Sept. 5, 1939. J. H. McDERMENT 2,171,883

ROTARY VENTILATOR

Filed Nov. 19, 1937 2 Sheets-Sheet 1

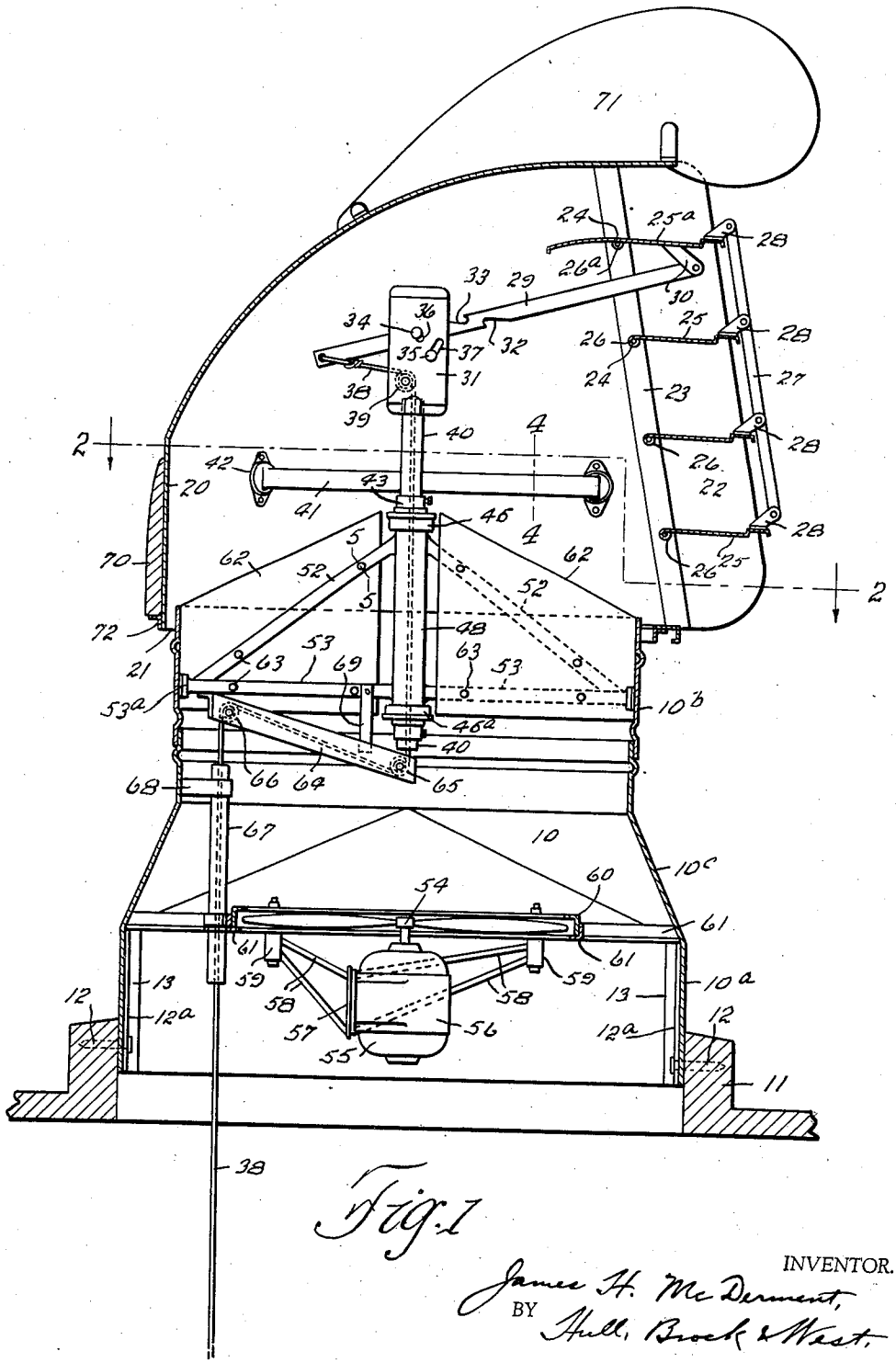


Fig. 1

INVENTOR.

BY James H. McDerment,
Hull, Brock & West.

ATTORNEYS.

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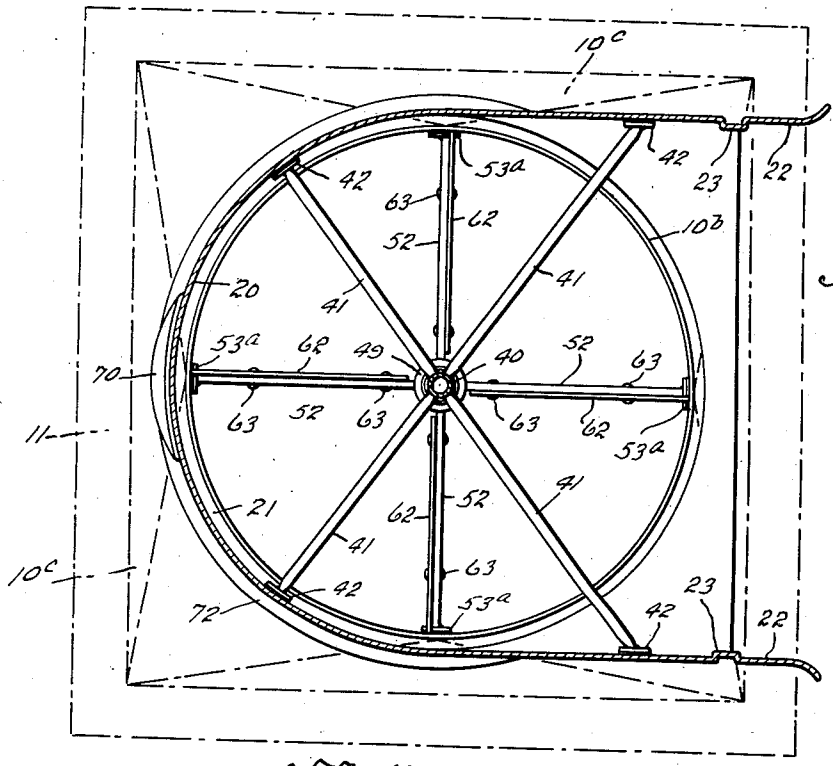


Fig. 2

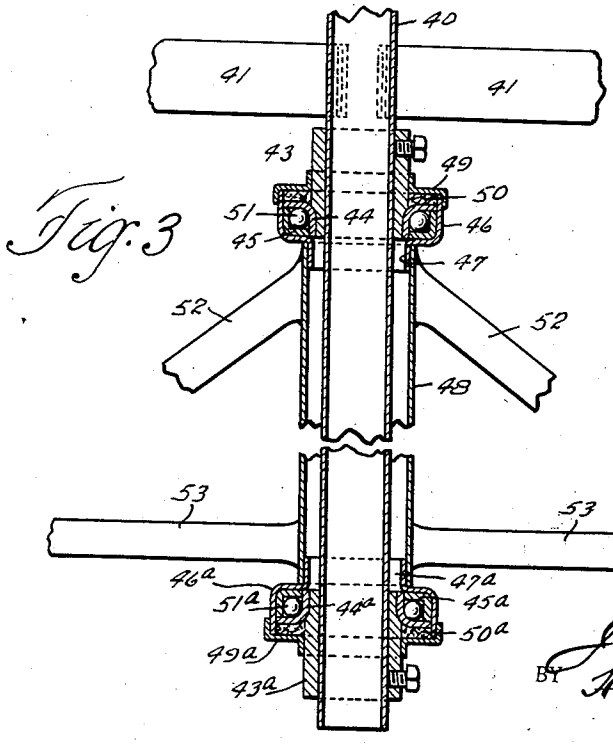


Fig. 3

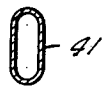


Fig. 4

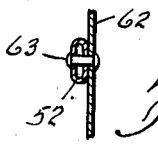


Fig. 5

INVENTOR.
James H. McDerment,
BY Hull, Brock & West,
ATTORNEYS.

Patented Sept. 5, 1939 2,171,883

UNITED STATES PATENT OFFICE

2,171,883

ROTARY VENTILATOR

James H. McDerment, Cleveland, Ohio, assignor to The Swartwout Company, Cleveland, Ohio, a corporation of Ohio

Application November 19, 1937, Serial No. 175,456

7 Claims. (Cl. 98—68)

This invention relates to rotary ventilators and has for its general object to improve the construction and operation of the same. More limited objects of the invention will be set forth in the body of the specification and will be covered in the combinations embodied in the claims hereto annexed.

The drawings forming part hereof illustrate my invention in the best form in which I have thus far embodied the same. Referring to the said drawings, Fig. 1 represents a central longitudinal sectional view through a rotary ventilator constructed in accordance with my invention, the fan and the motor therefor being shown in elevation; Fig. 2 a sectional view corresponding to the line 2—2 of Fig. 1, the fan and motor and their supports being omitted; Fig. 3 a detail in section and elevation of a portion of the means for supporting the rotary cowl from the collar; and Figs. 4 and 5 are details in section corresponding respectively to the lines 4—4 and 5—5 of Fig. 1.

Describing the various parts by reference characters, 10 denotes the base member of a ventilator which, as shown, comprises a square base section 10a and a cylindrical upper collar section 10b of smaller diameter than the forming section, said sections being connected by a square-to-round section 10c. The lowermost section is preferably formed of heavy sheet metal and is supported within a roof coaming 11, as by nails or screws 12 which extend through the flanges 12a of vertical angle braces 13.

The hood-like rotary cowl member 20 is open at the bottom 21 and at the front or delivery end 22. Within the front or delivery end and on opposite sides thereof, inclined ribs 23 are pressed from the metal sides, these ribs providing supports for the pins 24 on which the inner ends of all of the loubers 25, below the uppermost louvers 25a, are sleeved, as shown at 26. The uppermost louver 25a is shown as projecting inwardly beyond the ribs 23 and is provided intermediate its ends with a sleeve 26a by means of which it is mounted upon the pins 24. Each louver is pivotally connected at its outer end to a link 27, by means of an arm 28 pivoted to said link. The louvers are opened and closed by means of a lever 29 having its outer end pivotally connected to an arm 30 which is connected to the uppermost louver outside the pivot 24, the lever being indicated as slidably mounted between a pair of plates, one of which is shown at 31, and having notches 32 and 33 adapted to engage the pins 34 and 35 which are mounted in the slots 36 and 37, respectively, in the manner shown and described more particularly and claimed in my Patent No. 1,770,178, issued July 8, 1930.

The lower and inner end of the rod 29 is connected to a cable or similar flexible operating member 38 which passes around a pulley 39, which may be supported by and between the plates 31. This cable extends downwardly through a tube 40 which, in cooperation with the other parts to be described, serves to support the cowl from the collar 10b formed at the top of the base member.

41 denotes tubular brace bars each secured at its outer end to the inner wall of the cowl, as by means of foot brackets 42. The inner ends of these brace bars are secured, as by welding, to the tube 40. Secured to the tube 40 beneatn the braces 41, is a sleeve 43 carrying at its lower end the upper race 44 of a thrust ball bearing, the lower race 45 whereof is supported within a cup 46 having a short sleeve 47 at its lower end fitting within the top of a long sleeve 48 surrounding the tube 40.

49 denotes a cap which is fitted about the sleeve 43 and provided with an outwardly extending flange forming a cover for the bearing, there being a washer 50 interposed between the cover thus provided and the upper ball race. The lower end of the sleeve 48 receives therewithin the short sleeve 47a of a cup 46a, similar to the sleeve 47 and cup 46, respectively. Within the angle formed between the horizontal and vertical walls of the cup 46a is the upper race 45a of the lower guide bearing while the lower race 44a of the said guide bearing is carried by the top of the sleeve 43a. 49a and 50a denote the parts of the lower cover corresponding to the parts 49, 50, respectively, and 50a denotes the washer interposed between the part 49a and the lower ball race. The balls in both races are indicated at 51 and 51a, respectively

By the construction thus far described, the weight of the rotary cowl is taken by the upper thrust bearing and the thrust and guide bearings are in turn supported from the collar 10b by means of brace bars secured to the tube 48 and to the collar. Two sets of such brace bars shown, namely: a set of bars 52 extending downwardly and outwardly from the top of the tube 48, the lower ends being connected indirectly to the collar by welding or otherwise securing said ends to the outer ends of the horizontal bars 53, the inner ends of which are secured, as by welding, to the tube 48 while their outer ends are se-

cured, as by foot brackets 53a, to the inner wall of the collar.

In the embodiment of my invention shown herein, a fan 54, driven by a motor 55, is employed for the purpose of ejecting the air through the ventilator. The motor and fan are shown as supported by means of a widened band 56 extending about the motor and a plate 57 to which the ends of the band are secured, the plate in turn being supported by brace bars 58 having their outer ends supported by hangers 59 depending from a ring 60, which in turn is supported by bars 61 having their outer ends supported on top of the vertical braces 13. Where a fan is employed for ejecting or exhausting air through the ventilator, I have found that eddy currents will be set up in the upper portion of the base member as well as in the cowl of the ventilator, thus reducing its exhausting efficiency. In order to overcome this objection, I have provided the collar 10b with vertically extending vanes or baffles 62, preferably trapezium-shaped. These vanes or baffles are secured to each pair of inclined and horizontal braces 52, 53, with their outer edges in substantial contact with the inner wall of the collar, their upper edges extending adjacent to the upper thrust bearing, their lower edges extending somewhat below the brace bars 53, and their inner edges, which are parallel with the outer edges, located adjacent to the sleeve 48. The vanes or baffles are secured to their respective pairs of brace bars, as by means of rivets 63. It will be noted that the bars 41, 52 and 53 are formed from tubes. These tubes are elliptical in shape, with their longer axes vertically disposed, whereby they offer a minimum of disturbance and resistance to the air passing thereby.

The vanes serve to straighten the flow of air as it comes from the fan and prevents any turning of the cowl by the pressure of this air, thereby enabling the cowl to be operated by the outside currents of air in the usual manner, through the vane 71.

Where the fan 54 is employed, it will be necessary to so lead the flexible operating member 38 as not to be fouled by the fan. For this purpose, I provide a supporting bar 64 which extends from the central portion of the collar 10b outwardly toward and in proximity to the wall thereof, the said bar supporting a pulley 65 below the tube 40 and a pulley 66 adjacent to its outer end and in such position that the said flexible member may be led directly downwardly through a tubular guide 67, located at one side of the fan and supported by a suitable brace 68 secured to the inner wall of the collar. The bar 64 may be supported in any convenient manner, as by means of a hanger strap 69 secured to the brace bar 53 thereabove, its outer end being secured to the bottom of said brace bar, as by welding.

70 denotes a weight which is secured to the back of the cowl, to provide a counterbalance at the opposite side of the pivot from the louvers. The cowl is also provided with a vane 71, and at its bottom with a reinforcing angle iron ring 72 extending therearound and secured thereto.

While I have illustrated and described my invention herein as embodied in a ventilator equipped with an ejector fan, it will be understood that certain features of construction herein set forth are advantages in ventilator constructions which are not so equipped.

Having thus described my invention, what I claim is:

1. In a rotary ventilator, the combination of a collar, a cowl, and means for rotatably supporting the cowl from the collar, said means comprising a centrally located vertically extending rotatable member, one or more supporting members connecting the cowl to the rotatable member, and means for rotatably supporting the said rotatable member, the last-mentioned means comprising a sleeve surrounding the said rotatable member, an upper supporting bearing and a lower guide bearing interposed respectively between the said rotatable member and the upper and lower ends of the said sleeve, and supporting members connected to said sleeve and to said collar, the supporting members comprising brace bars having their upper ends connected to the upper portion of the sleeve and extending downwardly and outwardly therefrom and brace bars extending substantially horizontally from and connected to the lower portion of the sleeve, the outer ends of said bars being supported by the inner wall of the collar, a fan located below the said supporting members, and vertical vanes extending radially between the sleeve and the collar.

2. In a rotary ventilator, the combination of a collar, a cowl having an outlet, and means for rotatably supporting the cowl from the collar, said means comprising a centrally located vertically extending rotatable member, one or more supporting members connecting the cowl to the rotatable member, means for rotatably supporting the said rotatable member, a fan located below the said cowl, and vertically extending vanes located above said fan and below the outlet from said cowl.

3. In the combination recited in claim 1, the said vanes being secured to the members connecting the sleeve and the collar.

4. In a rotary ventilator, the combination of a collar, a cowl, and means for rotatably supporting the cowl from the collar, said means comprising a centrally located vertically extending rotatable member, one or more supporting members connecting the cowl to the rotatable member, means for supporting the rotatable member for rotation, braces connecting the last mentioned supporting means with said collar, vertically extending vanes interposed between said collar and said rotatable member, and a fan below said vanes.

5. In the combination recited in claim 1, the supporting member or members and the brace bars consisting of flattened tubing substantially elliptical in cross section with their major axes extending vertically.

6. In a rotary ventilator, the combination of a collar, a cowl, and means for rotatably supporting the cowl from the collar, said means comprising a centrally located vertically extending rotatable member, braces connecting the cowl to the rotatable member, a sleeve surrounding the said rotatable member and supporting the same for rotation, braces connecting the sleeve and the collar, vertically extending vanes interposed between said collar and the said sleeve and secured to the said braces, and a fan below said vanes.

7. In a rotary ventilator, the combination of a cowl having a discharge opening, louvers for said opening, a centrally disposed vertically extending tube, means supporting the said cowl from the said tube, a collar, means for rotatably supporting the tube from the said collar, a fan located below the aforesaid supporting means and the said tube, for delivering air through the said

cowl, a bar located above the fan and beneath the bottom of the said tube and extending outwardly from the bottom of the tube to a point located beyond the periphery of the fan, a pulley supported by said bar beneath the bottom of said tube, a pulley also supported by the said bar at a point beyond the outer periphery of the fan, a vertically disposed guide tube also arranged beyond the periphery of the fan, and a flexible member operatively connected to the said louvers and extending through the first-mentioned tube, around the said pulleys and through the second-mentioned tube.

JAMES H. McDERMENT.