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TOILET

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FIG. 1

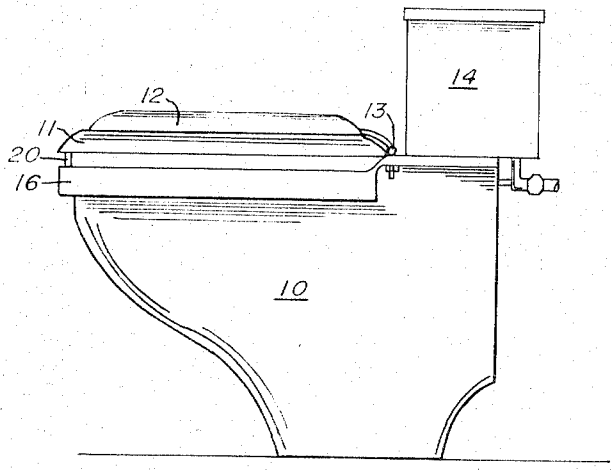

FIG. 2

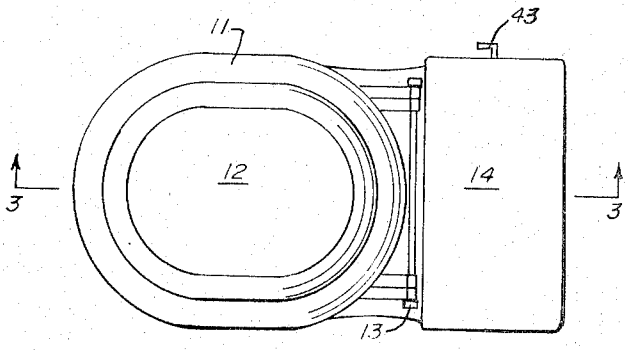

FIG. 4

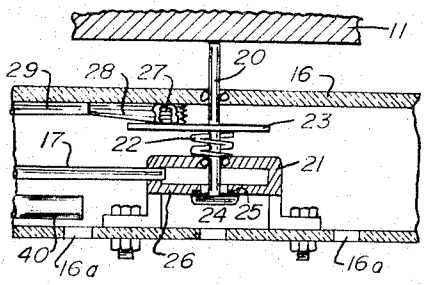

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FIG. 3

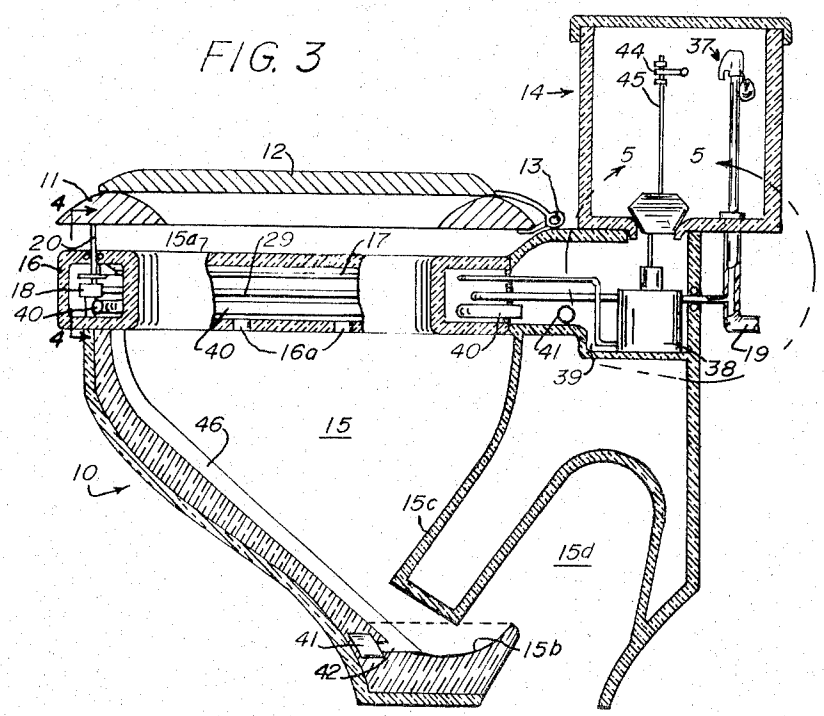


FIG. 5

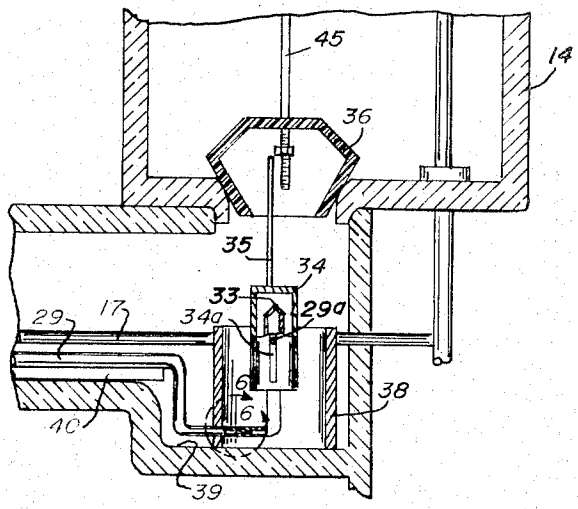
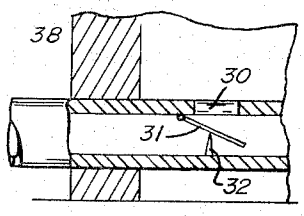


FIG. 6



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TOILET

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5 Claims. (Cl. 4—82)

This invention relates to toilets and more particularly to flushing systems therefor.

Most toilets in common use today include a bowl in which a pool of water is maintained and into which waste material is directly introduced before the toilet is flushed and the waste material and water are discharged to a sewer line. Flush water from a water tank is distributed through a crown surrounding the bowl and cleans the sides of the bowl as it falls to a depressed bottom and is discharged to the sewer line. The last of the flush water is trapped in the depressed bottom to form the pool, thereby placing the toilet in condition to again receive waste material.

Such conventional toilets are unsatisfactory for a number of reasons. For example, many persons find the noises resulting from introduction of waste material directly into the pool objectionable or embarrasing. In addition, waste material accumulating on the sides of the bowl is unsanitary, and the manual flushing does not always remove it, especially if it has been allowed to remain in place for a period of time.

Accordingly, an object of the present invention is to provide a toilet wherein the pool maintained in the bottom of the bowl is positioned completely out of the area into which waste material is introduced, so that the noises commonly associated with the introduction of such material are eliminated. It is also an object to continuously rinse or pre-flush the sides of the toilet bowl as material likely to adhere thereto is introduced, and to automatically full-flush the toilet thereafter, while still allowing normal flushing operations to be initiated.

Principal features of the invention are a toilet bowl having a depressed area therein, that is positioned behind a partition and separated from the area of the bowl that receives waste material and a special flushing system that pre-flushes the bowl when a downward pressure is applied to the toilet seat, automatically full-flushes the bowl when the pressure is relieved, and can be conventionally manually flushed whenever desired.

There is shown in the accompanying drawings specific embodiments of the invention representing what are presently regarded as the best modes of carrying out the generic concepts in actual practice. From the detailed description of these presently preferred forms of the invention, other more specific objects and features will become apparent.

In the drawings:

FIG. 1 is a side elevation view of the toilet of the invention;

FIG. 2, a top plan view;

FIG. 3, a vertical section taken on the line 3—3 of FIG. 2;

FIG. 4, a fragmentary vertical section taken on the line 4—4 of FIG. 3;

FIG. 5, an enlarged view, in section, and with parts broken away, taken within the line 5—5 of FIG. 4; and

FIG. 6, still further fragmentary view taken within the line 6—6 of FIG. 5.

Referring now to the drawings:

In the illustrated preferred embodiment, the toilet comprises a base **10** that carries the usual toilet seat **11** and cover **12**, both hinged at **13**. A water tank **14** is mounted on the base **10** and provides a reservoir for water to be used in the full-flush operations to be described.

Base **10** includes a bowl **15** interiorly thereof with a top receiving opening **15***a*, and a depressed area **15***b* positioned beneath and behind a partition **15***c* that extends into the bowl such that waste material is prevented from falling directly into the depressed area. Partition **15***c* is constructed such that water, accumulating in depressed area **15***b*, and shown in dotted lines in FIG. 3, and not discharged through reverse trap **15***d* will form a liquid seal.

A crown **16**, having discharge openings **16***a* therein surrounds the receiving opening **15***a* and in conventional manner and the toilet seat **11** is positioned above and surrounds the crown.

When it is pivoted to its illustrated lowered position, also, as is conventional, cover **12** is adapted to rest on the toilet seat.

A small diameter pre-flush line **17** extends through one side of the crown **16** to a valve **18** at the front of the toilet. The other end of line **17** passes out through the rear of the base and is coupled to an inlet pipe **19**. Water from pipe **19** can then flow into line **17**, and, when valve **18** is opened, into the crown to be distributed through openings **16***a*. Because of the small diameter of line **17**, the small amount of pre-flush water carried through the line will be, for the most part, distributed through the openings **16***a* nearest the valve, and only a small amount, if any, will be distributed through the openings most remote from the valve. The pre-flush operation takes place whenever pressure is applied to the toilet seat, as by a person sitting thereon, and is accomplished by the use of a valve actuator rod **20**, seen best in FIG. 4, that extends through the valve housing **21** and the crown **16** to be contacted by the toilet seat **11**.

A spring **22** on the valve housing **21** acts against a plate **23** fixed to the actuator rod to normally bias it to its raised position and to hold a valve head **24** carried at one end thereof against valve seat **25** that surrounds a passageway through partition **26** in the valve housing.

Spring **22** is strong enough to overcome the weight of the valve seat to hold the actuator rod in its raised position and to overcome the biasing effect of a spring **27** in a bellows **28**, positioned between the top wall of the crown and plate **23**, thereby compressing the bellows and forcing water from the bellows and a conduit **29** connected thereto. However, the weight of a person, even a small child, on the toilet seat, will overcome the biasing effect of spring **22** to open the valve and to allow spring **27** to expand the bellows.

When valve **18** is opened the pre-flush water can flow into the toilet bowl. At the same time, expansion of bellows **28** draws in water from conduit **29** and allows water to flow into the line through an opening **30** and past a flapper valve **31** that is pivotally connected to the downstream side of the interior of conduit **29**. A stop **32** limits pivot movement of valve **31** and prevents the valve blocking flow through the line.

Removal of the actuating weight from the toilet seat results in closing of the valve and compression of the bellows under the influence of spring **22**. The compression of the bellows forces the water allowed into conduit **29** through opening **30** past the flapper valve **31**, with the impinging action of the water effectively closing the valve, and out a restricted orifice **33** in the end of the conduit. The jet of water issuing from orifice **33** impinges on a sleeve **34** and forces it upwardly. A stem **35**, carried by the sleeve, then contacts the usual flush valve **36** in the water tank **14** and raises it off its seat. As is well known, the water discharging from the water tank will hold valve **36** off its seat until all of the water has been discharged, at which time the valve will again settle on the seat and the flush tank will be refilled through the usual float controlled ball cock assembly shown generally at **37**, FIG.

3. A pin **29***a* protrudes from line **27** into a slot **34***a* formed in the wall of sleeve **34** to limit travel of the sleeve. The flush water from the water tank, in discharging past valve **36** enters a holding reservoir **38** and overflows into an auxiliary reservoir **39** from where the greatest part is diverted through line **40** to the front of the crown **16** before it is discharged into the crown and out ports **16***a* to clean the walls of the toilet bowl. The remainder of the water is diverted to a line **41** to carry it through the base **10** to a discharge port **42** adjacent the depressed area **15***b* of the bowl **15**, to provide an extra cleaning action at this low, settling out point in the bowl.

The water retained in holding reservoir **38** is then available to flow into conduit **29** when the bellows **28** is expanded.

Thus, a pre-flush is automatically initiated when a person sits on the toilet seat and a full-flush occurs as soon as he moves off the seat.

The usual operating handle **43** is positioned on the side of the water tank, and through levers **44**, and rod **45**, on which valve **36** freely slides. The toilet can be manually flushed, whenever desired, merely by pivoting the handle. Conventional operating structure can be employed for this purpose.

The bowl is preferably shaped to have a trough **46** extending from near the crown at the front of the bowl downwardly to the depressed area **15***b* of bowl **15**. With this arrangement material falling into the bowl will normally be carried into trough **46** and be carried by the greatest volume of flush water to depressed area **15***b*.

Whereas there are here illustrated and specifically described certain preferred constructions of apparatus which are presently regarded as the best modes of carrying out the invention, it should be understood that various changes can be made and other constructions adopted without departing from the inventive subject matter particularly pointed out and claimed herebelow.

I claim:

1. A toilet comprising in combination a bowl having its rim formed as a hollow flushing crown provided with discharge openings for directing water onto walls of the bowl;

a pre-flush supply line connected to a source of flush water;

a pre-flush valve positioned in said line to control discharge into said crown;

a valve actuator extending through the crown and into engagement with the toilet seat; and

means biasing said valve closed against the weight of the seat, said valve being opened by the weight of a person on the seat.

2. A toilet according to claim **1**, further including normal flushing means; and

means responsive to removal of the weight of a person from the toilet seat for actuating said normal flushing means.

3. A toilet according to claim **2**, wherein

the means responsive to removal of the weight of a person from the toilet seat to flush the bowl includes a bellows, said bellows being normally biased to an expanded condition;

means, including the means biasing the pre-flush valve closed, compressing the bellows when the pre-flush valve is closed;

and means responsive to compression of the bellows for actuating said normal flushing means.

4. A toilet according to claim **2**, wherein the bottom of the bowl is adapted to retain a pool of water; and the back of the bowl is formed as a wall overhanging said bottom to shield said pool of water.

5. A toilet according to claim **4**, wherein the front of the bowl is troughed from the crown to the bottom thereof.

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