United States Patent

[11] 3,628,196

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[54] **FLEXIBLE CHEMICAL TOILET**
10 Claims, 1 Drawing Fig.

[52] U.S. Cl. 4/115, 210/167
[51] Int. Cl. A47k 11/02, B63b 17/06
[50] Field of Search 4/99, 110, 111, 112, 113, 114, 115, 119

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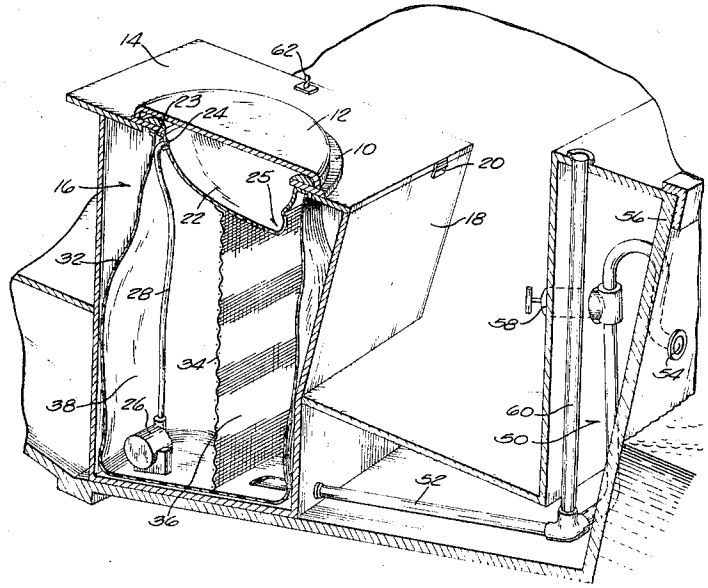
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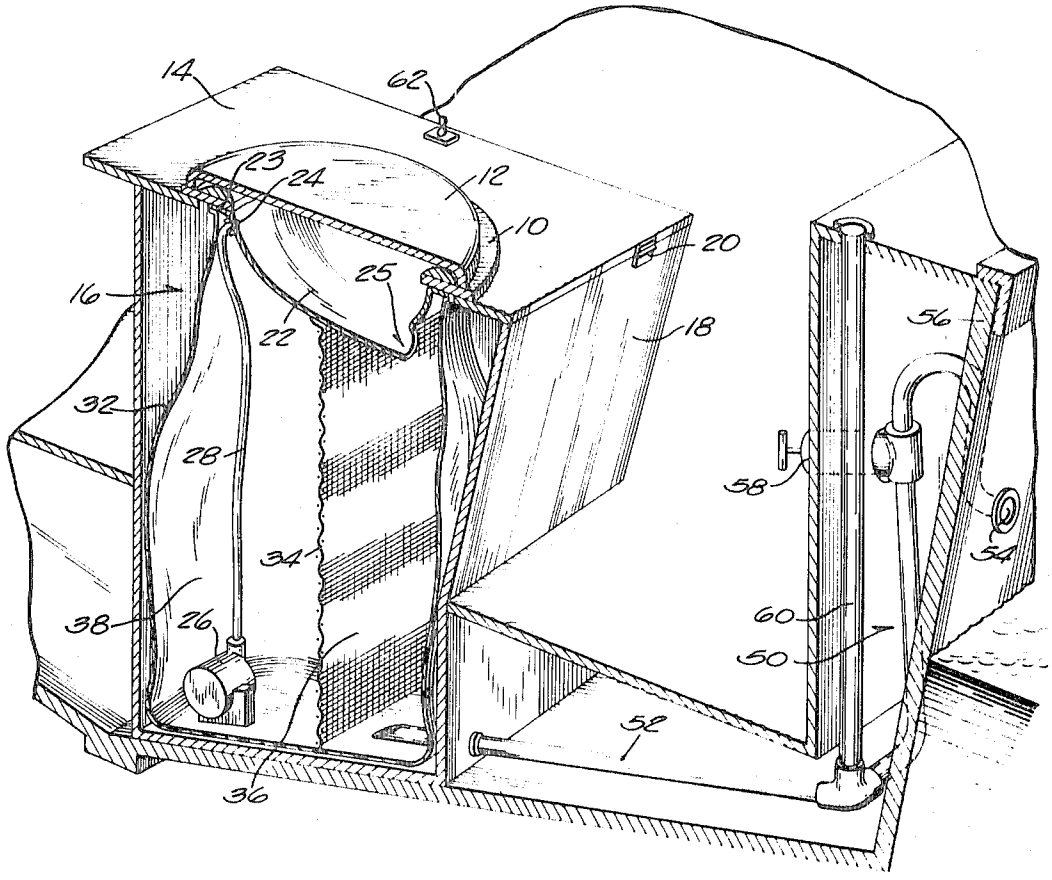
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ABSTRACT: Disclosed herein is a recirculating marine toilet including a bowl having a discharge outlet, a flexible container containing chemically treated fluid located to receive waste fluid from the outlet, a flexible filter screen separating the flexible container into a first compartment for waste fluid and a second compartment for filtered fluid, and a recirculating pump in the second compartment to pump the chemically treated filtered fluid from the second compartment to the bowl to flush waste through the outlet into the first compartment. A vacuum discharge port and an overboard discharge can be provided from the first compartment for removal of waste fluid from the container.





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FLEXIBLE CHEMICAL TOILET

BACKGROUND OF THE INVENTION

Strict pollution laws require waste containers in substantially all boats. Generally available marine toilets have rigid containers which are not readily adaptable to the contour of and space available in many boats, and particularly smaller boats.

SUMMARY OF THE INVENTION

The recirculating marine toilet of this invention is provided with a flexible waste fluid container which can readily adapt to the contour of and the space available in the bottom of a boat. The toilet includes a bowl having a discharge outlet with the flexible fluid container located to receive waste fluid from the discharge outlet of the bowl. The fluid in the container is chemically treated and is filtered prior to recirculation by a flexible filter screen which separates the container into a waste fluid compartment and a filtered fluid compartment. The bowl is flushed by pumping filtered fluid from the filtered fluid compartment into the bowl. The waste fluid from the bowl is discharged through the outlet and into the waste fluid compartment in the container. Fluid to be recirculated passes through the filter screen recirculating into the filtered fluid compartment for recirculation. The flexible container is also capable of responding to surging of fluids in the container and to gas expansion without any adverse effects on the container and reduces stresses normally produced by such forces on the seals. The filter screen is automatically cleaned by the reverse flow of filtered fluid through the screen upon removal of the contents of the waste fluid compartment.

Other objects and advantage will become apparent from the following detailed description when read in connection with the accompanying drawings in which a cross-sectional view is shown of the rcirculating chemical toilet located in a boat.

DESCRIPTION OF THE INVENTION

The recirculating marine toilet of this invention generally includes a set **10** having a cover **12** both of which are hingedly mounted on a top panel **14** for an enclosure **16** formed by sidewall panels **18**. Access to the enclosure **16** is provided by hingedly connecting the top panel **14** to one one of the sidewall panels **18** by means of hinges **20**. The enclosure can be of any shape and is closed at the bottom by the sloping surface of the bottom of the boat. A bow **22** is secured to the seat **10**, depending downwardly therefrom within the enclosure, and includes an annular flange **23**, nozzle **24** and a discharge outlet **25**.

In accordance with the invention, means are provided within the enclosure **16** to receive the waste fluid discharged from the outlet **25** in the bowl. Such means is in the form of a flexible bag or container **32** secured to the underside of the annular flange **23** of the bowl **22**. The flexibility of the bag or container readily affords conformance to the shape of the interior of the enclosure **16** and to the sloping contour at the bottom of the boat.

The container **32** is filled with a slush fluid such as water which is chemically treated with one of the standard treating liquid. As an example, a Monochem T5 chemical can be used which is made by Monogram Industry, Inc. of Culver City, Calif. The chemically treated fluid is pumped into the bowl to flush waste through the outlet by means of a submersible electrically actuated pump **26** connected to the nozzle **24** in the bowl by a flexible conduit **28**. The nozzle **24** is arranged to direct fluid in both directions around the upper portion of the

bowl **22**. The pump **26** is immersed in the fluid within the container **32** to recirculate chemically treated fluid from the container **32** to the bowl **22**.

The fluid to be recirculated is filtered prior to recirculation by means of a flexible filter screen **34** provided in the container **32**. The screen is made from a fine mesh such as vinyl plastic and is welded or otherwise suitably connected to the sides and bottom of the bag or container **32** to separate the container into a first compartment **36** for waste fluid and a second compartment **38** for filtered flush fluid. The flexible filter screen can also be used in any shape enclosure. In addition, the flexibility of the filter material affords use of a greater filtering area than would be the case with a rigid filter. In addition, the flexible filter can shift to accommodate varying loads.

The flexible container **32** can be emptied at a pump-out station by means of a vacuum discharge tube **60** connected to a conduit **52** connected to the container **32** or through an overboard discharge system **50** including the conduit **52** and which terminates in a port **54** in the hull **56** of the boat. Waste fluid can be pumped overboard from the container by means of a manually actuated pump **58** connected to the conduit **52**. One or both systems can be used. The screen **34** is automatically cleaned by the reverse flow of filtered fluid from the second compartment **38** into the first compartment **36** when the waste fluid is removed from the container.

Means are provided for actuating the pump **26** in the form of a switch **62** connected to an electrical power source in the boat and to an electric circuit for the pump **26**. The switch **62** is located at a convenient position in the panel **14**. A timer can be provided in the pump circuit to control the duration of operation of the pump.

Various of the features of the invention are set forth in the following claims:

What is claimed is:

1. A toilet comprising a bowl having a discharge outlet, a flexible container for receiving flush fluid through said outlet from said bowl and including a flexible filter for filtering the flush fluid in said container, and means communicating with said bowl and with said container for pumping the resultant filtered fluid from said container back into said bowl.

2. A toilet according to claim 1 wherein said filter separates said container into a first compartment for flush fluid and a second compartment for filtered fluid.

3. A toilet according to claim 1 wherein said filter comprises a fine mesh plastic screen.

4. A toilet according to claim 3 wherein said screen is made from a vinyl plastic.

5. A toilet according to claim 3 including means for discharging fluid from said container.

6. A recirculating toilet comprising a toilet bowl having a discharge outlet, a flexible container depending from said bowl and adapted to contain a chemically treated fluid, filter means for separating said container into a first compartment communicating with said discharge outlet and a second compartment, sand means for pumping fluid from said second compartment into said bowl to flush waste from said bowl into said first compartment.

7. A toilet according to claim 6 wherein said filter means comprises a flexible filter screen.

8. A toilet in accordance with claim 1 wherein said pumping means is located in said container.

9. A toilet in accordance with claim 6 wherein said pumping means is located in said container.

10. A toilet in accordance with claim 9 wherein said pumping means is located in said container second compartment.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,628,196 Dated December 21, 1971

Inventor(s) Ronald G. Quiram and Gaylord M. Borst

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 25 delete "recirculating";

Column 1, line 35 "rcirculating" should be

--- recirculating ---;

Column 1, line 40 "set" should be --- seat ---;

Column 1, line 46 "bow" should be --- bowl ---;

Column 1, line 58 "slush" should be --- flush ---;

Column 1, line 60 "liquid" should be --- liquids ---.

Signed and sealed this 11th day of July 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents