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2,297,049

BLOWER STRUCTURE

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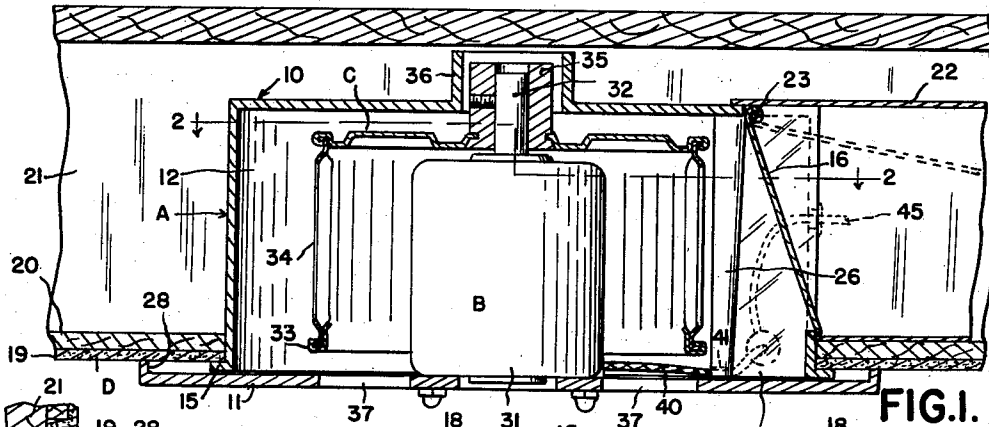


FIG. 1.

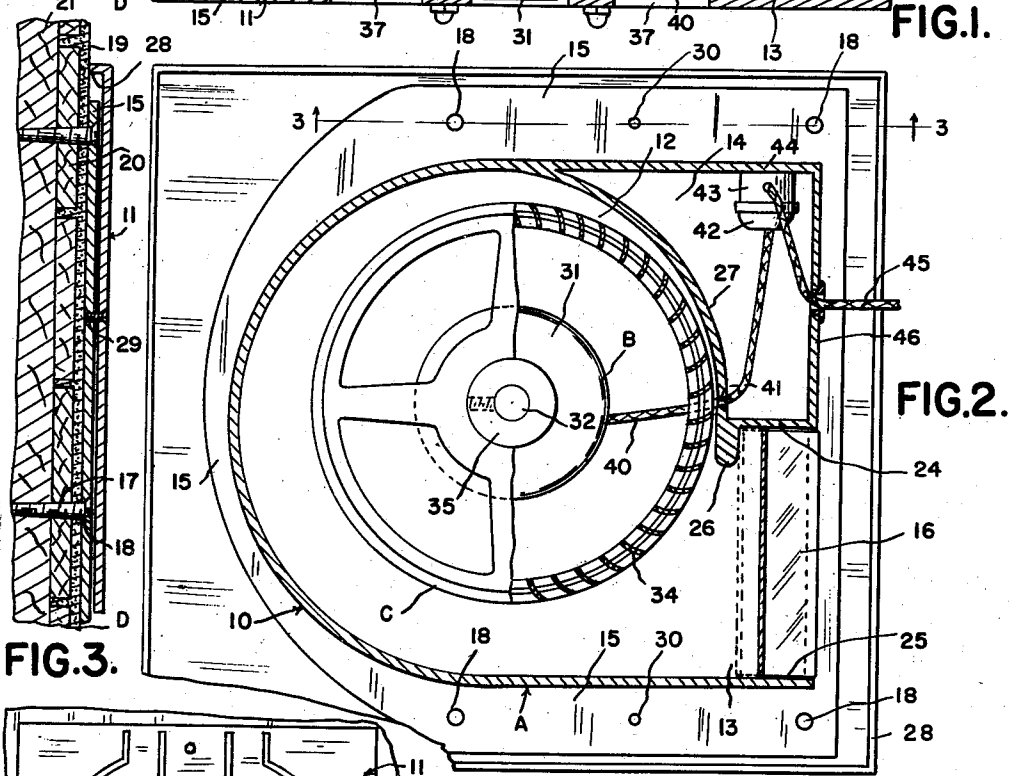


FIG. 2.

FIG. 3.

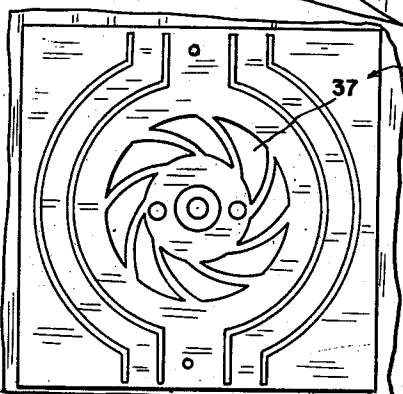
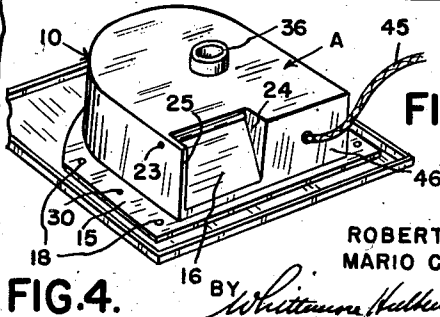


FIG. 4.

FIG. 5.

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BLOWER STRUCTURE

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8 Claims. (Cl. 230—117)

This invention relates generally to blower structures and refers more particularly to a self-contained electric blower adapted to be mounted in a ceiling or upright wall of a room and having means for conducting air, odors, etc., from such room to a suitable outlet.

One of the essential objects of the invention is to provide a blower structure of this type wherein the annular part of a rotary squirrel cage fan is provided with circumferentially spaced vanes for producing currents of air and is arranged concentric with and operatively connected to an electric motor within a two-part supporting housing.

Another object is to provide a blower wherein one part of the housing is adapted to be set in and secured to the ceiling or upright wall and comprises a hollow body having two chambers, one being substantially circular for receiving the motor and fan and provided with a shutter-controlled tangentially extending air outlet passage, and the other being substantially triangular-shaped and located at one side of the tangential outlet passage so as to constitute a handy terminal box for electrical parts.

Another object is to provide a blower wherein the second part of the housing constitutes a covering or face plate for the body part and has one or more air inlets registering with the space between the motor and concentric fan.

Another object is to provide a blower wherein the face plate is detachably secured to the body part of the housing and carries the motor and fan so that such plate, motor and fan as a unit may be removed at will from the body part of the housing for repairs or other purposes.

Another object is to provide a blower structure wherein the electric parts within the triangular chamber of the body include a mating plug and socket which may be separated when the unit just mentioned is removed from the body of the housing.

Another object is to provide a blower structure that is simple in construction, inexpensive to manufacture, and efficient in operation.

Other objects, advantages and novel details of construction of this invention will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawing, wherein:

Figure 1 is a fragmentary vertical sectional view through a ceiling installation of a blower structure embodying our invention;

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1;

Figure 3 is a sectional view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a fragmentary bottom plan view of the structure illustrated in Figure 1;

Figure 5 is a fragmentary perspective view of the blower structure.

Referring now to the drawing, A is the housing, B is the electric motor, and C is the squirrel cage fan of a blower structure embodying our invention.

As shown, the housing A has a hollow inverted substantially cup-shaped body part 10 and a substantially flat cover or face plate part 11. Preferably the body part 10 has a substantially circular chamber 12 provided with a tangentially extending air outlet passage 13, and is provided at one side of the outlet passage with a substantially triangular chamber 14. At the lower edges of the body part is a laterally extending substantially flat flange 15, while at the outer end of the tangential outlet 13 is a gravity closed pivoted shutter 16. When the body part 10 of the housing is set into a ceiling such as D of a room, any suitable means such as screws 17 engaging openings 18 in the lateral flange 15 may be employed for holding the body part in place. As shown, these screws 17 extend through the plaster 19 and laths 20 and are anchored in the structural supporting elements such as wood beams 21 of the ceiling.

When the body part 10 of the housing is mounted as described in the ceiling, the tangential outlet 13 opens into a suitable air duct 22 which may lead to a flue or other outlet means (not shown). The pivot 23 for the shutter 16 is carried by opposite walls 24 and 25, respectively, of the tangentially extending outlet 13 at the top thereof so that the shutter 16 may normally rest in closed position against an extended part 26 of the curved wall 27 of the circular chamber 12 at the inner end of the outlet 13.

The cover or face plate 11 has a greater area than the body part 10 so as to overlap and extend beyond the lateral flange 15 and has a marginal upturned flange 28 for abutting engagement with the lower surface of the ceiling D. Preferably this cover plate 11 is detachably held in place by screws 29 that threadedly engage suitable openings 30 in the lateral flange 15 of the body part of the housing.

The electric motor B has a cylindrical housing 31 rigidly mounted in an upright position on the cover plate 11 at the center thereof and has a drive shaft 32 extending upwardly above the upper end of the housing 31.

The squirrel cage fan C has an annular part 33 concentric with the motor housing 31 and provided with circumferentially spaced vertically extending vanes 34 for producing currents of air, and has a hub 35 sleeved upon and secured to the upstanding drive shaft 32 of the motor.

When the cover plate 11 is secured as aforesaid to the body part 10 of the housing, the motor B and fan C are received in the circular chamber 12, while the hub 35 of the fan is received in an upstanding tubular part 36 of said chamber.

Located in the cover plate 11 in registration with the annular space between the motor housing 31 and the annular part 33 of the fan is a circular series of openings 37 forming air inlets for the housing A. By referring to Figure 1, it will be noted that the inside diameter of the circle of openings 37 is substantially equal to the diameter of the motor housing 31, while the outside diameter of the circle of openings 37 is substantially equal to the diameter of the annular part 33 of the fan. Hence, practically all air received through said openings 37 passes upwardly between the motor housing 31 and annular part 33 of the fan and not only serves to cool the motor, but also permits the fan to function more efficiently.

In the present instance, the motor B has an electric conductor 40 that extends through a notch or recess 41 in the wall 27 of the chamber 12 and is provided at its free end with an electric plug 42 that mates with a suitable electric socket 43 located within and rigid with a wall 44 of the triangular chamber 14. Thus, when the screws 29 are withdrawn from the flange 15 so that the cover plate 11, motor B and fan C as a unit may be removed from the body part 10 of the housing, the plug 42 may be disengaged from the socket 43. Any suitable electric conductor 45 in circuit with the usual wiring system of the building of which the room mentioned is a part may extend through a wall 46 of the triangular chamber 14 and be connected to the electric socket 43. Likewise, any suitable means such as a conventional electric switch (not shown) may be employed in the circuit for controlling the operation of the motor B.

Thus, from the foregoing, it will be apparent that air, odors, etc., will be drawn from the room through the openings 37 in the cover plate 11 into the space between the motor housing 31 and annular part 33 of the fan and that such air will then be forced by the vanes 34 of the fan outwardly from the chamber 12 through the tangentially extending outlet 13 past the damper 16 to the air duct 22. When the motor B is operating, the force of air in the outlet 13 is such that it will swing upwardly the normally closed damper 16 to permit the outflow of air as described and will keep it up until the motor is again stopped whereupon the damper 16 will fall by gravity to its normally closed position.

What we claim as our invention is:

1. A blower structure having a hollow body adapted to be set in a ceiling or upright wall of a room and having an air outlet, an electric motor within said body and having a drive shaft, a squirrel-cage fan having a hub secured to the motor drive shaft and having an annular part substantially concentric with the motor and provided with circumferentially spaced vanes for producing currents of air, and a face plate for the hollow body detachably secured thereto and forming a support for the motor and fan, said

face plate being provided in registration with the space between the motor and concentric annular part of the fan with a circular series of air inlet openings.

2. A blower structure having a two-part housing, one part being hollow and having an outlet opening for air, the other part being a cover plate for the hollow part and detachably connected thereto, an electric motor within the hollow part and having a housing rigid with the cover plate, said motor having a drive shaft, a squirrel cage fan having a hub mounted upon the drive shaft and having an annular part substantially concentric with the motor housing and provided circumferentially thereof with vanes for producing currents of air, and the cover plate being provided in registration with the space between the motor housing and concentric annular part of said fan with one or more inlet openings for air.

3. A blower structure having a two-part housing, one part having two chambers, the other part being a cover plate for both chambers and detachably secured to the first mentioned part.

4. A blower structure having a two-part housing, one part having two chambers, an electric motor within one chamber and having a housing and a drive shaft, a squirrel cage fan having a hub fixed to the motor drive shaft and having an annular part substantially concentric with the motor housing and provided with circumferentially spaced vanes for providing currents of air, an electric socket anchored in the second chamber, the motor having an electric conductor extending between said chambers and provided with a plug for detachable engagement with said socket, and the second part of the housing being a cover plate for both chambers and a common support for the motor and fan, the motor housing being rigidly secured to said cover plate, and the cover plate being detachably secured to the first mentioned part of the two-part housing.

5. A blower structure having a two-part housing, one part being inverted cup-shaped in configuration and having an opening through which air in the cup-shaped part may be discharged, the other being a substantially flat cover or face plate extending over the open mouth of the cup-shaped part and having one or more openings through which air from the atmosphere may enter the cup-shaped part, and an electric motor and a squirrel-cage fan within the cup-shaped part and carried by the cover plate, the motor having its housing anchored upon the cover plate and having its drive shaft extending axially of the cup-shaped part, the fan having a hub mounted on the drive shaft of the motor and having an annular skirt part encircling and substantially concentric with the housing of the motor, the cover plate being detachably secured to the cup-shaped part whereby said plate, motor and fan as a unit may be separated from or assembled with the cup-shaped part of the housing.

6. A blower structure having a two part housing, one part having two chambers, the other part being a common cover plate for both chambers and detachably secured to the first mentioned part, an electric motor in one of the two chambers aforesaid and having a housing and a drive shaft, the motor housing having one end thereof secured to and extending at substantially right angles from the cover plate, the drive shaft being at the end of the motor housing, a fan having a hub fixed to the motor drive shaft and

having a substantially cup-shaped portion enveloping the motor housing and opening toward but terminating short of the cover plate, the sides of the cup-shaped portion constituting an annulus substantially concentric with the motor housing and provided with circumferentially spaced vanes for providing currents of air, the cover plate being provided in registration with the space between the motor housing and concentric annulus of the fan with one or more inlet openings for air, the chamber aforesaid containing the motor and fan having an outlet opening for air, an electric socket anchored within the second chamber of the first mentioned part, and an electric conductor for the motor extending between the two chambers of the first mentioned part and provided with a plug for detachable engagement with the said socket.

7. A blower structure having a two part housing, one part having a chamber, the other part being a cover plate for said chamber and detachably secured to the first mentioned part, an electric motor in said chamber and having a housing and a drive shaft, the motor housing having one end thereof secured to and extending at substantially right angles from the cover plate, the drive shaft being at the other end of the motor housing, a fan having a hub fixed to the motor drive shaft and having a substantially cup-shaped portion enveloping the motor housing and opening

toward but terminating short of the cover plate, the sides of the cup-shaped portion constituting an annulus substantially concentric with the motor housing and provided with circumferentially spaced vanes for providing currents of air, the cover plate being provided in registration with the space between the motor housing and concentric annulus of the fan with one or more inlet openings for air, and said chamber containing the motor and fan having an outlet opening for air.

8. A blower structure having a two part housing, one part having a chamber provided with a closed end and an open end, the other part being a cover plate for the open end of said chamber and detachably secured to the first mentioned part, an electric motor in said chamber and having a housing and a drive shaft, the motor housing having one end thereof secured to and extending at substantially right angles from the cover plate, the drive shaft being at the other end of the motor housing, a fan having a hub fixed to the motor drive shaft at the closed end of said chamber, the cover plate being provided in registration with the space between the motor housing and the side walls of the chamber with one or more inlet openings for air, and a side wall of said chamber having an outlet opening for air.

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