SELF-PLUNGING TOILET AND METHOD OF CLEARING A TOILET

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ABSTRACT
The present toilet relates to devices for removing clogs from drains and hand operated toilet plungers. More particularly the present invention concerns a toilet which when clogged can clear the clog automatically. With one push of a valve or turning a valve, clogs are moved and eliminated. The toilet contains within the toilet base a plunger or means to clear the obstructions.
FIG. 1
SELF-PLUNGING TOILET AND METHOD OF CLEARING A TOILET

[0001] This application claims the priority of Provisional Application 60/744591 filed on Apr. 6, 2006, which is hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] The present toilet relates to devices for removing clogs from drains and hand operated toilet plungers. More particularly the present invention concerns a toilet which when clogged can clear the clog automatically. With one push of a valve or turning a valve, clogs are moved and eliminated. The toilet contains within the toilet base a plunger or means to clear the obstructions.

[0003] Not a month goes by in some households when a toilet will stop up either due to low volume flush toilets or the interior piping from the toilet accumulating debris causing a clog. Generally toilet plungers are kept beside every toilet for this emergency event. Though most plungers can be successfully operated contaminated water might be sprayed, spilled, or tracked across the floor because the toilet clogged. This toilet eliminated dripping a plunger or other device across a floor to be put away as the toilet houses and operates the plunger only when needed. This leads the device to place other drain cleaners into the toilet.

[0004] With current standard toilets, often stubborn clogs may required additional appliances such as a snake or pressurized flushing device added to the toilet to eliminate the blockage. When these external devices are removed, often residual matter remains on the device which could potentially contaminate the environment.

[0005] Many times plunging a toilet requires repeated flushing before the clog is loosened and the pipes cleared. This self-flushing system reduces the amount of water used to clean or flush a clog. Considerably less water is wasted as this device is self-cleaning.

[0006] As stated above there exists a distinct need for a toilet with a mechanism to eliminate clogs and aggravations in an efficient and sanitary method.

SUMMARY OF THE INVENTION

[0007] The present invention provides a self-plunging, self-cleaning, and drain flushing toilet whereby with one motion activates a water valve. The toilet responds by sealing the drain to prevent backflow so that full water pressure from the house hold supply is applied to the blockage. Once the blockage clears, the water pressure in the device cleans the valve mechanism and then the device returns to resting or normal operation position. The device includes a diverter valve which when pushed or turned redirects the water to the device. The device features a plunger, or rotating valve, or gate which clamps the drain line shut. Once sufficient pressure to seal the drain is achieved the configuration allows water pressure to open into the drain blowing clear the clog. Letting go of the diverter valve returns the toilet to normal operation by redirecting water from the toilet plunger or rotating valve to the toilet waste system.

DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a side view cross-section of a toilet embodiment of the invention, in a pressurized mode position.

[0009] FIG. 2 is a side view cross-section of a toilet embodiment of the invention, in a normal mode position.

[0010] FIG. 3 is a pair of cross-section views of a diverter valve in a normal mode position in FIG. 3 and in a diverted position in FIG. 3b.

[0011] FIG. 4 is a pair of cross-section views of a diverter valve in a normal mode position in FIG. 3a and in a diverted position in FIG. 3b.

[0012] FIG. 5 is a cross-section and exploded view of the plunger mechanism, showing the cross-section view in FIG. 5e and the exploded view of the components in FIG. 5b.

DETAILED DESCRIPTION OF THE INVENTION

[0013] As shown in FIG. 1, the invention apparatus is preferably connected to a toilet outlet drain, near the toilet bowl. It could be located anywhere along the drain line. As shown, the device could be incorporated into the toilet bowl design.

[0014] The plunger mechanism is designed to fill the outlet drain and seal it such that water can not flow back into the toilet bowl. The mechanism may include at least two cylinders 1, 2 which fit inside each other and are machined to slide apart when water pressure is supplied to them and later contract back together, via pressure from a spring 3 which is internally located. The base cylinder 1 has a waterline attachment 4 located on it which connects to a water source, such as the water line from the diverter valve 17 on the toilet water source. For convenience in usage, and to help keep waste debris out of the chamber 5, another water line is located on the flattened portion of the cylinder on top 6. The flattened inside of the base cylinder serves to prevent rotation of the inner cylinder 2. This could be achieved by other methods, such as a groove along the cylinders. The base cylinder 1 further includes means for connecting the spring 3, as shown in FIG. 4 by the bent bar 7. The interior cylinder 2 has means to attach a rubber seal 8, which in FIG. 4 is a threaded hollow bolt 9. The bolt 9 has a bar 10 for attaching to the spring 3. The bolt 9 can be permanently attached and could be provided simply by a groove for the seal to attach itself to the interior cylinder. The rubber seal 8 would need to be designed to withstand the water pressures supplied to the toilet, most commonly under 120 pounds per square inch. The design shown in FIG. 4 is made of separate components that are designed to have threads to screw together tightly to prevent leakage. The other side of disc-like rubber seal 8 is attached to the head of a plunger 11 via another hollow bolt 9. The head of the plunger 11 has a threaded opening to accept a pressure relief valve 12. The pressure relief valve 12 has a spring 13 and ball valve 14. The valve 12 has passages 15 which are the paths of the water to flow into the toilet drain 16 to force the clog through the system.

[0015] Operation of the water flow to the mechanism would be provided by a diverter valve 17 that takes the water supply to the toilet to be used by the mechanism. Separate water supply connections could also be provided. The diverter valve 17 could be of other designs, including common rotational designs, but the push button style shown in FIG. 3 is seen as preferred for simplicity. The diverter valve 17 of the design in FIG. 3 attaches to the base of a toilet tank 18 via standard plumbing fittings. The water supply line to the toilet attaches to the bottom section 19 of the diverter valve 17. The diverter valve 17 in its normal state allows the toilet to operate normally, as a standard toilet. Upon pressing of the button on the diverter valve 17, the water pressure is diverted or re-routed to the plunger mechanism 1. The plunger responds by expand-
ing pressure against the opening and expanding the rubber seal 8. Once sufficient sealing has occurred the pressure relief valve 12 opens which opens passageways 15 to the clogged drain line 16, which is then pushed clear. Once clearing is complete, the diverter valve 17 senses a drop in pressure like a vibration. When the diverter valve 17 is manually released, it returns to its normal position and normal operation of the toilet water supply system. The water and water pressure in the plunger system must then be eliminated to return the plunger mechanism to normal operation. This invention may allow the diverter valve 17 to return the water via a second line, to the tank via the attachment connection 6 of the plunger. This serves to clean the plunger mechanism and prevent debris from prohibiting return of the plunger.

[0016] It is envisioned that the parts could preferably be manufactured of stainless steel construction except the rubber seal 8 and drain line 16. Plastic materials could easily be used for the plunger 1, the inner cylinder 2, the threaded hollow bolt 9, and the plunger head 11 if it will withstand necessary water pressures. The inner cylinder 2, the threaded hollow bolt 9, and the plunger head 11 could be made in one piece if a rubber seal 8 could be made strong enough to withstand the necessary water pressures. The rubber seal 8 could be manufactured of a rubber compound, similar to what plumbers commonly use to stop up a line or silicon rubber similar to what scuba face masks are made of. The part itself may look like a disk, as designed in FIG. 4.

I claim:

1. A toilet consisting of:
   a bowl;
   means for flushing the bowl with water, including a water supply, and a drain line;
   a diverter valve for diverting the water supply from flushing the bowl to a plunger mechanism upon activation by a user;
   the plunger mechanism having means for sealing the drain line and connection of the water supply into the drain line, whereby the water pressure of the water supply could remove clogs in the drain line.

2. A toilet clog remover for incorporation into a toilet having a water supply and a drain line extending downstream from the toilet to a sewage outlet, comprising:
   a plunger mechanism having means for activation by a user;
   means for sealing the drain line of the toilet;
   and means for connecting the water supply downstream of the means for sealing the drain line, such that the water supply can remove clogs in the drain line.

3. A method of clearing a toilet clog from a toilet having a water supply and a drain line comprising:
   a user activating the water supply to a plunger mechanism;
   the plunger mechanism sealing off the drain line;
   the water supply being connected to the drain line, such that the water pressure clears the toilet clog.

4. A self-plunging toilet comprising:
   a plunger;
   a diverter valve linked to the plunger by water lines, whereby a diverter valve directs pressure from a water supply to seal a toilet drain with an expanding seal, whereas the water supply flushes an obstruction free.

5. The self-plunging toilet of claim 4, wherein the diverter valve returns water from the plunger to the toilet.

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