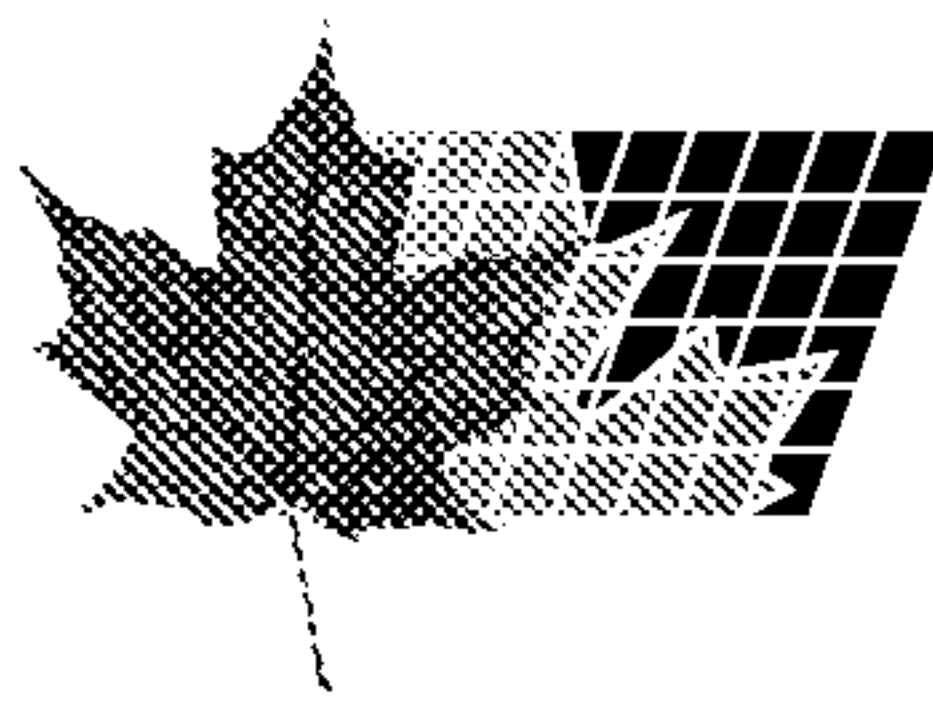




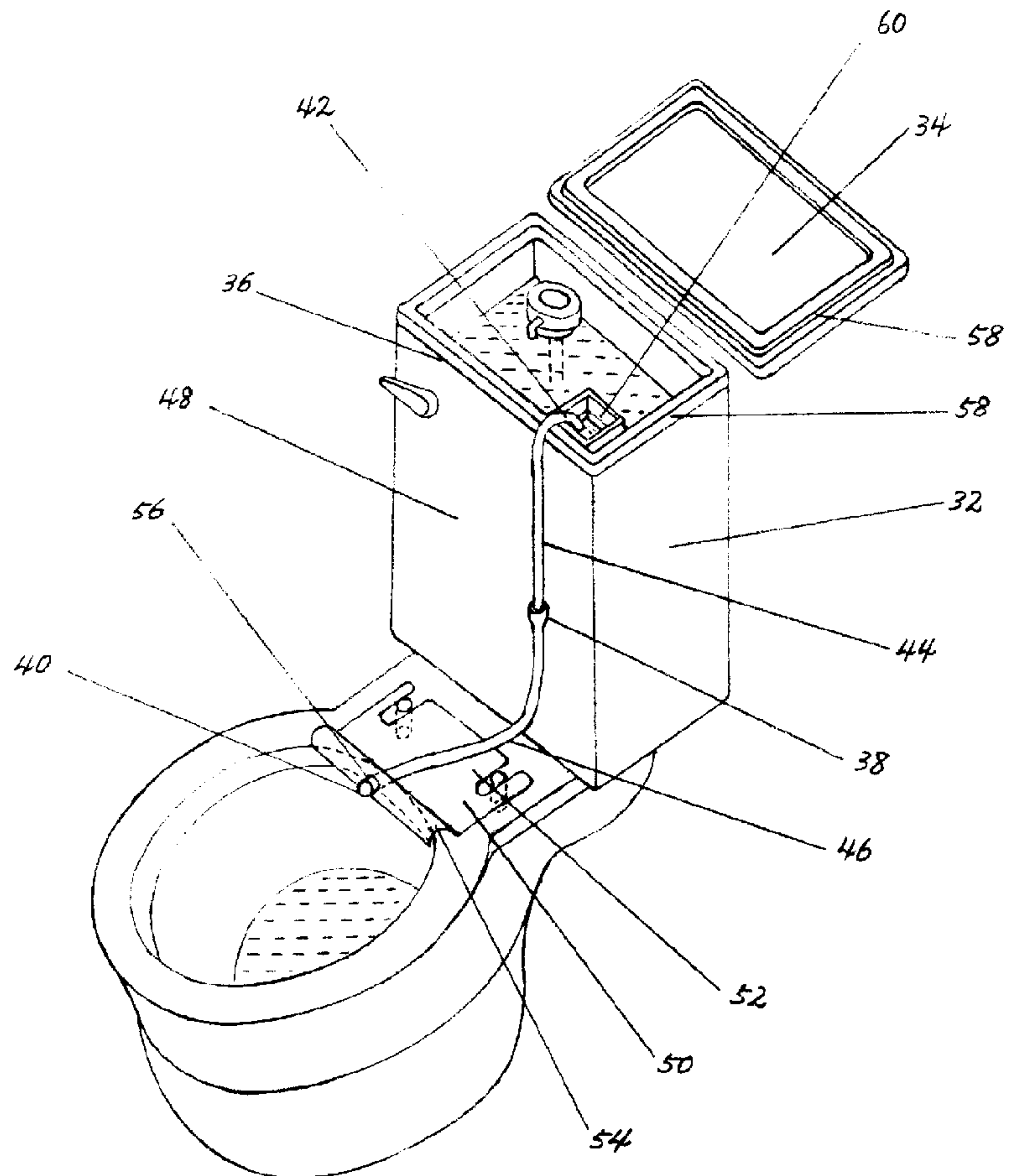
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(54) **SYSTEME DE VENTILATION DE TOILETTE**

(54) **TOILET VENTILATING SYSTEM**



(57) A toilet venting system adaptable to a conventional water closet, comprises a vent-pipe connecting a toilet bowl with a water flushing tank. The latter is provided with a sealing. When after the use of the water closet, water is let to rapidly escape and flow from the water flushing tank into the toilet bowl, a partial vacuum or negative pressure is created in the water flushing tank. As a result, an upward current occurs, foul smelling air and gases being drawn from the toilet bowl into the water flushing tank. By contacting the wet surface of the interior walls of the latter, and especially, the surface of the water therein, a substantial condensation of the foul smelling gases takes place.

Abstract

A toilet venting system adaptable to a conventional water closet, comprises a vent-pipe connecting a toilet bowl with a water flushing tank. The latter is provided with a sealing. When after the use of the water closet, water is let to rapidly escape and flow from the water flushing tank into the toilet bowl, a partial vacuum or negative pressure is created in the water flushing tank. As a result, an upward current occurs, foul smelling air and gases being drawn from the toilet bowl into the water flushing tank. By contacting the wet surface of the interior walls of the latter, and especially, the surface of the water therein, a substantial condensation of the foul smelling gases takes place.

Title : Toilet ventilating system

Background of the invention

1. Field of the invention

5 The invention relates to water closets in general, and more particularly to a toilet ventilating system.

2. Description of the prior art

10 In former years, the bathroom was placed on an outside wall for ventilation to be obtained by means of a window, while the tendency today is to place bathrooms in inside rooms and, thus, make the more desirable outside rooms available for living rooms. There is, accordingly, a greater need for better ventilation of the modern bathroom over the inefficient conventional ceiling vents.

15 Attempts have been made in the past to develop better ventilation systems for water closets. United States Patent, No 3,568,216, dated March 9, 1971 and granted to Valdespino for a "Toilet flushing and ventilating mechanism" uses a sealed main tank, an auxiliary tank and a three-way valve. The latter can be selectively operated, so that in one position water will be forced through a venturi to create a negative pressure within the area of the bowl and exhaust the odor to a sewer. At least one of the liquid lines is provided with a vacuum break to introduce air under atmospheric pressure into the water pressure line, in the event of a break in the same, which could create a partial vacuum or negative pressure within the toilet and suck material from the sewer line, if the negative pressure were not broken. The auxiliary reservoir is completely or partially filled during the power flush cycle and 20 supplies liquid to the bowl, after the power flush has been completed and the siphon effect of the toilet has drained most of the liquid therefrom. This mechanism has two main shortcomings. First, the design is complicated a three-way valve and an auxiliary tank. Second, the existing type of bowl must be redesigned. United States Patent No. 4,439,874, dated April 3, 1984 and granted to Schrock for a "Water closet rim and venting process therefor" describes a rim for a water closet. The rim has a 25 horizontally disposed cavity, which is selectively supplied with pressurized water from a flush

mechanism. The rim has a series of perforations into the cavity, whereby pressurized water within the cavity is permitted to exit from the rim. The rim is also provided with a vent passageway having an inlet open into an upper portion of the cavity and an outlet open into the atmosphere. During a flushing operation, a portion of the air within the cavity is vented through the vent passageway, as pressurized water fills the cavity. A vent tube is provided in the downstream portion of the rim. The vent portion of the rim is provided with an inlet, interconnecting the upper portion of the rim cavity with the vent passageway. The above summarily described water closet presents one basic unsatisfactory aspect. The rim requires changes in the configuration of the bowl, which becomes less break resistant and more difficult to manufacture. United States Patent No. 4,800,596, dated Jan. 31, 1989 and granted to Menge for a "Ventilated toilet" discloses a toilet having a toilet bowl and flushing tank. A pipe for evacuating odors from the bowl connects the latter to the tank. This evacuating pipe has an open end in the bottom of the bowl and a second end in the tank. An air duct hooked into the waste line also extends into the tank, and can be caused to communicate with the evacuating pipe when the toilet is in use. The air duct is provided with a blower, which functions to convey odors from the bowl to the waste line, via the evacuating, flushing tank and the air duct. A liquid seal cuts off communication between the air duct and evacuating pipe, when the toilet is not in use, to prevent backflow of odors from the waste line to the bowl. Menge's structure has a number of shortcomings. First, use is made of a blower. Second, a communication with the exterior must be provided. This necessitates adequate architectural solutions. United States Patent No. 4,989,276 dated Feb. 5, 1991 and granted to Martens for a "Ventilated toilet" relates to a ventilated toilet system for removing obnoxious odors from the toilet bowl. The system includes integral vent channels, formed along the base and the back inside of the water tank, and a vent adapter. The latter is mounted inside the passage, that directs the flow of venting air along the vent channels to an exhaust pipe and discharges it by a remote in-line exhaust fan to the outside atmosphere. As can be seen from the above description, this toilet requires a relatively complicated water tank. United States Patent No. 4,998,299, dated Mar. 12, 1991 and granted to Menge for a "Toilet with apparatus for evacuating malodorous air from the bowl" teaches the use of an odor barrier in the tank.

The latter can seal or establish a path for the flow of air from the bowl by way of a conduit and duct and into the intake of a pipe, so that a fan, which is installed at the outlet of the pipe, can draw air from the pipe and convey it into a flue. The odor barrier has a liquid containing vessel surrounding the intake of the pipe and carried by the upper end of the duct, a vertically movable cap, which normally dips into the liquid in the vessel and sealingly engages the intake of the pipe, a mechanism which can raise the cap, and a bell, which dips into the supply of liquid in the tank and defines a compartment for the cap and the vessel. There is a main drawback to this toilet design. The use of a fan with a motor wiring creates an electrical hazard and the use of an odor barrier, as described above, renders the toilet complex and expensive.

10 **Summary of the invention**

There is accordingly a need for an improved water toilet, which eliminates or, at least, alleviates the existing disadvantages.

It is the primary objective of the present invention to create a self-ventilation cycle during the use of the toilet.

15 It is an another objective of the present invention to basically use the conventional and known type of water toilet.

It is yet another objective of the present invention to develop a simple and inexpensive toilet ventilating system.

20 Broadly, the toilet ventilating system, according to the present invention, is adaptable to a water closet, which comprises a toilet bowl with a rim having a top surface. To the toilet bowl is attached, with screws, a seat provided, with hinges. On the top of an extension of the toilet bowl is mounted a water flushing tank. A cover is disposed of the top of a horizontal edge of the water-flushing tank. The venting system includes a vent-pipe for connecting the toilet bowl with the water-flushing tank. The vent-pipe is, with its lower end, in communication with the upper side of the interior of the toilet bowl, while it is, with its upper end, in communication with the water flushing tank, near the upper end of the latter, above its maximum water level. A pipe fixture for removably attaching the vent-pipe to the toilet

bowl is provided. Use is made of a sealing between the top of the horizontal edge of the water flushing tank and the cover thereof. In one aspect of the present invention, the vent-pipe comprises an upper segment, made of relatively semirigid material and a lower segment, made of resilient plastic material. The upper segment is bent in a substantially U-form, in order to be hooked on the horizontal edge. The
 5 location of the upper segment in the interior of the water flushing tank is adapted to be out of the reach of a flushing mechanism, which is disposed in the interior of the water-flushing tank. Outside the latter, the upper segment extends downwardly on its front face. The bottom end of the upper segment is snugly fitted into the lower segment.

In another aspect of the present invention, the pipe fixture for removably attaching the vent-pipe to
 10 the toilet bowl is made of a relatively thin sheet. The pipe fixture has a back portion, extending horizontally between the two screws and under the hinges, and a front, rolled portion, which extends vertically between the top surface of the rim and the back surface of the seat. A passage for the lower end is provided in the front rolled portion.

In yet another aspect of the present invention, for sealing between the top of the horizontal edge of
 15 the water flushing tank and the cover, use is made of a self-sticking strip, which is provided with a peeling tape.

Optionally, an open, relatively small receptacle containing a pleasantly smelling substance is disposed in the interior of the water flushing tank, under the upper end of the vent-pipe.

Brief description of the drawings

20 Although the characteristic features of this invention will be particularly pointed out in the claims, the invention itself, and the manner in which it may be made and used, may be better understood by referring to the following description, taken in connection with the accompanying drawings, forming part hereof, wherein like reference numerals refer to like parts throughout the several views, in which:
 Fig. 1 is a partial vertical cross section of the water closet; and
 25 Fig. 2 is a perspective view of the water closet, without the seat and the lid.

Description of the preferred embodiment

Referring now to the drawings and initially to Fig. 1 thereof, 10 denotes a water closet, to which is adaptable a toilet ventilating system 12. Water closet 10 comprises a toilet bowl 14, which includes a rim 16 having a top surface 18. To toilet bowl 14, two screws 24 and wing nuts 26 attach a seat 20, which is provided with hinges 22. Seat 20 has usual bumper buttons 28, by which, in its lowered position, is spaced a short distance above top surface 18. A lid 30 is pivotally connected to hinges 22 of seat 20. A water-flushing tank 32 is mounted on the top of a usual bracket extension 31 of toilet bowl 14. Water-flushing tank 32 has a cover 34, easily removable for cleaning and repairing purposes. The latter is disposed on the top of a horizontal edge 36 of water flushing tank 32, to sealingly engage it for a purpose which will be described later. Toilet ventilating system 12, which, as stated before, is adapted to be installed with a water closet 10, of conventional or standard type, comprises a vent-pipe 38 connecting toilet bowl 14 with water flushing tank 32. Thus, vent-pipe 38 has a lower end 40 in communication with the upper side of the interior of toilet bowl 14, and an upper end 42 in communication with water flushing tank 32, near the upper end of the latter, above its maximum water level. Vent-pipe 38 is composed of an upper segment 44, made of relatively semi-rigid plastic material, preferably transparent, and a lower segment 46, made of resilient plastic material, preferably transparent as well. Upper segment 44, in order to be hooked on the horizontal edge 36 is bent substantially in a U-form.

The location of upper segment 44, in the interior of water flushing tank 32, is out of the reach of the flushing mechanism (not shown). Upper segment 44 extends downwardly on the front face 48 of the latter. The bottom end of upper segment 44 is snugly fitted into lower segment 46, the interference fit between the former and the latter forming a seal. The lower segment passes through a pipe fixture 50 and then, enters the upper side of the interior of toilet bowl 14. Pipe fixture 50 is made of a relatively thin sheet of aluminium or plastic and has a back portion 52, which extends between two screws 24 and under hinges 22, and a front rolled portion 54, which extends vertically between top surface 18 of rim

16 and the back surface of seat 20. Rolled portion 54 is provided with a passage 56 for lower segment 46.

A known type of self-sticking strip 58, made of foam and having a rectangular or square cross-section, is provided with a peeling tape. Self-stickig strip 58, after the removal of the peeling tape is
 5 attached to the top of horizontal edge 36, except a relatively narrow space for the passage of upper segment 44. Another self-sticking strip 58', after removal of its peeling tape, is attached to cover 34. Thus, water-flushing tank 32 becomes airtight.

Conventionally, an open relatively small receptacle 60, containing pleasantly smelling crystals or liquid, is disposed in the interior of water flushing tank 32 and hooked up under upper end 42 of vent-
 10 pipe 38.

Operation

When after the use of water closet 10, water is let to rapidly escape and flow from water flushing tank 32 into toilet bowl 14, a partial vacuum or negative pressure is created in water flushing tank 32. As a result, an upward current occurs, foul smelling air and gases being drawn from toilet bowl 14 into
 15 water flushing tank 32, until the latter has been thoroughly emptied. By contacting the wet surface of the interior walls of water flushing tank 32, and, especially the surface of the water, a substantial condensation of the foul smelling gases takes place and, hence, a significant reduction of the unpleasant odors occurs.

As water flushing tank 32 fills, the air contained therein is expelled through vent pipe 38 into toilet
 20 bowl 14. Thus, a continuous ventiltion of toilet bowl 14 is maintained.

When use is made of an open receptacle containing pleasantly smelling crystals or liquid, the air forced through vent pipe 38 into toilet bowl 14 is not only substantially low in unpleasant odors, but induces a ventilation with a pleasant odor.

As required, one embodiment of the present invention has been disclosed, however, it is to be
 25 understood that the disclosed embodiment is merely exemplary of the invention, which may be embodied in various forms. Therefore, specific structural an functional details disclosed herein are not

to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention in virtually any appropriately detailed structure.

The embodiments of the invention in which a exclusive property or privilege is claimed are defined as follows:

1. Toilet ventilating system, adaptable to a water closet which comprises a toilet bowl having a rim with a top surface, to said toilet bowl being attached with screws a seat provided therefore with hinges, and on the top of an extension of said toilet bowl is mounted a water flushing tank, on which a cover is disposed on the top of a horizontal edge of the latter, said venting system including:

- a vent-pipe means connecting said toilet bowl with said water flushing tank, said vent pipe means having its lower end in communication with the upper side of the interior of said toilet bowl and an upper end in communication with said water-flushing tank, near the upper end of the latter, above its maximum water level;
- pipe fixture means for removably attaching said vent pipe means to said toilet bowl; and
- sealing means disposed between the top of said horizontal edge of said water-flushing tank and said cover.

2. Toilet ventilating system, as defined in claim 1, wherein said vent-pipe means comprises an upper segment, made of relatively semi-rigid material, and a lower segment, made of resilient plastic material, said upper segment being bent in a substantial U-form in order to be hooked of said horizontal edge, the location of said upper segment in the interior of said water flushing tank being adapted to be out of the reach of a flushing mechanism, located in the interior of the latter, said upper segment starting from the upper inside of said water flushing tank extends downwardly on the front face of the latter, the bottom end of said upper segment being snugly fitted into said lower segment.

3. Toilet ventilating system, as defined in either claim 1 or 2, wherein said pipe fixture means for removably attaching said vent-pipe means to said toilet bowl is made of a relatively thin sheet of rigid material and has a back portion, which extends horizontally between said screws and under said

hinges, and a front, rolled portion, which extends vertically between said top surface of said rim and the back surface of said seat, a passage for said lower end being provided in said front, rolled portion.

4. Toilet ventilating system, as defined in either claim 1, 2 or 3, wherein said sealing means comprises a self-sticking strip, which is provided with a peeling tape and is attached on said horizontal edge, and another corresponding self-sticking strip which is attached to said cover.

5. Toilet ventilation system, as defined in either claim 1 or 2, further comprising an open, relatively small receptacle containing a pleasantly smelling substance, said receptacle being disposed in the interior of said water flushing tank, under said upper end of said vent-pipe.

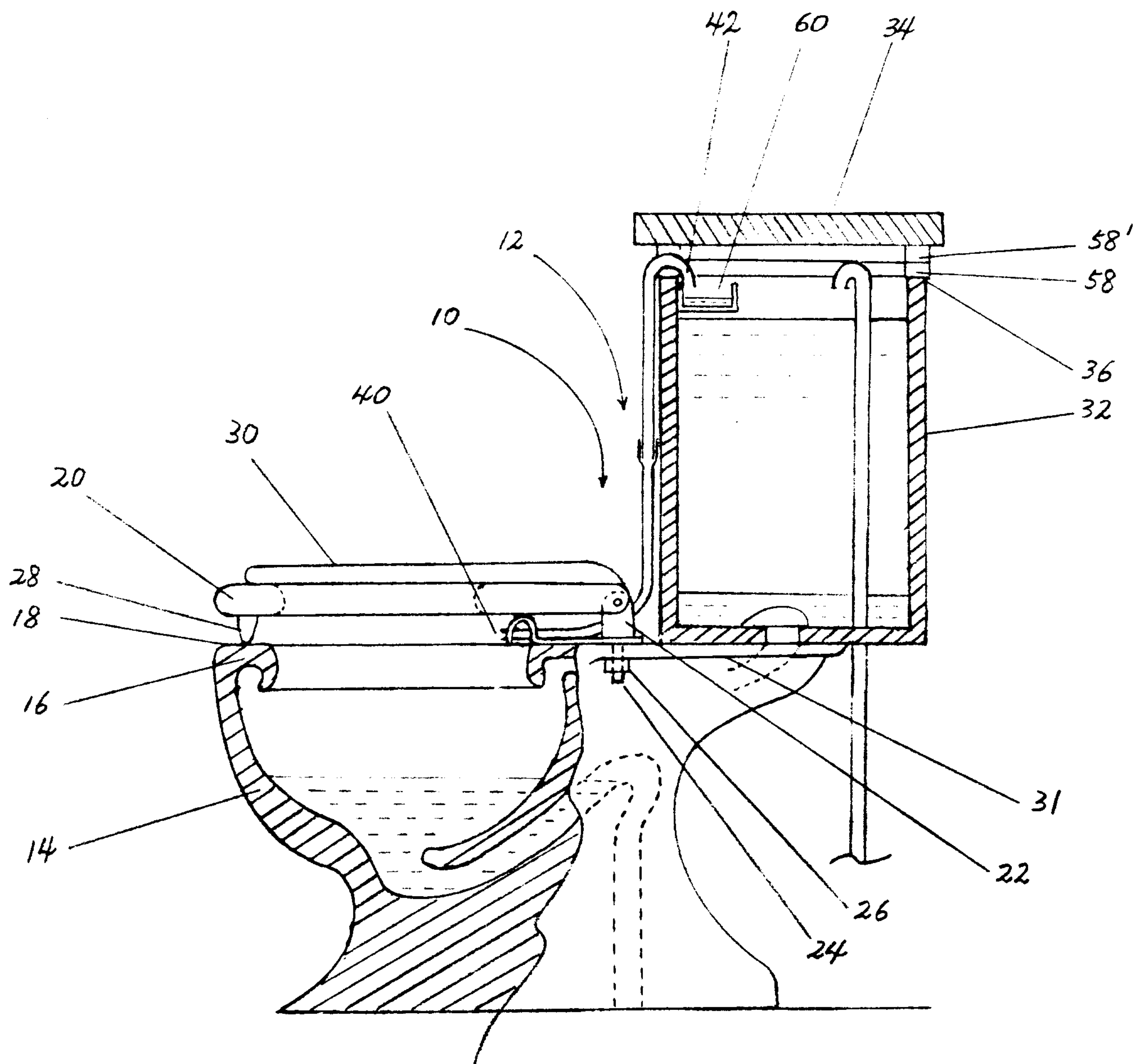


Fig. 1

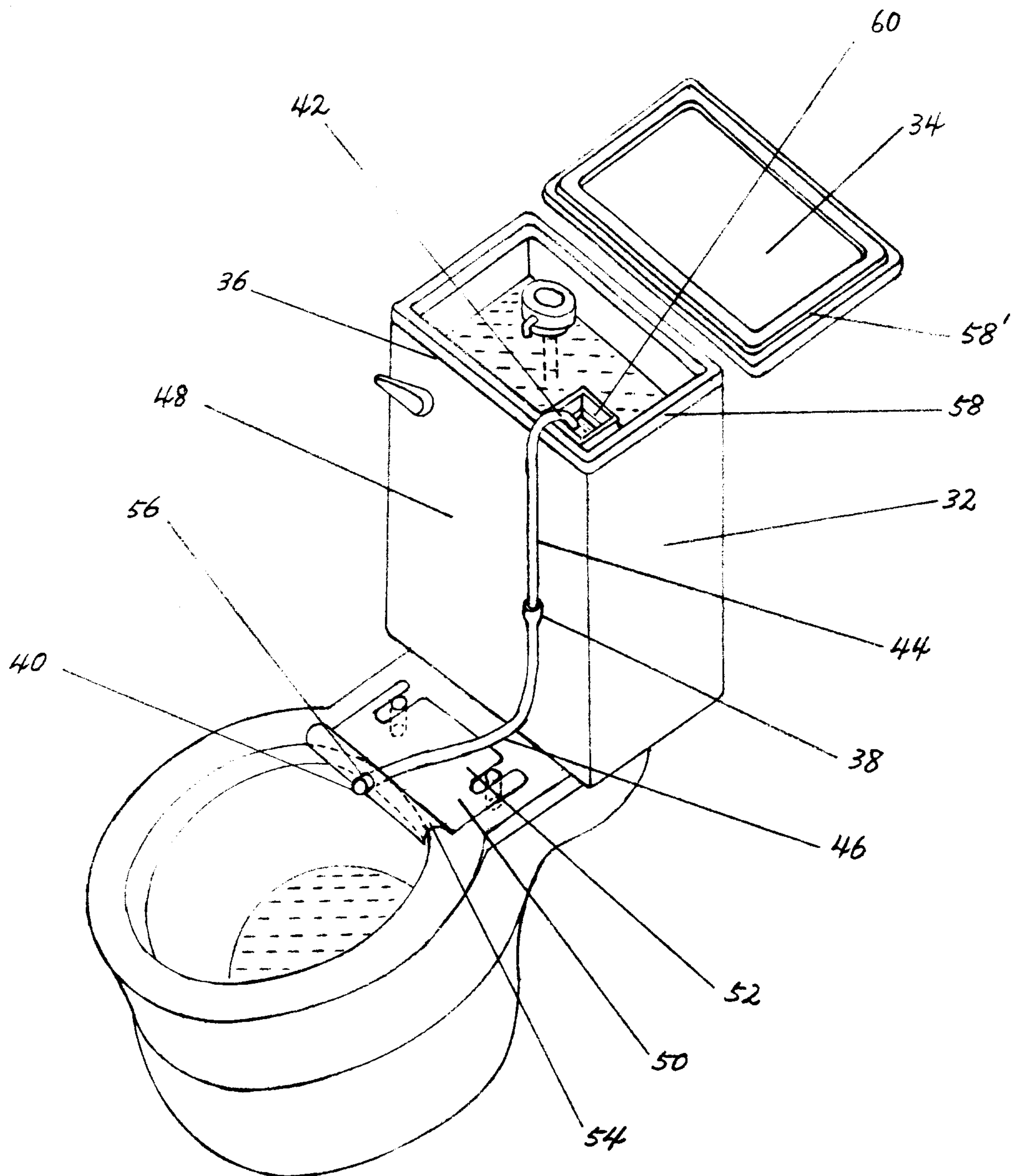


Fig. 2

