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(54) Ventilating Apparatus.

(57) Ventilating apparatus with a rotatable closing device (3) mounted between an upper and lower profile (1,2), sealing means (19,20,21,22) between the profiles (1,2) and the closing device (3), the outer boundary of the closing device lying partly on an imaginary cylinder and partly within the circumference of the same cylinder, whereby the shortest radial distance of the closing device is smaller than the distance between the sealing means (20,22) mounted on the respective profiles (1,2).

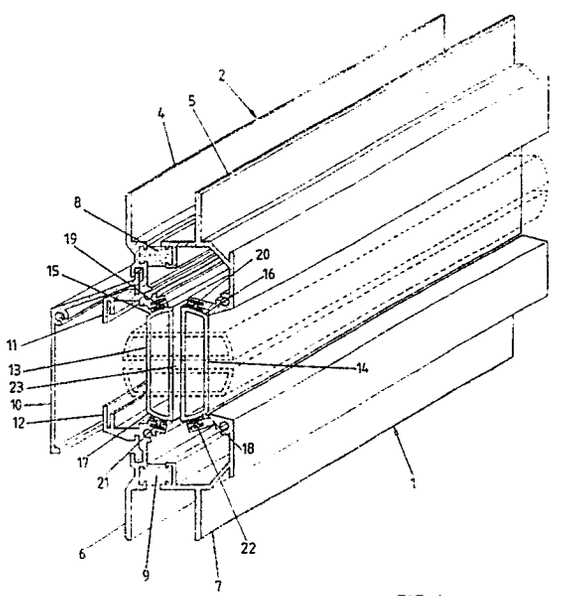

FIG. 1

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VENTILATING APPARATUS.

The invention relates to a ventilating apparatus including a house consisting of two profiles, a rotatable closing device with cylinder wall portions mounted between the profiles, the closing device consisting of one or more closing members mounted to end parts at their outer ends and sealing means between the profiles and the closing members, whereby the closing device can be rotated from a first position with a closed air passage into a second position with a fully opened air passage.

Such an apparatus is known from US-A-3,237,547.

This known apparatus has the disadvantage that cleaning the apparatus, more in particular the closing device and possibly mounted wire screens on the outside, is very difficult and in fact can only be done proper by taking the apparatus apart. This is also the case if new wire screens or new closing means have to be mounted on the profiles.

Another disadvantage of the known apparatus is that if only a relatively small air flow is wanted to pass the apparatus, for instance with strong winds, the direction of air flow is very difficult to control, which in practice means that for instance in a sleeping room a person almost immediately experiences a sense of draught.

It is an object of the invention to overcome these disadvantages.

Further it is an object of the invention to provide an improved ventilating apparatus of a simple construction, which requires a minimum of parts and which can also be manufactured easily.

Accordingly the invention provides a ventilating apparatus as defined in claim 1.

With such a closing device it is possible to remove the device from the ventilating apparatus without demounting the apparatus when the closing device is in the position with the maximum possible air passage or even before this position is reached.

With maximum air flow the air passes along both sides of the closing members, whereby the guide passage for the air between the closing members is smaller than the air passage of the known closing device, the total area of the different air passages together, however, being at least equal to that of the known closing device. When only using the guide passage for the air between the closing members, the air flow can be directed very accurately.

From the Dutch patent application NL-A-8105360 a ventilating apparatus is known with a closing device consisting of two closing members with a central air passage between the closing members. The outer boundaries of the closing members are lying on the same imaginary cylinder, which makes it impossible to remove the closing device from the ventilating apparatus, without demounting the ventilating apparatus.

The ventilating apparatus known from the Dutch patent application NL-A-7505355 has a closing device with only one closing member, which makes it impossible to direct the air flow accurately by a small air passage.

The same applies to the ventilating apparatus of Dutch patent application NL-A-8601402, which also has a closing device consisting of a single member.

The ventilating apparatus described in the British Patent GB-A-1,006,828 also does not allow to take the closing device out of the ventilating apparatus without demounting the apparatus and to direct the air flow.

From the Dutch patent application NL-A-7208739 an air flow box is known, having a central bar with a number of parallel radial bores. The air flow can be directed by rotating the central bare whereby the air coming through the radial bores is deflected by deflector plates mounted adjacent the central bar, which, however, does not allow to direct the air flow very accurately.

A preferred embodiment of the invention provides in that the closing device consists of at least two closing members spaced from each other, whereby each closing member has the shape of a cylinder slice with two parallel planes and two cylinder wall portions of the same cylinder.

With such a closing device the guide passage for the air is bounded by two parallel flat planes which ensures a very well guided air flow.

When the ventilating apparatus is set in a position with only a small air passage, thus only using the central guide passage, the air flow can be directed very accurately over an angle which is dependent on the radial measurements of the closing members and the guide passage.

The air flow will be directed inclined to the horizontal and preferably in a upward direction, so that considerable less draught is experienced than with an undirected air flow.

A rigid and simple construction for the closing device is obtained by providing that the end parts fit into the closing members. To prevent a possible heat transmission between the outer ends of the closing members it is provided that the end parts are made of plastic material.

Another embodiment of the invention preferably provides that the closing device is removable and that a wire screen mounted at the outside thereof is removable to the inside.

The wire screen can be mounted in grooves in

a vertical or inclined position, the upper groove having a greater depth than the lower groove.

For symmetry reasons of the upper and lower profile of the ventilating apparatus, both the grooves can be made with the same depth, whereafter filling pieces are inserted into the lower groove.

The invention not only comprises a ventilating apparatus as depicted above, but also the profile needed for the manufacturing of the closing members of the closing device. Accordingly the invention provides a hollow profile having an outer shape with two parallel flat planes, connected to each other by cylinder wall portions, which form part of the same imaginary cylinder. Also the end parts, forming together with such hollow profiles the closing device, are part of the invention.

The invention is elucidated in the following on hand of the drawing, in which:

Figure 1 shows a view in perspective and a cross-section of the ventilating apparatus;

Figure 2 shows schematically a front view of the closing device;

Figure 3 shows a section along line III-III of fig. 2; and

Figure 4 shows a section along line IV-IV in fig. 2.

The ventilating apparatus according to fig. 1 consists of a bottom profile 1 and a top profile 2 with a rotatable closing device 3 mounted between these profiles. The closing device is mounted in bearings 26,27 (vide fig. 2, 3 and 4), which are part of the closing parts connecting the outer ends of the profiles 1,2. These closing parts are not shown in the drawing.

The bottom and top profiles 1,2 both consist of two parts 4,5 and 6,7, which are connected to each other according to a known method with a connecting piece 8,9 of plastic material to prevent the forming of a "cold-connection".

Further the profiles are provided with connecting means 11,12 for a not shown insect screen or wire screen, which are mounted in such a way, that the insect screen has a vertical position, but which just as good can be mounted in such a way that the screen has an inclined or horizontal position.

To the top profile 2 a cap 10 is mounted to prevent the rain from coming in.

The closing device 3 has two hollow closing members 13, 14, with in between a guide passage for the air 23. The boundary planes 15,16,17,18 of the closing members 13,14 are lying on an imaginary cylinder and are, with the two closing members 13,14 in a vertical position, in contact with the brushes 19,20,21,22 mounted in pairs on the bottom and top profile 1,2.

Except for the brushes 19,20,21,22 used here, it is also possible to use sealing means of plastic material or of felt.

With rotation of the closing device 3 the boundary planes 16,17 get out of contact with the brushes 20,21 and the boundary planes 15 and 18 respectively come into contact with the brushes 20 and 21, permitting the air to flow from the outside via the guide passage for the air 23 to the inside. The flow direction is directed upward, as a result of which less hindrance of draught is experienced than with an undirected air flow.

With further rotation of the closing device the air can flow along both sides of the closing members 13,14 and a maximum possible air flow is reached with a horizontal position of the closing members 13,14, which position is indicated in the drawing with interrupted lines.

Fig. 2 schematically shows a front view of the closing device 3, rotatable in bearings 26,27, which are mounted in or form part of the closing parts connecting the lower and top profiles 1,2.

The closing members 13,14 are connected with end parts 24,25 fitting into bearings 26,27. These end parts 24,25 are made of plastic material to avoid a "cold-connection" also at this spot.

In the bearing 26,27 cut-outs 28,29 with the form of a circle segment are made, so that the end parts 24,25 are free over less than 180 degrees, whereby in the free part of end part 25 holes 30,30′ are made for a control handle 31 for the closing device 3. The angle enclosed by the cut-outs is such that the closing device 3 with the control handle 31 can be rotated from a fully closed position to a completely opened position.

Fig. 2, 3 and 4 show the construction that permits the removal of the closing device 3 out of the ventilating apparatus in an easy manner, as a result of which the screen placed on the outside can be reach from the inside.

With the axial force exerted by the spring 32, mounted between end part 24 and bearing 26, the end part 25 is hold in the bearing 27, where it butts against a removable ring 34. Herewith sufficient space is left between the end part 24 and the bearing 26, so that by moving the closing device 3 against the force of the spring 32 the end part 25 can be moved out of the bearing 27, whereafter the closing device 3 can be removed from the ventilating apparatus to the outside. To ensure sufficient freedom of movement with bearing 26 the end part 24 has a somewhat tapered form. Although theoretically a spherical shape is needed, in practice a truncated cone shape will do in most cases.

The bearing both have the same outer dimensions because of the equal measurements of the closing parts. This means that the bearing 27 has larger dimensions than is strictly necessary to support end part 25.

Preferably the bearings 26,27 have exactly the

same bores, whereby the space in bearing 27 is filled partly with a ring 34 and the spring 32 is kept in bearing 26 by mounting it to a removable plate 33. Herewith it is possible, by interchanging the ring 34 with the plate 33 and spring 32, to remove and control the closing device from both the left side and the right side, whereby the control handle has to be removed from hole 30 to hole 30' or vice versa.

Claims

1. Ventilating apparatus including a house consisting of two profiles, a rotatable closing device with cylinder wall portions mounted between the profiles, the closing device consisting of one or more closing members mounted to end parts at their outer ends and sealing means between the profiles and the closing members, whereby the closing device can be rotated from a first position with a closed air passage into a second position with a fully opened air passage, characterized in that the boundary formed by the two closing members (13,14) is lying in part on an imaginary cylinder and in part within the circumference of the same cylinder, so far that the smallest radial distance of the closing device (3) is smaller than the distance between the sealing means (20,22).

2. Ventilating apparatus according to claim 1, characterized in that the closing device (3) consists of at least two closing members (13,14) spaced from each other, whereby each closing member (13,14) has the shape of a cylinder slice with two parallel planes and two cylinder wall portions of the same cylinder.

3. Ventilating apparatus according to claim 1 or 2, with hollow closing members, characterized in that portions of the end parts (24,25) fit into or close round the closing members (13,14).

4. Ventilating apparatus according to one or more of the preceding claims, characterized in that the end parts (24,25) are made of plastic material.

5. Ventilating apparatus according to one or more of the preceding claims, characterized in that the closing device (3) is removable, whereby a wire screen mounted at the outside thereof, is removable to the inside.

6. Hollow profile for the manufacturing of a ventilating apparatus according to one or more of the preceding claims, characterized in that it has an outer shape with two parallel flat planes, connected to each other by cylinder wall portions, which form part of the same imaginary cylinder.

7. Closing device for a ventilating apparatus according to one or more of the claims 1-5, characterized in that the closing device (3) consists of at least two closing members (13,14) spaced from each other and connected to end parts (24,25) at their outer ends, whereby each closing member (13,14) has the shape of a cylinder slice with two parallel planes and two cylinder wall portions of the same cylinder.

8. Ventilating apparatus with a rotatable, in principle cylindrical closing device, mounted between two profiles, the closing device having an air passage and cooperating with sealing means in such a way, that in a first position the air passage is closed and in a second position open, characterized in that the closing device (3) can be axially displaced from a first position, wherein at both ends the pins (24,25) or holes give a support, into a second position, wherein at one end the pin (24,25) or the hole is displaced over such a distance with respect to its complementary member, that the closing device (3) can be radially removed, whereby controllable means (32) are present to hold the closing device in the first position.

9. Ventilating apparatus according to claim 8, characterized in that the controllable means are spring means (32), the spring force thereof can be overcome by manual effort.

10. Ventilating apparatus according to claim 15 or 16, characterized in that a control handle (31) is mounted on a pin (24,25) that protrudes into a bearing (26,27) with a cut-out (28,29), to allow a full swivelling movement of the closing device (3).

11. Ventilating apparatus according to one or more of the claims 8-10, characterized in that the rotating part (24,25) of the closing device (3) at least at one end is symmetrical round the rotating axis and mounted in a ring (26,27) with a cut-out (28,29), which is smaller than 180°, but large enough to mount a control handle (31) to the rotating part (24,25) with sufficient freedom of movement.

12. Ventilating apparatus according to one or more of the claims 8-11, characterized in that at least one rotating part (24,25) has a conical form and that the first complementary member has a radius equal to that of the largest circle of the conical form.

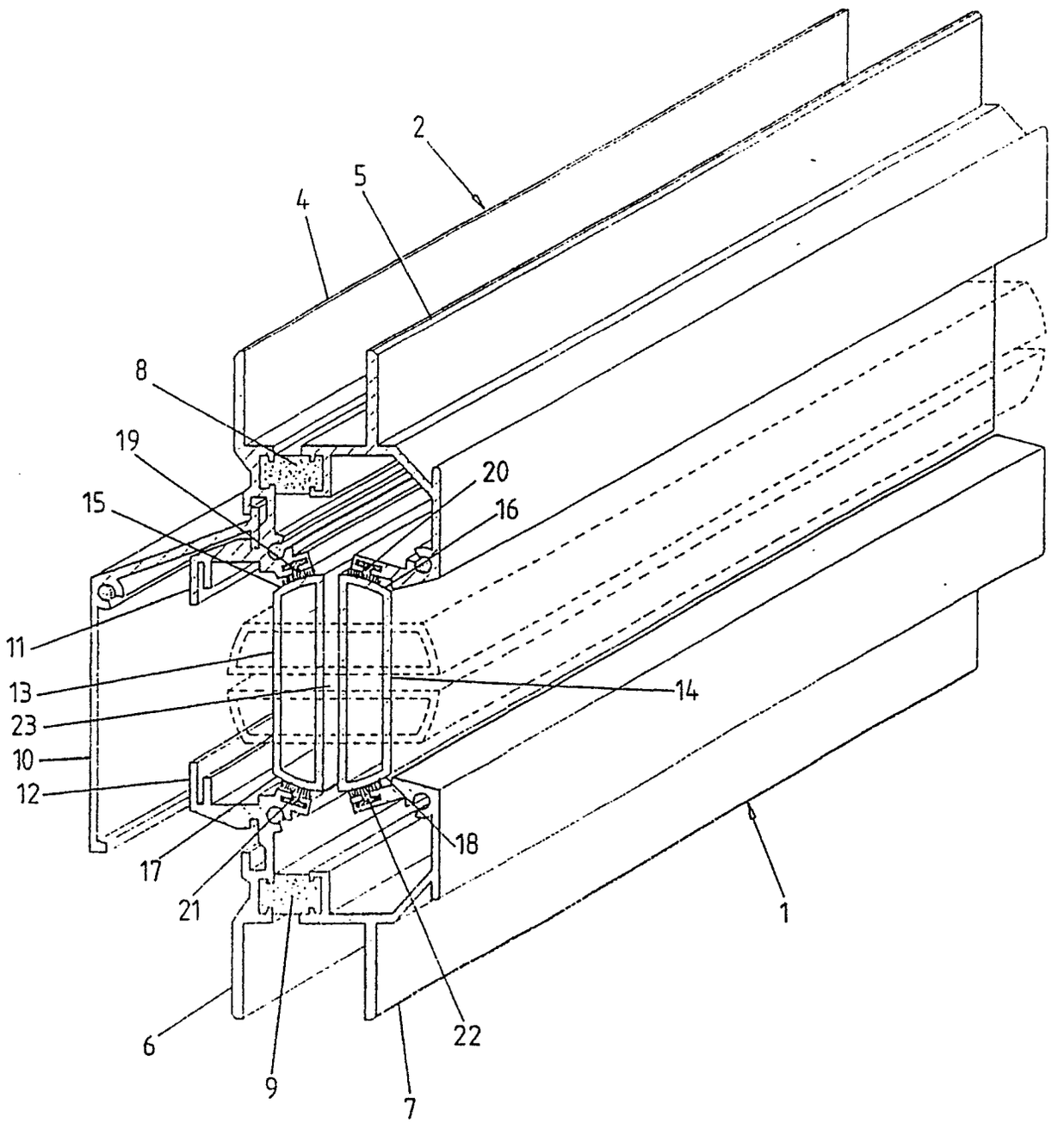

FIG. 1

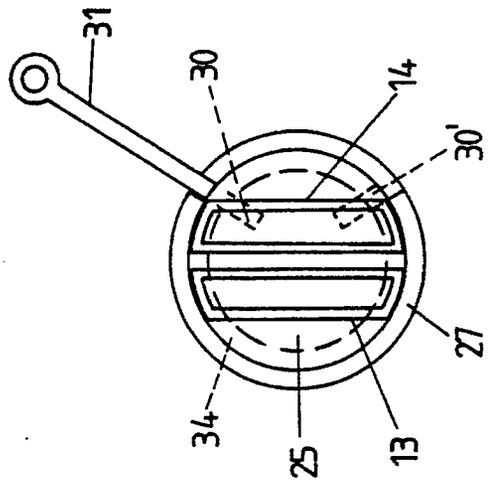

FIG. 4

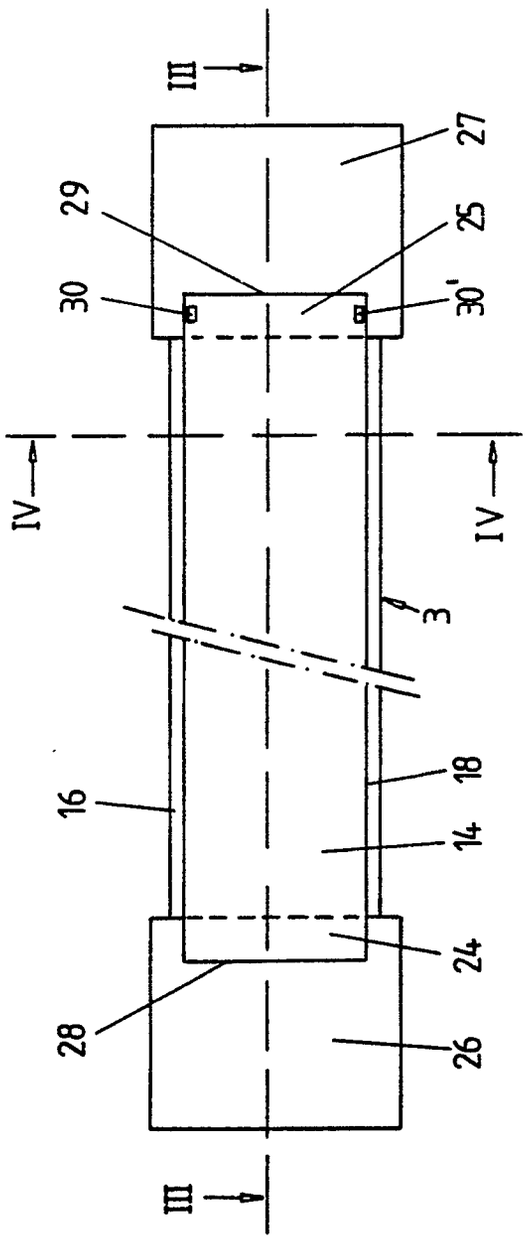

FIG. 2

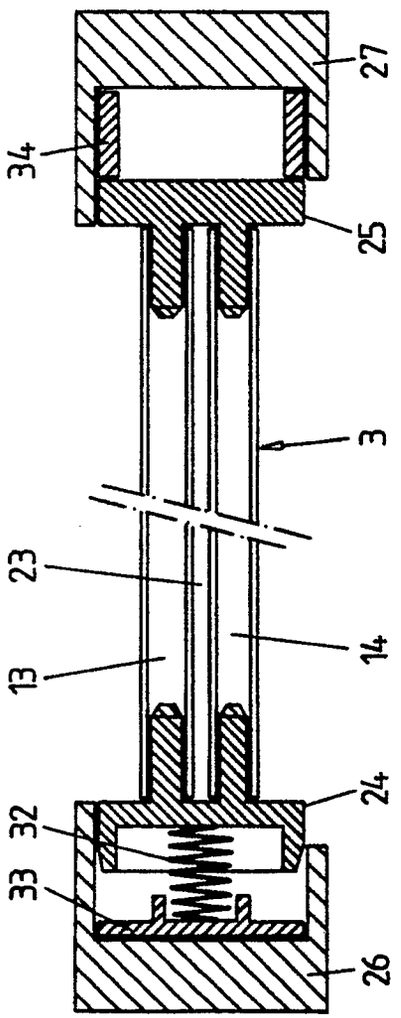

FIG. 3