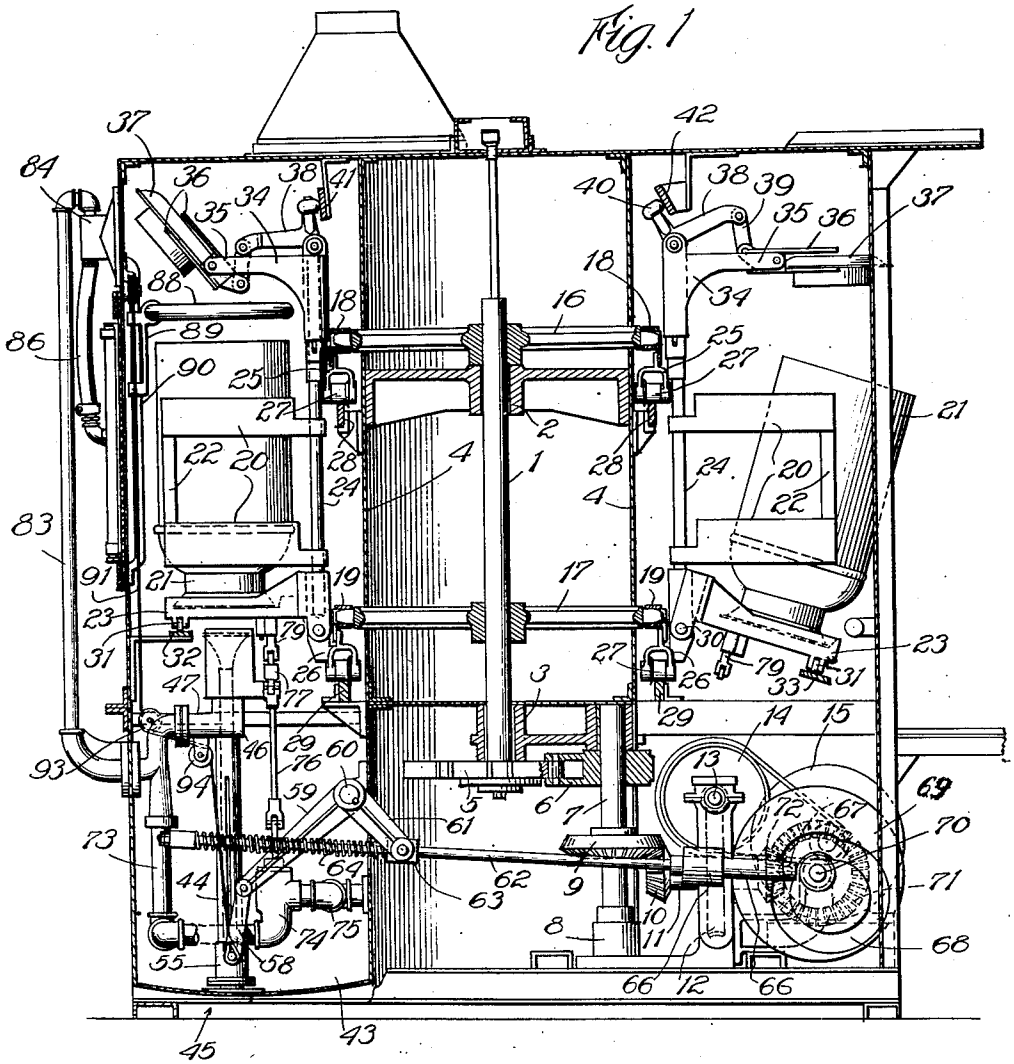
March 21, 1933. I. R. HIPPENMEYER 1,902,238

CAN WASHING MACHINE

Filed July 5, 1929 3 Sheets-Sheet 1

Fig. 1



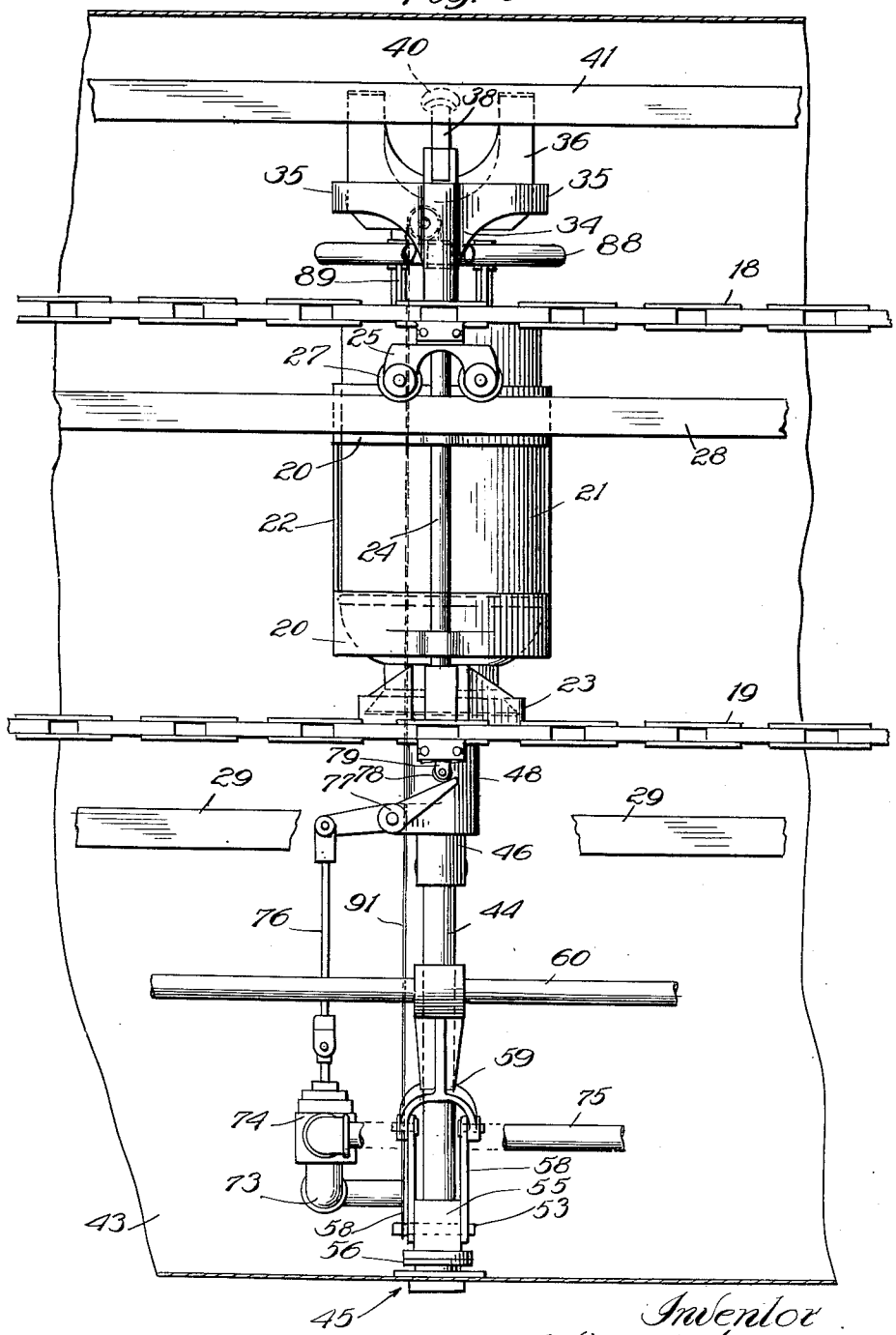
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CAN WASHING MACHINE

Filed July 5, 1929 3 Sheets-Sheet 2

Fig. 2



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Filed July 5, 1929 3 Sheets-Sheet 3

Fig. 6

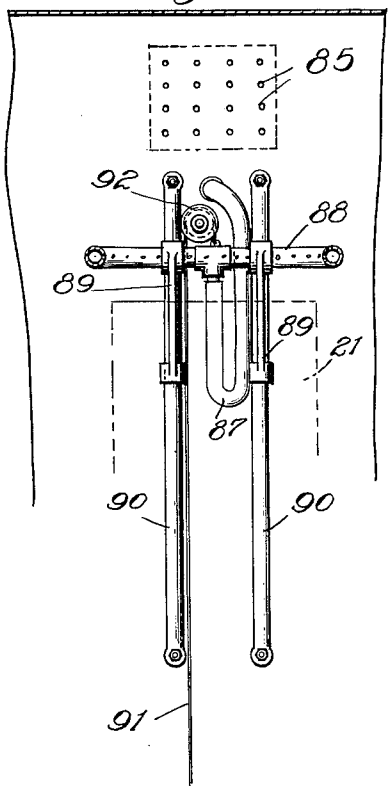


Fig. 3

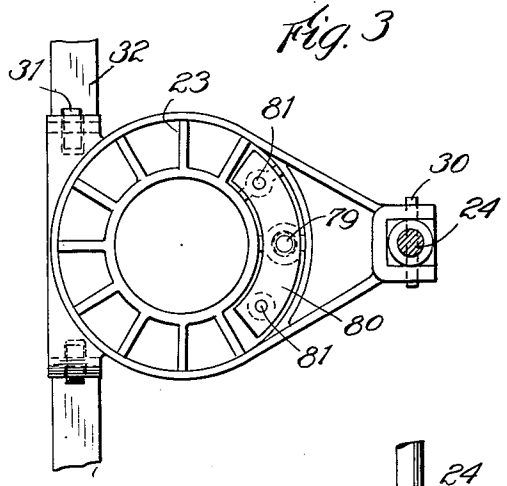


Fig. 4

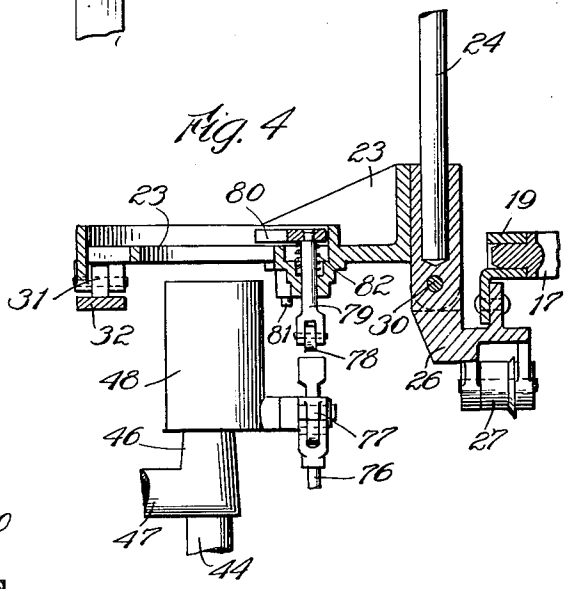
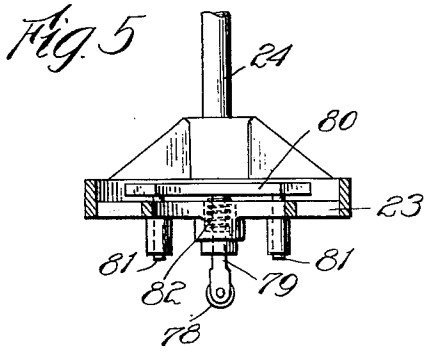


Fig. 5



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Patented Mar. 21, 1933 1,902,238

UNITED STATES PATENT OFFICE

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CAN WASHING MACHINE

Application filed July 5, 1929. Serial No. 376,256.

The invention relates to milk can washing machines of the type in which the cans are moved through a succession of zones wherein they are subjected to cleansing treatment.

In the machine herein disclosed, an endless conveyor is employed to carry the cans through a circuitous arrangement of cleansing zones wherein various treating devices operate upon the succession of cans while they rest with the intermittent movement of the conveyor, as further disclosed in Patents No. 1,805,142, issued May 12, 1931, and No. 1,831,388, issued November 10, 1931.

An object of the invention is to provide an improved simple liquid discharging device operable into a can and effective to thoroughly wash all parts of the interior surfaces of the can.

Another object is to provide a simple effective mechanism for controlling the operation of the liquid discharging device, and for rendering it inoperative when no can is in place to receive the treatment.

A further object is to provide improved means for spraying cleansing fluid over the outside surfaces of a can, and to more effectively apply the force of the spray thereto.

Other objects and advantages will be apparent in the following detailed description of a preferred embodiment of the invention which I have selected for illustration in the accompanying drawings. It will be understood, however, that various changes in form, construction and arrangement may be made by those skilled in the art, without departing from the spirit and scope of the invention, as expressed in the appended claims.

Referring to the drawings, Fig. 1 is a cross sectional view in elevation of a machine embodying the invention. Fig. 2 is a side view in elevation of the jet and spray mechanism, looking outward from within the machine. Figs. 3, 4 and 5 respectively are a plan view, a sectional elevation, and a sectional detail of the jet control device operable by a can in position for treatment. Fig. 6 is a view in elevation of the outside spray device.

In the drawings, the reference numeral 1 indicates a vertically positioned drive shaft having its bearings in brackets 2 and 3 supported upon the partition walls 4 of the machine. The drive shaft 1 is rotated intermittently by means of a conventional Geneva stop mechanism comprising a star wheel 5 and a driver 6 of which the driver is mounted on a shaft 7 having its bearings in the bracket 3 and in the machine base 8. A bevel gear 9, mounted on the shaft 7, is in driven mesh with a bevel pinion 10 mounted on the shaft 11 carrying the gear 12 of a conventional worm and gear drive of which the worm shaft 13 carries a pulley 14 belted in conventional manner to the drive pulley of an electric motor 15.

Secured on the shaft 1 is an upper sprocket 16 and a lower sprocket 17 which extend through openings in the partition walls 4 and respectively support, at one end of their operative runs, a pair of chain or link belts 18 and 19 extending longitudinally of the machine. The opposite ends of the belt runs are supported upon a similarly positioned pair of idler sprockets and shaft (not shown).

Regularly spaced along and secured to the belts 18 and 19 is a series of can holders, each comprising a pair of horizontally positioned laterally open and shaped straps 20 providing lateral support for a can 21 standing within them, the outer ends of the upper and lower straps preferably being connected as by upright straps 22. A bottom grid plate 23 supports the weight of the can inverted thereupon with its open mouth portion resting upon the open grid through which the cleansing fluids are introduced into the can. The side straps 20 are rearwardly fixed upon an upright bar 24 which is attached at its upper and lower ends respectively to upper and lower roller brackets 25 and 26, the latter being secured to appropriately formed links in the chain belts 18 and 19.

Each of the brackets 25 and 26 is provided with a pair of rollers 27, the rollers of the upper brackets operatively bearing upon a stationary rail 28 and those of the lower brackets bearing upon another stationary rail 29. The rails 28 and 29 are positioned respectively below and parallel to the belts 18 and 19 throughout their paths of travel, and are suitably mounted upon the

adjacent walls of the machine. The rails 28 and 29 support the weight and guide the movement of the can holders and their contents, while the belts 18 and 19 serve as operating and spacing means for the holders.

The grid plate 23 of each holder is rearwardly supported by horizontal pivotal attachment, as at 30, to the lower bracket 26, and is frontwardly supported by rollers 31 pivoted thereon and bearing upon a stationary rail 32 positioned outwardly of and parallel to the path of the bracket 26, and having suitable support on the frame of the machine. The rail 32 serves to maintain the pivoted grid plates 23 in horizontal position throughout their travel, except at the point where the cans are discharged from the holders after the cleansing treatment is completed. As illustrated at 33, a portion of the rail is lowered a substantial distance below the normal horizontal plane of the rail. As the can holders reach this lowered portion of the rail, the rollers 31 pass downward and lower the outer end of the plate 23, thus outwardly tipping a can supported on the plate to an angle causing it to fall clear of the conveyor.

Rigidly mounted on the upper end of the bar 24, in each of the can holders, is an L shaped bracket 34 extending laterally outward in the form of spaced arms 35. Pivotally supported between the arms 35 is a can cover carrier 36 comprising a pair of spaced U shaped plates rearwardly secured to a suitable spacer base and adapted to receive and support a can cover 37 between their outwardly extending arms. A bell crank 38 is pivotally mounted upon the upper side of the bracket 34, one arm of the crank being pivotally connected to a link 39, the latter also being pivotally connected to the cover carrier 36 rearwardly of the carrier's pivotal support. The other arm of the bell crank 38 carries a roller 40 extending into operative contact with a stationary cam rail 41 having suitable support on the frame of the machine, and positioned parallel to the path of movement of the bracket 34 except as to the portion 42 immediately over the lowered portion 33 of the rail 32, the cam rail portion 42 being curved inwardly for a substantial distance. The cam rail actuates the bell crank in control of the position of the cover carrier. The outer ends of the latter normally are uplifted to retain the cover by gravity during the cleansing treatment, and upon the arrival at the point of discharge of the can, the carrier is lowered to horizontal to facilitate removal of the cover and replacement by another to be cleaned, through the cam action of the portion 42 of the cam rail.

One of the operations in the series to which the cans are subjected in the cleansing treatment is a pressure discharge or spray of cleansing liquid into the interior of the cans as they are successively brought to rest, by the intermittent movement of the conveyor, at the stations occupied by the liquid jet discharging devices. There may be one or more of the latter, as desired, positioned in one or more basins 43, preferably formed by the walls of the machine, each of the jet devices comprising a tubular standard 44 stationarily mounted beneath the center of the position of rest for the can to be treated. The standard 44 may be rigidly secured to the bottom wall of the basin by conventional means as illustrated at 45. The upper end of the standard carries an upwardly directed nozzle structure 46 having a laterally extending liquid inlet connection 47 and preferably an upwardly extending cup shaped member 48 extending above the nozzle.

Operatively positioned within the standard 44, and extending through and outward of the nozzle 46, is a plunger bar 49 having a deflector head 50 formed on its upper end. The surrounding wall of the nozzle 46 is spaced from the plunger 49, forming an annular discharge orifice communicating with the inlet 47. The plunger is supported for longitudinal movement in a suitable liquid tight bearing 51 at the upper end of the standard 44, and carries a suitable spacer sleeve 52 having operative bearing within the standard. A cross pin 53 is rigidly mounted in the lower end of plunger and extends outwardly of the standard through longitudinal slots 54 provided in the standard wall. The pin 53 carries an outer sleeve 55 having sliding bearing on the outer surface of the standard and serving as a stop for the lowermost position of the plunger by abutment with a stop ring 56 mounted on the lower portion of the standard.

The upward movement of the plunger 49 carries the deflector head 50 through the grid plate 23 into the interior of a can resting thereupon. Liquid discharged from the nozzle 46 follows the plunger 49 in a cylindrical column, as illustrated in Fig. 7, and upon striking the deflector head 50 is thrown laterally against the surrounding can wall, passing up and down the wall as the plunger is moved up and down, the spent liquid draining out of the mouth of the can without interfering with the discharge jet and falling into the basin 43. Preferably, the deflector head is provided with radial slots 57 to permit a portion of the liquid to pass directly upward into cleansing contact with the inverted bottom of the can. In lowered position, the deflector head is retracted within the receptacle 48.

The reciprocatory movement of the plunger 49 is accomplished by means of a pair of links 58 pivotally mounted on the cross pin 53 and pivotally connected with a crank arm 59 rigidly mounted on a shaft 60, the latter having suitable bearings preferably mounted

on the wall of the basin. The crank shaft 60 similarly serves all of the plungers 49, when there are more than one of the liquid discharging devices employed. A crank lever 61, also rigidly secured to the shaft 60, is pivotally connected to a reciprocatory drive bar 62, preferably through a cushioned pivot block 63 slidably mounted on the bar and resiliently retained in position by a spring 64 secured to the bar.

The bar 62 is flexibly secured to and actuated by a piston 65 supported in a suitable bearing 66 which may conveniently be provided on the housing for the worm drive members 12 and 13. The piston 65 carries a laterally mounted roller 67 operatively positioned in a cam slot 68 formed in a wheel 69 mounted on a shaft 70 having suitable bearing support on the machine frame. The shaft 70 carries a bevel gear 71 in driven engagement with a bevel pinion 72 mounted on an extension of the worm gear shaft 11. By this arrangement of drive, the plunger 49 is raised and lowered in synchronism with the intermittent stops of the can conveyor during which a can is at rest over the discharge nozzle.

Cleansing liquid is supplied to the nozzle inlet 47 through pipe connections 73 leading to a control valve 74 and thence through a pipe 75 to a pump (not shown) drawing its supply from the basin 43. The valve 74 preferably is of sliding operating stem type, the stem being connected by a link 76 to a lever 77 pivoted on the stationary member 48.

One arm of the lever 77 extends into the pathway of a roller 78 carried by a depending stud 79 rigidly mounted in a sub plate 80 carried by the grid plate 23. The sub plate 80 is guided in vertical movement relative to the grid plate 23 by a pair of pins 81 for which, and the stud 79, suitable sliding bearings are provided in the structure of the grid plate. The sub plate is resiliently retained in upper position by a spring 82, and in such position the roller 78 passes over the lever 77 without engagement therewith in the progressive movement of the conveyor grid plate 23, as when no can is present on the grid plate the control valve 74 remains closed and no liquid is discharged from the nozzle. With a can positioned on the plate 23, a portion of the mouth rim rests upon the sub plate 80, forcing the latter down and lowering the stud and roller 78 into position to engage the lever 77, when the conveyor comes to rest with the can over the nozzle 46, and open the valve 74 for discharge of the cleaning liquid into the can as the plunger 49 rises and falls.

Means for washing the can covers and the outsides of the cans is provided by connecting a branch pipe 83 into the cleaning liquid supply pipe 73, the branch pipe leading to a header 84 mounted on the outer wall of the machine and having spray openings 85 extending through the wall immediately before the position of the can cover in one of the cover carriers as the conveyor intermittently rests. The discharge from the openings 85 is also controlled by the valve 74, and is operable only when a can is present on the grid plate with its cover in position above it.

Leading from the header 84 is a pipe 86 in continuation of the branch liquid supply pipe, the pipe 86 being connected through the wall of the machine with a flexible pipe 87 leading to a circular pipe 88 adapted to pass down around a can in position of rest over the nozzle 46, and having spray openings along its inner periphery from which cleaning liquid is discharged against the outside of the can. The spray pipe 88 is operatively supported by attachment to a pair of brackets 89 slidably mounted upon a pair of vertically positioned bars 90 suitably secured to the wall of the machine. Movement of the spray pipe 88 is controlled by a cable 91 attached to the pipe and passing upwardly over a sheave 92 mounted on the machine wall, thence downwardly around sheaves 93 and 94 and terminating in attachment to the cross pin 53 in the lower end of the plunger 49. With the operative movement of the plunger and deflector head into the can positioned thereover, the spray pipe 88 is lowered about the outside of the can, the ends of the pipe being spaced to pass the support for the strap 20, and the cleaning liquid is discharged upon the outer surface of the can at the same time that the nozzle 46 is in operation, by virtue of the common control valve 74.

The construction herein disclosed has great advantage in efficiently washing milk cans. The annular column of liquid, discharged from the nozzle 46, passing outwardly of the plunger and being progressively deflected over the whole inner surface of the can, permits the effective use of greater volume of liquid than in other types of jets known to the art, and more thoroughly cleanses those surfaces which have contact with the milk. Simultaneously, the outer surface of the can is effectively cleaned of the soil of handling in transit, and the can cover is thoroughly cleaned.

I claim as my invention:

1. In a can washing machine, a liquid discharging jet mechanism having a connection for the supply thereto of liquid under pressure, a valve controlling said connection, mechanism for operating said valve having an actuating lever, a conveyor having a series of can holders adapted to receive cans for successive positioning over said jet mechanism, a plate mounted on each of said can holders adapted to be depressed by a can positioned in said can holder, and a member

carried by said plate which is moved by the depression of said plate into position to engage said lever when said can is positioned over said jet mechanism.

2. In a can washing machine, a conveyor having a series of can holders adapted to receive cans and to move them successively into position to be washed, a liquid spray pipe normally positioned adjacent to the path of movement of said cans and shaped to substantially encircle a can when moved thereabout, said spray pipe having a connection for the supply thereto of liquid under pressure, a support for said spray pipe operable to move said pipe into encircling relation to a can, and along substantially the entire length of said can, and mechanism for operating said support when said can has been conveyed into position to be washed.

In witness whereof I have hereunto attached my signature.

IRVING R. HIPPENMEYER.