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TOILET VENTILATING DEVICE

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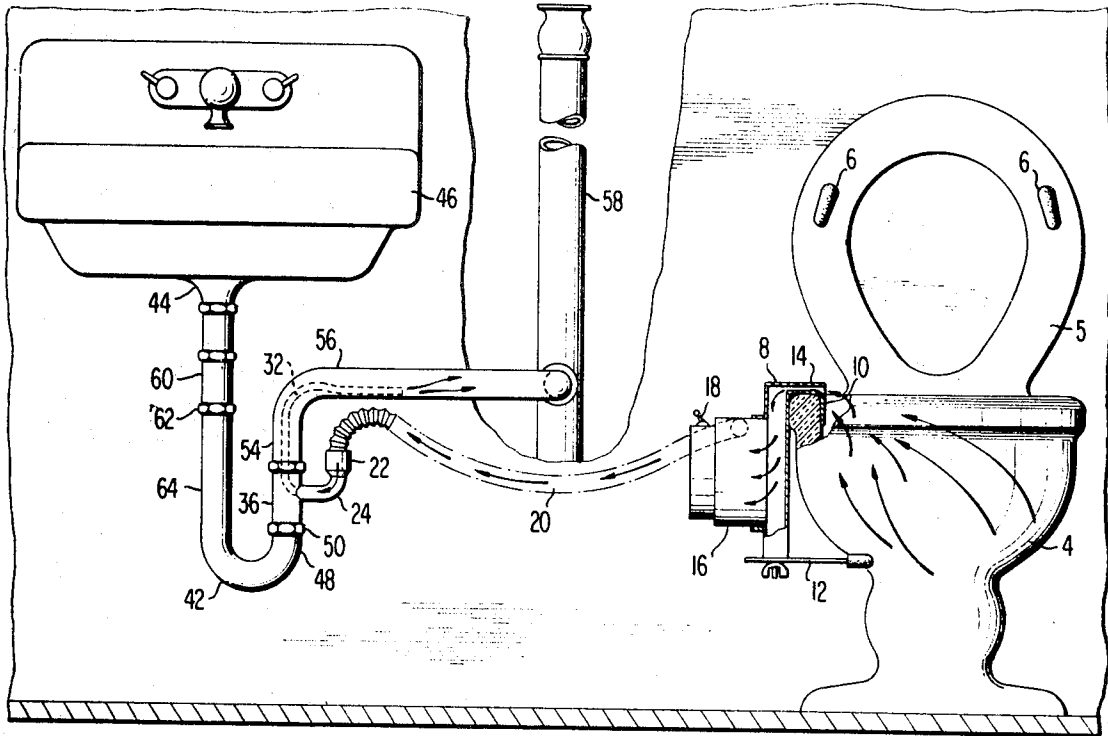


FIG. 1

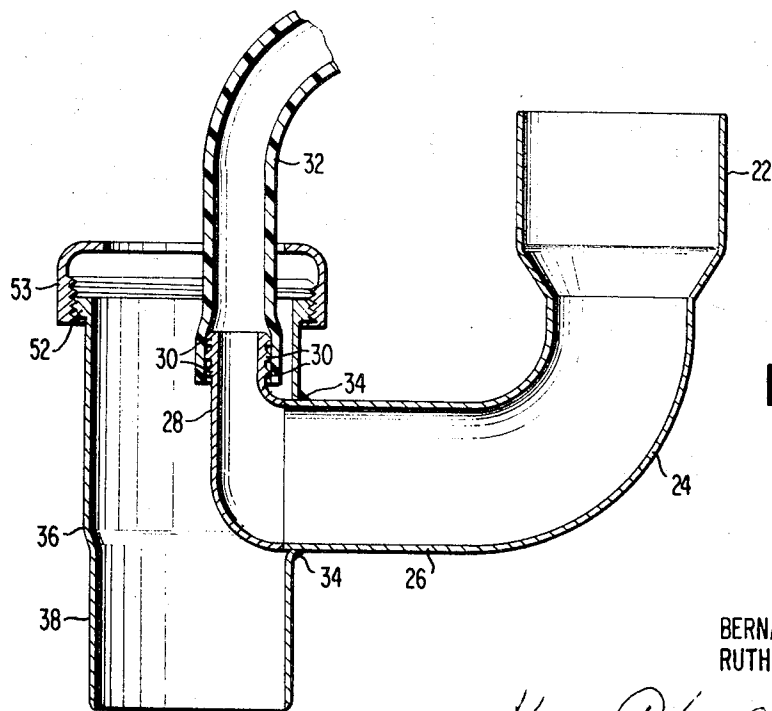


FIG. 2

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TOILET VENTILATING DEVICE

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4 Claims

ABSTRACT OF THE DISCLOSURE

A toilet bowl ventilating device provided with a power driven exhaust system mounted on the toilet bowl and connected to the drain pipe of a wash basin. The exhaust system is connected to the drain pipe at a point on the discharge side of the water trap so that objectionable doors may be directed through the drain pipe with the water trap acting as an effective barrier.

BACKGROUND OF THE INVENTION

A variety of toilet bowl ventilating devices have been known in the art. While many of these require either rearrangement of the conventional toilet or complicated plumbing installation procedures, there have been some attempts to provide ventilating devices of a type which tend to lend themselves to a somewhat simplified installation. Such attempts, however, while requiring no modifications of the toilet, do require some knowledge concerning plumbing installation and the mounting of motor-driven blowers upon a conventional toilet. All of this tends to remove such devices from the type which might readily be regarded as being extremely simple and easy to install.

SUMMARY OF THE INVENTION

The ventilating device or exhaust system of the present invention is directed to a power-driven fan that is supported upon a conventional toilet bowl with an inlet segment communicating with the interior of the bowl below the customary seat. The fan outlet has a conduit connected thereto, and it, in turn, is connected to a water drain pipe of a basin. The connection to the drain pipe is above the conventional "U" or water trap of the drain, so that the water trap acts as a septic seal against the seepage or escape of gases through the basin outlet. The conduit is mounted in the drain pipe in such a manner that water would not enter the conduit at any time. The conduit is so connected to the drain pipe that any water flowing through the pipe will tend to create a suction or aspirator effect on said conduit to effect a withdrawing from said conduit of any gases contained therein. Thus, the flow of water tends to aid and abet the action of the fan.

An object of this invention is to provide a toilet bowl ventilating device which so lends itself to ease and speed of installation as to obviate the drawbacks of the prior art and to constitute a definite improvement thereon.

A further object is to provide a simple and dependable toilet bowl ventilating device, the installation of which requires no modification of the standard toilet, no holes to be drilled, and no prior skill on the part of the person installing it.

Another object is to provide a toilet ventilating device which is easily manufactured, economical of cost, marketable, and readily adaptable to a conventional toilet bowl.

DESCRIPTION OF THE DRAWING

FIG. 1 is a front elevational view of a basin and toilet bowl equipped with the ventilating or exhaust device of the present invention, a portion of the toilet bowl shown in section in the interest of clarity; and

FIG. 2 is an enlarged sectional view showing the connection between the basin drain and the exhaust conduit of the ventilating device of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, there is shown in FIG. 1 a conventional bowl 4 having a seat 5 hingedly secured thereto in the customary manner. The seat 5 is provided with the usual support feet 6 which engage the top of bowl 4 to support the seat thereon in the customary manner and also to provide a space or vent between the top of the bowl and the bottom of the seat.

Mounted on the top of the bowl 4 is an intake duct structure 8 which is retained in position by means of a depending lip portion 10. The lower end of the duct structure 8 has a bracing arm 12 adjustably secured thereto by any suitable means such as a bolt and wing nut. The intake duct structure 8 has a mouth portion or passageway 14 of such thickness as to clear the space in the top of the bowl 4 and the bottom of the seat 5 when the latter comes to rest over the bowl.

The duct structure 8 communicates with a conventional exhaust fan, not shown, enclosed within a housing 16, that also encloses a conventional electric fan motor, not shown which derives electrical power from a conventional household wall outlet. A switch 18 is located on the top of the housing 16 for energizing the motor thereby driving the exhaust fan which draws gases from the interior of the bowl through the passageway 14 and duct structure 8.

The gases exhausted from the interior of the bowl 4 are directed into a flexible hose 20, that has one end connected to the fan housing 16. The hose 20 should be of appropriate length to permit the free end thereof to be connected to the drain pipe of a conventional wash basin. The hose 20 is inserted into an enlarged end portion 22 of a pipe segment 24. The hose may be secured in the end portion 22 by means of a press-fit, or a suitable adhesive may be employed to effectively connect the hose to said end portion.

As shown in FIG. 2, the pipe segment 24 is shown to be made up of an intermediate horizontally disposed portion 26 which terminates in an upwardly projecting nozzle-like end portion 28. The cross sectional area of the end portion 28 is considerably less than that of the pipe segment 24 and portion 26 so that any air or gas will be forced through said nozzle end portion at a rate of flow greater than the rate of flow through the pipe position 26. The end portion 28 is provided with a plurality of external, annular thread-like projections 30 which engage the inner surface of an end of a plastic tube or hose 32. The thread-like projections 30 are designed to bite into the plastic tube or hose 32 so as to form a seal-like fit between said hose and the nozzle-like end portion 28. The end portion 28 and a portion of the pipe segment 24 are inserted through an opening formed in a pipe section 36 and are secured therein by welding as shown at 34. It is to be noted that when the pipe segment 24 is mounted in the pipe section 36, the nozzle end portion 28 and the enlarged end portion 22 are both arranged in spaced parallel relation to one another.

The pipe section 36 is formed with a reduced lower end 38 that is press-fitted into an end 48 of a U-shaped drain pipe 42 in a conventional manner. A union 50 is threaded upon the end 48 to insure a fluid tight fit with the end 38. The other end or leg of the drain pipe 42 is provided with a union 62 for connecting a pipe section or insert 60 to the drain pipe 42 and the conventional outlet 44 of a wash basin 46. The upper end of pipe section 36 terminates in an external flange 52 which has a union 53

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threaded thereon so as to facilitate the connecting of pipe section 36 to basin drain pipe 56 which in turn is connected to a conventional soil discharge pipe 58. It is to be noted that plastic tube 32, which may be formed from any suitable synthetic resin material, extends into pipe 56 for a short distance so as to insure that when water flows through the pipe 56 its passage will tend to draw or suck, in an aspirating fashion, any gases contained in said tubes. This action tends to aid and abet the forcing action of the exhaust fan in withdrawing gases or odoriferous air from the bowl 4 and forcing them through the hose 20.

From the above description, the ease of installation of my device should become apparent. In essence, what it amounts to is to disconnect U-pipe 42 underneath the wash basin 46, attach pipe segment 60 to the drain pipe 42 and pipe section 36 to the short portion or leg of the U-pipe and at the same time making sure that the plastic tube 32 extends freely upwardly through the interior of pipe 56. The housing 16 and intake duct structure 8 are mounted on the bowl 4, as shown, by engaging lip 10 with a top portion of the interior of the bowl 4. In operation, turning on the switch 18 energizes the motor within housing 16 which motivates the exhaust fan to suck the objectionable gases from the interior of the bowl and drive them through hose 20, pipe segment 24, and up plastic tube 32 toward the soil discharge pipe 58. Due to the presence of a small volume of water, trapped in the bottom of U-pipe 42 underneath the wash basin 46, the gases are prevented from going in the opposite direction and up through the wash basin drain 44. The seal between hose 32 and reduced portion 28 of pipe segment 24 prevents water flowing from wash basin 46, through U-pipe 42 and up pipe 56, from entering into the exhaust system. On the other hand, such flow of the water past the upper end of plastic tube 32 will tend to create a suction effect on tube 32 thus aiding the withdrawal of gases from the interior thereof.

Although the foregoing description is necessarily of detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the spirit or scope of the invention.

The embodiments of the invention in which an exclusive property or right is claimed are as follows:

We claim:

1. A connector for use in combination with a wash basin drain pipe having a return bend portion defining a water trap and a toilet bowl ventilator having intake means connected to duct means with an exhaust means for withdrawing objectionable odors from said toilet through the intake means and forcing them through said duct means, said connector comprising a first pipe section and a second pipe section having its longitudinal axis generally vertically oriented, an end of said first pipe section being sealingly mounted in an aperture in the side wall of said second pipe section and projecting through said side wall of said second pipe section into the interior thereof with the longitudinal axis of said first pipe section being normal to the longitudinal axis of said second pipe section, the portion of said end of said first pipe section located within said second pipe section

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forming a substantially right angle bend with said first pipe section and terminating in a reduced nozzle end portion that is disposed in a plane parallel to the longitudinal axis of said second pipe section, said connector being interposed in said drain pipe between the water trap portion and the exit end thereof connected to the conventional soil discharge pipe, the other end of said first pipe section being connected to said duct means whereby water flowing through said drain pipe will withdraw objectionable odors through said connector and duct means and said water trap will act as a barrier to the passage of said odors to said wash basin.

2. A connector as set forth in claim 1 wherein said nozzle end has an elongated plastic hose affixed thereto with said plastic hose extending within said drain pipe upon said second pipe section being interposed in said drain pipe.

3. A connector as set forth in claim 1 wherein the other end portion of said first pipe section terminates in an upwardly extending section having an enlarged mouth for the reception of said duct means.

4. A connector for attaching the exhaust duct of a toilet bowl ventilator to the discharge portion of a U-shaped drain pipe for a wash basin comprising a first pipe section and a second pipe section having its longitudinal axis generally vertically oriented, an end of said first pipe section being sealingly mounted in an aperture in the side wall of said second pipe section and projecting through said side wall of said second pipe section into the interior thereof with the longitudinal axis of said first pipe section being normal to the longitudinal axis of said second pipe section, the portion of said end of said first pipe section located within said second pipe section forming a substantially right angle bend with said first pipe section and defining a discharge nozzle lying in a plane parallel to the longitudinal axis of said second pipe section, said discharge nozzle communicating with the discharge portion of said drain pipe upon the insertion of said second pipe section in said discharge section above the U-shaped portion thereof, the other end of said first pipe section being connected to the outlet end of said exhaust duct for delivering objectionable odors to the discharge portion of said drain pipe with the U-shaped portion forming a liquid barrier to the passage of said odors to the wash basin, and flexible tubular means connected to said discharge nozzle and serving as an aspirator for withdrawing gases from said toilet bowl upon the passage of liquid through said drain pipe.

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