Dec. 19, 1933. G. W. COCKS 1,940,076

BOTTLE WASHER AND STERILIZER

Filed Oct. 11, 1929 3 Sheets-Sheet 1

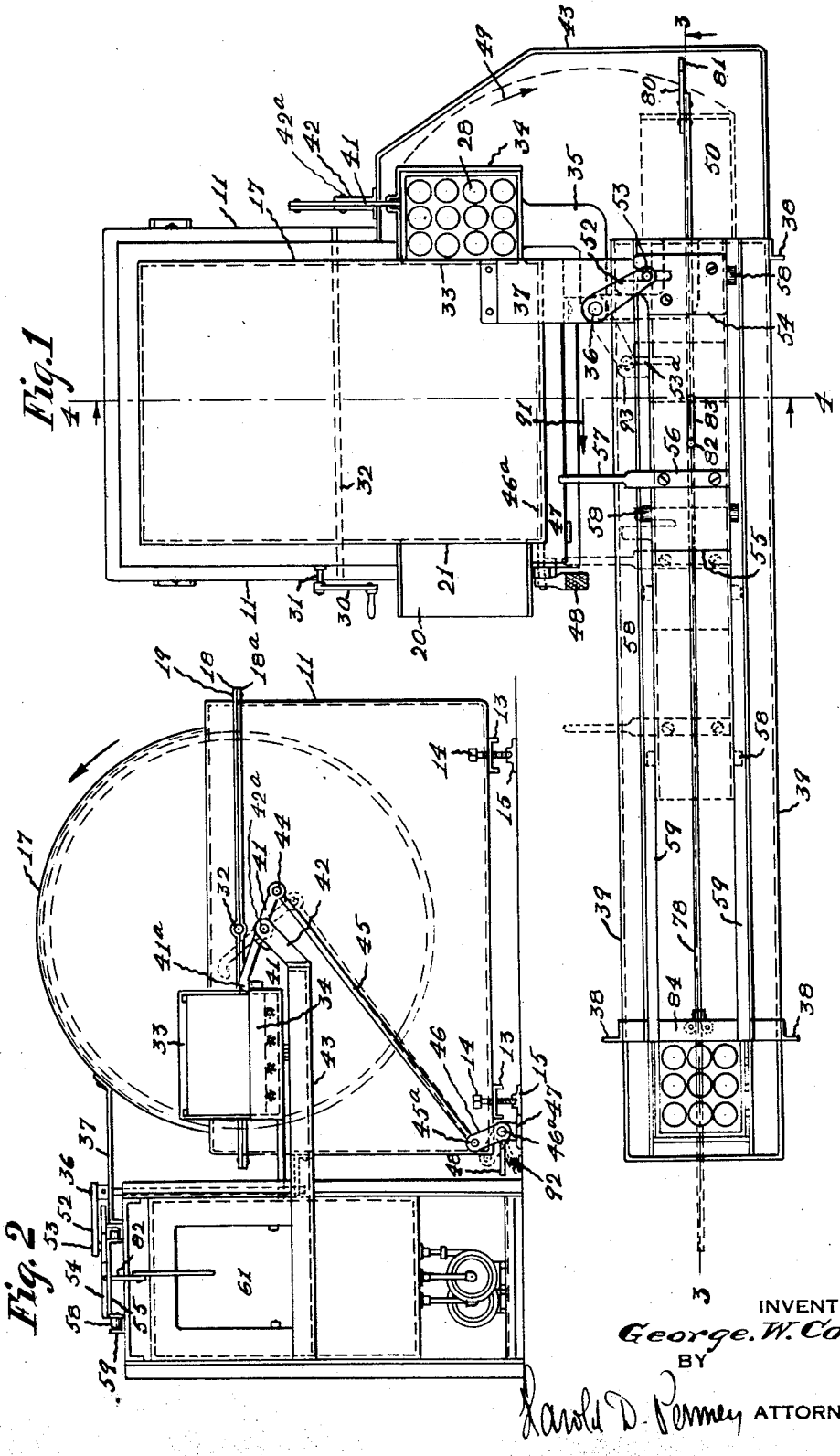


Fig. 1



Fig. 2

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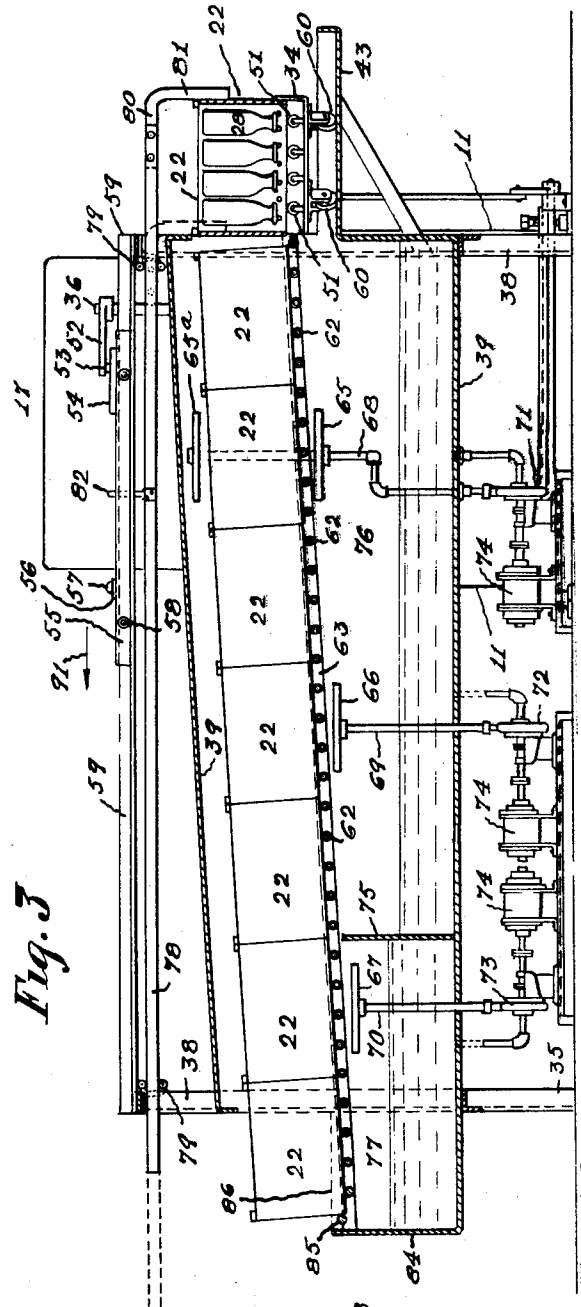


Fig. 3

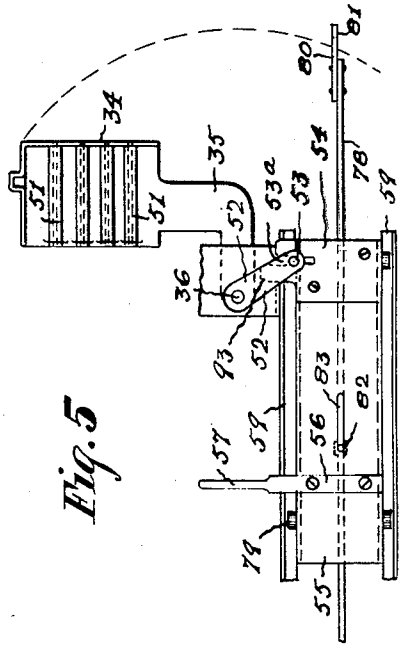


Fig. 5

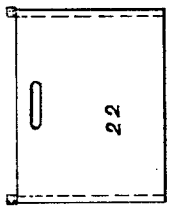


Fig. 7

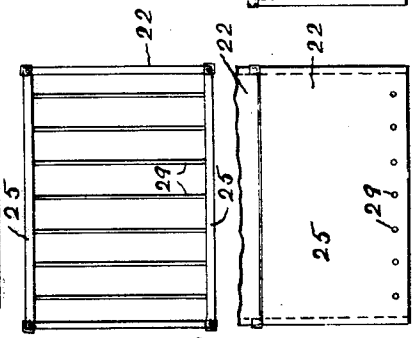


Fig. 8

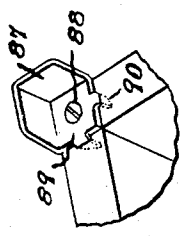


Fig. 9

Fig. 6

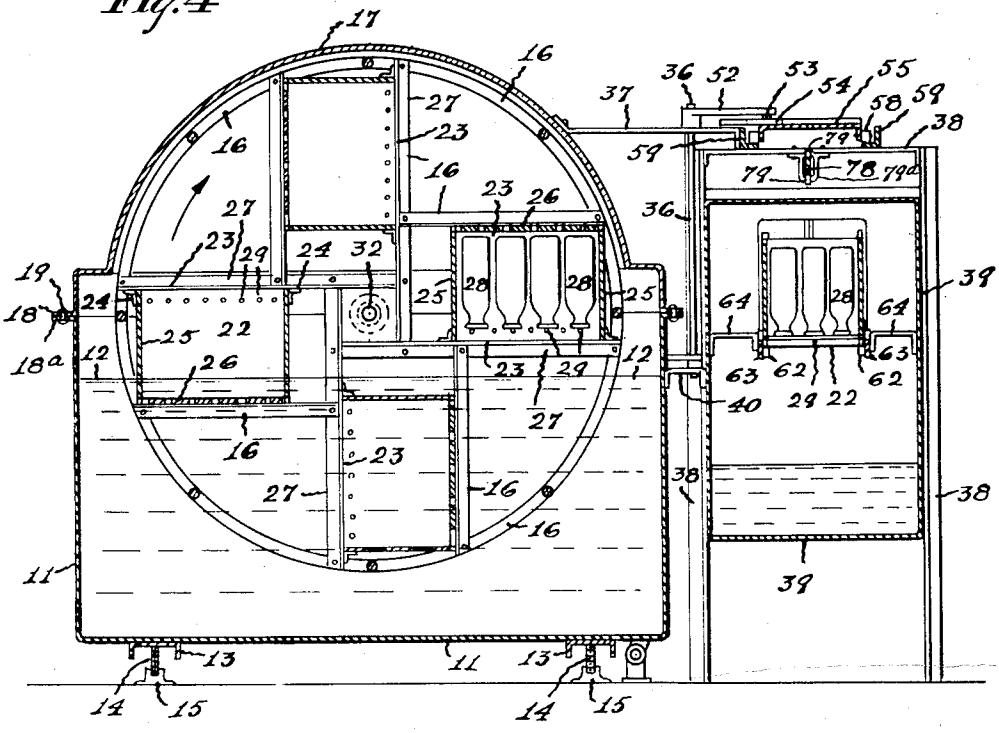
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Fig. 4




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# UNITED STATES PATENT OFFICE

1,940,076

## BOTTLE WASHER AND STERILIZER

George W. Cocks, New York, N. Y.

Application October 11, 1929. Serial No. 398,901

11 Claims. (Cl. 141—7)

This invention relates to improvements in a machine and apparatus for washing bottles and other articles, more particularly machines and apparatuses for washing milk bottles, and it consists in the novel features, which are hereinafter described.

One of the objects of my improvement is to produce a perfected machine and apparatus of this class, which is adapted for use in comparatively small plants, where the volume of work is relatively not very large, and where the outlay for a large automatically operated, fed and controlled machine would be too high to be practical.

Another object of my improvement is to provide a perfected machine of this class, which may be operated, fed and controlled by one man.

A further object of my invention is to wash and sterilize the boxes, which are employed for carrying milk bottles therein, along with the bottles.

A still other object of my invention is to eliminate troubles due to the complicated nature of automatically operated, fed and controlled machines, such as jamming of the boxes in the machines.

A further object of my invention is to produce a perfected machine and apparatus for washing bottles and other articles, which is efficient, simple, durable and inexpensive.

Other objects and advantages will hereinafter appear.

I attain these objects by the machine and apparatus, illustrated in the accompanying drawings, or by any mechanical equivalent or obvious modification of the same.

In the drawings,

Fig. 1 is a plan view of my machine and apparatus for washing bottles and other articles;

Fig. 2 is a rear elevation of the same, looking from right to left in Fig. 1;

Fig. 3 is a vertical section on the line 3—3 of Fig. 1, looking in the direction of the arrow, which is from right to left of the operator of the machine, and showing sundry parts in elevation;

Fig. 4 is a vertical section on the line 4—4 of Fig. 1, looking in the direction of the arrows at the ends of said line 4—4, which is rearwardly in the machine;

Fig. 5 is a fragmentary plan view of a bottle or jar transfer and feeding mechanism, forming a part of my machine and apparatus for washing bottles and other articles;

Fig. 6 is a plan view of a box containing milk bottles, such as employed for feeding bottles or jars into and through my machine and apparatus for washing bottles and other articles;

Fig. 7 is an end view of the box shown in Fig. 6;

Fig. 8 is a fragmentary side view of vertically stacked multiple boxes, such as shown in Figs. 6 and 7;

Fig. 9 is a detail in perspective showing an attachment at each of the upper corners of boxes, containing milk bottles, for engaging the lower ends of other boxes stacked thereon, to retain the latter in position.

Like reference characters refer to like parts throughout the several views:

11 designates a main tank, which is shown in Fig. 4 as containing a suitable liquid 12, such as a chemical solution for washing bottles therewith, which solution may be supplied to or circulated through said tank 11 by means of a suitable pump, which is not shown in the drawings.

The tank 11 may be made of sheet metal, and is shown in Figs. 2 and 4 as reinforced on the bottom thereof by channel bars 13, which are adjustably connected by means of screws 14 to feet 15, which rest on the floor or ground of a plant.

A revolving skeleton drum or cage 16 is mounted on said tank 11, to revolve in a clockwise direction as viewed from the front of the machine, as indicated by the arrow in Fig. 4. The lower part of said drum 16 dips into the liquid 12, contained in said tank 11, and the upper part thereof is enclosed by a hood or cover 17, which is shown in Figs. 2 and 4 as secured to said tank 11 by means of flanges 18 and 18a and rivets 19.

A trough-like passage 20 leads to an opening 21 in the front wall of said hood 17, which opening admits to suitable carriers 23 for boxes 22 of milk bottles 28 or the like on said drum or cage 16. Said carriers 23 extend transversely to the plane of revolution of said drum 16 and consist each of angular guides 24 for the side walls 25 of boxes 22 for milk bottles 28 and a perforated platform 26, which is positioned opposite said bars or guides 24 and may be formed of spaced bars, secured to suitable frame parts on said drum 16, and angle bars 27 on said drum 16, extending parallel to said platform 26 and transversely to said guides 24.

Milk bottles 28 are inverted in said boxes 22 and placed with their mouths against the wires or openwork bottom 29, which normally serve as supports for the bottoms of milk bottles.

The boxes 22 with the inverted bottles 28 therein are placed on said passage 20 and passed one at a time through said opening 21 into one of said carriers 23, which are successively brought into registration with said opening 21 by revolving said drum 16 by means of a crank 30 and suitable reduction gears (not shown, since they are well known to those skilled in the art), operatively connecting the crank shaft 31 to the shaft 32 of said drum 16.

By means of the above gears each complete

revolution of the crank 30 and crank shaft 31 will produce one quarter of a revolution of the drum shaft 32, thereby bringing each successive carrier 23 into registration with said opening 21.

The crank 30 is intermittently operated by hand; boxes 22 are introduced into each carrier 23 in succession, as it comes into registration with said opening 21.

As the drum 16 is being revolved the bottles 28 are first filled with liquid 12, then emptied thereof, thereby initially washing the bottles by means of said liquid 12.

The dimension of said drum 16, which is parallel to the shaft 32 thereof, allows each carrier 23 to support therein two boxes 22, thereby allowing the bottles 28 to be revolved twice through said liquid 12 before being removed therefrom by the action of the operator when he forces a third box into one of said carriers 23 at said opening 21, thereby forcing the second or preceding box from the front part of the carrier 23 to the rear portion thereof and forcing the first box, or the one in advance of said preceding box, from the rear portion of said carrier 23 through an opening 33 in the rear wall of said hood 17 on to a turntable 34 at the rear of said hood 17.

Said turntable 34 has thereon an arm or extension 35, which is secured to a vertically disposed rod 36, which is pivotally connected to an upper plate 37, which is secured at one end thereof to said hood 17, and at the other end thereof to the frame 38 of a drip tank 39. The lower end of said rod 36 is pivotally supported by connections 40, joining said tank 39 to said tank 11, as shown in Fig. 4.

The turntable 34 is intermittently kept in position at the rear of said opening 33 by means of a latch end $41^a$ of a latch-lever 41, shown in Figs. 1 and 2, which is pivotally connected by means of a pin $42^a$ to a bracket 42, which is secured to one end of a platform 43, which is secured to said frame 38 at the rear thereof.

The other end of said lever 41 is pivotally connected by means of a pin 44 to the upper end of a reach rod 45, the lower end of which is pivotally connected by means of a pin $45^a$ to the outer end of an arm 46, which is secured to a horizontally disposed spindle $46^a$, which extends under said tank 11 to the front of the tank 11 and is pivoted in suitable bearings 47.

The front end of said spindle $46^a$ has secured thereto a pedal 48, shown in Fig. 1, within easy reach of the operator of the machine; a spring 92 under said pedal keeps said spindle $46^a$ in position for having said latch $41^a$ engaged to said turntable 34; by stepping on said pedal 48 the operator turns said spindle $46^a$, thereby swinging said arm 46 and pulling on said reach rod 45, which turns said lever 41 into a position shown by dotted lines in Fig. 2, thereby disengaging said latch $41^a$ from said turntable 34 and thereby releasing the same, to be turned with said rod 36 on its pivots in the direction as indicated by the arrow at 49 Fig. 1 and into the position on said platform 43 as indicated by dotted lines at 50 in Fig. 1.

Said turntable 34 has thereon rolls 51, shown in Figs. 3 and 5, to facilitate the moving of said boxes 22 thereonto and therefrom.

Said rod 36 has secured thereto at the upper end thereof the inner end of an arm 52, which is movably engaged at the outer end thereof by means of a pin 53 thereon to a saddle 54 which has therein a slot $53^a$, to engage said pin 53, and is secured to a carriage member 55, which has also secured thereto a handle bar 56, which terminates in a handle 57.

Said carriage 55 has thereon rolls 58, which are shown in Fig. 3 as supported by angular bars 59, forming a trackway for said carriage 55. The bars 59 are secured to the frame 38 of said drip tank 39, as shown in Figs. 3 and 4.

When the operator pulls on said handle 57 frontwardly, as shown by the arrows at 91 in Figs. 1 and 3, said arm 52 is thereby turned from the position shown in full lines to the position shown in dotted lines in Fig. 1, thereby turning said rod 36, with said arm 35 thereon and said turntable 34 through an angle substantially of 90 degrees, thereby moving said turntable 34 with a box 22 and bottles 28 thereon on said platform 43, to the position shown at 50 in Fig. 1.

To facilitate the motion of said turntable 34 on said platform 43 the former is provided with rolls 60 thereunder, as shown in Fig. 3.

From said turntable 34 the boxes 22 are moved by a means, which is hereinafter described, through an opening 61 in the rear of said drip tank 39 on to an inclined conveyor or track which includes a double series of rolls 62, carried by a pair of inclined bars 63, positioned in said tank 39 lengthwise thereof and spaced from the side walls of said tank 39 by means of brackets 64, as shown in Fig. 4. As these rollers 62 are spaced apart the track is in effect an openwork structure.

Said bars 63 are inclined downwardly and frontwardly, and the boxes 22 are moved by gravity from the rear end of said drip tank 39 towards the front thereof with said bottles 28 therein inverted over said wires 29, to receive a spray from nozzles or spraying heads 65, $65^a$, 66 and 67, which are connected to the upper ends of discharge pipes 68, 69 and 70 respectively of circulating pumps 71, 72 and 73, which are driven by motors 74. The spraying means 65, 66, 67 are positioned at successively decreasing heights to accommodate the incline of the passage containing the rolls 62.

The sprays from said nozzles 65, 66 and 67 are directed upwardly to wash the bottles 28 interiorly and the spray from the nozzle $65^a$ is directed downwardly to wash said bottles externally.

A vertical partition 75 divides the interior of said tank 39 into two compartments 76 and 77, which may contain distinct solutions for rinsing said bottles 28, as for example, the compartment 76 may contain clean water and the compartment 77 may contain chlorinated water.

The intakes of said pumps 71 and 72 are shown in Fig. 3 as communicating with said compartment 76 and the intake of said pump 73 communicates with said compartment 77.

Suitable means either standard or special for replenishing the liquids in said compartments 76 and 77 may be provided, which are not shown in the drawings.

To move said boxes 22 from said turntable 34 on to said series of rolls 62 I provide a horizontally disposed pulling rod 78, which passes at each end of said frame 38 between a pair of rolls 79, supported by brackets $79^a$ thereon and forming a guide for said rod 78.

At the rear end thereof said rod 78 has secured thereto one branch 80 of a hook 80—81, which has its other branch 81 disposed substantially vertically and rearwardly of said boxes 22, as shown in Fig. 3.

A vertically disposed pin 82 is secured to said

rod 78 at a point opposite a slot 83 in said carriage 55 lengthwise thereof.

When said carriage 55 is moved as above described, to effect the rotation of said turntable 34 through an angle of 90 degrees, said slot 83 in said carriage 55 allows the latter to be moved a required distance without affecting said pin 82. A continued motion of said carriage 55 frontwardly causes the end of said slot 83 to engage said pin 82, thereby moving said rod 78 frontwardly and thereby causing said branch 81 of said hook 80—81 to engage and move said box 22 from said turntable 34 and pull it on to said series of rolls 62.

During this continued motion of said carriage 55 the pin 53 of said arm 52 is disengaged from said slot 53a, the parts of said carriage 55 adjacent said slot 53a being shaped to disengage said pin 53 by a motion of said carriage from the rear to the front of the machine beyond the point at which said arm 52 is instrumental in bringing said turntable 34 to the rear end of said drip-tank 39, and to re-engage said pin 53 at said point by a rearward motion of said carriage 55. To effect this last mentioned purpose said carriage 55 has thereon a spur 93 at the front of said slot 53a, as shown in Figs. 1 and 5, disposed to effect the above described result.

A rearward motion of said carriage 55 returns said rod 78 with said hook 80—81 thereon to the position shown in Fig. 3 and also returns the arm 52 to the position shown in Fig. 5 and in full lines in Fig. 1, thereby bringing the turntable 34 to the position shown in Figs. 1 and 5 at the rear of the hood 17, to receive another box 22 with bottles 28 therein.

Said boxes 22 on intermittently descending on said series of rolls 62 in said tank 39 may form a train, as shown in Fig. 3, which passes through an opening 61 in the rear part of said tank 39 and is stopped at the frontward delivery end 84 of said tank 39 by means of a roll 85.

Said end 84 extends frontwardly of the upper inclined part of said tank 39 and has at the top thereof a horizontal opening 86, through which said boxes 22 may be manually removed one at a time and piled up in vertical stacks as shown in Fig. 8 preliminary to their being removed for refilling. The rollers 62 adjacent the platform 43 form a receiving end of the roller conveyor, and those at the opening 86 a delivery end.

To insure the retention of said boxes 22 in vertical stacks of some height I provide at the top of each corner of each of said boxes 22 a semicubical corner clasp 87, as shown in Fig. 9.

Each of said clasps 87 consists substantially of three sides adjacent to one corner of a hollow cube or parallelepiped, one of said sides 89 being secured by means of a screw 88 to the top of said box 22 at the corner thereof and the remaining two sides of said clasp 87 are positioned with their inner surfaces substantially in the planes of the outer sides of said box 22 intersecting at said corner.

Said side 89 is shown in Fig. 9 as having thereon claws 90, formed integrally therewith and extending at right angles thereto, to be driven into the wood of said box 22 at said corner, to cooperate with said screw 88 in retaining said clasp 87 in position on said box 22.

The action of said clasps 87 is evident from the drawings and the above description.

Many changes may be made in the details of my machine and apparatus for washing bottles and other articles without departing from the main scope of my invention, and parts of my invention may be used without other parts.

I do not therefore restrict myself to the details as shown in the drawings; but I intend to include also all mechanical equivalents and obvious modifications of the same within the scope of my invention.

Whenever in the claims hereinafter the term "bottles" is employed, it is meant to include also jars and other articles to be washed.

I claim as my invention, and desire to secure by Letters Patent:

1. In a machine for washing bottles and other articles, a drip tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turntable for transferring said boxes from the said washing means to said tank, means for oscillating said turntable, means for successively passing said boxes from said turntable to said support, and one or more spraying heads to discharge sprays of liquids into said bottles on said support.

2. In a machine for washing bottles and other articles, a drip tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turntable for transferring said boxes from the washing means to said tank, an oscillating member, secured to said turntable, means for oscillating said member, thereby operating said turntable, means for successively passing said boxes from said turntable to said support, and one or more spraying heads to discharge sprays of liquids into said bottles on said support.

3. In a machine for washing bottles and other articles, a drip tank, a frame for said tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turntable for transferring said boxes from the washing means to said tank, an oscillating member secured to said turntable, a carriage mounted on said frame to have a to-and-fro motion thereon, an arm secured to said member to be intermittently engaged by said carriage thereby oscillating said member and operating said turntable, means for actuating said carriage to move said carriage to-and-fro, means for successively passing said boxes from said turntable to said support, and one or more spraying heads to discharge sprays of liquids into said bottles on said support.

4. In a machine for washing bottles and other articles, a drip tank, a frame for said tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turntable for transferring said boxes from the washing means to said tank, an oscillating member secured to said turntable, a carriage mounted on said frame to have a to-and-fro motion thereon, an arm secured to said member, a pin on said arm, said carriage having therein a slot intermittently to engage said pin thereby oscillating said member and operating said turntable, a means for actuating said carriage, to move said carriage to-and-fro, a means for successively passing said boxes from said turntable to said support, and one or

more spraying heads to discharge sprays of liquids into said bottles on said support.

5. In a machine for washing bottles and other articles, a drip tank, a frame for said tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turntable for transferring said boxes from the washing means to said tank, a carriage mounted on said frame to have a to-and-fro motion thereon, a means for transmitting motion from said carriage to said turntable to operate the same a means for actuating said carriage, to move said carriage to and fro, a pulling rod, having thereon a branch for successively passing said boxes from said turntable to said support, a means for transmitting motion from said carriage to said pulling rod to actuate the latter without interfering with the operation of said turntable by said carriage, and one or more spraying heads to discharge sprays of liquids into said bottles on said support.

6. In a machine for washing bottles and other articles, a drip tank, a frame for said tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turntable for transferring said boxes from the washing means to said tank, a carriage mounted on said frame to have a to-and-fro motion thereon, a means for transmitting motion from said carriage to said turntable to operate the same, a means for actuating said carriage to move said carriage to-and-fro, a pulling rod having thereon a branch for successively passing said boxes from said turntable to said support, a pin and slot connection between said carriage and said pulling rod for transmitting motion from the former to the latter, to actuate the same without interfering with the operation of said turntable by said carriage, and one or more spraying heads to discharge sprays of liquids into said bottles on said support.

7. In a machine for washing bottles, a drip tank, a frame for said tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turntable for transferring said boxes from the washing means to said tank, a carriage mounted on said frame to have a to-and-fro motion thereon, an oscillating member secured to said turntable, an arm secured to said member, a pin on said arm, said carriage having therein a slot to engage said pin during part of its motion and to release said pin at a point in its motion in one direction, thereby intermittently oscillating said member and operating said turntable, a pulling rod for successively passing said boxes from said turntable to said support, a means for actuating said pulling rod by and during another part of the motion of said carriage, a spur on said carriage at said slot, to cause said slot to reengage said pin at said point when said carriage is moving in the opposite direction from the one above mentioned, thereby allowing said turntable and said pulling rod to be successively actuated by the motion of said carriage without their operations interfering with each other, and one or more spraying heads to discharge sprays of liquids into said bottles on said support.

8. In a machine for washing bottles, a drip tank, a frame on said tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turntable for transferring said boxes from the washing means to said tank, a carriage mounted on said frame to have a to-and-fro motion thereon, an oscillating member secured to said turntable, a means for intermittently oscillating said member by the motion of said carriage during part of said motion thereby operating said turntable, a pulling rod having thereon a branch for successively passing said boxes from said turntable to said support, a means for actuating said pulling rod by and during another part of the motion of said carriage, said second named means including a means for allowing said turntable and said pulling rod to be successively actuated by the motion of said carriage without their operations interfering with each other, and one or more spraying heads to discharge sprays of liquids into said bottles on said support.

9. In a machine for washing bottles and other articles, a drip tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turntable for receiving said boxes from the washing means and transferring the same to said tank, a latching means for holding said turntable during the operation of receiving said boxes, a means for operating said latching means, a means for successively passing said boxes from said turntable to said support, and one or more spraying heads to discharge sprays of liquids into said bottles on said support.

10. In a machine for washing bottles and other articles, a drip tank, a support in said tank for passing thereover boxes containing bottles to be washed, means for initially washing said bottles in said boxes preliminary to passing them through said tank, a turnable for receiving said boxes from the discharge end of said washing means and transferring the same to said tank, a pivotally mounted latch lever for holding said turntable at said end during the operation of receiving said boxes, a reach rod at the discharge end of said washing means, operatively connected at one end thereof to said lever for intermittently actuating the same, an oscillating spindle extending from end to end of said washing means and operatively connected to the other end of said reach rod to move the same, means for intermittently oscillating said spindle thereby moving said reach rod and actuating said lever, means for successively passing said boxes from said turntable to said support, and one or more spraying heads to discharge sprays of liquids into said bottles on said support.

11. In a bottle washing machine, means for washing bottles, an oscillatable platform for receiving the washed bottles, an inclined gravity conveyor for conveying the bottles from the platform to a discharge point, means to oscillate said platform so as to bring it adjacent to said washing means or said gravity conveyor, and a spraying device disposed in bottle spraying position adjacent the conveyor.

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