July 11, 1961 R. J. SCHUYLER 2,991,947

GARBAGE EMULSIFIER AND DISPOSAL

Filed Jan. 9, 1959 4 Sheets-Sheet 1

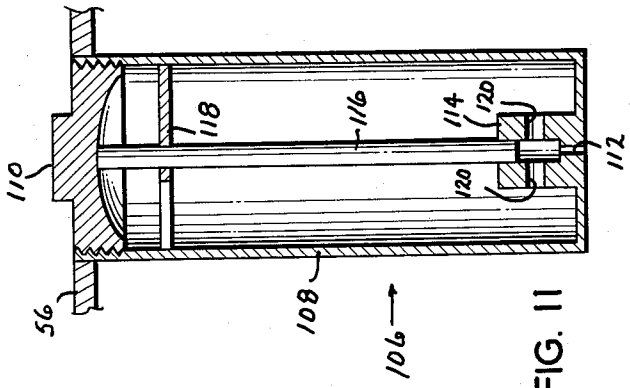


FIG. II

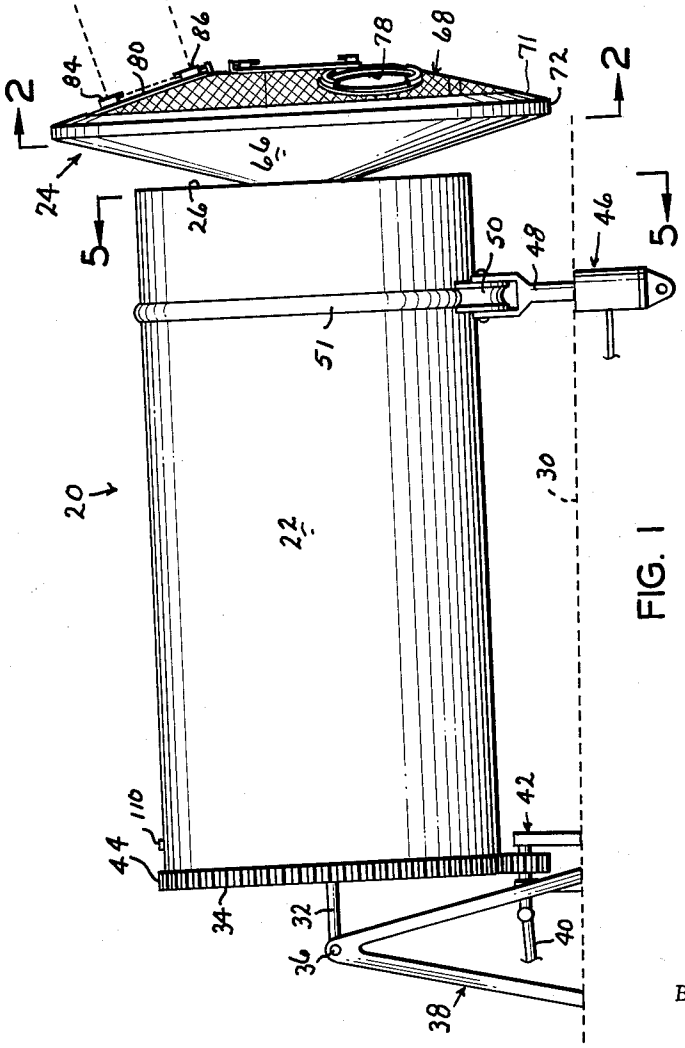


FIG. I

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GARBAGE EMULSIFIER AND DISPOSAL

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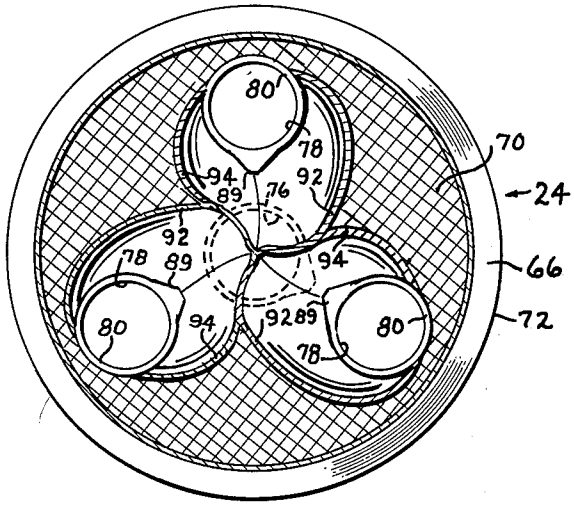


FIG. 2

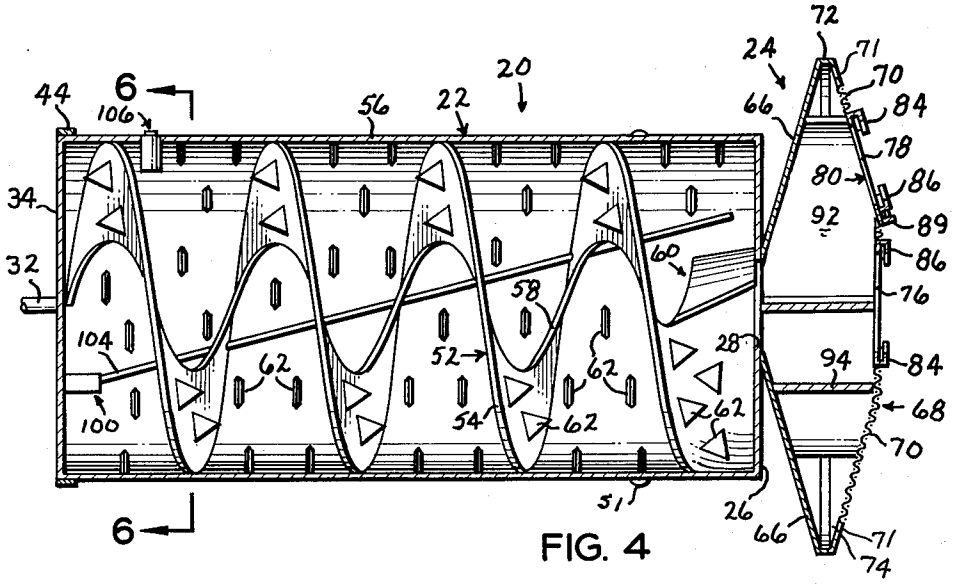


FIG. 4

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GARBAGE EMULSIFIER AND DISPOSAL

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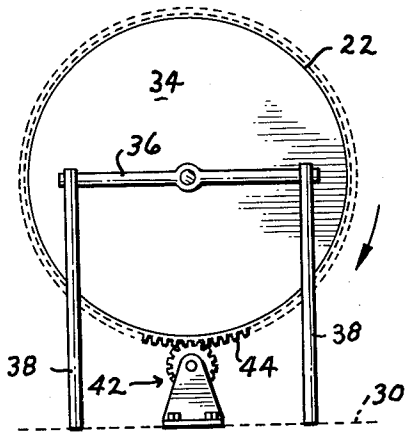


FIG. 3

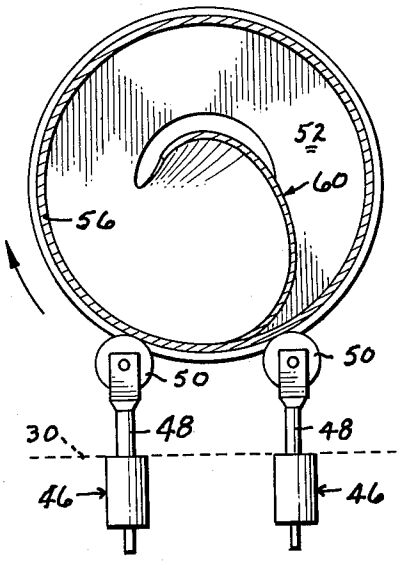


FIG. 5

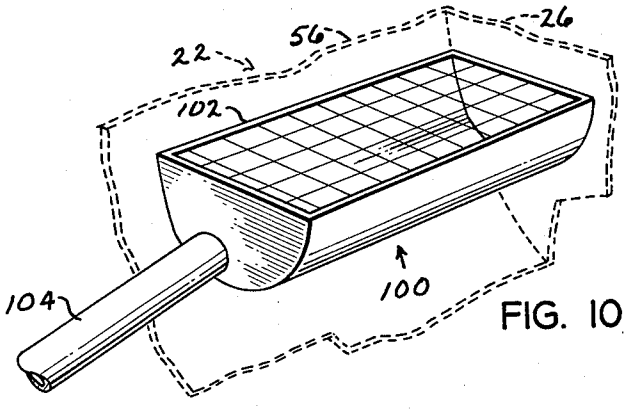


FIG. 10

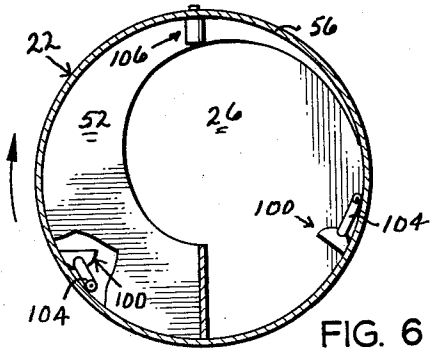


FIG. 6

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GARBAGE EMULSIFIER AND DISPOSAL

Filed Jan. 9, 1959 4 Sheets-Sheet 4

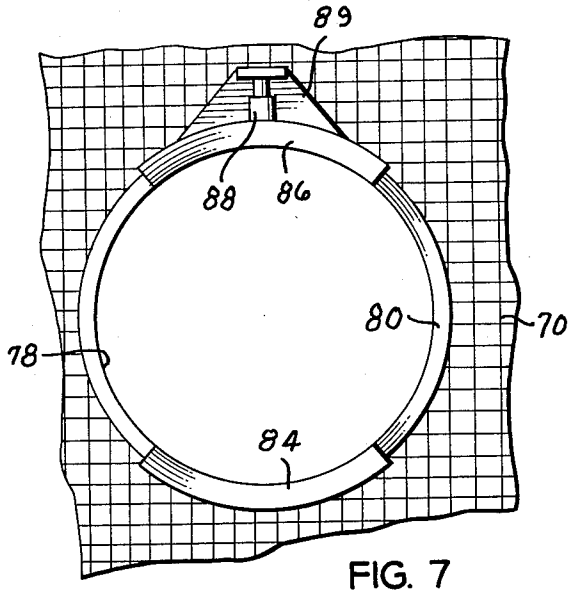


FIG. 7

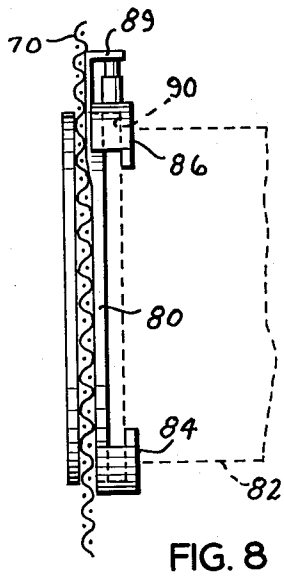


FIG. 8

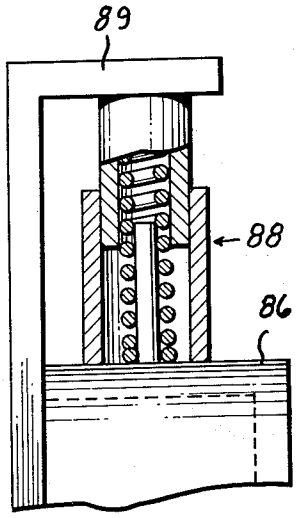


FIG. 9

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2,991,947

GARBAGE EMULSIFIER AND DISPOSAL

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Filed Jan. 9, 1959, Ser. No. 785,853
2 Claims. (Cl. 241—41)

The present invention relates to garbage disposal devices and more particularly to an apparatus for collecting and emulsifying garbage and the like.

At present one of the more common methods of collecting and disposing of garbage and the like comprises the placing of all refuse, including left-over food, paper, bottles, cans, boxes, etc., within garbage receiving receptacles or cans usually located at the rear of business establishments or residential dwellings. These cans are picked up by authorized persons and emptied into a garbage collecting truck. These trucks are provided with facilities for compacting or compressing the refuse placed therein and when full the truck is driven to a common dump ground where the garbage is released within a fenced enclosure or dumped on the ground where it is covered with soil.

The principal objection of such an apparatus and method of collecting garbage is that the garbage cans are frequently over-turned before being emptied into the truck resulting in an unsightly and unsanitary condition around the area. Furthermore, various papers are blown over a wide area thus littering adjacent areas. Similarly when the truck is at the curb in front of dwellings or business establishments and refuse collection cans are emptied into the truck more refuse is frequently spilled resulting in littering up the street or grounds nearby. Furthermore, since these garbage trucks do not provide means for dampening or grinding up the collected refuse, when the same is released at the common dump ground, wind scatters the refuse over a large area. Some communities dump the garbage and associated trash into a fenced enclosure containing hogs which feed off of the garbage. During the summer months this results in a quite unsanitary and unsightly condition and is quite objectionable to persons living down wind or adjacent such dump grounds.

It is, therefore, the principal object of the present invention to provide an apparatus and method of collecting garbage and the like wherein the garbage is placed within such an apparatus at or adjacent its point of origin and immediately wet and subsequently emulsified.

A similarly important object is to provide a garbage emulsifier and disposal device which may be located adjacent a business establishment or the like or which may be mounted upon a truck chassis or the like.

Another object is to provide a device of this class containing a quantity of water and which features cutting blades wherein the blades reduce the size of bulky garbage, boxes or cartons, and the like, by a rotative movement of the garbage container.

Another object is to provide a garbage containing device which includes an auger conveyer which agitates the garbage and moves the same toward the end of the container opposite its garbage receiving end and wherein the conveyer is formed to discharge the emulsified garbage from its open end when the container is rotated in the opposite direction.

Still another object is to provide a garbage receiving and emulsifying apparatus which features a refuse receiving hopper connected to the opening in the container whereby garbage collecting receptacles or cans may be connected to the hopper which will direct the garbage into and through the opening of the garbage container.

Another object is to provide an apparatus and method of collecting garbage and the like wherein the garbage is

emulsified and materially reduced in volume and which may be dumped on poor soil and buried which will result, in time, in forming a more productive soil.

Still another object is to provide an apparatus of this class which will substantially eliminate blowing of papers and other trash during the garbage collecting and disposal operations.

A further object is to provide an apparatus of this class which includes a container for adding a chemical, such as a disinfectant, to the contents of the apparatus each time the latter is rotated about its longitudinal axis.

The present invention accomplishes these and other objects by providing a cylindrical container horizontally mounted for rotation in either direction about its longitudinal axis. One end of the container is provided with a central opening. Reversible drive means is connected to gear teeth carried by the periphery of the container opposite its open end for rotating the container. Roller equipped hydraulic support means permit raising and lowering the open end of the container for disposing the axis of the latter horizontally or inclined upwardly.

An auger conveyer within the container extends between the opposing ends of the container. The outwardly disposed edge of the auger conveyer is rigidly connected to the inner surface on the container wall. The auger conveyer has an inward edge substantially defining a cylindrical surface generated about the longitudinal axis of the container. The end portion of the auger conveyer, adjacent the opening, is connected to the container end wall and arcuately curved around a portion of the periphery of the opening therein to form a refuse receiving and discharging throat. Cutter blades secured to the inner surface of the container wall and to opposing surfaces of the auger conveyer act to reduce or cut up garbage, and the like, received by the container in a cutting action as the container is rotated. A refuse receiving hopper is connected to the end of the container around the opening therein for rotation with the container. The hopper includes means for removably connecting and emptying a refuse receiving container.

Arcuate flanges, within the hopper, direct the refuse received thereby into the container through the auger throat.

Other objects will be apparent from the following description when taken in conjunction with the accompanying four sheets of drawings, wherein:

FIGURE 1 is a side elevational view of the device;

FIGURE 2 is an elevational view of the hopper as seen in FIG. 1, taken substantially along the line 2—2;

FIGURE 3 is a left end elevational view of the container and its mounting means;

FIGURE 4 is a vertical cross-sectional view of the container and hopper, per se;

FIGURE 5 is a vertical cross-sectional view, partly in elevation taken substantially along line 5—5 of FIG. 1;

FIGURE 6 is a vertical cross-sectional view taken substantially along line 6—6 of FIG. 4;

FIGURE 7 is a fragmentary elevational view of a garbage receptacle holding device carried by the hopper;

FIGURE 8 is a side elevational view of FIG. 7;

FIGURE 9 is a fragmentary elevational view, partly in section of a garbage receptacle holding flange;

FIGURE 10 is a perspective view of a fluid dipping member connected to the inner surface of the container wall, a fragment of the container being shown by dotted lines; and,

FIGURE 11 is a vertical cross-sectional view on an enlarged scale of the chemical injecting device carried by the container wall.

Like characters of reference designate like parts in those figures of the drawings in which they occur.

In the drawings:

The reference numeral 20 indicates the device, as a whole, comprising a cylindrical container 22. The device shown in FIG. 1 is intended to be mounted substantially horizontally on a mobile support such as the bed of a truck 30. However it is to be understood that the device 20 may be permanently installed at any desired location. A shaft 32 is axially connected to the closed end 34 of the container. This shaft 32 is journaled by a transverse support member 36 which is in turn journaled by a pair of spaced-apart supporting members or stands 38 mounted on the surface of the truck bed 30. A drive shaft 40 driven by motor means or the truck transmission, not shown, is connected with gear means 42 mounted on the truck bed 30 adjacent the closed end of the container. The teeth of the gear means is drivably engaged with the teeth of a gear ring 44 secured to the periphery of the container 22 adjacent its closed end 34.

A pair of vertically disposed hydraulic cylinders 46 are mounted below the surface of the truck bed 30 in spaced-apart relation adjacent the end portion of the container 26 having the opening 28. Each of the free upper end portions of the hydraulic cylinder pistons 48 is bifurcated and journals a sheave or roller 50. The periphery of each of the rollers 50 is provided with a circumferential groove which co-operatingly receives a ring or band 51, substantially semicircular in cross section, extended about the circumference of the container 22 for supporting the latter for rotation about its longitudinal axis. Thus it may be seen that simultaneous actuation of the hydraulic cylinders 46 will lift the adjacent end of the container 22 and dispose the axis thereof on an incline or, conversely, lowering the hydraulic cylinder pistons 48 lowers the adjacent end of the container until the longitudinal axis of the container is substantially horizontal for the purposes which will be more fully explained hereinbelow.

The interior of the container is provided with an auger conveyer 52 formed from sheet metal which extends between the ends of the container and has its peripheral edge 54 rigidly connected to the inner surface of the container wall 56. The conveyer 52 has an inwardly directed edge 58 which extends inwardly of the container wall and defines a substantially cylindrical surface generated about the longitudinal axis of the container. The end portion of the conveyer adjacent the container end 26 is formed to contact and is secured to the inner surface of the end wall 26 and arcuately curved to partially surround the opening 28 to form a conveyer throat portion 60 for receiving and discharging garbage or refuse, not shown, through the opening 28 in a manner more fully disclosed hereinbelow.

A plurality of cutter blades 62 are connected to the inner surface of the container wall and to opposing sides of the auger conveyer 52 for the purpose of cutting, ripping or tearing papers, boxes, bags and the like which are placed within the rotating container. Each of the cutter blades is substantially equilateral triangular in shape and is rigidly connected by one side edge thereof to the respective surface. The remaining side edges of each blade 62 are sharpened and terminate in a sharpened tip end.

The hopper 24 is circular in general configuration and diametrically is substantially greater than the container 22 and is substantially diamond shaped in vertical cross-section (FIG. 4). The hopper 24 is formed of an imperforate back wall portion 66 which is frustro-conical in shape and is connected, at the small end of the cone shape, to the container end wall 26 around the opening 28. The forward wall 68 of the hopper is substantially frustro-conical in shape, being formed primarily of wire mesh material 70, and is connected by the periphery of its larger end to a sheet metal ring 71 which is in turn connected to the peripheral edge of the larger end of the back wall 66 as at 72 (FIG. 4). The ring 71 co-operates with the opposing back wall 66 to form a comparatively

shallow substantially V-shaped recess 74 for retaining therein a quantity of fluid for the purposes more fully explained hereinbelow. The forward wall 68 of the hopper is provided with a central aperture 76 of a selected size and a plurality of similar apertures 78 in equally spaced-apart relation on the inclined surface of the wall 68. The apertures 76 and 78 are each defined by a metallic ring 80 which is connected to the wire mesh material 70. The size of the rings 80 are substantially equal to the size of conventional garbage or refuse cans or collecting receptacles 82. An angle iron or channel shaped member 84, co-operatingly curved to describe an arc complemental with respect to an arc of equal length of each ring 80, is rigidly connected to each respective ring 80. A similarly formed angle member 86 is slidably connected to each respective ring 80 opposite the member 84 by a telescoping guide and a ring means 88 secured to a lateral extension 89 of the ring 80. The purposes of the members 84 and 86 are to receive and hold one of the garbage cans 82 while the same is being emptied. The can 82 is preferably provided with an annular flange 90 projecting outwardly of its open end so that it may be received within the arcuate recesses formed by the members 84 and 86. The can 82 to be emptied is connected to the members 84 and 86 by manually inserting an edge portion of the can flange 90 into the recess of the member 86 and forcing this member outwardly of the ring 80 by compressing the spring means 88 to permit an opposite portion of the can flange 90 to be inserted into the recess formed by the member 84. Thus the spring means 88 co-operates with the members 84 and 86 to maintain the can connected to the ring 80 while the hopper 24 is rotated with the container 22. Gravitational attraction for the material or refuse, not shown, within the can 82 will cause the can to be emptied by the time the can reaches the position illustrated in FIG. 1. The can 82 is removed from contact with the respective ring 80 by reversing the above connecting procedure.

The hopper 24 is further provided with a pair of interconnected flanges or vanes 92 and 94 extending from each aperture 78 to the center of the hopper. These vanes, 92 and 94, extend between and are connected with the hopper walls 66 and 68. The flange 92 is arcuately curved and extends from the outwardly disposed arc of the respective ring 80 to the central portion of the hopper thus forming a trough-like recess or groove which directs refuse entering the hopper from the cans 82 into the throat 60 of the conveyer through the opening 28 as the container and hopper is rotated in one direction. Conversely, when the container is disposed substantially horizontal and rotated in the opposite direction, emulsified refuse discharged by the conveyer throat 60 is received by the arcuately formed flange 94, which is trough-like in cross-section and extends between the central portion of the hopper and joins the respective aperture ring 80 opposite the flange 92, whereby the emulsified refuse is discharged through the apertures 78 into a suitable receptacle or on the surface of the earth as the respective aperture reaches the lowermost point of its travel.

As indicated hereinabove the container 22 is intended to contain a quantity of fluid to aid in dampening and emulsifying garbage or refuse placed therein, which may be or will contain a substantial amount of relatively dry matter. The preferred ratio of fluid to garbage is maintained by adding fluid to the refuse, from a source of supply, not shown, as the refuse is dumped into the hopper. Thus the refuse is initially dampened as it enters the hopper 24 which aids in its being directed into the conveyer throat 60 as the hopper revolves.

When first placing refuse within the container the latter will be substantially horizontally disposed and fluid contained therein will be distributed throughout its length. As the quantity of refuse within the container

22 increases the hydraulic cylinders 46 are used to raise the open end of the container thus causing the fluid within the container to seek its level adjacent the closed end thereof. Therefore, at least one scoop or dipping member 100, substantially trough-like in configuration, is connected by a portion of its longitudinal wall to the inner surface of the wall of the container adjacent its closed end 34 so that as the container is rotated in one direction fluid will be picked up by the trough 100. A tubular member 104 is connected at one end to the end of the trough opposite the container end 34 and is extended along the inner surface of the container wall toward the end 26. Thus as the container is rotated in a direction to cause the trough 100 to dip fluid, the fluid runs by gravity through the pipe 104 to the receiving end 26 of the container when the trough 100 is positioned above the level of the outlet end of the pipe 104 by the rotative movement of the container.

A chemical injector or feeder 106 is connected to the container 22 inwardly of the wall thereof adjacent the closed end 34. The feeder 106 comprises a cylindrical tube 108 of a selected size having an open internally threaded end substantially flush with respect to the outer surface of the container wall. This open end is closed by a plug 110. The opposite end of the container 106 is closed except for a relatively small central opening 112. A boss 114 formed on the inner surface of the closed end of the tube 108 is counter bored substantially greater diametrically than the bore 112 for slidably receiving an end of a push rod 116. The opposite end portion of the rod 116 is slidingly supported by a guide member 118. Lateral ports 120 formed in the boss 114 communicate with the enlarged rod receiving bore. The length of the rod 116 is substantially equal to the distance between the lateral ports 120 and the inward surface of the plug so that the rod 116 may be moved longitudinally within the enlarged bore of the boss. Thus, when the tube 108 is filled with a desired chemical, such as a disinfectant, and the refuse container 22 is positioned with the feeder 106 at the lowermost part of the container, the rod 116 will be supported by the inner surface of the plug 110. As the container 22 is rotated the chemical, not shown, will enter the ports 120 and thereafter, as the container 22 continues to rotate, gravitational attraction will cause the rod 116 to slide past and close the port openings, and force a small quantity of the chemical, trapped within the rod bore, out through the small bore 112 and into the garbage or refuse within the container 22. This operation is repeated each time the container makes a complete revolution.

It seems obvious, therefore, that the above described apparatus provides a method or process for collecting garbage and the like wherein the refuse is materially reduced in volume by emulsification of soluable materials. All cans, bottles or other containers placed within the container 22 will be filled with the emulsified refuse thus effectively reducing the bulk of refuse from its original state when placed within the container.

Obviously the invention is susceptible to some change or alteration without defeating its practicability, and I therefore do not wish to be confined to the preferred embodiment shown in the drawings and described herein, further than I am limited by the scope of the appended claims.

I claim:

1. A garbage emulsifier and disposal device, including: a substantially cylindrical container having a central opening in one end; support means mounting said container for rotation about its longitudinal axis, said support means including a pair of upright support members, a transverse member extending between the upper end portions of said upright support members, a shaft axially secured to the end of said container opposite the opening and journaled at its other end by said transverse member; a ring secured to the periphery of said container adjacent its end portion opposite said end portion having the central opening; reversible motor and drive means connected with said ring for rotating said container; hydraulic cylinder means supporting the end of said container having the opening for raising the last mentioned end of said container; at least one roller journaled by said hydraulic cylinder means in contact with the periphery of said container; an auger conveyer within and extending between the ends of said container, said auger conveyer having its peripheral edge rigidly connected to the inner surface of the container wall, said auger conveyer having an inwardly directed edge defining a substantially cylindrical surface generated about the longitudinal axis of said container, the end portion of said auger conveyer adjacent the opening in said container being arcuately curved and connected to a peripheral portion of the edge of the container end defining the opening for forming, in co-operation with the container end wall and opening, a refuse receiving and discharging throat, whereby when said container is rotated in one direction refuse placed within said throat is moved, by gravity and said auger conveyer, toward the opposite end of said container and when said container is rotated in the opposite direction refuse therein is moved by said auger conveyer toward and discharged through said throat; and a plurality of substantially equilateral triangular shaped cutter blades secured, by one side edge, to the respective inner surface of the wall of said container and to opposing side surfaces of said auger conveyer, each said cutter blade projecting inwardly in substantially perpendicular relation from the respective surface.

2. A garbage emulsifier and disposal device, including: a substantially cylindrical container having one closed end and having a central opening at its other end, said container adapted to hold a quantity of fluid; support means mounting said container for rotation about its longitudinal axis, said support means including a pair of upright support members, a transverse member extending between the upper end portions of said upright support members, a shaft axially secured to the closed end of said container and journaled at its other end by said transverse member; a ring secured to the periphery of said container adjacent its closed end; reversible motor and drive means connected with said ring for rotating said container; hydraulic cylinder means supporting the end of said container having the opening for raising and lowering the adjacent one end of said container and disposing the longitudinal axis of the latter on an incline; at least one roller journaled by said hydraulic cylinder means in contact with the periphery of said container; an auger conveyer within and extending between the ends of said container, said auger conveyer having its outer peripheral edge connected to the inner surface of the container wall, said auger conveyor having an inwardly directed edge defining a substantially cylindrical surface generated about the longitudinal axis of said container, the end portion of said auger conveyer adjacent the opening in said container being arcuately curved and connected to a peripheral portion of the edge defining the opening for forming, in co-operation with the container end wall and opening, a refuse receiving and discharging throat, whereby when said container is rotated in one direction refuse placed within said throat is moved, by gravity and said auger conveyer, toward the closed end of said container and when said container is rotated in the opposite direction emulsified refuse therein is moved by said auger conveyer toward and discharged through said throat; a plurality of substantially equilateral triangular shaped cutter blades secured, by one side edge, to the respective surface of the inner wall of said container and to the opposing sides of said auger conveyer, each said cutter blade projecting inwardly in substantially perpendicular

relation with respect to the surface with which it is connected; a fluid dipping member secured to the inner surface of the container wall adjacent its closed end for trapping a quantity of fluid when said container is rotated in one direction; and a tubular member connected at one end to said dipping member and extending along the inner surface of the wall of said container for conveying fluid trapped by said dipping member to the opposing end of said container.

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