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Levey et al.

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[45] **Mar. 4, 1975**

[54] **SUSPENDED DISSOLUBLE DISINFECTANT CONTAINER**

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[21] Appl. No.: **296,672**

Related U.S. Application Data

[63] Continuation of Ser. No. 48,896, June 15, 1970, abandoned, which is a continuation of Ser. No. 745,750, July 18, 1968, abandoned, which is a continuation-in-part of Ser. No. 692,840, Dec. 22, 1967, abandoned.

[52] **U.S. Cl.** **222/180,** 4/228, 116/114

[51] **Int. Cl.** **B67d 3/00**

[58] **Field of Search** 4/228, 225, 231, 112, 224, 4/222, 223; 116/114, 124.9; 200/84; 9/323, 317; 222/228, 225

[56] **References Cited**

UNITED STATES PATENTS

2,675,776	4/1954	Ture	116/114
2,807,807	10/1957	Harper	4/228
3,457,661	7/1969	Repko	401/132
3,545,014	12/1970	Davis	4/228

FOREIGN PATENTS OR APPLICATIONS

1,256,631	2/1961	France	4/228
321,496	11/1929	Great Britain	4/228
1,330,138	5/1963	France	4/231

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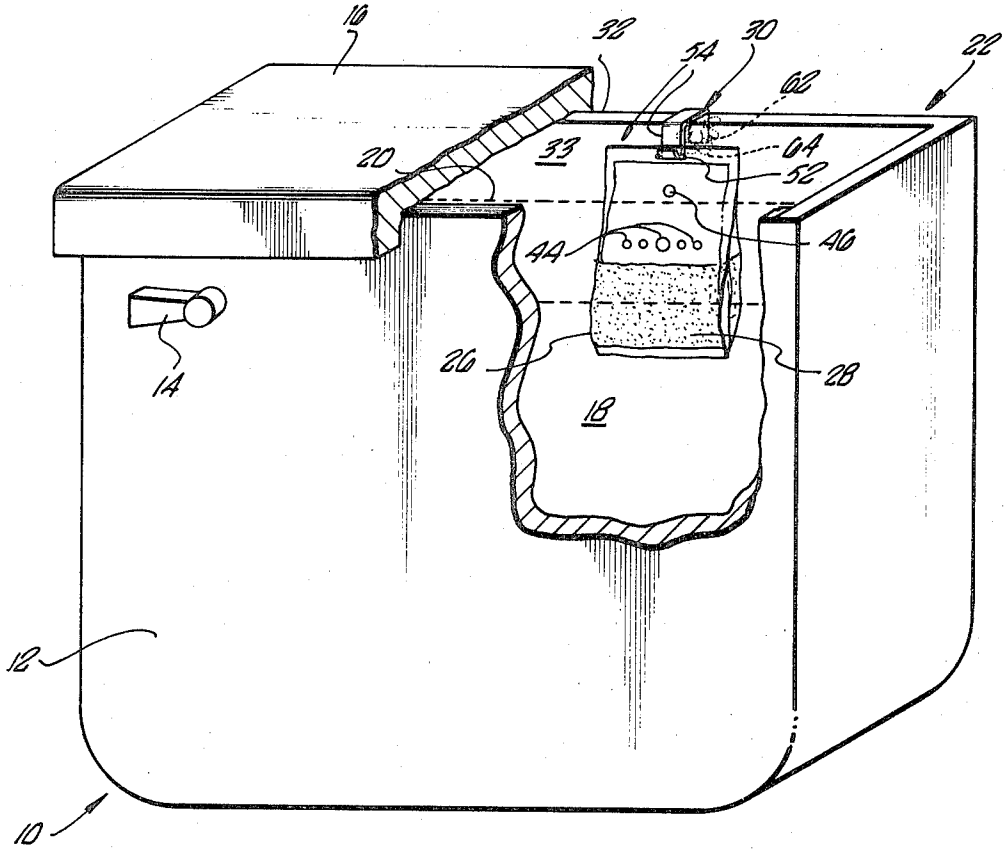
[57] **ABSTRACT**

Apparatus for dispensing quantities of a chemical into a periodically drained water tank. The chemical is stored in a water impervious container which is suspended in the water and has a plurality of apertures, at least one of which is submerged in the water when the tank is filled. A hanger suspends the container and may, adjacent its one end, have a fragrance emitting means which is disposed exteriorly of the tank and which may act as a retainer for the hanger. A water soluble cover is placed over the apertures and prevents escape of the chemical before the container is placed in the water.

3 Claims, 6 Drawing Figures



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SHEET 1 OF 3

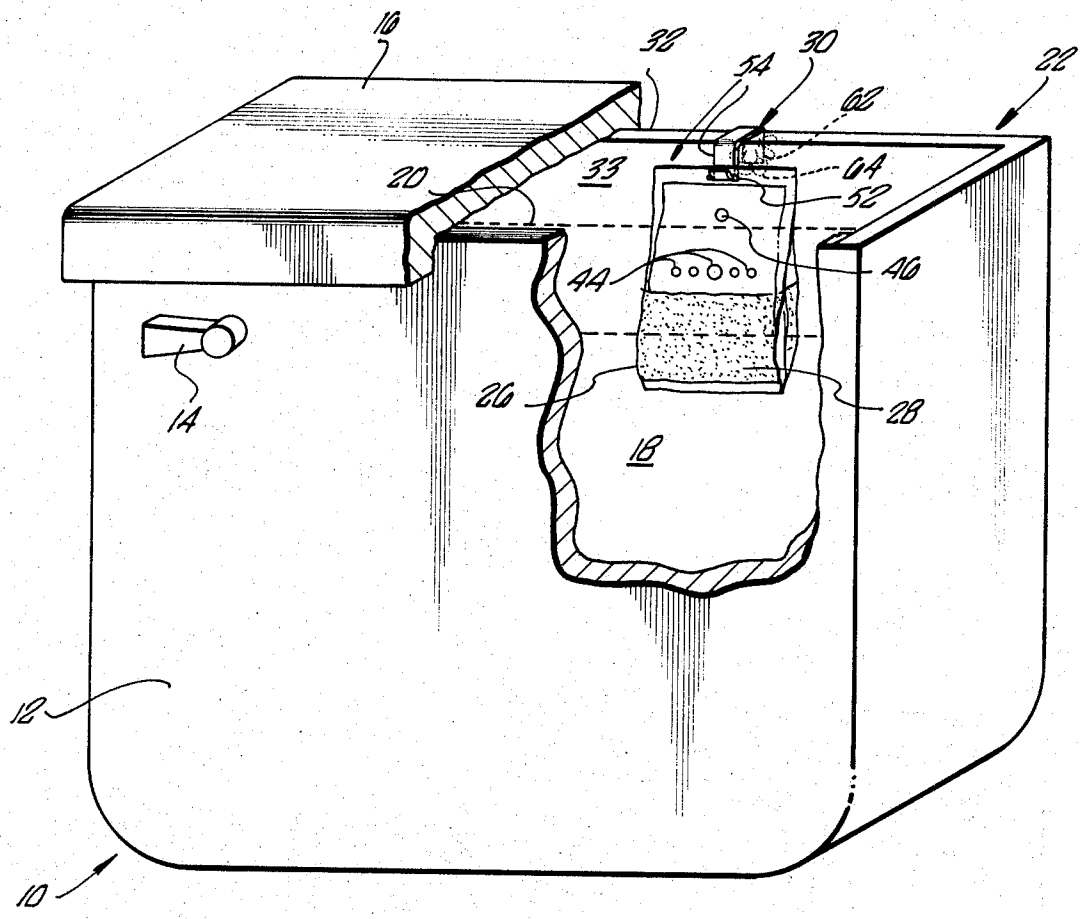

FIG. 1

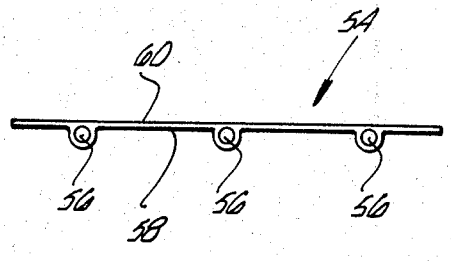

FIG. 4

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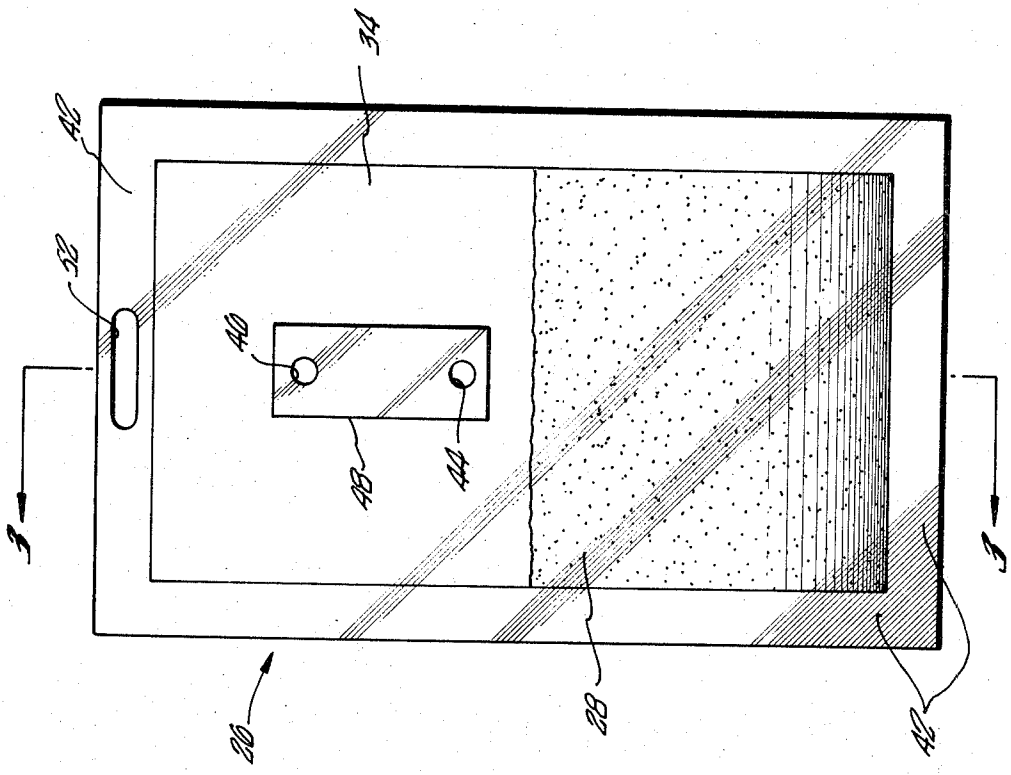

FIG 2

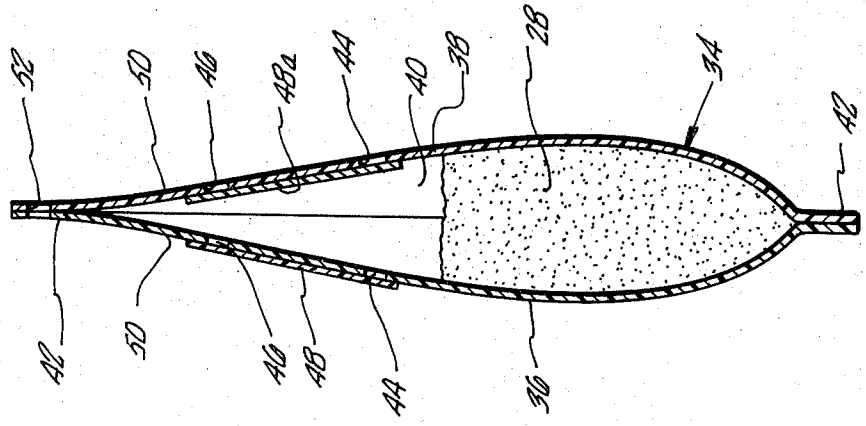

FIG 3

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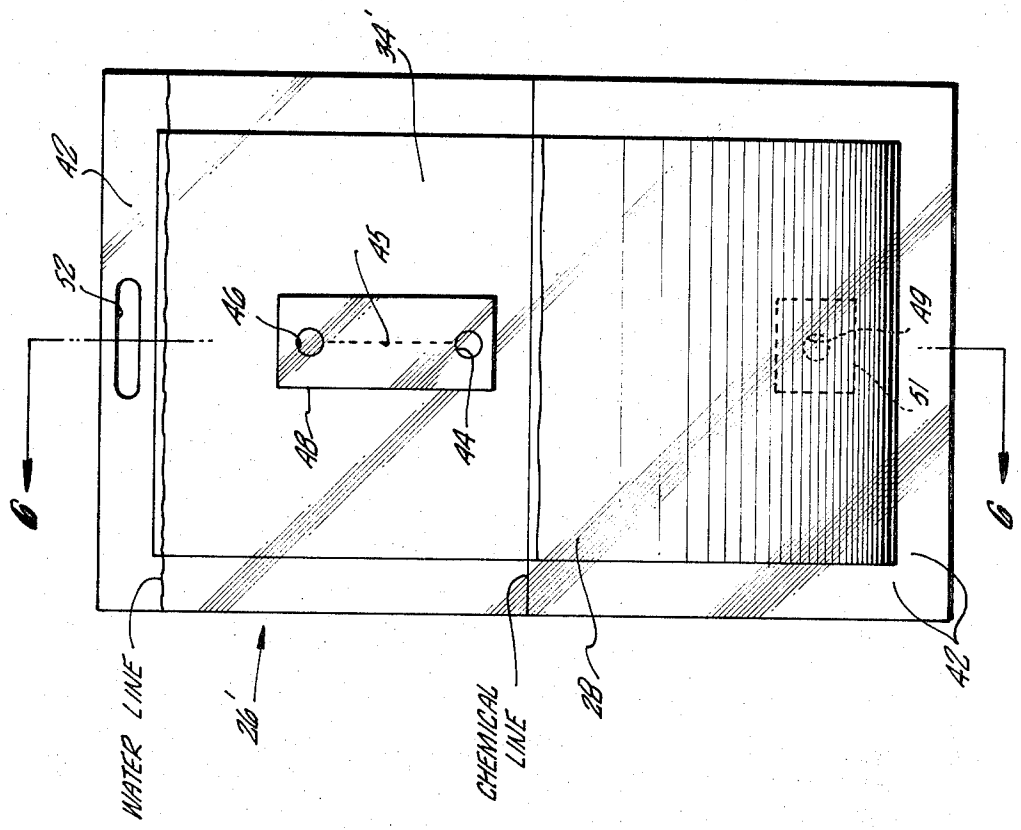

FIG 5

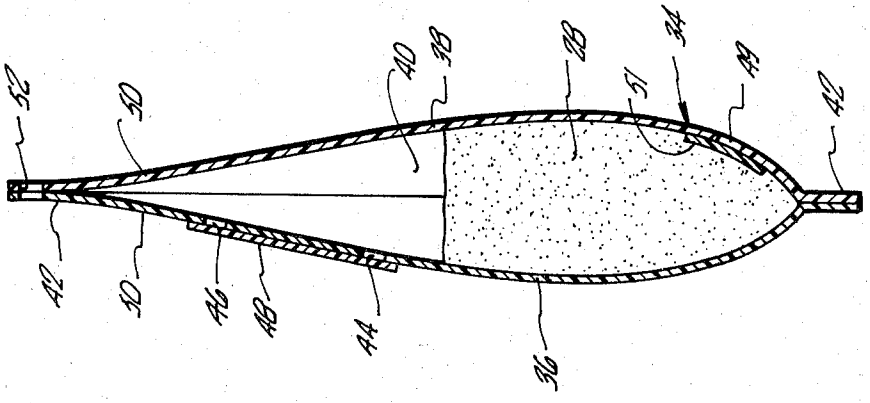

FIG 6

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SUSPENDED DISSOLUBLE DISINFECTANT CONTAINER

This application is a continuation of Ser. No. 48,896, filed June 15, 1970, now abandoned which is a continuation of Ser. No. 745,750, filed July 18, 1968, now abandoned which is a continuation in part of Ser. No. 692,840, filed Dec. 22, 1967 now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention:

This invention relates to dispensing apparatus and more particularly to a dispensing apparatus for use in conjunction with periodically drained tanks for adding quantities of an additive to the liquid stored in the tank.

2. State of the Prior Art:

In many applications it is desirable to dispense a quantity of an additive into a container of liquid. One such application is encountered in water closets of household or public toilets. Commonly, cleansing agents, deodorants, rust retardants, and colors are added to the water to maintain the installation in a sanitary and properly operating condition.

In the past the chemicals were generally added by placing a bottle filled with additives dissolved in water in the tank. Every time the water is drained from the closet and thereafter refilled a measured quantity of the additives is dispensed into the water.

For a number of reasons this arrangement is not fully satisfactory. Dissolved chemicals, many of which have strong colors, are easily spilled nd may damage property. In addition the bottles can be broken, they are heavy to carry and require relatively expensive frequent replacement.

More recently undissolved additives were placed in bottles and dispensed therefrom. Although the danger of inadvertently spilling the contents of the bottle have thereby been reduced, the expense of bottling the chemicals as well as the danger of breaking the container are still present.

At the present there exists therefore a need for a simple, quickly installed and inexpensive package for dispensing preferably dry chemicals into water tanks.

SUMMARY OF THE INVENTION

The present invention provides apparatus for dispensing chemicals in a periodically drained water tank such as a water closet of a conventional domestic toilet. Briefly, a closed container is constructed of a water impervious material and is adapted to be suspended in the tank. The container has spaced-apart first and second apertures which are arranged such that they are vertically spaced when the container is suspended in the tank. Water soluble means are secured to the container adjacent the apertures to seal interior portions of the container from its exterior until it is submerged in and dissolved by the water.

The invention also provides means for adjustably securing the container in the tank. Preferably this means includes an elongated hanger which extends through an aperture in the container and is engaged by a wall of the tank. One end of the hanger is thereby disposed on the exterior of the tank. Preferably a fragrance emitting means is secured to the free end of the hanger and simultaneously acts as a retainer which cannot pass between the tank wall and the tank cover. This prevents the hanger from accidentally slipping into the interior of the tank whereby the container would be totally submerged and cease to function as a dispensing apparatus.

In its preferred form the container is constructed of thin plastic material in the form of an envelope. This not only assures low costs of the container but makes it unbreakable as well. Accidental spilling of the contents is thereby substantially eliminated. The envelope remains sealed until it is placed in the interior of the tank and the water soluble means have been dissolved. The person installing the container does not have to manipulate it and does not even soil his hands because he never comes in contact with the envelope's contents. The container is lightweight and not bulky and can therefore be transported at substantially lower costs as compared to prior art dispensers without moving parts.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view, with parts broken away, of a conventional domestic water closet having a dispensing apparatus constructed in accordance with this invention installed therein;

FIG. 2 is an enlarged plan view of the dispensing apparatus;

FIG. 3 is a side view, in section, taken along line 3—3 of FIG. 2;

FIG. 4 is an enlarged end view of the hanger suspending the apparatus in the water;

FIG. 5 is an enlarged plan view of a modified dispensing apparatus; and

FIG. 6 is a side view, in section, taken along the line 6—6 of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Initially referring to FIG. 1, a conventional water closet 10 for use in conjunction with domestic water toilets includes a water tank 12 having an actuating handle 14 and a cover 16. A suitable conventional actuating mechanism (not shown) for draining water 18 stored in the tank is disposed on the interior thereof. When filled, a water level 20 is some distance below an open end 22 of the tank.

A dispensing apparatus 24 constructed in accordance with the present invention includes a container 26 which is partially submerged in the body of water 18. Chemical additives 28 are stored within the container and a quantity thereof is dispensed into the body of water 18 whenever the water has been drained and the tank is refilled. A hanger 30 is secured to the tank, preferably it is looped over an upper end 32 of a side wall 34 of the tank, and suspends the container in the water.

Referring to FIGS. 2 and 3, the container 26 is preferably constructed to define an envelope 34 which may be constructed of two sheets 36 and 38, as best seen in FIG. 3. The sheets are bonded together or otherwise secured to each other in a seal-tight manner to prevent water from entering its interior 40. In a presently preferred form of this invention the sheets are constructed of thin thermoplastic sheets such as polyethylene sheets, for example. The sheets are then best heat-sealed, or alternatively, bonded together and define a narrow seal strip or fringe portion 42. Alternatively, the container can, of course, be constructed of one sheet or molded in one piece. The chemical additive 28 is disposed in the interior space 40 and preferably fills about one-quarter to one-third of that space.

At least one, but preferably both sheets, include first and second apertures **44** and **46**, respectively, which communicate the interior space **40** with the exterior of the bag. A strip of water soluble material **48** or **48***a* is disposed adjacent each of the apertures and seals the interior space from the envelope's exterior. The water soluble material, which may be any one of a number of commercially available ones, may be bonded to exterior sides **50** of the sheets **36** and **38** by a water soluble adhesive. In the presently preferred embodiment, however, the strip **48***a* is secured to the sheets on the interior thereof. The interiorly affixed strips prevent users from removing it prior to the insertion of the container in the tank. Such a removal of the strip can cause spillage and possible damage to property from the chemicals **28.** To assure that the apertures **44** and **46** are open after the container has been placed in a water tank the strips are secured to the sheets with a water soluble bonding agent. If the agent were not water soluble a thin film might remain over the apertures even after the strips **48** or **48***a* have ben dissolved and effective communication of the container's interior with its exterior would be prevented.

Preferably, the first and second apertures are positioned on the centerline of the envelope such that they are vertically spaced apart when the apparatus is installed in the water tank **12** as shown in FIG. **1.** In an alternative embodiment a plurality of first apertures may be placed in a side-by-side relation along a horizontal line with at least one vertically spaced aperture.

It has been found that an air lock may develop in the envelope under certain conditions and that it is preferable to modify the envelope to avoid the tendency of an air lock developing. This has been accomplished through the provision of a slit **45** connecting the apertures **44** and **46** as illustrated in FIG. **5.** This results in a more functional, and less expensive, package since it avoids the necessity of punching the envelope through both sides. Specifically, the apertures **44** and **46** covered by the strip **48***a*, as well as the strip **48***a* may be eliminated when this modified construction is resorted to.

Although the envelope **34** is illustrated in FIG. **2** with fringe portions **42,** it is understood that the fringe portion at the bottom of the envelope may be omitted so that the chemical **28** extends to the bottom of the envelope **34.** The provision of a fringe **42** at the bottom of the envelope **34** has some unexpected advantages as will be evident immediately hereafter. The envelope **34** is provided with a "chemical line" (see FIG. **5**) to which the chemical **28** is stored. For proper usage the chemical **28** is shaken down in the package until it falls below the "chemical line." With the provision of a fringe **42** at the bottom of the envelope **34,** the same amount of chemical **28** is stored in the envelope as when the fringe **42** is omitted. Under these conditions, when the chemical **28** is shaken below the "chemical line" it has been found that the product is more effective. This is attributed to the fact a wider area of contact of the chemical **28** with the water is provided. In addition, this results in better control of the life span of the chemical **28** since the chemical is more effective with each flushing.

The envelope may be further modified through the provision of an aperture or apertures similar to the aperture **49** arranged adjacent the bottom of the envelope **26'**, as illustrated in FIG. **5.** This aperture **49** is covered by a strip of water soluble material **51** similar to those previously described. The strip **51,** however, has a slower acting water soluble adhesive and will dissolve in the water only after it has been immersed in the water for 2 to 3 weeks. At this point in time the chemical **28** has been used to the point that it is stored adjacent the bottom of the envelope **26'**. When the strip **28** dissolves, then this remaining chemical **28** is dispensed through the aperture **49** as well and rendering the product more effective with each flushing. In the same fashion, the envelope **26** may be modified to allow the more efficient dispensing of the chemical **28** when it is stored adjacent the bottom of the envelope. For this purpose, the envelope **26** may be defined to reduce the area or volume of the package below the "chemical line." This may be accomplished, for example, by sealing the two sheets **36** and **38** together in an angular relationship — in the fashion of a funnel.

An elongated slot or aperture **52** is preferably centered and aligned with the first and second apertures **44** and **46** and is disposed in one of the fringe portions **42.** The aperture **52** has a configuration to permit passage of the hanger **30** therethrough.

Referring to FIGS. **1** and **4,** the hanger **30** is constructed of an elongated, deformable and preferably corrosion resistant band **54.** The band includes one or more wire strands **56** which are embedded in a plastic material. The plastic material may comprise a pair of plastic strips **58** and **60** which are suitably bonded together. The band has a sufficient length to permit it to extend through the aperture **52** and engage a portion of the envelope **34,** to extend upwardly and be looped over the upper end **32** of a side **33** of the tank. This hanger permits adjustment of the position of the envelope **34** by extending more or less of the band **54** through the aperture **52.** Thus, the hanger provides convenient means for mounting the envelope in water tanks irrespectively of their configuration and the distance between the water level **20** and the upper end **22** of the tank.

Particularly when used in conjunction with domestic toilets a free end **62** of the band **54** may be provided with fragrance emitting means **64.** These fragrance emitting means may have any desired configuration, may be given an artistic design and preferably include a sufficient amount of a strong perfume to last for about the length the chemical additives **28** in the envelope last. Most conveniently, the perfume is contained in a conventional gel having a scented liquid which evaporates upon exposure to air and which is readily available on the market. This gel is stored within the fragrance emitting means. Before being used the gel is surrounded by a seal-tight material such as a plastic covering (not shown). For use the covering is removed or pierced to expose the gel to the surrounding atmosphere. The fragrance emitting means also act as a retainer which prevents the hanger **30** from slipping past the tank **12** and the cover **16** which would cause total submersion of the container and render it ineffective as a dispensing apparatus.

To install the dispensing apparatus the band **54** is passed through the aperture **52** in the envelope **34** and it is bent about 180° to define a U-shaped hook which suspends the envelope. Thereafter, the cover **16** is removed from the water tank **12.** The envelope is now submerged into the water tank such that the high water

level 20 of the tank falls over the first and second apertures 44 and 46 as shown in FIG. 1.

The other end of the band 54 is looped over the upper end 32 of any of the sides 33 of the tank. It is also deformed by about 180° and forms a U-shaped hook similar to that of the end of the band suspending the envelope. The envelope has now been placed in the tank in the correct position. The distance between the high water level 20 and the upper end 32 of a side 33 of the tank, which may vary from tank to tank has been automatically compensated for by the application of the deformable tie. Thus, the apparatus is adapted for use with any water tank. By merely positioning the apertures 44 and 46 correctly and the required length of band 54 is provided as soon as the other end of the bank is looped over the upper end 32 of the tank side.

Insertion of the bag in the water dissolves the water soluble strips 48 or 48*a* to communicate the interior space 40 of the envelope with the body of water 18 and the atmosphere. To facilitate the dissolution of the strips the bag is preferably fully submerged just prior to affixing it to the tank. Portions of the strips 48 or 48*a* adjacent the second aperture 46 are thereby brought in immediate contact with the water and are dissolved.

Water now enters through the first aperture or apertures 44 and fills the interior space 40 up to the water line on the envelope 26. This water dissolves portions of the chemical additives 28 which become suspended in the water disposed in the interior. Drainage of the tank causes the removal of water from the interior space 40 down to the level of the first apertures 44. The water includes dissolved additives to provide for the desired cleansing and deodorizing action. The removal of the water through the first apertures is aided by the second aperture 46 which acts as an air-vent. As the tank becomes filled, water again enters the interior space 40 to dissolve additional amounts of chemical additives 28. Renewed drainage of the tank dispenses another quantity of dissolved additives into it.

To facilitate the speed with which the additives are dispensed the apertures 44 and 46 are preferably disposed in both sheets 36 and 38 of the envelope 34. See FIG. 3.

While the dispensing apparatus adds chemicals to water in the tank the fragrance emitting means 64, which are secured to the end of the bank 54 looped over the upper end 32 of the tank, continuously emit agreeable odors. At the same time they help retain the container 26 in the proper position.

Although the apparatus of this invention has been described in conjunction with a particular water tank, namely a common domestic water closet, it can, of course, be used in conjunction with any periodically drained water tank into which a dissolved additive is to be dispensed. Its use is therefore not limited to use in conjunction with the herein illustrated water closet.

We claim:

1. In a system for dispensing chemicals in the water tank of a water closet, said water tank being filled and drained periodically to and from a full level;

a closed container constructed of water impervious material with thin flexible thermoplastic side walls and having a pair of apertures spaced one below the other aperture through one of said side walls;

means for suspending said container in said tank with said aperture at a level which is at least partially below said full level;

a quantity of said chemicals partially filling said container;

a thin, flexible water soluble strip adhesively secured to and flexibly conforming with said one side wall and closing the upper of said aperture, and water soluble means covering the lower of said apertures, both said water soluble strip and water soluble means sealing interior portions of the container until said strip is submerged in the water in said tank, said water dissolving said strip to open said aperture and admit said water into said container to dissolve a portion of said chemicals and cause said dissolved chemicals to flow into said water in said tank and be dispensed by said tank when said tank is periodically drained.

2. Apparatus for storing and dispensing water soluble chemicals in a periodically drained water tank, comprising:

a watertight envelope containing a quantity of soluble chemicals constructed of flexible plastic sheet material and having a pair of opposing sidewalls having peripheral edges, said edges of one of said sidewalls being sealed to said edges of the other of said side walls to form a peripheral fringe portion along the entire periphery of said envelope which resides in an effectively single plane and has a thickness twice that of either of said sidewalls whereby said fringe portion is effectively twice as rigid as said flexible sidewalls, each of said sidewalls having a surface area greater than the planar area peripherally surrounded by said peripheral fringe portion whereby said sidewalls bulge outwardly to define an interior chamber for containing such chemicals;

a pair of apertures through one of said side walls said apertures being vertically spaced relative to each other and communicating between said chamber and the interior of said envelope with a vertical slit in said one sidewall extending between said apertures for tending to prevent development of an air lock in said chamber, a flexible thin water soluble strip covering said apertures and slit to seal said chemicals in said chamber until said envelope is immersed in water in said tank; and

means provided in said fringe portion at said one end for suspending said envelope in said tank with said pair of apertures positioned below the level of the water within said tank when said tank is filled.

3. Apparatus according to claim 2, wherein said thin flexible water soluble strip is adhesively secured to and flexibly conforming with said one sidewall to close said apertures and said vertical slit.

* * * * *