

PATENT SPECIFICATION

(11)

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- (21) Application No. 18559/71 (22) Filed 2 June 1971
- (23) Complete Specification filed 26 May 1972
- (44) Complete Specification published 14 May 1975
- (51) INT. CL.⁸ F24F 7/00//13/14
- (52) Index at acceptance
F4V A1E A2C1
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(54) IMPROVEMENTS RELATING TO VENTILATORS

(71) We, COLT INTERNATIONAL LIMITED, a British Company of New Lane, Havant, Hampshire, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to ventilators and concerns louvred ventilators more particularly, although not exclusively, for roof mounting.

15 An object of the invention is to provide a louvred ventilator having improved weathering characteristics enabling it to be used in a substantially flat position, on a flat roof for example.

20 It is known to provide louvred ventilators having louvres hingeably movable to open and close the ventilator and control the ventilation therethrough.

25 It is desirable that in their open position the louvres define air passages within a duct. Otherwise the exhaust of stale air through the ventilator cannot be assured under windy conditions but instead, a draught is created inwardly through the ventilator into the building.

30 With such a louvred ventilator it is necessary for the louvres to prevent weather entry in their closed position. To this end it is usual for the louvres to engage against one another and in many cases against a sealing flange or lip at the mouth of the duct to provide a rain-tight seal.

40 The present invention provides a louvred ventilator comprising an outer body part or casing defining a duct and an inner body part or casing defining a ventilation opening within the duct, there being a plurality of louvres hingeably movable to control ventilation through the ventilation opening, each louvre overlying and spanning an op-

posed pair of walls of the inner body part or casing, which in part define said ventilation opening, the louvres having flanges or lips on their side edges which, in a closed position of the louvres overlap one another to form at least part of a wall formation to the outside of and extending along the whole length of each of said opposed pair of walls of the inner body or casing, each wall formation penetrating between a corresponding one of said opposed pair of walls and the outer body part or casing defining the duct in spaced relation to said wall and the outer body part, the louvres, in their closed position completely covering over and weathering the ventilation opening, and acting to drain water on their outer surfaces over said opposed pair of walls into gutter means in said duct and leading outside said duct.

65 With a ventilator as just defined the duct itself is not sealed against weather entry in the closed position of the louvres. The louvres combine together to form a weather shield within the duct which prevents the entry of water through the ventilator into the building.

75 By avoiding sealing engagement between contacting surfaces to prevent the entry of water, the ventilator does not have to be mounted at a large angle of inclination to drain off water which might otherwise seep between such surfaces. The wall formations form with the opposed pair of walls spanned by the louvres and the outer body part labyrinths which may act to prevent water being blown into the ventilation opening under the wall formations. Furthermore, because the wall formations lie in spaced relation to said opposed pair of walls, water is unable to penetrate between them into the ventilation opening by capillary action.

80 Preferably, each wall formation further comprises an operating link for the louvres 90

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hingebly connected with each one of said, overlapping flanges or lips.

Preferably also, the operating link is of channel section and receives said overlapping flanges or lips between its flanges, the operating link also forming a part of said gutter means.

Specific embodiments of the present invention will now be described by way of example with reference to the accompanying drawings in which:—

Fig. 1 is a plan view of a ventilator according to this invention;

Fig. 2 is a partial cross-section of the ventilator shown in Fig. 1;

Fig. 3 is a view on line 3-3 in Fig. 2;

Fig. 4 is a perspective view of one end of the louvres of the ventilator;

Fig. 5 is a perspective view of the other end of an adjacent pair of the louvres of the ventilator in their closed position;

Fig. 6 is a perspective view showing a control link for hingebly adjusting the louvres, and

Fig. 7 is an end view of a further ventilator according to this invention.

Referring to the accompanying drawings, the ventilator shown in Figs. 1 to 6 is a louvred ventilator for roof or wall mounting but is intended more particularly for mounting on a flat roof in a substantially flat position as shown in Figs. 1 and 2 and this position will be assumed for the purposes of the following description.

The ventilator has a rectangular body comprising an inner body part or casing 10 presenting a base flange 11 for flashing the ventilator to the roof. The inner body part has two opposite pairs of upstanding walls 12 defining a rectangular ventilation opening 14 through the base flange 11.

The body further comprises a pair of channel members 15 and a pair of channel members 16 disposed respectively along opposite sides of the inner body part 10. The channels 15 have a substantially greater width than the channels 16 and act as drainage channels for water which runs off the outer surface of the louvres yet to be described. The channel members 15 and 16 are welded to the base 10 with one upstanding flange or wall abutting the outside of one of the walls 12 and the web or floor of one of the walls 12 and the web or floor of the member abutting the base flange 11.

An outer body part or casing 20 of the ventilator is in the form of a rectangular duct having an outwardly directed flange 21 abutting the flange 11. The part 20 is secured to the outside of the upstanding flanges or walls of the channel sectioned members 15 and 16 remote from the walls 12 by means of rivets for example.

As shown in Fig. 3 one end of each channel member 15 opens through the

outer body part 20 to drain off water outside the body of the ventilator, a slot 22 being formed in the lower edge of the body part 20 which fits over the channel member.

The ventilator may, if desired, be fitted at a small angle, say $2\frac{1}{2}^\circ$ so that the channels 15 slope downwardly towards said one end thereof.

The walls 12 each have an out-turned lip 12a to prevent water being blown up the walls 12 into the opening 14.

Ventilation through the opening 14 is controlled by a louvre structure composed of a plurality of louvres 40 (see Figs. 4, 5 and 6) which are hinged for opening and closing movement, each on a hinge axis 41, between opposite sides of the body part 20. Each louvre overlies the ventilation opening 14, which is positioned within the casing part 20 and well down inside it. This enables the louvres also to be positioned inside the casing 20, the casing acting as a windshield for the louvres when these are in an open position and preventing a return draught of air inwardly through the ventilator. The louvres span the opposed pair of walls 12 extending parallel with the channels 15 at the exit from the ventilation opening 14 and lie in upwardly spaced relation to the opening when in their closed position as shown in Figs. 5 and 6.

The hinge axes 41 of the louvres lie midway between their leading and trailing edges 44 and 45 respectively. At their side edges the louvres have depending flanges or lips 48 each formed at the lower leading edge corner with a lobe 50.

An operating link 52 for the louvres is provided along each side, one immediately above and centrally disposed over each channel member 15, and the lobes 50 along each side are all hinged to the adjacent one of these links. The links 52 are connected conveniently through one or more of the louvres, with further operating mechanism (not shown) for moving the links longitudinally thereby to adjust the louvres in unison about their hinge axes.

The links 52 are of channel section and receive the flange 48 between their flanges as shown in Fig. 2.

In their closed position, the leading and trailing edge portions of each pair of adjacent louvres 40 overlap one another, as shown in Fig. 5 and this overlap extends to the flanges 48.

The side edges of the louvres diverge slightly from their leading to their trailing edges so that the flanges 48 are spaced apart where they overlap. This prevents water penetrating between the overlapping surfaces of the flanges 48 by capillary action.

The flanges 48 together with the links 52 form a depending wall formation in the closed position of the louvres to the outside of and extending along the whole length of the opposed walls 12 adjacent the channels 15. These wall formations penetrate well down between these opposed walls 12 and the outer casing part 20 as shown in Fig. 2. A labyrinth is thus formed preventing water being blown into the opening 14. Furthermore, these wall formations drain water on the outer surfaces of the louvres over the opposed walls 12 adjacent the channels 15 and direct into the channel section of the links 52. Water drains from the links 52 into channels 15 and from the channels 15 to the outside of the casing part 20. The links 52 and the channels 15 thus form gutter means inside the casing part 20 leading outside the ventilator casing.

In order to prevent any water penetrating under the trailing edges 45 of the louvres entering the opening 14 the leading edge portion of each louvre is turned upwardly, as at 55, and then rearwardly, as at 56, to form a water drainage channel 57 to lead the water over the outside of the flanges 48 of the louvre.

In order to prevent water in the channels 57 running back along the front surface of the upturned portions 55 and dripping through the opening 14, the flanges 48 have ears extending forwardly of the portions 55, as at 60.

The trailing edge portion of each louvre is turned downwardly as at 64 and then rearwardly as at 65, so as to seal against the outer surface of the leading edge portion of the adjacent louvre in the closed position of the louvres so as to prevent as far as possible water penetrating under the trailing edges of the louvres.

The outer casing 20 is formed along its ends adjacent the channel members 16 with fixed portions 70 (see Fig. 1) of the louvre structure, shaped in accordance with the leading and trailing edge portions respectively of the louvres as described, the fixed leading-edge-shaped portion underlying the trailing edge of the first louvre at the end of the ventilator shown in Fig. 2 and the fixed trailing-edge-shaped portion overlying the leading edge of the last louvre at the other end of the ventilator. The channel 57 of the fixed leading-edge-shaped portion opens at its ends over fixed depending flange portions to lead water from the channel into the channels 15.

In order to prevent the passage of moisture laden air through the labyrinths described, the labyrinth passages have a through flow cross-section which enlarges downstream of their inlet so that the velocity of the air flow is reduced. An inwardly

directed lip 20a on the wall 20 restricts the inlet opening to each labyrinth for this purpose.

In their closed position the louvres and the links 52 combine to form a weather shield completely covering over and weathering the opening 14.

The louvres may be partially opened while still weathering the opening 14 to some extent since the rain falling on the outer surfaces of the louvres may then drain down those outer surfaces into the channels 57 which lead the rain water transversely into the channels 52 and 15 and then out onto the outer surface of the roof.

By positioning the louvres vertically a substantially clear opening to the sky is provided through the opening 14.

A flat roof opening largely to the sky may be provided using a large number of ventilators as described.

Fig. 7 shows a ventilator having an inner body part 10a presenting the base flange 11 and having one pair of opposite upstanding end walls 12b in common with the outer body part or casing 20a which in this case is completed by an opposite pair of side baffles 20b which define bottom openings 20c one to each side of and on the outside of the other pair of opposite upstanding side walls 12b of the inner body part 10a, and confronting top openings 20d one to each side of and on the outside of this pair of walls. The same side walls 12b present openings which allow air to pass laterally out of the ventilation duct into the outer casing 20a and then through the top and bottom openings 20c and 20d. The channel members 15a extend between the end wall 12b to define between the members 15a and the end walls 12b a top ventilation opening which is controlled by a louvre structure made up of louvres 40a as already described, water draining off the louvres 40a into the channels 15a being led off by the channels 15a over one or other of the end walls 12b.

The outer surfaces of the louvres are correspondingly inclined downwardly from their trailing edge portions to their leading edge portions at an angle of about 4° - 5° when the ventilator is disposed horizontally on a flat roof and the louvres are in their closed position.

In their open position the louvres present their leading edges towards the exhausting air stream rising upwardly through the ventilation opening from the interior of the building.

Attention is directed to our Patent Application No.: 43854/74 (Serial No.: 1393873) which has been divided from the present application and which claims further features of the ventilators described

herein with reference to the accompanying drawings.

Attention is also directed to the fact that the present invention, as described herein, cannot be performed without use of the invention described and claimed in our patent application No. 18558/71 (Serial No: 1393871).

10 WHAT WE CLAIM IS:—

1. A louvred ventilator comprising an outer body part or casing defining a ~~duct~~ and an inner body part or casing defining a ventilation opening within the duct, there being a plurality of louvres hingeably movable to control ventilation through the ventilation opening, each louvre overlying and spanning an opposed pair of walls of the inner body part or casing, which in part define said ventilation opening, the louvres having flanges or lips on their side edges which flanges, in a closed position of the louvres overlap one another to form at least part of a wall formation to the outside of and extending along the whole length of each of said opposed pair of walls of the inner body or casing, each wall formation penetrating between a corresponding one of said opposed pair of walls and the outer body part or casing defining the duct in spaced relation to said wall and the outer body part, the louvres,

in their closed position completely covering over and weathering the ventilation opening and acting to drain water on their outer surfaces over said opposed pair of walls into gutter means in said duct and leading outside said duct.

2. A ventilator as claimed in claim 1 wherein each wall formation further comprises an operating link for the louvres hingeably connected with each one of said overlapping flanges or lips.

3. A ventilator as claimed in claim 2 wherein the operating link is of channel section and receives said overlapping flanges or lips between its flanges, the operating link also forming a part of said gutter means.

4. A ventilator as claimed in claim 1 substantially as hereinbefore described with reference to, and as shown in, Fig. 1 to 6 of the accompanying drawings.

5. A ventilator as claimed in claim 1 substantially as hereinbefore described with reference to, and as shown in, Fig. 7 of the accompanying drawings.

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Attention is also directed to the fact that the present invention, as described herein, cannot be performed without use of the invention described and claimed in our patent application No. 18558/71 (Serial No: 1393871).

10 WHAT WE CLAIM IS:—

1. A louvred ventilator comprising an outer body part or casing defining a duct and an inner body part or casing defining a ventilation opening within the duct, there being a plurality of louvres hingeably movable to control ventilation through the ventilation opening, each louvre overlying and spanning an opposed pair of walls of the inner body part or casing, which in part define said ventilation opening, the louvres having flanges or lips on their side edges which flanges, in a closed position of the louvres overlap one another to form at least part of a wall formation to the outside of and extending along the whole length of each of said opposed pair of walls of the inner body or casing, each wall formation penetrating between a corresponding one of said opposed pair of walls and the outer body part or casing defining the duct in spaced relation to said wall and the outer body part, the louvres,

in their closed position completely covering over and weathering the ventilation opening and acting to drain water on their outer surfaces over said opposed pair of walls into gutter means in said duct and leading outside said duct.

2. A ventilator as claimed in claim 1 wherein each wall formation further comprises an operating link for the louvres hingeably connected with each one of said overlapping flanges or lips.

3. A ventilator as claimed in claim 2 wherein the operating link is of channel section and receives said overlapping flanges or lips between its flanges, the operating link also forming a part of said gutter means.

4. A ventilator as claimed in claim 1 substantially as hereinbefore described with reference to, and as shown in, Fig. 1 to 6 of the accompanying drawings.

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