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WATER CLOSET DEODORIZER

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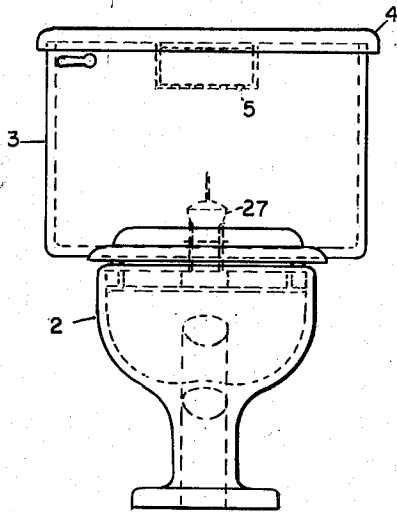


Fig. 1

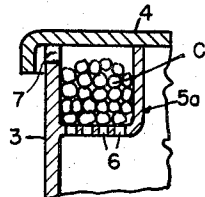


Fig. 2

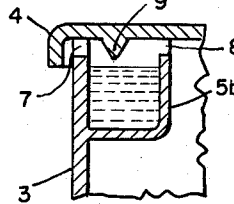


Fig. 3

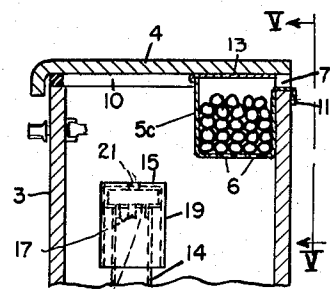


Fig. 4

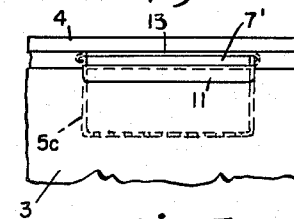


Fig. 5

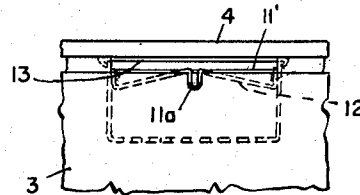


Fig. 6

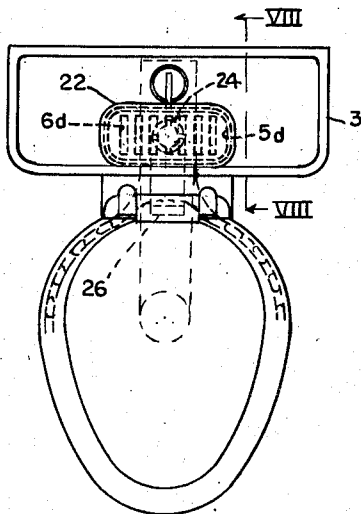


Fig. 7

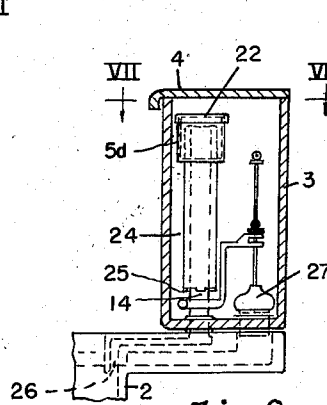


Fig. 8

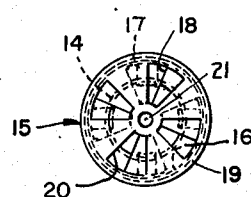


Fig. 9

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WATER CLOSET DEODORIZER

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8 Claims. (Cl. 4—228)

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This invention relates to water closet construction involving means for providing chemical materials such as suitable for deodorizing, perfuming, etc.

Among the features of the invention is the provision of a container for a chemical substance so located in a water closet as to utilize the fluctuation of the water to cause the air to be drawn in and expelled to flow through such container. Another feature is the provision of a container for a chemical substance arranged for directing air going into the water closet so that it will come into contact or close proximity with said substance. A further feature is the provision of means for controlling the amount of air containing the chemical substance as flowing to the bowl of the water closet through the overflow pipe. Another feature is the provision of such a container that can be installed in any existent water closet, and the provision of means for sealing against passage of air except where it will pass through the container. A further feature is the provision of a removable type of container and means for securely holding it in place in the water closet. Still further, a feature of the invention is the provision of a container having means for directing the flow of air within the container. And, means may be so provided that the air displacing the water in the flush tank when the water closet is flushed is drawn back from the closet bowl and through the container holding the chemical material and then be expelled by the refilling water, back through the container and into the closet bowl, thus thoroughly saturating such air with the desired material. Other objects and advantages will appear from the following description.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawing:

Fig. 1 is a front elevational view of a water closet embodying the present invention;

Fig. 2 is a fragmentary central vertical section through the upper portion of the flush tank, on slightly larger scale;

Fig. 3 is a similar view of a modification;

Fig. 4 is similarly a sectional view of a further modification;

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Fig. 5 is a rear elevational view in the direction of the arrows V—V of the structure in Fig. 4;

Fig. 6 is a similar view of a slightly different form;

Fig. 7 is a transverse section taken on a plane substantially indicated by line VII—VII, Fig. 8, i. e. with the cover of the flush tank removed;

Fig. 8 is a vertical section on a plane substantially indicated by the line VIII—VIII, Fig. 7; and

Fig. 9 is a top plan view of damper detail shown in Fig. 4.

In general, a water closet having a bowl 2 and flush tank 3 with cover 4, all of any usual or preferred detail form, is provided with a container 5 in the upper portion of the flush tank to hold suitable chemical substances C, such as of volatile nature for saturating the air passing therethrough. Thus, the container 5a as shown in Fig. 2 may be a box-like compartment against the upper wall of the flush tank and having its bottom provided with perforations 6 of such fineness as to hold pellets or crystals of desired chemical substances and allow air to pass therethrough as drawn in through an air inlet 7 under the edge of the cover 4. When the tank is flushed, air is drawn in through the container 5 as the water recedes, and then as the water rises again the air saturated with the material from container 5 is expelled partly through overflow tube 14 and partly back through container 5 into the room.

The chemical substances may be any desired volatile crystalline or pellet materials suitable for destroying or masking odors or provide desired disinfecting or perfuming action. Where liquid material is preferred, the container may take the form of a tight bottom box-like compartment 5b, with air inlet 7 under the edge of the flush tank cover 4, and air outlet 8 opposite. Preferably, a baffle 9 is provided above the surface of the liquid, to deflect the air current more forcibly against the liquid.

For universal application in existent flush tanks, the container may be in the form of a removable box-like compartment 5c, Fig. 4, with perforations 6 in the bottom, and air inlet 7' under the edge of the cover. A gasket 10 of rubber or other suitable backing material may be fitted between the top edge of the tank 3 and the cover 4 except at the air inlet opening 7'. The container 5c may conveniently be held in position by a downwardly bent lip 11 which hooks over the top edge of the flush tank wall, as shown in Figs. 4 and 5. Or the removable container

may be held by a spring clip 12, Fig. 6, which hooks over the top edge of the flush tank wall by a hook-like portion 11a, the ends of the resilient clip engaging against the inside of the chemical container, and a straight lateral flange 11' of the container carries the weight. In the removable form of container as in Figs. 4, 5 and 6, a cover 13 may be provided.

A control of the amount of air saturated with the disinfecting or deodorizing or perfuming vapors, as supplied through the overflow pipe 14 by gravitation, may be had by an adjustable damper 15, Figs. 4 and 9. This may involve a cap-piece 16 seating on top of the overflow pipe and held in position by spring fingers 17 engaging within the mouth of the pipe, the member 16 having openings 18, and on top of such member a rotatable closure cap 19 seats down on the member 16 and is provided with openings 20 which may be aligned with the openings 18 or may be disaligned therewith more or less completely by suitable turning arcuately, as desired. Where the flush tank equipment is of the form having a replenishing tube into the overflow pipe, an opening 21 therefor may be provided. The sleeve of cap 19 extends below the water line when the flush tank is full, thereby closing air circulation in the overflow pipe except through the adjustable openings 18, 20, but permitting overflow water when necessary to flow between cap 19 and pipe 14 and into the overflow pipe 14.

In one form of the invention, the container 5d, Figs. 7 and 8, may be carried on the overflow pipe, by a tubular extension 24 which sets over the pipe, being spaced therefrom, and having inward turned lugs 25 below which extend against the overflow pipe. The container 5d has perforations 6d, and a cover 22, the perforations providing in effect a grate upon which solid volatile disinfectant or deodorizing material is carried. The rise and fall of the water in the flush tank here again occasions air circulation through the container. Generally, the adjustable damper 15, if used, is applied with the forms of container arrangement shown in Figs. 1-6, but in instances where desired, it may also be applied in association with the form of container in Figs. 7 and 8.

As afore-indicated, the details of construction of the tank, including the inlet and discharge valve mechanisms, may be of any desired form, only sufficient showing of these portions being here given to indicate the positioning of the container means for the chemical substances.

Where the container for the disinfecting or deodorizing material is positioned over the upper end of the overflow pipe, as in Figs. 7 and 8 and the particular construction employing passage 26 is used, the air circulates from the water closet bowl to the passageway 26 and the overflow pipe 14 and up through the container 5d and out through its perforations 6d into the tank when the water in tank 3 is emptying and circulates conversely when the tank is refilling.

It is seen that, in general, the raising and lowering of the water in the flush tank, due to the flushing operation, draws air into the tank and through the chemical substances in the container, the air stream being generally deflected thereto by overhead deflecting surfaces, and it is expelled into the bowl and space adjacent to the water closet, and the air flowing into the bowl by gravity may be circulated as completely or partially as desired, by the damper control which regulates constant circulation due to substances of greater or lesser volatility may be gravitation of the chilled air in tank 3, so that

employed, to be taken up by the air for disinfecting, deodorizing, perfuming, etc. in and about the water closet. Where the container is located over the overflow pipe and the particular construction employing passage 26 is used, the air travels both ways through the container, and is particularly well saturated with the disinfecting or deodorizing agent, while if the water in the tank should rise sufficiently to require use of the overflow pipe, it can pass freely between tube 24 and overflow pipe 14 thence into overflow pipe 14.

Other modes of applying the principle of the invention may be employed, change being made as regards the detail described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In combination with a flush tank having a removable cover therefor with a passage therebetween permitting entry of air into and exit of air from said tank, a substantially closed container for a volatile deodorant carried by one of the walls of the tank with one end portion of the container provided with an aperture aligned with said passage and in open communication with the exterior of the tank through said passage, the opposing end of said container having a plurality of apertures whereby air entering one end of the container passes through the deodorant before passing out of the other end of the container.

2. In combination with a flush tank having a removable cover therefor with a passage therebetween permitting entry of air into and exit of air from said tank, and an overflow pipe providing communication between said tank and a bowl, a substantially closed container for a volatile deodorant carried by one of the walls of the tank with one end portion of the container provided with an aperture aligned with said passage and in open communication with the exterior of said tank through said passage, the opposing end of said container having a plurality of apertures whereby air entering one end of said container passes through the deodorant before passing out the other end of the container, and means for controlling the proportion of air passing from said flush tank to the overflow pipe.

3. In combination with a flush tank having a removable cover therefor with a passage therebetween permitting entry of air into and exit of air from said tank, and an overflow pipe providing communication between said tank and a bowl, a substantially closed container for a volatile deodorant carried by one of the walls of the tank with one end portion of the container provided with an aperture aligned with said passage and in open communication with the exterior of said tank through said passage, the opposing end of said container having a plurality of apertures whereby air entering one end of said container passes through the deodorant before passing out the other end of the container, and means for controlling the proportion of air passing from said flush tank to the overflow pipe, said means including an adjustable air-damper carried by the overflow pipe for adjustably controlling the flow of air therethrough.

4. In combination with a flush tank having a removable cover therefor with a passage therebetween permitting entry of air into and exit of air from said tank, a substantially closed con-

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tainer for a volatile deodorant spaced inwardly from at least three of the walls of said tank and carried by one of the walls of said tank, one end portion of said container provided with an aperture aligned with said passage and in open communication with the exterior of the tank through said passage, the opposing end of said container having a plurality of apertures whereby air entering one end of the container passes through the deodorant before passing out of the other end of the container.

5. In combination with a flush tank having a removable cover therefor, a gasket disposed between said cover and the upper edge of the tank and interrupted intermediately of its ends to define a passage between the cover and gasket permitting entry of air into and exit of air from said tank, and a substantially closed container for a volatile deodorant carried by one of the walls of the tank with one end portion of the container provided with an aperture aligned with said passage and in open communication with the exterior of the tank through said passage, the opposing end of said container having a plurality of apertures whereby air entering one end of the container passes through the deodorant before passing out of the other end of the container.

6. In combination with a flush tank having a removable cover therefor with a passage therebetween permitting entry of air into and exit of air from said tank, a substantially closed container for a volatile deodorant disposed adjacent the upper end of one wall of the tank, means securing said container to said one wall, the upper end portion of the container provided with an aperture aligned with said passage and in open communication with the exterior of the tank through said passage, the lower end of said container having a plurality of apertures whereby air entering one end of the container passes through the deodorant before passing out of the other end of the container.

7. In combination with a flush tank having a removable cover therefor with a passage therebetween permitting entry of air into and exit of air from said tank, a substantially closed container for a volatile deodorant disposed adjacent the upper end of one wall of the tank, means securing said container to said one wall, the upper end portion of the container provided with an aperture aligned with said passage and in open communication with the exterior of the tank through said passage, the lower end of said container having a plurality of apertures whereby

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air entering one end of the container passes through the deodorant before passing out of the other end of the container, said means including a downwardly bent lip integrally extending from said container at the upper portion thereof adjacent said one wall of the tank, said lip being engageable over the upper edge of said one wall of the tank.

8. In combination with a flush tank having a removable cover therefor with a passage therebetween permitting entry of air into and exit of air from said tank, a substantially closed container for a volatile deodorant disposed adjacent the upper end of one wall of the tank, means securing said container to said one wall, the upper end portion of the container provided with an aperture aligned with said passage and in open communication with the exterior of the tank through said passage, the lower end of said container having a plurality of apertures whereby air entering one end of the container passes through the deodorant before passing out of the other end of the container, said container having an outwardly extending lateral flange engageable on the upper edge of said one wall of the tank, said means including a spring clip having a hook portion engageable over the upper edge of the adjacent wall, and having a pair of ends resiliently engaging opposing inside walls of the container.

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