

- [54] **HOLDING TANK EVACUATING
APPARATUS FOR A RECREATIONAL
VEHICLE**
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- [52] U.S. Cl. **137/355.16**
- [51] Int. Cl. **B65h 75/36**
- [58] Field of Search.... **137/351, 354, 355.16, 355.18,
137/355.2, 355.24, 355.26, 355.28, 615, 604**

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Attorney—Watts, Hoffmann, Fisher & Heinke

[57] **ABSTRACT**

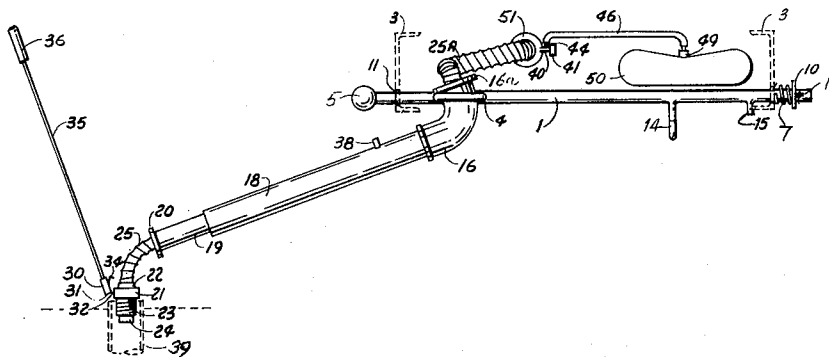
Apparatus for evacuating the holding tank of a recreational vehicle including a flexible hose and a carrier rotatably attached to the vehicle and a rigid sleeve for supporting the hose at all times.

[56] **References Cited**

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12 Claims, 12 Drawing Figures



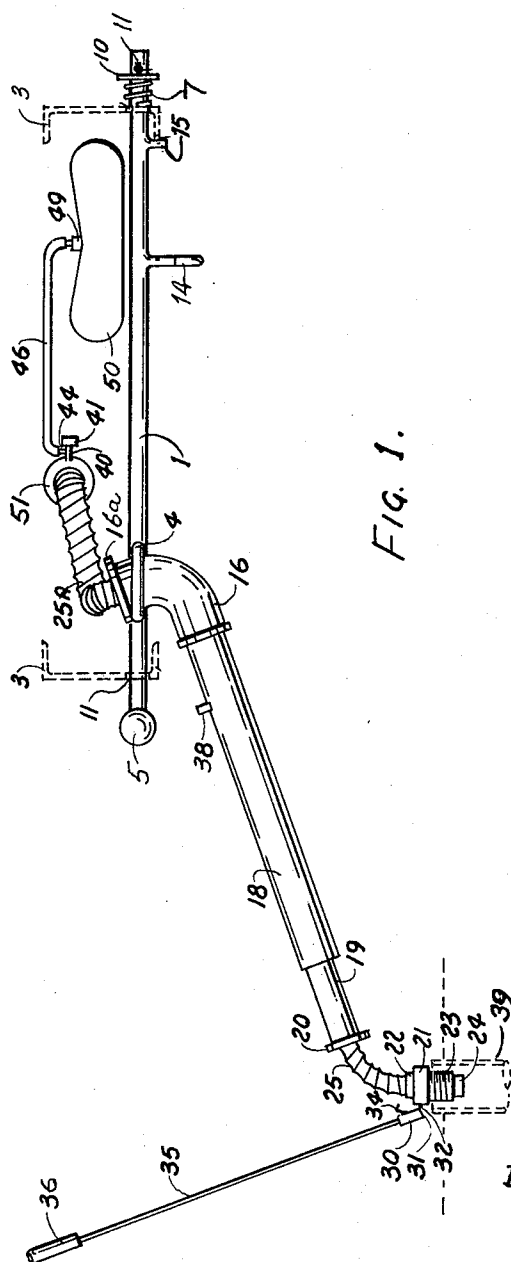


FIG. 1.

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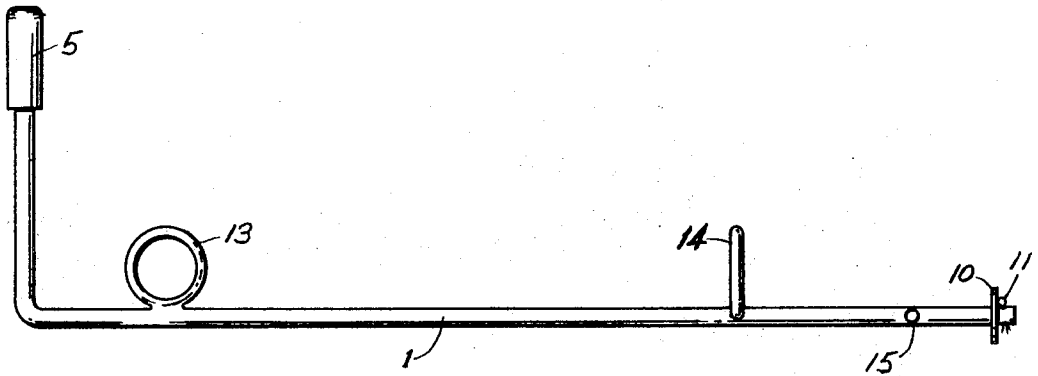


FIG. 3.

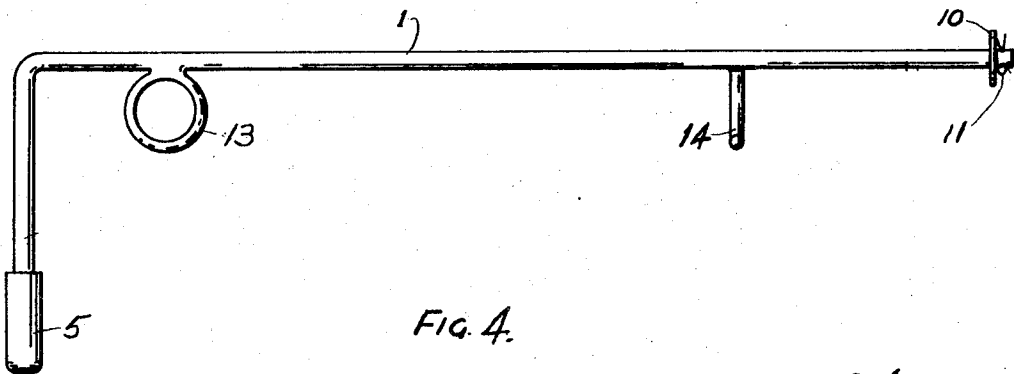


FIG. 4.

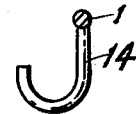


FIG. 5.

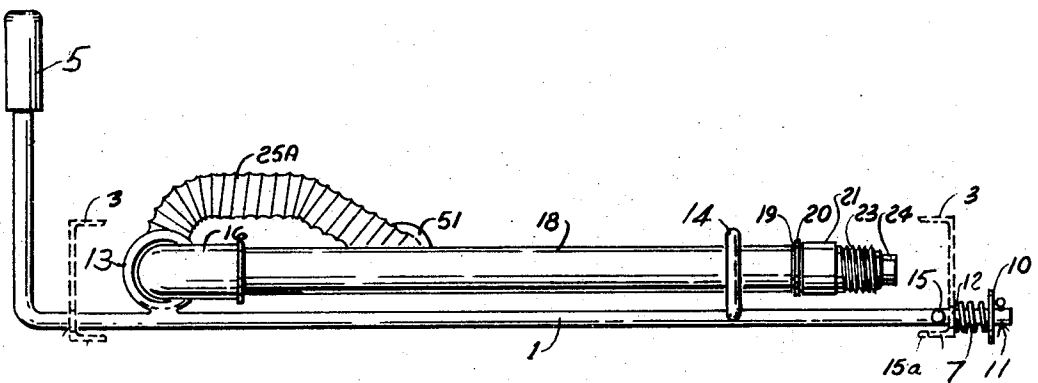


FIG. 2.

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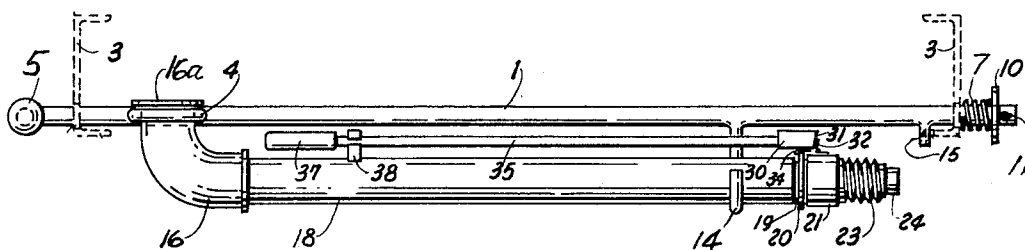


FIG. 6.



FIG. 7.

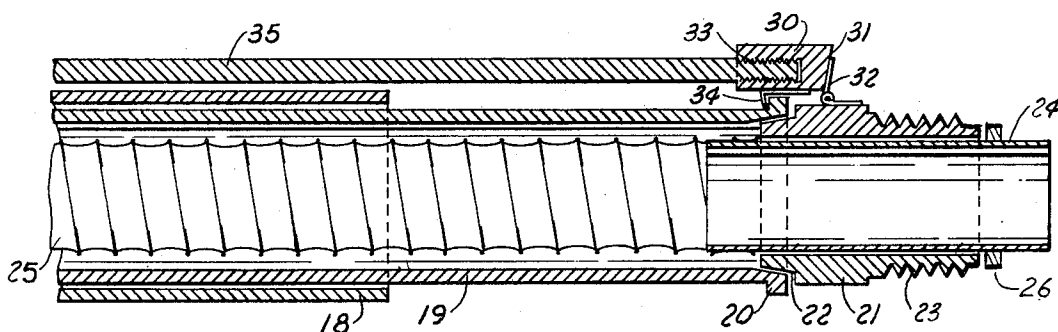


FIG. 8.

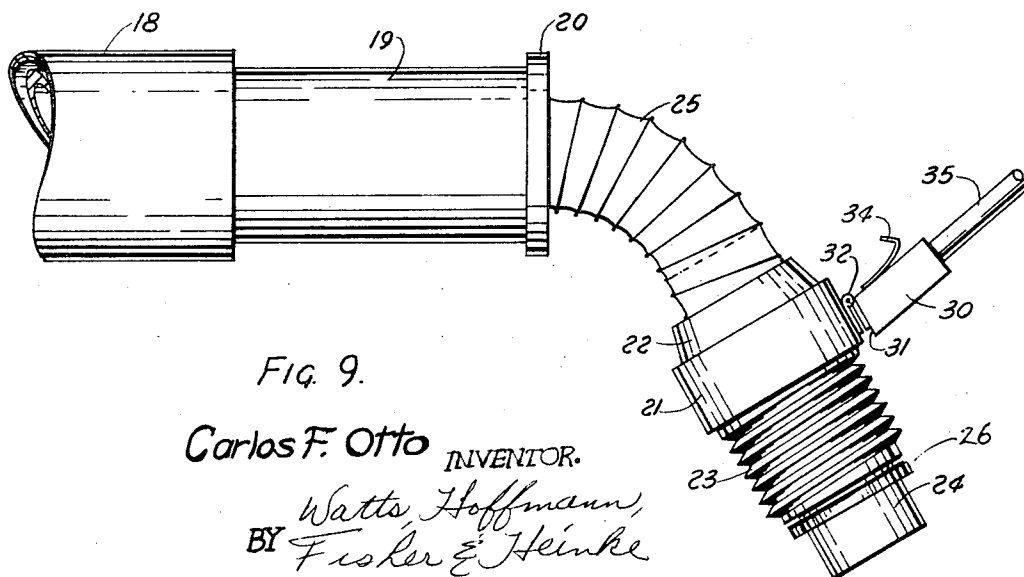


FIG. 9.

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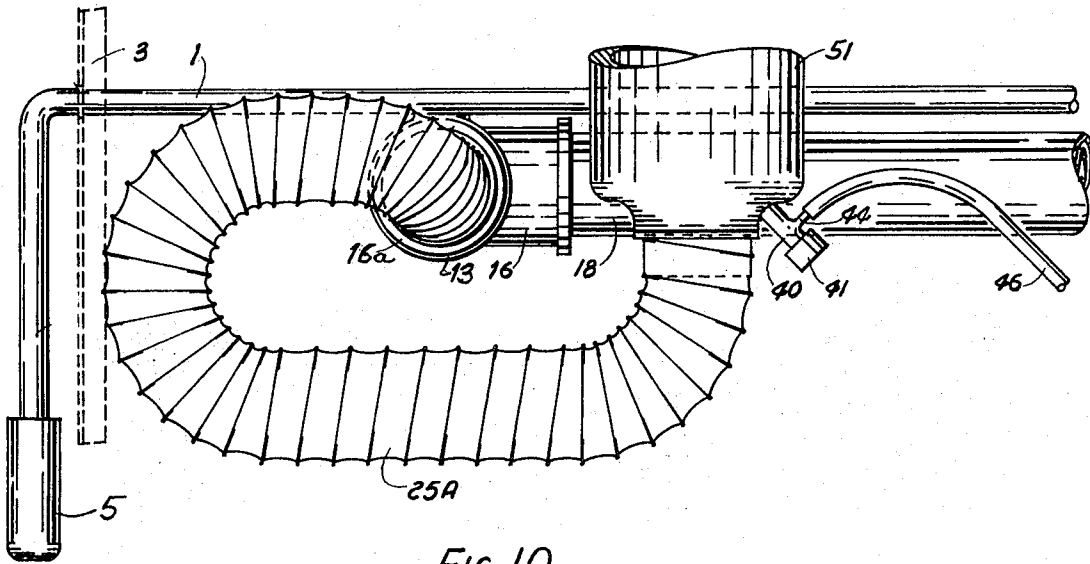


Fig. 10.

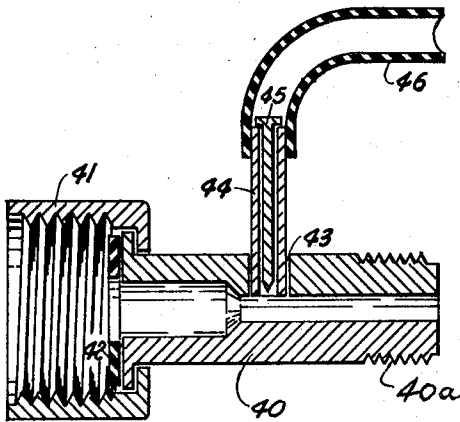


Fig. 11.

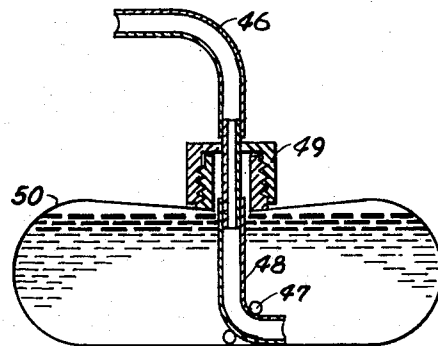


Fig. 12.

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HOLDING TANK EVACUATING APPARATUS FOR A RECREATIONAL VEHICLE

BACKGROUND

Prior to this invention it has been the practice for each recreational vehicle equipped with a holding tank to carry a suitable drain hose. The hose had a fitting on one end to connect with the outlet of the tank and another fitting on the other end to connect with a sewer or dump station. The hoses were quite flexible and it was necessary to provide suitable supports at close intervals to maintain a downward slope of the hose from the tank to the hose outlet. The supports varied from crude bricks and stones to various forms of wire or metal brackets. In all of the various arrangements it has been the practice to disconnect the hose from the tank, collect the supports, and store the loose parts in a container or elsewhere each time the vehicle was moved. There has been a need for a satisfactory apparatus to provide for a hose that could remain connected to the tank at all times and that could be quickly and easily cleansed and disconnected from the sewer facility and that could be securely and easily stored during movement of the vehicle.

SUMMARY

This invention concerns apparatus for evacuating the sewage contents of a holding tank of a recreational vehicle. The apparatus provides a simple and satisfactory means of storing an extensible accordion type drain hose during transit without disconnecting the hose from the tank. The apparatus completely eliminates the usual troubles and problems encountered in cleaning, disconnecting and storing such a hose and associated fittings each time the vehicle is moved to a new location. The apparatus also provides a rigid support having a fixed gradient for the full length of the hose when the outlet end is connected to a sewer or dump station.

Thus it is an object of the present invention to provide a safe, simple and sanitary means to evacuate the sewage contents of the holding tank of recreational vehicles.

It is a further object to provide a compact, protective and secure storage means for a recreational vehicle corrugated expansible type sewer hose while in transit.

It is a further object to provide means for a rigid support having a continuous gradient for a sewer hose when evacuating the contents of a holding tank.

It is a further object to provide an improved means to evacuate a holding tank to a sewer facility at various locations with respect to the vehicle.

It is a further object to provide an effective means to flush and cleanse the vehicle sewer hose and fittings after evacuation of the holding tank to destroy harmful bacteria and odors without disconnecting the hose from the holding tank.

It is also an object to provide a means to provide for a water rinse through the hose prior to flexing and movement of the hose in freezing weather to prevent cracking of the hose.

Other advantages and benefits of the present invention will be apparent from a consideration of the drawings in which:

FIG. 1 is an elevation view showing a typical position of the apparatus connected to a sewer or dump station;

FIG. 2 is an elevation view of the rotatable carrier rack when the rack is in the raised position for travel;

FIG. 3 is an elevation view of the rotatable carrier rack when the rack is in the raised position;

FIG. 4 is a plan view of the rotatable carrier rack in the lowered position;

FIG. 5 is an end sectional view of the rotatable carrier rack;

FIG. 6 is an elevation view of the rotatable carrier of FIG. 2 in a lowered position between travel and discharge positions;

FIG. 7 is a side view of the handling and positioning rod of FIGS. 1 and 6;

FIG. 8 is a fragmentary, partly sectional view of the flexible hose and the telescoping tubes of FIG. 1;

FIG. 9 is a fragmentary side elevation view of parts of FIG. 8 with the inner telescoping sleeve partially extended, the hose projecting from the sleeve, and the positioning rod connected to the end of the hose;

FIG. 10 is a fragmentary plan view of parts of FIG. 1 including the connection to the holding tank fitting of a source of disinfecting agent;

FIG. 11 is a sectional view of a water supply fitting equipped with a chlorine venturi and removable core; and

FIG. 12 is a schematic, partly sectional view of the chlorine supply container of FIG. 1.

The embodiment of the present invention disclosed herein is attached to a vehicle and to a holding tank in the vehicle (neither being shown). This embodiment includes a carrier in the form of a rod 1 which extends through holes in brackets or side frames 3 of the vehicle chassis, and has an end portion 5 to serve as a handle to rotate the rod. Rod 1 is urged endwise by a spring 7 surrounding it and bearing against a washer 10 which is retained by cotter pin 11.

Rod 1 (see FIGS. 3 and 4) is provided with a ring 13, a J hook 14 and stub 15. These parts may be attached to rod 1, as by welding. Stub 15 seats in notch 15a in the lower flange of the side frame 3 adjacent to spring 7. The notch may be avoided by welding a lug on the lower flange of side frame 3 to be engaged by stub 15 when carrier 1 is rotated 90° from the position shown in FIG. 2. Elbow fitting 16 is rotatably mounted in ring 13, is loosely supported in the ring by flange 16a and is attached to one end of a tube 18 in which an inner tube 19 is freely slidable. As FIGS. 2, 6, 8 and 9 show, inner tube 19 is provided with a flange 20 and is cut away interiorly to receive a rotatable fitting 21 which is beveled at 22 to seat in the cut away portion of tube 19 and is exteriorly threaded as at 23. Nipple 24 is connected to the outlet end of flexible hose or conduit 25 and is retained by collar 26. That hose extends through tubes 19 and 18, and elbow 16 and is attached to tank fitting 51. The basin drain (not shown) is connected directly to fitting 51. Part 25A of the hose is for flexing when the carrier is in transit position (FIG. 2). Tube 18 forces up section of hose 25A when in the transit position, thereby entrapping a limited amount of basin water in fitting 51 and the lower part of hose 25A. When tube 19 is moved in tube 18 toward elbow 16, hose 25 is compressed in tube 18. Tubes 18 and 19 constitute a rigid shield for the hose.

A socket 30 (FIGS. 1, 6 and 9) is connected by hinge 32 to fitting 21. Rod 35 fitted with handle 36 is at-

tached to socket 30. Spring clip 34 attached to socket 30 has latching engagement with tube flange 20 when the rod is positioned parallel to tubes 18 and 19, for example, when the vehicle is in transit. Spring clip 34 is formed to permit a limited amount of elevation of handle 37 before unlatching from flange 20. A clasp 38 attached to tube 18 (FIG. 6) serves to hold rod 19 in a latched position. By manipulating rod 35 the fitting 21 may be moved into position in a permanent sewer connection indicated at 39 in FIG. 1 where threads 23 may engage with any there present for a permanent connection. Rod 35 also serves to move the hose back into the tubes. End surface 31 of socket 30 is at an angle to the axis of rod 35 to facilitate handling of fitting 21.

FIGS. 10, 11 and 12 show the arrangement of parts to flood and wash out the corrugated hose with a chlorine enriched supply of rinse water. Fitting 51 is fastened to the dump valve and opens horizontally to connect to inlet portion 25A of hose 25. Fitting 51 is also connected to the basin drain. Water hose connector 40 is mounted at an inwardly facing angle to fitting 51 so that the water stream will be directed against the face of the dump valve to prevent any accumulation that may prevent proper closing. Water hose connector 40 is provided with a thread 40a at one end to connect with fitting 51 and suitable washer 42 and coupling 41 are positioned at the other end to connect with a water hose (not shown). Intermediate of the two ends, water hose connector 40 is provided with a reduced flow area and suitable venturi tube 44 fitted with core 45.

Tube 44 is connected by hose 46 to a chlorine supply in plastic bag 50 supported on a shelf (not shown). Bag 50 is fitted with an internal tube 48, weight 47 and stopper cap 49 so that the chlorine supply may be expelled from bag 50 by manually pressing on the bag or by allowing the venturi action of water hose connector 40 to draw the chlorine supply into the rinse water stream.

When the holding tank of the vehicle is to be emptied, the vehicle is parked adjacent to a sewer connection or dump station. Then, if frame 3 does not have a welded on lug to engage stub 15, rod 1 is pulled endwise to disengage stub 15 from the notch 15a in the flange of frame 3, thereby compressing spring 7. Rotation of rod 1 moves hook 14 downwardly thereby freeing tube 18 for removal therefrom. Tube 18 is lifted out of hook 14, rod 35 is disengaged from its clasp 38 and is moved high enough to disengage spring clip 34 from flange 20 of the inner tube 19. Then the nipple 24 is inserted in the sewer connection or dump station and the threads 23 of fitting 21 are engaged with a threaded member if one is present in the sewer connection.

From the above description the procedure to follow in making a tight and downward slopping connection to a sewer or dump station will be evident. Prior to disconnecting the apparatus it is desirable to flush and rinse hose 25 by connecting a water hose to water hose coupling 41. While manually holding portion 25A of the corrugated hose in an elevated position, the water supply is turned on to flush out fitting 51 and connected parts and to flood and fill that portion of the hose and fitting with a chlorine-enriched supply of water. Thereafter the hose is lowered and the surge of water through the remaining portion of hose 25 does an effective removal of all residue in the hose. If desired,

this step may be repeated several times for thoroughly adequate cleaning action.

When the vehicle is to be moved, the apparatus may be "loaded for travel" by reversing the foregoing steps, i.e., by disconnecting fitting 21 from the sewer connection, urging the hose endwise in the tubes while moving the inner tube as far as possible in the outer tube, engaging rod 35 with clasp 38, placing tube 18 in hook 14 and rotating rod 1 and latching it in position by engaging stub 15 in its notch on the vehicle frame.

Having thus described this invention in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the same, and having set forth the best mode contemplated of carrying out this invention, I state that the subject matter which I regard as being my invention is particularly pointed out and distinctly claimed in what is claimed, it being understood that equivalents or modifications of, or substitutions for, parts of the above specifically described embodiment of the invention may be made without departing from the scope of the invention as set forth in what is claimed.

What is claimed is:

1. Apparatus of the class described comprising in combination,

- a. a vehicle having a holding tank for liquid,
- b. a carrier rotatably carried by said vehicle,
- c. a rigid shield including telescoped tubes,
- d. a flexible, extensible conduit communicating at one end with the interior of said tank and extending through said shield, and
- e. a fitting connected to said shield and loosely carried by said carrier whereby the latter may be rotated to allow said shield and said conduit to be selectively positioned with respect to said vehicle while said conduit remains in communication with said tank.

2. The combination of elements set forth in claim 1 in which the conduit extends in the inner tube of the shield and to a point adjacent to the outer end of the inner tube.

3. The combination of elements set forth in claim 1 in which the shield is supported and held in position by the carrier when the vehicle is in transit.

4. The combination of elements set forth in claim 1 in which the conduit is extensible independently of said shield.

5. The combination of elements set forth in claim 1 in which said carrier is rotatable through approximately 90° to rotate the inlet of said fitting from a substantially horizontal position to substantially vertical position.

6. The combination of elements set forth in claim 1 in which the carrier is spring loaded and latched in position to hold the inlet of said fitting substantially horizontal during transit.

7. The combination of elements set forth in claim 6 in which a basin drain is connected to a tank fitting which is connected to the inlet end of said conduit and the portion of said conduit adjacent to the inlet end portion is maintained above the outlet of said tank fitting whereby drain water from said basin is trapped in said tank fitting.

8. The combination of elements set forth in claim 1 in which the outlet end portion of said conduit is positioned adjacent to a screw threaded fitting that is

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rotatable with respect to said outlet end, and a movable handle is connected to said fitting to facilitate handling and positioning said fitting and attached conduit.

9. The combination of elements set forth in claim 8 in which said handle latches with said shield to maintain said conduit in said shield during transit. 5

10. The combination of elements set forth in claim 1 in which a water hose is connected to the conduit near its inlet end whereby a supply of water may be introduced into said conduit to flush out the conduit after 10

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the contents of the holding tank have been discharged.

11. The combination of elements set forth in claim 10 in which means is provided for introducing a cleansing agent into the flush water.

12. The combination of elements set forth in claim 11 in which the cleansing agent is carried in a manually collapsible container in direct communication with said hose connector.

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