FORCED VENTILATOR FOR TOILET BOWLS

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The principal object of this invention is to provide a forced ventilator for toilet bowls that utilizes the flushing tube of the bowl and which will remove all odors from the bowl.

A further object of my invention is to provide a forced ventilator for toilet bowls that may be readily placed on installations now in use and which may be operated when the bowl is in use.

A still further object of this invention is to provide a forced ventilator for toilet bowls that is uniform and direct in its application of suction for the removal of gases or fumes.

A still further object of this invention is to provide a forced ventilator for toilet bowls that can be used on a number of installations in the same building.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawing, in which:

Fig. 1 is a side sectional view of a toilet bowl and water tank with my device installed ready for use.

Fig. 2 is an enlarged sectional view of a portion of an overflow pipe showing the water seal.

Fig. 3 is an enlarged view of a portion of a toilet seat showing the air seal or gasket.

Fig. 4 is an enlarged sectional view showing the method of installing my device on a common overflow pipe.

Fig. 5 is an enlarged side view of the valve float and air chamber illustrated in Fig. 4.

Every installation of a closet bowl, urinal, or the like has an outside ventilator. However this is merely a pipe opening into the outside atmosphere and is not satisfactory. Several attempts have been made to attain forced ventilation by adding to the bowl or vessel some complicated type of external suction apparatus but, due to the complication of the device, they have not been satisfactory. These types were hard to install. The present invention presents enough suctional area within the vessel, and were extremely limited in their adaptation to installations already in use. A distinct need is felt for a forced ventilator for toilet bowls and the like that will efficiently and completely carry off all odiferous gases as they originate and expel these fumes into the outside atmosphere at some remote point. I have overcome the disadvantages herebefore enumerated and have supplied a solution for the need of an economical, compact, easily installed, and practical forced ventilator for bowls and the like as will be appreciated and hereinafter set forth.

Referring to the drawing, I have used the numeral 10 to designate the ordinary toilet bowl having the integrally formed flush conduit 11 about its top edge. The numeral 12 designates the ordinary toilet seat ring hingedly secured to the upper surface adjacent the rear portion of the bowl 10 and having the ordinary cover lid hinged thereto.

The numeral 13 designates a resilient gasket such as a rubber tube or the like which is secured to the seat 12 and which, when the seat is down, prevents air from entering the bowl 10 between the seat and the top of the bowl.

I have used the numeral 14 to designate the common water storage box. As is known, this box remains full of water to a predetermined level and is supplied with a rubber ball release valve which I have designated by the numeral 15. This rubber valve 15 is seated in the flared end of a water pipe 16 which has its inside passage-way in communication with the inside passageway of the flush conduit 11. The numeral 17 designates an overflow pipe which is in communication with the inside of the pipe 16 below the ball valve 15 and has its upper end curved in the form of a horizontal 18 to form a water seal as shown in Fig. 2. This U-shaped portion I have designated by the numeral 18. The numeral 19 designates the ordinary filler pipe which may flow into the open end of the U-shaped pipe 18. As is generally known, the filler pipe 19 is for the purpose of continuing a flow of water after the tank has been flushed which will run through the overflow pipe 17 and into the bowl 16 for preserving a water trap therein. The numeral 20 designates a ventilator pipe having one end in communication with the inside of the pipe 16 and having its other end in communication with a remotely positioned housing 21. Secured within this housing is an electrical motor 22 which operates a blower fan 23. This fan is so constructed that, when in operation, it sucks air or gas from the pipe 20 and expels it through a pipe 24 into the atmosphere or a suitable filter. The numeral 25 designates an electric wire in communication between one side of a source of electric energy and one side of the windings within the motor 22.

The numeral 26 designates a second electric wire having one end in communication with the electric motor 22, and its other end in communication with a suitable switch 27. This switch 27 may be either of the manually operated type or may be automatically actuated by the hinge action when lowering the seat 12. The other side of the switch 27 is in communication with the other side of a source of electric energy as shown in the drawing. Referring to Fig. 4 of the drawing, it will be noted that I have pro-
vided an alternate construction for the accomplishment of the same specific purpose, but which utilizes the common overflow pipe located within the water chamber as a ventilator tube when it is not being used for the specific purpose of carrying water. This type, while being of practical value, lends itself particularly to specific forms of construction. The overflow pipe has its inside passageway in communication with the inside of the pipe 16 below the ball valve 15 and has on its upper end an air chamber which I have designated by the numeral 26. The pipe 20 is secured to, and in communication between, the blower fan and the chamber 28 for sucking the air from the bowl 10 through the conduit 11, the pipe 16, the overflow pipe 17, through the chamber 28, and thence through the pipe 20, where it is expelled into the outside atmosphere by the fan 23. When using this type of construction, the pipe 19 will extend through the upper part of the housing 28 to be directly above the overflow pipe 17 and capable of discharging water into it. A portion of the lower surface of the housing 28 slopes upwardly and outwardly and has a hole therein to receive a valve plate 29 as shown in Fig. 4. The numeral 30 designates a float arm which is rotatably mounted in the walls of the housing 28 and which has operatively secured thereto the valve 29.

The arm 30, external of the housing, is bent at right angles downwardly and outwardly and has secured to its end portion a float 31 as shown in Fig. 5. By the above construction it will be seen that normally the valve plate 29 will be closed and the air chamber between the bowl 10 and the fan 23 will be intact. However, should the tank 14 become too full of water due to leakage, it will actuate the float 31 thereby rotating the arm 30 within the housing 28 opening the valve 29 to allow the excess water to overflow through the pipe 17.

The practical operation of my device is as follows: The pipe 28 is secured to the pipe 16 in the manner illustrated in Fig. 4. When the switch 27 is closed, the motor 2 will operate thereby actuating the fan 23 and sucking air, uniformly, from the inside of the bowl 10 through the conduit 11. The gasket element 13 will prevent any air leak between the seat 12 and the top of the bowl 10 thus pulling air from the throat through the conduit 11 into the conduit 16 through the pipe 20, housing 21, and expelling it through the pipe 24. When the bowl is flushed, the valve ball 15 is pulled upwardly in the usual manner allowing the water to come through the pipe 16, the conduit 11, and thence into the bowl, after which the ball 15 drops back to its seat, and the tank 14 again fills with water. When it has reached the proper height, it is shut off by the ordinary float valve, but some water flows, during the filling of the tank, through the pipe 13 for restoring the water in the bottom of the bowl 10 should it be forced out by the force of the flushing action. This action of the pipe 13 also fills one end of the S-shaped member 18 which effectively seals it and prevents the blower fan 23 from pulling air out of the other end of the same. Thus the force of the suction is directed entirely upon the bowl 10. The same is true of the construction illustrated in Fig. 4 except in this case a mechanical valve is provided for the overflow and the overflow pipe itself is utilized as an air pipe.

From the foregoing it will be seen that I have provided a forced ventilator for toilet bowls that is extremely easy to install, that is highly efficient in its use, and that does not interfere with the normal function of any portion of the system in conjunction with the toilet bowl. Furthermore, my device is inconspicuous and directs its force where it is most needed. It is positive in its operation, and has nothing that would become out of order being free of complicated mechanical parts.

My device may be easily used in multiple installation by merely tapping into the pipe 20 and using the same blower fan for all of the bowls. My device is highly desirable for use in public buildings where there is usually a lack of ventilation, and is particularly adaptable to private homes.

While I have shown and described my device for use with tank reservoirs, it may also be used with delayed valve and automatic installations by tapping into the flushing conduit between the valve and the bowl for the utilization of the flushing conduit as an air suction conduit for the uniform extraction of gases from the vessel. Some changes may be made in the construction and arrangement of my improved forced ventilator for toilet bowls without departing from the spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In combination with a toilet bowl having a flushing conduit about its edge and communicating with the inside of the bowl, a water pipe leading from said conduit, a water cabinet, and an overflow pipe having its lower end in communication with said water pipe, a forced ventilator comprising, an S-shaped water seal trap in the upper end of said overflow pipe, an air pipe having one end in communication with said water pipe and having its other end enlarged to form a housing, an electric motor secured on said housing in electrical communication with a source of electrical supply, and a blower fan operatively secured to said motor capable of pulling air from said bowl through said flushing conduit, said water pipe and said air pipe and expelling it.

2. In combination with a toilet bowl having an integrally formed flushing conduit therein and around its upper edge designed to flow water into the bowl at times, a water supply tank, and an overflow pipe in communication with said conduit, a forced ventilator for toilet bowls comprising, an air conduit having one end in communication with said overflow pipe, a means for closing said overflow pipe preventing air from entering said water supply tank by admitting water into said overflow pipe, an electrically operated suction means on the other end of said air conduit, and a means for manually connecting said suction means to an electrical circuit at times for operating said suction means.

3. In a device of the class described, a ventilator conduit having one end in communication with the overflow pipe of toilet bowl assembly, an S-shaped water seal trap in the upper end of said overflow pipe designed to seal said overflow pipe against the passage of air through its intake at times, and a suction means in the other end of said conduit for pulling air from said overflow pipe through said conduit.

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