

April 4, 1967

P. E. T. KRISTENSEN ET AL

3,311,931

TOILET DEODORIZER

Filed April 9, 1964

2 Sheets-Sheet 1

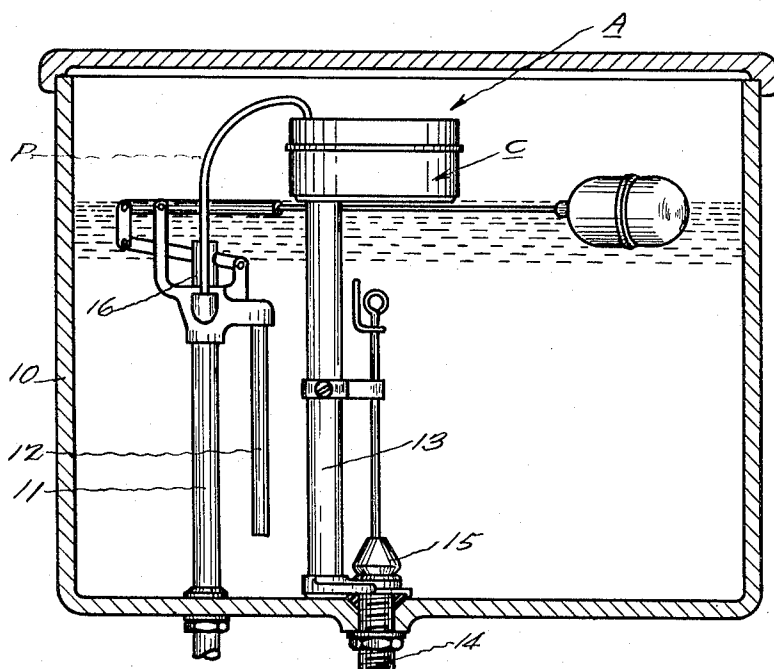


FIG. 1

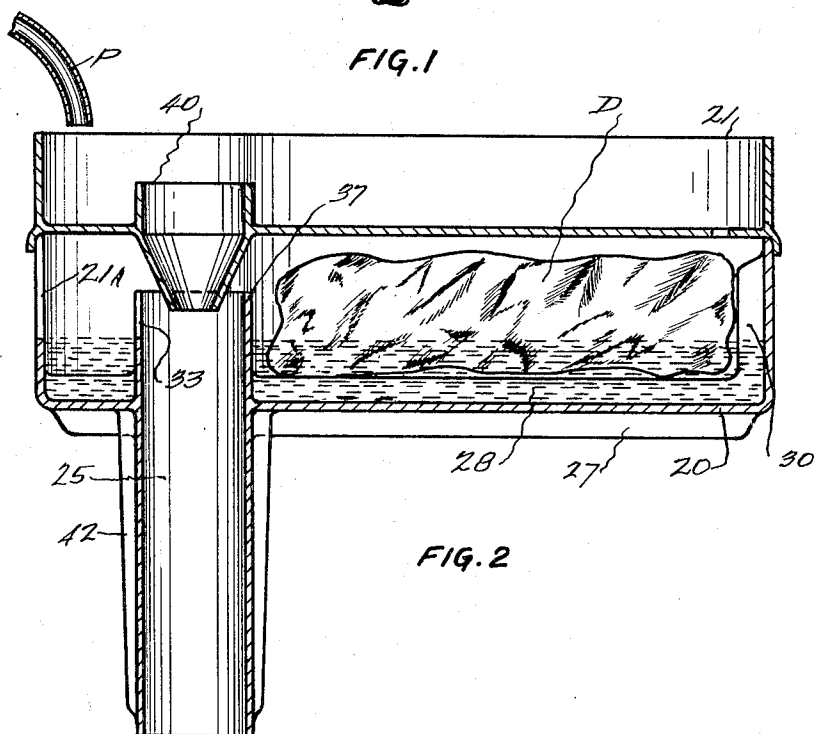


FIG. 2

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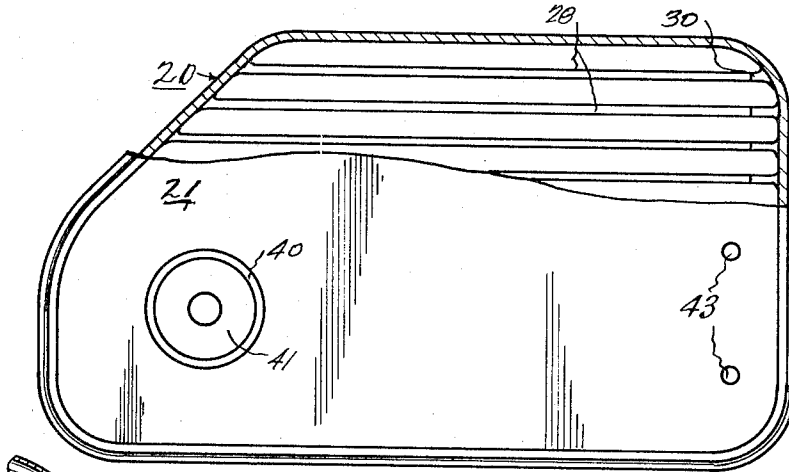


FIG. 3

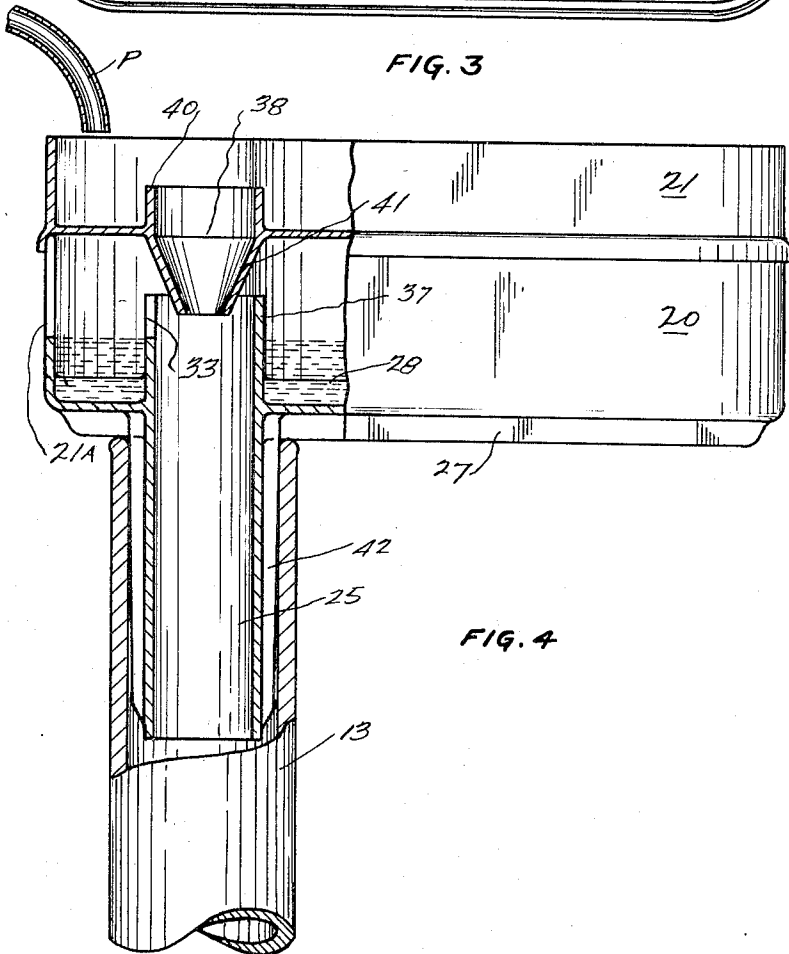


FIG. 4

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TOILET DEODORIZER

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6 Claims. (Cl. 4-227)

This invention relates to a deodorizer for use in water closet flush tanks of the type generally used.

An object of the invention is to provide a simple and efficient deodorizer device for a water closet.

Another object of the invention is to provide a deodorizer device in the form of a self-contained unit which may be acquired as an accessory and easily and conveniently installed upon the existing overflow pipe.

Another object of the invention is to provide a deodorizer such that it operates to supply a solution of the deodorizing agent to the bowl after it has been flushed, so that the solution will remain stagnant in the bowl between successive flushings.

Still another object of the invention is to provide a deodorizer such that a solution of a deodorizing agent will be supplied to the bowl and to a lesser extent, to the water tank as well.

In the drawings, wherein like numerals of reference indicate corresponding parts in the various figures,

FIGURE 1 is a sectional view of a conventional water closet flush tank equipped with a deodorizer made in accordance with the invention;

FIGURE 2 is an elevational cross-section of the deodorizer, with a bag of deodorizing powder enclosed;

FIGURE 3 is a top plan view of the device, in part broken away; and,

FIGURE 4 is a side elevation of the device, partly broken away, in operative position upon the overflow pipe.

Referring now by numerals to the drawings, 10 shows a flush tank having the conventional fittings, namely, flush valve 15 controlling the flow through the drain pipe 14, overflow pipe 13, water pressure pipe 11, float-operated valve 16, and outlet pipe 12 for filling the tank. Instead of the after-fill pipe which usually extends from the float-operated valve into the overflow pipe 13, the valve 16 is provided with a vertically-extending pipe P adapted to discharge water into the deodorizer device A of the present invention. Thus, the device A is supplied with water as the tank is being filled, following flushing.

The device A of the present invention will now be described. The device comprises essentially a container C which sits upon the upper end of the overflow pipe 13 and in which is a deodorizer, say, a bag D containing a suitable deodorizing powder, a certain volume of water being supplied into the container as the flush tank is being refilled, following flushing.

The container is adapted to contain at all times a certain volume (level) of water, in which at least part of the bag D is submerged. Following flushing, and as already stated, a certain volume of water is supplied to the container to mix with the solution already in the container, the mixture overflowing into the drain pipe 13 to reach and rest in the toilet bowl, where it will remain until the next flushing.

The container C is made of a lower part 20 and an upper part 21 which removably sits upon the upper edge of the lower part 20.

Depending from the floor of the lower part 20 of the container is a tubular member or sleeve 25, the sleeve extending for a certain distance above the floor as at 37, this latter sleeve being provided (preferably) with a downwardly-extending port or narrow aperture 33. Also formed through one vertical wall of the lower part 20 is a

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port or narrow slit 21A, the lower edge of the port 33 being on the same level as the lower edge of the slit 21A.

Formed on the upper face of the floor of the lower part 20 are ribs 28, the ribs at one end (the right-hand end as seen in FIGURE 2) merging into vertically-directed ribs 30 extending inwardly from the inside face of the adjacent vertical wall of the lower part 20. The ribs not only serve as reinforcing means but also serve to support the bag D above the floor of the lower part 20.

Depending from the floor of the part 20 are ribs 27. These ribs not only serve as reinforcing means but also support the container C, more particularly the floor of the lower part 20, spaced from the upper edge of the overflow pipe 13 as when the container C is in operative position, that is, when resting upon the upper end of the overflow pipe 13 so that water may freely escape down into the overflow pipe 13 from the water tank 10.

The upper part 21 of the container is formed with an aperture 38 through its floor, a vertical wall 40 rising from the floor to surround the aperture.

Depending from the floor of the upper part 21, and surrounding the aperture 38, is a tubular (preferably) inwardly-tapered tubular portion 41, the length of this portion being (preferably) such as to telescope slightly into the upper end of the tubular portion 37 rising from the floor of the lower part 20 of the container C.

Formed through the floor of the part 21 is a number of apertures 43 through which water in the upper part 21 may flow into the lower part 20.

Formed on the outside of the tubular portion 25 of the lower part 20 are ribs 42 tapering outwardly from bottom to top, as best seen in FIGURE 2. So tapering the ribs facilitates the application of the device upon the overflow pipe 13.

Operation

Upon flushing (by raising the flush valve 15), the flush tank gradually empties in spite of fresh water being admitted into the tank 10 through the pipe 12. When the tank becomes empty, the valve 15, which is floatingly kept open as long as liquid remains in the tank, closes by gravity, following which the level of the water in the tank gradually rises until the float-operated valve 16 closes. While the valve 16 is open, a certain volume of water rising through the water-pressure pipe 11 enters the pipe P, to be discharged into the device A more particularly into the upper part 21 of the container C, part of which drops through the apertures 43 into the lower part 20. If water is discharged into the upper part 21 by the pipe P faster than it drops through the apertures 43, the level of the water will rise above the upper end of the tubular portion 40 and spill into the overflow pipe 13.

The minimum level of water in the lower part 20 is determined or controlled by the port 33, any liquid lying above the lower edges of the port 33 and slit 21A dropping into the drain pipe 13 and into the tank 10.

The slit 21A is preferably made narrower than the port 33 so that more of the solution in the lower part 20 will drop into the drain pipe 13 (and therefore into the toilet bowl) than in the water tank 10.

The diameter of the pipe P, and the diameter and the number of the discharge apertures 43, slit 21A and port 33 and the height of the tubular member 40, are such that upon the closing of the flush valve 15, the upper part 21 will be filled, that is, filled to the level of the upper end of the tubular member 40. The water dropping through the apertures 43 into the lower part 20 of the container mixes with the deodorizing solution, and the mixture overflows partly into the water tank 10 through the slit 21A, and partly but mostly into the drain pipe 13, through the port 33. At all times, a minimum volume or level of water remains in the lower part and partly submerges the bag of deodorizer. The concentration of the solution in-

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creases gradually until saturation, or until a fresh volume of water is admitted, after flushing of the toilet, into the solution, with which it mixes, the mixture overflowing partly into the flush tank but mainly into the drain pipe 13.

We claim:

1. A deodorizer for water closet flush tanks of the kind including a water supply pipe and after-fill pipe and flushing valve and overflow pipe arrangement, said deodorizer comprising a container including a lower chamber, and an upper chamber adapted to receive water from the after-fill pipe and having escape apertures for allowing water received thereinto from the after-fill pipe to escape into said lower chamber, said lower chamber including a tubular member extending upwardly from the floor of said chamber and downwardly from said floor to project into the overflow pipe when said container is resting in operative position upon the overflow pipe, said lower chamber being adapted to enclose a deodorizing substance which is immersed in the water within said lower chamber.

2. A deodorizer as in claim 1, wherein said upper chamber is removably supported by said lower chamber.

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3. A deodorizer as in claim 1, wherein the floor of said lower chamber is provided with ribs to retain the deodorizing substance spaced from the floor to facilitate circulation of liquid under the deodorizing substance.

4. A deodorizer as in claim 3, wherein reinforcing ribs are provided on the underside of said floor.

5. A deodorizer as in claim 1, wherein said upwardly-extending tubular member is formed with an escape port below the level of the upper edge of said tubular member.

6. A deodorizer as in claim 5, wherein a side wall of said lower chamber is formed with an escape slit on a level with said first-mentioned escape.

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