United States Patent

Sowards

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[54] VENTILATING SYSTEM

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[21] Appl. No.: **7,100**

[52] **U.S. Cl.** **4/211**

[51] **Int. Cl.** **E03d 9/04**

[58] **Field of Search** 4/111, 211, 112, 213

[56] **References Cited**

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[57] **ABSTRACT**

Odors are removed from toilet bowls and/or bed pans by a blower through a suction pipe, with the exhaust outlet connected to a drain through which flushing water is conducted from a toilet bowl or wash basin. The blower is operated by a switch controlled electric motor.

14 Claims, 8 Drawing Figures

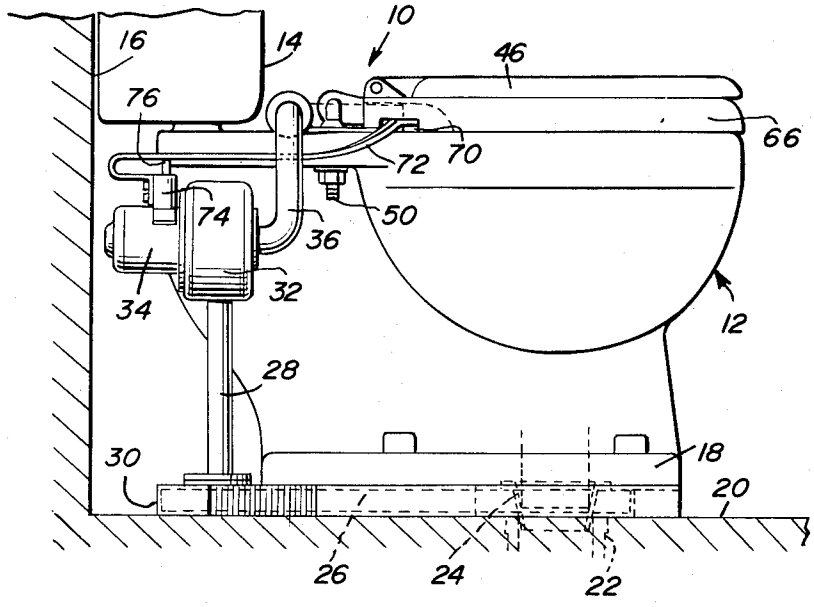

Fig. 1

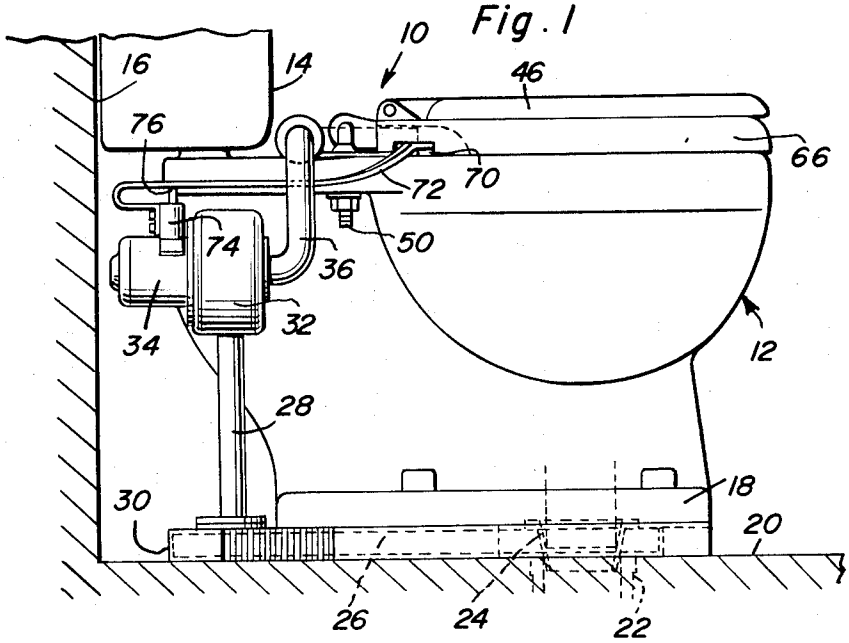

Fig. 2

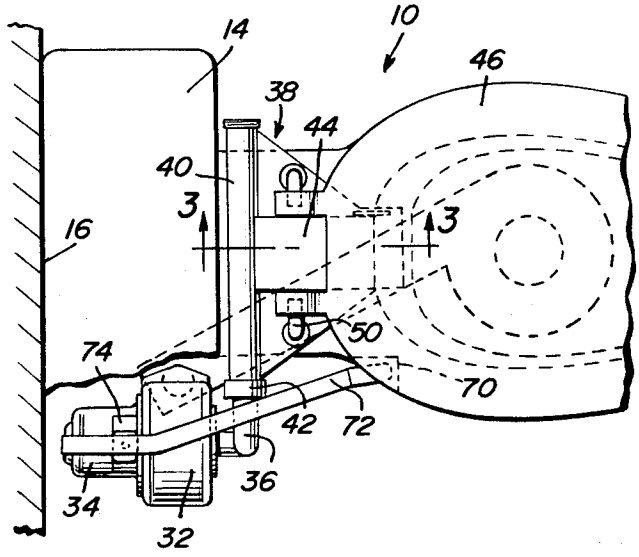

Fig. 3

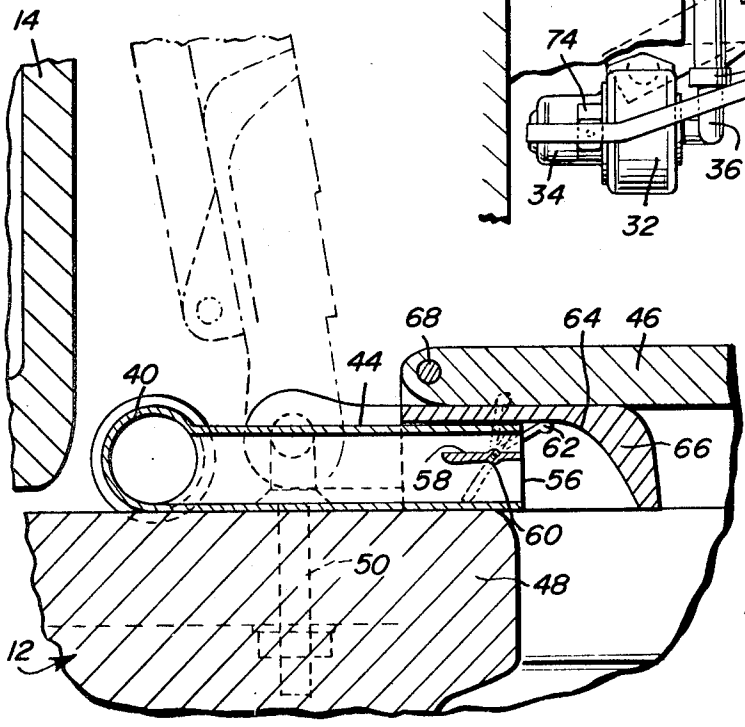

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Fig . 4

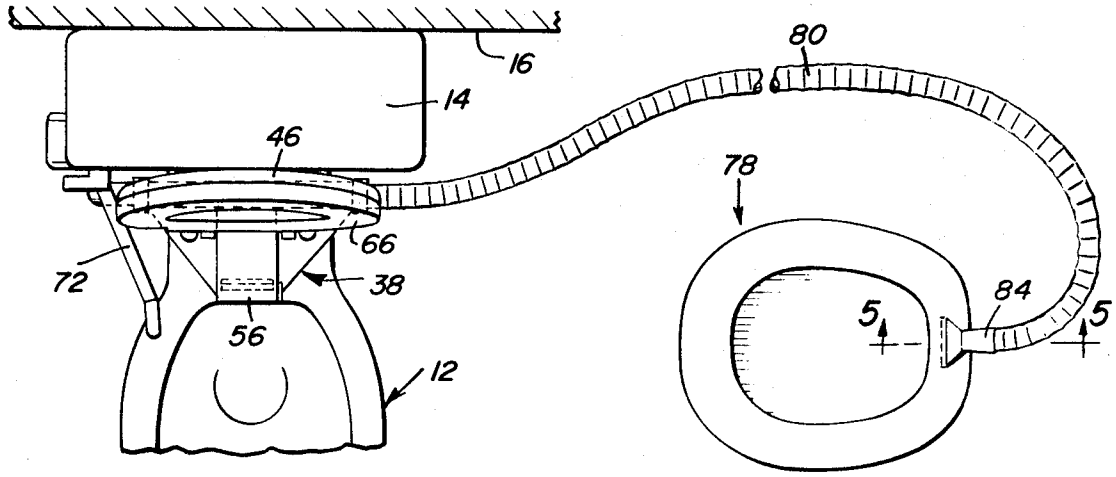


Fig . 5

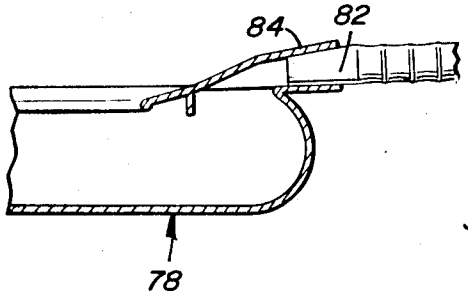


Fig . 6

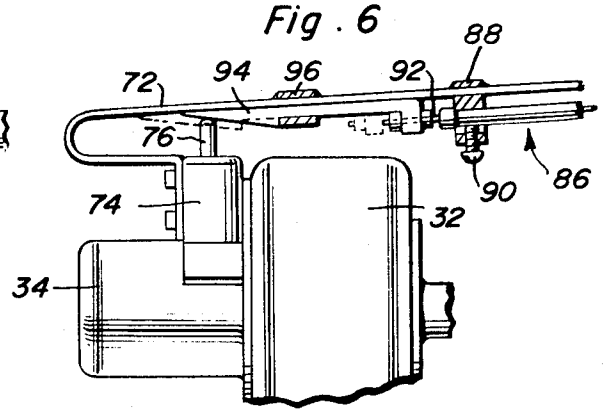


Fig . 7

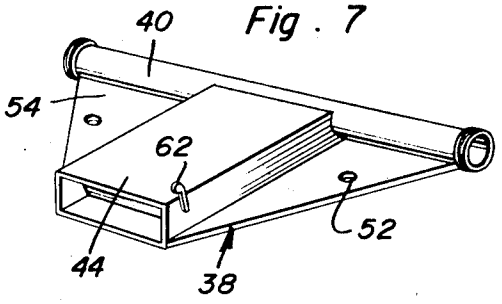
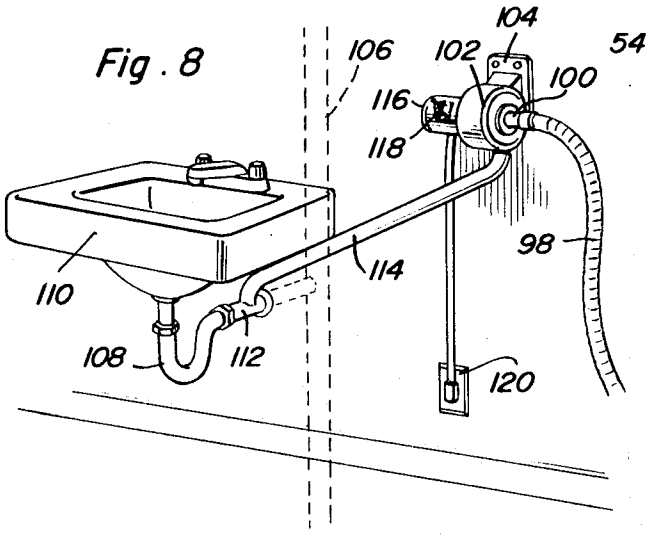


Fig . 8



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VENTILATING SYSTEM

This invention relates to the ventilation of odor emitting receptacles such as toilet bowls and bed pans.

An important object of the present invention is to provide a system for ventilating or removing odors emitted from receptacles such as toilet bowls and bed pans in such a manner as to avoid pollution of the atmosphere in the vicinity. In this regard, the present invention embodies certain improvements over the ventilating system disclosed in my prior U.S. Pat. No. 3,122,757.

In accordance with the present invention, a ventilating system is provided which is capable of being utilized for removal of odors from either a toilet bowl when closed or from a bed pan by means of a forced flow of air which is exhausted into a drainage outlet connected to a toilet bowl or wash basin.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 illustrates a side elevational view of a typical installation for the ventilating system of the present invention.

FIG. 2 is a partial top plan view of the installation shown in FIG. 1 with parts broken away.

FIG. 3 is an enlarged partial sectional view taken substantially through a plane indicated by section line 3—3 in FIG. 2.

FIG. 4 is a partial top plan view of the ventilating system being utilized for removal of odors from a bed pan.

FIG. 5 is an enlarged partial sectional view taken substantially through a plane indicated by section line 5—5 in FIG. 4.

FIG. 6 is a partial side elevational view with parts shown in section of a modification particularly suited for the arrangement illustrated in FIG. 4.

FIG. 7 is a perspective view of one of the parts associated with the installations illustrated in FIGS. 1–4.

FIG. 8 is a perspective view illustrating another embodiment of the ventilating system.

Referring now to the drawings in detail and initially to FIGS. 1 and 2, a ventilating system generally denoted by reference numeral 10 is shown installed adjacent to and connected to a toilet bowl 12 to which flushing water is supplied in the usual fashion from the usual water storage tank 14 positioned rearwardly and above the toilet bowl adjacent to a vertical wall 16. The toilet bowl includes a base 18 which is secured in the usual fashion to the floor 20. Fluid communication is established between the toilet bowl receptacle and a sewer drainpipe 22 shown by dotted line in FIG. 1 through a vent fitting 24 in communication with a tube 26 similar to the arrangement disclosed in my prior U.S. patent aforementioned. In this fashion, a forced flow of air entraining odors may be discharged into the drainpipe from the vertical exhaust outlet tube or duct 28 connected to and rising above a vent fitting 30 to which the tube or duct 26 is connected similar to the arrangement disclosed in my aforementioned U.S. patent. The exhaust outlet 28 supports a blower 32 positioned rearwardly and laterally of the toilet bowl below the water tank 14. The blower is driven by an electric motor 34 mounted on the blower casing. A suction intake tube 36 is connected to one axial side of the blower 32 and to one lateral side of a duct assembly 38 communicating with the interior of the toilet bowl.

Referring now to FIGS. 2, 3 and 7, the duct structure 38 includes a connecting conduit portion 40 having opposite axial ends, one of which may be closed and the other connected to the suction intake 36 through a connector 42. The ends of the connecting conduit 40 are laterally spaced relative to a cross-sectionally rectangular inlet air duct portion 44 which projects into the toilet bowl receptacle below a toilet cover lid 46 which is pivotally mounted on the rear portion 48 of the toilet bowl by pivot bolt assemblies 50 that extend through apertures 52 formed in the triangular braces 54 interconnecting the sides of the air duct portion 44 with the connecting conduit 40.

As shown in FIG. 3, the outlet end portion 56 of the air duct portion 44 mounts a pivoted vane 58 by means of the pivot pin 60. Connected to one end of the pivot pin externally of the air duct portion 44 is an actuating arm 62 adapted to be engaged by the cam portion 64 on the toilet seat 66 to which the cover lid 46 is pivoted by means of the pivot rod 68. The vane 58 is gravitationally biased by one weighted end portion to a closed position as shown by dotted line in FIG. 3. However, when the toilet seat is in a horizontal position resting on the toilet bowl as shown by solid line in FIG. 3, the actuating arm 62 is engaged to pivotally displace the vane 58 from the flow blocking position to the open position shown by solid line. Thus, with the cover seat in a closed position, the duct portion 44 will be opened to permit the blower 32 to effectively withdraw odors from the toilet bowl receptacle.

The blower 32 is rendered operative to remove odors or ventilate the toilet bowl when the toilet bowl is closed. Toward this end, the toilet seat 66 is provided with a lateral recess 70 receiving one end of a flat spring actuating arm 72 that is bolted to the housing of a switch mechanism 74 mounted on the motor 34. The actuating spring arm 72 is normally disengaged from the actuating plunger 76 associated with the switch mechanism. When the seat 66 is down however, the spring arm 72 is displaced downwardly engaging the actuating plunger 76 so as to close the switch mechanism 74 thereby energizing the motor 34 to operate the blower 32.

The toilet lid and seat are in the raised position as shown in FIG. 4, the outlet portion 56 of the air duct structure 38 will be closed as aforementioned. In this condition of the air duct structure 38, suction is more effectively applied to a bed pan 78 for removing odors therefrom by means of a flexible hose 80, one end of which is connected to the end of the connecting conduit 40 opposite the end to which the blower suction tube 36 is connected after removing the closure from this end of the connecting conduit. The flexible hose is provided with a tapered insert end 82 received in an outlet formation 84 of the bed pan as shown in FIGS. 4 and 5. Thus, the ventilating system may be rendered effective upon energization of the blower motor 34 to remove odors from the bed pan.

When utilizing the ventilating system for removal of odors from the bed pan, the spring arm 72 will be disengaged from the actuating plunger 76 of the switch mechanism 74. The switch mechanism may then be selectively or manually closed from a remote location by means of a Bowden wire cable assembly 86 as shown in FIG. 6. The sheathing of the Bowden wire cable assembly is accordingly secured at one end to the spring arm 72 by means of a collar 88 and setscrew 90 with the wire actuator 92 of the Bowden wire assembly secured to the end of a camming element 94 slidably mounted below the spring arm 72 by the slide collar 96. The cam element 94 may accordingly be displaced to actuate the switch mechanism while the spring arm 72 is disengaged from the switch actuating plunger 76 in order to effect ventilation of a remotely located bed pan.

The bed pan receptacle may be ventilated for removal of odors by a ventilating system as illustrated in FIG. 8. In this installation, a flexible hose 98 is attached to the bed pan in the same manner as illustrated in FIGS. 4 and 5. The opposite end of the flexible hose 98 is, however, connected to the axial suction intake end 100 of a blower 102 which is similar in construction and operation to the blower 32 hereinbefore described. The blower 100 is, however, mounted by means of a bracket 104 on a supporting wall adjacent to a drainpipe 106 to which the drain 108 is connected. The drain 108 extends downwardly from a wash basin 110 so that water from the basin will flush through the drain 108 into the drainpipe 106. A special connecting section 112 is interposed between the drain 108 and the drainpipe 106 to which the exhaust outlet tube 114 from the blower 102 conducts a forced flow of air containing the odors from the odor emitting receptacle to the drainpipe 106. The blower 102 is operated by means of an electric motor 116 on which an actuating switch mechanism 118 is mounted in order to control the supply of electrical

energy to the electric motor from any suitable power source available, for example, at the power receptacle **120**.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In combination with a drain through which waste flushing water is conducted under gravity induced flow, a conduit conducting the waste flushing water to the drain and a conventional toilet receptacle adapted to receive a source of odors, means for ventilating the receptacle to remove said odors comprising power operated blower means mounted in spaced relation to the receptacle inducing a forced flow of air, intake means connecting the blower means directly to said receptacle independently and separately of the conduit, and an exhaust outlet duct connecting the blower means to the drain.

2. The combination of claim **1** wherein said intake means includes a flexible hose connected to the receptacle which is constituted by a bed pan.

3. The combination of claim **1** wherein said intake means includes an inlet duct having an end portion projecting into the receptacle, a connecting conduit connected to said inlet duct and communicating therewith, said connecting conduit having opposite ends spaced laterally of said inlet duct, and a suction tube connecting one of said opposite ends to the blower means.

4. The combination of claim **3** including a flexible hose connected to the other end of the connecting conduit and a bed pan connected to the flexible hose from which odors are removed.

5. The combination of claim **4** wherein said receptacle is a toilet bowl which the drain extends downwardly.

6. The combination of claim **5** including a switch connected to the blower means, a toilet seat pivotally mounted on the toilet bowl and switch actuating means engageable by the seat in a closed position for actuating the switch to energize the blower means.

7. The combination of claim **6** including remote control means mounted by the actuating means for selectively actuating the switch independently of the seat.

8. The combination of claim **7** including a vane movably mounted in said end portion of the duct, means biasing the vane to flow blocking position, and means mounted on the seat for displacing and holding the vane in an open position when the seat is in said closed position.

9. The combination of claim **2** wherein said drain extends from a wash basin.

10. The combination of claim **1** wherein said receptacle is a toilet bowl from which the drain extends downwardly.

11. The combination of claim **10** including a switch connected to the blower means, a toilet seat pivotally mounted on the toilet bowl and switch actuating means engageable by the seat in a closed position for actuating the switch to energize the blower means.

12. The combination of claim **11** including remote control means mounted by the actuating means for selectively actuating the switch independently of the seat.

13. The combination of claim **3** including a vane movably mounted in end portion of the duct, means biasing the vane to a flow blocking position, and means mounted on the seat for displacing and holding the vane in an open position when the seat is in said closed position.

14. The combination of claim **13** including a flexible hose connected to the other end of the connecting conduit and a bed pan connected to the flexible hose from which odors are removed.

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