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(54) **Improved ventilation grid**

(57) Improved ventilation grid of the type substantially consisting of a housing (1) in which a ventilation duct (2) is situated which defines an inlet opening (3) and an outlet opening (4) in the housing (1), whereby the ventilation duct (2) can be closed off by means of a rotatable closing element (6) substantially consisting of two closing parts (7-8) installed diametrically opposite each other, in between which a duct (9) is situated, characterized in that at least one of the aforementioned closing parts (7-8) of the closing element (6) is made curved.

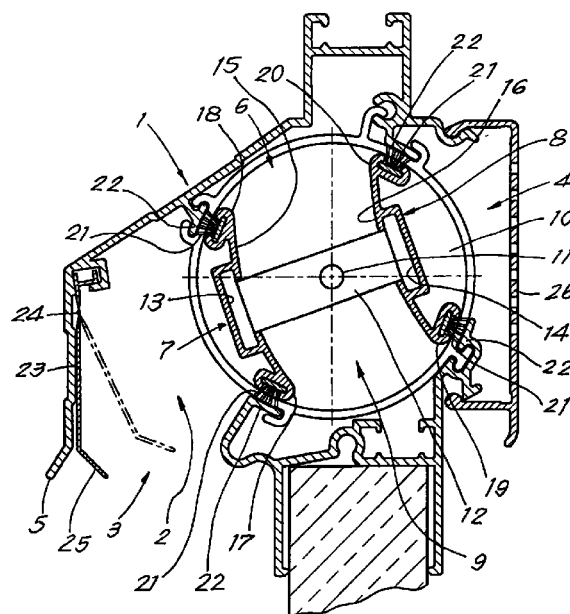


Fig. 1

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Description

[0001] This invention relates to an improved ventilation grid, more particularly a ventilation grid for installation in windows, doors and such, which substantially consists of a housing in which a ventilation duct is situated which defines an inlet opening and an outlet opening, whereby the ventilation duct can be closed off by means of a rotatable closing element on which one or more closing parts are provided.

[0002] In a known form of embodiment of a ventilation grid of the aforementioned type, the closing parts are made in a straight manner, such that between the two closing parts, a duct with straight, parallel walls is formed.

[0003] Such aforementioned ventilation duct in fact consists of different parts, amongst which one part which is formed by the aforementioned closing parts, which parts are connected to each other at certain angles, whereby, moreover, a lot of irregularities may prevail in the ventilation duct, such as protrusions and similar on the applied profiles.

[0004] This has as a consequence that the passage of air through such known ventilation duct is not optimum.

[0005] Indeed, a first disadvantage of these known ventilation ducts is that the air flow in the ventilation duct meets a large resistance, as this duct does not have smooth walls.

[0006] A second disadvantage of the aforementioned known ventilation ducts is that, as a result of the angles and the irregularities comprised in the duct, a lot of air turbulences arise in said ventilation duct, which then again results in an increasing resistance for the air flow.

[0007] A third known disadvantage consists in that the flow sounds in the ventilation duct can be increased up to a level which is experienced as impairing by certain persons, which increase also is a result of the air turbulences and of the resistance undergone by the air flow in the ventilation duct.

[0008] The present invention aims at an improved ventilation grid which provides in a better flow through the ventilation duct, as a result of which the aforementioned and other disadvantages are excluded.

[0009] To this aim, the invention relates to an improved ventilation grid of the type substantially consisting of a housing in which a ventilation duct is situated which defines an inlet opening and an outlet opening, whereby the ventilation duct can be closed off by means of a rotatable closing element substantially consisting of two closing parts installed diametrically opposite each other, in between which a duct is situated, characterized in that at least one of the aforementioned closing parts of the closing element is made curved.

[0010] Preferably, the closing element of an improved ventilation grid according to the invention is

formed by two closing parts situated diametrically opposite each other which each have a curved wall or which, in other words, are made shell-shaped.

[0011] In the most preferable form of embodiment, the walls of the closing parts are situated on two concentric circles to which the duct walls in front of and behind the closing element may connect.

[0012] In the latter case, an additional advantage is formed in that the aforementioned walls, in opened position of the ventilation grid, form a single smooth whole with the duct walls.

[0013] With the intention of better showing the characteristics of the invention, hereafter, by way of example without any limitative character, two preferred forms of embodiment are described, with reference to the accompanying drawings, wherein:

figure 1 represents a cross-section of an improved ventilation grid according to the invention, in closed position;

figure 2 represents a cross-section similar to that of figure 1, however, with the ventilation duct in opened position;

figure 3 represents an embodiment variant of the ventilation grid according to figures 1 and 2.

[0014] A ventilation grid according to the invention substantially consists of a housing 1 in which a slot-shaped ventilation duct 2 is provided which defines an inlet opening 3 and an outlet opening 4 in the housing 1.

[0015] At the height of the inlet opening 3, the housing 1 has an outward-bent lip 5.

[0016] In the ventilation duct 2, a closing element 6 is provided which substantially consists of two shell-shaped closing parts 7-8, in between which a duct 9 is situated.

[0017] The closing parts 7-8 are connected to each other at their extremities by means of two end pieces 10 which, by means of pivot pins 11, are beared in the end pieces of the housing 1.

[0018] For reinforcement, one or more spacing elements 12 installed in slots 13-14 may be provided between the closing parts 7-8.

[0019] These spacing elements 12 provide in a reinforcement of the closing element 6, which certainly is necessary for long ventilation ducts 2.

[0020] The aforementioned shell-shaped closing parts 7-8 have curved walls 15-16, namely, a convex wall 15 and a concave wall 16, in such a manner that the walls 15-16 follow the curvature of the ventilation duct 2, such that the resistance for the air flow diminishes.

[0021] In order to obtain that the two walls 15-16 of the closing parts 7-8 are situated at a distance in respect to each other such that this distance is constant, these walls 15-16 are arranged in a concentric manner.

[0022] The closing parts 7-8 each are provided at their edges 17-18, 19-20 respectively, with sealing elements 21 known in themselves, for example, in the form

of brushes or such, which can cooperate with parts 22 of the ventilation duct 2.

[0023] Further, the ventilation duct 2 can be provided with a valve 23 at its inlet opening 3, which valve itself is movable and which, under the influence of pressure differences or wind load on the ventilation grid, enlarges or diminishes said inlet opening.

[0024] Finally, the ventilation grid according to this preferred form of embodiment is provided with a grid 26 at its outlet opening 4, which grid is clicked onto the housing 1 and which prevents that the ventilation duct 2 is visible from the room where it is ending and which, at the same time, serves as a protection against insects.

[0025] The functioning and use of a ventilation grid as described heretofore is very simple and as follows.

[0026] When the ventilation grid is closed, as represented in figure 1, the closing element 6 is turned in such a manner that the closing parts 7-8 close off the ventilation duct 2 hermetically, in that the sealing elements 21 are pressed against the aforementioned parts 22 of the ventilation duct 2.

[0027] By turning the closing element 6 in a suitable manner by means of an adjustment mechanism not represented in the drawings, the ventilation duct 2 is turned open until it comes into the position as represented in figure 2.

[0028] The closing element 6 is held, amongst others, in the closed position and in the completely opened position, in its place by the friction between the sealing elements 21 and the parts 22 of the ventilation duct 2.

[0029] By giving the walls 15-16 of the closing parts 7-8 such curved shape, the air resistance in the ventilation duct 2 is strongly reduced, in particular at the height of the closing element 6, which in its turn has as a consequence that considerably less air turbulences occur in the ventilation duct 2, with a better air flow and less flow sounds as a result.

[0030] In the embodiment variant according to figure 3, which is of the same type as the form of embodiment from figures 1 and 2, the ventilation duct 2 moreover is provided with acoustically insulating material 27-28, more particularly in the zone in front of and the zone behind closing element 9.

[0031] The insulating material 27-28 is formed in such a manner that the streamline of the ventilation duct 2 is improved in that the angles of the ventilation duct 2 are rounded and the irregularities of the duct 2 are covered by this acoustically insulating material.

[0032] Moreover, the closing parts 7-8 of the closing element 6 can be situated in the same plane as the plane of the walls 29-30 of the acoustically insulating material 27-28 in the ventilation duct 2, as a result of which a better air flow is obtained, whereas the acoustically insulating material 27-28 moreover provides for a further reduction of the flow sounds.

[0033] The functioning and use of the aerating grid according to this embodiment variant is similar to the functioning and use of the first form of embodiment.

[0034] It is, of course, perfectly possible to provide acoustically insulating material at other places in the ventilation duct 2 in order to still improve the streamline of this ventilation duct 2 and/or the silencing features.

[0035] To this aim, for example, acoustically insulating material might be provided in the slots 13-14 of the closing parts, between the spacing elements 12, such that the walls 15-16 will cause even less air turbulences.

[0036] The present invention is in no way limited to the forms of embodiment described as an example and represented in the accompanying drawings, on the contrary may such ventilation grid be realized in a variety of forms and dimensions without leaving the scope of the invention.

Claims

1. Improved ventilation grid of the type substantially consisting of a housing (1) in which a ventilation duct (2) is situated which defines an inlet opening (3) and an outlet opening (4) in the housing (1), whereby the ventilation duct (2) can be closed off by means of a rotatable closing element (6) substantially consisting of two closing parts (7-8) installed diametrically opposite each other, in between which a duct (9) is situated, characterized in that at least one of the aforementioned closing parts (7-8) of the closing element (6) is made curved.
2. Ventilation grid according to claim 1, characterized in that both closing parts (7-8) of the closing element (6) are made curved.
3. Ventilation grid according to claim 2, characterized in that one wall (15) of a closing part (7) of the closing element (9) is made convex, whereas the opposite wall (16) is made concave.
4. Ventilation grid according to claim 3, characterized in that the curved walls (15-16) are concentric.
5. Ventilation grid according to any of the preceding claims, characterized in that the closing parts (7-8), on each edge (17-18-19-20), are provided with sealing elements (21) which can cooperate with parts (22) of the ventilation duct (2).
6. Ventilation grid according to any of the preceding claims, characterized in that the ventilation duct (2) is provided with acoustically insulating material (27-28), more particularly in the zone in front of and in the zone behind the closing element (9).
7. Ventilation grid according to claim 6, characterized in that the insulating material (27-28) has curved walls (29-30) which, in opened position of the ventilation grid, are situated in the same plane as the walls (15-16) of the closing parts (7-8).

8. Ventilation grid according to any of the preceding claims, characterized in that in the closing parts (7-8), slots (13-14) are provided which are filled with acoustically insulating material.

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9. Ventilation grid according to claim 8, characterized in that, when one or more spacing elements (12) are provided between the closing parts (7-8), which spacing elements are set in the slots (13-14), the acoustically insulating material is provided in the slots (13-14), between the spacing elements (12).

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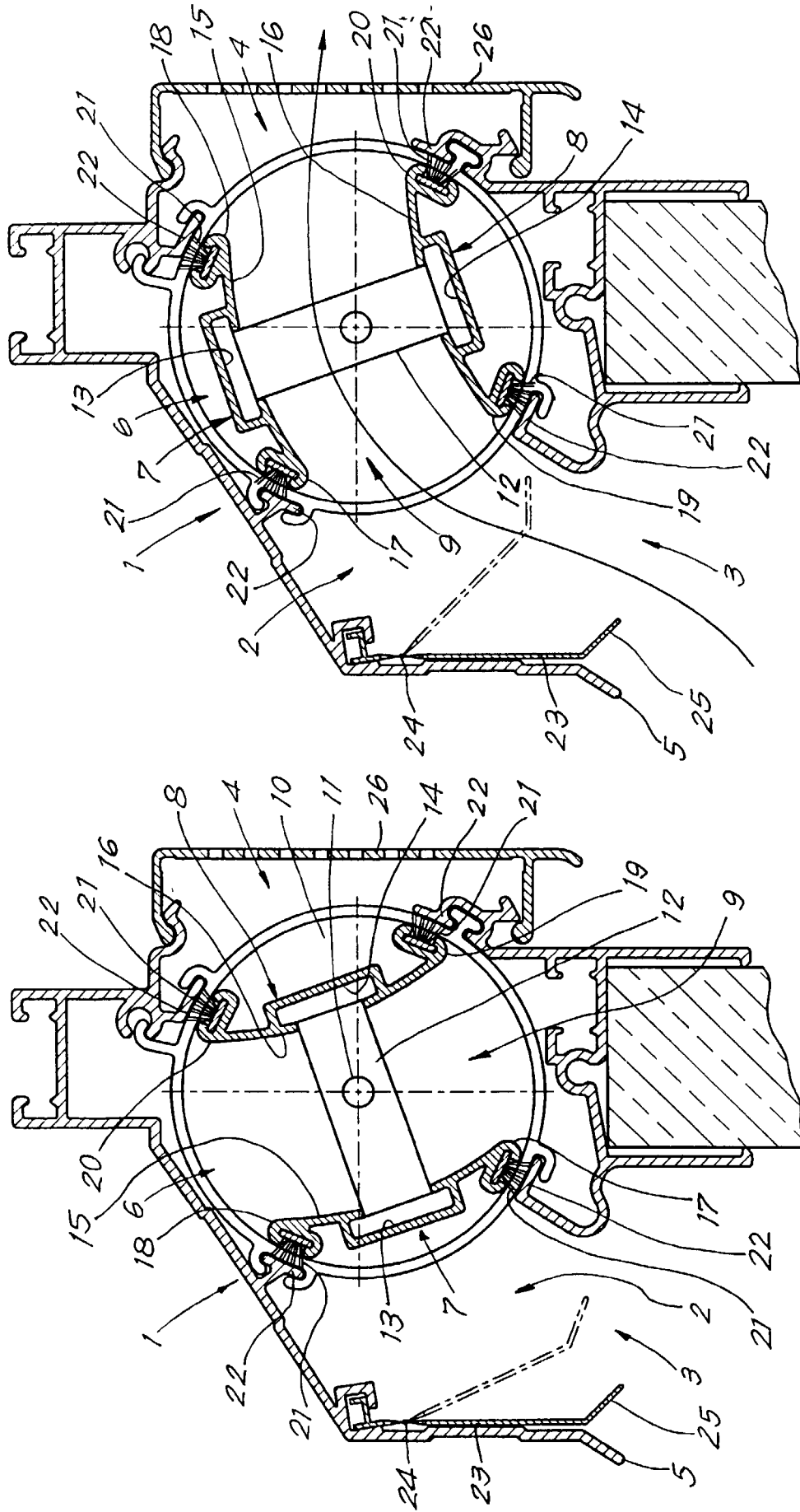


Fig. 2

Fig. 1

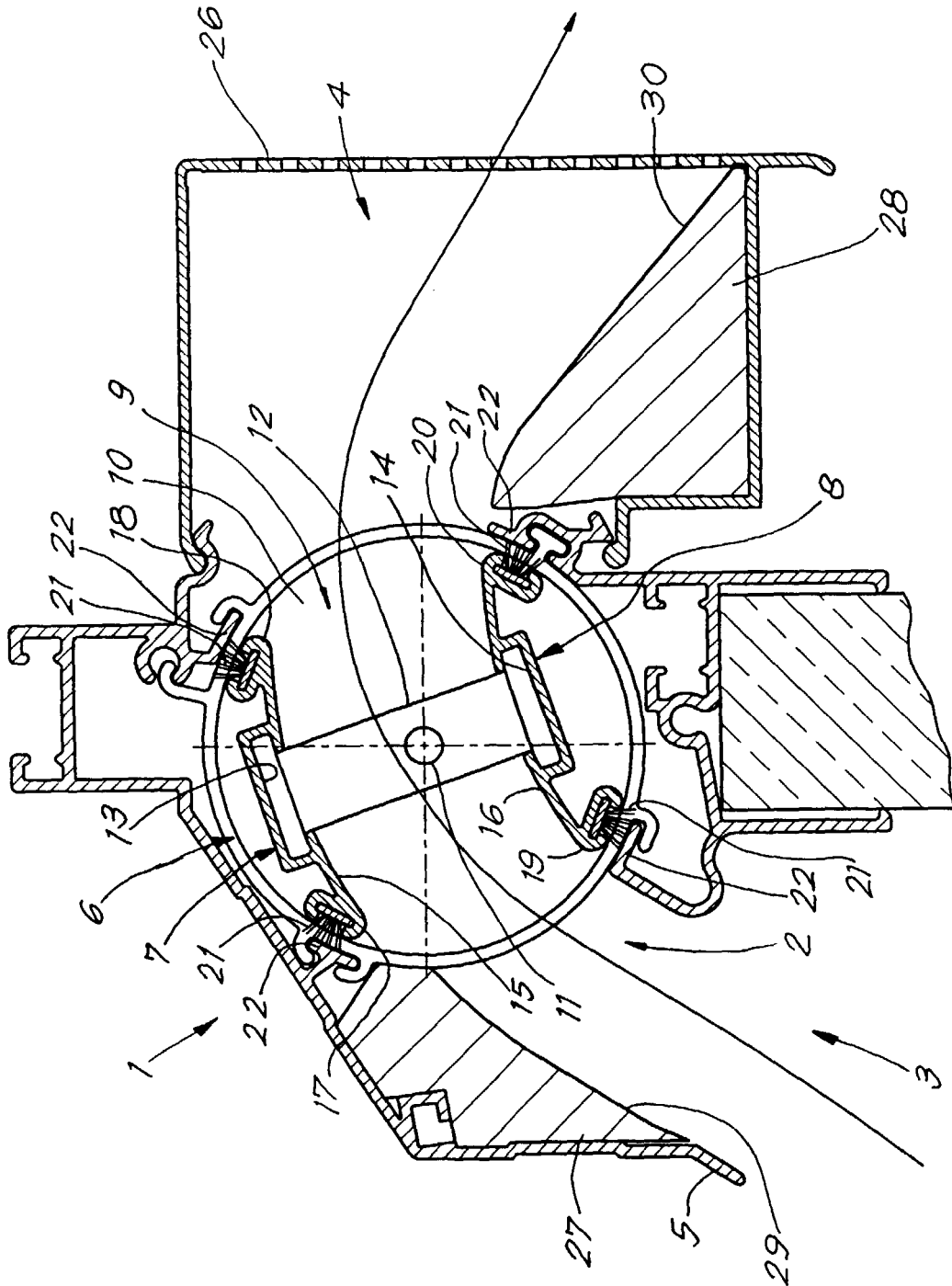


Fig. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 2833

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Y	* abstract *	6,7	
	* page 6, line 20 - line 30 *		
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	* figures 1,2 *		
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A	* figure 1 *	3,4	
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 October 2000	Examiner De Graaf, J.D.
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
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