Feb. 21, 1967 A. S. SHEPPARD 3,305,163

VENTILATOR

Filed April 12, 1965

2 Sheets-Sheet 1

Fig. 1

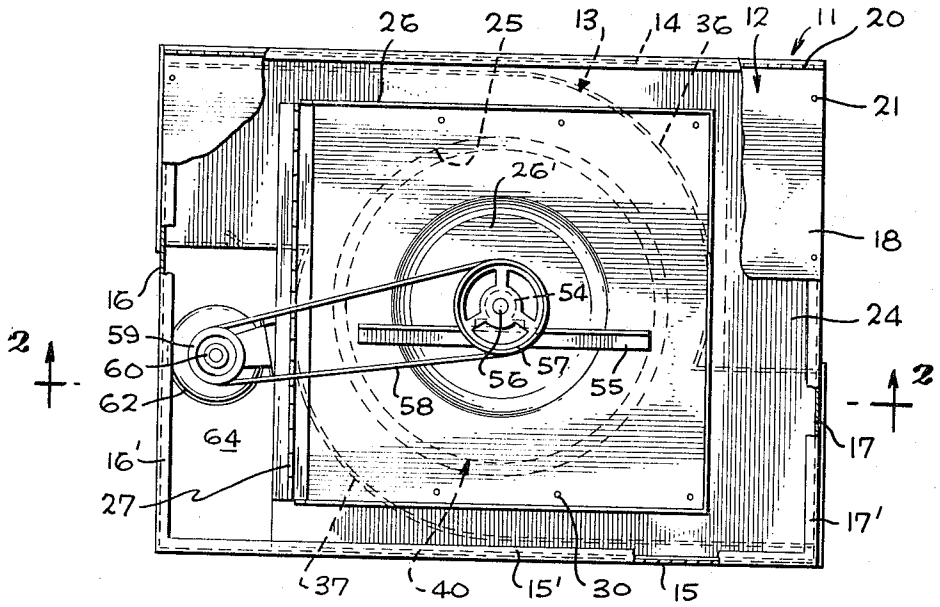
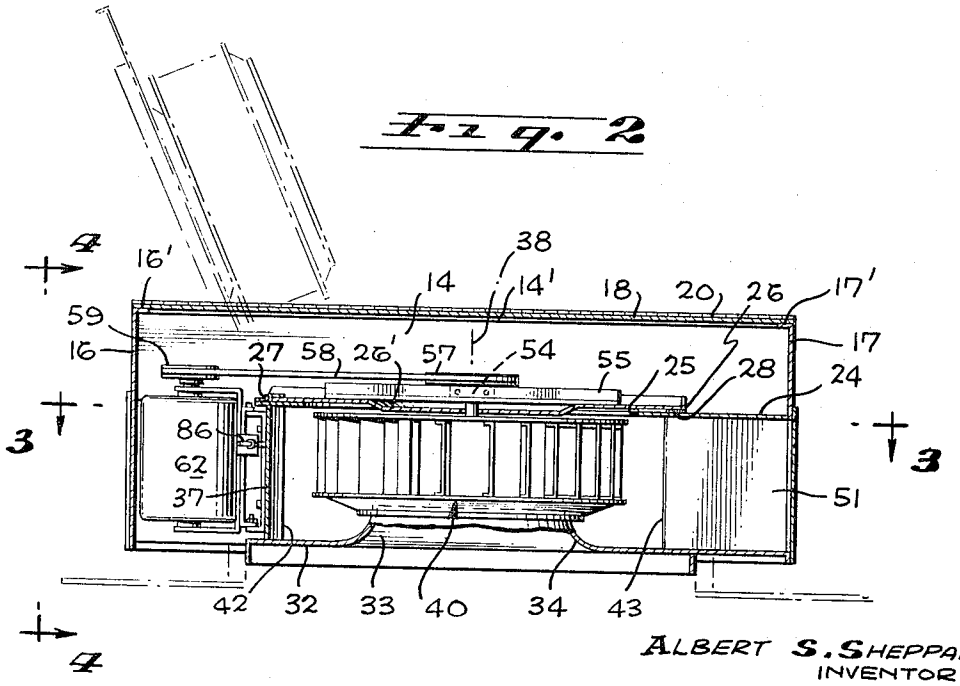


Fig. 2



ALBERT S. SHEPPARD
INVENTOR

BY Mason & Graham

ATTORNEYS

Feb. 21, 1967 A. S. SHEPPARD 3,305,163

VENTILATOR

Filed April 12, 1965 2 Sheets-Sheet 2

Fig. 3

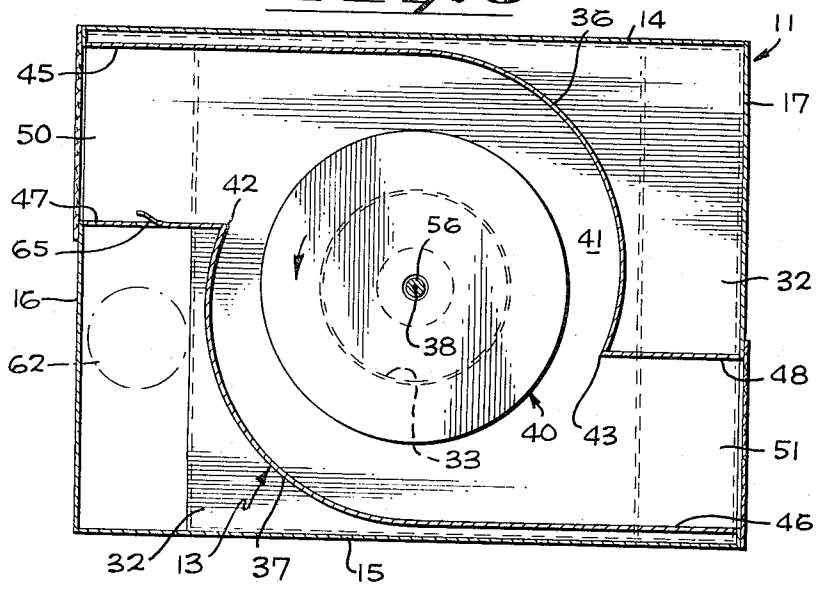


Fig. 5

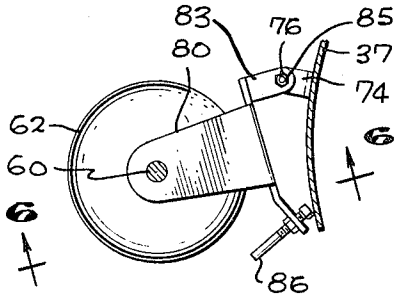
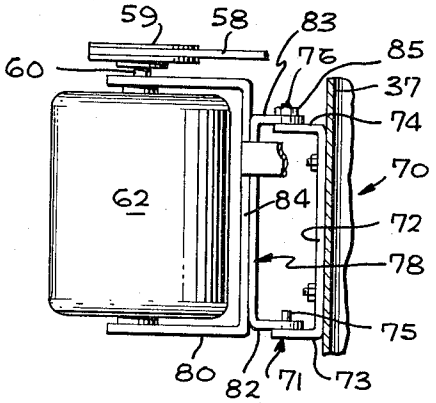


Fig. 6



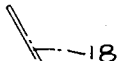


Fig. 4

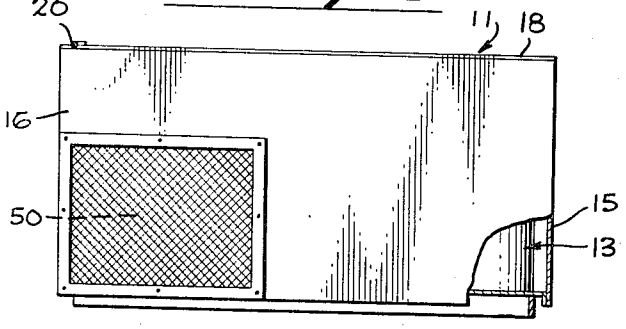
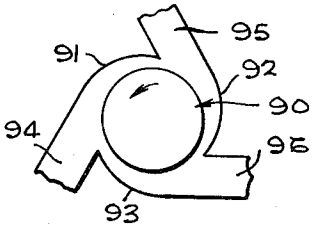


Fig. 7



ALBERT S. SHEPPARD
INVENTOR

BY Mason & Graham

ATTORNEYS

United States Patent Office 3,305,163 Patented Feb. 21, 1967

3,305,163

VENTILATOR

Albert S. Sheppard, Granada Hills, Calif., assignor to The G. C. Breidert Co., San Fernando, Calif., a corporation of California

Filed Apr. 12, 1965, Ser. No. 447,341
7 Claims. (Cl. 230—117)

This invention has to do generally with ventilating devices embodying motor-driven blower wheels of the centrifugal fan type and particularly with devices of this nature adapted to be mounted on the roof or wall of a building, or interiorly thereof for exhausting air from or supplying it to a given space in the building.

An object of the invention is to provide a new and improved motorized ventilator which is so constructed as to render the interior readily accessible for cleaning and other servicing. In this connection lack of accessibility to the interior of forced air ventilators has been a major problem particularly where the ventilators are used for removing smoke and hot gases with entrained grease and soot, as, for example, from cooking ranges of restaurants and the like. Major disassembly must often be resorted to periodically in such instances of use in order to clean the units to reduce the fire hazard.

More particularly it is an object to provide a novel housing and blower wheel mounting in a ventilator which enables the blower wheel to be quickly disengaged from the drive motor and to be removed from its housing and at the same time provide access to the interior of the housing scroll.

A further object is to provide a novel blower wheel and drive motor assembly.

Still another object is to provide a novel motor mounting bracket assembly.

A further object is to provide a novel blower wheel housing or scroll housing designed for a blower wheel of the centrifugal fan type and embodying multiple outlets to provide greater efficiency than conventional units.

These and other objects will be apparent from the drawings and the following description. Referring to the drawings:

FIG. 1 is a plan view of a device embodying the invention with the top wall or cover substantially broken away to expose the interior;

FIG. 2 is a sectional elevational view on line 2—2 of FIG. 1;

FIG. 3 is a sectional plan view on line 3—3 of FIG. 2;

FIG. 4 is an end elevational view on line 4—4 of FIG. 2;

FIG. 5 is a sectional detail plan of the motor and mounting, on a larger scale;

FIG. 6 is a sectional view on line 6—6 of FIG. 5; and

FIG. 7 is a diagrammatic representation of a blower housing with three outlets.

More particularly describing the invention, numeral 11 generally designates a ventilator device which has a main or outer housing 12 and an inner or blower wheel housing 13. The main housing is shown as rectangular although this particular shape is not essential and it includes side walls 14 and 15 and end walls 16 and 17. The upper edges of the end walls are provided with inwardly extending flanges, 14', 15' and 17', respectively. A cover or top wall 18 is hingedly mounted upon flange 14' by means of a piano-type hinge 20. Any suitable means, such as screws 21, extending through the cover and the flanges at appropriate places may be used for releasably securing the cover or top wall in position.

The blower wheel housing 13 is mounted within the main housing and includes an upper wall 24 having an opening 25 therein which is normally closed by a cover or trapdoor 26. The trapdoor is hingedly mounted at one

edge to the top wall as by a piano-type hinge 27. A gasket 28 may be provided between the perimeter edge portions of the trapdoor and the upper wall 24. Screws 30 or other fastening means may be provided for releasably securing the door in closed position.

The blower wheel housing includes a bottom wall 32 which has a central opening 33 defined by an upwardly curved circular wall section 34 which forms an inlet. The housing also includes scroll side wall means and this, in the preferred form of the invention which is illustrated, comprises the two generally spiral wall sections 36 and 37 disposed oppositely to each other and each extending through somewhat more than a quarter of the distance about the central axis 38 of the blower wheel 40. These walls, thus far described, form what may be termed a blower wheel chamber 41 in which the blower wheel, which is of the centrifugal fan type, is driven to rotate in the direction of the arrow thereon in FIG. 3. The scroll side walls define outlet openings 42 and 43 and beyond these, straight wall sections 45 and 46 are provided as a continuation of the spiral sections 36 and 37, respectively, to the ends of the outer housing. These latter walls, in conjunction with short wall sections 47 and 48, and the top and bottom walls 24 and 32, form outlet passages 50 and 51 which extend in opposite directions to the exterior of the outer housing.

The blower wheel 40 is journaled in a bearing 54 mounted on the trapdoor 26 which has a dished central portion 26'. A bridging cross member 55 forms part of the bearing mounting. The shaft 56 of the blower has a sheave 57 fixed thereto and this is driven by a belt 58 extending around it and a sheave 59 on the shaft 60 of an electric motor 62. The latter is positioned laterally of the blower within a motor compartment 64 formed by the two housings. The compartment is ventilated by a slot or louver 65 provided in wall 47 of the inner housing. It will be noted that the motor compartment is open at the bottom, and hence air may enter there and flow past the motor as it is drawn through slot 65 by the high velocity exhaust air from the blower.

The motor is supported upon a motor mount assembly 70. This comprises a stationary mounting bracket 71 having a main straight section 72 which is bolted or otherwise secured to the wall 37 of the blower housing. The bracket has a pair of parallel spaced ears, 73 and 74. The lower ear is provided with an upstanding pin 75 and the upper ear with an upstanding threaded pin or stud 76. The lower pin 75 is preferably longer than stud 76 to facilitate installation of the motor, however this is not essential and the pins can be of equal length, or the upper pin made longer. The assembly also includes a second bracket member 78 which is bolted to a motor mounting yoke 80. The second mounting bracket has a pair of parallel spaced ears, designated 82 and 83, extending out from the main section 84 and spaced apart the same distance as the ears on the first bracket. Ears 82 and 83 are apertured with the holes registering so that the ears may be placed over and receive the pins respectively of the first bracket. A nut 85 on the pin or stud 76 serves to detachably secure the parts.

The motor mounting yoke 80 is provided with an adjustable screw 86 for spacing the motor relative to the blower so that the tension of the belt 58 can be adjusted.

With the construction described it will be noted that when the cover 18 is swung upwardly to the broken-line position of FIG. 4, the trapdoor 26 can then also be swung upwardly as shown in broken lines in FIG. 2 to remove the blower from the blower housing and expose the interior thereof for cleaning. It is a feature of the invention that the trapdoor is so hinged that as it is

swung upwardly, the distance between the two sheaves **57** and **59** is decreased, thereby automatically disengaging the belt from the sheaves.

I have found that by using interrupted scroll side walls I can provide a larger total outlet area which allows the air to escape at a lower velocity, thereby substantially diminishing any noise which can be attributed to the velocity of the air. Also, with the larger volume of air being moved at a given static pressure and a specific rotational speed of the blower, there is an increase in work done by the unit for the same amount of horsepower input. I believe one reason for the increased performance of the multiple outlet design is that the cutoff points and outlets allow the entire volume of air being discharged to be broken into smaller volumes with lower velocities within the system and consequent less turbulence, thereby making for smoother flow of air and less internal friction losses.

Although I have illustrated and described a preferred form of my invention, I contemplate that various changes and modifications can be made therein without departing from the invention, the scope of which is indicated by the following claims. Thus I may form the blower housing to provide three or more outlets instead of only two as shown. Thus, by way of example, in FIG. 7 I show a diagrammatic view of a blower housing having three outlets. In the view, the blower wheel is designated **90** and rotates in the direction of the arrow thereon. The housing is formed to provide three spiral scroll walls **91**, **92** and **93** and these are interrupted to provide the three outlets **94**, **95** and **96**. Normally, the scroll walls are of equal length, irrespective of the number of outlets, but in some installations it may be desirable to provide these of different lengths and thereby locate the outlets at different circumferential spacings relative to the blower axis.

I claim:

1. In a motorized ventilator adapted to be mounted on the roof of a building or the like, a main housing including side walls and a top wall, said top wall being openable, a blower wheel housing mounted within said main housing and having an inlet and an outlet in open communication with the exterior of the main housing, said main and blower housings cooperating to define a head space inside the main housing above the blower housing, said blower wheel housing having an upper wall with a trapdoor therein, a blower wheel journaled on said trapdoor for rotation within the blower wheel housing, said trapdoor being movable to position the blower wheel exteriorly of the blower wheel housing and expose the interior thereof, an electric motor mounted laterally of said blower wheel in said main housing exteriorly of said blower wheel housing, and drive means extending through said head space connecting said motor and said blower wheel.

2. The device set forth in claim **1** in which said trapdoor is hingedly mounted at one edge whereby to swing upwardly and away from the blower wheel housing.

3. The device set forth in claim **1** in which said drive means includes an endless belt from the motor to the drive wheel, and in which said trapdoor is hingedly mounted for upward swinging movement about an axis so positioned as to shorten the distance between the driven end of the blower wheel and said motor as the trapdoor swings upwardly.

4. The device set forth in claim **1** in which the top wall of said main housing is hingedly mounted at one edge to swing upwardly and in which said trapdoor is hingedly mounted at one edge to swing upwardly and away from the blower wheel housing to position the blower above said main housing.

5. In a motorized ventilator adapted to be mounted on the roof of a building or the like, a main housing including side walls and a top wall, a blower wheel housing mounted within said main housing and defining a blower wheel chamber having an inlet, a blower wheel mounted on one of said housings for rotation within the blower wheel chamber, said main housing and said blower wheel housing defining a motor chamber laterally of said blower wheel housing and open at the bottom, said blower wheel housing defining an outlet passage leading from said blower wheel chamber to the exterior of said main housing, said blower wheel housing having an opening of limited cross-sectional area between said outlet passage and said motor chamber whereby to draw air out of said motor chamber, a motor in said motor chamber, and a driving connection between said motor and said blower wheel.

6. A motor mount, comprising a first mounting bracket providing a pair of spaced parallel ears, one of said ears having a first pin projecting toward the other ear and said other ear having a pin projecting therefrom in the same direction as and in axial alignment with said first pin, a second mounting bracket providing a pair of parallel ears spaced apart the same distance as the ears of said first bracket, said ears of said second bracket being provided with registering apertures receiving the pins respectively of said first bracket.

7. The motor mount set forth in claim **6** in which one of said pins is threaded and in which a nut is employed thereon to detachably secure to brackets together.

References Cited by the Examiner

UNITED STATES PATENTS

2,330,938	10/1943	Williams	230—47
2,458,045	1/1949	Angus.	
2,464,473	3/1949	Wessek	230—235
2,482,519	9/1949	Schwarz	230—117 X
3,102,679	9/1963	Rudy	230—117

ROBERT M. WALKER, *Primary Examiner.*