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TOILET

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4 Claims. (Cl. 4-10)

This invention relates to a toilet assembly.

The object of the invention is to provide a toilet assembly which utilizes a source of fluid as well as a source of compressed air or gas as the flushing medium.

Another object of the invention is to provide a toilet assembly which includes a bowl that is adapted to be flushed by the simultaneous action of water and air whereby material within the toilet bowl can be conveniently flushed or discharged from the toilet bowl.

A still further object of the invention is to provide a toilet which can be conveniently or readily emptied or flushed by the combined action of water and air under pressure, the toilet assembly of the present invention being especially suitable for use in locations such as aboard ships or boats or the like.

A further object of the invention is to provide a toilet assembly which is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same.

Figure 1 is an end elevational view illustrating the toilet of the present invention.

Figure 2 is a top plan view of the toilet.

Figure 3 is a sectional view taken on the line 3-3 of Figure 1.

Figure 4 is a sectional view taken on the line 4-4 of Figure 3.

Figure 5 is a fragmentary plan view illustrating the pair of pumps which are simultaneously actuated.

Figure 6 is a sectional view illustrating a modified check valve.

Figure 7 is a sectional view taken on the line 7-7 of Figure 6.

Figure 8 is a sectional view illustrating a still further modified check valve.

Referring in detail to the drawings, the numeral 10 indicates the toilet bowl which has a discharge 11, and arranged in the upper end of the bowl 10 is a ring member 12. The numeral 13 indicates a seat which is hingedly mounted adjacent the top of the bowl 10 by means of a hinge unit 14. The hinge unit 14 also provides a pivotal mounting for a lid or closure 15. A latch 16 is provided for selectively retaining the lid 15 in closed position, and the latch 16 can be opened when the lid 15 is to be raised. The numeral 17 indicates a gasket which is positioned between the lid 15 and the seat 13. The numeral 18 indicates a gasket which is positioned between the seat 13 and the top of the bowl 10.

Spaced from the bowl 10 is a support member 19, and mounted on the support member 19 is a water pump 20 and air pump 21. Extending upwardly from an end of the support member 19 and secured thereto or formed integral therewith is a pair of ears 22, and a handle or lever 23 is pivotally connected to the upper ends of the ears 22 by means of a pivot pin 26. The numeral 24

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indicates connectors which are connected to the upper ends of the pumps 20 and 21, and the connectors 24 are secured to the handle 23 by suitable securing elements 25.

As shown in Figure 4, the pumps such as the pump 21 may consist of a bulb-like member which is compressible, and the bulb-like member or pump includes upper and lower sections 27 and 28 which are secured together at their meeting edges. A base 29 is arranged adjacent the lower end of the pump 21, and a conduit 30 leads from the base 29 to the vicinity of the top of the bowl 10. The numeral 31 indicates an inlet conduit which can be used for supplying air to a check valve assembly 32 which may be arranged in the base 29. As shown in Figure 4, the check valve assembly 32 includes movable flaps or valve members 33 and 34 which are mounted for movement into and out of opening and closing relation with respect to openings 35 and 36 respectively. A pipe section 37 extends from the base 29 and is adapted to be connected to the conduit 31 by means of a clamp 38. There is further provided a pipe section 39 which can be connected to the conduit 30 by means of a hose clamp 40. The base 29 is provided with a passageway 41 which registers with a port or opening 42 in the section 28 of the pump 21.

Referring to Figures 6 and 7 of the drawings, there is illustrated a modified check valve assembly which is indicated generally by the numeral 43, and the check valve assembly 43 includes a housing 44 which has pipe sections 45 and 46 connected thereto, and a pipe section 47 leads from the housing 44 to a base 49 which has a passageway 48 therein. The check valve assembly 43 is provided with movable flaps or valve members 50 and 51.

Referring now to Figure 8 of the drawings, there is shown a still further modified check valve assembly which is indicated generally by the numeral 52, and the check valve assembly 52 includes a housing 53 which has pipe sections 54 and 55 extending therefrom. The housing 53 serves to support a movable flap or valve member 56 which is mounted for movement into and out of opening and closing relation with respect to an opening or valve seat 57.

From the foregoing, it is apparent that there has been provided a novel toilet assembly wherein the combination of water and air are used to flush the toilet and wherein the water and air are simultaneously introduced into the toilet bowl to effect the flushing operation. Water can be supplied to the base 60 of the pump 20 through a conduit 58 from a suitable source of supply, and this water under pressure is forced from the base 60 through a conduit 59 to the top of the bowl 10.

With the parts arranged as shown in the drawings, and with the lid 15 held in closed position by means of the latch 16, it will be seen that by manually actuating the handle or lever 23, the water pump 20 and air pump 21 will be simultaneously actuated. Thus, the air pump 21 will cause air under pressure to be forced through the conduit 30 to the top of the toilet bowl 10, and at the same time, the pump 20 will force water through the conduit 59 to the top of the bowl so that this water and air under pressure will effectively flush the toilet whereby the material and fluid in the bowl 10 will pass out through the discharge 11.

The base 29 and the base 60 may be provided with suitable check valves as for example a check valve assembly 32 may be provided in each base. These check valves serve to insure that air or water can pass through the opening 36 and then out through the opening 35 and through the proper outlet conduit, but the flexible valve members 33 and 34 prevent the flow of air or water in the opposite direction. The pumps 20 and 21 may be made of a suitable compressible material such as rubber

so that when the lever 23 is moved downwardly, the pumps or bulb-like members will be compressed to thereby provide the necessary means for forcing the air or water into the toilet bowl.

Instead of using a check valve 32 as shown in Figure 4, a modified check valve such as that shown in Figures 6 and 7 may be utilized. Thus, in Figure 6 the pipe section 45 may have a water inlet line such as the line 31 connected thereto, so that this water can flow through the pipe section 45, and then up past the valve member 51, and then since the pipe section 47 communicates with the passageway 48, it will be seen that the pump 21 can provide sufficient force to cause such water to pass up beyond the valve member 50 and out through the pipe section 46, and this water can pass out through a suitable outlet conduit such as the conduit 59 or 30. The valve members 50 and 51 serve to insure that the water or air can only flow in the proper direction through the check valve assembly so that there will be no back flow of the water or air.

A further modified check valve assembly is illustrated in Figure 8 wherein water or air can flow from right to left through the pipe section 55 and through the opening 57 and the opening 57 is normally kept closed by means of the flexible valve member 56. However, when sufficient pressure is generated, or when sufficient vacuum is provided, the valve member 56 opens so as to permit water or air to pass through the opening 57 and out through the pipe section 54 and then through a conduit such as the conduit 31.

The parts can be made of any suitable material and in different shapes or sizes. Where suitable, plastics may be utilized. The present invention is highly suitable for locations where water is scarce and for such units which are mobile because the toilet can be flushed into a reservoir with a very small amount of water. The construction and operation of the pumps may vary as desired and also, different types of check valves can be used as required or desired. The ring member 12 serves as a baffle so that water issuing from the conduit 59 will impinge against the ring member 12 whereby splashing of the water is minimized or prevented. The connectors 24 may be made of a suitable material such as plastic, and the sections of the pumps such as the sections 27 and 28 may be cemented or secured together at their meeting edges. Suitable gaskets can be used wherever required or desired.

To use the pumps, the lid 15 is opened, and then the pumps are operated to wet the bowl 10, in order to raise the water to the proper level. Then, the toilet is used and then after the toilet has been used, the lid 15 is closed and locked in place by means of the latch or lock 16. Then, by actuating the handle 23 a few times, the toilet will be flushed. In Figure 3 the numeral 61 indicates the water level pumped in before use, while the numeral 62 indicates the level after flushing. The discharge 11 may be varied in order to suit the particular installation. The air intake for the pump 21 may be scented if desired.

Thus, it will be seen that the toilet bowl 10 has a seat 13 and lid 15 which is equipped with soft rubber gaskets 17 and 18 so as to provide an airtight seal when the lid latch 16 is fastened. The bowl 10 has the rinse ring 12 around the top to which the water hose 59 leads, and the hose or conduit 30 for the air supply has its outlet in the bowl flange inside of the gasket 18.

The water pump 20 is shown as a bulb-type but different types of pumps can be used to meet the particular requirements of an installation and this also applies to the air pump 21. These pair of pumps are simultaneously actuated by means of the lever or handle 23.

The toilet discharge 11 can vary to suit the particular installation. Thus, stationary vessels may install a bowl without the water trap, but instead, the discharge passage would be straight down, or approximately straight down through the bottom of the vessel, provided the toilet is located properly in relation to the water line for the vessel.

When the toilet is to be operated, the following sequence of steps are carried out. The latch 16 is released and the lid 15 is raised, and then the lever 23 is operated to pump water into the bowl 10 so as to raise the level and wet the bowl and air can escape. Then, the toilet is used in the normal manner and then the lid 15 is closed and the latch 16 is fastened. Again, the lever 23 is actuated and air pressure from the pump 21 will force the waste downward into the discharge 11 and clean water will rinse the bowl. When air escapes through the discharge 11 flushing is accomplished. Enough clean water remains to form an odor trap. It is only necessary to actuate the lever 23 with a few strokes.

Some of the advantages of the present invention are as follows. The mechanism will eliminate waste going through pumps and check valves, and back flooding is prevented with the lid closed and locked. The construction is simple and maintenance is very easy and the pump unit can be located independently from the bowl. Also, simple and varied installations may be accomplished, and deodorants can be automatically dispensed by introduction into the air pump intake.

With the present invention, normal waste will readily pass, and clogging of the toilet is prevented and the mechanism is especially suitable for installation such as marine installations or aboard small crafts or boats or the like. Instead of using air, other gases above atmospheric pressure can be used to provide the force necessary to empty the toilet.

It has further been discovered that an adult's breath can flush the toilet should the air pump fail provided a check valve is in the conduit being blown into and this indicates the small amount of compression which is necessary.

Minor changes in shape, size and rearrangement of details coming within the field of invention claimed may be resorted to in actual practice, if desired.

I claim:

1. In a toilet, a bowl, a discharge connected to the lower end of said bowl, a ring member arranged in the upper end of said bowl, a hingedly mounted seat on top of said bowl, a hingedly mounted lid arranged above said seat, a gasket positioned between said lid and seat, a gasket between said seat and the top of the bowl, a latch for selectively maintaining said lid in closed position, a support member spaced from said bowl, a water pump and an air pump on said support member, conduits connecting said pumps to the top of said bowl, and a lever for simultaneously actuating said air and water pumps.

2. In a toilet, a bowl, a discharge connected to the lower end of said bowl, a ring member arranged in the upper end of said bowl, a hingedly mounted seat on top of said bowl, a hingedly mounted lid arranged above said seat, a gasket positioned between said lid and seat, a gasket between said seat and the top of the bowl, a latch for selectively maintaining said lid in closed position, a support member spaced from said bowl, a water pump and an air pump on said support member, conduits connecting said pumps to the top of said bowl, and a lever for simultaneously actuating said air and water pumps, said lever being manually operable.

3. In a toilet, a bowl, a discharge connected to the lower end of said bowl, a ring member arranged in the upper end of said bowl, a hingedly mounted seat on top of said bowl, a hingedly mounted lid arranged above said seat, a gasket positioned between said lid and seat, a gasket between said seat and the top of the bowl, a latch for selectively maintaining said lid in closed position, a support member spaced from said bowl, a water pump and an air pump on said support member, conduits connecting said pumps to the top of said bowl, and a lever for simultaneously actuating said air and water pumps, said lever being manually operable, inlet conduits connected to said pumps, and check valves operably connected to said pumps.

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4. In a toilet, a bowl, a discharge connected to the lower end of said bowl, a ring member arranged in the upper end of said bowl, a hingedly mounted seat on top of said bowl, a hingedly mounted lid arranged above said seat, a gasket positioned between said lid and seat, a gasket between said seat and the top of the bowl, a latch for selectively maintaining said lid in closed position, a support member spaced from said bowl, a water pump and an air pump on said support member, conduits connecting said pumps to the top of said bowl, and a lever

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for simultaneously actuating said air and water pumps, said lever being manually operable, inlet conduits connected to said pumps, and check valves operably connected to said pumps, said pumps each including compressible bulb-like members.

References Cited in the file of this patent

UNITED STATES PATENTS

334,941

De Rycke ----- Jan. 26, 1886

2,529,587

Bates et al. ----- Nov. 14, 1950