Dec. 2, 1952 R. W. TITMAS 2,620,097

PLASTIC DISPENSER FOR DISINFECTANTS AND THE LIKE

Filed March 31, 1950 2 SHEETS—SHEET 1

Fig. 1

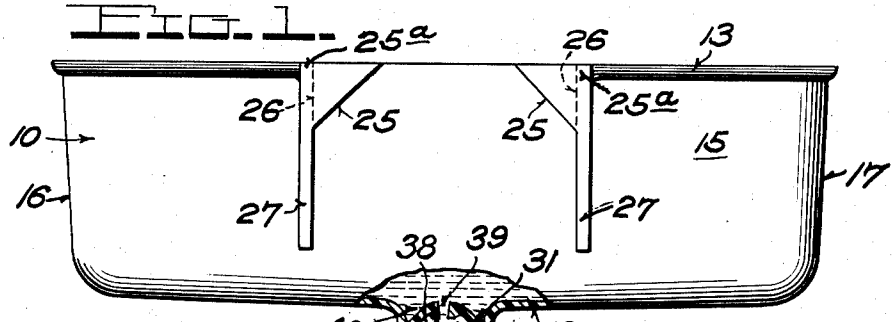


Fig. 4

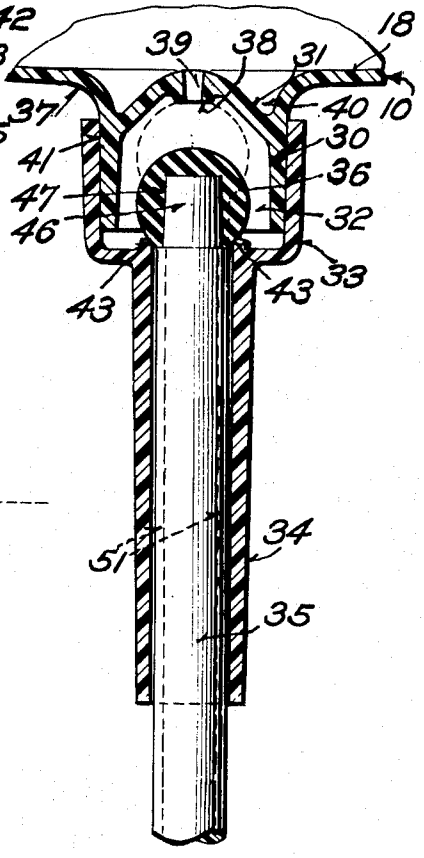
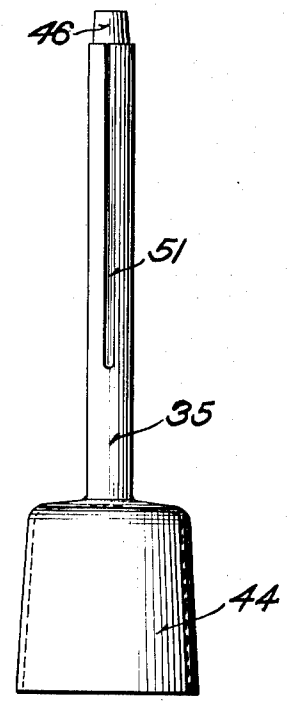
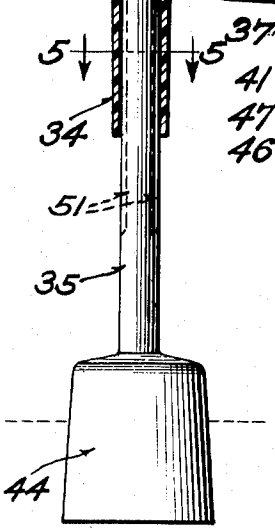


Fig. 6





INVENTOR

REGINALD W. TITMAS,

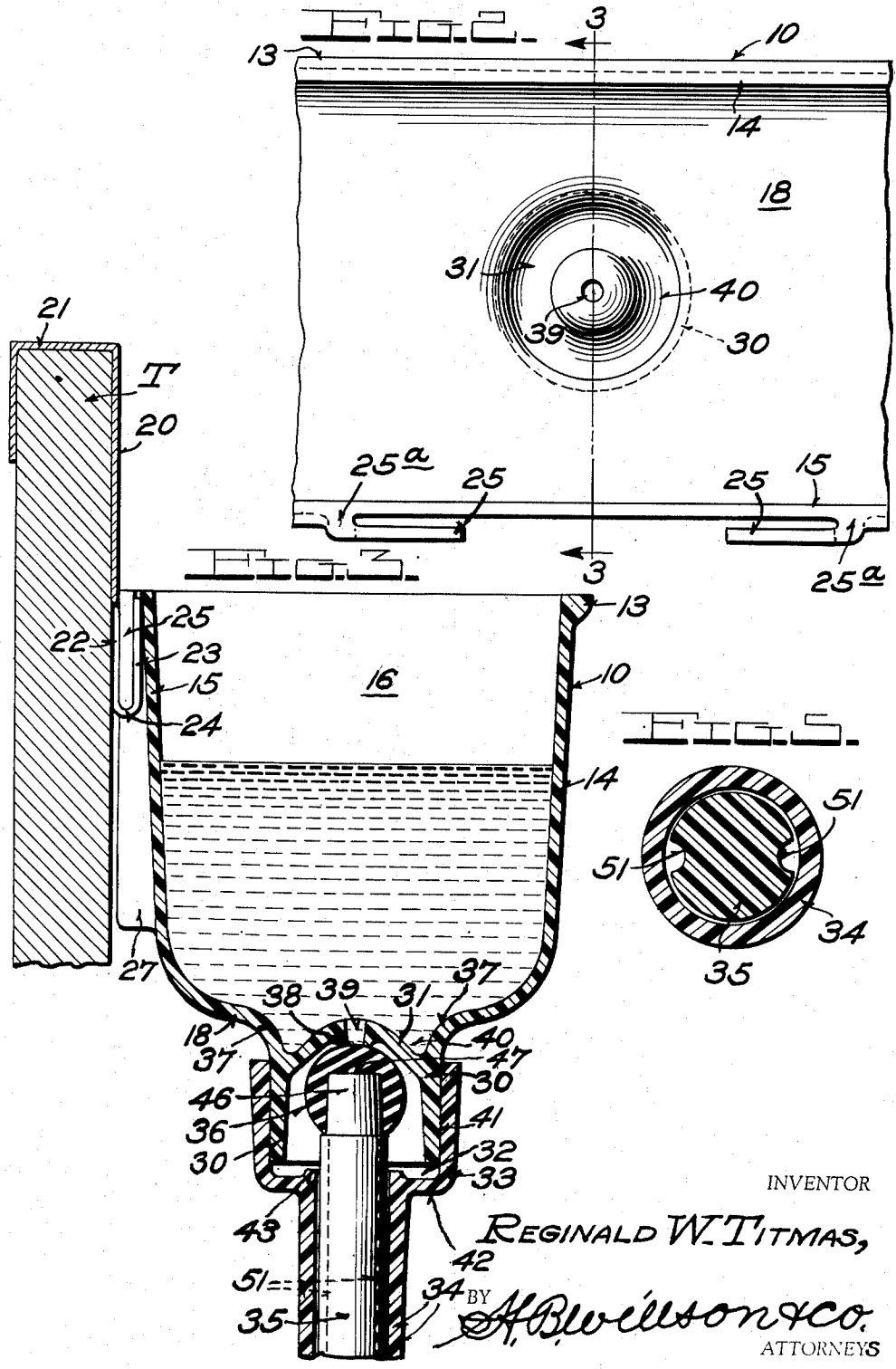
BY A. B. Wilson & Co.

ATTORNEYS

Dec. 2, 1952 R. W. TITMAS 2,620,097

PLASTIC DISPENSER FOR DISINFECTANTS AND THE LIKE

Filed March 31, 1950 2 SHEETS—SHEET 2



INVENTOR

REGINALD W. TITMAS,

BY A. B. Wellson & Co.

ATTORNEYS

Patented Dec. 2, 1952

2,620,097

UNITED STATES PATENT OFFICE

2,620,097

PLASTIC DISPENSER FOR DISINFECTANTS AND THE LIKE

Reginald Wollaston Titmas, Hickory Hill, Anderson, S. C.

Application March 31, 1950, Serial No. 153,260

2 Claims. (Cl. 222—453)

1

This invention relates to dispensers used in toilet flush tanks for supplying to the water in the tank each time the toilet is flushed, a small quantity of a liquid which has sterilizing, disinfecting, deodorizing and/or cleaning properties; and it presents improvements in the dispenser disclosed in my application, Serial No. 131,679, filed December 7, 1949.

The dispenser of that application embodies a molded plastic tank to hold the liquid to be dispensed, means for hanging or suspending the tank within the toilet flush tank and means for discharging from the liquid tank into the flush tank water a predetermined amount of the liquid each time the toilet is flushed. The present invention employs a similar plastic tank and the same tank suspending means but the liquid dispensing means is entirely different.

One object of this invention is to provide an improved dispensing means having few and simple parts which may be inexpensively made from plastic materials, and quickly and easily assembled, and which will be durable in use and effective in operation.

Another object of the invention is to provide an improved dispensing means in which the operative parts may be shipped assembled, so that the purchaser will have no difficulty in applying the device to a flush tank without the use of any tools.

These and other objects and advantages, as will hereinafter appear, are attained by the present preferred embodiment of the invention illustrated in the accompanying drawings, and described and claimed in the following specification.

In the drawings:

Figure 1 is a side elevation of the tank and the dispensing means, with parts broken away and in section;

Fig. 2 is a detail top plan view of the central portion of the liquid tank on an enlarged scale;

Fig. 3 is a vertical cross sectional view taken on line 3—3 of Fig. 2 and showing the hanger suspending the liquid tank from a wall of the toilet flush tank;

Fig. 4 is a detail sectional view similar to a part of Fig. 3 but showing the valve in a different position in full lines;

Fig. 5 is a detail section on line 5—5 of Fig. 1; and

Fig. 6 is a side elevation of the valve and float stem.

Referring more in detail to the drawings, T denotes one wall of the usual toilet flush tank, 10 the molded plastic liquid tank and 20 the sheet

2

metal hanger for suspending the tank from the wall T. As in my previous application the liquid receptacle or tank 10, which is preferably molded in one piece from polystyrene or other suitable plastic which is rigid but slightly flexible or elastic, is of generally rectangular shape having an open top substantially surrounded by a reenforcing head 13 extending outwardly from its side walls 14, 15 and end walls 16, 17. These walls are upwardly and outwardly flared and are united by a slightly curved or dished bottom 18. The hanger 10, made of a rectangular sheet of aluminum or other metal, is the same as in said application, having its upper edge bendable around the wall T, as at 21, and its lower edge formed with a notch 22 to provide two square projections. The inner and lower corners of these tongues or projections are bent on diagonal lines to form two opposed upwardly and inwardly extending angular hooks 24 adapted for supporting engagement with a pair of opposed lugs 25 molded on the outer face of the wall 15. These lugs 25 are of triangular shape and project toward each other from a pair of vertically extending tank spacing and reenforcing ribs 27 molded on the wall 15, as seen in Fig. 1. The lugs 25 are spaced from the wall 15 as shown in Fig. 2, and they are integral with the ribs as shown at 25^a. The single hanger 20 may thus be used to support the liquid container or tank 10 at varying distances from the top of the wall T and at various points around the latter, according to the location of the fittings within the flush tank. The tank suspending means is claimed in application, Serial No. 131,679.

Molded on the bottom 18 of the liquid tank 10 is a downwardly projecting tubular member 30 in which is an integral transverse partition 31. The parts form the upper portion of a measuring or metering chamber 32, the lower portion of which is formed by an enlarged upper part 33 on a vertical guide tube 34 for the stem 35 of a valve 36 located in the measuring chamber 32.

The tubular projection 30 is substantially cylindrical and has its upped end united to the bottom 18 by a curved connecting portion 37 located at the center and lowest point in the tank bottom. The partition 31 extends inwardly and upwardly from the lower end of the curved connecting portion 37 and its central portion is substantially semi-spherical. Formed on the lower face of the partition is an annular bead to provide a valve seat 38 surrounding a small valve opening 39 through which the liquid in the tank may enter the metering chamber 32. The construction is such that the centrally positioned valve opening

is disposed just below the upper face of the substantially flat portion of the bottom 18 and above an annular sediment collecting channel 40 formed between the lower portion of the partition 31 and the horizontally opposition curve connecting wall 37.

The lower portion of the member 30 is preferably reduced and has a substantially cylindrical outer face to be frictionally engaged by the similar inner face of the substantially cylindrical or cup-shaped enlargement 33 on the stem guide 34. The latter is also molded from polystyrene or a similar plastic which is rigid but somewhat elastic or yielding, and the telescoped portions 41, 33 have a slight taper so that a snap fit is obtained and the guide will be securely held by friction on the projecting member 30. The valve stem guide 34 is preferably cylindrical and the flared portion 42 which connects the guide tube with the enlargement 33 has its inner face shaped to provide an annular bead which serves as a lower seat 43 for the valve 36.

The stem 35 is likewise molded of polystyrene or the like and carries at its lower end a suitable float 44 preferably molded in one piece with the stem. The float is shown in the form of a bell or inverted cup. The upper end of the stem 35 is reduced to provide a cylindrical neck 46. The valve 36 is preferably substantially spherical or ball-shaped and is molded from a more elastic or resilient material such as rubber or polythene so that it may be sprung onto the neck 46. The body of the valve is of spongy or cellular formation covered by a smooth skin, and it has a socket 47 of a size to be snapped onto the neck 46, so as to be frictionally retained thereon. This construction permits of the renewal or replacement of the valve if necessary.

The float 44 moves up and down according to the water level in the flush tank, and, hence, the ball valve 36 will be alternately moved between its two seats 43 and 38. When the water level is high, the float will thrust the stem upwardly to hold the valve against the seat 38 to prevent liquid from passing from the tank 10 to the measuring chamber 32. As the float lowers with the water when the toilet is flushed, the weight of the float and stem 35 will move the lower portion of the ball valve against the seat 43 to seal the lower end of the measuring chamber. When the valve is off of its lower seat, the liquid which has entered the chamber 32 through the opening 39 will slowly pass down one or more longitudinal grooves 51 formed in the surface of the upper portion of the stem and into the water in the flush tank. Preferably two diametrically opposite grooves 51 are used and the diameter of the cylindrical stem 35 is such that it has only a free sliding fit in the guide 34. The size of the opening 39 is relatively small so that with the chamber 32 and the grooves 51 properly proportioned, a predetermined very small amount of the liquid will be permitted to slowly enter the flush tank each time it is discharged.

It will be noted that with the exception of the metal hanger, the device comprises but four parts, each of which may be molded at small expense and quickly and easily assembled. If desired, the parts of the dispenser may be assembled at the factory by inserting the stem 35 in the guide 34, snapping the sponge rubber valve 36 on the stem. These parts thus assembled may be packed within the tank for shipment. All the purchaser need do is to snap the end 33 of the guide on the projection 30 on the tank. He may then engage the hooks of the hanger with the lugs 25 and bend the top portion of the hanger over the tank wall T so that the tank will be suspended at the proper elevation. Since the tank 10 has no slot or opening in its upper edge, it may be filled right to its top with the liquid to be dispensed and, hence, a smaller tank may be used. The liquid may, of course, be a disinfectant, detergent, or deodorant which will not affect the plastic, but it is preferable to use one which sterilizes, cleanses and deodorizes. Due to the construction of the members 30, 31, practically all of the liquid in the tank may be dispensed, and any sediment, rust or solid particles in the liquid or tank will collect in the annular depression 40 which may be easily cleaned at intervals by removing the tank from the hanger. The soft construction of the valve in connection with the beads forming the valve seats makes it unlikely that the valve will be prevented from closing against the seats by any foreign matter and causing leakage and waste of the liquid.

From the foregoing, taken in connection with the accompanying drawing, it will be seen that novel and advantageous provision has been made for carrying out the objects of the invention, and while preferences have been disclosed, attention is invited to the possibility of making variations within the scope of the invention as claimed.

I claim:

1. A device to be suspended in a toilet flush tank to intermittently dispense a chemical liquid into the water in the tank comprising a generally rectangular liquid tank having a substantially flat bottom portion, a metering chamber below such liquid tank including two longitudinally telescoped tubular members having substantially cylindrical surfaces frictionally engaged to hold them assembled, the inner member being integrally formed with said flat bottom portion of the liquid tank and depending from the same, a partition being integrally formed in the upper part of said inner member and having a central valve opening affording communication between said chamber and said liquid tank and an annular valve seat bead surrounding said valve opening on the underside of said partition, said outer member being cup-shaped and formed at the center of its bottom with an integral depending tubular guide with a cylindrical bore, a second annular valve seat bead formed on the upper and inner side of said bottom of the cup-shaped outer member and surrounding the upper end of the bore of said guide, said second valve seat bead being coaxial with the first mentioned valve seat bead and of larger diameter than the same, a cylindrical stem extending through and having a sliding fit in said bore, said stem having an upper end disposed in said chamber, a float carried by the lower projecting end of said stem, and a valve member on said upper end of said stem, said valve member coacting with the two valve seat beads alternately as said float moves with the rise and fall of the water level in the flush tank.

2. The structure of claim 1 in which the central portion of said partition is substantially semi-spherical in shape to dispose the top of its valve opening substantially flush with the interior of the flat bottom portion of the liquid tank, and in which said inner member is united with the flat bottom portion of the liquid tank by an upwardly and outwardly flared connecting portion extending from the outer edge of said par-

tition to the liquid tank bottom to provide between said flared portion and the curved central portion of said partition an annular sediment collecting chamber below the plane of the top of said valve opening.

REGINALD WOLLASTON TITMAS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
708,652	Lee	Sept. 9, 1902
741,981	Schmidt, Jr.	Oct. 20, 1903
984,630	Williams	Feb. 21, 1911
1,062,576	Baskett et al.	May 20, 1913
1,359,593	Hardt	Nov. 23, 1920
1,402,137	Beaumont et al.	Jan. 3, 1922
1,416,037	Kooperstein	May 26, 1922
1,431,467	Kooperstein	Oct. 10, 1922
1,527,032	Dollar	Feb. 17, 1925
1,714,199	Webster	May 21, 1929
1,858,164	May	May 10, 1932