Nov. 12, 1963 E. M. FRICK ETAL 3,110,037

WATERLESS TOILET

Filed April 6, 1961

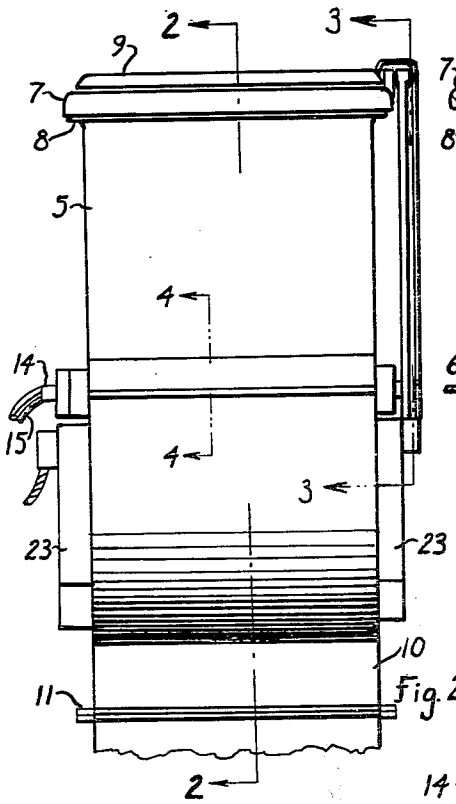


Fig. 2

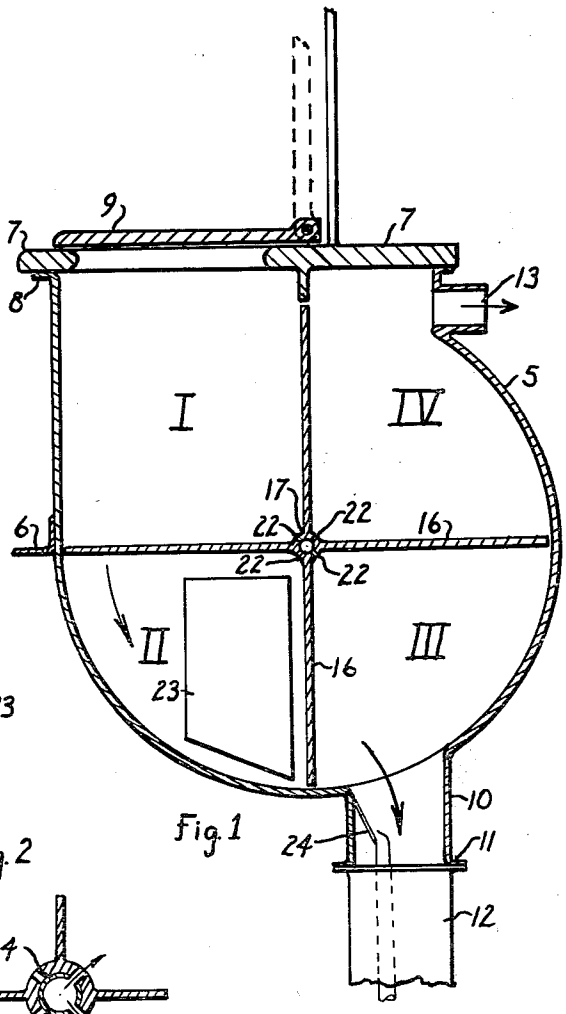


Fig. 1

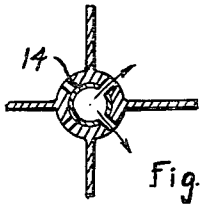


Fig. 4

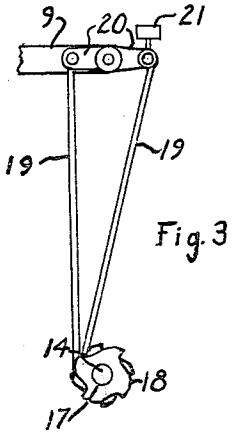


Fig. 3

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WATERLESS TOILET

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This invention relates to waterless toilets and specifically concerns a toilet which has mechanical flushing and incinerating means as well as deodorizing ventilation.

In many places such as airplanes, buses and in desert locations where a sufficient amount of water is not available for the use of a common water closet a waterless toilet would be desirable. In airplanes, particularly where any added weight due to water is highly undesirable and cannot be tolerated, this would be of utmost importance. Airplanes, heretofore, have been using incredibly old-fashioned methods which have caused great inconvenience and unpleasantness to the travelling public and cause difficulties in serving at airports. This invention eliminates these difficulties by providing a toilet of simple construction which has mechanical and air flushing, which incinerates and evaporates all liquid and reduces the remainder to ashes, thereby almost entirely eliminating the weight. This toilet, furthermore, is much more sanitary than those now in use in airplanes and buses and can easily be cleaned from time to time.

An important object of our invention is to provide a toilet which does not require water for flushing.

Another important object of our invention is to provide a toilet which will incinerate all organic matter, evaporate all liquids and thus be disinfecting.

Another object of our invention is to provide a toilet of exceptionally light construction and having automatic deodorizing ventilation to eliminate all unpleasant odors.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming part of this specification, and in which like numerals are employed to designate like parts throughout the same,

FIGURE 1 represents a section taken along the line 2—2 in FIGURE 2,

FIGURE 2 is a front elevation of a toilet embodying my invention,

FIGURE 3 is a partial section taken along the line 3—3 in FIGURE 2, and,

FIGURE 4 is a partial section taken along the line 4—4 in FIGURE 2.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of our invention, numeral 5 designates the outer housing which is of a semi-cylindrical shape as seen in FIGURE 2. The housing 5 has a flange 6 whereby the toilet may be mounted extending through a floor. The open top end of the housing 5 is covered by a deck 7 which is fastened on flange 8 and carries the usual hinged cover 9. The housing 5 has a large disposal duct 10 at the bottom extending the entire width of the housing 5. This duct 10 has a flange 11 to which may be fastened a second duct 12 leaning to a removable ash container. At this point may also be connected a separate device for draining off and evaporating the liquid. The housing 5 furthermore has a second ventilating opening 13 which may be connected to a flexible hose to the outside.

A stationary shaft 14 penetrates the cylindrical part of the housing 5 at its center. The shaft 14 is closed at one end and open at the other where it may be connected to an air hose 15 supplying ventilating air. A rotor having four radial vanes 16 is rotatable on the shaft 14. The center hub 17 of the rotor extends outside the housing 5 over the closed end of the shaft 14 and

carries two rachet wheels 18, see FIGURE 3. The rachet wheels 18 have four teeth which are operated by the push rods 19 the other end of which are fastened to one end of the levers 20 the other ends of which are fastened to the cover 9. The levers 20 are fastened to a shaft which is fastened to the cover 9 which extends beyond same to a pair of bearings mounted on the deck 7. The levers 20 also operate the limit switch 21 which is mounted under the cover 22 which covers the mechanism and which couples the cover 9 to the rotor 17. The rotor 17 furthermore has a number of radial holes 22, one row of such holes extends axially in each quadrant of the rotor 17. The space encompassed by the four vanes 16 are numbered with the Roman numerals I–IV for the purpose of facilitating illustration. The holes 22 in quadrants III and IV line up with similar holes in the stationary shaft.

A pair of heating elements 23 are mounted one on each side of the housing 5 in the quadrant II. These elements are preferably of the metal enclosed, flush surface type, similar to those used in electrical stoves. These elements are electrically heated and are controlled by the limit switch 21.

It is understood by anyone skilled in the art that the present device could equally well be constructed with the cylindrical housing having its axis in a vertical position. However, in this case it would take more space and would not be as efficient as the species illustrated in the present drawings. It is equally obvious that instead of electric incineration means it would be possible to utilize hot exhaust gases from airplane or bus motors and in deserts and other dry locations where neither electricity nor hot gases are available one may use oil or gas fired means for the same purpose.

The operation of our invention is as follows:

The cover 9 being normally closed will, when opened, turn levers 20 which are coupled by means of push rods 19, to the rachet wheels 18. This motion will lift one of the push rods 19 to the next notch of the rachet wheel 18 at the same time as the other rod 19 advances the rotor one step. After the use of the toilet the cover 9 is closed whereby the push rods 19 are moved and thus turn the rachet wheel 18 and the attached rotor 17 ninety degrees. At the same time the limit switch 21, through a suitable relay, closed the electric circuit to the heating elements 23. The turning of the rotor 17 has now brought the organic matter from quadrant I into the quadrant II between the two heating elements 23. These heating elements will quickly incinerate and destroy all organic matter and most of the liquid. If any liquid matter is left it may be caught in a trap 24 in the duct 10 and evaporated as mentioned above. A common thermostatic control, not shown, turns off the heating elements 23 after complete disintegration of all organic matter and the toilet is now ready for the next operation. At the next operation the rotor will again turn as before described and the ashes will be pushed into the duct 10 and will fall into a suitable container. Experience may show that it may be entirely satisfactory to drop these from airplanes, but the weight will be so minimal that the ashes may just as well be collected and removed in a clean container, easily handled. At the time of pushing the ashes into duct 10, air will escape continuously through the holes 22 and will blow the ashes into duct 10 as well as ventilate quadrant III. A similar ventilation is continuously carried on in quadrant IV by air escaping through holes 22. The air may be obtained from a small air scoop in the case of airplanes and buses, or may be supplied by an air blower in other places.

It is to be understood that the form of our invention, herewith shown and described, is to be taken as a pre-

ferred example of same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of our invention or the scope of the subjoined claim.

Having thus described our invention, we claim:

In a waterless toilet of the character described comprising semi-cylindrical housing, said housing having a horizontal deck with a hinged cover; air and waste removal ducts associated with said housing; a fixed hollow shaft having a plurality of spaced holes mounted in the center of said semi-cylindrical housing; a star-wheel shaped rotor mounted freely rotatable on said fixed shaft, said rotor having spaced holes in its center hub co-operating with said holes in said fixed hollow shaft whereby a supply of ventilating air is controlled; means coupling said wheel to said cover whereby said wheel will turn one step each time said cover is actuated, and controlled high temperature incinerating means mounted inside said housing and operated by means timed by said cover.

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