TOILET FLUSH APPARATUS

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Int. Cl. ................................... E03d 1/34, E03d 1/14
Field of Search ......................... 4/57 R, 56, 37, 67 A

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Primary Examiner—John W. Huckert
Assistant Examiner—Milton S. Gerstein

ABSTRACT

Apparatus for controlling the retention and selectively controlling the full or partial discharge of water from a toilet tank is disclosed wherein there is a non-buoyant valve cup associated with the usual discharge outlet seat and buoyancy is provided by a float adjustably located in spaced relation above said valve cup.

2 Claims, 4 Drawing Figures
TOILET FLUSH APPARATUS

BACKGROUND OF THE INVENTION

1. Field of Invention
This invention relates to flush control apparatus for toilet tanks and, more specifically, to a non-buoyant valve cup which is separately buoyed while unseated to provide a user with the choice of fully or partially discharging the water from the tank.

2. Description of the Prior Art
The desirability of conserving water is rapidly becoming a must in many parts of the country and during certain seasons. In order to meet the ever increasing population demands it has been proposed to decrease the quantity of water used during certain flushings of toilets. Quite often a full flush is not required yet most toilet tanks do not permit less than a full flush. Consequently excessive water wastage occurs.

It has previously been known to arrange the toilet flush apparatus so that user may selectively obtain a partial or full flush. Various systems are disclosed in the following U.S. Pat. Nos.:

<table>
<thead>
<tr>
<th>Inventor</th>
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<tbody>
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<td>Wuster</td>
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The conventional prior practice has almost invariably been to employ a self-buoyant valve closure element for the outlet seat of the tank. When such are raised off the seat they float until the water level drops and the friction of outflowing water and suction pulls them down into seating relation to terminate outflow.

However, there appears to remain a need for a toilet flush apparatus which is inexpensive, easily installed, and serviceable repeatedly over a long period of time with practically no attention. It is therefore the main object of this invention to provide a mechanism or apparatus which meets those needs and in which there is wide choice as to the amounts of initial flow and residual water in the tank is available.

SUMMARY OF THE INVENTION

Having in mind the foregoing, there is provided here a flush control apparatus which affords the choice between a single partial flush of water from a toilet tank and two closely sequential flushes using substantially the full contents of such tank. The invention is applicable to toilet tanks of the conventional, widely used type in which there is a discharge outlet seat at or near the tank floor and a standpipe is located adjacent thereto to accommodate overflow and to provide a support for certain components of the flush controlling valve cup which is, without restriction, upwardly open to the body of water in the tank. Raising the cup from the seat initiates flushing. The cup in a filled tank supports a column of water which tends to firmly press the cup downward onto the outlet seat. A lift stem has a threaded lower end which is seated in a threaded socket at the axis of the bottom of the cup. A guide arm standing to the side of the standpipe has a passage axially aligned with the valve cup and the lift stem is slide-

ably mounted therein. Means operable to limit upward movement of the valve cup is disposed between the cup and the guide arm. When the valve cup is unseated, it is initially buoyed in the water by a float, located above the guide arm, and mounted on the lift stem, so long as the latter is beneath the tank water level. As the water level falls the float descends lowering the valve into closing engagement with the outlet seat. Conventional, manually operable lifter means are loosely associated with the upper end of the lifter stem to facilitate raising the valve cup. Preferably the valve cup is formed of rubber, natural or synthetic, or of rubberlike plastic compounds providing flexibility and resilience, durability, and effective operability in closing the outlet seat. It will be seen from the following description of a preferred embodiment of the invention that the needs mentioned and the primary and other objects herein are fully accomodated.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view of toilet flush apparatus according to this invention with related portions of a toilet tank shown for reference purposes;
FIG. 2 is an enlarged sectional view of the valve cup engaged in closing position in an outlet seat;
FIG. 3 is a cross sectional view on line 3--3 of FIG. 2; and
FIG. 4 is a cross-sectional view on line 4--4 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A conventional toilet tank has a bottom wall 10 provided with an opening 12, a tank wall 14 in the upper portions of which is mounted rotary handle 16 attached to actuator arm 18 within the tank. The water outlet structure at opening 12 comprises flanged discharge pipe 20 which connects between tank bottom 10 and a toilet by means of a conduit (not shown). Commonly pipe 20 includes flange 22, outlet seat 24, and hollow lateral arm 26 which supports the standpipe 28. Overflowing water entering the upper end of standpipe 28 flows through passage 30 in arm 26 and enters pipe 20 below seat 24. Pipe 30 rests on flange 22 atop gasket 32 and with a lower gasket and nut 36 is secured leak-proof in opening 12. Guide arm 38 is mounted on standpipe 28 by clamp 40 and includes a head 42 for lifter stem 44.

Lifter stem 44 reciprocates vertically in a guide opening of head 42 and includes a lower threaded end 48 and the upper eye 50. A lifter link 52 has a loop encircling stem 44 beneath eye 50 and is engaged in hole 56 of arm by means of hook 58.

The valve cup 60, shown in FIGS. 1 and 2, is unrestrictedly open upward to the body of water in the toilet tank. Preferably cup 60 is molded of natural or synthetic rubber or of like plastic materials which supply resilience and flexibility. Its shape is desirably conical, having angularity in the range of 50° to 60°, with a rounded solid nose 62 in which is provided threaded axial socket 64 that receives the threaded lower end of link 44. The rim 66 of cup 60 is preferably somewhat thicker and stiffer than the intervening wall 68, the external surfaces of which mates with seat 24 to seal the outlet through pipe 20.

Means is provided to limit or restrict upward travel of the valve cup to a predetermined degree or distance.
from seat. In the preferred such means comprises a sleeve 70 surrounding the lower end of rod 44 and resting on the bottom of cup 60. As the cup is raised sleeve 70 comes into contact with head 42 and prevents raising the cup valve 60 relative the seat 24.

What is claimed is:

1. For use with a toilet tank of the type having a discharge outlet seat near the floor of the tank and a standpipe adjacent thereto, flush control apparatus, comprising:

an inverted conical valve cup unrestrictedly open upward to a body of water in said tank, said cup being devoid of buoyancy and having an annular resilient wall intervening between its nose and its rim for engagement with said outlet seat to control discharge and retention of water from said tank whereby, when said tank is charged with water, a column thereof is borne by said valve cup and its annular resilient wall to press the same to said outlet seat;

a lift stem having a threaded lower end;

said valve cup having a threaded socket, axially located within the nose of said cup and adapted to receive said lift stem;

a lift stem guide arm supported from said standpipe in spaced relation above said outlet seat and said valve cup;

a spacer bushing about said lift stem between said valve cup and said guide arm operable to limit upward travel of said valve cup to a predetermined degree;

a float fixed on said lift stem above said guide arm having sufficient buoyancy when said valve cup is displaced from said seat and said float is submerged to support said valve cup above said seat; and

manually operable lifter means associated with the upper end of said lift stem for freeing said valve cup from said seat and to initiate the discharge of water from the toilet tank.

2. The structure of claim 1 in which the valve cup rim is thickened and stiffer than the annular resilient wall.