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[54] **VENTILATING TOILET**

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[52] **U.S. Cl.** **4/72,** 4/94, 4/213

[51] **Int. Cl.** **E03d 9/04,** E03d 11/02, E03d 11/18

[58] **Field of Search** 4/72, 213, 214, 215, 216, 4/217, 209, 83, 94, 105, 106, 100

[56] **References Cited**

UNITED STATES PATENTS

1,955,579	4/1934	Malaussene	4/213
2,619,655	2/1952	Huff	4/213
3,193,846	7/1965	Lefebvre	4/100
2,451,108	10/1948	Molpus	4/213
2,575,778	11/1951	Wilson	4/213
2,677,830	5/1954	Allen et al.	4/214
3,120,006	2/1964	Knappe	4/213
3,273,170	9/1966	Wheeler	4/72
3,335,431	8/1967	Coates	4/213

FOREIGN PATENTS OR APPLICATIONS

1,147,836	6/1957	France	4/214
471,073	1/1929	Germany	4/217

Primary Examiner—Henry K. Artis

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[57] **ABSTRACT**

A ventilating toilet which embodies apparatus preferably integrally formed with the basic toilet bowl for exhausting objectionable odors therefrom, including an air exhaust conduit generally ringing the toilet opening, an air exhaust fan interconnecting the foregoing conduit with a discharge conduit which may be separate from or combined with the main waste pipe. A floor mounted switch adjacent the forward portion of the toilet assures for automatic operation of the air exhaust fan to achieve the ventilating feature without conscious effort during either standing or seated toilet usage.

4 Claims, 4 Drawing Figures

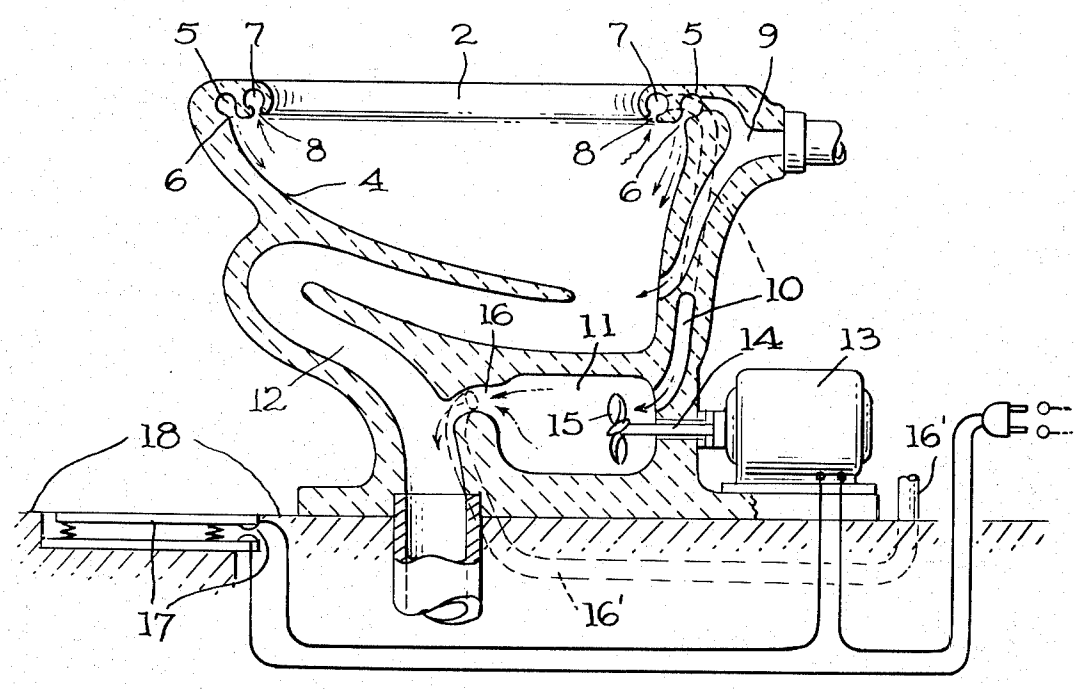


FIG. 1.

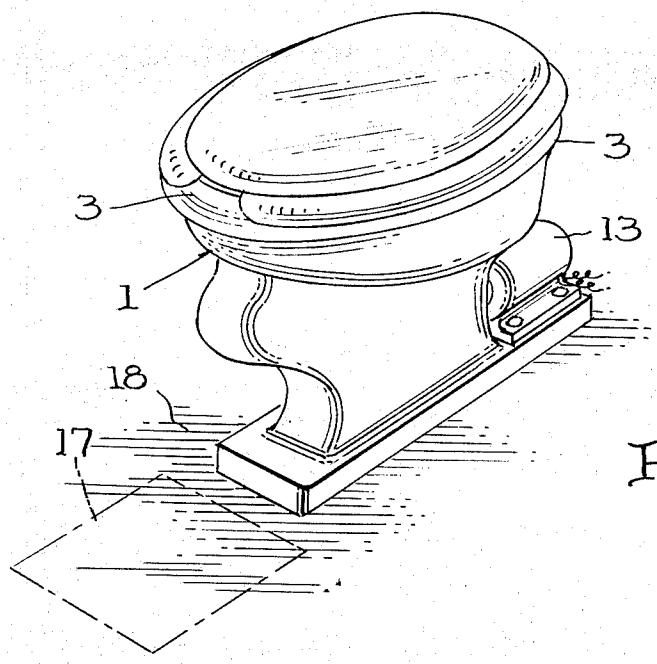


FIG. 2.

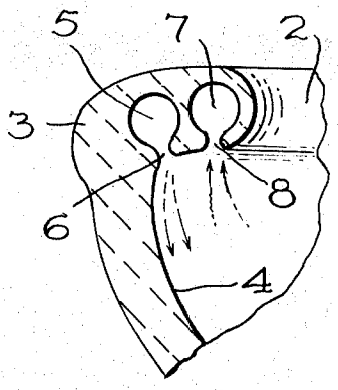


FIG. 4.

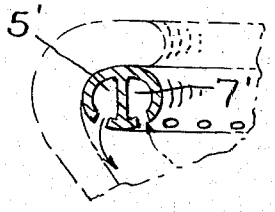
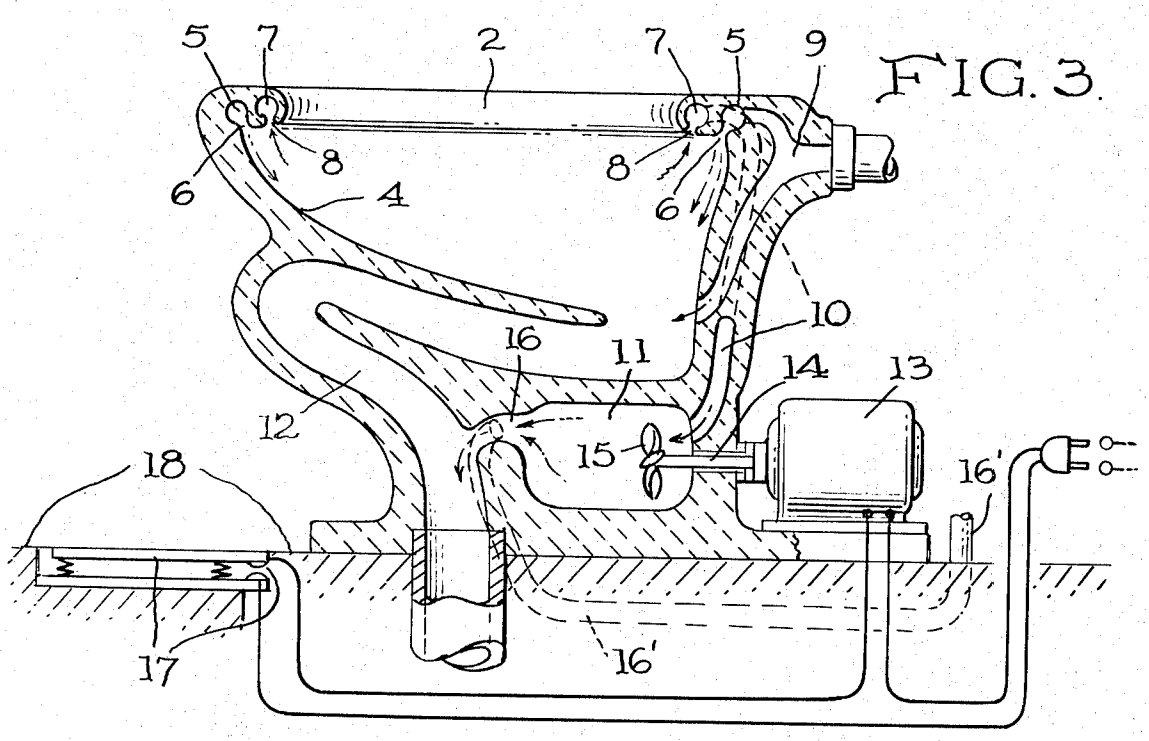


FIG. 3.



VENTILATING TOILET

BACKGROUND OF THE INVENTION

The present invention relates to stool type ventilating toilets, and more particularly to ones of the automatic or self-ventilating type which thereby provide for improved sanitary conditions by providing integrated flushing and ventilation of the toilet bowl and to independently provide for continual ventilation of unpleasant odors attendant elimination of body wastes.

Various odor eliminating apparatus and methods have been devised and previously tried in association with lavatories and other individual latrines. Among such prior art efforts have been various physical deodorizing apparatus and methods utilizing chemical means therewith. However, many such prior art apparatus and/or methods have not been fully satisfactory to the trade for various construction or economic reasons, leaving a need for further improvement in this area.

SUMMARY OF THE INVENTION

The present invention relates to a generally conventional water pressure operated flush type of stool toilet which embodies preferably integrally formed ventilatingapparatus.

A principal object therefore is to provide a toilet of the foregoing character embodying automatically operated ventilating apparatus to more effectively and efficiently provide for the prompt removal of objectionable toilet odors preceding, during and immediately following toilet usage.

Another object is to provide such a ventilating toilet embodying an air exhaust blower fan with associated air conduits through which ventilating air forcibly discharges the unpleasant toilet-associated odors, and to provide for automatic operation of the blower fan without conscious manual effort during toilet usage.

Still another object is to provide for the forced discharge of objectionable toilet odors by entraining them into the main waste discharge passageway or pipe, or by directing them otherwise in non-objectionable fashion to an outside atmosphere remote of the toilet room.

These and other objects and advantages are achieved by providing a basic toilet bowl which embodies an air exhausting conduit preferably integrally formed within the upper generally annular or oval shaped circumferential edge defining the principal horizontal opening of the toilet bowl, and having a plurality of air inlet holes directed essentially downwardly or toward the internal bowl area. The circumferential air exhausting conduit is further connected via an intermediate body formed conduit with an air exhausting chamber preferably formed integrally in a base portion of the toilet body. The exhausting chamber is provided with an air exhausting electrically driven blower fan which directs the exhausting air flow toward and through another intermediate exhaust conduit which in a preferred form communicates directly with the major waste sewer pipe or stack, so as to effect entrainment of the objectionable odors thereinto. In another form the ventilating exhaust air can be connected with a separate discharge vent or conduit by which the unpleasant odors are forcibly discharged into the atmosphere away from the toilet room. The apparatus further embodies electrical

circuitry to run the electric blower motor, and has a floor installed switching means, such as a depressible floor panel which automatically closes the fan circuit responsive to the users weight thereon during preliminary, basic and concluding functions attendant toilet usage.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing objects and advantages will become more apparent to those skilled in the art from the following more detailed description of a preferred embodiment, taken in conjunction with illustrative drawings wherein:

FIG. 1 is a perspective view of the stool type toilet of the present invention;

FIG. 2 is a fragmentary enlarged view showing a cross-sectional detail taken through the upper toilet bowl rim;

FIG. 3 is a longitudinal cross-sectional view of the ventilating toilet apparatus of the present invention; and

FIG. 4 is a cross-sectional detail of a composite water and air circumferential channel means. DESCRIPTION OF PREFERRED EMBODIMENT

Referring in more detail to the drawings wherein like reference characters designate like parts throughout the various figures, a basic toilet body 1 having a principal bowl opening 2 is preferably fabricated of any acceptable ceramic, plastic or other suitable material, and embodies a generally conventional configuration with associated water traps and water flushing channels. Within the upper circumferential edge 3 which generally defines together with bowl wall 4 at least part of the principal horizontal opening 2, there is provided the usual circumferential water conduit or channel 5 having a downwardly directed, reduced water discharge passageway or series of contricted water openings 6 through which water is directed under pressure from a main water supply 9 operably connected therewith, to aid in the usual water flushing operation of the toilet. Preferably inwardly adjacent and integrally formed within said edge 3 there is provided a similar shaped circumferential passage 7 constituting an air exhausting or ventilating channel, which is further provided with a similar constriction or series of smaller size air inlet holes 8. Said passage or channel 7 and its holes 8 are disposed separate from and not in communication with the water discharge conduit 5 and related openings 6. Air channel 7 is connected via an intermediate air ventilating or exhaust conduit 10 with an enlarged evacuating air chamber 11 provided preferably in a base portion of the toilet body. An electrically operated exhaust blower fan 15, mounted on shaft 14 of electric motor 13, is disposed within the air chamber 11 to effect reduced exhausting or evacuating air pressure within air channels 7 and 10 and to forcibly discharge the odor laden air through a second intermediate venting conduit 16 preferably connected with the main waste pipe 12 in a manner so as to accelerate the combined water and air-laden waste discharge functions, by the entrainment of the ventilated air-laden odors with the discharging waste-laden water down the main sewer pipe. Alternately, and or concurrently, the second intermediate venting conduit 16 can be also connected with the outside atmosphere or other suitably facility to vent the toilet odors in an unoffensive manner remote from the toilet room, at 16'. The motor 13 is preferably

mounted on an elongated base portion of the toilet bowl body extending rearwardly thereof and exteriorly of said chamber **11** so as to provide for more efficient servicing thereof as may be needed.

The apparatus further importantly embodies a treadle or other similarly floor disposed and properly insulated switching means, having a switch schematically depicted at **17**, and connected by electrical connector wires with the motor **13** and a conventional line plug, for cooperation with a suitable power source connected to a convenience wall outlet, or the like. The switch **17**, as disposed in the floor **18** is designed to make or break the electrical circuit to control the operation of the blower fan **15**, said switch being closed automatically each time by the weight of a user who approaches sufficiently close to the toilet.

It is also within the contemplation of this invention for the provision of an auxiliary mounted ventilation conduit in lieu of channel **7**, when not integrally molded within the toilet body. Furthermore, it is contemplated that a single conduit having medial partitian for separating the conduit into separate water **5'** and air **7'** channels corresponding to and for the equivalent functional purpose of the channels **5** and **7**, respectively, may be provided as a further alternate construction, such as shown in FIG. **4**.

During operation of the subject ventilating toilet, the floor disposed switching means for effecting the ventilating feature is understood to be automatically operated responsive to either standing or seated toilet use functions. Furthermore, since the posture of a user is normally such as to be located above the switch **17** from the beginning to the end of use, including redressing, the electric circuit of the motor **13** is maintained closed so that the fan **15** of the air flowing chamber **11** continues uninterrupted to provide maximum ventilation. During a sitting posture on the stool, the effective open area **2** of the main body **1** which is open to the atmosphere is greatly reduced by the body and usually equal to only one of several-tenths of the principal opening **2**, with the result that the air circulation or exhaust rate is raised several times due to forced suction action within the toilet bowl, hence, any unpleasant odors are nearly completely and immediately exhausted during and shortly after use, before being returned to the normal opening area. Thus, a subsequent user is not subjected to residual maloders from a preceding user and does not notice any unpleasantness even when using the facility immediately thereafter. While any unpleasant odors are usually nearly completely removed during use, with more complete ventilation being essentially completed during the short time of dressing, the ventilation operation is further continued when a subsequent user is preparing to use it. Accordingly, the improved self-ventilating device hereindescribed provides for toilet room air conditioning which is always fresh as though there had been no preceding user at all; that is, the subsequent user is assured of more sanitary use with pleasantness as if he were the first user.

It is apparent that the present invention effectively performs the above-mentioned operation with the aid of ventilating fan **15** which is periodically operable without any conscious effort, or without need for closing the ventilating fan circuit by hand switching effort, but which is automatically effected during use of the toilet facility.

It is apparent from the foregoing that an improved ventilating toilet apparatus has been evolved which achieves all of the objects and advantages set forth hereinabove, and reference should be made to the appended claims for a definition and scope of the claimed invention.

What is claimed is:

1. A combination of a water flushable, stool type toilet, and an automatic odor ventilating mechanism for use with a room-enclosed toilet, said toilet having a bowl, an elongated and water inlet channel means for connection with a source of water pressure, and further having a major waste drain passageway for connection with a sewer means, said combination further including an upstanding circumferential free edge defining a principal horizontal opening of mid toilet bowl, means defining dual and at least partial circumferentially extending channels disposed in non-intercommunicating relation with one another near said free edge;

said dual channels respectively having generally downwardly directed openings of less cross-sectional size than the cross-sectional size of each respective channel;

said channels respectively constituting part of water inlet channel means for flushing said toilet, and a part of air ventilating evacuation channel means to facilitate removal of objectionable toilet odors;

means defining an evacuating air chamber in a base portion of said toilet bowl body;

intermediate separate passageways interconnecting said respective circumferential water inlet and air evacuation channel means with said source of water pressure and with said evacuating air chamber respectively;

another intermediate air outlet passageway connecting said air evacuating chamber at a point remote of the connection therewith of said first-mentioned intermediate air outlet passageway connecting said air evacuating chamber at a point remote of the connection therewith of said first-mentioned intermediate air passageway, with means for conveying said objectionable toilet odors exteriorly both of said toilet bowl and said toilet room;

electrically operated air ventilating exhaust fan means including at least a fan portion disposed partially within said air evacuating chamber, and a ventilating exhaust fan motor mounted on said elongated base and in direct association with said fan means, an electircal circuit including a floor mounted switch means for operatively connecting said exhaust fan with a source of electrical power; said switch means including a switch for closing said exhaust fan operating circuit, and disposed so as to close automatically without conscious effort responsive to the application of a user's weight upon the floor mounted switch attendant use of said toilet.

2. The combination as defined in claim **1**, wherein said dual circumferentially extending channels, said intermediate passageways, and air evacuation chamber are formed integrally with one another and are separated by a generally medially disposed partition means.

3. The combination as defined in claim **1**, wherein said means with which said other intermediate air outlet passageway is connected for conveying said objectionable odors exteriorly of said toilet bowl, include

said major waste drain passage, whereby said objectionable odors are forcibly exhausted thereinto for entrainment with the discharging waste and water passing therethrough.

4. The combination as defined in claim **1,** wherein said means with which said other intermediate air outlet passageway is connected for conveying said objectionable odors exteriorly of said toilet bowl and toilet room, include means defining an exhaust ventilating conduit leading exteriorly to the atmosphere remote of said toilet room.

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