United States Patent [19]

Mallin

[11] **3,760,433**

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[54] **AIR DISPLACEMENT DEODORIZER FOR TOILET TANKS AND THE LIKE**

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[52] **U.S. Cl.** **4/228,** 4/261

[51] **Int. Cl.** **E03d 9/02,** A47k 4/00

[58] **Field of Search** 4/222, 227, 228, 4/261

[56] **References Cited**

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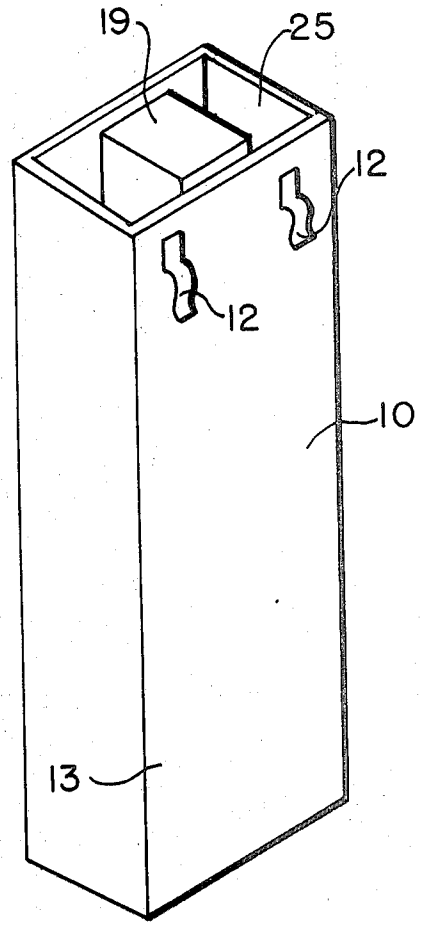
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[57] **ABSTRACT**

A canister hangs in the toilet tank with the lower open end below the water level when the tank is full. A reservoir is situated at the upper end of the canister and as the water in the tank empties and refills, a column of air is displaced within the container which bubbles through the liquid in the reservoir and evaporates same.

1 Claim, 5 Drawing Figures



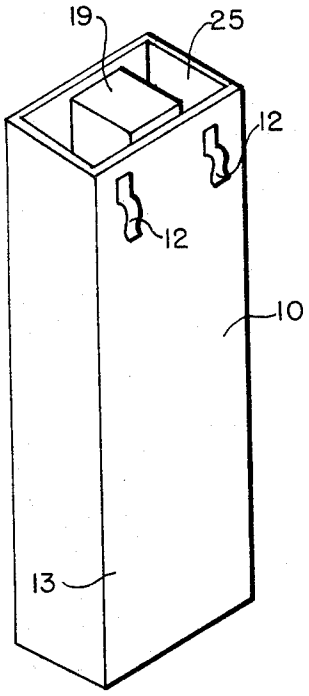


FIG. 1

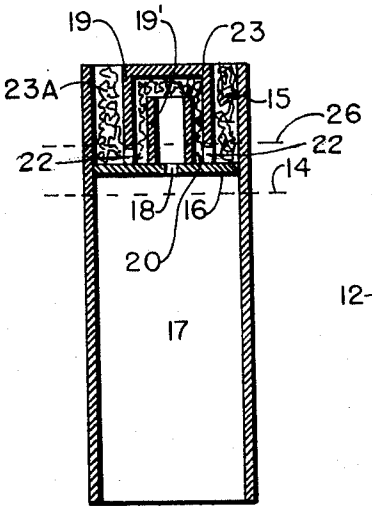


FIG. 2

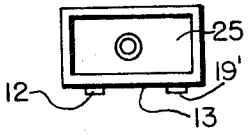


FIG. 3

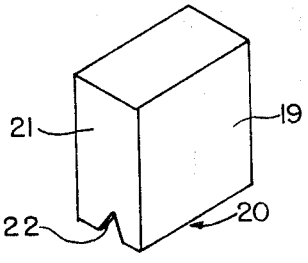


FIG. 4

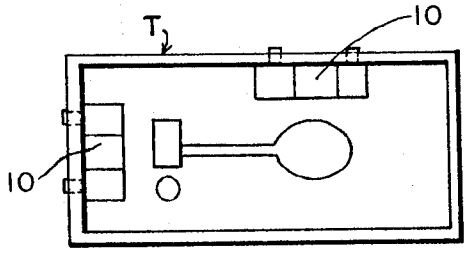


FIG. 5

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AIR DISPLACEMENT DEODORIZER FOR TOILET TANKS AND THE LIKE

This invention relates to new and useful improvements in air displacement deodorizers for toilet tanks.

It is common in such devices to place a chemical in a container and to depend upon the normal flow of air into and out of the container as it is being emptied or filled with water or the like, said flow of air evaporating a quantity of chemical or deodorant and dispensing the resultant vapour into the surrounding air.

This is not particularly satisfactory due to the fact that there is absolutely no control on the amount of evaporation and that the evaporation varies depending upon the quantity of chemical remaining. Ambient temperature also effects the evaporation and the movement of air is not normally sufficient to supply the required deodorant action.

The present device overcomes these disadvantages by providing a positive air displacement as the tank empties and fills, this displaced air passing over wicks impregnated with an evaporative liquid. Furthermore the displacement of the air also ensures that the wick material remains saturated at all times with the evaporative liquid.

Although the term "evaporative liquid" is used, it should be understood that this includes any evaporative liquid which acts as deodorant, a disinfectant, or a fragrance or the like.

Another object of the invention is to provide a device of the character herewithin described which is easily situated within a toilet tank at any desired position.

A yet further object of the invention is to provide a device of the character herewithin described which is simple in construction, economical in manufacture, and otherwise well suited to the purpose for which it is designed.

With the considerations and inventive objects herein set forth in view, and such other or further purposes, advantages or novel features as may become apparent from consideration of this disclosure and specification, the present invention consists of the inventive concept which is comprised, embodied, embraced, or included in the method, process, construction, composition, arrangement or combination of parts, or new use of any of the foregoing, herein exemplified in one or more specific embodiments of such concept, reference being had to the accompanying Figures in which:

FIG. 1 is an isometric view of the device.

FIG. 2 is a sectional view of the device.

FIG. 3 is a top plan view of FIG. 2 with the wick container removed.

FIG. 4 is an isometric view of the wick container per se.

FIG. 5 is a top plan view of a toilet tank with two of the deodorizers therein, shown on a reduced scale.

In the drawings like characters of reference indicate corresponding parts in the different figures.

Proceeding therefore to describe the invention in detail, the invention consists of a canister **10** manufactured from plastic or metal as desired, said canister being substantially rectangular when viewed in plan.

The lower end **11** is open and means such as clips **12** are secured to one wall **13** of the canister to enable same to be engaged over the upper edge of an associated toilet tank T (see FIG. **5**) with the lower end of the canister being situated below the normal water level existing within the toilet tank when said tank is filled. This water level is indicated by reference character **14** in FIG. **2**.

A reservoir **15** is formed in the upper end of the canister **10** and consists of a floor **16** or baffle spanning the interior of the canister and sealing the reservoir from the remaining air column portion identified by reference character **17**. This floor is apertured as at **18** and a short length of pipe **19'** is secured to the floor around the aperture so that communication is established between the portion **17** of the canister and the reservoir **15**.

A wick container **19** consists of a small box-like removable container or cap having an open base **20** and this is adapted normally to be seated over the pipe **14** and to rest upon the floor. In this regard the end walls **21** of the wick container are notched as at **22** to permit communication between the reservoir and the interior of the wick container **19**.

Wick material taking the form of any common absorbent material is indicated at reference character **23** and normally fills the wick container **19** and surrounds the pipe **19'**. If desired, further wick material **23A** may be placed within the reservoir externally of the wick container **19**.

An evaporative liquid is poured within the reservoir from the open upper end **25** of the canister and normally is situated at a level part way up the walls of the reservoir and indicated by reference character **26** in FIG. **2**.

In operation, as the toilet is flushed, the water level within the tank falls drawing a column of air downwardly through the open upper end **25** of the canister which forces the liquid level within the reservoir to fall, by displacement, causing the liquid level within the wick container to rise until air can bubble under the lower sides of the wick container, upwardly through the wick material **23** and thence downwardly through the pipe **19'** into the canister.

As the tank refills and the level of the water rises in the canister, a column of air is displaced from the portion **17**, upwardly through the pipe **19'** and thence downwardly through the wick material **23** forcing the level of the evaporative liquid to fall within the wick container and to rise within the reservoir until this air also bubbles under the lower ends of the wick container and upwardly through the reservoir and through the open upper end **25**.

In other words, as the toilet is flushed, air is first drawn downwardly through the canister and then forced upwardly through the canister, each movement evaporating liquid from the wick material. Furthermore this wick material is maintained in a saturated condition due to the alternate raising and lowering of the liquid level within the reservoir and wick container. The positive movement of the air as it is displaced inwardly and outwardly of the canister dispenses the resultant evaporative vapours into the air within the toilet tank and then out of the toilet tank by air displaced from the tank as the tank fills.

Various modifications can be made within the scope of the inventive concept which is herein disclosed and/or claimed.

What I claim as my invention is:

1. A toilet tank deodorizer comprising a vertically elongated canister adapted to be positioned in a tank so that its lower portion is immersed in water when the tank is full but is exposed to air when the tank is

flushed, said canister having open upper and lower ends and being provided with a transverse partition defining a reservoir for deodorizing liquid in the upper end portion of the canister, an open-ended pipe mounted on said partition in said reservoir and communicating through an aperture in the partition with the lower portion of the canister, an inverted cap removably positioned in the reservoir on the partition over said pipe so that the pipe communicates with the interior of the cap, said cap being spaced inwardly from side walls of said reservoir and the lower edge of the cap being provided with a notch communicating the interior of the cap with the space between the cap and the reservoir side walls, and deodorant absorbent material provided within said cap and in said space between the cap and the reservoir side walls.

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