

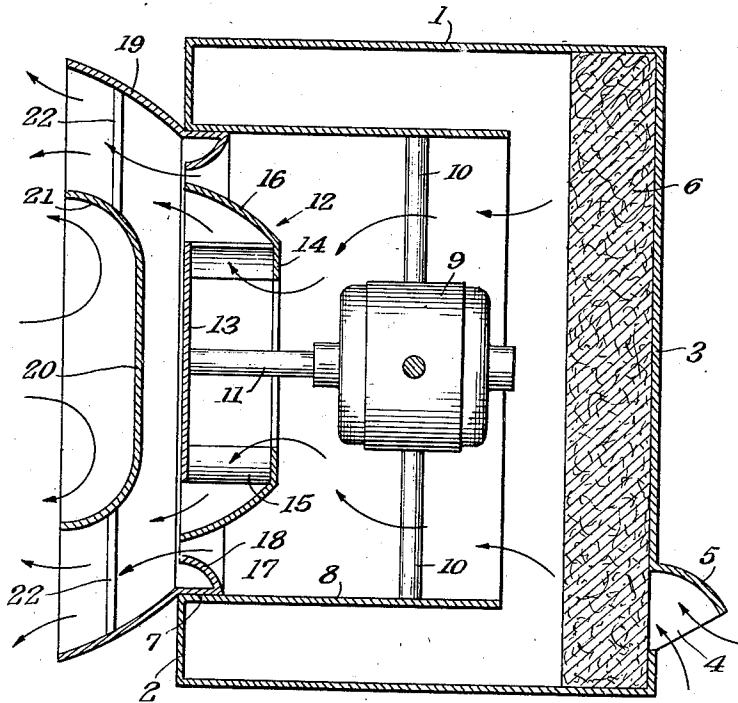
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VENTILATOR

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VENTILATOR

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5 Claims. (Cl. 230-127)

This invention relates to ventilators of the type intended to provide filtered air to the space to be ventilated.

The primary object of this invention is to provide a ventilator furnishing a fully adequate flow of air.

Further important objects of this invention are to provide means to create a flow of air which shall be inherently noiseless in its operation; which shall deliver air in such manner as to avoid drafts; which shall be simple in structure and efficient in operation.

Other and further objects and advantages of my invention will become apparent from the description herein of various preferred embodiments of my invention, shown in the drawing in which:

The figure is a vertical cross-sectional view of a ventilator embodying my invention in preferred form.

My ventilator comprises a casing 1 of box-like or similar shape, adapted to be placed in a window or other opening of the room or other space to be ventilated and provided with the front and rear walls, 2 and 3 respectively. The rear wall 3 is provided with air inlet openings 4 protected from the weather by hoods 5, only one of each of the openings 4 and hoods 5 being shown. Inside the casing 1 and adjacent the rear wall 3 an air filter 6 is placed across the flow of air from the inlets 4.

The front wall is provided with a circular opening 7. A tube or duct 8 of approximately the same diameter as the opening 7 extends backwardly into the casing 1 to a convenient distance. An electric motor 9 is mounted within the tube 8 by means of any convenient suspension as shown conventionally at 10.

The motor 9 is provided with a shaft 11 which drives the air impeller 12. The impeller comprises a front plate 13, to the rear of which the motor shaft is attached, a rear ring 14 and peripheral blades 15 held between the front 13 and the rear ring 14. A concave collecting and deflecting bowl 16 is attached to the rear ring 14 and extends upwardly and forwardly over the impeller cage.

A stationary structure co-operating with the rotor structure above described is mounted at the mouth of the duct 8 by means of the flange 17 fitting within the tube 8. A skirt 18 depends from the inner edge of the flange 17 and is curved forwardly to co-operate with the outer surface of the bowl 16, to provide a Venturi-like annular exit for air drawn over the exterior of the bowl

16. From the outer edge of the flange 17 an outwardly and forwardly flaring guide 19 collects, guides and delivers to the room all the air moved by the impeller. A flat plate 20, substantially of the same dimensions as the plate 13, is placed at an appropriate distance in front of the latter; and may have its edge curved forwardly as at 21 to provide an annular air exit duct in co-operation with the bell 19. The plate may conveniently be mounted within the bell 19 by means of the spider 22.

In operation, when the impeller is rotated by the motor, air enters the inlets 4, passes through the filter 6 and enters the duct 8. Part of the air entering the duct passes through the impeller cage, and the remainder is drawn over the outer surface of the bowl 16. The air passing through the cage is collected by the bowl 16 and directed outwardly and forwardly. The air drawn over the outside of the bowl passes through the duct formed by 16 and 18 and joins the air from the impeller cage. The mingled air is received by the bell 19 and guided and delivered forwardly into the space to be ventilated in the form of a diverging, annular sheet diffused sufficiently to avoid the creation of drafts in spite of the large volume of air moved by the impeller. The arrows in the figure show the movement of the air through and in the vicinity of my device.

The provision of the plate 20 is a very important feature of my invention. It prevents the formation of a vacuum by the low pressure area at the center of the wheel while the edge of the plate co-operating with the collector bowl, determines the pressure characteristics of the pump. Thus the plate 20 functions, in a manner comparable to that of the scroll in an ordinary centrifugal blower, to transform or convert velocity pressure into static pressure; and a good part of the efficiency of my pump arises therefrom.

It is clear that many variations in the application of my invention the ventilation of a room may be made without departing from its scope and spirit.

I claim:

1. An air pump comprising a centrifugal impeller wheel, a rotating collector and deflector extending over the periphery of the wheel, and a stationary plate placed parallel to and in front of the impeller wheel, said plate having its peripheral portion extending outwardly and forwardly, to block off the space in front of the said wheel.

2. In apparatus of the class described, an air duct, a centrifugal impeller wheel mounted to

rotate in said duct, a rotary collector and deflector receiving and discharging air from the impeller wheel, a member mounted within the duct and extending toward and co-operating with the said collector to provide an annular, Venturi-like passage for air drawn over the outside of said collector, and a stationary plate positioned to block off the space in front of said impeller wheel, said plate having its peripheral portion extending outwardly and forwardly.

3. In apparatus of the class described, an air duct, a centrifugal impeller wheel mounted to rotate in said duct, a collector and deflector mounted on and extending over the periphery of the impeller wheel, a stationary member provided with a portion extending toward and co-operating with the collector to form an annular Venturi-like passage for air drawn over the outside of the collector, and an outwardly flaring portion adapted to receive and direct forwardly air from the said collector and from the said annular passage.

4. In an apparatus of the class described, an air duct, a centrifugal impeller wheel mounted

to rotate in said duct, a collector and deflector mounted on and extending over the periphery of the impeller wheel, a stationary member provided with a portion extending toward and co-operating with the collector to form an annular, Venturi-like passage for air drawn over the outside of the collector and an outwardly flaring portion adapted to receive and direct forwardly air from the collector and from the said annular passage, and stationary means to block off the space in front of the impeller wheel.

5. In an apparatus of the class described, a centrifugal impeller mounted to rotate, means mounted on and extending forwardly over the periphery of the impeller to collect and direct forward air delivered by the impeller, stationary means at the front of the impeller to block off the low pressure area at the center of the impeller, said means having portions co-operating with the collector means aforesaid to convert velocity pressure of the air moved by the impeller into static pressure.

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