March 16, 1971 R. J. SARGENT ETAL 3,570,018

PORTABLE TOILET

Filed April 25, 1968 4 Sheets-Sheet 1

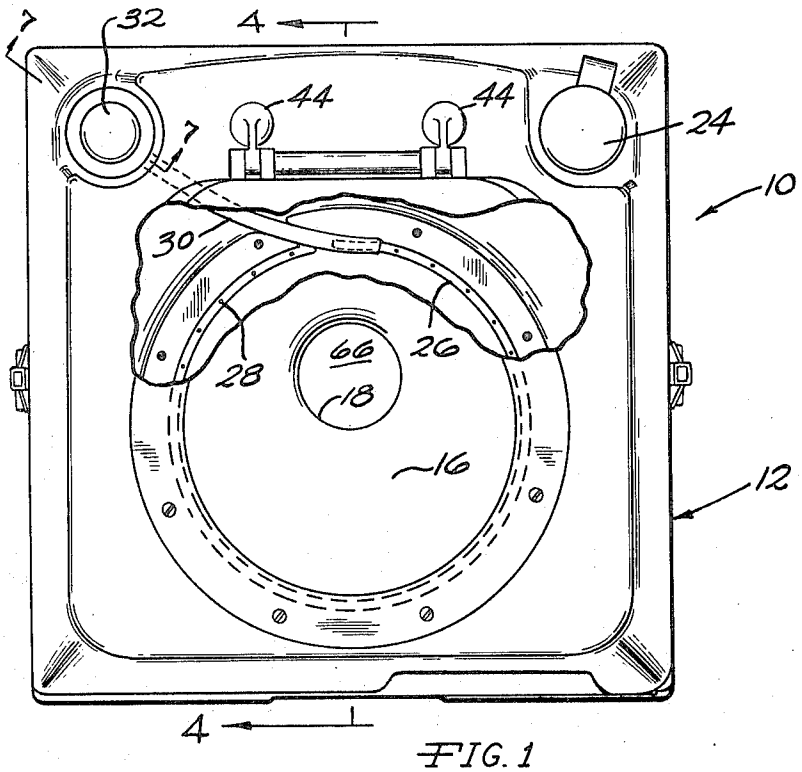

FIG. 1

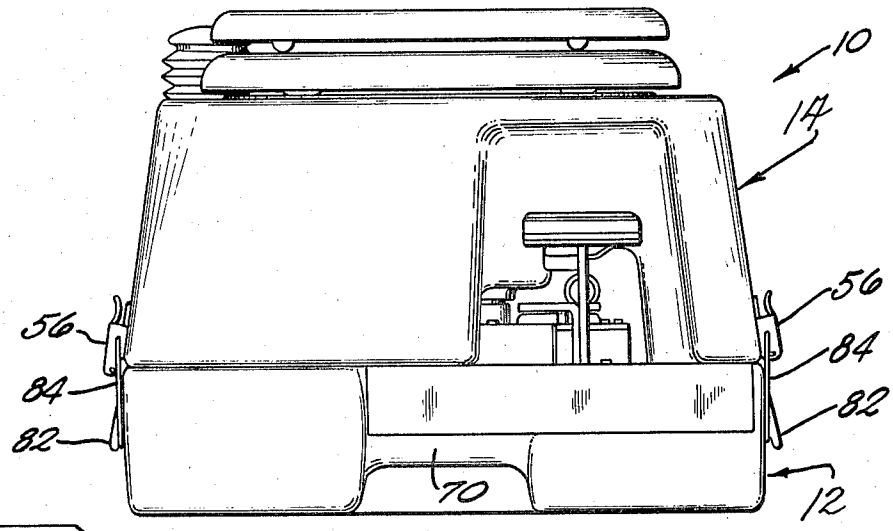

FIG. 2

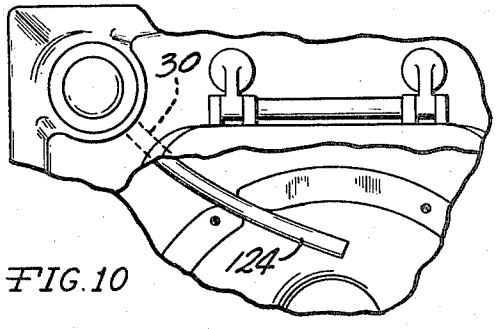

FIG. 10

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Filed April 25, 1968 4 Sheets-Sheet 2

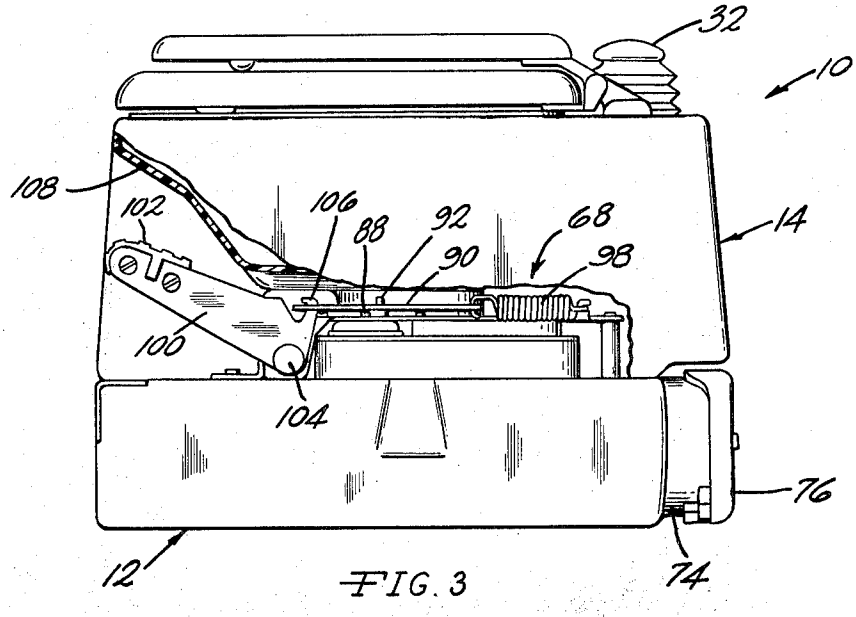

FIG. 3

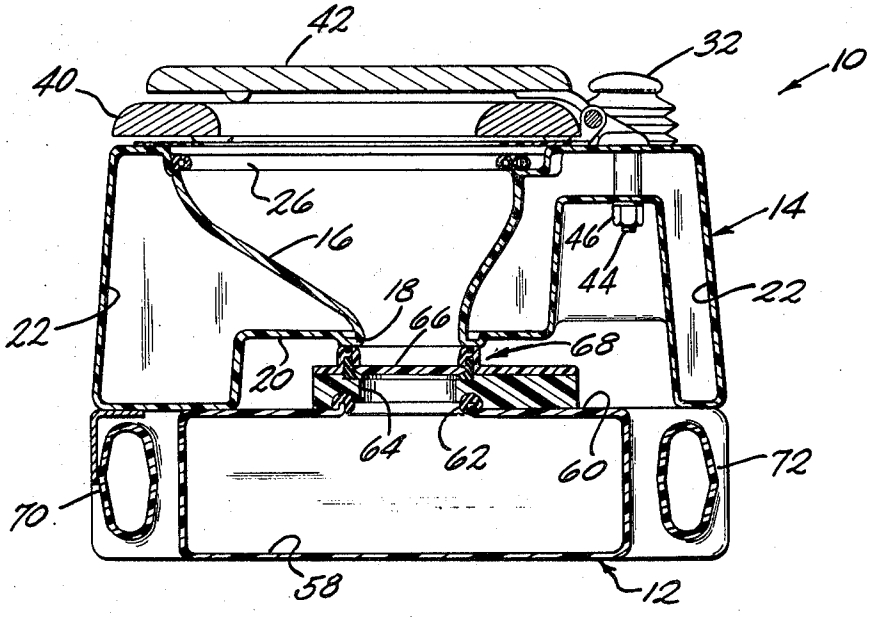

FIG. 4

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Filed April 25, 1968 4 Sheets-Sheet 3

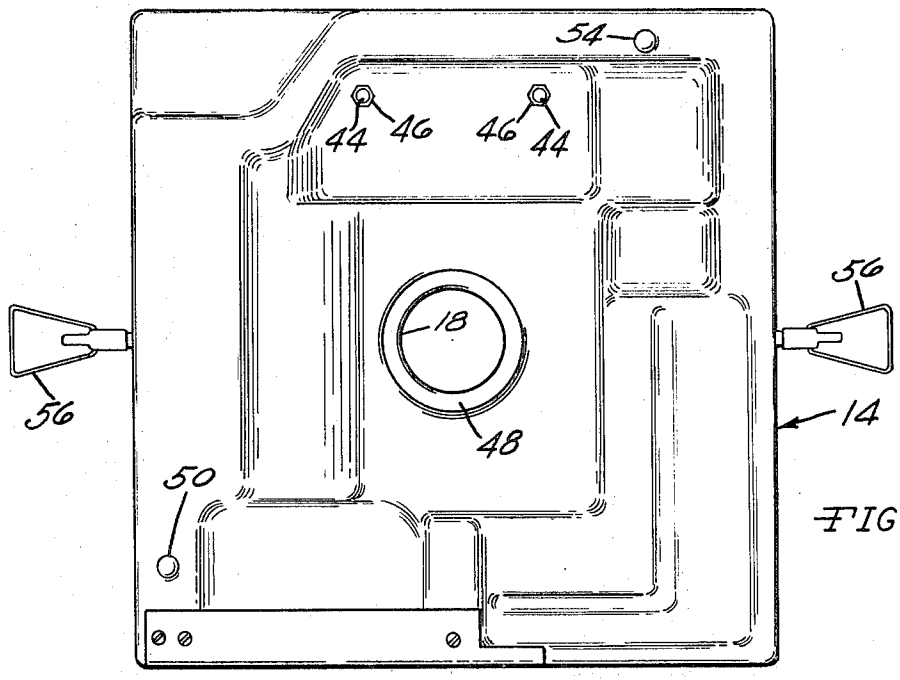

FIG. 5

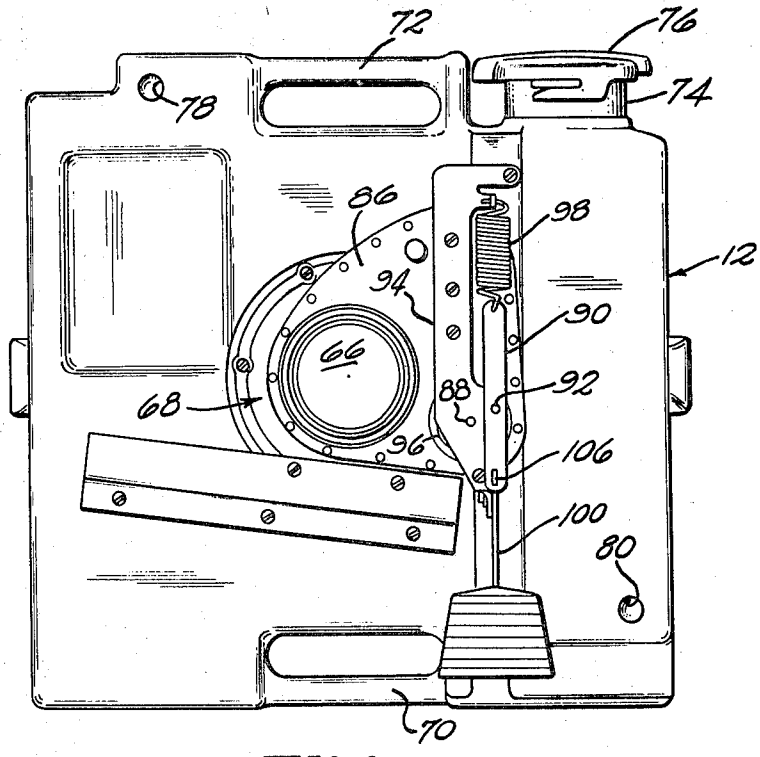

FIG. 6

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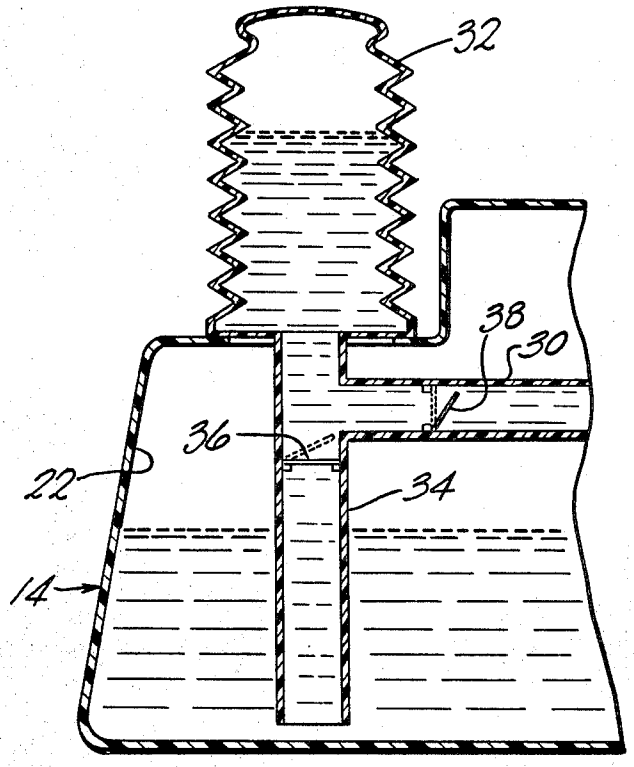


FIG. 7

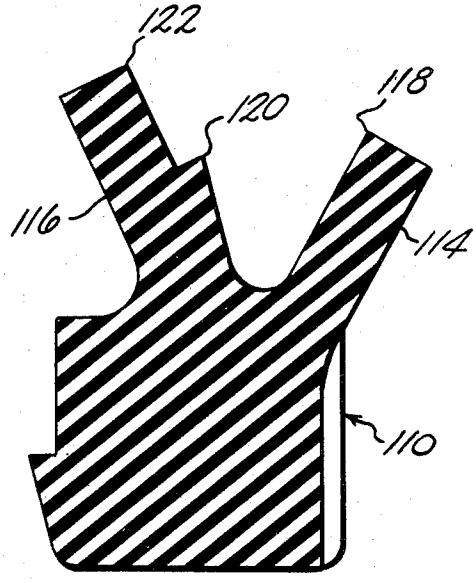
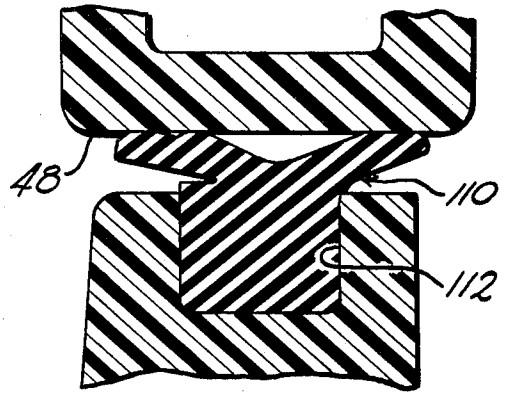


FIG. 8

FIG. 9



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United States Patent Office 3,570,018 Patented Mar. 16, 1971

3,570,018

PORTABLE TOILET

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Filed Apr. 25, 1968, Ser. No. 724,071
Int. Cl. E03d 5/016
U.S. Cl. 4—115 21 Claims

ABSTRACT OF THE DISCLOSURE

A self-contained portable sanitation unit formed in two sections. The top section includes a seat, seat cover and bowl which has a hollow wall structure serving as a water storage compartment for flushing purposes. The bottom section is the holding tank. In use, the two sections are held together by clamps. A flushing plunger is provided at the rear of the top section for flushing the unit. The holding-tank section is sealed from the environment by a normally closed slide valve element in the passageway that provide communication with the top section. The slide valve element is opened for flushing purposes by depressing a foot pedal located at the front side of the unit. For tank evacuation, the top section is removed by releasing the clamps and the holding tank can be carried like a suitcase by means of an integral handle on one side and is evacuated by emptying into a nearby permanent toilet facility.

BACKGROUND OF THE INVENTION

The present invention relates to portable toilets which are adapted for use in boats, trailers, campers and for other camping and recreational purposes, as well as for use on construction jobs, unimproved cabins and other places located away from sanitation facilities. In particular, the invention is directed to a self-contained unit including its own fresh water storage compartment and holding tank.

With the rapid growth in camping and other recreational activities, a need has arisen for a portable completely self-contained sanitation system. Systems of this character have been developed in the past, but they have left much to be desired. Among their shortcomings, the prior art devices have failed to be free from odor, and have been bulky and difficult to handle. Also, they have failed to provide a lightweight, portable holding tank which is designed for convenient transportation and easy evacuation. Still further, the prior art devices have failed to provide a portable toilet which is not readily identifiable as such while being carried between the site of its usage to the site of its evacuation. It is well known that most persons feel a social stigma is attached to the chore of emptying vessels containing human wastes and do not wish to be identified as the bearers of such vessels.

SUMMARY OF THE INVENTION

The present invention has overcome the shortcomings of the prior art and has provided a portable toilet comprising a portable lower holding-tank section and an upper seat section removably clamped thereon. The seat section defines a bowl with an outlet port in its lower surface, and the walls of the seat section are hollow to provide a storage chamber for flushing water. A flushing plunger is mounted on the rear of the top section for flushing the unit by simply depressing the flushing plunger. The holding tank section has an inlet port in its upper surface in register with the outlet port of the bowl, and it contains valve means normally closing the passageway

defined by the inlet and the outlet ports. A foot pedal is located at the front of the toilet and is operatively connected to a gate valve element so that the valve element can be opened by depressing the foot pedal. The valve mechanism employed is similar to that disclosed in prior U.S. Pat. No. 3,369,260, granted Feb. 20, 1968.

The holding tank has a unique construction in that it is shaped so that it can easily be carried like a suitcase by means of a handle which is integrally formed in one side thereof. The holding tank has a discharge spout on one side adjacent to the handle and has a closure cap for sealing the outlet to the spout. Thus, the holding tank has a shape and configuration making it readily suitable for carrying purposes and for being emptied into any nearby permanent toilet facility. The holding tank is also provided with a shape and configuration which prevents ready identification by a casual observer as to the true nature of its purpose and contents. The unit is light in weight because of its hollow construction, and its upper section has a compartment capable of holding fresh water in an amount sufficient to provide approximately 50 usages. The sealing means in the holding tank is also constructed and arranged to provide gas tight, odor tight properties.

Accordingly, it is one of the objects of the present invention to provide an improved portable, completely self-contained sanitation system, and particularly, a portable toilet of this character which is constructed and arranged so that its holding tank can readily be disconnected and transported to a nearby toilet facility for evacuation.

Another object of the present invention is to provide a water holding tank which can be transported between its site of use and its site of evacuation without being readily identifiable as a vessel holding human wastes, thus avoiding the social stigma which almost all persons feel in such a situation where identification as such is readily made by casual observers.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a portable toilet embodying one form of the present invention, a portion being broken away to illustrate details of one type of flushing mechanism that may be employed;

FIG. 2 is a front elevational view of the portable toilet;

FIG. 3 is a side elevational view of the portable toilet with portions broken away to illustrate the foot pedal and associated valve mechanism;

FIG. 4 is a vertical section taken on the line 4—4 of FIG. 1;

FIG. 5 is a bottom plan view of the upper seat section of the toilet illustrated in FIG. 1;

FIG. 6 is a top plan view of the lower holding tank section;

FIG. 7 is a fragmentary section taken on the line 7—7 of FIG. 1;

FIG. 8 is an enlarged radial section taken through an annular sealing ring located between the upper and lower sections of the toilet;

FIG. 9 is a fragmentary section of smaller scale illustrating the sealing ring as it is being compressed between portions of the upper and lower sections of the toilet; and

FIG. 10 is a fragmentary top plan view of a modified form of a portable toilet, illustrating another type of flushing mechanism that may be employed.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring now to the drawings, the invention will be described in greater detail. The portable toilet **10** comprises the lower holding tank section **12** and the upper seat section **14** movably supported thereon. The body portions of these sections preferably are constructed of a durable white polyethylene material. The sections are molded by an appropriate method to provide hollow constructions. The upper section **14** is molded to define a bowl **16** having a discharge outlet **18** in the lower surface or bottom wall **20**. The section **14** is molded so as to provide a double wall construction defining in its interior the fresh water compartment **22**. A fill opening is provided in the upper rear corner of the section **14**, such opening being closed by the closure cap **24**. Positioned around the upper end of the bowl **16** is a flushing ring **26** which has a plurality of apertures **28** for discharging water into the bowl. The ring **26** is connected to the conduit **30** which is in communication with the flushing plunger **32**. The latter is a resilient bellows-like construction, which can be seen best in FIG. 7, and is formed of a flexible plastic material so that it can be used to pump fresh water from the water compartment **22** to the flush ring **26**. As shown in FIG. 7, a vertical conduit **34** extends to a position adjacent to the bottom of the water compartment **22** and is in communication with the interior of the flushing plunger **32**. Positioned in the conduit **34** is a conventional valve member **36** which is adapted to be closed when a pressure on its upper surface exceeds that on its lower surface and to open when the pressure on its lower surface exceeds that on its upper surface. A similar type valve member **38** is located in the conduit **30**, and it functions to open when the pressure on the plunger side exceeds that on the flushing ring side. Thus, when the plunger **32** is depressed, if no water is therein, the air within the plunger will close the valve member **36** so that the air will be discharged through the valve member **38**, and when the resilient characteristics of the plunger **32** cause the same to expand to the position shown in FIG. 7, the pressure differential in the conduit **34** will cause water to be lifted in the conduit **34** partially filling the plunger **32**, as is shown in FIG. 7. Thereafter, when the plunger **32** is depressed, the valve member **36** will close and the valve member **38** will open, causing a quantity of water corresponding to the amount displaced from the plunger **38** during the plunging action, to be discharged to the flush ring **26**. By virtue of this construction, fresh water can be pumped when desired for flushing purposes, so long as the compartment **22** contains fresh water. In the illustrated embodiment of the invention, the compartment **22** has a capacity to permit flushing of the portable toilet approximately 50 usages.

Mounted on the upper surface or top wall of the upper section **14** is a conventional toilet seat **40** and a toilet seat cover **42**, which are supported in a conventional manner to the upper surface by means of the bolts **44** which extend through the compartment **22** and are secured in place by means of the nuts **46**, see FIG. 4.

The under surface of the upper section **14** has an annular flat surface **48** circumscribing the outlet port **18** to provide a sealing surface around such outlet port. The lower surface or bottom wall of the section **14** also has at least two pins or male members **52** and **54** which are adapted to fit into corresponding female portions

of the lower section for proper alignment of the two sections. Also, the upper section **14** has a pair of latching mechanisms **56** on opposite sides thereof, which are adapted to be engaged with elements on the lower section **12** for clamping the two sections together, as will be described.

The lower holding-tank section **12** is molded so as to define the holding tank or compartment **58** and has in its upper surface or top wall **60** an inlet port **62** which is in register with the outlet port **18** of the upper section. Thus, the outlet port **18** and the inlet port **62** define, in effect, a sealed passageway **64** therebetween, which is normally closed by the valve element **66** in the valve mechanism **68**. The lower holding-tank section **12** is also molded so as to define two hollow handles **70** and **72** for carrying purposes. Also integrally molded as a part of the holding-tank section **12** is the discharge spout **74** which is shown in FIG. 6 as being closed by a closure cap **76**. As there shown, a suitable bayonet-type joint may be used to provide a gas and liquid tight seal, or any other conventional type closure cap arrangement may be employed for this purpose. Also mounted in the lower section **12** are the holes or recesses **78** and **80** which comprise the female portions of the alignment means for positioning and retaining the upper section **14** in proper location on the lower section **12**. As can be seen from FIGS. 5 and 6, the pin **54** of the upper section is adapted to be received and positioned in the hole **78**, and the pin **50** is adapted to be received and positoned in the hole **80**. When these parts are in such mating relationship, the inlet port **62** of the lower section will be in register with the outlet port **18** of the upper section. The lower section **12** also has molded on two opposite sides the lugs **82** which are adapted to receive the wire loop portion **84** of the clamping mechanism **56** for securely clamping the upper section **14** to the lower section **12** in a conventional manner.

As shown best in FIGS. 3, 4 and 6, the inlet port **62** and its associated passage **64** is normally closed by the valve element **66** of the valve mechanism or means **68**. The latter is mounted on the upper surface of the holding-tank section **12** so that when the upper section **14** is disconnected and removed from the lower section **12**, the holding tank will be in a sealed condition. When in use, the capacity of the holding tank **58** is such as to permit approximately 50 usages before evacuation is required. When evacuation is required, the holding tank can be carried by means of the one handle **72** much like an ordinary suitcase would be carried. For the evacuation purposes, the closure cap **76** can be removed, and the evacuation can be carried out by emptying the tank through the spout **74** into any nearby permanent toilet facility.

The valve mechanism **68** is of the type shown in U.S. Pat. No. 3,369,260, to which reference is made for a detailed description. Briefly, the valve mechanism **68** comprises the horizontally slidable valve element or gate valve member **66** which is adapted to move horizontally in the valve housing **86**, about the pivot pin **88**. The valve element **66** is caused to pivot about the pin **88** by movement of the linkage **90** which carries a pin **92** which extends through a slot (not shown) in the bracket **94** into the hub **96**. The pin **92** is normally retained in the position shown in FIG. 6 by means of the spring **98** which is connected at one end to the bracket **94** and at the other end to the linkage **90**. The action of the spring **98** can be overcome by moving the linkage **90** by means of the lever **100**, which preferably has a foot pedal **102** at its outer end. As can be seen in FIG. 3 the lever **100** is pivotally mounted at **104** and is connected by the lever arm **106** to the linkage **90** for effecting movement of the same axially away from the spring **98**. When so moved, the pin **92** will be pivoted about the pin **88**, thereby pivoting the valve element **68** about the pin **88** to an open position. However, when pressure on the foot pedal **102** is released,

the spring **98** will function to return the valve mechanism **86** to its closed position illustrated in the drawings. As previously indicated, a more detailed description of the valve mechanism can be found in prior Pat. No. 3,369,260.

For the purpose of actuating the foot pedal **102** the upper section **14** has its front side constructed so as to provide a cavity **108**, so that when it is desired to flush the toilet, the foot pedal **102** can be depressed and water can be pumped through the bowl by utilizing the pump means or plunger **32**.

From the foregoing description, it will be recognized that the holding tank and its associated valve mechanism are constructed and arranged to provide an extremely compact unit and the overall height of the toilet unit **10** is maintained at a minimum. A lightweight unit is provided for transportation from one site to another by virtue of the hollow interiors of the upper and lower sections. The unit is also constructed and arranged so as to provide gas tight and odor tight seals and so as to prevent leakage between the two sections during normal usage. This latter feature is accomplished by means of the clamping and alignment arrangements provided for alignment of the outlet port **18** with the inlet port **62** and the seal that is provided between the upper and lower sections. For a description of the seal construction, attention is directed to FIGS. 8 and 9.

As there shown, the annular flat surface **48** is adapted to be urged tightly against the annular sealing member or ring **110** which has a generally Y-shape or cross section and its stem is fitted securely into the groove **112** in the upper surface of the holding tank **12**. It will be recognized that the valve mechanism **68** is considered for this purpose to be part of the upper surface of the holding tank **12**. By virtue of the construction and arrangement of the arms **114** and **116** of the ring **110**, a plurality of continuous sealing edges **118**, **120** and **122** are urged tightly into engagement with the annular surface **48** when the upper section **14** is clamped to the lower section **12** by the clamping mechanisms **56**. Thus, an especially effective seal is provided which prevents leakage between the two sections during normal usage.

The portable toilet **10** has been illustrated as employing a flush ring **26**. Other suitable flushing devices may also be used. One such alternate arrangement is shown in FIG. 10 wherein a vortex spray nozzle **124** is connected to the conduit **30** and the flush ring **26** has been eliminated.

It is claimed:

1. A portable toilet comprising a portable lower holding-tank section and an upper seat section removably supported thereon, said seat section having top, side and bottom walls with an outlet port in its bottom wall and defining a bowl extending between said top and bottom walls and opening at the bottom to said outlet port, said holding-tank section having a flat top wall and side and bottom walls forming a closed receptacle with an inlet port in its top wall and sealed registry with said outlet port, the top wall of said holding-tank section and the bottom wall of said seat section having parallel upper and lower parting surfaces, and flat slide valve means mounted on said holding-tank section for movement in a plane generally parallel to the parting surfaces of said sections and normally closing said inlet port and sealing the interior of said tank section from the environment.

2. A portable toilet according to claim **1**, wherein said bowl and said walls of said seat section form a closed receptacle which serves as a storage chamber for flush water, said bottom wall of the seat section defining the bottom of the storage chamber.

3. A portable toilet according to claim **2**, wherein manually operated pump means are mounted on said seat section, said pump means having an inlet in communication with said storage chamber and an outlet in communication with said bowl.

4. A portable toilet according to claim **2**, wherein said seat section has an inlet port in its top wall for filling said storage chamber, and a closure cap removably secured to the seat section closing said inlet port.

5. A portable toilet according to claim **3**, wherein said seat section includes an apertured hollow flush ring positioned around the inner upper periphery of said bowl, and a conduit connecting the outlet of said pump means to the interior of said flush ring.

6. A portable toilet according to claim **3**, wherein said seat section includes a nozzle positioned to discharge water in a vortex pattern into said bowl, and a conduit connecting the outlet of said pump means to the inlet end of said nozzle.

7. A portable toilet comprising a portable lower holding-tank section and an upper seat section removably supported thereon, said seat section having top, side and bottom walls with an outlet port in the bottom wall and defining a bowl with an opening in the top wall and extending between said top and bottom walls and opening at the bottom to said outlet port, the walls and the bowl of said seat section forming a closed receptacle to provide a storage chamber surrounding the bowl for storage of flush water, means on said seat section for pumping water from said section into said bowl adjacent to the upper periphery thereof, said holding-tank section having a flat top wall and side and bottom walls forming a closed receptacle and an inlet port in its top wall in sealed registry with said outlet port, the top wall of said holding-tank section and the bottom wall of said seat section having parallel parting surfaces, slide valve means mounted on one of said sections normally closing the passageway formed by said inlet and outlet ports, and sealing means sealing the interior of said tank from the external environment when said valve means is closed.

8. A portable toilet according to claim **7**, wherein said sections define between them a cavity opening externally of the portable toilet at one side of the toilet, and said valve means includes a slide valve element normally closing said passageway, and a mechanism extending from the central region of said cavity and operatively connected to said valve element for moving said valve element manually to an open position.

9. A portable toilet according to claim **8**, wherein said holding tank section has generally flat top and bottom walls and means closing said inlet port when said upper seat section is removed.

10. A portable toilet according to claim **9**, wherein said holding-tank section has a relatively small vertical dimention with respect to the transverse dimensions of the top and bottom walls and has an integral handle on one of its side walls for carrying the holding-tank section by an individual at his side with its normally top and bottom walls in vertical positions.

11. A portable toilet according to claim **10**, wherein said holding-tank section has a discharge spout adjacent to one of its side walls and a removable closure cap on said spout.

12. A portable toilet according to claim **7**, wherein said bottom wall of the seat section and said top wall of the holding-tank section include mating means for maintaining said outlet port and said inlet port in registry.

13. A portable toilet according to claim **12**, wherein clamp means are connected to the side walls of said sections for clamping said bottom wall of the seat section to the top wall of the holding-tank section when said ports are in registry.

14. A portable toilet according to claim **13**, wherein an annular sealing means surrounds said passageway between said sections.

15. A portable toilet according to claim **14**, wherein said sealing means comprises an annular flat portion in said bottom wall circumscribing said passageway, a corresponding upwardly opening annular groove in said top wall, and a resilient ring seated in said groove and pro-

jecting thereabove into multi-sealing relationship with said flat portion, said resilient ring having a plurality of continuous edges clamped under compression against said flat portion to provide said multi-sealing relationship.

16. A portable holding tank for use with a portable toilet seat section which has a bottom wall and a bowl with an outlet port opening through the bottom wall, said holding tank having horizontal upper and lower walls and vertical side walls forming a closed receptacle, the vertical dimension of said side walls being relatively less than the transverse dimensions of said upper and lower walls, said upper wall including an inlet port centrally located in its upper wall capable of being positioned below said outlet port, a slide valve means mounted on said upper wall normally closing said inlet port, and a handle in one of said side walls for carrying said tank as a suitcase with the upper and lower walls in vertical positions.

17. A toilet comprising a seat section means having an internal wall portion defining a bowl open at the top and at the bottom, a single nozzle positioned to discharge a single measured volume of water tangentially against the internal wall portion adjacent to the top of the bowl for flow in a vortex pattern to the bottom of said bowl, a storage chamber for flush water, pump means for measuring and discharging a single measured volume of flush water, said pump means having an inlet in communication with said storage chamber and an outlet in communication with said nozzle.

18. The portable holding tank that is defined in claim **16**, wherein a pour spout is located in one of the walls of the tank, and a closure cap is removably secured thereon in a normally sealed relation.

19. The portable holding tank that is defined in claim **18**, wherein said pour spout is located adjacent to said handle to facilitate emptying the tank when the closure cap is removed.

20. A portable toilet comprising a portable lower holding-tank section and an upper seat section removably supported thereon, said seat section having top, side and bottom walls with an opening in its top wall and an outlet port in its bottom wall and defining a bowl extending between said opening in the top wall and said outlet port in the bottom wall, the side walls of said seat section together with said top and bottom walls and said bowl forming a closed receptacle providing a storage chamber around said bowl for storage of flush water, means on said seat section for manually pumping water from said chamber to said bowl, said holding tank having flat top, side and bottom walls with an inlet port in its top wall in registry with said outlet port to provide a passageway from the bowl to the holding tank, a flat slide valve element normally closing said inlet port and mounted for slidable movement in a path essentially parallel to the flat top wall of the holding tank to open said inlet port, and a mechanism for manually moving said slide valve element to its open position, said bottom wall of the seat section and said top wall of the holding tank section defining between them a cavity opening to the exterior of the toilet, said mechanism extending from said slide valve element into said cavity.

21. The portable toilet that is defined in claim **20**, wherein an annular sealing means surrounds the registered inlet and outlet ports between said top and bottom walls, and releasable clamp means interconnect said holding tank section and said seat section and maintain said annular seal means in sealing relation around said passageway.

References Cited

UNITED STATES PATENTS

254,086	2/1882	Alexander	4—81
337,546	3/1886	Angell	4—128
484,559	10/1892	Niles	4—80
983,565	2/1911	Pierson	220—46
984,696	2/1911	Ogden	4—115X
1,119,968	12/1914	Le Sieur	220—46X
2,190,040	2/1940	Newnes	4—115
2,224,868	12/1940	Houck et al.	4—115
3,054,117	9/1962	Cella	4—115
3,067,433	12/1962	Dietz et al.	4—115X
3,070,810	1/1963	Jones	4—114
3,289,214	12/1966	Corliss	4—115
3,418,664	12/1968	Carmichael et al.	4—115
3,435,464	4/1969	Harding	4—116X

FOREIGN PATENTS

1,433,276	2/1966	France	4—115
379,426	3/1940	Italy	4—115

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PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,570,018 Dated March 16, 1971

Inventor(s) Ronald J. Sargent, Charles L. Sargent and Frank T. Sargent

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 22, "provide" should be - - provides - - .
Column 3, line 74, "52" should be - - 50 - - .
Column 5, Claim 1, line 58, "and" should be - - in - - .
Column 5, Claim 1, line 64 "normally" should be deleted.
Column 6, line 32, Claim 7, "normally" should be deleted.
Column 6, line 39, Claim 8, "normally" should be deleted.
Column 7, line 15, Claim 16, "normally" should be deleted.
Column 8, line 7, Claim 20, "normally" should be deleted.

Signed and sealed this 6th day of June 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents