

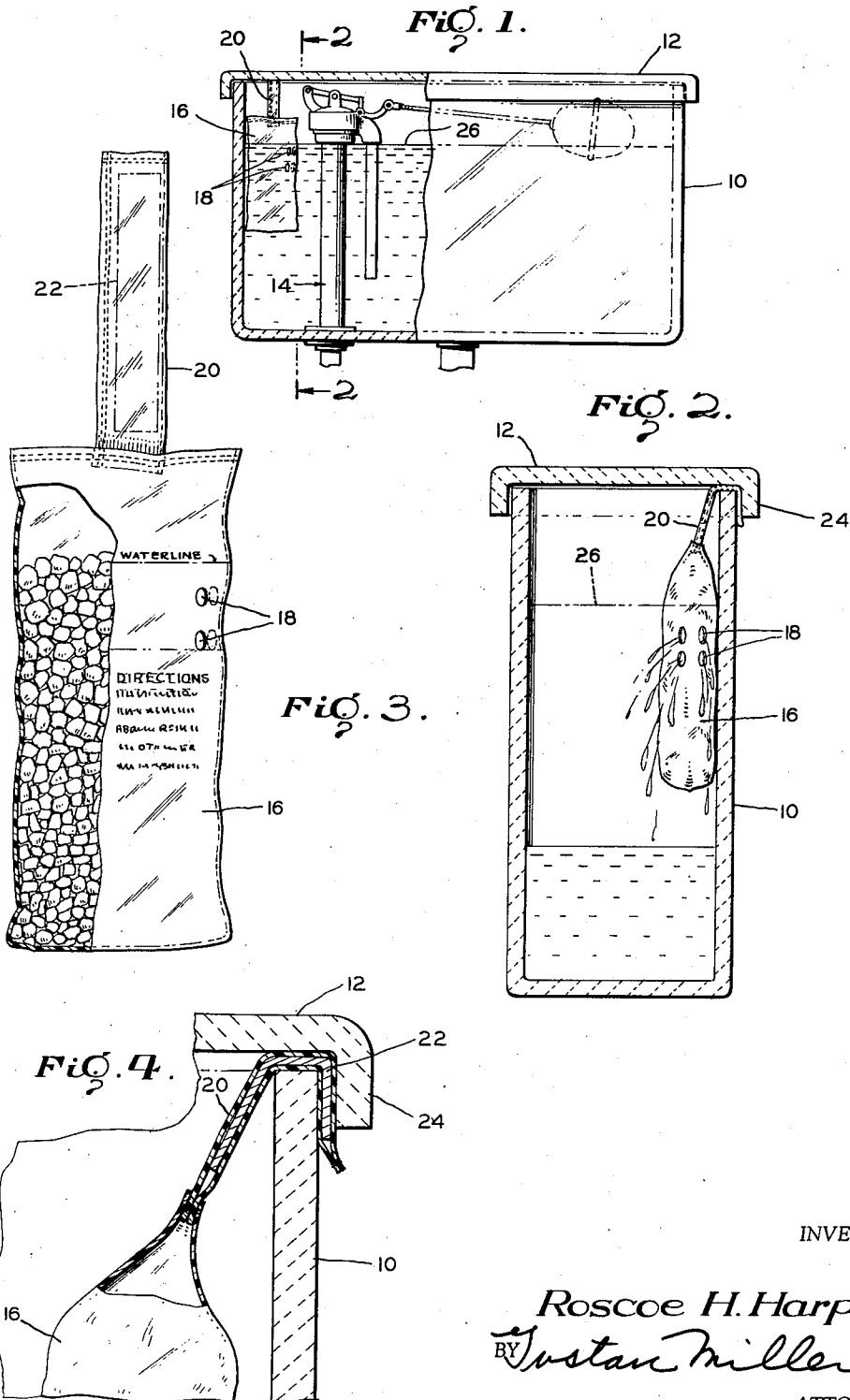
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SEDIMENT PREVENTION MEANS

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SEDIMENT PREVENTION MEANS

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This invention relates to means for preventing the accumulation of solid deposits on the walls of toilet bowls and the like, and particularly relates to the prevention of such deposits from the water standing in the bowl.

There have, heretofore, been provided various devices for cleaning the walls of a toilet bowl; however, such prior devices have generally not been satisfactory since they were either not effective in keeping the bowl constantly free of accumulated sediment or had to be constantly replaced or replenished. These prior devices generally involved the use of detergents of various types and these detergents were not only expensive and rapidly used up, but they required a scrubbing or vortex action in order to frictionally remove the sediment. Such scrubbing action was not always practical or effective so that a large proportion of the detergent was wasted. The only practical way of using such detergents is still a hand scrubbing action which is both messy and repugnant. Furthermore, such hand scrubbing is not automatic and can be provided only at intervals, usually after the sediment has already accumulated.

It is, therefore, one object of the present invention to provide a means for automatically maintaining a toilet bowl or the like free of deposits of sediment at all times.

Another object of the present invention is to provide a means for maintaining a toilet bowl or the like free of deposits of sediment which requires very little replenishment and which is operative for extensive periods of time.

Other objects of the present invention are to provide an improved means for preventing accumulation of solid deposits on toilet bowls or the like, that is easily and economically produced, which is sturdy in construction, and which is highly efficient in operation.

With the above and related objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when used in conjunction with the accompanying drawing in which:

Fig. 1 is a front view, partly in section and partly in elevation, of a tank having a device therein embodying the present invention.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged detailed view, partly in section and partly in elevation, of the water-treating device shown in Figs. 1 and 2.

Fig. 4 is an enlarged, fragmentary, sectional view showing the connection between the water-treating device and the tank.

Briefly stated, the present invention involves the use of a water conditioning material which reacts with the water in the toilet tank to form a solution which prevents the precipitation of solid particles from the solution.

The material used for keeping the solid particles in the water in suspension is selected from the group of ortho and polyphosphates, and is preferably an alkali ortho or polyphosphate such as sodium or magnesium polyphosphate. It has been found that among the ortho-phosphoric

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acid salts, tri-sodium phosphate, di-sodium phosphate and mono-sodium phosphate are highly effective; the tri-sodium phosphate, of course, providing a highly alkaline reaction, the di-sodium phosphate providing a reaction similar to that of sodium bicarbonate and the mono-sodium phosphate being slightly acid.

Referring now more particularly to the drawing wherein similar reference characters refer to similar parts, there is shown a water tank 10, of the conventional type, having a lid 12. In the tank 10 is provided a float-operated toilet-tank valve structure, generally indicated at 14. This valve structure is conventional and need not be further described here since it forms no part of the present invention. Mounted in the tank 10 is a bag 16, preferably constructed of polyethylene or some other similar type of flexible synthetic resin material. This bag is adapted to be filled through an open top which is then stitched closed. The bag is provided with one or more apertures 18 in the upper portion thereof below the top edge. Preferably, a plurality of such apertures are provided arranged in vertically spaced relationship, as illustrated in the drawing. This plural arrangement of the apertures permits a re-cycling of the water through the apertures and into and out of the bag.

At its top edge, the bag 16 is provided with a sleeve-like hanger strap 20, preferably of the same material as the bag. A flexible strip of metal 22 is enclosed within the sleeve 20 and is maintained in position therein by appropriate stitching in the sleeve.

In use, the bag 16 is filled with the phosphate salts to a position above the level of the apertures 18, as illustrated most clearly in Fig. 3, and the top of the bag is stitched closed. The bag is then hung in the tank 10 by the simple expedient of folding the metal-containing strap 20 over the top edge of the tank. The flexible metal strip 22, when bent around the edge, acts to positively support the depending bag structure and its contents. The lid 12 is then placed in position over the top of the tank so that the strap 20 and its metal insert 22 are clamped between the top edge of the tank and the main portion of the lid at one area, and between the external surface of the tank side wall and the peripheral flange 24 of the lid 12 in another area. This is best shown in Fig. 4.

The normal level of the water in the tank is indicated at 26. At this level, the water stands above the plane of the apertures 18 in the bag 16.

When the filled bag is first inserted into the tank, the water in the tank enters through the apertures 18, dissolving all the salt crystals at the level of the apertures and carrying them out of the apertures in solution. This complete dissolving of the salt crystals at the level of the apertures is accomplished during the first several flushing actions of the apparatus. At this time, since so much of the salt is passed into solution in the tank, the solution is relatively highly concentrated, and when it passes into the toilet bowl during the flushing action, it has a sufficiently high emulsifying effect to thoroughly cleanse the toilet bowl of previously deposited sediment.

After the top layers of the salt in the bag 16 have been carried away in solution, the water in the tank continues to enter the apertures 18 after each flushing action. Each time, the water dissolves only the top layer of the salt and carries it away in solution since the salt level is now below the level of the apertures through which the water enters and leaves. This, however, is sufficient to provide a water solution of the salt which will prevent any precipitation of entrained solids onto the toilet bowl walls. After each flushing action, the solution is re-created by the water entering the bag through the apertures 18 and dissolving the top layer of the salt.

Since only a small percentage of the salt crystals is washed away during each flushing operation after the

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first few, a bag full of the salt will last for about a year. The cost of operation is, therefore, practically negligible.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. A device for conditioning the water in a tank to prevent the precipitation of solids which comprises a flexible bag, a body of solids precipitation preventing salts in said bag, said bag being completely imperforate except for at least one aperture in the upper side wall portion thereof, and a hook portion extending from the top edge of said bag.

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2. The device of claim 1 wherein said hook portion comprises a flexible sleeve constructed of the same material as said bag, a flexible metal strip being enclosed within said sleeve.

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