

[54] DRUM WASHER FOR VEHICLES

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214/302; 296/28 M[51] Int. Cl.² B08B 3/02; B08B 9/12[58] Field of Search 214/302; 296/28 M;
134/104, 107, 115 R, 115 G, 152, 171

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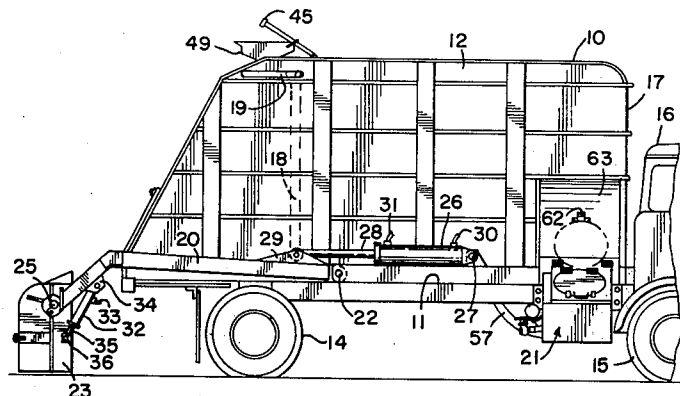
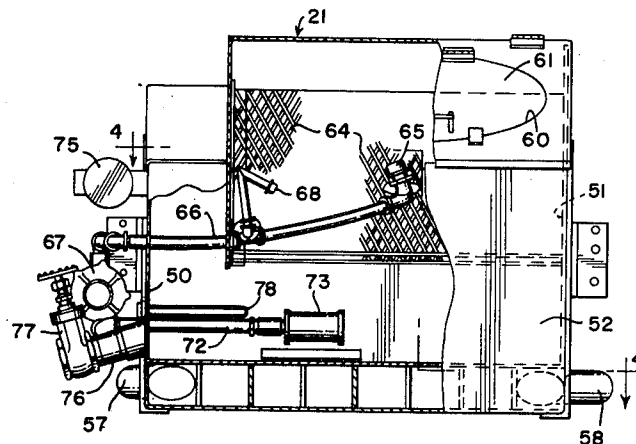
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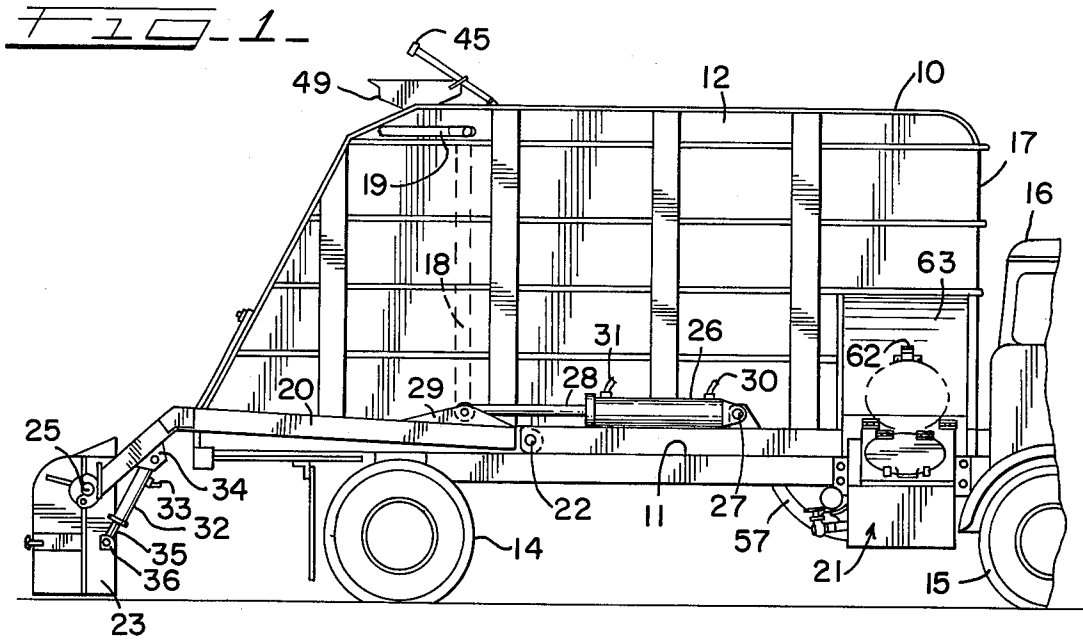
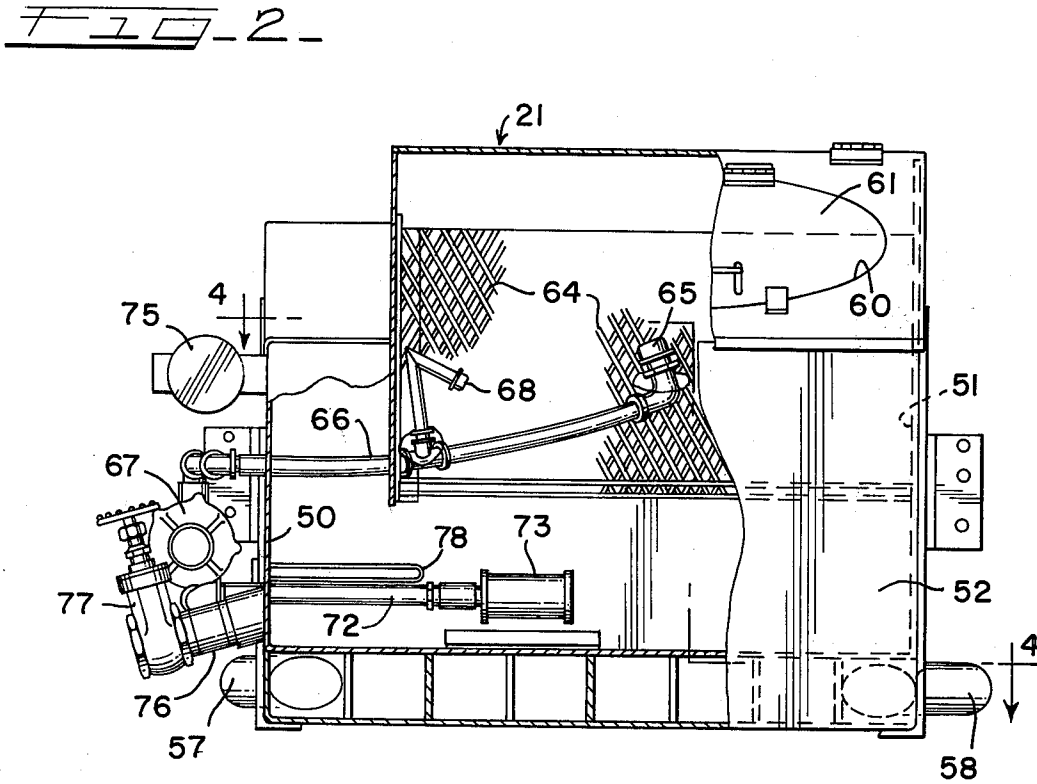
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ABSTRACT

This invention relates to a drum washer of the type for installation on a refuse hauling vehicle and which is adapted to be incorporated into the structure of the vehicle at a location where a drum can be placed in the washer apparatus from ground level and which comprises a generally rectangular container in the form of a boxlike structure adapted to be secured into the vehicle structure and having a sloping top wall including an opening for inserting an inverted drum in the container to rest on a sloping supporting wall of open construction where it is washed out by flushing apparatus in the container and having a heating chamber under the floor of the container for maintaining a supply of flushing solution at the proper temperature.

8 Claims, 6 Drawing Figures





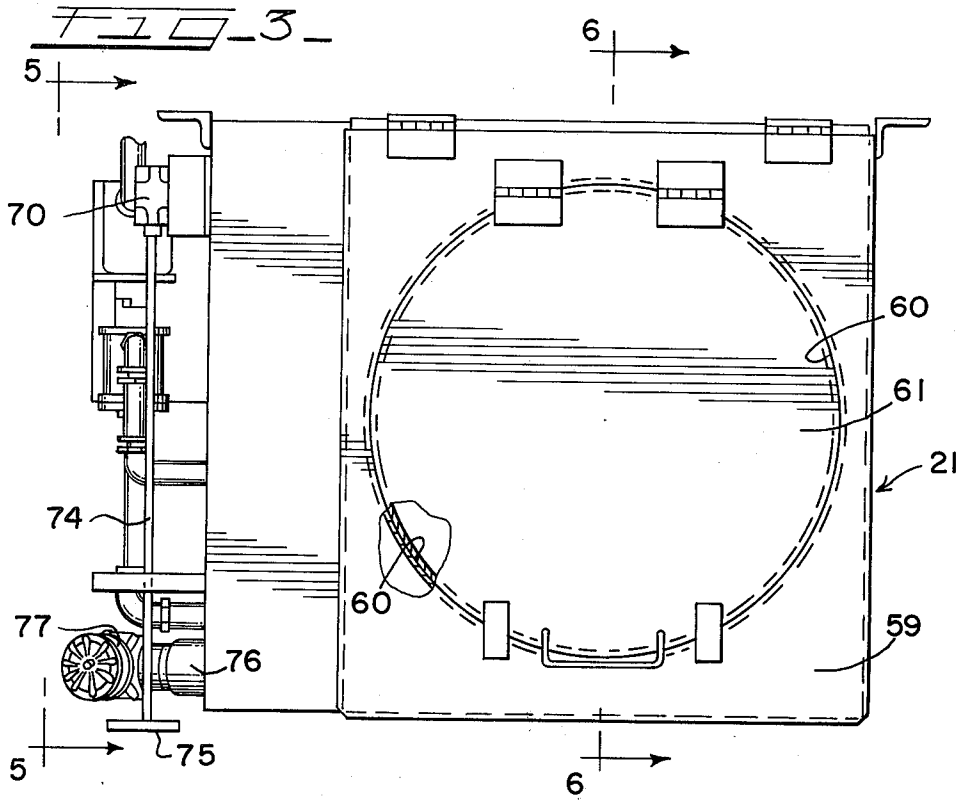
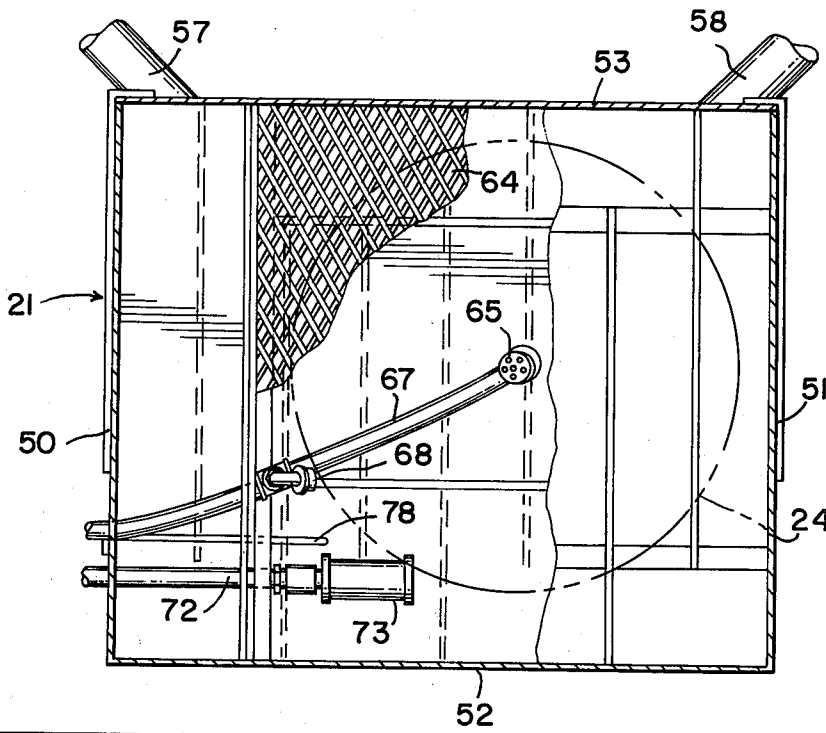


FIG. 4

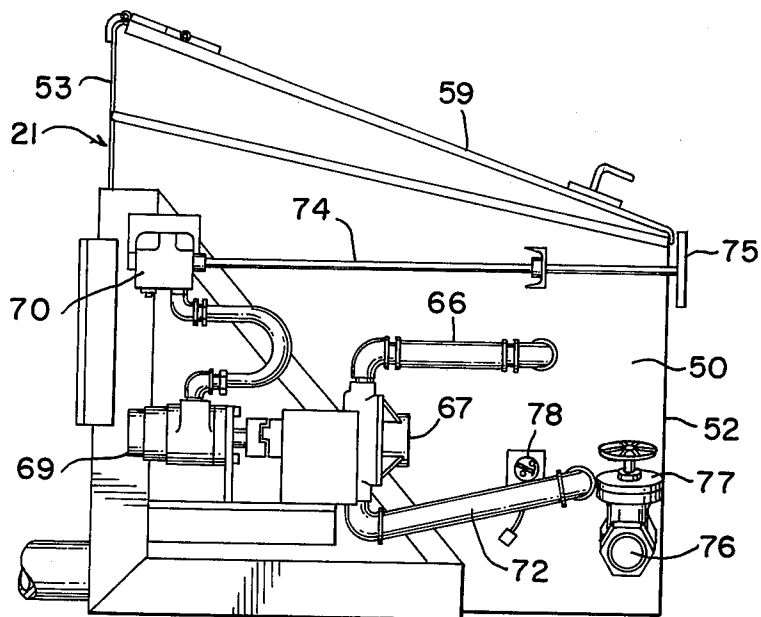


FIG. 5

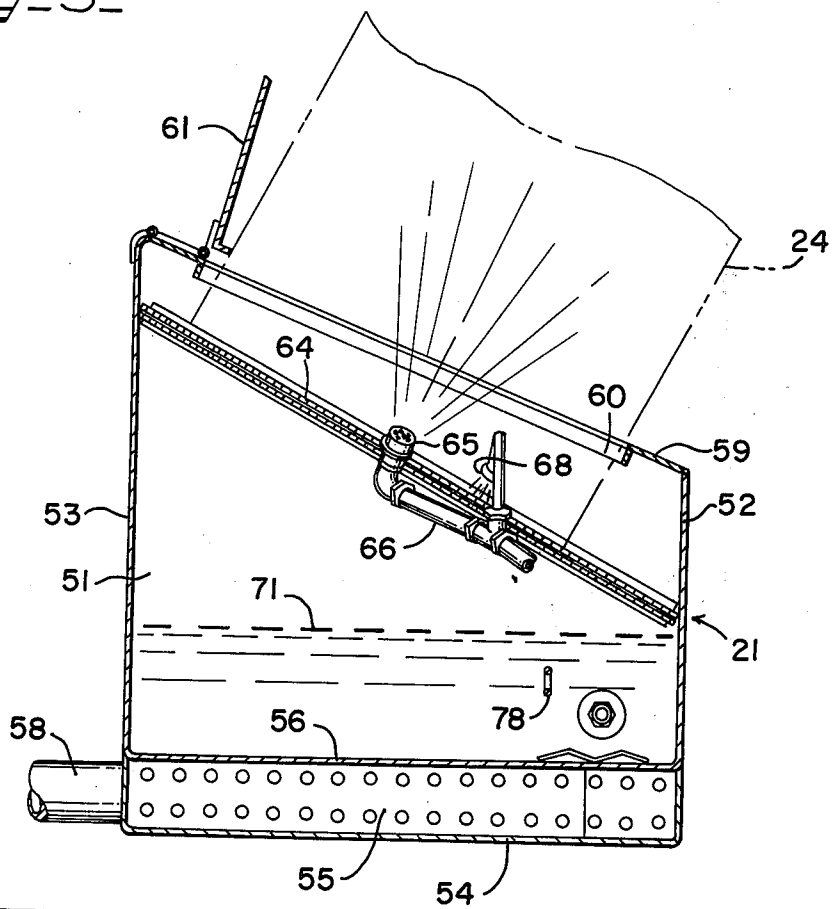


FIG. 6

DRUM WASHER FOR VEHICLES

Cross-reference is made to our copending application for Multiple Drum Washing Apparatus for Vehicles filed coincidentally herewith, Ser. No. 443,332, the disclosure of which is hereby incorporated herein by this reference.

BACKGROUND OF THE INVENTION

Heretofore, drum and container washing arrangements have been proposed for use on refuse hauling trucks and some of which were designed for cleaning one drum at a time. However, a number of these arrangements were mounted on the top side of such trucks and made it necessary for personnel to ascend to the top of the vehicle for the drum washing operation. Some arrangements associated the drum washing apparatus with storage facilities for the drums. Another disclosure builds the drum cleaning mechanism into a vertical wall at the side of a refuse truck but utilizes rotating scrub brushes for performing the drum cleaning operation. Still another prior arrangement proposes to blow out the drums with compressed air. All of these prior art structures fail to meet modern day requirements for a simplified design for a drum washing apparatus which may be used economically for the efficient washing of the drums handled by refuse truck personnel particularly for cleaning of single drums.

SUMMARY OF THE INVENTION

The present invention provides a drum washer for vehicles of the type that haul refuse and which may be secured into the structure of the vehicle in a position for convenient use by personnel without detracting from the normal operation or capacity of the truck. This drum washer utilizes a generally box-like container mounted at the side of the truck immediately below a recess provided in the side wall of the truck and includes a downwardly and outwardly inclined top wall with a drum opening therein having a hinged cover. A grid-like inner wall of open construction also slopes downwardly and outwardly so that with the hinged cover secured open and a drum inverted into the container for support on the grid, the drum is disposed at an outwardly inclined angle for ready manipulation by an operator. The interior of the drum, while resting on the grid, is flushed out with washing solution by means of a main nozzle, and a secondary nozzle simultaneously washes the rim of the drum. The container includes a bottom chamber for heating the washing solution by means of the truck exhaust and has means to divert the exhaust heat from the chamber or direct it therethrough to maintain a proper temperature of the washing solution. A pump is provided for circulating the solution under pressure and which is driven from a power take-off from the truck engine with a control valve for activating or deactivating the pump and including means for actuating the valve from the side of the truck by an operator's knee while the operator's hands are busy with the manipulation of the drum. A supplementary heating element is provided which may be plugged in during downtime of the truck to maintain the temperature of the washing solution.

OBJECTS OF THE INVENTION

The primary purpose of the invention is related to drum washers for use in refuse vehicles and is con-

cerned especially with washers of this type for cleaning single drums.

The principal object of the invention is the provision of a drum washing container for mounting in the side of a refuse truck for access from ground level.

An important object of the invention is the provision of a drum washing container at the side of a refuse truck and having a sloping top wall provided with an opening for insertion of an inverted drum disposed at an outwardly inclined angle.

Another object of the invention is to provide a drum washing container for refuse trucks wherein an interior grid-like wall of open construction is disposed at an angle inclined downwardly and outwardly to support a drum at an outwardly inclined angle during the washing operation.

A further object of the invention is to provide a drum washer for vehicles utilizing a container for a supply of washing solution and having a bottom chamber for heating the solution from the vehicle exhaust with diverter means for directing the exhaust heat into or away from the heating chamber and utilizing a circulating pump for the solution driven by a power take-off from the vehicle engine, and control means for the pump adapted to be actuated by the knee of an operator.

The foregoing and other and more specific objects of the invention are attained by the structure and arrangement illustrated in the accompanying drawings wherein:

FIG. 1 is a general side elevational view of a refuse hauling vehicle equipped with the drum washer of this invention;

FIG. 2 is a detail view to larger scale of the drum washer apparatus with portions broken away;

FIG. 3 is a plan view of the washer apparatus;

FIG. 4 is a plan sectional view through the washer apparatus taken on the line 4-4 of FIG. 2;

FIG. 5 is an end elevational view of the washer apparatus looking at that end from the plane indicated by line 5-5 in FIG. 3; and

FIG. 6 is a cross-sectional view through the washer apparatus taken on the line 6-6 of FIG. 3.

DESCRIPTION OF PREFERRED EMBODIMENT

In the drawings, 10 represents a vehicle of the type generally used for hauling refuse and, as shown, comprises an open top truck body having a floor 11 and side walls 12 and 13. The truck body is supported on wheels 14 for driving the vehicle and steerable wheels 15 under a driver's cab 16 which includes an engine providing a source of power on the vehicle. In a vehicle of this type, refuse is loaded into the truck body through the open top side by emptying drums or other containers over the open top area to pile up the refuse on the floor 11 between the several walls of the vehicle including side walls 12 and 13 and the end wall 17 behind the driver's cab. Compacting apparatus such as movable rear wall 18 may be utilized if desired to increase the loading capacity of the truck body by condensing the refuse as the load builds up under continued loading. The rear wall panel 18 is shiftable longitudinally of the vehicle in side wall slots 19 as indicated in FIG. 1.

The drum or barrel handling apparatus includes a lifting cradle formed by a pair of longitudinally disposed arms 20 disposed at respectively opposite sides of the

truck body and pivotally mounted on the same axis as at 22. A container or bucket 23 for drums 24 completes the cradle and is pivotally mounted in the arms 20, as at 25, to be lifted by the actuation of the lifting arms in connection with the dumping of the drum contents into the truck body and the washing thereof afterward.

The lifting arms 20 are actuated by identical hydraulic cylinders 26 mounted at respectively opposite sides of the truck body. The hydraulic cylinder 26 is pivotally mounted at respective sides of the truck body, as at 27, and the operating plunger 28 of each cylinder is pivotally connected with the respective arms 20 by means of a bracket 29 which provides an off-center connection between the cylinders and the lift arms. The cylinders 26 have hydraulic connections 30 and 31 with a suitable source of hydraulic pressure on the truck driven by a power take-off from the truck engine.

The drum bucket 23 pivotally mounted between the free ends of the lift arms 20 is also actuated hydraulically for pivotal movement about the mountings 25 by means of cylinders 32 which also are of identical size and capacity and similarly mounted for pivoting the bucket 23 about its pivotal axis. Hydraulic connections 33 operatively connect these cylinders with the source of power driven from the truck engine. The hydraulic cylinders 32 are each pivotally anchored on the respective lift arms 20 by means of a bracket 34 and the operating plunger 35 of each cylinder is pivotally connected with the bracket 23 at respectively opposite sides thereof through a rigidly mounted bracket 36. Thus, with the hydraulic cylinders 32 functioning in unison, the drum bucket 23 may be rotated about the pivotal axis 25 between the several operative positions required in the handling and washing of the drums 24.

In this arrangement washing of the drums in the drum bucket 23 takes place at an overhead position with the drum inverted for immediate drainage. The flushing apparatus includes a plurality of spray heads 45, which may be a revolving type if desired and which are connected with a suitable source of hot water on the truck. This source of hot water may be heated from the exhaust of the truck engine, if desired, or by such other means as may be preferred. Suitable means may be employed to maintain the hot water supply at the temperature desired for washing the drums.

The truck body is provided with means at the top of the body to receive the flushed drainage from the drums and to conduct such drainage downwardly of the body into the hot water supply for reheating and recirculation with means for filtering the drainage water in order to remove any foreign matter and prevent contamination of the hot water supply. The water supply means, filtering mechanism and recirculation system do not form any part of the inventive concept and are not shown. The drainage from the washed drums 24 is collected in a trough 49 extending between the side walls 12 and 13 at the top of the truck body and which is rigidly secured to the respective side walls 12 and 13 for fixed support in the position shown relative to the drum washing sprays 45 and the inverted position of the bucket 23 at the drum washing position. The trough 49 being fixed occupies permanent relationship with respect to the drum washing equipment and arrangement.

The foregoing arrangement is suitable for washing a plurality of drums simultaneously but, where a single drum requires washing, the invention provides a drum

washing unit 21 mounted at the side of the truck body 10 adjacent the front end thereof behind the driver's cab 16. This drum washing unit is located so that it is accessible from ground level and includes a housing that is generally rectangular, having vertical side walls 50 and 51 and front and rear walls 52 and 53 respectively. A bottom wall 54 underlies a heating chamber 55 defined by an interior wall 56 acting as a top cover for the heating chamber. Exhaust connections 57 and 58 provide a source of heat into and out of the heating chamber 55 from the engine that provides motive power for the truck.

The drum washing unit 21 is provided with a top wall 59 to complete its enclosure and which is disposed at an angle sloping downwardly and outwardly. An opening 60 in the top wall provides access for inserting a drum into the washing unit and this top opening is provided with a hinged cover 61 which is swung upwardly to expose the drum opening 60 for insertion of a drum 24 to be washed and secured by a suitable latch 62. The truck body 10 is provided with a recess 63 to enable the cover 61 to be raised and the drum 24 to be inserted in the washing unit 21 without projecting outwardly beyond the outermost width of the truck.

An interior foraminous wall or grid-like screen 64 is provided in the washing unit below the top wall 59 of the housing and this interior wall supports a drum resting thereon inserted through the top opening 60. The wall 64 also is disposed at a downwardly and outwardly sloping angle somewhat greater than that of the top wall 59 so that when a drum 24 is placed in the washing unit and rested on the foraminous wall 64 the drum is canted at an outward angle as best indicated in FIG. 6. A centrally disposed spray head 65 extends upwardly through the wall 64 at an angle corresponding substantially with the cant of the inverted drum 24 so that in operation the jet of washing solution issuing from the spray head will thoroughly flush out the interior of the drum.

The spray head 65 is supplied with washing solution under pressure from a line 66 which receives the solution under pressure from a pump 67 mounted on the side wall 50 of the housing for the washing unit 21. A secondary spray head 68 also is operative from the supply line 66 and is so located and disposed at an angle such as to wash the rim of the drum as it is rotated during the washing operation by truck personnel. The pump 67 is driven by a suitable motor 69 which may be suitably powered by means of a power take-off on the truck engine and is also mounted on the side wall 50 of the housing and under regulation of a suitable control 70.

The housing for the drum washing unit 21 contains a suitable washing solution 71 as best indicated in FIG. 6 and the circulating pump 67 draws on this supply of washing solution through a line 72 having a strainer or filtering unit 73 on its inner end where the solution is drawn into the line and the pump 67 and thence to the drum washing spray heads 65 and 68. The circulation of the washing solution is under the control of an operator from the side of the truck while the drum is being handled for thorough cleaning. The control 70 is actuated by a control rod 74 having a large flat faced head or push button 75 which may be actuated by a knee of the operator while the drum is being manipulated by hand.

The supply of washing solution 71 in the housing may be replenished as needed through a suitable connection or port 76 having a valve 77 controlling the outlet. This connection may be utilized also for draining the solution from the housing when that becomes necessary. A plug-in type of heating element 78 projects into the housing for the washing unit 21 and is submerged in the solution 71. When the truck may stand for some period of nonuse with the engine not running, the heating element 73 may be plugged into a source of energy to maintain the temperature of the washing solution or prevent the solution from freezing when temperature conditions are such that this might occur.

The single drum washing unit 21 and the multiple drum washer 23, 45 may be used simultaneously or separately and may use the same source of supply for the hot washing solution for the drums 24, and of course the same source of power and exhaust heat from the engine providing motive power for the truck can be utilized to operate both systems. In this manner it will be seen that means are provided on a refuse hauling vehicle affording a choice of washing a plurality of drums at once or to wash single drums one at a time and utilizing either the multiple drum washing system or the single drum washer for independent operation, or use both systems for maximum drum washing capacity.

What is claimed is:

1. In a drum washing system for a refuse hauling vehicle, a drum washer comprising a generally box-like housing having vertical side and end walls and a downwardly sloping top wall, a drum opening in said top wall, a hinged cover on the top wall for said opening, an interior wall of open grid construction below said opening to support a drum inserted through said opening, a floor in the housing below said grid construction supporting a supply of drum washing solution, a main flushing nozzle for directing washing solution upwardly into a drum supported on said grid construction, and means mounted on a wall of said housing for propelling said washing solution through said nozzle including a pump driven from a power takeoff on said vehicle, a suction line from said supply of washing solution, a

pressure line to said nozzle, and a control valve for activating said pump.

2. A drum washer for a vehicle as set forth in claim 1, wherein said vehicle is provided with a recess in a side wall thereof for receiving a drum inserted into said container.

3. A drum washer as set forth in claim 2, wherein said container is secured to the structure of said vehicle below said recess.

4. A drum washer as set forth in claim 3, wherein said housing is provided with a heating chamber below said floor for heating drum washing solution from an exhaust source on said vehicle, a series of baffles in said heating chamber for directing exhaust heat through said solution, and an exhaust heat diverter for directing exhaust heat away from said heating chamber.

5. A drum washer as set forth in claim 4, wherein said housing is provided with a heating element extending through one of said vertical walls and submerged in said supply of drum washing solution, and means for plugging a source of energy into said heating element exteriorly of said vertical wall.

6. A drum washer as set forth in claim 5 wherein said control valve includes a control rod extending from the valve to the side of said vehicle for actuation by an operator's knee or the like.

7. A drum washer as set forth in claim 3, wherein said top wall slopes downwardly and outwardly to the outer side of said housing at the side of said vehicle, and said wall of open grid construction slopes downwardly and outwardly at an angle at least as great as that of the top wall whereby a drum inserted into said drum opening in the top wall will be supported on the open grid at an outwardly inclined angle for manipulation by an operator.

8. A drum washer as set forth in claim 7, wherein said pressure line to said nozzle is provided with a secondary line, and a second nozzle on the secondary line disposed at an angle to wash the rim of said drum simultaneously with the flushing of the drum by said main nozzle.

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