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2,045,473

CLEANSING AND DEODORIZING DEVICE FOR CLOSET BOWLS

Filed March 2, 1936

2 Sheets-Sheet 1

Fig. 1.

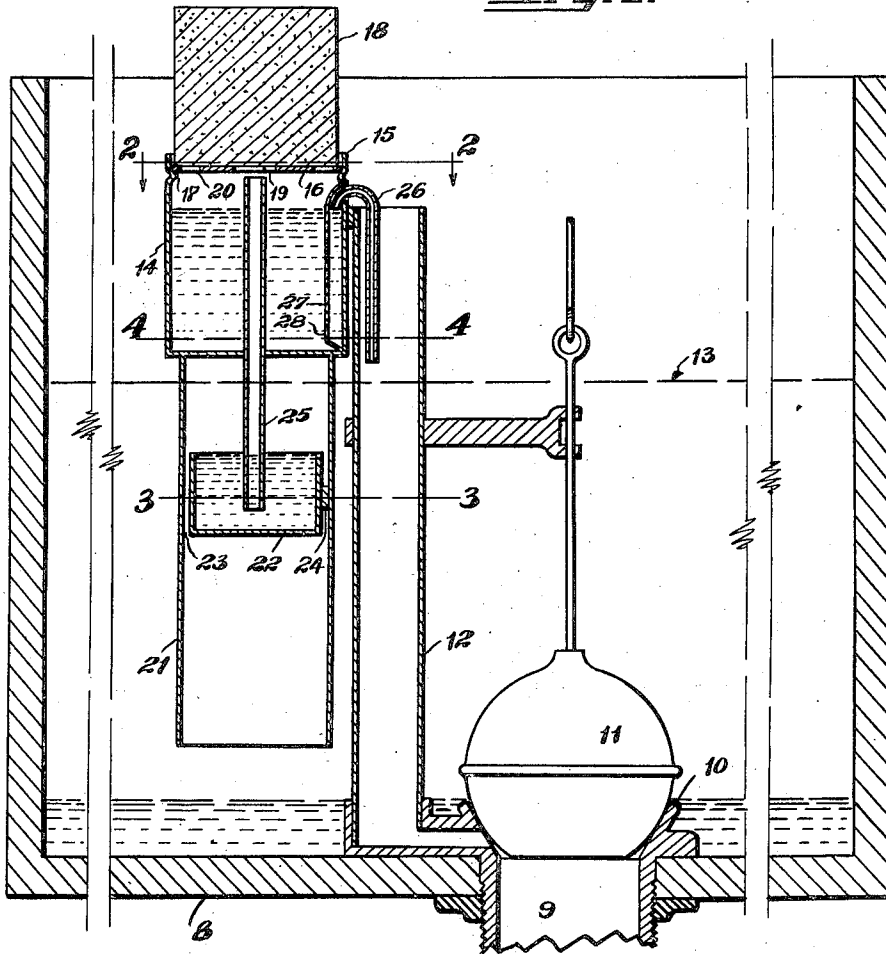


Fig. 3.

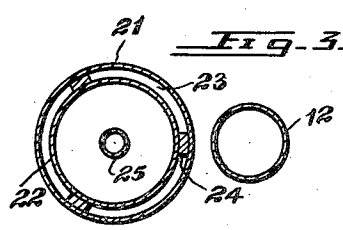


Fig. 2.

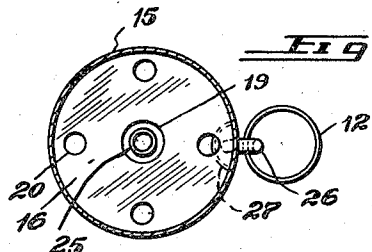
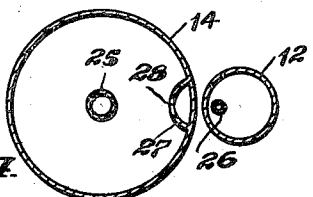


Fig. 4.



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2 Sheets-Sheet 2

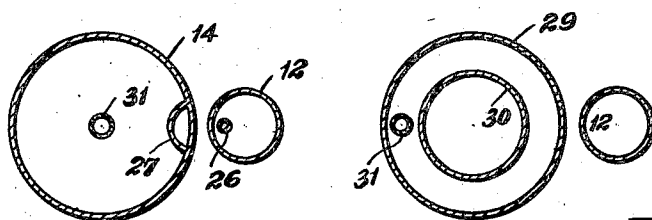
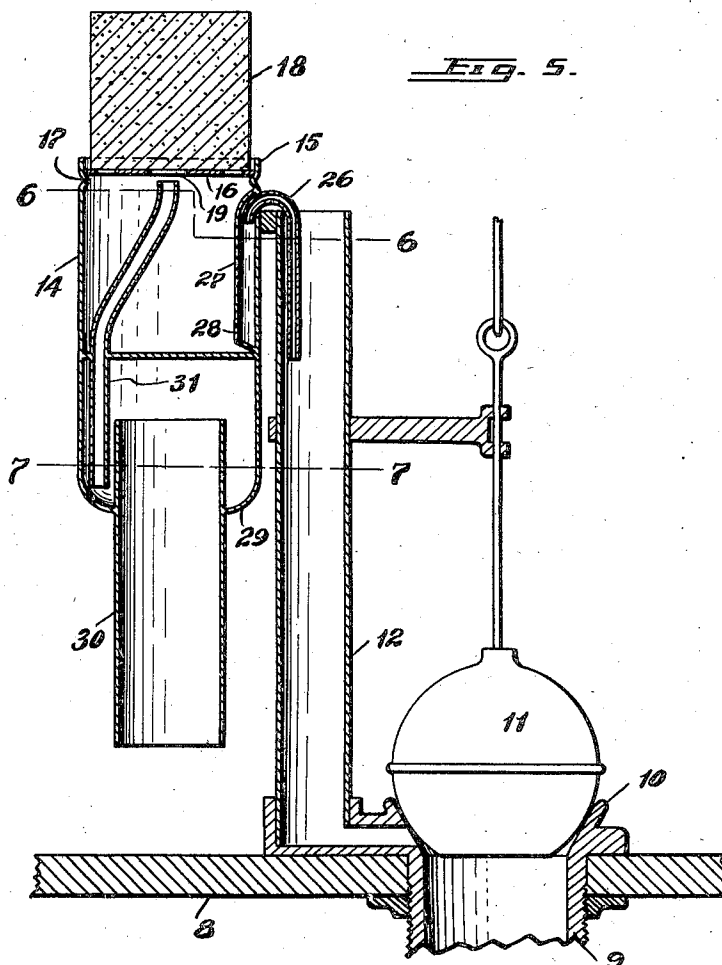


Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE

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CLEANSING AND DEODORIZING DEVICE
FOR CLOSET BOWLSJoseph Dempster Keillor, Aylmer,
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Application March 2, 1936, Serial No. 66,670

12 Claims. (Cl. 4—227)

The invention concerns a device adapted to be installed in the conventional tank of a closet in order that upon operation of the flushing valve a cleansing and deodorizing solution will automatically be fed into the stream of water discharged into the bowl. The entrained solution enables the bowl to be kept in a clean and deodorized condition.

The invention has for its object to produce a device so constructed and arranged that a submerged reservoir is filled with water from the tank supply and forced upwardly by an air trap so as to impinge an elevated chemical compound in the form of a cake or mass. The chemical compound is composed of well known ingredients which are for the purpose of this invention combined into a loosely packed cake or brick so that the elevated water will partially disintegrate it and thus form a solution. The solution is caught in a chamber provided with a syphon which automatically discharges a portion of it down the usual overflow pipe upon operation of the flushing valve of the tank.

A distinctive advantage of the invention is that it is entirely automatic in its operation and that it has no moving parts that are likely to get out of order. The device is inexpensive to manufacture, and a cake or brick of the chemical compound will last for a considerable length of time before having to be replaced.

Referring to the accompanying drawings, Figure 1 is a vertical sectional view through a conventional closet tank showing the invention embodied therein.

Figure 2 is a cross sectional view of the invention taken on line 2—2 of Figure 1.

Figure 3 is a cross section on line 3—3 of Figure 1, and Figure 4 is a cross section on line 4—4 of this figure.

Figure 5 is a similar view to Figure 1, but omitting part of the tank and depicting a slight modification of the invention.

Figure 6 is a cross section of Figure 5 taken on line 6—6 thereof, and Figure 7 is a cross section thereof taken on line 7—7.

Like numerals of reference indicate corresponding parts in each of the figures throughout the drawings of the invention.

In describing the invention in greater detail, the preferred form shown in Figures 1 to 4 inclusive will first be recounted.

The reference numeral 8 denotes a standard flush tank which is mounted above the bowl of a closet for discharge through the flush connection 9 provided with the usual float valve 10 of which

the rubber float 11 forms a part. The float of course is tripped in well known manner each time the bowl (not shown) is to be flushed.

The regular overflow pipe is shown at 12, which pipe communicates at its base with the flush connection for the purpose of taking care of undue rise in the level of the water contained in the tank and controlled by the ball-cock, which is not shown since it does not form a part of the present invention. The normal level of the water in the tank is denoted at 13.

The device of the present invention is suitably supported in the tank alongside of the overflow pipe 12 and comprises a cup-shaped chamber or solution receptacle 14 of which the open top 15 supports a perforated plate 16. A convenient expedient for supporting the plate consists of an annular ledge 17 inside the top of the chamber and formed by crimping the metal sidewall thereof.

The plate rests upon the ledge 17 in order to seat the chemical compound which is in the nature of a cake or brick 18 as aforesaid. The plate preferably has a large central hole 19 encompassed by several small holes as at 20.

A tubular cylinder 21 is attached to and depends from the bottom of the solution receptacle 14. The upper end of the cylinder is closed by the receptacle. The lower end however is open and disposed in spaced relation to the floor of the tank. The cylinder constitutes an air trap as will be later explained.

Within the cylinder and spaced from its top is a cup 22 of a smaller diameter than the cylinder bore so as to provide an intervening passage 23. The cup is rigidly attached by suitable means such as denoted at 24.

Vertically mounted in the cylinder is an education tube 25 having its lower end open and disposed within the cup 22 at a distance from its bottom. The tube extends upwardly through the solution receptacle 14 and terminates in an open top slightly below the plate 16 in alignment with the central opening 19 therein.

The solution receptacle is furnished with a syphoning tube 26 laterally disposed with the short end protruding downwardly through the upper part of the sidewall and the long end projecting into the overflow pipe 12 for emptying therein. The short end is fitted in a duct 27 vertically arranged and in communication with the interior of the solution receptacle by means of the aperture 28 at the bottom thereof. By this arrangement the solution is drawn off from

the bottom of the receptacle where it is better commingled.

Having described the invention, its operation will now be recounted: Following the installation of the device, the initial filling of the tank serves as a primer for the cup 22 so as to fill it with water. It will be understood that in this initial filling, the water in rising to its usual level, indicated at 13, will freely rise in the cylinder 21 and thus fill the cup 22. The water within the cylinder flows out in the flushing of the bowl. As the tank refills and the water level rises above the lower end of the cylinder 21, it exerts pressure upon the air trapped therein, which is sealed off by the water in the cup. As the pressure increases with the rise of the water in the tank, the water held in the cup is subjected to sufficient pressure to expel it through the eduction tube 25 along with the entrained air. As the educted water emerges from the top of the tube it sprays upon the bottom of the chemical compound causing partial disintegration that results in a solution that is caught in the chamber 14.

The device is so proportioned that several flushes of the tank are required to fill the chamber with the solution, of which the final flush causes the solution to overflow in the syphon tube 26. This automatically discharges into the overflow pipe 12 until syphoning is cut off by the lowering of the level of the solution in the receptacle 14. The solution thus discharged gravitates to the bowl and the next flushing operation produces an additional amount of the solution and serves to cause a recurrent syphoning of the solution to the overflow pipe.

Adverting to the modification shown in Figures 5 to 7 inclusive, the variation in the structure consists in providing a cup 29 around the top portion of the tubular cylinder 30. The cup constitutes a reservoir which is filled with water entering the cylinder in the refilling of the tank. The eduction tube 31 in this case has its lower extent offset so as to lead into the cup, as depicted in Figure 5.

The operation of this slightly modified structure is precisely the same as the preferred construction above recounted.

What I claim is:—

1. In a cleansing and deodorizing device, the combination with a closet tank, of a solution receptacle, means for supporting a soluble chemical compound thereover, a vertical air cylinder disposed in the tank and adapted to be submerged when the tank is filled, the lower end of said cylinder being open and disposed above the level of the water remaining after discharge, a water reservoir in communication with the top of the cylinder, an eduction element extending from the reservoir to the chemical compound, and discharge means for said receptacle.

2. In a cleansing and deodorizing device, the combination with a closet tank, of a solution receptacle, a soluble chemical compound thereover, supporting means therefor, an air cylinder vertically disposed in the water space of the tank with an open bottom and a closed top, a water reservoir adapted to be filled from the cylinder and subjected to pressure of air trapped therein, means providing an eduction passage from the reservoir to the chemical compound, and discharge means for conveying the solution from the said receptacle.

3. In a cleansing and deodorizing device, the

combination with a closet tank, of a solution receptacle, discharge means therefor, means providing a perforated support over the receptacle for a soluble chemical compound, an air cylinder vertically disposed in the water space of the tank with an open bottom and a sealed top, a water reservoir adapted to be filled from the cylinder and subjected to pressure of air trapped therein, and means providing an eduction passage from the reservoir to the aforesaid perforated support for discharge through the perforations thereof.

4. In a cleansing and deodorizing device, the combination with a closet tank, of a receptacle for containing a solution, said receptacle having an open top, a ledge formed therearound, a perforated support mounted on said ledge for seating a soluble chemical compound, means for discharging the solution from said receptacle, an air cylinder vertically disposed in the water space of the tank with an open bottom and a sealed top, a water reservoir adapted to be filled from the cylinder and subjected to pressure of air trapped therein, and means providing an eduction passage from the reservoir to the aforesaid perforated support for discharge through the perforations.

5. In a cleansing and deodorizing device, the combination with a closet tank, of a solution receptacle, a syphon discharge therefor, means providing a perforated support over the receptacle for a soluble chemical compound, an air cylinder vertically disposed in the water space of the tank with an open bottom and a sealed top, a water reservoir adapted to be filled from the cylinder and subjected to pressure of air trapped therein, and means providing an eduction passage from the reservoir to the aforesaid perforated support for discharge through the perforations thereof.

6. In a cleansing and deodorizing device, the combination with a closet tank, of a solution receptacle, a syphon tube having its short end protruding through the side of the receptacle and extending downwardly therein, the long end of the tube being disposed in the overflow pipe of the tank, means providing a perforated support over the receptacle for a soluble chemical compound, an air cylinder vertically disposed in the water space of the tank with an open bottom and a sealed top, a water reservoir adapted to be filled from the cylinder and subjected to pressure of air trapped therein, and means providing an eduction passage from the reservoir to the aforesaid perforated support for discharge through the perforations thereof.

7. In a cleansing and deodorizing device, the combination with a closet tank, of a solution receptacle, discharge means therefor, means providing a perforated support over the receptacle for a soluble chemical compound, an air cylinder depending from the receptacle and having an incorporated water reservoir at the top thereof adapted to be filled through the cylinder, said reservoir being spaced from the receptacle of which the bottom forms a closure for the top of the cylinder, the bottom of the cylinder forming an ingress for air and water, and means providing an eduction passage from the reservoir to the aforesaid perforated support for discharge through the perforations thereof.

8. In a cleansing and deodorizing device, the combination with a closet tank, of a solution receptacle, discharge means therefor, means providing a perforated support over the receptacle

for a soluble chemical compound, a cylinder depending from the receptacle and terminating in an opening short of the floor of the tank, means providing a closure for the top of the cylinder, an enclosed reservoir in the vicinity of the top of the cylinder and communicating therewith, and means providing an eduction passage from the reservoir to the aforesaid perforated support.

9. In a cleansing and deodorizing device, the combination with a closet tank, of a solution receptacle, discharge means therefor, means providing a perforated support over the receptacle for a soluble chemical compound, an air cylinder depending from the receptacle and terminating in an opening short of the floor of the tank, a cup suspended in the bore of the cylinder with an intervening passage, said cup being disposed in proximity to the bottom of the receptacle aforesaid, and means providing an eduction passage from the cup to the aforesaid perforated support.

10. In a cleansing and deodorizing device, the combination with a closet tank, of a solution receptacle, discharge means therefor, means providing a perforated support over the receptacle for a soluble chemical compound, an air cylinder depending from the receptacle and terminating in an opening short of the floor of the tank, a cup suspended in the bore of the cylinder with an intervening passage, said cup being disposed in proximity to the bottom of the receptacle aforesaid, and an eduction tube having an end dis-

posed in the cup and extending upwardly through the said receptacle to the aforesaid perforated support for discharge therethrough.

11. A cleansing and deodorizing device composed of a solution chamber, a perforated support mounted thereon for seating a soluble chemical compound, a syphon tube carried by the chamber for drawing off solution therefrom, an air cylinder integral with and depending from the chamber, said cylinder having an open bottom end, a reservoir incorporated in the top of the cylinder in spaced relation to the bottom of the chamber, and an eduction tube extending upwardly from the reservoir to the aforesaid perforated support.

12. A cleansing and deodorizing device composed of a solution receptacle, means for mounting a soluble chemical compound upon the receptacle, a vertical duct inside the receptacle, said duct being closed at the top and open at the bottom, a syphon tube having its short end in the top of the duct and its long end located outside of the receptacle, an air cylinder integral with and depending from the bottom of the receptacle, said cylinder having an open bottom, a reservoir incorporated in the top of the cylinder in spaced relation to the bottom of the receptacle, and an eduction tube extending upwardly from the reservoir to the aforesaid means for mounting the chemical compound upon the receptacle.

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