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Rassbach et al.

[11] **3,837,012**

[45] **Sept. 24, 1974**

[54] **INCINERATING TOILET**

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[73] Assignee: **Eliminex Technology Inc.,** Wheatridge, Calif.

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[52] **U.S. Cl.** ..... **4/131,** 110/9 R

[51] **Int. Cl.** **A47k 11/02**

[58] **Field of Search** ..... 4/131, 118, 10; 110/9 R, 110/9 E, 8 C

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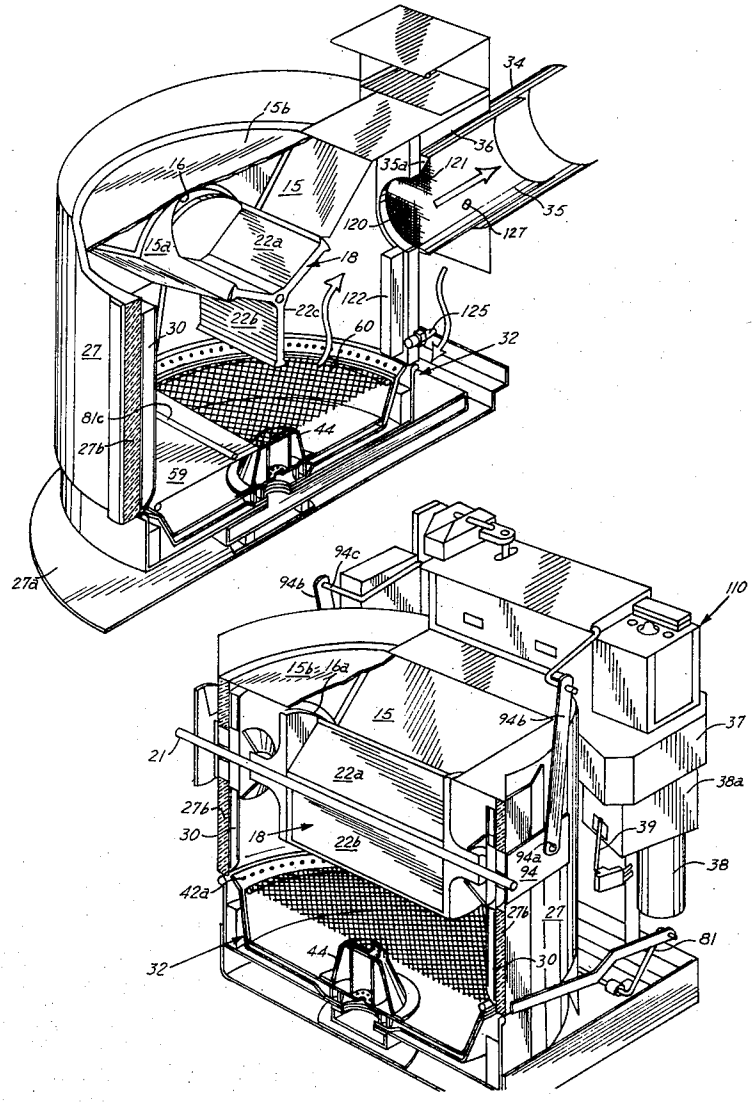
Primary Examiner—Henry K. Artis

Attorney, Agent, or Firm—Richard D. Law

[57] **ABSTRACT**

A container having a conventional toilet seat and cover, includes an inner rotating pan to catch waste, separate liquid, and after use to rotate to dump solid from the pan onto an incinerating hearth. The separated liquid flows into a jacket defining the firebox side wall for evaporating liquid during the incineration of the solids. The rotary pan is movable from a sealed position, which seals the fire chamber from the seat, to a rotating position spaced therefrom. Air is forced into the unit maintaining it under positive pressure and provide a positive circulation of air throughout the fire chamber. Solids are initially dried and incinerated on a solid hearth following one use cycle, and then are scraped onto a grill for open flame incineration following the next use cycle. Lifting and lowering the toilet seat activates the device.

20 Claims, 11 Drawing Figures



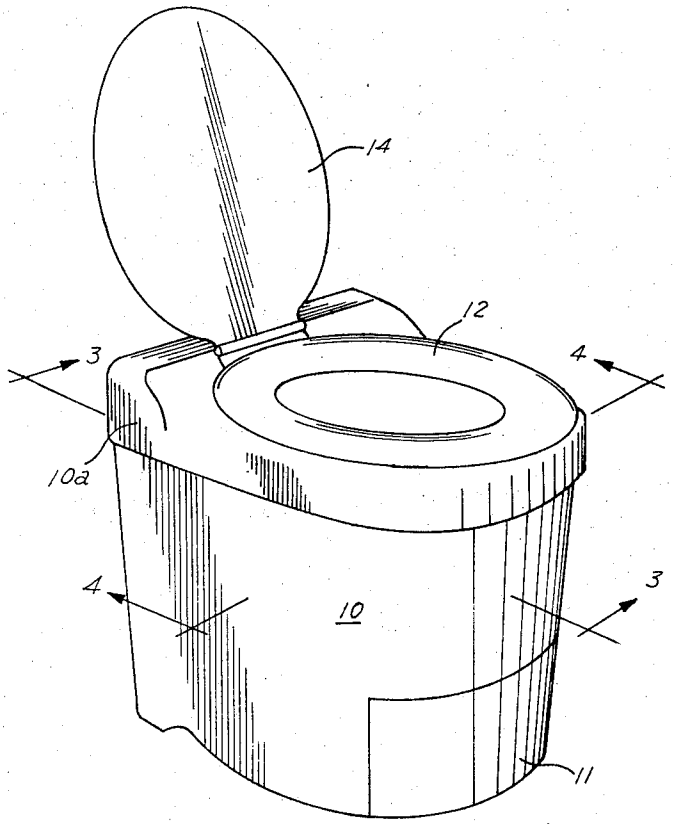


FIG. 1

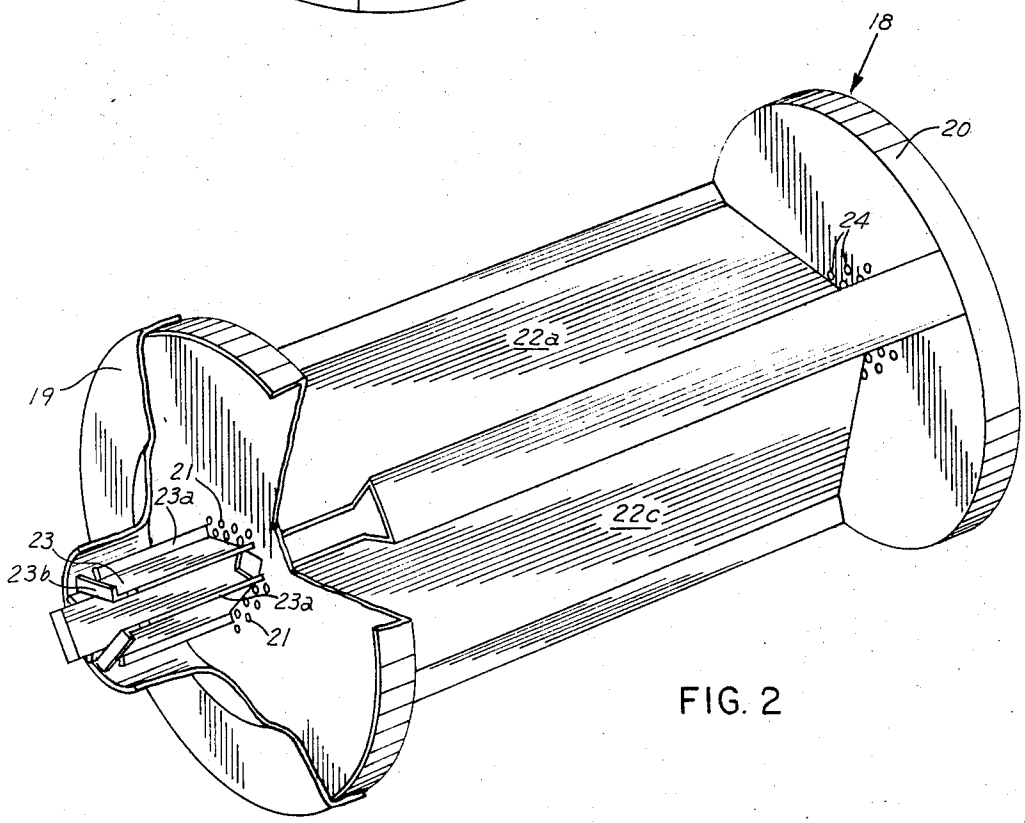


FIG. 2

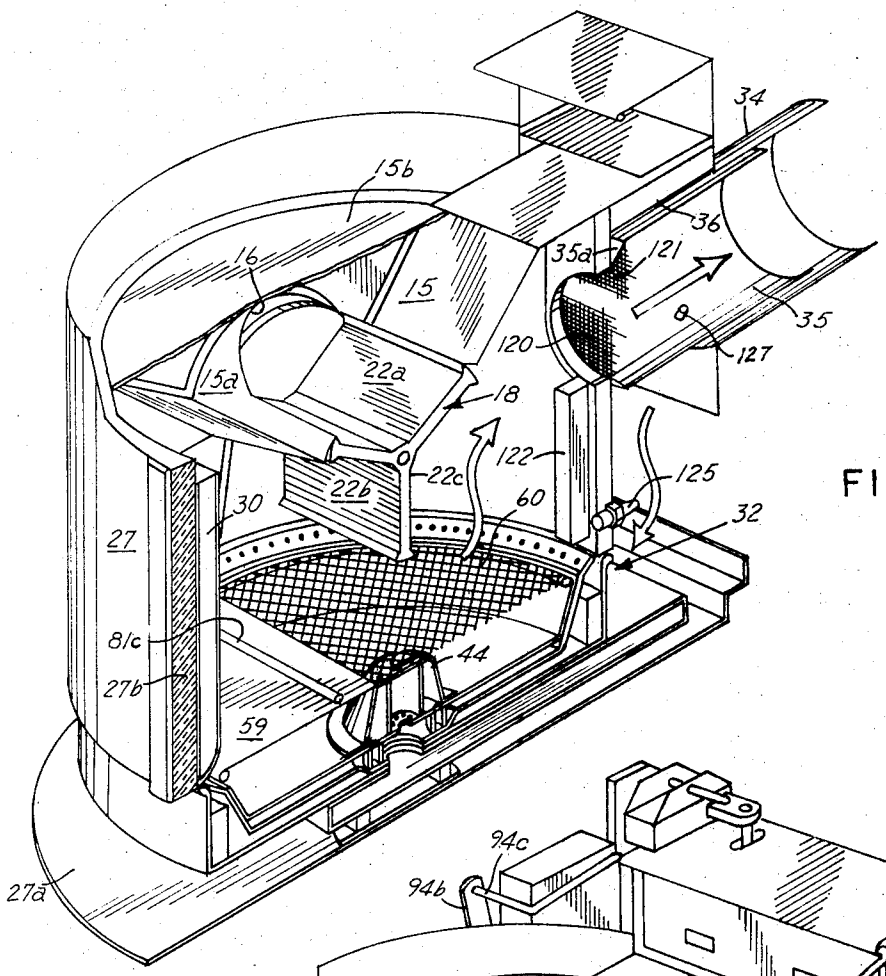

34
15b
36
16
35a
121
15
35
120
127
15a
22a
18
122
125
22c
22b
30
60
32
27
81c
44
27b
59
27a

FIG. 3

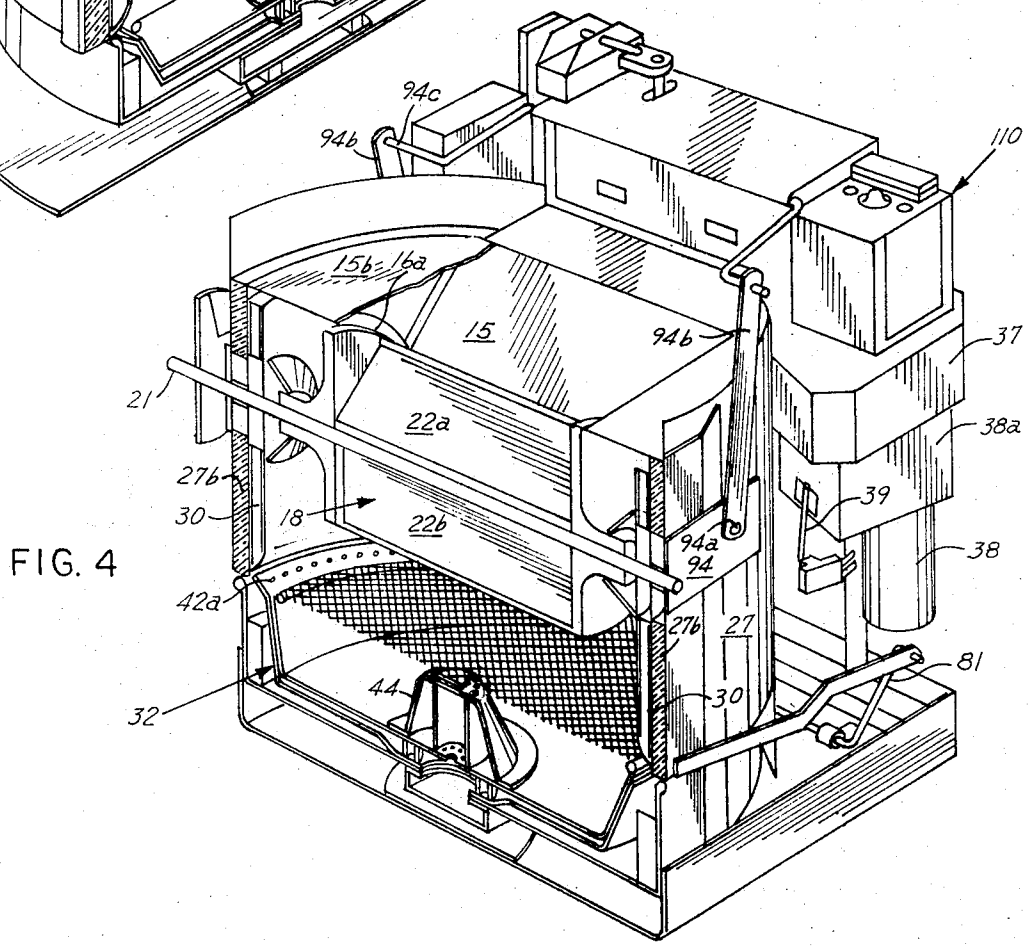

94c
94b
110
15b
16a
15
94b
37
21
22a
38a
27b
39
30
18
22b
94a
94
38
42a
27b
27
81
44
30
32

FIG. 4

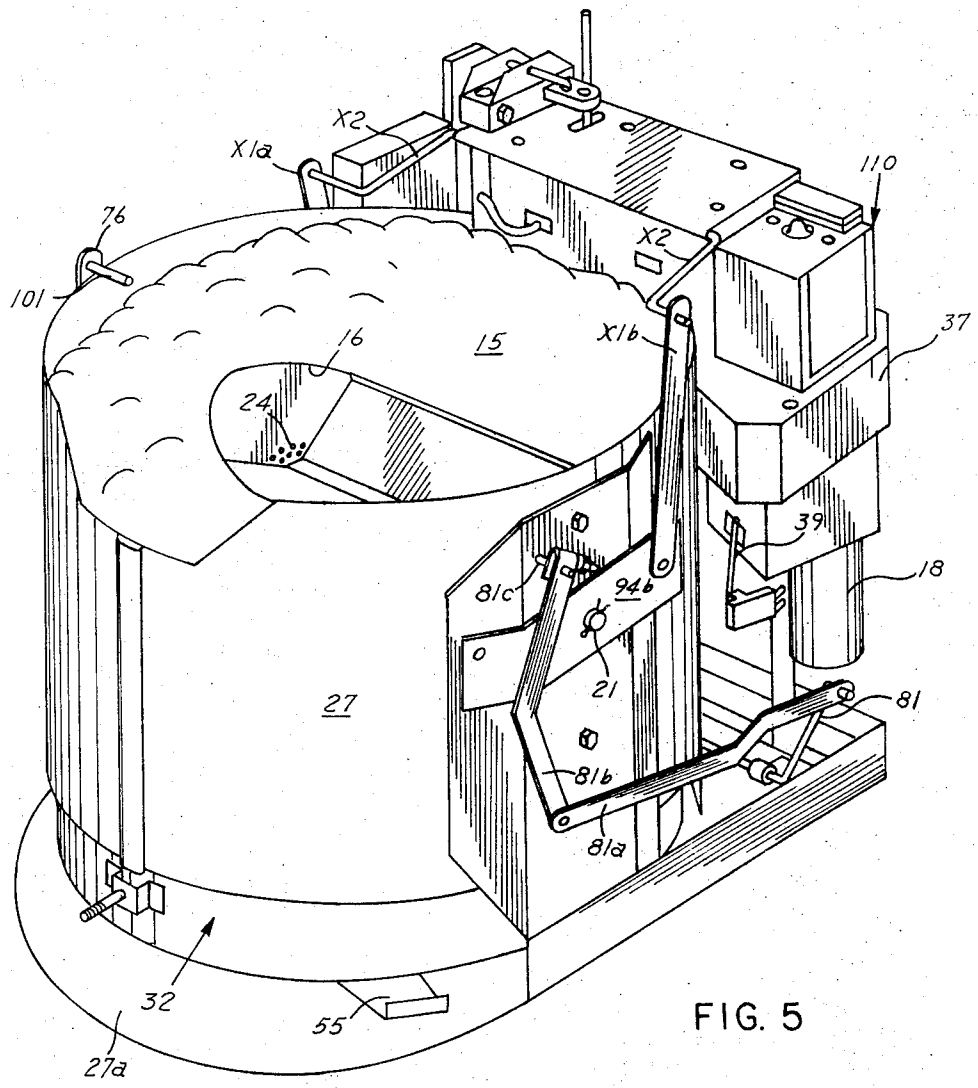

X2
X1a
110
76
X2
101
37
16
15
X1b
24
39
18
81c
94b
21
81
27
81b
81a
32
55
27a

FIG. 5

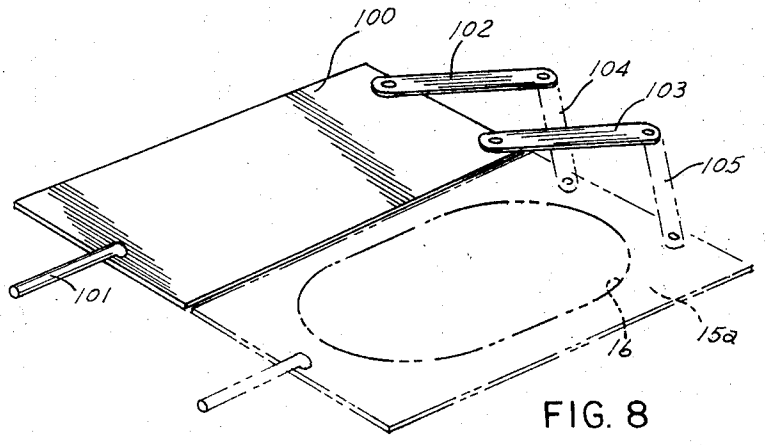
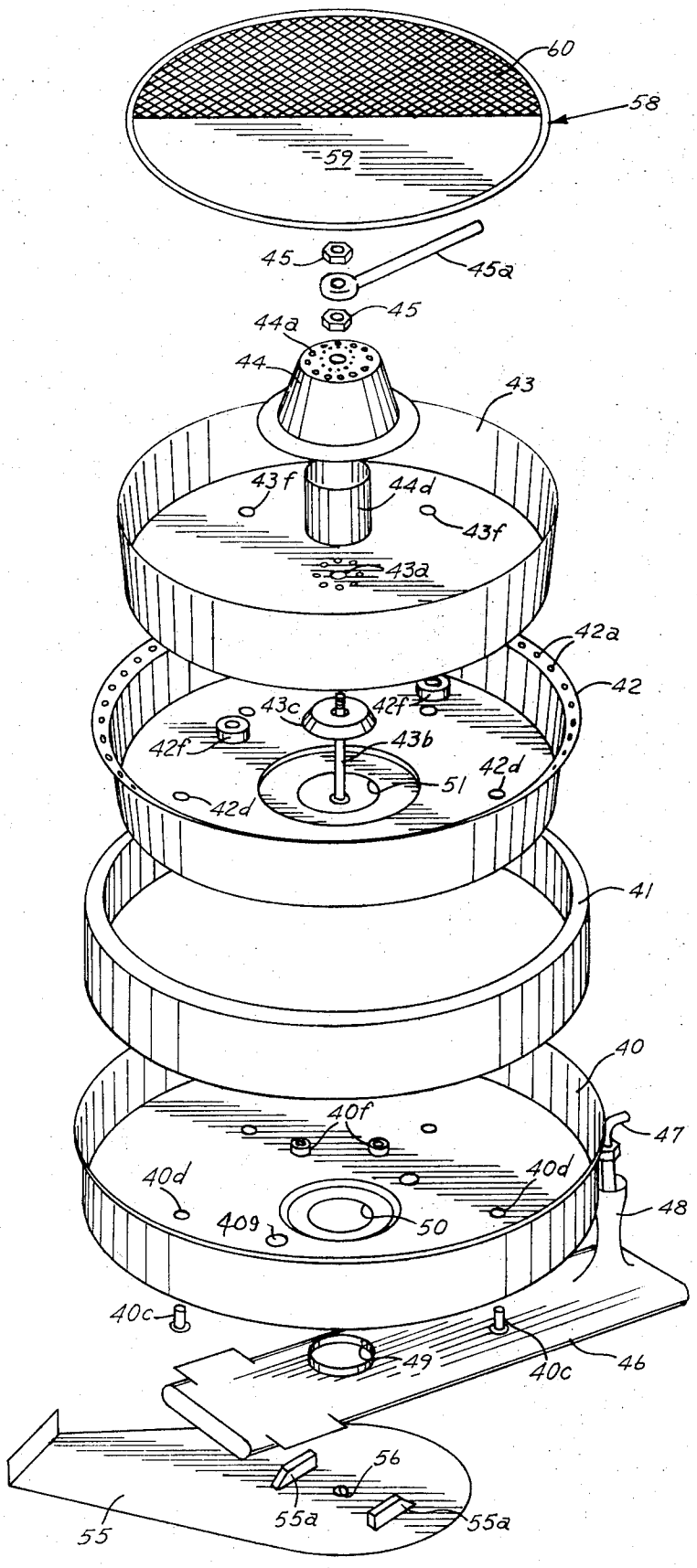

100
102
104
103
105
101
16
15a

FIG. 8

FIG. 6


60
58
59
45
45a
45
44a
44
43
43f
44d
43f
43a
42a
42
43c
42f
42f
43b
42d
51
42d
41
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40d
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48
40g
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40c
49
40c
46
56
55a
55a
55

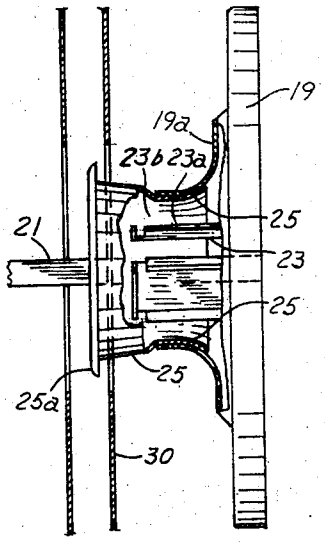

19
19a
23b
23a
25
23
25
25
25a
21
30

FIG. 9

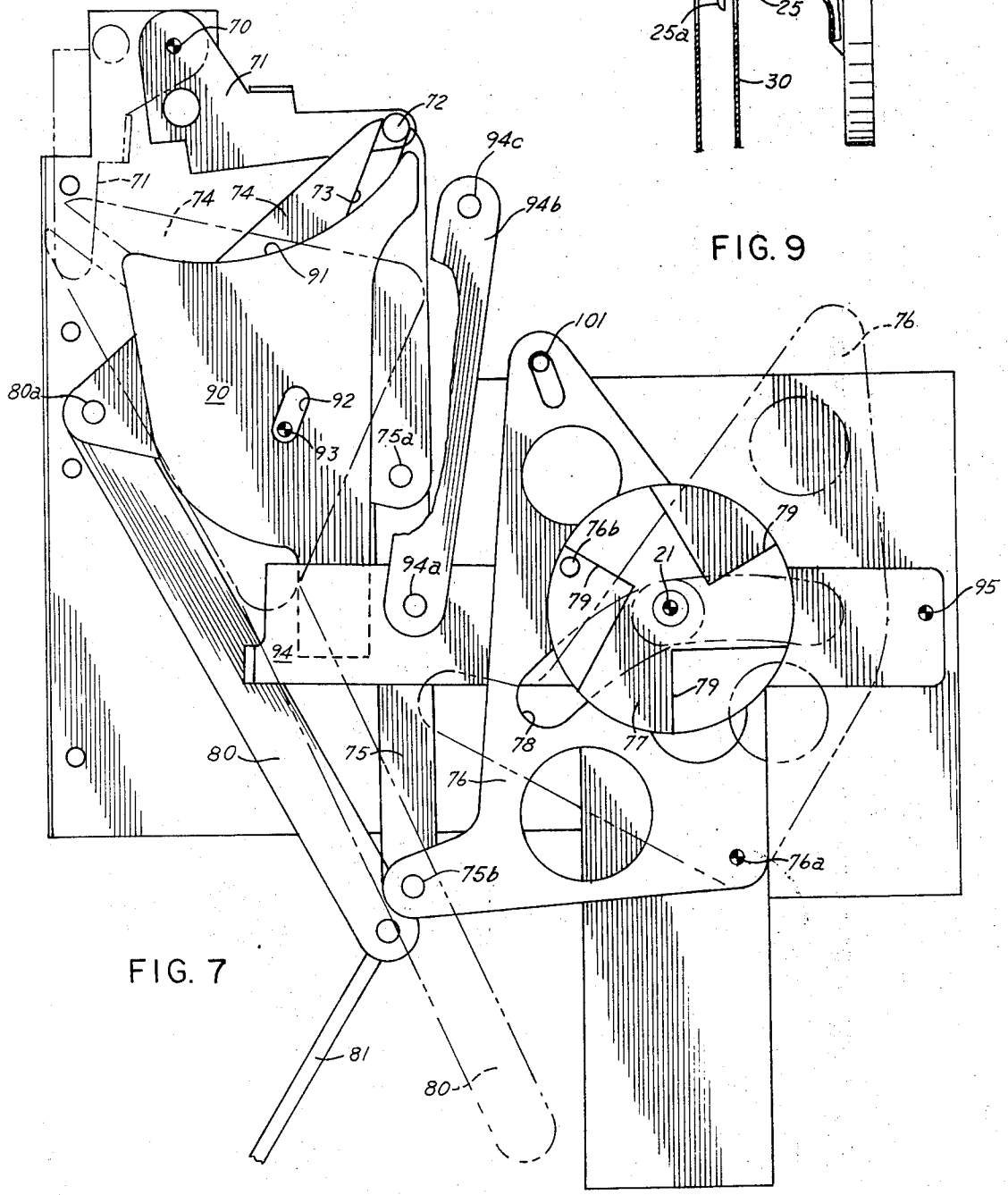

70
71
72
94c
71
74
74
73
94b
91
101
76
80a
90
92
93
75a
76b
79
21
94a
79
95
94
79
80
75
78
77
76
75b
76a
81
80

FIG. 7

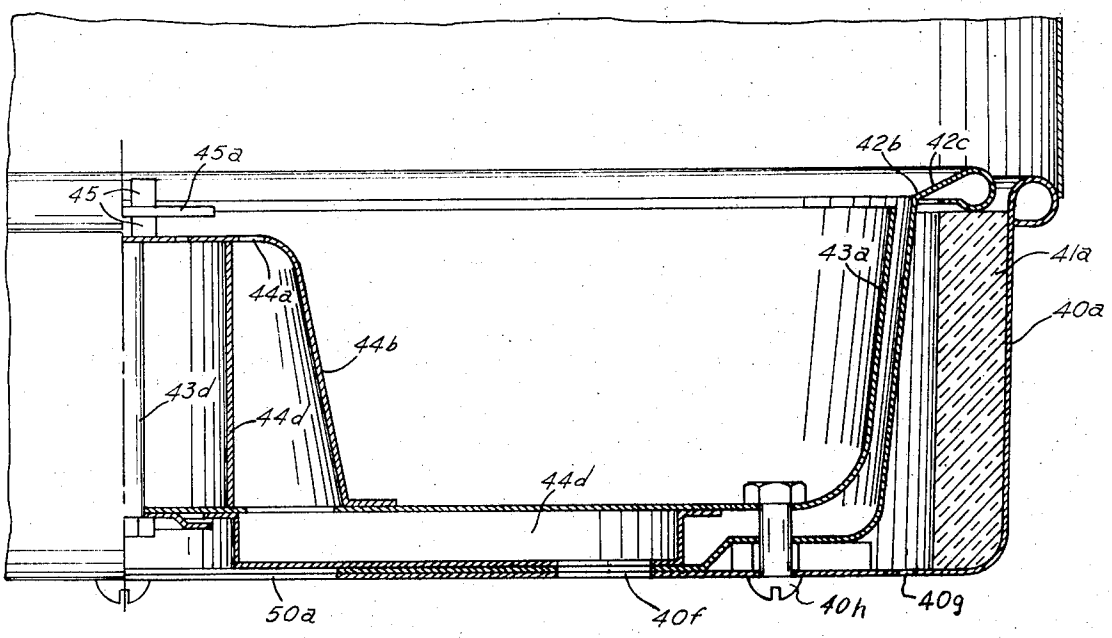

45a
45
42b
42c
43a
41a
40a
44a
44b
43d
44d
44d
50a
40f
40h
40g

FIG. 10

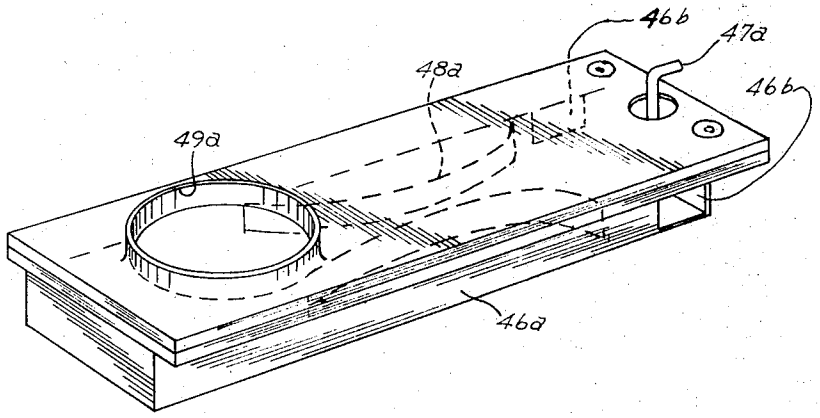

46b
47a
48a
46b
49a
46a

FIG. 11

INCINERATING TOILET

This invention relates to incinerating toilets which incinerate human waste after each use to eliminate such waste without odor or an accumulation. Preliminarily to incineration, there is an immediate separation of solids and liquids. The solids are incinerated separately while simultaneously the liquids are evaporated and dissolved solids, particularly organics, are vaporized into a gaseous discharge which is eliminated with the gases of combustion from the solids.

Pollution of water and land has greatly increased as human population itself has increased. One obnoxious source of water pollution is human waste, which is not only obnoxious, but is generally very unsanitary and capable of vast spreading of disease and the like. Conventionally in the United States, such waste is flushed with a large volume of water down a sewer for subsequent treatment. In some cases it is flushed directly into a body of water (streams, lakes, oceans, etc.). Sometimes the waste is passed through leeching fields before entering a water course, and in other instances it may de dumped into open pits, or the like. Many boats and ships discharge waste directly into the water. Trailers, campers and some boats having toilets use a holding take, which must be subsequently dumped into a sewage system. Such disposal of human waste is not satisfactory for the ecological preservation of water supplies of the world.

Numerous attempts to incinerate human waste appear in patent and other literature. These have been generally crude and rudimentary ideas on a complex problem, and such simple approaches have not proven commercially successful. Early attempts to provide incinerating toilets include ideas of the incineration of the combined solid and liquid waste. This not only requires an excessive amount of heat, but usually results in an obnoxious stack gas and incompletely incinerated solids. Further, such attempts have not been suitable for use in buildings due to the fire hazards both to the equipment and to users of the devices. Other attempts utilize a fire box separate from the toilet, which eliminates the possibility of portability of such units. Along with the problems of fire safety and portability are found problems of air tightness of the unit which will not release obnoxious odors into the area of the unit; a unit small enough to be useful for trailers, boats, etc., yet efficient enough to eliminate the quantity of human waste deposited into the unit; to provide a sufficient concentration of heat for fast, efficient incineration of solids; to provide a safety unit which utilizes external air for combustion, etc. The present invention provides a device which solves the problems set out above as well as others, and it provides a compact, efficient incinerating toilet.

Therefore, included among the objects and advantages of the present invention is an incinerating toilet which initially separates liquids and solids and then separately subjects them to incineration.

Another object of the invention is to provide an incinerating toilet utilizing a rotary pan which initially separates liquid and solid waste and then seals off the incinerating chamber for an incinerating cycle.

Still another object of the invention is to provide an incinerating toilet having a rotary pan for initially catching and separating waste, and which is movable from a sealed position to rotary position during a use cycle.

A further object of the invention is to provide an incinerating toilet having a two section incinerating grate for solids, whereby solids are initially dried and incinerated by indirect heat in one section and subsequently burned in an open flame in the other section.

A still further object of the invention is to provide an incinerating toilet having forced air circulation providing a positive pressure in the combustion chamber and providing external air for such combustion.

Yet another object of the invention is to provide an incinerating toilet having a combustion system controlled by the outlet gas temperature to prevent overheating of the unit and to control the use cycle.

Another object of the invention is to provide an incinerating toilet having a combustion cycle controlled by the temperature differential generated upon the evaporation and gaseous discharge of liquid waste materials.

These and other objects and advantages of the invention may be readily ascertained by referring to the following description and appended illustrations in which:

FIG. **1** is a generally schematic perspective view of a device according to the invention;

FIG. **2** is a cut-away perspective of one form of rotary pan useful for the incinerating toilet of FIG. **1**;

FIG. **3** is a perspective cut away view of the incinerating toilet of FIG. **1**, generally taken along the section lines **3—3**;

FIG. **4** is a perspective cut away view of the incinerating toilet of FIG. **1** taken generally along section lines **4—4** with the outer shell removed;

FIG. **5** is a perspective view of the mechanism with the outer shell removed;

FIG. **6** is an exploded view of one form of a burner assembly useful for the incinerating toilet of the invention;

FIG. **7** is a detailed view of one form of actuating mechanism of the invention;

FIG. **8** is a generally schematic view of one form of safety cover for an incinerating toilet according to the invention;

FIG. **9** is an enlarged detail view of one end of a rotary pan of the invention illustrating the liquid separating mechanism thereof;

FIG. **10** is a portion, cut away, of a modified burner assembly of the invention; and

FIG. **11** is a perspective view of a manifold for mixing air and gas for the flame of the burner.

In the device selected for illustration in FIG. **1** a shell or outer housing **10** is arranged to enclose an inner shell and operating mechanism. The shell encloses the incinerator in a neat appearing housing. The shell **10** supports a cover **10***a* to which is attached a toilet seat **12** with its cover or lid **14.** Access to an incinerating burner mechanism (described below) is provided through a lower front opening door **11,** which may be provided with a lock, handle, or the like, as is common with such drawer type containers. The housing and cover may be formed of metal or preferably resin impregnated glass fibers which produces a strong, light and molded unit. Furthermore, the shell may be made of colors to match or contrast with the surrounding area, and with the toilet seat, in accordance with the desires of the purchaser.

As illustrated in FIGS. 3 and 4, an inner housing 27 is mounted on a base 27*a*, and the shell 10 is arranged to fit over and enclose the inner housing 27 as well as the mechanisms attached thereto. A narrow annular space is left between the two shells as explained below. Mounted internally of the inner shell 27 is an insulating layer 27*b* which extends around the inside of the inner shell. An annular jacket 30 is arranged internally of the insulation, and the jacket 30 is arranged to accept and hold liquids for evaporation under influence of heat from the burner as described below. Extended across the shell 27, adjacent the upper end, is an inner closure member 15, which includes an elongated opening 16 in an arcuate portion 15*a*. A generally planar cover 15*b* mounts above and covers the inner closure 15, and it includes an opening 16*a* which coincides or registers with the opening 16 in the inner cover 15.

Mounted below the opening 16 is a three sectioned rotary pan, shown in general by numeral 18, which includes three sections 22*a*, 22*b* and 22*c* which are arranged in a general V-shape of about 120°. The rotary pan 18 is mounted on a shaft 21 which extends through opposed sides of the inner shell 27. Shown in FIG. 2, the pan includes ends 19 and 20, with the end 19 having perforations 21 communicating with each of the pans 22*a*, 22*b* and 22*c*. The opposite end has apertures 24 for discharging liquid from the pan. Each of the pans includes a flat area which extends into the hubs 19 and 20 of the pan, and these extensions 23 on end 19 (with similar extensions on end 20) form troughs including sidewalls 23*a* and an end wall 23*b*, with a space between the sidewalls and the end wall. Liquid draining from solids in the pan passes through the apertures 21*a* in the one end and 24 in the opposite end along the extension which forms the trough 23. Liquid from the trough flows into a cone 25 (FIG. 9) which includes a rolled back lip 25*a*. The lip is mounted internally of the jacket 30. With this arrangement liquid flows only into the jacket 30 and not along the shaft 21.

As shown in FIG. 5, insulation may be placed on top of the inner cover 15 to hold the heat in the fire box. The burner for the incineration is arranged at the lower end of the fire box, and preferably with a peripheral flame for heating the jacket and a central flame for incinerating solids. One form of burner is shown in FIG. 6, wherein an outer pan 40 is arranged to accept an inner insulating ring 41 mounted concentrically with the inner wall of the pan 41. An inner pan 42 is arranged to nest inside the insulation ring 41 and to be secured to the pan 41 by means of screws 40*c* which pass through openings 40*d* in the pan 40 and through the holes 42*d* in the pan 42. An inner pan 43 nests in the pan 42 and it is secured in place by means of a screw 43*b* which is held in opening 51 of the pan 42 by means of cup 43*c*. The pan 43 may have a corrugated wall or a corrugated sheet may be mounted between the two walls. An inner burning cone 44 is held on the bolt 43*b* by means of nuts 45. The cone 44 seats over an inner tube 44*d* which encompasses holes 43*a* in the pan 43. With the pans secured together, the assembly seats on the manifold assembly 46 which includes a gas jet 47 entering a venturi tube 48 and exhausting through the lipped outlet 49 which mates with the hole 50. The hold 51 of pan 42 mates with the hole 50 whereby some of the gas-air mixture diffuses outwardly in the space between the pan 43 and the pan 42 towards the openings 42*a*, while the remainder of the gas-air mixture passes through the holes 43*a*, through tube 44*d*, into the burner cone 44. The secondary air for burning the peripheral flame enters the lower pan 40 through openings 40*g*. For the central burner air enters by means of tubes 40*f* which exhaust into pan 42 through tubes 42*f* and subsequently into the burner cone 44 through openings 43*f* and out through openings 44*a*. This provides secondary air for both flame areas of the burner. The primary air and gas provides a burnable mixture in an annular flame around the periphery of the pan 43 and, also, for an inner flame from the burner cone 44. The pan 43 is preferably corrugated to provide outlets for the gas and primary air mixture adjacent to pan 42. A corrugated insert ring could be placed between the pans 43 and 42 to provide passage for the gas for the annular flame. Secondary air which enters the tubes under pressure from a fan, explained below, exhausts through the holes 42*a* adjacent the annular flame and also the holes 44*a* in the burner 44. This arrangement provides sufficient oxygen for efficient combustion of the gas mixture and to provide a high temperature of the burning gas.

Between the two upper nuts 45 is a washer and ignition tube assembly 45*a*. The hollow tube opens on and extends from the burner cone 44 to the outer peripheral flame adjacent the holes 42*a*, so that ignition of the annular flame provides ignition for the inner burner. This is similar to the tube from a pilot light on a gas stove to a burner.

A grate 58 completes the burner assembly. The grate includes a solid metallic section 59 and an open grill work 60. The grate is arranged to sit on the assembly spaced above the inner burner to permit gas to flame under the grate. The reasons for this grate construction are explained below.

With the burner parts of FIG. 6 assembled, it is maintained in position in the inner housing 27 by means of a cam lock lever 55 pivotally secured to the base 27*a* by means of a rivet 56. The burner assembly is moved into place through the opening behind door 11 into the bottom of the inner shell 27, and the cam lock plate 55 is rotated so that the cams 55*a* press the assembly upwardly into a lock position against the jacket 30, securing it in place.

A slightly modified burner assembly is shown in FIG. 10, wherein an outer pan 40*a* is provided with an insulating ring 41*a* and an inner pan 42*b* nests therein. Inner pan 42*b* is provided with openings 42*c* which correspond with the openings 42*a* of FIG. 6. These two pans are held together by means of bolts 40*h*. An inner pan 43*a* nests internally of the pan 42*b*. The upright wall of the pan 43*a* is corrugated to provide openings adjacent pan 42*b* for a gas-air mixture for burning adjacent to pan 42*b*. A burner cone 44*b* is held in place on pan 43*a* by means of a bolt 43*d* which is secured in place by means of nuts 45 which hold a washer and ignition tube assembly 45*a* therebetween (similar to FIG. 6). A spacer tube 44*d* permits a gas and air mixture to pass upwardly through burner holes in the top of the burner cone. Opening 50*a* in the pan 40*a* communicates with the manifold opening. An air passage for secondary air in the burner cone 44*b* is provided through a trough which exhausts into the space between the tube 44*d* and the burner cone 44*b*. Secondary air enters through an opening 40*f*, passes through the trough and out the openings 44*a* in the burner cone. Additional holes 40*cg* of the radial distance of holes 40*f* provide

secondary air for passing up between the pan **42***b* and the pan **40***a* exhausting through the openings **42***c* adjacent the peripheral flame. This assembly is seated on a manifold and it in turn is secured in place by means of the cam block arrangement of FIG. **6.**

A slightly modified manifold assembly is shown in FIG. **11,** wherein a manifold **46***a* includes a lipped opening **49***a* which is arranged to seat in the opening **50***a* of the pan **40***a* providing gas-air mixture for the burner. Gas enters the manifold by means of a line **47***a* and this passes through an internal venturi **48***a* which provides effective mixing of the entering gas and in through holes **46***b* in the manifold **46***a*. The mixing achieved by the internal venturi **48***a* provides a uniform mixture of gas passing into the burner for the two sections of flame.

As an additional safety measure, a cover may be provided which automatically opens when the lid is raised and closes when the lid of the toilet seat is closed for the burning cycle. As shown in FIG. **8,** a cover **100** is arranged to move in a parallel movement over the opening **16** registered with the rotary pan. The cover is moved in a parallel movement by means of links **102** and **103** connected to secondary links **104** and **105** which are attached to the frame. Actuating movement on pin **101** provides reciprocal movement of the cover, and the links **102** through **105** provide the parallel action. The top planar cover **15***b* provides still an additional safety measure in that it provides an air space above the inner cover **15.**

As explained above, actuation of the unit is achieved by raising and lowering the lid of the toilet seat. A series of linkages connected to the shaft of the lid rotates the pan to deposit solid material on the grate, actuate the rake for the grate, move the rotary pans downwardly for rotation and then upwardly into sealed position and to operate the cover of the opening **16.** An electric switch may be provided so that when the seat is closed a blower is operated providing exterior air to the unit, a gas valve is opened providing gas for incineration. Ignition of the gas-air mix is achieved by igniter means which preferably operates continuously during the burning cycle.

One form of the linkage mechanism for operating the various mechanisms is shown in FIG. **7,** wherein shaft **70** is affixed to the toilet lid **14** and rotates therewith. Mounted inside the housing or the outer shell **10** and supported on the inner shell is an L-shaped lever arm **71** having a pin **72** at one end spaced from the shaft **70.** The L-arm is affixed to the shaft **70** and rotates therewith. As the lid **14** is lowered the L-arm **71** pivots toward the left or clockwise. The cam pin **72** moves into a slot **73** in a triangular shape plate **74** which rotates on a pin **93** secured to the inner frame **27.** As the L-arm moves clockwise it moves the triangular shaped plate to its leftmost position shown in dashed lines **74.** Rotation of the plate **74** pushes the rod **80** downwardly to rotate the rake actuator rod **81** which extends along the base **27***a* to the opposite side. The actuator rod **81** (FIG. **5**) pushes a rod or link **81***a*, which has its counterpart on the opposite side of the incinerator. The link **81***b* is pinned to outwardly projecting ends of a U-shaped rake mechanism **81***c* which rests on the plate **59.** Forward movement of the rod **81** pushes the connecting link **81***a* and the link **81***b* rotating the rake so that it moves from the front of the plate **59** towards the grill **60** of the grate.

When the L-arm **71** is moved to its furtherest clockwise position on the plate **74,** cam **90** which is under spring tension, not shown, returns to its normal upward position as the pin **72** moves off the cam surface **91** freeing the plate **90** for its return journey. In this clockwise rotation of arm **71,** the pin **72** impinges upon the cam surface **91** on a cam **90** which is pivoted about pivot **93** in an elongated slot **92.** This provides a lost motion of cam **90.** As the pin **72** slides along the cam surface **91** it depresses the cam plate **90** which in turn depresses connected arm **94** which pivots about pivot **95** secured to the frame **27.** In one form, the plate **90** is welded to the arm **94** and the lost motion slot permits the unit to be depressed downwardly. The axle **21** supporting the rotary pans in the unit is mounted in opposing arms **94** on either side of the inner housing. Also, pivoted on the bar **94** is a connecting rod **94***b* having a counterpart **94***b* on the opposite side, forming a stabilizing unit. The upper ends of the two rods **94***b* are connected to a generally U-shaped stabilizing rod **94***c* to provide a parallel movement linkage for simultaneously moving both sides of the rotating pan downwardly to permit rotation thereof. The movement of the bars **94** breaks the contact of the pan **18** with the inner cover **15** and allows the pan **18** to be rotated.

A link bar **75** is pivotally connected by means of a pivot pin **75***a* to the triangular shaped plate **74.** The opposite end of this bar is pinned by means of a pin **75***b* to another plate **76** which pivots about pivot point **75***a*. Rotation of the plate **74** pulls up the link rod arm **75** which in turn pulls up the plate **76** to the position shown in dashed lines. A slot **78** in the plate **76** encompasses the axle **21** and permits movement of the axle upwardly and downwardly by arms **94** while the plate **76** moves thereon. A pin **76***b* secured to the plate **76** contacts a cam surface **79** on wheel **77.** The cam surface closest to the pin contacts the pin and movement of the plate **76** rotates wheel **77** and the attached pan **18** which is spring loaded, not shown, so as to turn the pan **18** 120° on each rotational movement.

Air is introduced into the unit through an inlet pipe **34,** which is preferably a 6-inch pipe. This exhausts into a plenium chamber **36** which connects with a blower intake **37,** shown in FIGS. **3** and **4.** The blower intake **37** is mounted on a blower housing **38***a* which is mounted above the blower motor **38.** Air from the blower **38***a* passes a sail switch **39** and enters the space between the inner housing **27** and the outer housing **10.** Some of the air is forced through the burner assembly as explained above, and the remainder is forced around and into the fire chamber above the burner assembly. Air and gases of combustion pass from the burning chamber, as shown in FIG. **3,** upwardly past the rotary pans and out an inner tube **35,** which is preferably a 4-inch tube. This dimensioning leaves an inch annulus for the intake of air. An adapter **35***a* conducts air from a smaller opening in the inner housing **27** to the pipe **35.** A finer screen **120** is placed in the smaller opening of the adapter and a coarser screen **121** is placed in the larger opening of the adapter **35***a* which is approximately the diameter of the outlet pipe **35.** The inner screen **120** catches fly ash, and the outer screen eliminates odors.

A channel **122** for gas from the burner **32** is arranged to exhaust in front of the screen **120** to insure that the screen is heated as soon as ignition takes place in the firebox. The inner screen should be fairly coarse, in the

20–60 mes range, for example, to collect fly ash which results from the combustion. The second screen **121** should be slightly finer, in the 80–120 mesh range, for example, which provides a heated screen for eliminating any odors that might escape the firebox. Gas-air mixtures from the outer burner pass through the tube **122** and are ignited in front of screen **120.**

Ignition of the gas and fuel mixture is achieved by means of a spark plug **125,** which is mounted adjacent the annular flame of the burner **32.** The spark plug may be made to spark through a coil, breaker point assembly, or the like, all of which are conventional ways of producing spark in a spark plug. The sparking of spark plug should be controlled by a switch, not shown, which operates during the entire burning cycle. A solenoid valve (not shown) controlling the gas flow is controlled by the sail switch. This switch is open holding the gas solenoid valve circuit open until it is closed by an air stream from the blower housing which then closes the circuit activating the solenoid valve to permit gas to enter the burner. A circuit assembly housing **110** mounted above the blower intake provides the electrical circuitry for the blower solenoid valve and the spark plug.

During a usage cycle the water pan, which initially collects the waste material, permits separation of the liquids from the solid material. The liquid material drains from the pan into the jacket **30** and the solids stay in the pan until it is rotated by lowering the lid of the toilet. The rotary pan is arranged above the burner so that the pan section which just dumped waste material is subjected to high heat during the incineration. The next movement moves that same pan section toward the outlet side and it is, also, subjected to high heat thereby providing an automatic, double cleaning cycle for each pan section. The solid material which is dumped by the rotation of the pan, falls on the solid plate **59** of the grill and the heat from the burner cone is utilized for drying the solid material and providing some incineration. Concurrently with the drying action the outer peripheral flame impinges on the inside of the jacket, causing evaporation of the liquid material in the collection jacket. As long as evaporation takes place in the jacket, the exhaust gas is relatively cool. When the liquid is completely evaporated, the remaining solids are heated and disintegrated. At the beginning of the next cycle the dried material is scraped onto the mesh and is subjected to open flame.

The air that is blown into the space between the outer case and the inner case provides a moving cool air insulation barrier for the unit prior to entering the combustion chamber. This air under pressure enters the burner chamber providing primary and secondary air for combustion with the net result that butane, LP, natural, etc. gas burns at a very high temperature within the unit for good incineration. As pointed out above, the combustion takes place in two modes, the first being a circular platter around and adjacent the bottom of a liquid evaporating jacket, and the second under the grate provides solids drying and incineration. The temperatures generated in the area of the grate are preferably in the 1,600°–1,700° F. range, which is sufficient to eliminate odors and provide rapid drying and combustion of solid waste material. As the hot gases and flames rise past the grate they must pass the previously used sections of the rotating pans which are exposed to the high temperatures. Each pan section is thus heat cleaned through two combustion cycles prior to its next use cycle. By placing a thermal switch in the exhaust duct, the combustion cycle may be accurately controlled. For example, during evaporation the stack gas is relatively cool but at the conclusion of liquids evaporation a rapid temperature rise is shown in the exhaust gas. A thermal detector switch would detect the rapid rise and this may be used to shut down the combustion cycle. Once the combustion cycle is completed the unit is then automatically cooled down, and using the exhaust thermal switch, the exhaust temperature gases may be used to indicate whether or not the next combustion cycle may be started.

As pointed out above, by using the sail switch, the combustion cycle may be made so that it will not commence unless the forced draft system has created an air flow and a positive pressure sufficient to create a forced draft through the combustion chamber. By using the exhaust gas temperature as a major safety control, a temperature of below 300° F., for example, may be used for commencing the next cycle. Once the stack gas is below that temperature, closing the lid starts the combustion cycle. The blower is activated and the gas solenoid valve may be subsequently made to open which permits gas to enter the combustion chamber. Providing the electrical energy to a sparking system it may be made to fire the gas-air mixture. For safety, the electrical spark emissions should continue as long as the gas-air mixture enters the burner. Under normal usage an exhaust temperature of about 700° F. at the outer thermocouple **127** may be reached in a matter of from 3 to 5 minutes. A short cooling period of from one to one and a half minutes under influence of the air flow from the blower cools the exhaust gases to below about 300° F., ready for the next use.

The rotary pan is pressed against the inner cover **15** for use and for combustion, forming a seal in the opening **16.** As pointed out above, the pan is rotated after every use. The mechanism momentarily lowers the bars **94** which support the axle of the pans, permitting free rotation of the pans. With the lid **14** in either up or down position, the pan is in sealed position.

Power for the unit may be provided by conventional 115 v. A.C. when the unit is installed in position to use household current. For a trailer, boat, and other portable mounting, it may be powered by 6 or 12 volt D.C. The power requirements are mainly for the blower, sparking for ignition, and the switch circuitry. The fuel supply may be natural gas or bottled gas for mobile units.

What is claimed is:

1. An incinerating toilet having an outer shell; an inner shell separated from said outer shell; a combustion chamber mounted in said inner shell including burner means at the bottom thereof; grate means mounted above said burner means; the wall of said combustion chamber being a hollow jacket for collecting and holding liquid and having upper vapor outlets; barrier means at the upper end of said combustion chamber having an opening therein; a waste catching and separating rotary pan mounted in the upper end of said combustion chamber below said barrier arranged to separate liquid waste on receipt and pass it in to said hollow jacket and to deposit solid waste on said grate on rotation of said rotor; said burner arranged at the bottom of said combustion chamber having peripheral flame means for heating said jacket and central flame

means for heating solid waste on said grate means; seat and lid means positioned above said barrier; and means connecting said lid to said rotary pan means for rotating the same after use.

2. An incinerating toilet according to claim **1** wherein said rotary pan includes three compartments.

3. An incinerating toilet according to claim **1** wherein said rotary pan seals against said barrier means for use and for incineration cycles.

4. An incinerating toilet according to claim **1** being further characterized by pressurized air inlet means exhausting into the space between said inner and outer shells providing a flowing stream of cool insulating air.

5. An incinerating toilet according to claim **1** wherein hot gases of combustion heat cleans the portion of said rotary pan exposed to said combustion chamber.

6. An incinerating toilet according to claim **1** wherein hot gases exhaust through an outlet from said combustion chamber, and at least one screen is mounted in said exhaust outlet.

7. An incinerating toilet according to claim **6** wherein a pair of screens are mounted in said outlet.

8. An incinerating toilet according to claim **1** wherein said grate means is formed of a solid sheet portion and an open grid portion.

9. An incinerating toilet according to claim **8** being further characterized by scraper means moving from said solid grate section to said grid section.

10. An incinerating toilet according to claim **1** wherein said rotary pan includes liquid drain means whereby liquid is separated from solid waste immediately on being deposited on said pan.

11. In an incinerating toilet having a combustion chamber for incinerating waste separated from a toilet seat by a barrier, the improvement of a multiple compartment waste catching and separating rotor mounted below said barrier and having circular end walls and including three separated compartments, there being a series of openings in the end wall for each compartment permitting separation of liquid from solid therein; means for moving said rotor from a sealing position against said barrier; means for rotating said rotor to dump solid from said rotor and turn the used compartment into said combustion chamber when said rotor is spaced from said barrier; and means for moving said rotor into sealing position against said barrier after such rotation.

12. The improvement of claim **11** wherein said rotor includes three compartments.

13. The improvement of claim **12** wherein each compartment is insulated from the others by an air gap and solid insulation.

14. The improvement of claim **11** wherein said means for moving and for rotating said rotor is connected to the toilet seat, whereby lifting and lowering the seat activates said means.

15. The improvement of claim **11** wherein each compartment includes a generally flat bottom, extension means beyond said end walls for flowing liquid, and guide means on said extension means for guiding flowing liquid.

16. In an incinerating toilet having a combustion chamber for burning waste disposed below a waste catching rotor; the improvement of means associated with said rotor for separating solid waste from liquid waste as they are deposited in said rotor; means inclusive of drainage means from said rotor and chamber means circumscribing the combination chamber for separately storing and evaporating liquid waste; grate means in the combination chamber to receive solid waste from the rotor; and means for separately subjecting liquid waste in said circumscribing chamber and solid waste on said grate means to the incinerating heat produced in the combustion chamber.

17. The improvement of claim **16** wherein said circumscribing chamber means for separately storing liquid and evaporating waste includes an annular container around said combustion chamber, the inner wall of said chamber being thin and defining the inner wall of the combustion chamber and providing a major thermal barrier for the combustion chamber.

18. The improvement of claim **16** wherein said means for separately subjecting liquid waste and solid waste to incinerating heat includes burner means having peripheral flame means adjacent to said means for separately storing liquid waste and central flame means.

19. The improvement of claim **18** wherein said burner means includes annular passage means for introducing second air under pressure for combustion into the flame issuing therefrom and providing cooling of said burner means.

20. An incinerating toilet as defined in claim **1**, the further improvement of air inlet means for said combustion chamber, and exhaust gas outlet means for said combustion chamber, blower means in said inlet means for introducing air under pressure into said combustion chamber, and temperature detector means in said outlet means for controlling a combustion cycle in said toilet.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3837012 Dated September 24, 1974

Inventor(s) Volker Rassbach, Clyde W. LaGrone

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

Item [73] Assignee: Eliminex Technology Inc., Wheatridge, Calif.

should read: Eliminex Technology Inc., Wheatridge, Colorado

Signed and sealed this 3rd day of December 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

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