Aug. 31, 1965 F. S. FAUST 3,203,437

TRASH AND GARBAGE CAN WASHER

Filed Jan. 30, 1964 2 Sheets-Sheet 1

Fig. 1.

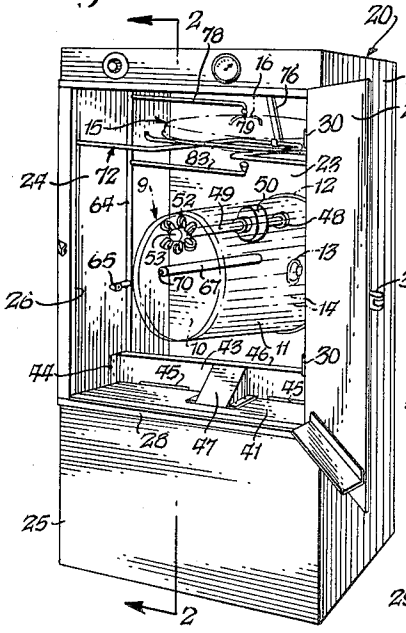


Fig. 2.

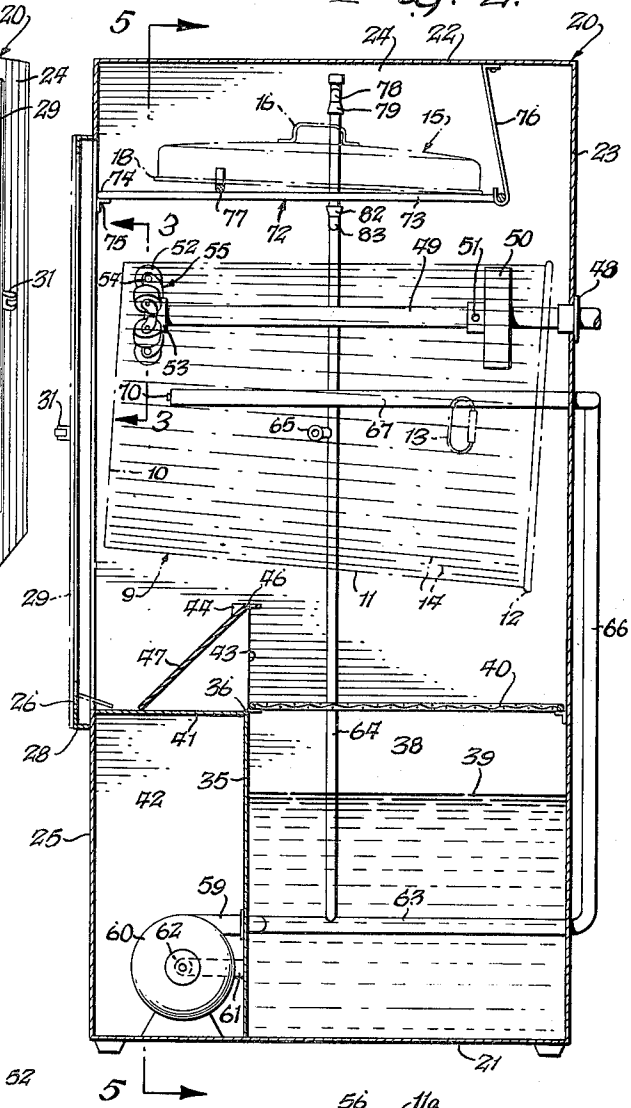


Fig. 3.

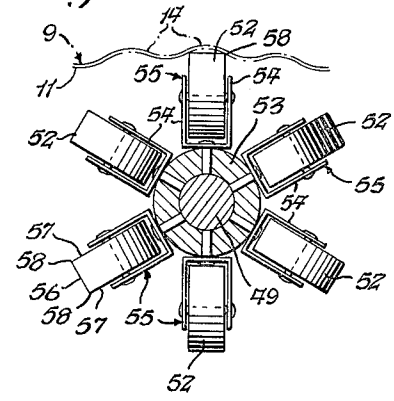


Fig. 4a.

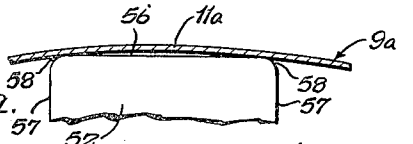
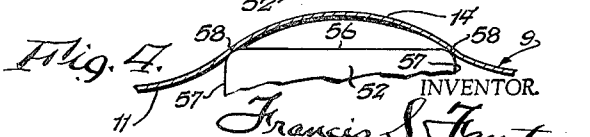


Fig. 4.



INVENTOR.
Francis S. Faust
BY
Popp and Sommer
attorneys

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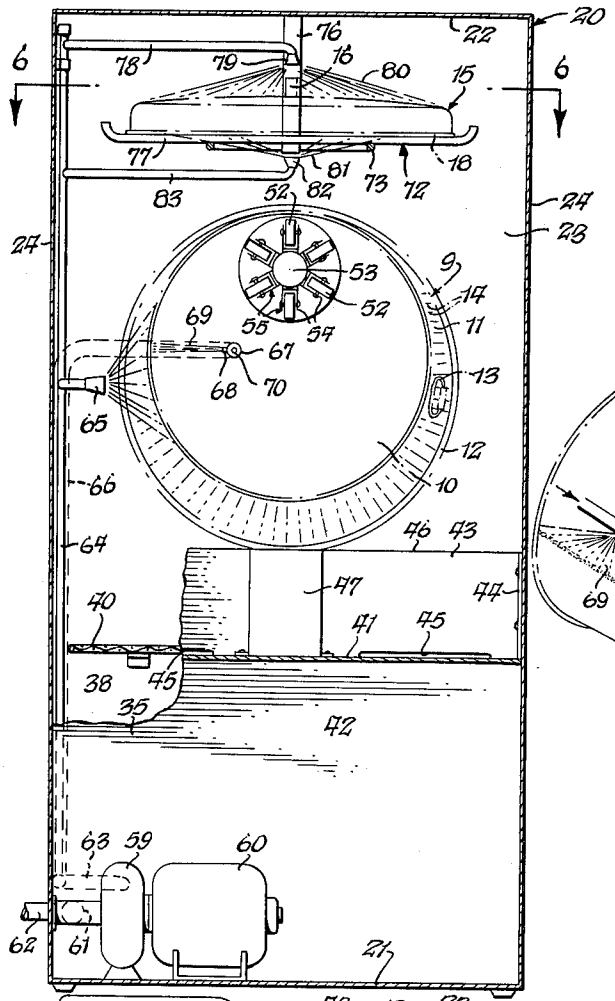

Fig. 5.

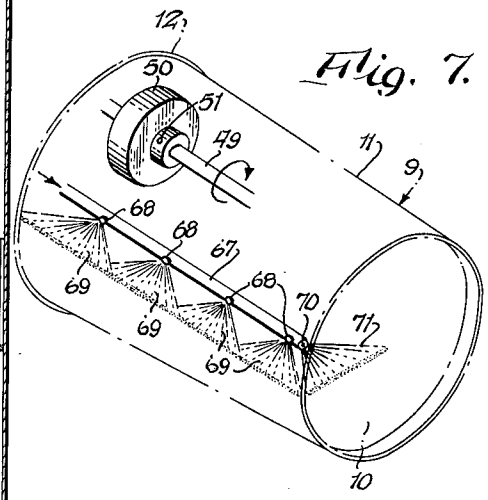

Fig. 7.

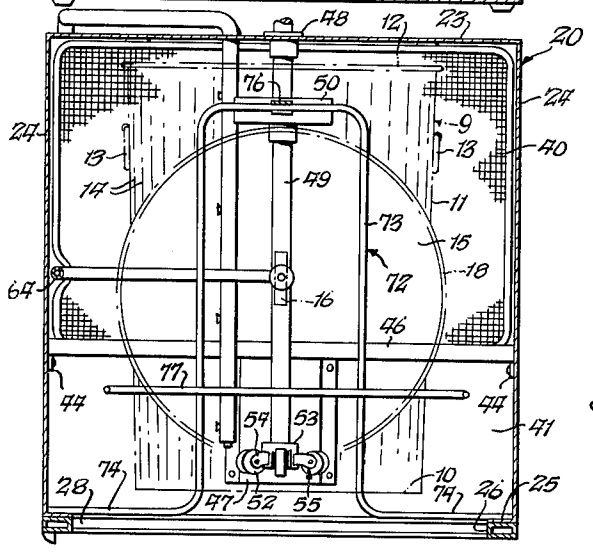

Fig. 6.

INVENTOR.
Francis S. Faust
BY
Popp and Sommer
attorneys

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TRASH AND GARBAGE CAN WASHER

Francis S. Faust, Buffalo, N.Y., assignor to R. G. Wright Company, Inc., Buffalo, N.Y., a corporation of New York

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4 Claims. (Cl. 134—148)

This invention relates to a washer for cleaning and sanitizing heavy duty manually portable cans and their covers and while the invention is applicable to cylindroidal containers designed for various purposes, it is particularly intended for use in washing and sanitizing heavy gage garbage and trash containers, together with their covers.

While such trash and garbage cans are manually portable, particularly when made for institutional use, they are made of heavy gage metal and an important object of the present invention is to reduce to a minimum the amount of effort required to load the empty garbage or trash can into the cleaner and sanitizer forming the subject of the present invention, together with its cover, and to remove a cleaned and sanitized can and cover therefrom.

Another important object is to provide such a washer for garbage cans and the like which is highly effective in its cleaning and sanitizing action, the inside of the can in particular being subjected to intense high pressure sprays having a limited zone of action, but this zone of action being extended over the entire interior of the can by rotating the can while it is being washed.

Another object of the invention is to provide such a can washer and sanitizer which is adapted to timer controlled detergent wash and rinse cycles to insure complete processing and drainage of each can and its cover.

Another object of the invention is to provide such a trash or garbage can cleaner or washer which will effectively wash and sanitize cylindrical containers of widely varying sizes, such as cans varying from 8 inches to 12 inches in diameter and from 10 inches to 27 inches in length.

Another object of the invention is to provide such a cleaner and sanitizer in which the garbage or trash can is always right side up until it is inserted into or removed from the casing of the washer and sanitizer, thereby to avoid hazardous floor conditions around the apparatus due to refuse droppings, drainage from the interior of the can.

Another object is to provide such a cleaner and sanitizer in which any debris washed out of the cans is trapped on a debris screen and in which the removal of stubbornly encrusted soil is obtained through the use of a detergent or cleaning solution of adequate strength and temperature, together with thorough coverage of the soiled surfaces with correct volume and pressure for an adequate time.

Another object of the invention is to provide a rotary support for the can which supports the same at such pitch that the washing solution and rinse water rapidly drains out of the can thereby to reduce the time of the washing and rinsing cycles.

Another object is to provide such a rotary can washer in which the rinse and/or cleaning liquids drain into a sump for reuse.

Another object is to provide a conveniently available support for receiving the cover of the can for washing at the same time its can is washed.

Another object is to provide such a cleaner and sanitizer which is simple and rugged in construction and which will stand up under conditions of severe and constant use without getting out of order or requiring repairs.

Other objects and advantages of the invention will be apparent from the following description and drawings in which:

FIG. 1 is a perspective view of a garbage can washer embodying the present invention, showing the access door open.

FIG. 2 is an enlarged vertical fore-and-aft central section taken generally on line 2—2, FIG. 1.

FIG. 3 is a further enlarged vertical section taken generally on line 3—3, FIG. 2.

FIG. 4 is a fragmentary view similar to FIG. 3, on an enlarged scale.

FIG. 4*a* is a view similar to FIG. 4 but showing a smooth sided garbage can being washed as compared with the corrugated sided garbage can shown in the preceding and succeeding figures.

FIG. 5 is a vertical transverse section taken generally on line 5—5, FIG. 2.

FIG. 6 is a horizontal section taken generally on line 6—6, Fig. 5.

FIG. 7 is a diagrammatic perspective view of the mechanism arranged inside of the garbage can being washed, and in particular illustrating the knife edge or narrow band spray pattern.

The apparatus forming the subpect of the present invention is particularly designed to wash and sanitize heavy duty, heavy gage trash and garbage cans 9 shown in phantom, such as are used in institutions, and which comprise a circular bottom 10 and a tubular side wall 11 and terminating in an open mouthed rim 12 remote from the bottom 10. The can can be provided with swinging bail-like handles 13 and as shown in all the figures except FIG. 4*a*, the side wall 11 can be provided with corrugations 14 extending lengthwise thereof to strengthen the side wall. However, such trash cans, designated at 9*a*, can also be smoothed walled, as indicated at 11*a*, FIG. 4*a*. In either event the garbage or trash cans are usually of frusto-conical form although the invention is effective in washing any type of trash can having cylindroidal side walls, whether smooth surfaced or otherwise, and is particularly applicable to washing heavy service trash cans which are heavy and difficult to lift or move about. The washer of the present invention also simultaneously washes and sanitizes the cover 15 for each garbage can, such cover being shown as being of conventional sheet metal, shallow dome-shaped form having a rigid handle 16 at its apex and a rolled bottom rim 18 adapted to fit snugly around the rim 12 of the can.

The garbage can washer forming the subject of the present invention is contained within a housing or casing indicated generally at 20 and having a bottom wall 21, top wall 22, rear wall 23, side walls 24 and a front wall 25. The front wall 25 is provided in its upper part with a large rectangular access opening 26, the sill 28 of which is located a substantial distance above the bottom 21 of the casing but at an elevation less than the height of the heavy duty trash cans 9 to be washed and sanitized. The opening 26 is closed by a sheet metal door 29 which can be of any suitable construction but preferably is hinged to one side of the vertical opening 26, as indicated at 30, so that when the door is swung open, substantially the full length of the sill 28 is available for use as a fulcrum in lifting the trash cans 9 into position, as hereinafter described. The door 29 can be latched in its closed position by any suitable form of latch 31.

A vertical partition 35 extends across the bottom of the casing parallel with the front and rear walls 23, 25 thereof with its upper edge 36 preferably at about the same elevation as the sill 28 of the opening 26 and this partition 35 forms a sump 38 between it and the rear wall 23 which contains a body 39 of detergent or other cleaning liquid. The top of this sump can be enclosed by a removable

horizontal screen 40 which catches debris washed from the trash cans.

The chamber 42 in front of the transverse vertical partition 35 can be provided with a horizontal top wall 41 which connects the sill 28 with the upper edge 36 of the vertical partition 35. Preferably an internal vertical panel 43 extends between the side walls 24 to which it can be secured by ears 44 and has its lower edge resting on the top ledge 36 of the partition 35 and provided with drain notches 45. This panel has a top ledge 46 adapted to serve as a fulcrum and slide in positioning the can and also carries an inclined way or slide 47 which facilitates transfer of the can from the ledge 46 to the can rotating mechanism, and vice-versa, as hereinafter described.

The rear wall 23 of the casing is provided near its center with a horizontal bearing 48 carrying a generally horizontal, rotatable cantilevered can supporting shaft 49 which projects generally toward the center of the access opening 26. The shaft can be rotated by any suitable drive (not shown) and near the rear wall 23 of the casing is provided with a circular, concentric enlargement 50 adapted to rotatably support the inside of the rim 12 of the can being washed, as hereinafter described. This part 50 is in the form of a wheel movable axially along the shaft 49, to accommodate cans of different height, and can be held at any selected position by a set screw 51 or in any other suitable manner. At its outboard end the can carrying shaft 49 has journalled thereon an annular series of rollers 52, six of these rollers being shown. These rollers are shown as being mounted on an end head 53 fixed to the end of the can supporting shaft 49 and each is journalled between a pair of ears 54 of a bracket 55 suitably secured to the periphery of the end head 53 so that the axes of the several rollers 52 are tangential to a circle concentric with the can supporting shaft 49. It will be noted that by this mounting the outer peripheral portions of the several rollers 52 project radially outwardly from the can supporting shaft 49 for a purpose which will presently appear. It is also a feature of the invention that the several rollers 52 are of generally cylindrical form to provide cylindrical peripheries 56, parallel radial end faces 57 and abrupt annular shoulders 58 between the mating portions of the peripheral faces 56 and end faces 57.

The trash cans 9 are sprayed with cleaning liquid or detergent from both inside and outside to clean and sanitize the same and to this end a spray system is provided which is preferably constructed as follows:

The numeral 59 represents a high pressure cleaning solution or detergent pump contained within the chamber 42 and driven by an electric motor 60. A part of the solution to this pump can be supplied from the body 39 in the sump 38, via an intake line 61, the balance being supplied from a suitable external source via an intake line 62.

The horizontal outlet line 63 from this pump extends rearwardly and within the casing is provided with an upwardly extending branch 64 which extends upwardly close to one of the side walls 24 above the level of the upper edge 46 of the panel 43 and below the level of the generally horizontal cantilevered can supporting shaft 49. This branch 64 is provided with one or more spray nozzles 65 adapted to play against the exterior of the rotating can 9 being cleaned and santized, as hereinafter described. A second branch 66 of the outlet line 63 from the high pressure liquid cleaner or detergent pump 59 connects with the rear end of a supply pipe 67 cantilevered forwardly from the rear wall 23 of the casing immediately below and parallel with the horizontal cantilevered can supporting shaft 49. This spray pipe has a series of side nozzles 68 which are directed horizontally from the same side of the pipe and each of which produces a knife edge spray 69 the pattern of which is of narrow horizontally elongated form extending lengthwise of the can supporting shaft 49 and these sprays 69 being arranged in overlapping relation to one another to provide, in effect, a single narrow horizontal high pressure spray extending the full length of the can 9 being washed as best shown in FIG. 7.

In addition a spray nozzle 70 projecting from the end of the pipe 67 projects a spray 71 having a knife edge pattern which is of narrow elongated form extending generally parallel wtih the radius of the can bottom 10 and extending the full diametral extent thereof whereby the bottom of the rotating can is cleaned by a narrow line of high pressure spray liquid, as hereinafter described.

The covers 15 of the cans 9 are placed upon a horizontal rack 72 within the casing which is spaced a short distance below the top wall 22 thereof. This rack 72 can be of any suitable open work construction and is preferably removable and to this end is shown as comprising a U-shaped horizontal top wire or rod 73 with front end legs 74 resting on angle brackets 75 fixed to the inside of the front wall 25 along opposite sides of the access opening 26 thereof. The center of this U-shaped top rod or wire 73 is suspended by a strap 76 from the top 22 of the casing 20 as best shown in FIG. 2. This U-shaped horizontal top wire 73 also carries a horizontal cross rod 77 which extends parallel with the front and rear walls 25, 23 of the casing 20.

The cover 15 so placed on this rack 72 can be washed and sanitized from above by a horizontal overhead spray pipe 78 forming a branch of the branch 64 of the outlet line 63 from the high pressure cleaning liquid or detergent pump 59 and having a downwardly directed nozzle 79 from which a high pressure spray 80 is discharged downwardly. The underside of the cover 15 can be cleaned by an upwardly directed high pressure spray 81 from a nozzle 82 at the end of a spray pipe 83 forming a branch of the branch 64 of the discharge 63 from the high pressure pump 59.

In the operation of the trash can cleaner or sanitizer forming the subject of the present invention the trash can 9 and its cover 15 are brought to a position in front of the casing 20. The door 29 is opened, swinging about its vertical hinges 30 at one side of the opening 26 in the front wall 25 of the casing and if a cleaned garbage can 9 and its cover 15 is present in the casing, they are removed.

The cover 15 of the trash or garbage can 9 to be cleaned is then removed and placed on the horizontal wires 73 and 77 of the horizontal top rack 72, preferably right side up, so that cleaning or rinse liquid cannot collect in this cover. The heavy garbage can 9 in front of the access opening 26 is then tilted toward the casing so that its side wall 11 engages the sill 28 of this opening 26. The operator then seizes and lifts the bottom 10 of the garbage can, using the sill 28 as a fulcrum, and brings it toward a horizontal position. The operator then lifts the elevated garbage or trash can 9 and moves it through the opening 26 toward the rear wall 23 of the casing, at the same time bringing the inside of the rim 12 of the can 9 on top of the uppermost roller or rollers 52 on the outboard end head 53 of the cantilevered horizontal rotatable can supporting shaft 49. Since the axes of rotation of these uppermost rollers 52 extend transversely of the can supporting shaft 49 and tangentially to a circle concentric with this shaft, the can 9 is easily pushed back into the casing on the uppermost roller or rollers 52, the inside top surface of the side wall 11 of the can riding along the top roller or rollers 52 which provides an antifriction bearing for this generally horizontal axial movement of the can. The operator can also use the top edge 46 of the panel 43 as a fulcrum in threading the can 9 over the shaft 49 if this is more convenient for particular cans, and the slide 47 acts as a guide leading the rim 12 of such can onto this ledge.

The inside of the rim 12 of the can 9 is then placed on top of the adjustable radial enlargement or wheel 50 at the outboard end of the generally horizontal, rotatable cantilevered can supporting shaft 49 and the parts are in

condition for washing, the operator closing the door 29 and securing it by its latch 31 and starting the rotation of the generally horizontal, rotatable, cantilevered can supporting shaft 49 as well as the motor 60 driving the high pressure cleaning liquid or detergent pump 59.

Rotation of the generally horizontal, rotatable, cantilevered can supporting shaft 49 causes a much slower rotation of the garbage or trash can 9 supported thereby, the enlargement or wheel 50 and also the annular series of rollers 52, particularly the latter, acting in the manner of a pinion to drive the garbage or trash can 9 in the manner of a gear. In this action, it will be noted that the annular shoulders 58 provided between the generally cylindrical peripheries 56 and the end faces 57 of the several rollers 52 are particularly effective in insuring rotation of the can 9 about a generally horizontal axis. Thus, if the side wall 11 of the trash or garbage can 9 is corrugated lengthwise of the axis of the can, as best shown in FIG. 4, the one shoulder 58 of each roller 52 comes into engagement with the side of a corrugation 14 of the can 9 as the roller reaches the top position and comes into engagement with the inside of the side wall 11 of the can 9. This insures a positive propelling action providing, in effect, gear teeth on the array of rollers 52 acting in the manner of a pinion against the corrugations 14 of the trash can 9 which form, in effect, the teeth of a driven gear. If, as shown in FIG. 4*a*, the can 9*a* is smooth sided, it will be noted that when each roller 52 reaches the topmost position of the array, both of its shoulders 58 have driving contact with the inside of the smooth sided wall 11*a* of the can 9*a* so that both of these shoulders are effective in causing the can to rotate slowly about a generally horizontal axis.

While the garbage or trash can 9 is being so rotated about a generally horizontal axis it is washed from the inside and outside by high pressure sprays which are concentrated in their action. Thus, cleaning liquid or detergent from the high pressure detergent pump 59 is supplied via the branch 66 to the spray pipe 67 within the rotating can 9 and immediately below the generally horizontal, rotatable cantilevered can supporting shaft 49. The horizontally fanned sprays 69 from the side nozzles 68 of this pipe merge with one another to provide a single vertically narrow zone of action or spray pattern extending the full length of the can 9 being washed. It will further be seen that since this spray pipe 67 is close to the shaft 49 and since the sprays 69 from the nozzles 68 are directed horizontally, the line of impingement of the sprays 69 from these nozzles is close to these nozzles 68 so that they are highly effective in their cleaning action as compared with the diminished spray force which would obtain if the spray pipe 67 were at a lower elevation with a greater distance between the nozzles 68 and the part of the side wall 11 of the can being washed. Further by the close proximity of the spray pipe 67 to the generally horizontal, rotatable, cantilevered can supporting shaft 49 this spray pipe 67 does not interefere with the ready loading or threading of the cans 9 on the shaft, as previously described.

The bottom 10 of the can is also washed by the high pressure spray 71 from the end nozzle 70 and since the spray pattern of this spray is in the form of a horizontally elongated narrow stripe, it will be seen that as the can 9 rotates the inside of its bottom 10 is progressively subjected to the intense action of the highly localized high pressure spray 71 so as to loosen solids which might otherwise adhere, and so as to thoroughly wash and santize the inside of the bottom 10 of the can.

The spray water from the nozzles 68 and 70 within the can 9 being rotatably supported on the cantilevered can supporting shaft 49 pours out over the bottom of the rim 12 of this can onto the screen 40 which serves to retain any large debris. This spray water goes through this screen 40 into the body 39 in the sump 38 and any part of this can be reused.

At the same time that the inside of the can is so being washed, its outside is being washed by the spray from the nozzle 65 of the branch 64 which plays against the outside of the side wall 11 of the can from one side thereof.

At the same time that the can is being washed, the cover 15 upon the rack 72 is being subjected to the overhead sprays 80 from the nozzle 79 from the overhead spray pipe branch 78 and the upwardly directed spray 81 from the nozzle 82 of the horizontal spray pipe branch 83 arranged under the rack 72. Accordingly, while the garbage or trash can 9 is being washed and sanitized, its cover is also being washed and sanitized.

From the foregoing, it will be seen that the present invention provides a garbage or trash can washer which can be loaded and unloaded with both the can and also its cover with a minimum of manual effort; which is applicable to cans and covers of widely varying heights and diameters; and which serves to effectively clean and sanitize both with high pressure sprays having a limited zone of action but which is rendered effective over the entire area of the can by rotating the same.

I claim:

1. A washer for garbage cans and the like, which cans have a generally circular bottom and a tubular side wall rising from said bottom and terminating in an open mouth and rim remote from said bottom, comprising a generally horizontal, rotatable, cantilevered can supporting shaft, roller means journalled at the outboard end of said shaft to rotate about at least one axis extending transversely of said shaft with the peripheral portion thereof projecting laterally from said shaft whereby the inside of the rim of the can can be placed upon said peripheral portion and upon elevating the bottom of the can it can be moved longitudinally on said roller means lengthwise of said shaft to have the inside of its rim supported by the inboard end of said shaft with the inside of the bottom end of its side wall supported by said roller, means for rotating said can so supported about a generally horizontal axis by said rotating shaft and roller means, and means for spraying cleaning liquid against the can so supported and rotated.

2. A washer as set forth in claim 1 wherein said roller means comprises a series of rollers encircling the outboard end of said shaft with their axes arranged generally tangentially to a circle concentric with said shaft so that in any position in which the shaft comes to rest at least one of said rollers is on top of the shaft.

3. A washer as set forth in claim 1 additionally including a circular concentric enlargement at the inboard end of said shaft on which said inside of said rim of said can is supported.

4. A washer as set forth in claim 1 additionally including a casing surrounding said shaft and said means for spraying liquid and having an opening in line with the outboard end of the shaft whereby the can can be inserted through said opening onto said roller means and shaft.

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CHARLES A. WILLMUTH, *Primary Examiner.*