

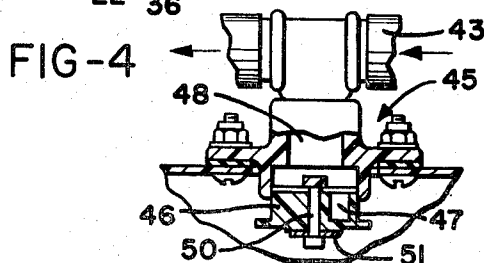
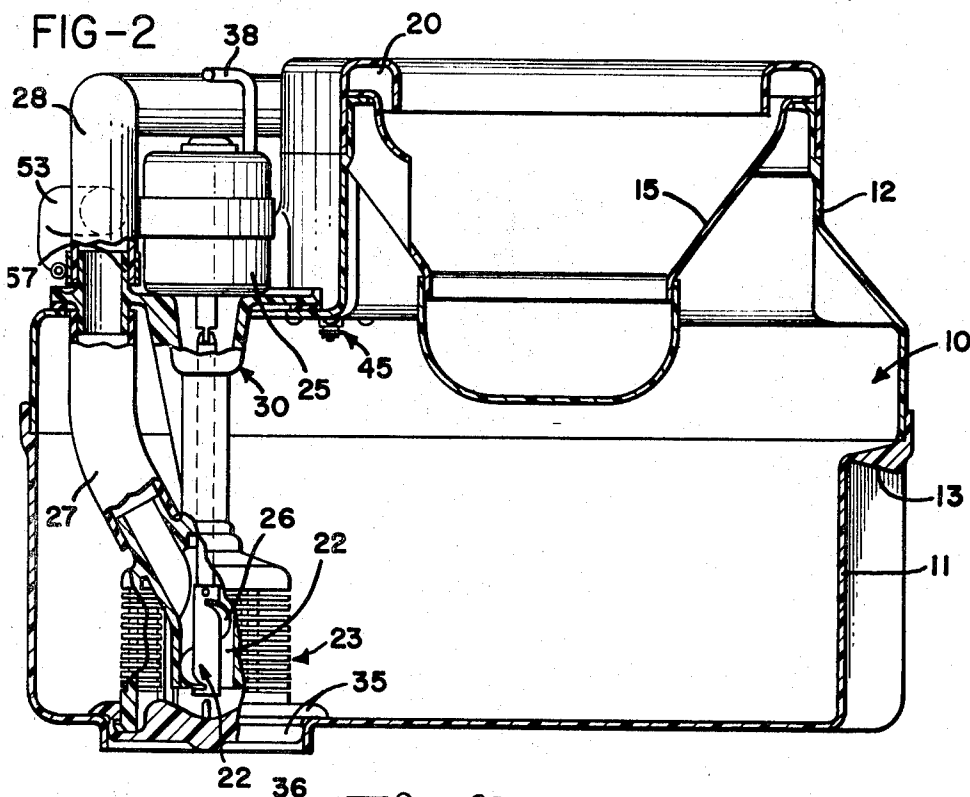
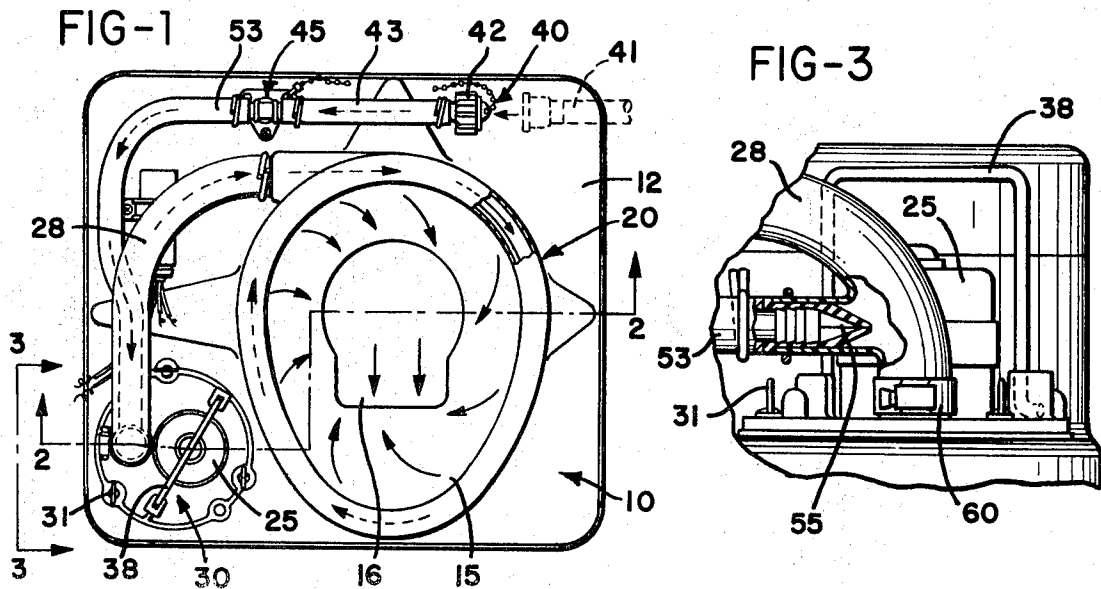
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CLEANING SYSTEM FOR PORTABLE TOILET

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1

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CLEANING SYSTEM FOR PORTABLE TOILET
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1 Claim

ABSTRACT OF THE DISCLOSURE

A portable toilet including a main holding tank, a toilet bowl emptying into the holding tank, and means to recirculate filtered liquid from the main holding tank through a flushing manifold surrounding the bowl includes means for passing cleaning water simultaneously through the filter, through the flushing manifold, and to spray the cleaning water into the main holding tank. The portable toilet also includes a drain opening in the bottom surface which is sealed by a portion of the filter assembly so that cleaning of the unit is facilitated.

RELATED APPLICATIONS

Reference is made to copending application Ser. No. 782,240, filed Dec. 9, 1968, entitled Sewage System, and application Ser. No. 782,062, filed Dec. 9, 1968, entitled Flushing Manifold for Portable Toilet, both applications being assigned to the same assignee as the present invention.

SUMMARY OF THE INVENTION

This invention relates to an improved system for cleaning self-contained, recirculating toilets. Such toilets include a main holding tank, a toilet bowl emptying into the holding tank, a flushing manifold surrounding the bowl, and means for drawing filtered liquid from the main holding tank and directing the liquid into the flushing manifold. In the preferred embodiment of this invention, a static filter is located within the main holding tank, and the lower portion of the filter is provided with a seal which closes one end of the filter and which also closes the drain opening in the tank. A pump is located within the filter to draw liquid from the main holding tank and direct it upwardly into the flushing manifold. The pump, pump motor, filter and the drain valve seal are all mounted on a single member to facilitate handling and to lower the cost of construction, as described in the above mentioned application Ser. No. 782,240.

Cleaning of the pump and filter, the main holding tank, the flushing manifold, and the toilet bowl is accomplished in the present invention by directing clean flushing water into the pipe which connect the pump with the flushing manifold. Thus clean water is directed into the flushing manifold and then downwardly across the bowl into the main holding tank, and at the same time a portion of this water is directed downwardly through the pump and out through the filter in a reverse direction to cause cleaning of those elements. Cleaning water is also applied to a spray nozzle located within the main holding tank so that the side walls of that tank are also cleaned. During the cleaning operation, the member supporting the pump, pump motor, and filter may be loosened from the main holding tank and the drain seal removed so that the cleaning water can drain from the main holding tank through the now open drain opening.

It is therefore an object of this invention to provide an improved cleaning system for a self-contained portable toilet wherein cleaning water is simultaneously directed as a spray into the main holding tank to clean the walls

2

thereof, into the flushing manifold and thus across the toilet bowl, and through the pump and out through the filter in a reverse direction.

Other objects and advantages of this invention will be apparent from the following description, the accompanying drawings and the appended claim.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a self-contained portable toilet showing the location of the toilet bowl, pump motor, and spray nozzle, with a portion of the flushing manifold surrounding the toilet bowl shown in cross section;

FIG. 2 is a cross sectional view taken along line 2-2 in FIG. 1;

FIG. 3 is an elevational view taken along line 3-3 in FIG. 1, with a portion of the cleaning water inlet hose in cross section to show the location of a check valve; and

FIG. 4 is a view, partly in cross section, of the spray nozzle located within the main holding tank.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, a self-contained, recirculating toilet includes a main holding tank 10, preferably molded from plastic or fiberglass, having a lower section 11 and an upper section 12. In FIG. 2, one hand hold 13 is shown formed in the lower section 11, while a second hand hold, not shown, is provided on the other side of the tank to facilitate the removal of the unit from its operating position. Not shown is the toilet seat under which the unit is positioned when in use.

A bowl 15 is mounted to the upper section 12 and has an opening 16 through which the contents of the bowl are discharged into the main holding tank 10. The bowl 15 may be formed from a separate piece of plastic or fiberglass, or may be integrally formed with the upper section 12, as explained in the above mentioned copending application Ser. No. 782,062.

A flushing manifold 20 surrounds the bowl 15 and directs filtered liquid drawn from the main holding tank 10 around the bowl 15 to cause cleaning thereof and to assist the discharge of the contents of the bowl into the main holding tank. A preferred embodiment of this flushing manifold 20 is described in more detail in the above mentioned application Ser. No. 782,062.

A pump 22 is located within the main holding tank 10 and is surrounded by a filter 23. A motor 25 turns the impeller 26 in the pump to draw liquid from the main holding tank, through the filter 23 and direct it upwardly through hoses 27 and 28 into the flushing manifold 20. The pump 22, the filter 23, and the pump motor 26 are all mounted on a single member shown generally at 30, which is secured to the top of the main holding tank by quick release fasteners 31. A seal 35 is mounted over the bottom end of the filter 23 and fits within a drain opening 36 when the member 30 is locked in place on the main holding tank. A handle 38 above the motor 25 may be used as an aid in removing the member 30 from the main holding tank.

A primary feature of the present invention is in the use of means for simultaneously cleaning the filter, the bowl, and the interior of the tank. This means includes an inlet, shown generally at 40 in FIG. 1, into which clean water may be applied, as from a hose 41. In the preferred embodiment, a cap 42 covers the inlet 40 when not in use. Clean water then flows through a hose 43 to a spray nozzle, shown at 45, where a portion of the clean water is sprayed into the interior of the tank 10.

The spray nozzle 45 includes a rotating head 46 (FIG. 4) which has an opening 47 formed therein on one side and which receives a portion of the clean water from the hose 43 which is directed downwardly through pas-

sageway 48. Since the opening 47 is on one side of the head 46, a spray of water will be formed which causes the head to rotate about the pin 50 and spray the water into the interior of the main holding tank 10. The head 46 is held in place on the pin 50 by a retaining ring 51.

Cleaning water also flows through hose 53 to a connection formed in the hose 28. A one way valve (FIG. 3) is installed in the hose 53 to prevent any flushing liquid drawn from the main holding tank from flowing backwards through the hose 53 during recirculation of the flushing liquid, and therefore the check valve prevents any possible contamination of the source of clean water. The arrangement shown also prevents liquid from being siphoned from the main holding tank 10 since the upper portion of the hose 28 is vented to the atmosphere through the flushing manifold 20. Thus, clean water from the hose 53 is directed both downwardly through the hose 27 and through the pump 22 and filter 23 into the main holding tank 10 to clean those elements, and at the same time a portion of the cleaning water will flow upwardly through hose 28, through the flushing manifold 20, and down across the bowl 15. Since the cleaning liquid is flowing through the pump 22 and filter 23 in a reverse direction, these elements will be flushed clean.

If desired, the hose 28 may be removed from connection 57 in the member 30, which joins hoses 27 and 28, by removing or loosening hose clamp 60. When this is done, the entire member 30 may be removed from the main holding tank 10 for cleaning at a location remote from the toilet.

Thus, an improved cleaning system for a self-contained sewage system has been described wherein cleaning water from a separate source is simultaneously sprayed into the interior of the main holding tank, directed through the flushing manifold and across the toilet bowl, and made

to flow in a reverse direction through the toilet pump and filter assembly.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention.

What is claimed is:

1. A self-contained sewage system including a main holding tank, a toilet bowl emptying into said tank, a flushing manifold surrounding said bowl, a filter, and a pump to draw liquid from said tank and force it into said manifold to flush said bowl, the improvement comprising means for cleaning said filter, said bowl, and said tank, said means comprising inlet means adapted to receive cleaning water and direct said water into a conduit connecting said flushing manifold to said pump, said conduit including a one-way valve to prevent the flow of flushing liquid into said inlet means; and a spray nozzle located within said tank and connected to said inlet means; whereby application of cleaning water to said inlet means will cause water to be sprayed through said spray nozzle into the interior of said tank, and at the same time cause a flow of cleaning water through said flushing manifold and across the bowl and in a reverse direction through said pump and filter.

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