ABSTRACT

A toilet overflow preventer includes an overflow sensor configured to extend into the interior of a toilet bowl. The overflow sensor includes a housing having a liquid-porous bottom with a switch located inside the housing. A battery is in electrical communication with the overflow sensor. An actuator assembly is connected to the battery and the overflow sensor. The actuator assembly includes an actuator having an actuator arm moveable from a first position not in contact with the toilet flush valve to a second position in contact with the toilet flush valve based upon a signal from the overflow sensor switch.
TOILET OVERFLOW PREVENTER
CROSS REFERENCE TO RELATED APPLICATION


BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention
[0003] This invention relates generally to toilets and, in one particular embodiment, to an assembly for preventing the toilet bowl from overflowing onto the bathroom floor.

[0004] 2. Technical Considerations

[0005] Almost everyone has at one time or another had to deal with the problem of a clogged toilet bowl. Toilet bowls can become clogged for many reasons. For example, the discharge line can become obstructed due to excessive waste matter, toilet tissue, or the flushing of inappropriate articles. The undesired result is typically a toilet bowl overflow, which can lead to unsanitary conditions or even property damage caused by the overflowing water.

[0006] Therefore, it would be desirable to provide a device that can detect and prevent a toilet bowl overflow.

SUMMARY OF THE INVENTION

[0007] A toilet overflow preventer comprises an overflow sensor configured to extend into the interior of a toilet bowl. An electrical power source is connected to the overflow sensor. An actuator assembly (which can be located inside the toilet bowl tank) is connected to the overflow sensor such that activation of the overflow sensor causes the actuator assembly to close the toilet flush valve.

[0008] Another toilet overflow preventer comprises an overflow sensor configured to extend into the interior of a toilet bowl. The overflow sensor comprises a housing having a liquid-porous bottom with a switch located inside the housing. A battery is in electrical communication with the overflow sensor. An actuator assembly is connected to the battery and the overflow sensor. The actuator assembly comprises an actuator having a movable actuator arm, for example, movable from a first position not in contact with the toilet flush valve to a second position in contact with the toilet flush valve based upon a signal from the overflow sensor switch.

[0009] An exemplary overflow preventer of the invention will be described with reference to the following drawing figures wherein like reference numbers identify like parts throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a front, elevated view of a conventional toilet incorporating an overflow preventer of the invention;
[0011] FIG. 2 is a bottom view of a sensor housing of the invention; and
[0012] FIG. 3 is an interior view of a sensor housing of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0013] As used herein, spatial or directional terms, such as “left”, “right”, “inner”, “outer”, “above”, “below”, and the like, relate to the invention as it is shown in the drawing figures. However, it is to be understood that the invention can assume various alternative orientations and, accordingly, such terms are not to be considered as limiting.

[0014] A conventional toilet 10 is shown in FIG. 1. The components and operation of a conventional toilet will be well understood by one of ordinary skill in the art and, therefore, will not be described in detail. The toilet 10 components will first be described and then the overflow preventer of the invention will be described. The toilet 10 has a seat portion 12 comprising a bowl 14 having a rim 16. A waste drain, typically referred to as a siphon jet 18, is located at the bottom of the bowl 14. The siphon jet 18 leads to a siphon (waste discharge) at the back of the bowl 14. A tank 20 is located above the seat portion 12 and has a hollow interior configured to hold water. A fill tube 24 having a filler float 26 and a filler valve (28) is located in the tank. The fill tube 24 is connected to a source of water via the filler valve 28. The filler valve 28 is in operational connection with the filler float 26. An overflow tube 30 is also located in the interior of the tank 20 and has a hollow interior in flow communication with the toilet bowl 14.

[0015] A drain 32 is located in the interior of the tank 20 and is in flow communication with the interior of the bowl 14. A flush valve 34, such as a conventional flapper valve, is configured to close-off the drain 32. The flush valve 34 is connected to a handle 36, such as by a lever 38 having a chain 40 connected to the flush valve 34.

[0016] Under normal circumstances, when the toilet 10 is to be flushed, the handle 36 is depressed. This lifts the flush valve 34 and allows water from the interior of the tank 20 to flow into the bowl 14 through the drain 9 and flush material out of the bowl 14 through the siphon jet 18. As the water leaves the tank 20, the filler float 26 descends on the fill tube 24. This activates the filler valve 28 to allow water flow into the interior of the tank 20 through the fill tube 24. As the water begins to refill the tank 20, the filler float 26 rises on the fill tube 24 until it rises to a position to close the filler valve 28 and stop water flow into the tank 20.

[0017] Should the siphon jet 18 become clogged, such as by the insertion of children’s toys or other inappropriate objects, water entering the bowl 14 through the drain 32 will rise in the bowl 14 and then overflow onto the bathroom floor.

[0018] However, an overflow preventer of the invention can prevent this undesirable occurrence. An exemplary overflow preventer 50 of the invention is shown in FIG. 1. The components of the overflow preventer 50 will first be described and then the operation of the overflow preventer 50 will be described. The overflow preventer 50 includes an overflow sensor 52 configured to extend into the interior of the bowl 14. In the illustrated embodiment, the overflow sensor 52 is attached to the rim 16 of the bowl 14, such as by a hook or hanger 54. The overflow sensor 52 includes a housing 56 having a liquid permeable bottom 58 (see FIG. 2). The bottom 58 can either be completely open or can have a screen or mesh across the opening to allow liquid (water) to enter but prevent material entering the housing 56. The overflow sensor 52 can include a switch 60 (see FIG. 3), such as a conventional two position limit switch or arm switch. One switch particularly suitable for the present invention is a “momentary push button switch” (part number 275-1547) commercially available from Radio Shack.

[0019] The overflow sensor 52 (i.e., the switch 60) is connected to an electrical power source 62, such as by a cable or wire 64. While in the broad practice of the invention the
The invention claimed is:
1. A toilet overflow preventer, comprising:
an overflow sensor configured to extend into the interior of a toilet bowl;
an electrical power source connected to the overflow sensor;
and
an actuator assembly connected to the overflow sensor and the electrical power source such that activation of the overflow sensor causes the actuator assembly to mechanically close a toilet flush valve.
2. The overflow preventer of claim 1, wherein the overflow sensor includes a housing having a porous bottom.
3. The preventer of claim 1, wherein the overflow sensor includes a float switch.
4. The preventer of claim 1, wherein the electrical power source is a battery.
5. The preventer of claim 1, wherein the actuator assembly includes an actuator having an actuator arm, with the actuator arm configured to move from a first position not contacting a flush valve to a second position pressing a flush valve against a tank drain.
6. A toilet overflow preventer, comprising:
an overflow sensor comprising a housing having a liquid permeable bottom and a two-position switch located in the housing;
a battery connected to the overflow sensor;
an actuator assembly connected to the overflow sensor and the battery, the actuator assembly comprising an actuator having an actuator arm movable from a first position to a second position.
7. A toilet having an overflow preventer, comprising:
a toilet having a toilet bowl, a rim, and a flush valve;
an overflow sensor connected to the rim and extending into the interior of the toilet bowl, the overflow sensor comprising a housing having a liquid-porous bottom with a switch located inside the housing;
a battery in electrical communication with the overflow sensor;
an actuator assembly connected to the battery and the overflow sensor, the actuator assembly comprising an actuator having an actuator arm moveable from a first position not in contact with the toilet flush valve to a second position in contact with the toilet flush valve based upon a signal from the overflow sensor switch.