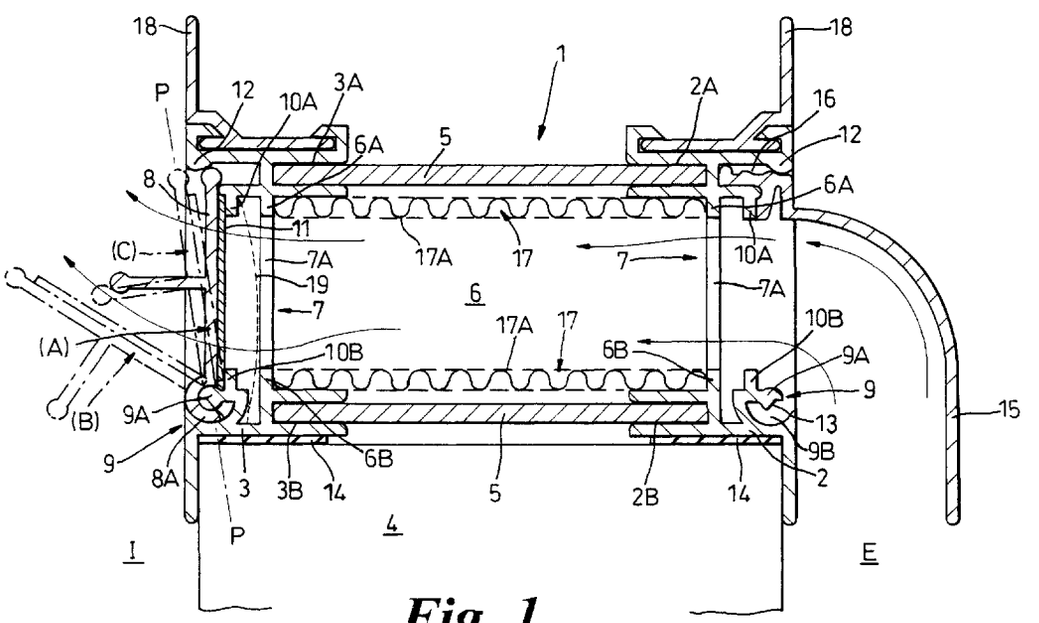

Fig. 1

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Description

The present invention relates to a ventilation device. Ventilation devices for placement at windows or doors, or in through apertures in walls are well established. Generally these comprise some sort of wall-formation for the provision of an airflow passage across the window, door, or wall, and a usual feature is the location of an airflow control at an end, of said air passage to control the airflow rate between zero (shut) and a maximum (fully open). W093/09327 of the present applicant shows and example of such a ventilation device, and provides a wall-formation comprising identical end members which sit on respective opposed edges of a window frame and which include sockets to receive two parallel plates so as to define said air passage. The airflow control used was of the so called "hit-and-miss" type wherein an apertured slider plate moving in one of the end members could register with corresponding apertures on a fixed wall of this end member. A disadvantage of this control was that the solid portion of this apertured wall constituted a substantial area i.e half the total area and this created inefficiency in the airflow (and performance) of the ventilation device.

It is the principal object of the present invention to provide a ventilation device with an improved airflow control, and a further object is to provide additional features for the creation of a more efficient airflow via the device.

According to the present invention a ventilation device for placement at a window door, or wall for airflow between an input side an output side includes a basic structure for the formation of an air channel enabling airflow between said input and output sides, and an airflow control comprising a plate means swingable on a pivot device for movement of the plate means between first and second positions defining respectively minimum and maximum airflows via said air channel, said pivot device being arranged such that in a third swung position of the plate means the plate means can be removed. Preferably the pivot device is of ball-form cross-section, with a corresponding formation on the plate means whereby the plate means swing about said ball, the ball being recessed so that in said third position the plate means has a further degree of movement freedom relative to the ball for removal of the plate means. Preferably a catch means is provided to hold the plate means in said first position, preferably a shut position, and said third position comprises a position when the plate means is swung back just clear of said catch means. In a preferred embodiment at least one additional fill sheet is present in the air channel and serves to avoid or reduce any protuberances to airflow in the channel, the fill sheet preferably having sound absorbing properties for example by being of corrugated form. Further a curved canopy can be provided at least on of the ends of the air channel for smooth airflow into the channel (or, smooth discharge therefrom).

Further preferred features comprise (a) the provision of insertable closure means to permanently close a portion of the inlet or outlet sides and (b) means to enable the plate means to be set at various open positions. An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings wherein:

Fig. 1 shows a cross section of a ventilation device for location on the edge of a window frame, and in accordance with the present invention.
Fig. 2 shows a detail of the device to a larger scale;
Fig. 3 shows a sectional end view similar to Fig. 1 but including modifications;
Fig.4 shows an end view of a possible further addition;
Fig. 5 shows a front view on the internal side of a ventilator embodying the present invention, and including a further modification;
Fig. 6 shown and end detail of Fig. 5;
Fig. 7 and 8 are respectively front and plan views of the flange member present in Fig. 6 for setting of the air control flap, while Figs. 9 and 10 show side views in the direction of arrows A and B respectively on Fig. 7 and;
Fig. 11 shows an end view illustrating the variable setting of the flap by means of the flange member.
Referring to the drawings, a ventilation device 1, in accordance with W093/09327 (EP 0612 369) comprises identical members 2, 3 adapted to sit at respective corners of a window frame 4, and parallel plates 5 extending into opposing sockets 2A/B, 3A/B of the end members 2, 3, the end members 2, 3 and plates 5 defining a basic structure forming an air channel 6 across the window frame 4 between external (E) and internal (I) sides. Openings 7 are present in each end member 2/3 to permit air flow between the external/internal sides, while the openings 7 include spaced struts 7A for structural purposes.

The end members 2, 3 are conveniently cut from a common extrusion, e.g a plastic extrusion, and width variation of the device, can be achieved simply by adjusting the width of the plates 5. Also suitable end closures (see Fig. 5) are provided for the device 1.

In the ventilation device 1, an airflow control is provided in the form of a pivotal flap 8, conveniently located at the internal side 1, and each end member includes a part circular formation 9A extending the length of the member 2/3 with an adjacent arcuate slot 9B so that, as viewed in cross-section, each end member 2/3 includes a "ball-and-socket" 9 to pivotally receive said flap 8, the flap 8 including a corresponding curved end 8A for reception, in the slot 9B.

The end member 2/3 includes lips 10A, 10B against which the flap 8 bears in the closed, first (A) position, a sealing strip 11 serving for complete air-tight closure,

while a catch 12 in the form of a protrusion holds the flap 8 in the closed position, the slot 9B permitting the flap 8 to be located in a second (B) open positioned.

The ball 9A includes a recess 13 position such that_when the flap 8 is swung (snapped) back just clear of the catch 12 and in a third position (C) the flap 8 can have a further upward movement in the place (P) of the flap 8 to be removed clear of the associated end member 3. Cleaning of the interior of the device is then facilitated. Further sealing strips 14 can be located between the end member 2/3 and the frame 4 to prevent detraction of ventilation performance.

Therefore there need be no substantial reduction in the effective size of the openings 7 as only a minimal number of struts 7A, representing the solid area, are required and this substantially improves the ventilation performance in comparison with the ventilation device disclosed in W093/09327.

No flap 8 is located at member 2 at the external side E, but at this side a curved canopy 15 is positioned at the channel inlet and located by a recess 16 in the member 2 and also by the lip 10A and catch 12.

Lips 6A, B at the openings 7 could detract from airflow performance in the channel 6, and to avoid this problem fill sheets 17 are located between corresponding lips 6A, B to provide a smooth channel. Conveniently the sheets 17 can comprise readily available corrugated sheeting eg of plastics material including a perforated backing 17A and this material has the added benefit of a sound absorbing property.

As in W093/09327 various additional trims can be present, such as trims 18 to facilitate positioning of the device 1 relative to a surrounding wall, and a fly screen 19 may also be present. While the above ventilation device 1 is intended specifically for location at a window, it will be appreciated that the present invention could be applied to vent devices for location at other places eg doors and walls, and also in vent device of different design from device 1.

In the example of Fig. 3, the canopy 15 is provided with a fill sheet 20 similar to fill sheets 17, again being of corrugated form with a smooth outer layer 20A. The fill sheet 20 sits on a flange 15A of the canopy and serves to improve the airflow into the duct 6 and also provide sound insulation. The end members 2, 3 of Fig. 3 have a different profile to those of Fig. 1, in particular the trim 18A being integral with the member 2 in Fig. 3. It may be preferred to have the flap 8 extending on only a portion of the ventilator 1 and in this case a closure plate 21 as shown in Fig. 4 can be fitted on the ventilator portion where no flap 8 is present. The plate 21 includes a curved foot 22 fitting into the circular formation 9A of member 3 and a top bead 23 which can snap fit into the member 3 at formation 12 for location of the plate 21. As can be seen the plate 21 can be arranged to form a uniform wall surface with the member 3.

Fig. 5 illustrates the use of end plug members 24 for closure of the ends of the ventilator 1, and these plug members 24 may simply be in the form of foam elements for convenience. Additionally the ventilator 1 of Fig. 5 embodies special left and right side flange members 25A, 25B whereby the flap 8 can be positioned at various open settings. Fig. 7 to 10 show the right hand flange member 25B in greater detail: the left hand member 25A is similar, being a mirror image of member 25B. Therefore each member 25A, 25B includes a base wall 26 carrying a series of small projections 27A-E serving as stops for the flap 8, while a bifurcation 28 on the wall 26 serves to receive an end face plate 29 which conveniently can comprise the closure plate 21 described previously. Fig. 11 shows the left hand flange member 25A and illustrates the various settings of the flap 8 between the closed position and the maximum open setting. A certain resilience will be present between the flap 8 and the projections 27AE enabling the flap 8 to be pulled (or pushed) passed a projection for movement to a different setting.

Further modifications are of course possible. In particular the various open settings of the flap could be achieved by some other means.

Claims

1. A Ventilation device for placement at a window, door or wall for airflow between an input side (E) and an output side (I) includes a basic structure (1) for the formation of an air channel (6) enabling airflow between said input and output sides (E, I) and an airflow control controlling air flow through said air channel (6) characterised in that said airflow control comprises a plate means (8) swingable on a pivot device (9) for movement of the plate means (8) between first (A) and second (B) positions defining respectively minimum and maximum airflow's via said air channel (6) said pivot device (9) being arranges such that in a third swung position (C) of the plate means (8) the plate means (8) can be removed.

2. A ventilation device as claimed in claim 1, characterised in that the pivot device (9) is of ball-form cross-section (the ball 9A) with an adjacent arcuate slot (9b) accommodating a corresponding formation (8A) on the plate means (8) whereby the plate means (8) swing about said ball (9A) the ball (9A) being recessed (13) so that in said third position (C) the plate means (8) has a further degree of movement freedom relative to the ball (9A) for removal of the plate means (8).

3. A ventilation device as claimed in claim 1 or 2, characterised in that a catch means (12) is provided to hold the plate means (8) in said first position (A) preferably a shut position and said third position (C) comprises a position when the plate means (8) is swung back just clear of said catch means (12).

4. A ventilation device as claimed in any one of the preceding claims, characterised in that at least one additional fill sheet (17) is present in the air channel (6) and serves to avoid or reduce any protuberances to airflow in the channel (6).

5. A ventilation device as claimed in any one of the preceding claims, characterised in that a curved canopy (15) is provided on at least one of the ends of the air channel (6) for smooth airflow into the channel or smooth discharge therefrom.

6. A ventilation device as claimed in claim 5, characterised in that a fill sheet (20) is located on an internal wall of the canopy (15).

7. A ventilation device as claimed in claim 4 or 6, characterised in that the fill sheet (17, 20) has sound absorbing properties.

8. A ventilation device as claimed in claim 7, characterised in that the fill sheet (17, 20) has a portion of corrugated form with a sheet covering (17A, 20A).

9. A ventilation device as claimed in any one of the preceding claims, characterised in that position setting means (27A-27E) are provided whereby the plate means (8) can be set in any one of a plurality of open positions between said first (A) and second (B) positions.

10. A ventilation device as claimed in claim 9, characterised in that said position setting means (27A-27E) comprises a series of deformable stops.

11. A ventilation device as claimed in claim 2, characterised in that said basic structure (1) includes similar internal and external end members (2, 3) linked by wall means (5) for the formation of said air channel (6), each of said end members (2,3) including a said pivot device (9).

12. A ventilation device as claimed in claim 10, characterised in that said end members (2, 3) include opposed slots to receive plates defining said wall means (5).

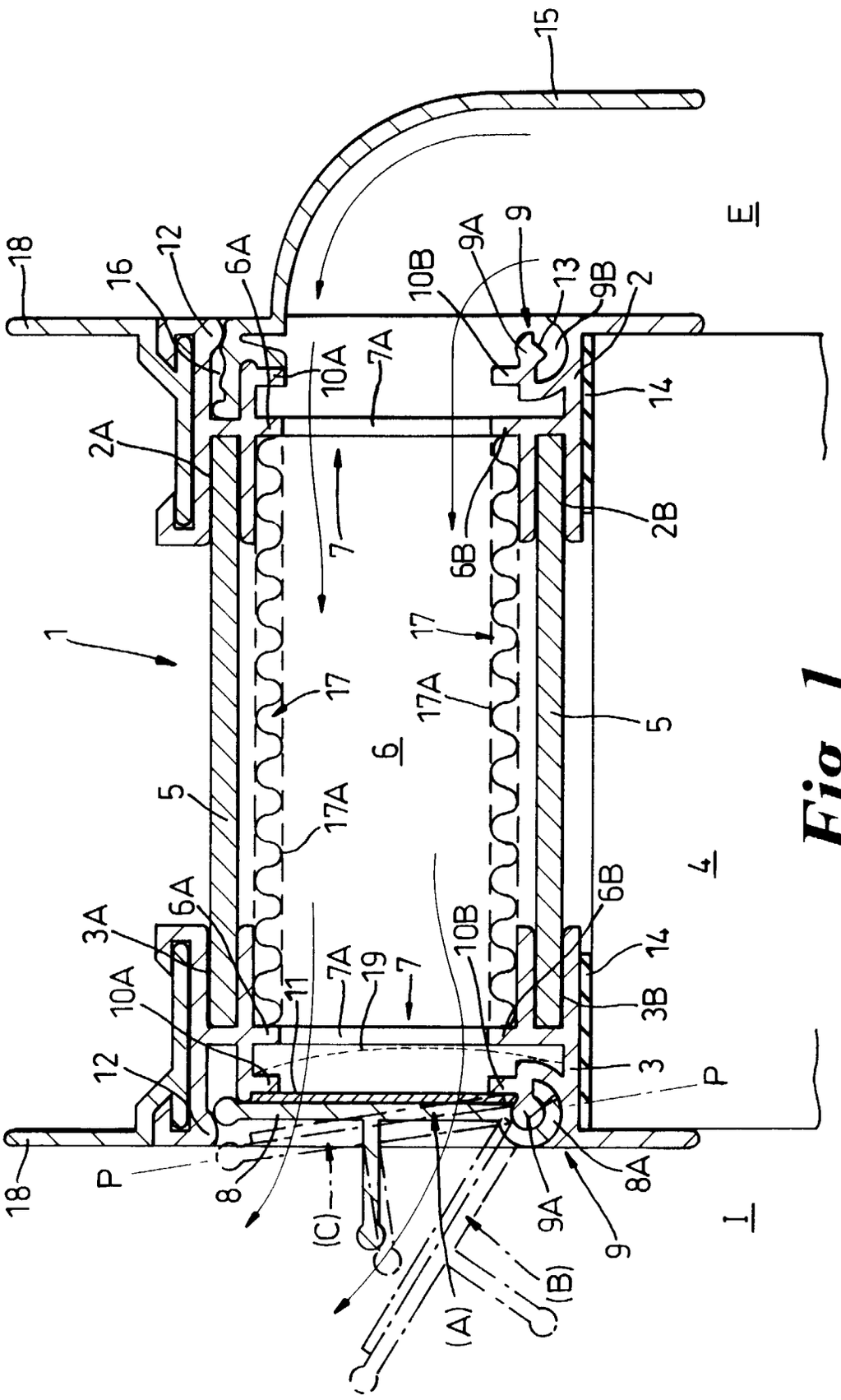
15
E
18
16
12
6A
10B
9A
9
13
9B
2
10A
7A
14
2A
2B
7
6B
1
17
17A
5
6
4
3A
11
19
3B
3
P
8
8A
(C)
(A)
(B)
1

Fig. 1

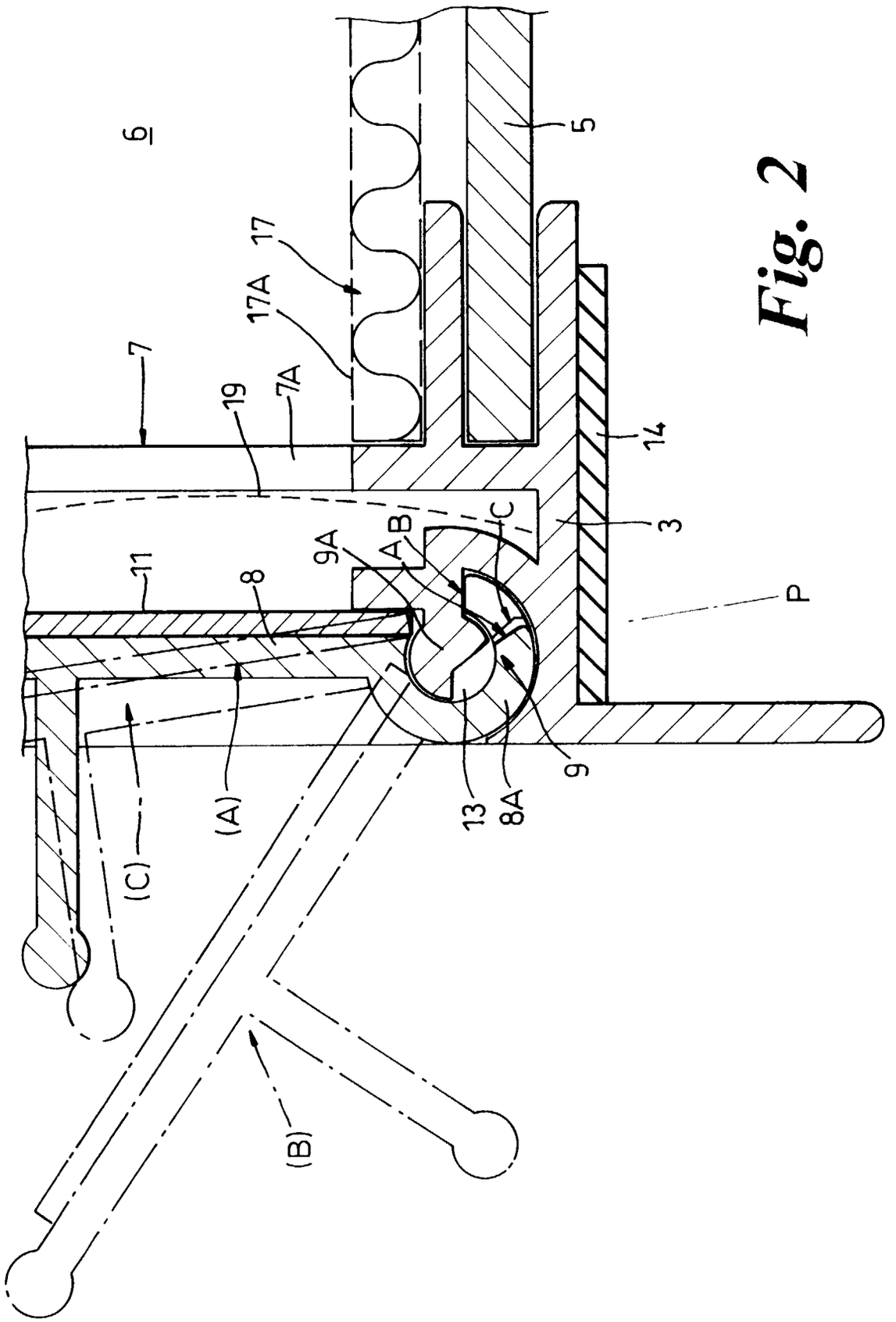

Fig. 2

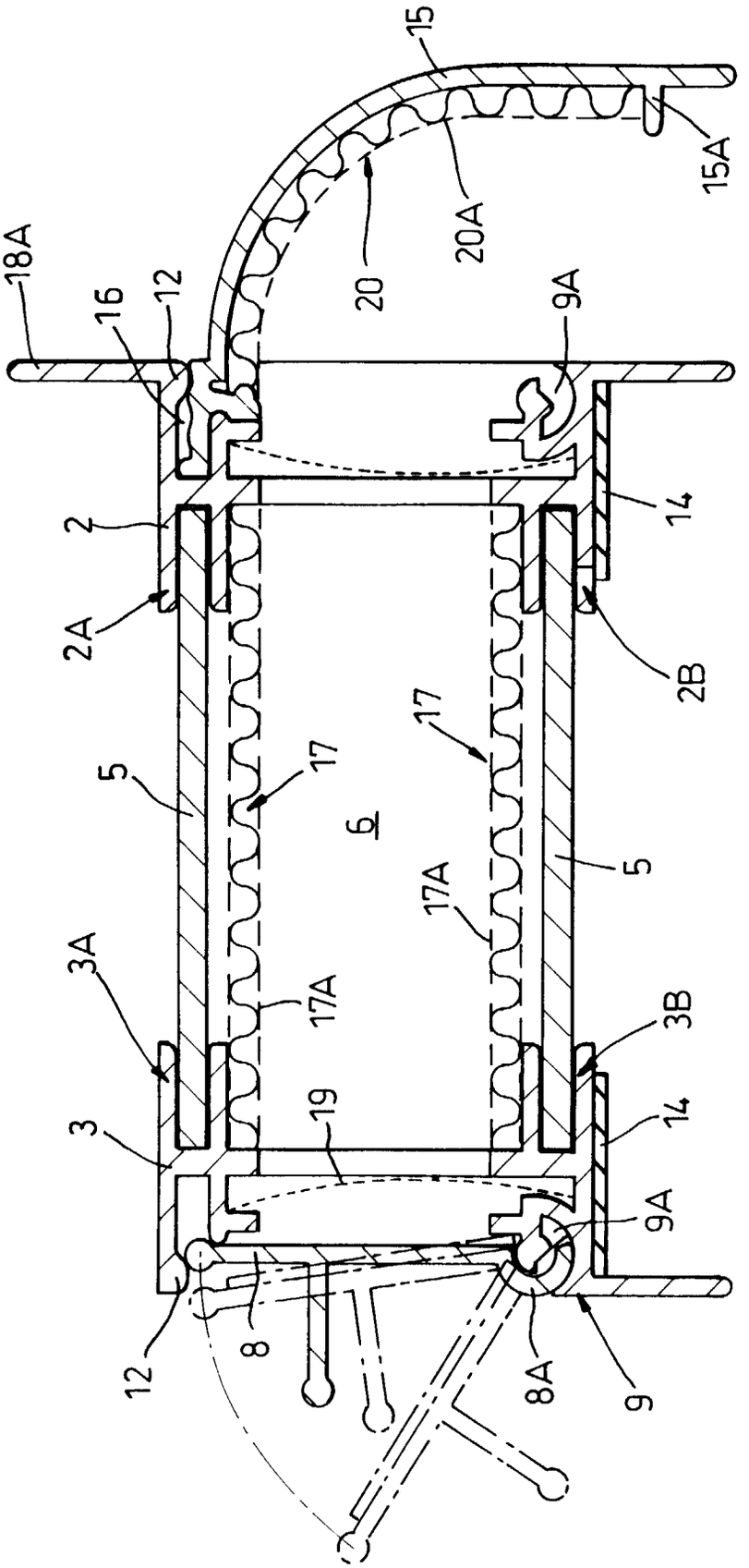
15
15A
20A
20
18A
16
12
9A
14
2
2A
2B
17
17
5
6
5
17A
3A
17A
3B
19
14
3
9A
12
8
8A
9

Fig. 3

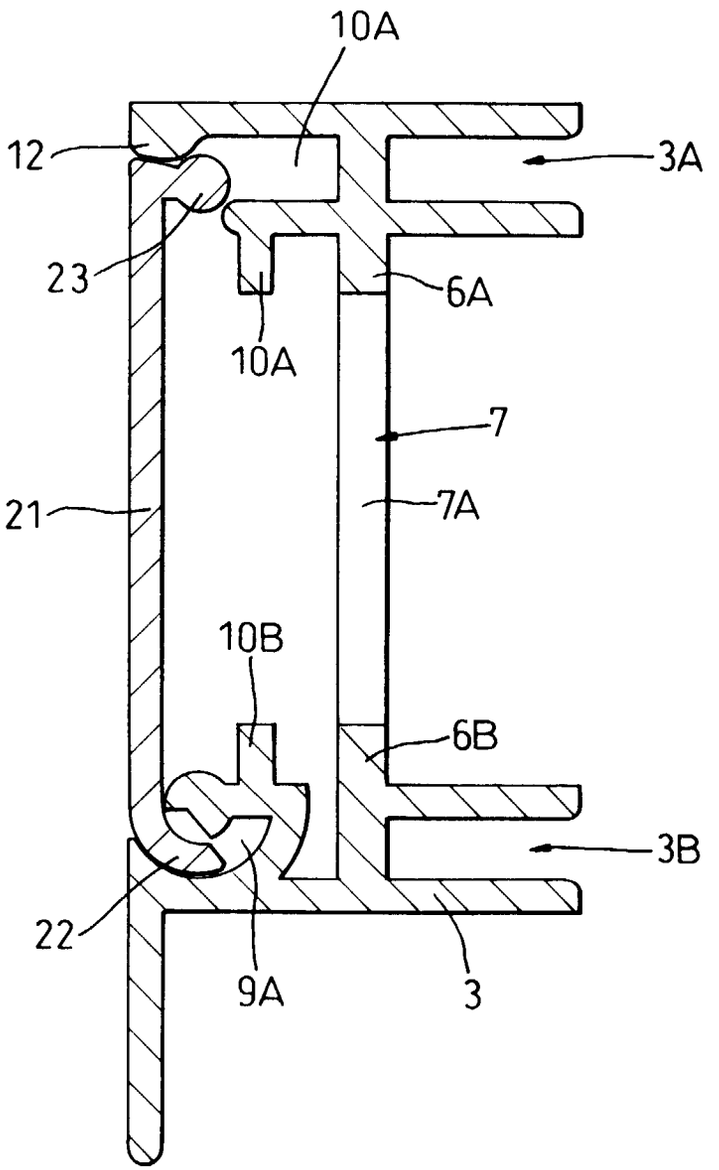

Fig. 4

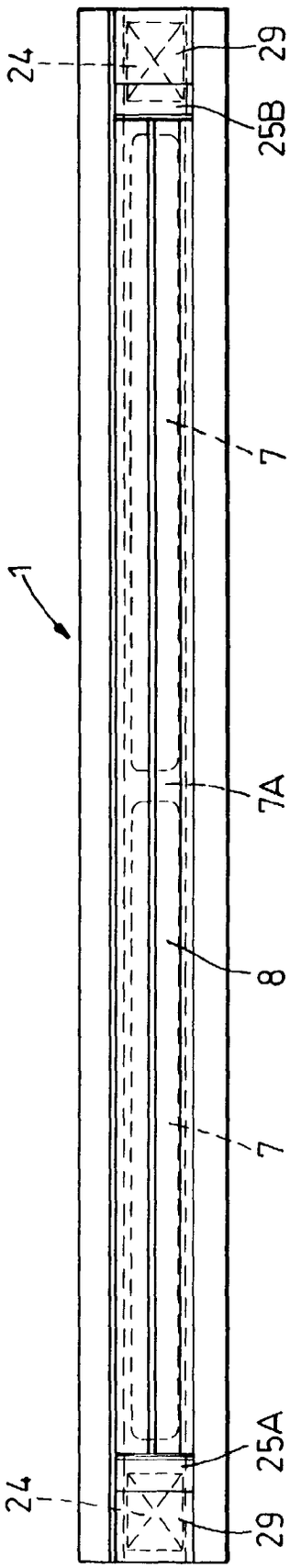

Fig. 5

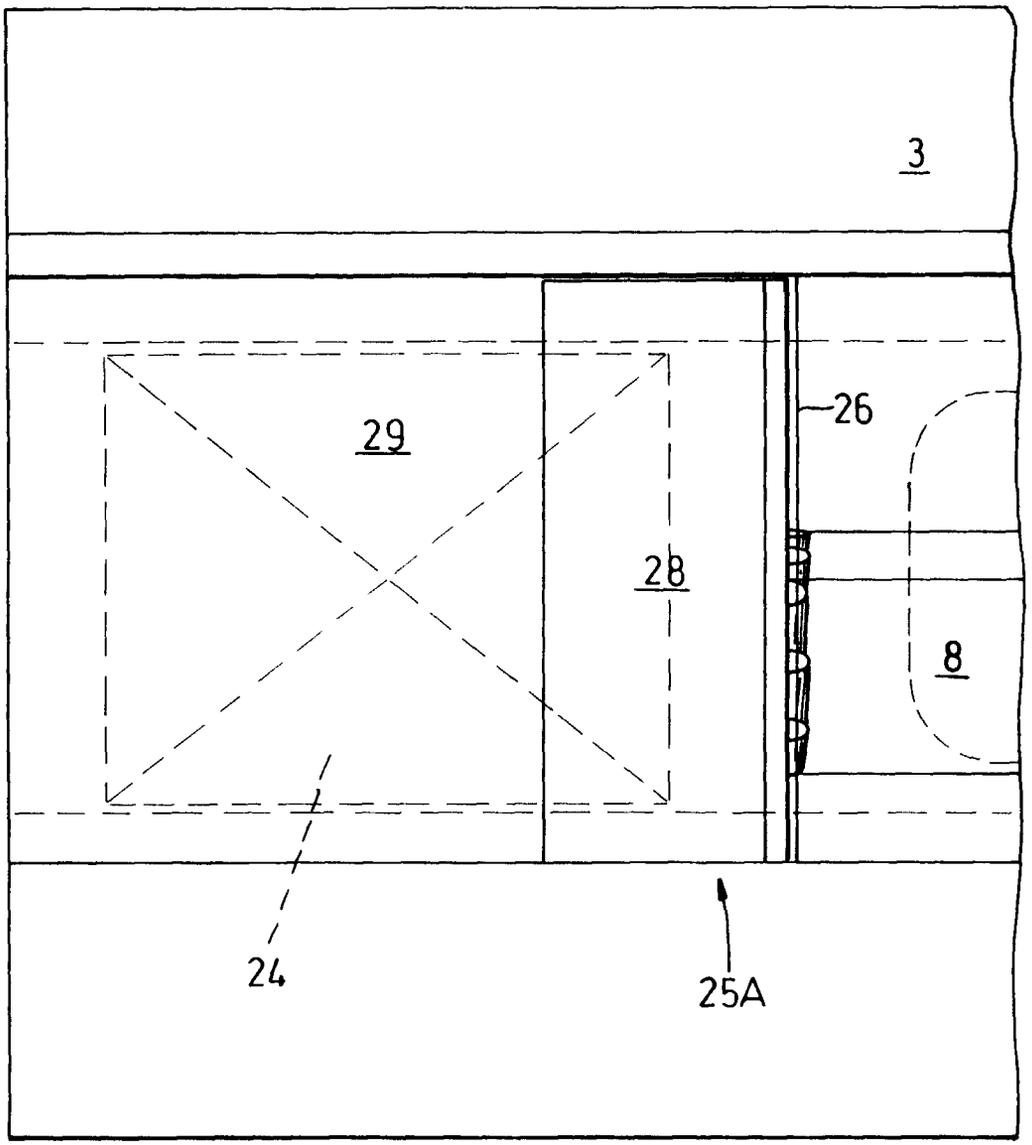

Fig. 6

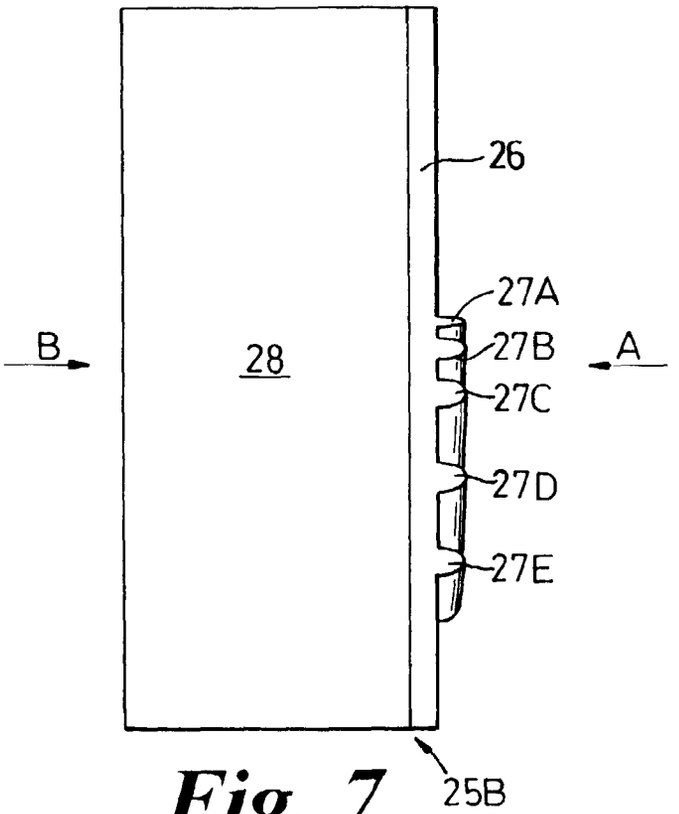

Fig. 7

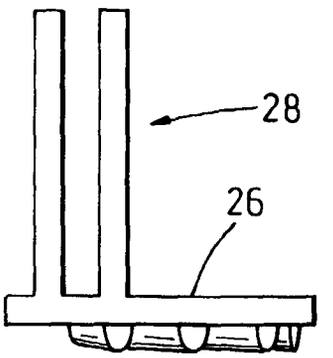

Fig. 8

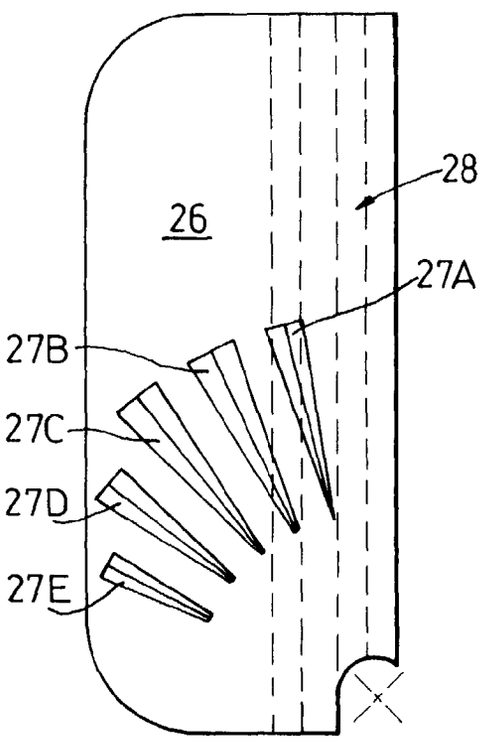

Fig. 9

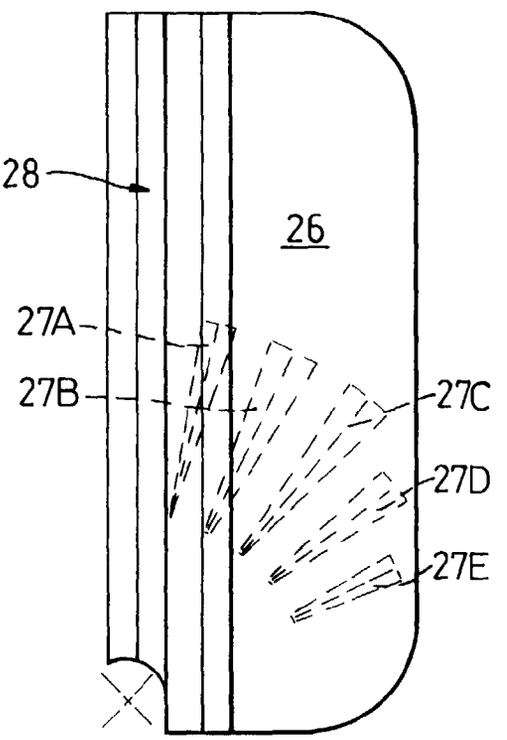

Fig. 10

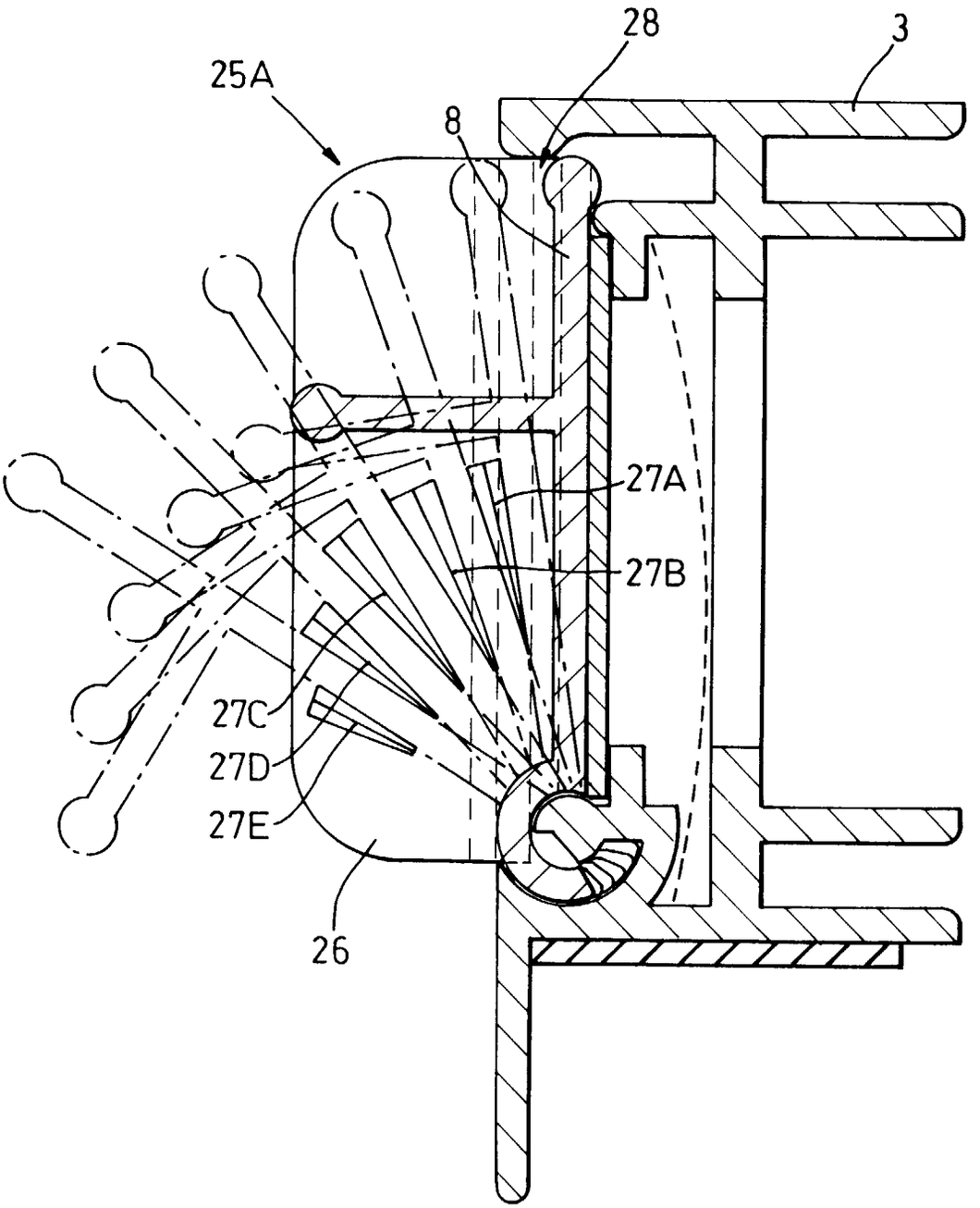

Fig. 11