Dec. 17, 1968 W. R. KLEMME 3,416,167

VENTILATED TOILET

Filed Feb. 8, 1967 2 Sheets-Sheet 1

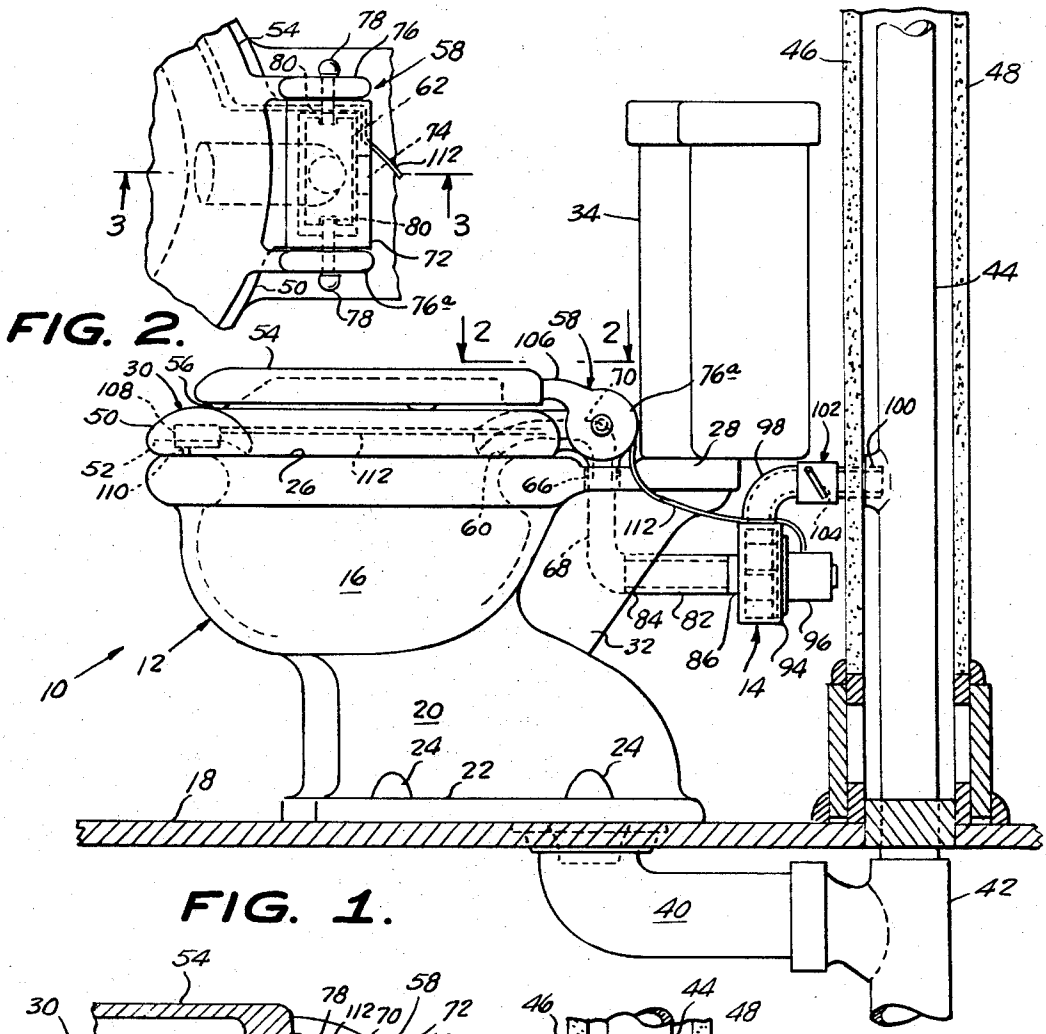


FIG. 2.

FIG. 1.

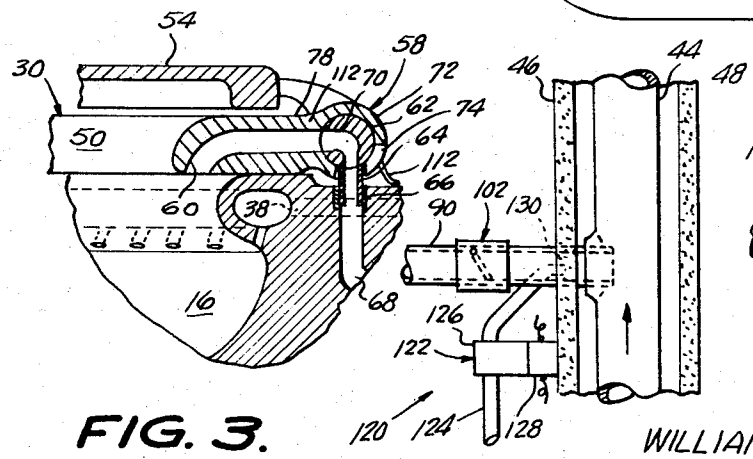


FIG. 3.

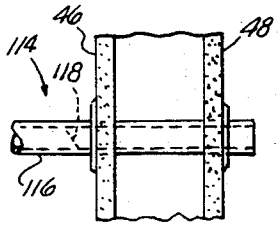


FIG. 4.

FIG. 5.

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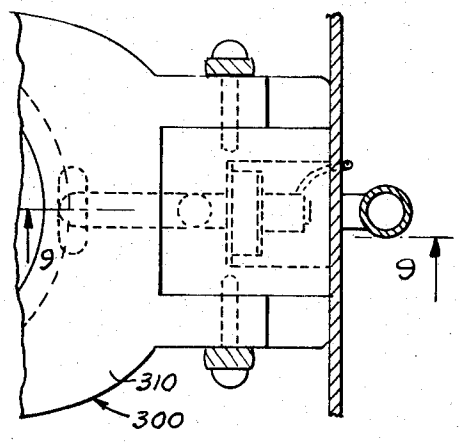


FIG. 8.

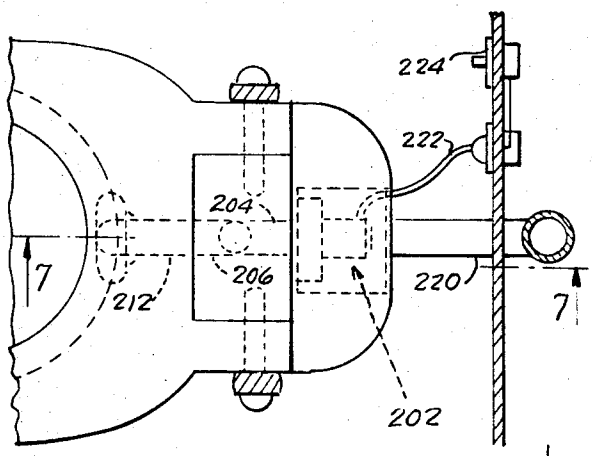


FIG. 6.

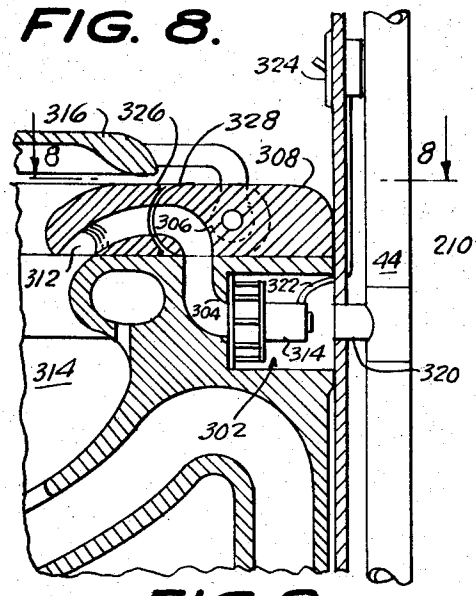


FIG. 9.

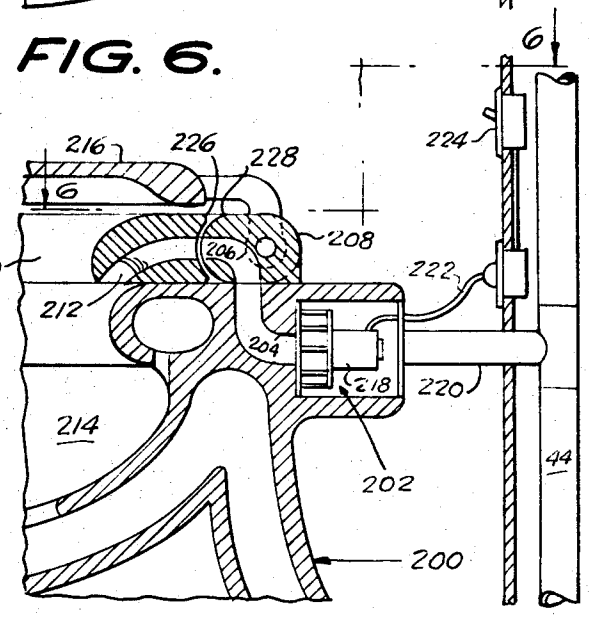


FIG. 7.

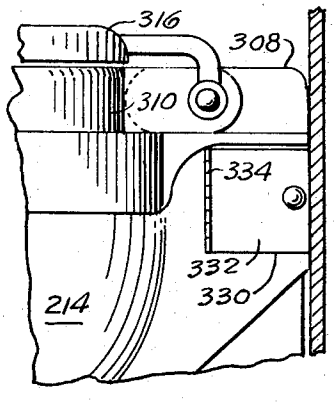


FIG. 10.

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VENTILATED TOILET

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1 Claim. (Cl. 4—217)

ABSTRACT OF THE DISCLOSURE

A toilet provided with air inlet means at the front and air exit means at the rear and a blower for drawing a stream of air through the toilet bowl and exhausting air and odor at the rear and a switch in the toilet seat for energizing the blower is disclosed.

Background of the invention

Field of the invention.—This invention relates to ventilated toilets, and more particularly to a toilet construction for minimizing bad odors by inducing a moving stream of air through the toilet and into an exterior vent.

Description of the prior art.—As conducive to an understanding of the instant invention, it should be noted that the prior art has provided ventilated toilets in which an air connection is disposed between the toilet bowl and a venting outlet such that a draft of air may be created between the toilet and the outside atmosphere to prevent odor accumulation in a bathroom. One apparent disadvantage with the prior art devices is the provision of externally visible air conduits leading from a position above the toilet bowl to a wall of the room. It will be manifest that exteriorly visible conduits substantially detract from the utilitarian lines of the device.

Another disadvantage of prior art ventilated toilets is that a substantially continuous draft is created by connecting the air line to a vented compartment to produce a "chimney" action. This has similarly been disadvantageous since the only requirements for ventilation occur when the toilet is being used. A substantially continuous draft results in a considerable loss of heat during the wintertime and results in the unnecessary use of fuel and oversized heating plants as well as creating drafts.

Summary

It is accordingly an object of the instant invention to provide a ventilated toilet in which the air passageways leading therefrom are hidden from view.

Another object of the instant invention is to provide a ventilated toilet which is operative only when the toilet is in use.

A further object of the instant invention is to provide a ventilated toilet in which the movable connection between the toilet seat and the toilet bowl forms suitable air passageways for carrying a moving stream of air in order to camouflage the objectionable features of prior art ventilated toilets.

A further object of the instant invention is to provide a toilet hinge which may be used to mount a seat or movement on a bowl and to pass a stream of moving air therethrough, the hinge being so constructed and arranged to allow the flow of air through the hinge when the seat is down and to prevent the flow of air and moisture therethrough when the seat is up.

Other objects and advantages of the instant invention reside in the combinations of elements, arrangements of parts, and features of construction and operation, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawing wherein there are shown preferred embodiments of this inventive concept.

Brief description of the drawing

FIGURE 1 is a side elevational view of the ventilated toilet of the instant invention illustrating in cross-section the floor upon which it rests and the wall adjacent which it is positioned;

FIGURE 2 is a partial top plan view of the hinge, seat and lid of the ventilated toilet of FIGURE 1 as may be seen from along line 2—2 thereof as viewed in the direction indicated by the arrows;

FIGURE 3 is a cross-sectional view of the hinge construction of the toilet of FIGURES 1 and 2 taken substantially along line 3—3 of FIGURE 2 as viewed in the direction indicated by the arrows;

FIGURE 4 is a cross-sectional view of the wall with the air line entering therein to provide another embodiment of the air draft means for exhausting air from the ventilated toilet of the instant invention; and

FIGURE 5 is another cross-sectional view of the wall through which the air line of the ventilated toilet extends illustrating another form of air draft means for drawing a stream of air through the ventilated toilet of the instant invention.

FIGURES 6 and 7 are top and side cross-sectional views respectively of an alternative embodiment wherein the air draft means is integral with the toilet bowl.

FIGURES 8 and 9 and 10 are top, side cross-sectional and side plan views of a second alternative embodiment of the invention wherein the toilet bowl is fitted flush against the wall and where the toilet bowl includes an integral air draft means.

Description of the preferred embodiment

Referring now to the drawing in detail, wherein like reference characters designated like elements throughout the several views thereof, the ventilated toilet of the instant invention is shown generally at **10** having as its major components a toilet shown generally at **12** and an air draft means denominated generally at **14** for creating a moving stream of air through toilet **12** to a vent. Toilet **12** includes a bowl **16** elevated above a floor **18** by a stanchion **20** and a plate **22** fastened to floor **18** by a plurality of studs **24**. Bowl **16** forms the conventional upper lip **26** and a rearward extension **28** projecting beyond the confines of a seat shown generally at **30**, the importance of which will be explained more fully hereinafter. Extension **28** is rigidly supported from stanchion **20** by a brace **32** with an upstanding toilet tank **34** being positioned on the rear of extension **28** by any suitable means.

Tank **34** communicates with the interior of bowl **16** through a suitable flushing line **38** (FIGURE 3) in which conventional valve arrangements (not shown) are placed for controlling the discharge of water from tank **34**. A closet L **40** is positioned under floor **18** and acts to carry the discharge from bowl **16** to a Y-shaped connection **42** communicating with a soil line **44** extending between a pair of partitions **46**, **48** perpendicular to floor **18** with partition **46** being located closely adjacent the rear of tank **34**. It should be apparent that soil line **44** extends downwardly from connection **42** to carry away the discharge from bowl **16**. Soil line **44** is vented above Y **42** thereby carrying away fumes.

Seat **30** is preferably made of a molded peripherally extending plastic body **50** of substantially conventional shape and is directly supported on the upper edge **26** of bowl **16**. Body **50** forms an inlet passageway **52** at the front thereof providing communication between the interior of the room and bowl **16**. Positioned immediately above toilet seat **30** is a lid **54** of conventional configuration supported from the upper surface of body **50** by a plurality of rubber feet **56** with a hinge connecting means

or member shown generally at **58** securing lid **54**, seat **30** and rearward extension **28** of toilet **12** together to allow separate conventional pivotal movement of lid **54** and seat **30**. An important feature of the instant invention resides in the provision and construction of hinge **58** and the cooperation thereof with an air passage **60** formed in seat body **50** as shown best in FIGURE 3.

Hinge connecting means **58** comprises a partially hollowed or inner journal member **62** having a conduit extension **64** extending downwardly therefrom into a socket portion **66** formed in brace **32** which is in communication with passage **68** also formed in brace **32**. A generally right angular fluid passage **70** is formed in journal member **62**. When seat body **50** is in the down position, as shown in FIGURE 3, inner journal member **62** communicates at one end with air passage **60** formed in seat body **50** and at the other end with passage **68** formed in brace **32** forming an intercommunicating passage therebetween. Hinge connecting means **58** further comprises an outer journal sleeve **72** which is received about inner journal member **62** for relative rotation about the inner journal member **62** when the seat body **50** is lifted and lowered. A slot **74** is formed in the lower portion of outer journal sleeve **72** to clear conduit extension **64** thereby permitting relative rotation between inner journal member **62** and outer journal sleeve **72**. Lid **54** is also pivotally mounted by hinge means **58** which further comprises a pair of generally circular mounting arms **76** through which securing pins or bolts **78** extend, as best shown in FIGURE 2. Pins **78** extend into indents **80**, which may be threaded and which may threadably receive the ends of pins or bolts **78**.

Thus hinge member **58** comprises a partially hollowed inner journal member having a conduit extension **64** which serves to pass air from the bowl and, in addition, to secure hinge means **58** to extension **28**. The latter securement may be accomplished by threading conduit extension **64** on socket portion **66**, by friction fit, or by any convenient means known to the art. Hinge means **58** further comprises an outer journal sleeve **72** which, in a preferred embodiment, may be integrally molded with the seat body **50** and forwardly extending tongue thereof having a passage therethrough. Cover **54** is mounted by a pair of arm extensions and mounting pins to the inner journal member **62**.

When seat body **50** is in the down position as shown in FIGURES 1–3, flow of air is permitted through inlet passageway **52** at the front of the seat body **50**, through the bowl **16**, exiting through air passage **60**, fluid passage **70** in inner journal member **62** and fluid passage **70** in brace **32**, and from the toilet seat through conduit **82**, which is received in socket portion **84** of brace **32**, to inlet **86** which is in fluid-transmitting relation to squirrel cage fan **94**. It will be apparent that operation of squirrel cage fan **94** will result in air flow through the path just described.

An important feature of this invention lies in the relationship of the fluid passage **70** in inner journal member **62** and air passage **60** in seat body **50**. As shown in FIGURE 3, when seat body **50** is in the down position there is communication between passage **60** and passage **70**; however, when seat body **50** is raised, thereby pivoting outer journal sleeve **72**, passage **60** is no longer in alignment with passage **70** and flow inwardly from passage **70** is prevented by closure of the passage inlet by journal sleeve **72**. Thus, only when seat body **50** is in the down position is air drawn from the room through the bowl and outwardly through passage **68**. In this manner, drafts, extraction of heat from the room, undue noise and other disadvantages of devices of the prior art are avoided.

Fan **94** is powered by a conventional electric motor **96** and delivers the air stream to an outlet conduit or line **98** received by a coupling **100** in soil line **44**. A check valve shown generally at **102** having a conventional flapper **104** is positioned in outlet line **98** to allow flow away from toilet **12** and to prevent backflow. It will be evident that the energization of motor **96** drives fan **94** and results in the passage of a stream of air from within bowl **16** through air draft means **14** into vented soil line **44**.

In order to provide a means for selectively energizing motor **96**, a microswitch **108** is molded in seat body **50** providing a plunger **110** contacting upper edge **26** of bowl **16** such that the placing of a predetermined weight on seat **30** depressed plunger **110** and closes switch **108** to energize motor **96** thereby driving fan **94**. An insulated electric wire **112** is molded in seat **50** and extends rearwardly thereof to electric motor **96** thereby energizing motor **96** upon the depression of seat **30** by an adequate force.

Referring now to FIGURE 4, another form of air removal means is shown generally at **114** and constitutes a pipe **116**, which may be an extention of pipe **92**, extending through partition walls **46** and **48** to the exterior of the building. A conventional flapper **118** may be positioned in pipe **116** thereby acting as a check valve in a conventional manner.

Referring now to FIGURE 5, another form of air removal means is shown generally at **120** and comprises conduit **20** and check valve **102** with a water conduit shown generally at **122** being used in lieu of fan **94**. Water conduit **122** includes a relatively high pressure water line or pipe **124** connected to a suitable source of pressure with a solenoid operated valve **126** positioned therein for selectively starting and stopping the flow therethrough. A solenoid **128** is positioned adjacent valve **126** and is electrically connected to switch **108** to energize solenoid **128** upon the the placement of a predetermined weight on seat **30**. Downstream of valve **128**, water line **124** passes through conduit **90** with a terminus **130** lying therein such that the flow of water through pipe **124** acts to draw a stream of air through conduit **90** by the well known venturi action, thereby obviating the need for the electric motor.

In an alternative embodiment of the invention, the toilet **200** may include an integrally formed chamber **202** which communicates through a passage **204** which extends upwardly from the chamber **202** where it communicates with a passage **206** in a lid and cover mounting block **208**. A seat **210** has integrally formed therein a passage **212** which extends from a communicating relationship with the inside of bowl **214** to the rear where it communicates with passage **206**. A cover **216** is hingably mounted above seat **210**. The front of seat **210** may have an inlet passage formed in the manner described with respect to seat **50**.

A blower **218** is mounted in the chamber **202** and a conduit **220** extends rearwardly from the chamber in communicating relationship therewith to carry the vented air stream to the soil pipe **44**. Power is supplied through line **222** to the blower **218** which is energized by a switch **224** which may conveniently be mounted on the wall. Mounting block **208** may be secured by bolts, adhesive, or by any conventional means to toilet **200**. Seat **210** has formed a concave portion **226** on the rear thereon which cooperates with a convex portion **228** to permit pivotal movement of the seat **210** with respect to mounting block **208**. Movement upwardly closes the entrance to passage **206** while movement to the downward position, as shown in FIGURE 7, permits passage **212** to communicate with passage **206**.

While a wall switch **224** is shown as a convenient method for energizing the blower **218**, it will be realized that a switch may be mounted in the seat to energize the blower **218** in the manner shown in FIGURE 1. Since this wiring is adequately shown in the previous figures, it is omitted in FIGURES 6 and 7 for purposes of clarity.

In the embodiment of FIGURES 6 and 7, access is had to the blower **218** from the rear for purposes of maintenance, lubrication, and, if necessary, repair.

It is becoming customary to mount toilets flush with the wall which would preclude access to the blower in the embodiment of FIGURES 6 and 7. Therefore, a second alternative embodiment is provided in FIGURES 8, 9 and 10 which generally is similar to the embodiment of FIGURES 6 and 7 but is provided with access means on the side.

In FIGURES 8, 9 and 10, the toilet **300** is provided with a chamber **302** which communicates through passage **304** with passage **306** in mounting block **308**. Seat **310** is provided with a passage **312** which is in communication with passage **306** for drawing air from bowl **314**. A lid **316** is provided in the conventional manner. A blower **318** is mounted in chamber **302** for forcing the air through a conduit **320** to soil pipe **44**. The blower **318** is energized by a conductor **322** by means of switch **324**.

A concave portion **326** is provided on the rear of seat **310** and a convex portion **328** is provided on the front of mounting block **308** in a manner similar to that shown in FIGURES 6 and 7.

Access to blower **318** is had through a side opening **330** which is covered by a door **332** which is hingeably mounted by a hinge **334** to the toilet. This means of access to the blower permits the toilet to be mounted flush with the wall and also permits access to the blower for maintenance and repair.

It will thus be seen that an object of the invention, the provision of a toilet having integrally formed therein an air draft chamber and containing an air draft means therein which may be mounted either spaced apart from a wall or flush with the wall has been provided. In the embodiment of FIGURES 6 and 7 and FIGURES 8, 9 and 10, the hinge including mounting blocks **208** and **308**, respectively, includes passages for carrying air from the bowl through a passage in the seat. In this manner, a convenient, compact, and attractive fixture is provided which accomplishes the desired ends of this invention.

It is now seen that there is herein provided an improved ventilated toilet which accomplishes all of the objects of the instant invention and others, including many advantages of great practical utility and commercial importance.

Since many embodiments may be made of the instant inventive concept, and since many modifications may be made of the embodiment hereinbefore shown and described, it will be understood that the foregoing is to be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. An improved ventilated toilet comprising:

a unitary construction which includes means defining a bowl and a rearward extension which includes a chamber opening to the rear and a conduit opening to the top of the unitary construction, said conduit being in communication with the chamber;

a motor driven fan in the chamber so disposed as to propel air from the conduit into the chamber;

means for connecting the chamber to a conduit carrying the air from the chamber to a soil pipe when said air is propelled from the conduit;

a cover mounting block secured on the top of the unitary construction, said cover block including a convex arcuate front edge and having a passageway extending from said arcuate front edge through the block to the bottom thereof, said passageway being in fluid tight communication with the opening of the conduit in the unitary construction;

a toilet seat having rearwardly extending ears disposed on opposite ends of the mounting block, said toilet seat having a concave arcuate rear portion between the ears for complementary juxtaposition with the arcuate front portion of the block and a passageway extending from a point in communication with the passageway in the block to a point in communication with the toilet bowl when the seat is in position above the bowl;

means pivotally securing the seat ears to the block; and

a cover mounted to selectively cover the toilet seat, said seat and cover being movable to an upward position wherein said passageway in said seat is not in communication with said passageway in said block.

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