Feb. 13, 1962 E. B. BLANKENSHIP ETAL 3,020,559

INCINERATOR TOILET

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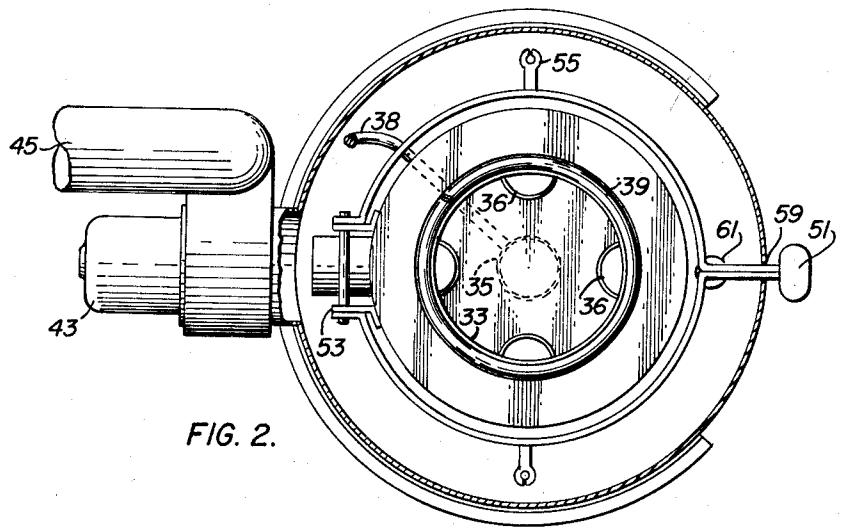


FIG. 2.

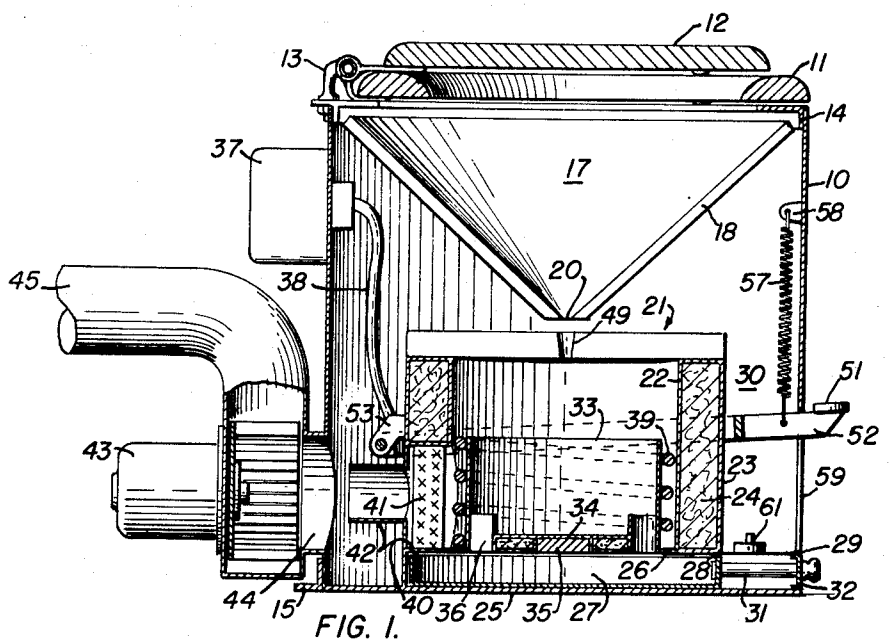


FIG. 1.

ERNEST B. BLANKENSHIP
HARRY A. BOWERS
INVENTORS

BY Herbert J. Brown

ATTORNEY

Feb. 13, 1962 E. B. BLANKENSHIP ETAL 3,020,559

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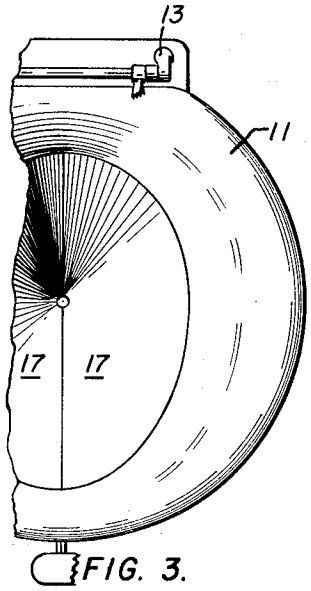


FIG. 3.

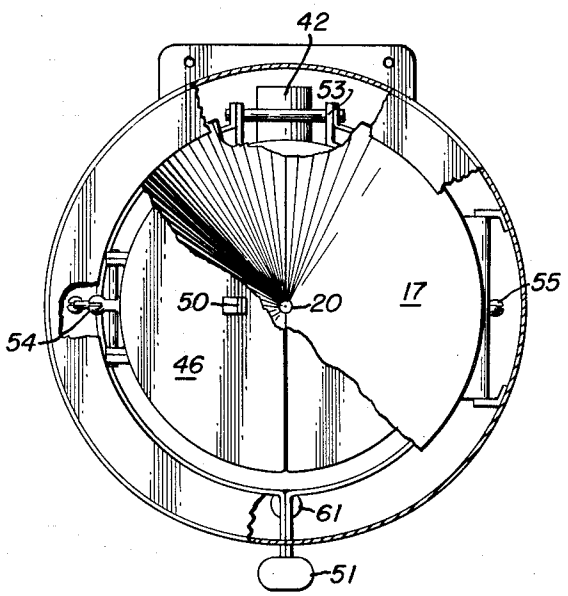


FIG. 4.

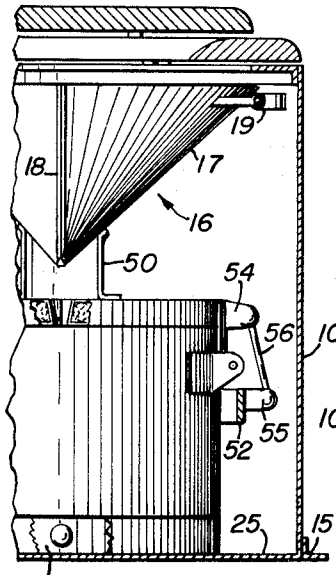


FIG. 5.

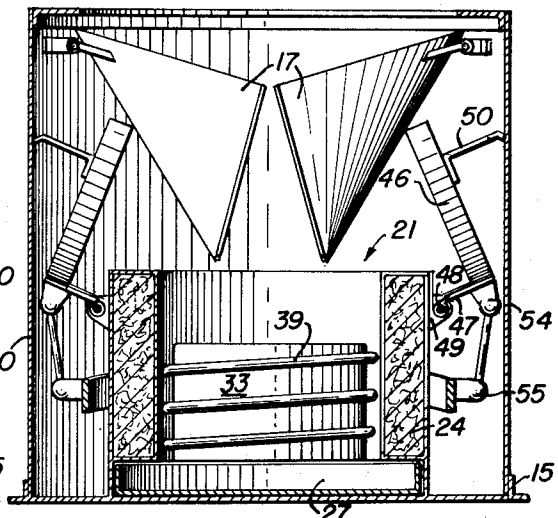


FIG. 6.



FIG. 7.

ERNEST B. BLANKENSHIP
HARRY A. BOWERS
INVENTORS

BY Herbert J. Brown
ATTORNEY

Feb. 13, 1962 E. B. BLANKENSHIP ETAL 3,020,559

INCINERATOR TOILET

Filed Jan. 5, 1959 3 Sheets-Sheet 3

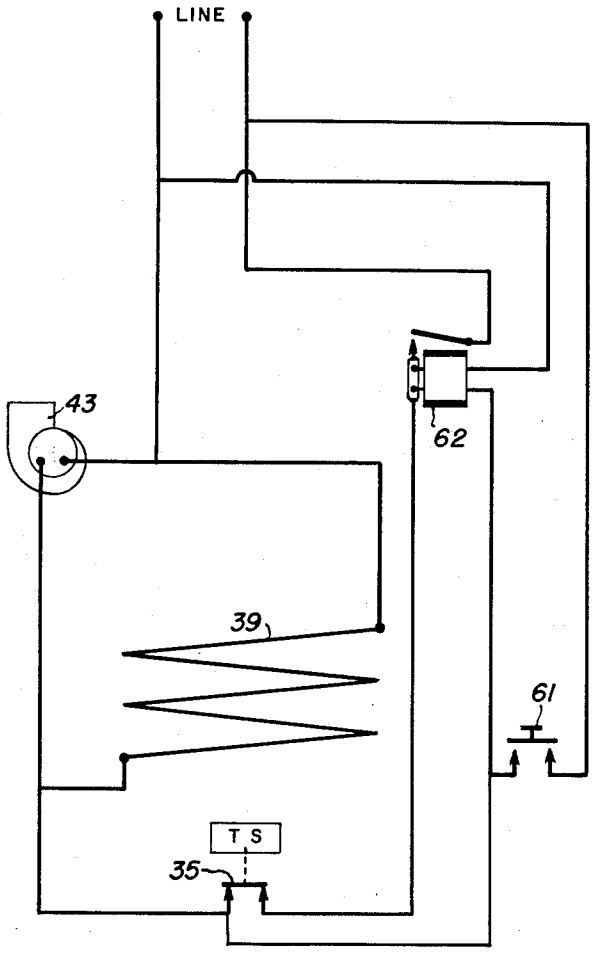


FIG. 8.

ERNEST B. BLANKENSHIP
HARRY A. BOWERS
INVENTOR

BY Herbert J. Brown
ATTORNEY

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INCINERATOR TOILET

Ernest Bayne Blankenship and Harry A. Bowers, Dallas, Tex., assignors to Research Products Manufacturing Company, Dallas, Tex., a corporation of Texas

Filed Jan. 5, 1959, Ser. No. 785,081
4 Claims. (Cl. 4—131)

This invention relates to incinerator type toilets for use in locations where water supplies are limited, such as on railroad trains, airplanes and buses, on farms or camp sites, or at other places where sewer connections are impossible or impractical.

An object of the invention is to provide an incinerator for the described purpose which is efficient yet relatively cool around its outer surface.

Another object is to provide an incinerator for receiving body wastes and in which the incinerator chamber remains clean and free of corrosion by reason of waste matter not touching the walls thereof.

A further object of the invention is to provide an improved smoke and odor reducer, yet one which does not materially impair the efficiency of the incinerator operation.

A further object of the invention is to locate a metal catalyst type odor reducer in such a manner that heat from the incinerator enhances the efficiency of the reducer.

A further object of the invention is to provide an improved bowl construction of the hinged type and wherein the connecting edges are liquid tight.

A further object is to provide an incinerator for the described purpose wherein both liquid and solid waste matter are accommodated, yet requiring relatively few servicing operations for removing resulting ash.

A particular object of the invention is to provide an incinerator wherein the cycle of operation is determined by reducing waste matter to ashes.

These and other objects will become apparent from the following description and the accompanying drawing, wherein:

FIGURE 1 is a vertical sectional view, parts of which are illustrated in broken elevation, of an incinerator embodying the features of the invention.

FIGURE 2 is a transverse sectional view taken below the hinged bowl and along the top of the incinerator chamber.

FIGURE 3 is a broken plan view showing the seat and bowl.

FIGURE 4 is a broken plan and sectional view illustrating the bowl and hinged incinerator chamber cover.

FIGURE 5 is a broken vertical sectional view showing the bowl and incinerator chamber in their closed positions.

FIGURE 6 is a view similar to FIGURE 5 but showing the bowl and incinerator chamber covers in their open positions.

FIGURE 7 is a perspective view of a conical liner of paper or the like which may be employed in the bowl, and

FIGURE 8 is a wiring diagram of a circuit for operating the invention.

The exemplary form of the invention shown in the drawings includes a vertical cylindrical body **10** of sheet metal open at its upper end and having a toilet seat **11**, lid **12** and conventional hinge **13** therefor. A circular reinforcing flange **14** is secured inside of the upper end of the body **10**, and a similar but external circular flange **15** is provided around a portion of the bottom of the body. The bowl **16** is of sheet metal and is in the form of a depending cone which is divided vertically into halves **17**, the adjoining edges of which are outwardly flanged, as at **18**, and as will become apparent, have to do with providing a liquid tight seal. The bowl halves **17** are connected at their upper outer surfaces, intermediate their flanges **18**, with the upper inner surface of the body **10** by means of hinges **19**. Semicircular orifices at apexes of the halves **17** provide a drain hole **20** when the bowl **16** is in its closed position.

The incinerator unit **21** is centrally located beneath the bowl **16** and includes a vertical cylindrical housing of inner and outer walls **22** and **23** and has insulating material **24**, such as fiber glass, therebetween. The outer wall **22** rests on the floor **25** of the body **10**, whereas the bottom **26** of the unit **21** is spaced thereabove to accommodate a removable ash pan **27**. The lower front and side portions of the outer wall **23** have an opening **28** through which the pan **27** slides; similarly, there is another opening **29** in the lower front of the body **10** for the same purpose. The diameter of the incinerator unit **21** is less than the diameter of the body **10** to provide an air space **30** which, as will become apparent, has to do with cooling and venting, but to span this space there is a handle extension **31** on the front of the pan **27**, the outer end of which extension is provided with a rigidly mounted arcuate plate **32** for closing the outer opening **29** when the pan is fully received in the unit.

Within the unit **21**, and supported on the bottom **26**, there is a vertical cylindrical metal receptacle **33** spaced from the unit inner wall **22**, and which receptacle has a raised bottom **34** to accommodate a thermostat, schematically illustrated at **35**. Vertical half-tubes **36** extend above and below the receptacle bottom **34** and open into the removable pan **27**. The half-tubes **36** are located at opposite sides of the bottom **34** and provide an arrangement whereby overflow of accumulated ash will fall into the pan **27**, but will retain liquids until the latter have evaporated. The thermostat **35** is electrically connected with a relay box **37** on the outside of the body **10** by a cable lead **38**. A coiled heating element **39** is positioned around the receptacle **33**.

Within the lower rear portion of the wall of the incinerator unit **21** there is an opening **40** in which is mounted a catalytic odor reducer **41** (such as manufactured by Oxycat, Inc. of Wayne, Pa.) and which odor reducer is ordinarily heated by electrical means. However, since the odor reducer is positioned relatively close to the heating element **39**, no additional heat input by electrical means is required. A short horizontal vent tube **42** on the rear of the unit **21**, and extending into the annular air space **30**, provides means for expelling smoke and fumes from the unit when acted on by a suction fan **43** mounted over an opening **44** in the body **10** opposite said tube. The suction fan **43** includes a discharge duct **45**.

The incinerator unit **21** has semicircular covers **46** and depending arms **47** on the sides thereof, the lower ends of which arms are pivotally connected with the unit by horizontal pins **48** through ears **49** on opposite sides of the outer unit wall **23**. When in their closed position, adjoining semiconical recesses in the abutting edges of the covers **46** provide a funnel shaped opening **49** beneath the bowl drain hole **20**. The axes of the pins **48** are parallel with the axes of the bowl hinges **19** and whereby upstanding springs **50** on the upper surfaces of the covers contacting the outer surfaces of the bowl halves **17** will close the bowl **16** when the covers are in their closed position, or permit the bowl halves to fall open when the covers are opened. It is to be noted, when in closed position, the springs **50** cause the bowl flanges **18** to fit tightly against each other.

The incinerator covers **46** are opened and closed by means of a foot pedal **51** on the front of the body **10**, and which pedal is mounted on a divided circular lever **52** positioned around the unit **21** and mounted on a horizon-

tal hinge 53 on the rear thereof. Projections 54 on the upper ends of the cover arms 47 are pivotally connected with similar projections 55 on the sides of the lever 52 by connecting links 56. The forward portion of the lever 52 is normally supported in its raised position by a spring 57 attached thereto and connected with an ear 58 on the upper inner surface of the body 10. As shown in FIGURE 1, there is a vertical slot 59 in the body 10 to accommodate the movement of the lever.

In operation, a conical liner 60 of combustible material such as paper may be placed in the bowl, or such liner may be eliminated by coating the bowl inner surface with an anti-adhesive substance, not shown, such as Teflon, manufactured by E. I. du Pont de Nemours and Company of Wilmington, Delaware. The liner 60 may or may not have a small drain hole in the bottom thereof.

In order to empty the contents of the bowl 16 into the incinerator unit 21, the user merely steps on the foot pedal 50, causing the covers 46 to open and which action releases the halves 17 of the bowl. Continued downward movement of the foot pedal closes a normally open switch 61 (FIGURE 8) which, in turn, closes a holding switch 62 connected in series with the normally closed thermoswitch 35 and the heating element 39. Since the fan 43 is connected in parallel with the element 39 these parts operate at the same time. The fan 43 draws air from the air space 30, and by reason of the short horizontal tube 42 a lesser amount of smoke and vapors are drawn from the incinerator 21. It is to be noted that these vapors pass over the deodorizer 41 as they are expelled from the incinerator. When solids in the bottom of the receptacle 33 have been reduced to an ash the thermoswitch 35 opens and de-energies the heating element 39 and fan 43, and the entire unit is again ready for another cycle. It is pointed out that liquids may drain through the holes 20 and 49 without electrically energizing the toilet. Such liquids are evaporated on the next use, and accumulated ash falls through the half tube openings 36 into the pan 27.

The invention is not limited to the exemplary construction herein shown and described but may be varied within the scope of the appended claims.

What is claimed is:

1. In a waterless toilet including an electrically actuated incinerator therein, a vertical hollow body, a vertically disposed incinerator unit, smaller in height and distance across than said body and positioned within said body at the base thereof and interiorly spaced from the walls of said body, a thermo switch within said incinerator unit near the base thereof, heating means at the walls of said incinerator unit, a suction fan positioned exteriorly of said body, means communicating the intake of said suction fan with the interior of said body, a vent tube opposite said intake of said fan communicating the interior of said incinerator unit with the interior of said body, and means electrically connecting said thermo switch with said heating means and said suction fan for de-energizing said heating means and said suction fan when said thermo switch is subjected to a temperature above a preset level.

2. In a waterless toilet, a vertical hollow body having an opening at the top thereof, a hollow incinerator within the bottom of said body and also open at the top thereof, insulation material within the inner wall of said incinerator, the outer wall of said incinerator being spaced from the inner wall of said body providing an air space therearound, an opening in the wall of said incinerator, an opening in said body opposite said opening in said incinerator, said opening in said body being in communication with both said incinerator and said air space, a coiled radiant heater inwardly of and adjacent said insulation and means actuating said heater.

3. In a waterless toilet as defined in claim 2, the construction wherein said opening in said body includes electrically actuated forced draft means discharging gas from both said incinerator and said air space, and switch means operating both said means actuating said heater and said forced drafts means simultaneously, at least during a portion of the sequence of operation of said waterless toilet.

4. In a waterless toilet as defined in claim 2, and including a heat actuated catalyst in the path of discharged gas from said incinerator, said catalyst being sufficiently close to said heater so as to actuate said catalyst.

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