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(54) **Ventilation unit for a window, a door or similar**

(57) Self-regulating ventilation unit (1) formed by a housing (2) with an outside wall (3) and an inside wall (4) that are connected by upright longitudinal walls (5-6) in the longitudinal direction of the housing (2) and which are connected together by two end walls (7-8), whereby the inside wall (4) and outside wall (3) contain a grid (11-12) and in which a band (13) is affixed that extends in the longitudinal direction over the grid (11) of the outside wall (3) and whose ends are secured to the outside wall (3) or the end walls (14), whereby somewhere between these ends the band (13) is pushed away in the direction of the inside wall (4) by means of an elastic element (15), whereby at least one of longitudinal wall (5-6) at least partially has an open structure (20).

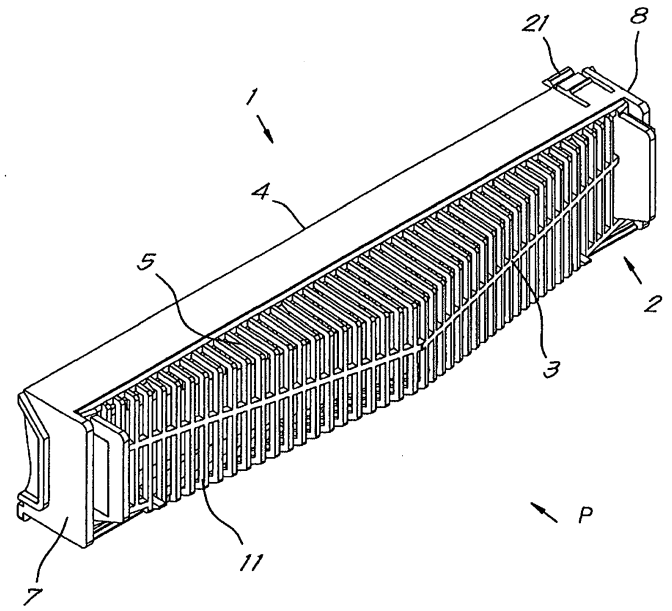

Fig. 1

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Description

[0001] The present invention relates to a ventilation unit for a window, a door or similar.

[0002] It is known that means of ventilation can be provided in the frames of windows, doors or similar.

[0003] For example, in BE 2008/0443 there is a frame in which there is an additional profile on the inside of the frame, such that the additional profile together with the aforementioned frame form a first frame for mounting a glass panel or a pivoted or sliding leaf.

[0004] The remaining space between the additional profile and the frame thereby forms a passage for ventilation in which one or more removable ventilation units can be provided.

[0005] The simplest ventilation units are made from a beam shaped housing with an outside wall and an inside wall opposite it that are connected together by upright walls, whereby there is a grid in the outside wall and inside wall, an outside and inside grid respectively, for the flow of air and whereby the upright walls are solid walls.

[0006] A disadvantage is that, depending on the air pressure outside, there can be considerable fluctuations in the air flow, which can cause unpleasant feelings of cold.

[0007] Self-regulating ventilation units are also known aimed at ensuring a uniform flow of fresh air into the room.

[0008] For example, there are ventilation units with a beam shaped housing, as described above, that have a band extending between the aforementioned walls with grids, whereby the band is secured to the outside wall by both its ends and in the middle there is an elastic element on this outside wall that pushes the band away from the aforementioned wall.

[0009] Because the band in the housing of the ventilation unit extends over practically the entire built-in height, the through-flow will be greatly limited such that good ventilation is not possible in certain circumstances.

[0010] When there is wind, the band will be pushed by the wind pressure towards the grid in the outside wall against the elastic force and the band will thus partially cover the grid in order to reduce the intake opening such that the air supply does not increase, and in this way cold flows and draughts are avoided.

[0011] The space between the upright walls and the band is very small, however, such that only a small quantity of air can pass through for ventilation, and more ventilation units are needed to satisfy the required air supply.

[0012] The purpose of the present invention is to provide a solution to one or more of the aforementioned disadvantages and/or other disadvantages, by providing a self-regulating ventilation unit for a window, a door or similar, that is formed by a housing with an outside wall and an inside wall opposite it that are connected together by two upright longitudinal walls that extend along the longitudinal direction of the housing and which are connected together by two end walls, whereby the inside wall and outside wall have an opening or grid and in which a band is affixed that extends in the longitudinal direction over the opening or the grid of the outside wall and is secured by its ends to the outside wall or the end walls, and at a place between these ends the band is pushed away from the inside wall in the direction of the outside wall by means of an elastic element, and whereby at least one of the aforementioned longitudinal walls at least partially has an open structure.

[0013] An advantage is that the flow of the ventilation unit is substantially increased such that fewer ventilation units are needed to obtain a sufficient air supply.

[0014] In a practical embodiment of the invention, the housing consists of two parts, and has, on the one part, a first base part with the aforementioned outside wall and a part of the transverse walls and, on the other part, a cover that encloses the inside wall and longitudinal walls.

[0015] In this embodiment the grid of the inside wall and the longitudinal walls is preferably constructed as a continuous grid.

[0016] With the intention of better showing the characteristics of the invention, a preferred embodiment is described hereinafter by way of an example, without any limiting nature, of a self-regulating ventilation unit according to the invention, with reference to the accompanying drawings, wherein:

figure 1 schematically shows in perspective a ventilation unit according to the invention.

figure 2 shows an exploded view of the ventilation unit of figure 1.

figure 3 illustrates the application of the invention in a profile.

[0017] Figure 1 schematically shows a self-regulating ventilation unit 1 according to the invention.

[0018] The ventilation unit 1 shown is constructed from a somewhat elongated box-shaped housing 2 primarily with six walls, i.e. two walls, respectively an outside wall 3 and an inside wall 4 situated opposite it, and four upright walls 5-8 that connect the outside wall 3 and inside wall 4.

[0019] The aforementioned upright walls are formed by two long longitudinal walls 5-6 that extend along the longitudinal direction of the housing, and by two shorter transverse walls 7-8, which are oriented at right angles to the aforementioned longitudinal walls 5-6 in the example shown.

[0020] The housing 2, as shown in figure 2, can be made of two parts with a base part 9 and a cover 10, whereby both parts can be secured together.

[0021] Of course alternative embodiments of the cover with an anti-insect action are not excluded according to the invention.

[0022] In the embodiment shown the cover 10 encloses the outside wall 3 and at least a part of the upright walls 5-8 and encloses the base part 9, the inside wall 4 and at least a part of the longitudinal walls 5-6.

[0023] The ventilation unit 1 at least has a grid 11 in

the outside wall 3 and a grid 12 in the inside wall 4 whereby the aforementioned grids 11-12 define an inlet or outlet opening for the incoming air.

[0024] In the housing 2 there is also a band 13 that extends along the longitudinal direction of the housing 2 and which is affixed to the grid 11 of the outside wall 3.

[0025] As can be seen in figure 2, the two ends of the band 13 are secured to two end walls 14 of the cover 10, but in other embodiments it is also possible that the ends are secured to the base part 9, preferably near the transverse walls 7-8.

[0026] The band 13 shown primarily consists of a rectangular foil whose length between the ends secured to the outside wall is greater than the distance between these ends. The band 13 is affixed in the housing 2 in a stretched condition and is supported by an elastic element 15 to this end.

[0027] As shown in figure 2, this elastic element 15 is secured to the cover 10 and the middle region of the band 13 is supported.

[0028] This elastic element 15 can consist of a folded metal wire that is somewhat U-shaped.

[0029] The U-shaped element 15 shown consists of two legs 16 and a transverse link 17.

[0030] The ends of the legs 16 are preferably secured to the housing 2 and to this end can have a small folded edge 18.

[0031] Preferably the transverse link 17 of the U-shaped element 15 supports the band 13, and to this end the transverse link 17 can have a deepened part 19, whereby the length of the deepened part 19 practically matches the width of the band 13 to be supported.

[0032] In this practical embodiment of the invention, the band 13 is pushed away from the inside wall 4, or in other words in the direction of the outside wall 3, by the transverse link 17 of the elastic element 15.

[0033] According to the invention, at least one of the aforementioned longitudinal walls 5-6 at least partially has an open structure 20.

[0034] In the embodiment shown, the grid 11 of the outside wall 3 and the grids 20 of the longitudinal walls 5-6 run into one another and together they form a continuous open structure.

[0035] In the example shown, the entire cover 10 is constructed as an open structure and the outside wall 3 of the cover has a somewhat kinked form.

[0036] In the cover shown the longitudinal walls 5-6 rather have the shape of an isosceles triangle, whereby the base of this triangle extends along the longitudinal direction of the housing 2, and more specifically between the ends of the band 13.

[0037] It is further clear from figure 2 that the top of this triangle is located in the zone where the band 13 is pushed away from the inside wall 4, and that the height of this triangle corresponds to the maximum distance over which the band 13 is pushed away from the inside wall 4.

[0038] Although in the embodiment shown, the cover 10 has upright end walls 14, this is not a strict requirement of the invention.

[0039] In a practical embodiment of the invention, the outside wall 3 has a kinked form whereby the highest point is situated in the area where the band 13 is pushed upwards by the elastic element 15.

[0040] It is clear that this area does not strictly have to be in the middle of the band 13.

[0041] In the embodiment shown, the cover 10 encloses the outside wall 3 and a part of the transverse walls 5-6, and on the base part 9 there are a number of clips 21 along the longitudinal direction and which are located on the edges of the inside wall 4.

[0042] These clips 21 secure the base part 9 and cover 10.

[0043] The operation of the self-regulating ventilation unit according to the invention is very simple and as follows.

[0044] If the air pressure on the outside of the ventilation unit 1 is greater than on the inside, the air that flows in through the grid 11 in the outside wall 3 will exert a certain force on the band 13 in the direction P.

[0045] In the event of a small air pressure increase, the band 13 will first be pushed, primarily near its ends, by the action of the elastic element 15 in the direction of the inside wall 4 of the housing 2, and thereby possibly contact the inside wall 4 so that the grid 12 in the inside wall 4, at the level of the secured ends of the band 13, is covered locally by the band 13.

[0046] Because the grid 12 is covered locally by the band 13, less air can flow into the room due to the limited passage through the grid 12.

[0047] The air thereby flows through the grid 11 in the outside wall 3 and longitudinal walls 5-6 under the band 13 and the uncovered part of the grid 12 in the inside wall 4 from one side of a window or door to the other side of the window or door.

[0048] The greater the air pressure difference, the greater the force exerted on the band 13 by the inflowing air, and the more the zone where the band 13 is pressed against the grid 12 increases in the direction of the middle of the inside wall 4, until the inside wall 4 is almost completely covered by the band 13.

[0049] In so doing sufficient ventilation is realised without an unpleasant cold feeling.

[0050] When the wind dies down again, the wind force on the band 13 falls away, such that the elastic element 15 again pushes the band 13 away from the inside wall 4 and the grid in the inside wall 4 is again clear.

[0051] It is clear that the ventilation units do not necessarily have to be constructed as removable cartridges, but can also be built in as fixed ventilation units or elements.

[0052] Figure 3 illustrates the application of the invention in a frame of a window, a door or similar.

[0053] The arrangement shown shows a cross-section of a frame with a composite profile, with an outer profile 22 and an inner profile 23 that are connected together

by a number of thermally insulating profiles 24.

[0054] As shown in figure 3, the ventilation unit 1 is positioned in the profile such that the triangular outside wall 3 is oriented towards the outer profile 22 and the inside wall 4 towards the inner profile 24, all such that when the wind blows to the inside according to the arrow P, the band 13 can partially cover the grid 12 in the inside wall 4.

[0055] It is thereby possible that the grid 11 in the outside wall 3 has an anti-insect action.

[0056] Although in figure 3 the grid 11 in the outside wall 3 acts as an inlet opening and the grid 12 in the inside wall 4 as an outlet opening for the air, alternative embodiments are also possible whereby the inlet and outlet openings are respectively formed by the grids 12-11 in the inside wall 4 and outside wall 3, albeit by adjusting the position of the elastic element 15 and/or the band 13.

[0057] It is clear that the grids can also be realised in the form of other open structures, for example by a wall with a pattern of holes or an opening.

[0058] The present invention is by no means limited to the embodiments described as an example and shown in the drawings, but a ventilation unit according to the invention can be realised in all kinds of variants, without departing from the scope of the invention.

Claims

1. Self-regulating ventilation unit (1) for a window, a door or similar, that is formed by a housing (2) with an outside wall (3) and an inside wall (4) opposite it that are connected together by two upright longitudinal walls (5-6) that extend along the longitudinal direction of the housing (2) and which are connected together by two end walls (7-8), whereby the inside wall (4) and outside wall (3) have a grid (11-12) and in which a band (13) is affixed that extends in the longitudinal direction over the grid (11) of the outside wall (3) and is secured by its ends to the outside wall (3) or the end walls (14), and at a place between these ends the band (13) is pushed away from the outside wall (3) in the direction of the inside wall (4) by means of an elastic element (15), **characterised in that** at least one of the aforementioned longitudinal walls (5-6) at least partially has an open structure (20).

2. Ventilation unit (1) according to any one of the foregoing claims, **characterised in that** the aforementioned open structure (21) at least extends along a triangular zone with a base that extends between the two ends of the band (13) and a top that is located in the zone where the band (13) is pushed away from the inside wall (3) and a height that corresponds to the maximum distance over which the band (13) is pushed away from the inside wall (4) by the elastic element (15).

3. Ventilation unit (1) according to any one of the foregoing claims, **characterised in that** the grid (11) of the outside wall (3) and the longitudinal wall (5-6) form a continuous grid.

4. Ventilation unit (1) according to any one of the foregoing claims, **characterised in that** both longitudinal walls (5-6) have a similar open structure (20) and form a continuous grid with the grid (11) of the outside wall (3).

5. Ventilation unit (1) according to any one of the foregoing claims, **characterised in that** the housing (2) is in two parts, whereby the continuous grid of the outside wall (3) and longitudinal walls (5-6) is formed as a cover (10) of the housing (2) that fits on a base part (9) of the housing (2) that is formed by the inside wall (4) and at least a part of the upright end walls (5-8).

6. Ventilation unit (1) according to any one of the foregoing claims, **characterised in that** the cover (10) and base part (9) have a clip connector (21).

7. Ventilation unit (2) according to any one of the foregoing claims, **characterised in that** the outside wall (3) has a kinked shape with the highest located at the place where the band (13) is pushed upwards.

8. Ventilation unit (1) according to any one of the foregoing claims, **characterised in that** the elastic element (15) is formed by a folded metal wire.

9. Ventilation unit (1) according to any one of the foregoing claims, **characterised in that** the folded wire is primarily folded in the form of a U-shaped element with two legs (16) and a transverse link (17) whereby the transverse link (17) pushes the band (13) away from the inside wall (4) and the free ends of the legs (16) are secured to the housing (2).

10. Ventilation unit (1) according to any one of the foregoing claims, **characterised in that** it has an anti-insect action.

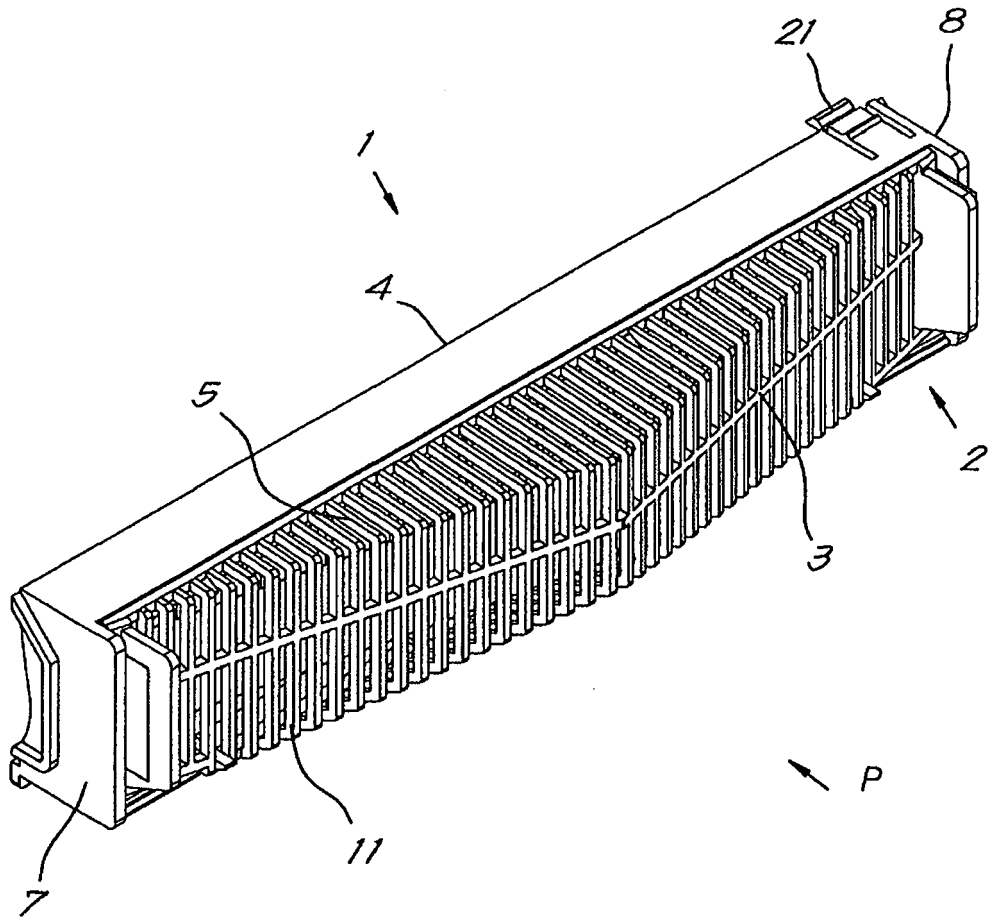

Fig. 1

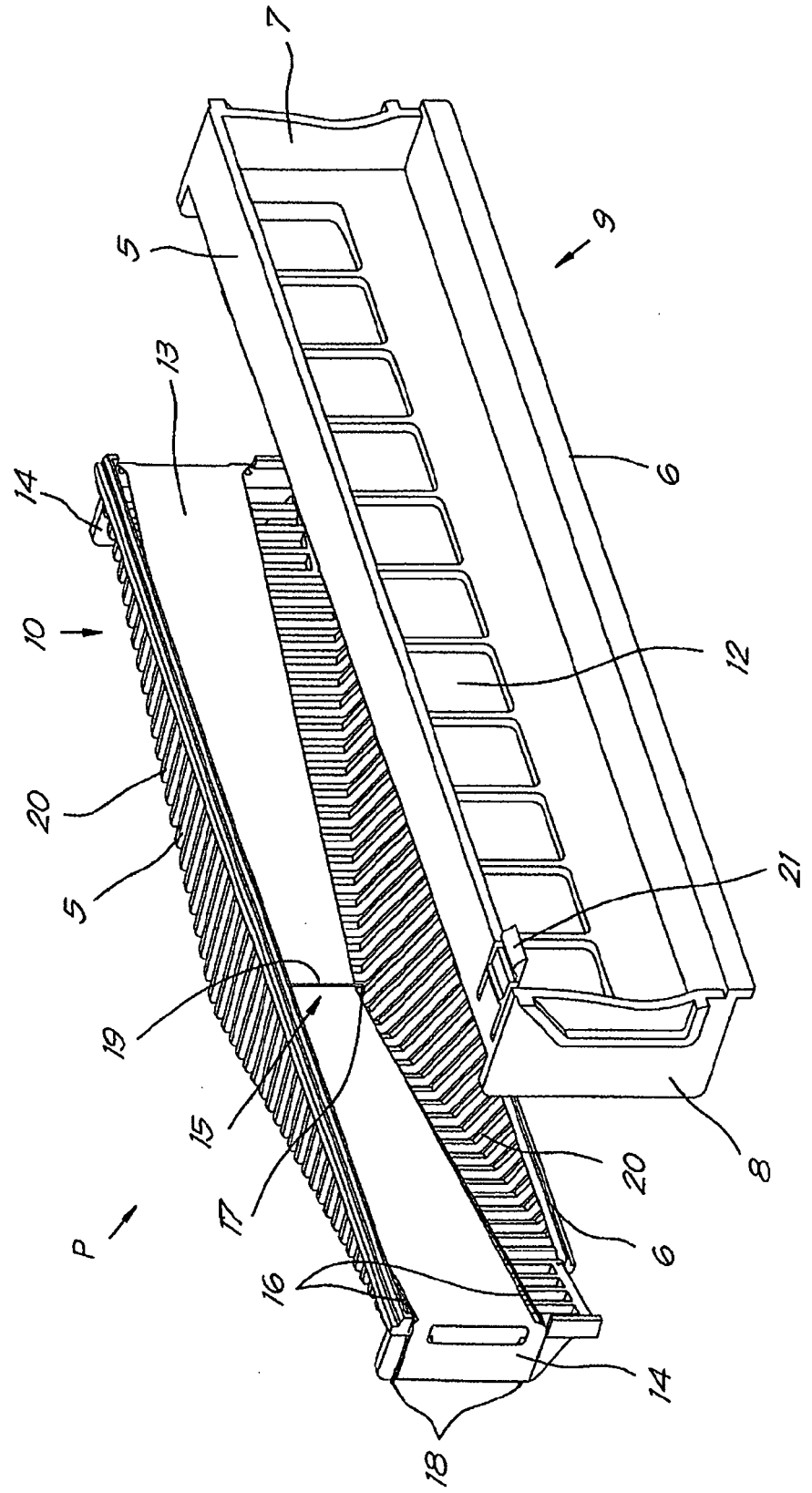

Fig.2

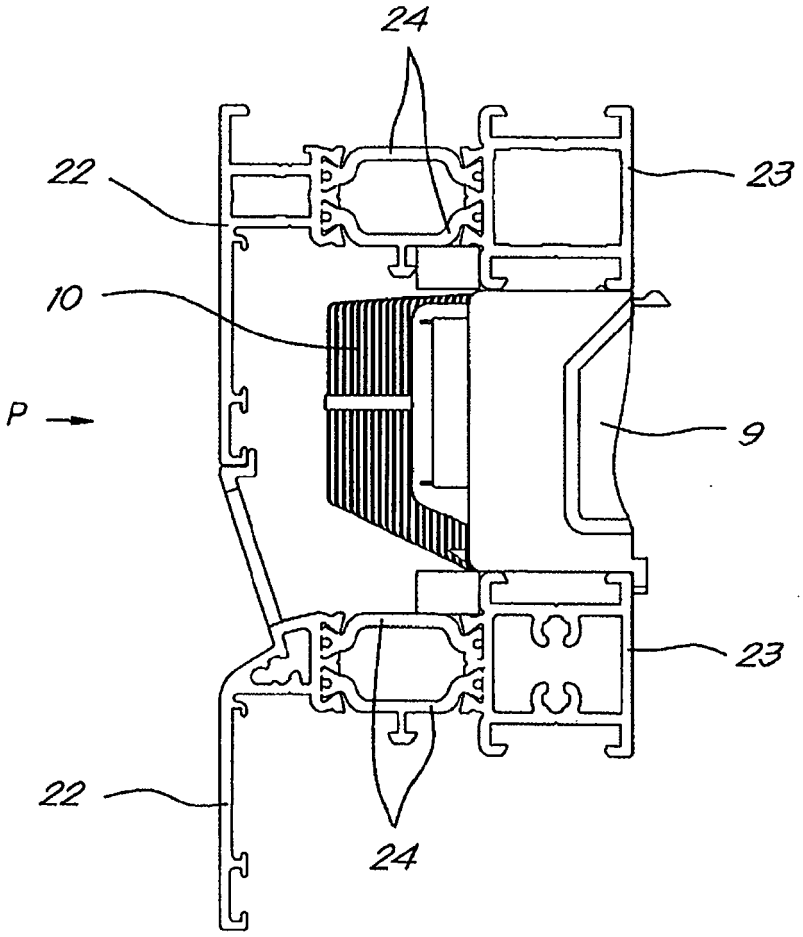

Fig.3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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