April 14, 1925. 1,533,150

C. J. ULRICH ET AL

MACHINE FOR WASHING SERVING TRAYS

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Fig. 1

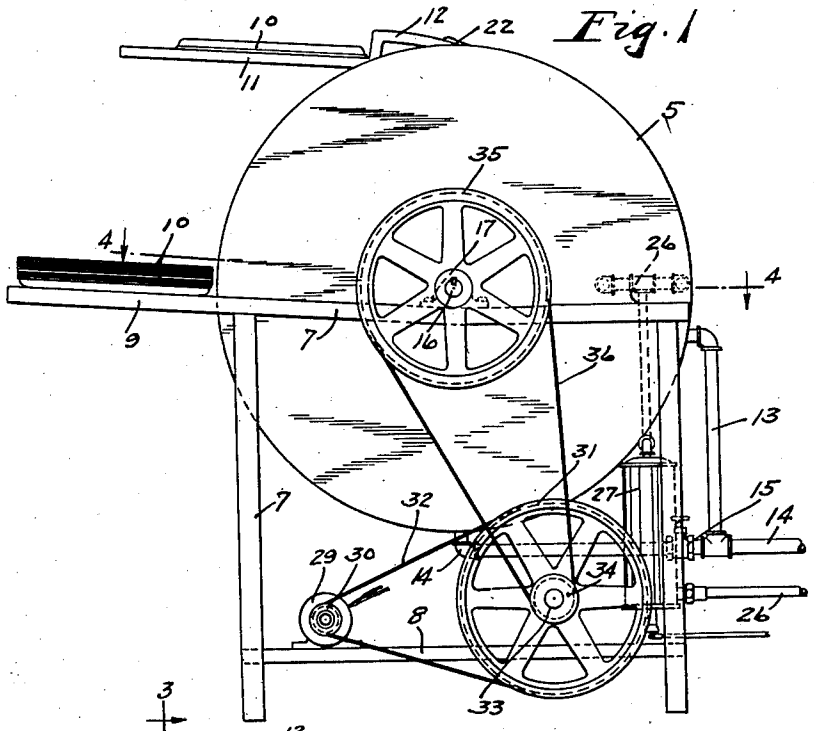
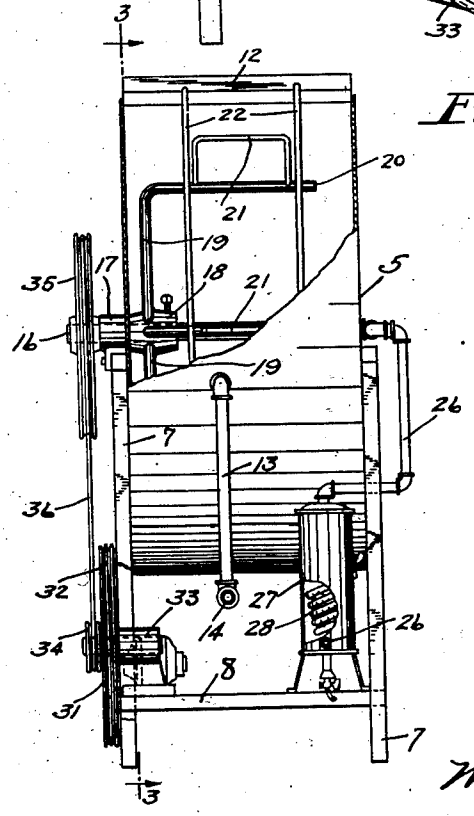


Fig. 2



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Fig. 3

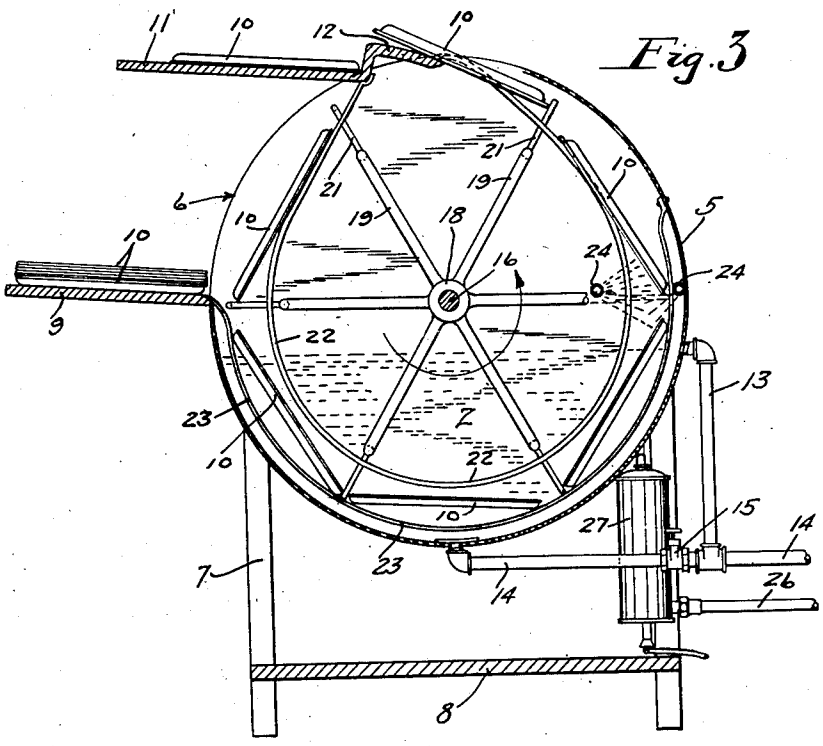
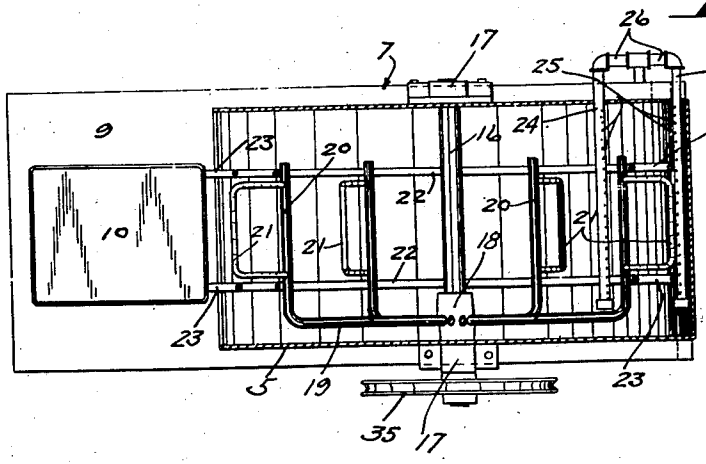


Fig. 4



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UNITED STATES PATENT OFFICE.

CARL J. ULRICH, OF LAKE CRYSTAL, AND WYMAN A. MILLER, OF MINNEAPOLIS, MINNESOTA.

MACHINE FOR WASHING SERVING TRAYS.

Application filed June 13, 1921. Serial No. 477,103.

To all whom it may concern:

Be it known that we, CARL J. ULRICH, a citizen of the United States, residing at Lake Crystal, in the county of Blue Earth and State of Minnesota, and WYMAN A. MILLER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Machines for Washing Serving Trays; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention has for its object to provide an extremely simple and highly efficient machine for washing serving trays used in restaurants, cafeterias, and the like, and to this end, it consists of the novel devices and combination of devices hereinafter described and defined in the claims.

In the accompanying drawing which illustrates the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:—

Fig. 1 is a side elevation of the improved machine;

Fig. 2 is a rear elevation of the same with some parts broken away and sectioned;

Fig. 3 is a view principally in vertical section, taken substantially on the line 3—3 of Fig. 2; and

Fig. 4 is a view partly in plan and partly in section, taken on the line 4—4 of Fig. 1.

The numeral 5 indicates a cylindrical water-containing drum or receptacle having a horizontally disposed axis and which drum is entirely closed, except for a single opening 6, in the front and above the axis thereof. This drum 5 is supported in a skeleton frame 7 having a shelf 8 located on the under side of said drum. Supported on the frame 7 at the lower edge of the opening 6, is a receiving shelf 9 adapted to support nested soiled trays 10, as shown in Fig. 3. Secured to the drum 5, above the shelf 9, is a delivery shelf 11 on which the washed trays 10 are automatically stacked, as will presently appear. Located above the shelf 11, at the inner edge thereof, and extending slightly into the drum 5, is a deflecting board 12.

An overflow pipe 13 taps the drum 5 at the back thereof and maintains a predetermined level of water Z in said drum below the axis thereof and arranged to discharge into a drain pipe 14 leading from the bottom of the drum 5. A normally closed valve 15 is interposed in the drain pipe 14 between the drum 5 and overflow pipe 13.

For conveying the trays 10 from the receiving shelf 9 through the water Z and onto the deflecting board 12, there is provided a reel mounted on a horizontal shaft 16, the ends of which extend through the heads of the drum 5 at the axis thereof, and journaled in bearings 17 on the frame 7. The hub 18 of the reel is keyed to the shaft 16 close to the right-hand head of the drum 5, and has rigidly secured thereto, a plurality of radial arms 19, the outer end portions of which are bent horizontally toward the left-hand head of the drum 5 parallel to the shaft 16 and afford circumferentially spaced arm extensions 20. To each arm extension 20 is rigidly secured a radially and outwardly extended U-shaped tray-engaging extension 21.

To guide the trays 10 from the receiving shelf 9 through the water Z and onto the deflecting board 12, there are provided concentric radially spaced inner and outer guide rails 22 and 23, respectively, arranged in laterally spaced pairs within the drum 5. The outer guide rails 23 are substantially semi-circular and radially spaced above the bottom of the drum 5 and extend from the inner edge of the receiving shelf 9 downward into the water and out thereof at the back of the drum 5, and are rigidly secured to the back of the drum 5, materially above the axis thereof, by rivets or otherwise. The inner guide rails 22 are considerably more than semi-circular and the front end portions thereof, above the axis of the drum 5, extend tangentially to the rear edge of the delivery shelf 11 and are attached thereto. By reference to Fig. 3, it will be noted that the tangential portions of the inner guide rails 22 incline inward materially in respect the receiving shelf 9 to support the trays 10 on the reel extension 21, as indicated in Fig. 3. The curvature of the rear end portions of the inner guide rails 22 above the outer guides rails 23 is materially flattened and the ends of said outer guide rails 23 are attached to the inner edge portion of the deflecting board 12 at the upper face thereof. The arm extensions 20 are arranged to travel quite close to, and over, the inner faces of

the inner pair of guide rails 22 and the tray-engaging extensions 21 extend between the pairs of guide rails 22 and 23, as shown in Figs. 2 and 4.

Water is supplied for rinsing the trays 10 and maintaining the water level in the drum 5 by means of a rinsing device, which, as shown, comprises a pair of horizontally extended and horizontally spaced nozzle tubes 24 which extend through the left-hand head of the drum 5 and substantially completely across the drum, at the rear thereof, with the pairs of guide rails 22 and 23 extending therebetween. In the opposing faces of the nozzle tubes 24 are formed a multiplicity of holes 25 arranged to discharge intersecting jets of water between said guide rails, and through which jets of water, the trays must pass during their travel from the water Z to the delivery shelf 11, as best shown in Fig. 3. Water is supplied to the nozzles 24 through a water supply pipe 26 having interposed therein, a gas water heater 27, the coil 28 of which forms a portion of said water supply pipe.

The reel is driven in the direction of the arrow marked thereon in Fig. 3, by an electric motor 29, mounted on the shelf 8, and on the armatured shaft of which is secured a relatively small grooved pulley 30 aligned with a relatively large grooved pulley 31, over which two pulleys runs a belt 32. The pulley 31 is loosely journaled on a bearing 33 on the shelf 8 and has rigidly secured thereto, on its outer face, a relatively small grooved pulley 34 aligned with a relatively large grooved pulley 35 keyed to the reel shaft 16, and over which two pulleys, 34 and 35, runs a belt 36.

The operation of the tray washing machine may be briefly described as follows: The reel is driven at the desired speed from the motor 29 and during the rotation of the reel, the spraying device is in constant action and drains into the drum 5 and thereby maintains the supply of water Z in which the trays are washed and in which water may be placed, soap or washing powder. The constantly open drain 13 maintains a predetermined water level in the drum 5 and when it is desirable to drain the water from the drum 5, the valve 15 may be opened to allow the water therein to flow through the drain pipe 14. The trays 10 are placed, by the attendant, on the receiving shelf 9 with their open sides up, and nested, as indicated in Fig. 3. These soiled trays are placed, by the attendant, one on each of the reel extensions 21, as the same are rotated past the receiving shelf 9, and leaned against the tangential portions of the inner guide rails 22 with their open sides turned toward the axis of the reel, as indicated in Fig. 3. The rotation of the reel permits the trays to enter the water Z, between the upper and lower guide rails 22 and 23, under their own weight. The trays are then engaged by the next following reel extension 21 and move through the water Z on the outer guide rails 23, lifted out of the water and carried through the rinsing water which sprays hot water on both sides of the trays. The reel extensions 21 hold the trays 10 edgewise spaced, one in advance of the other, so that all parts thereof come in contact with the water Z and the rinsing water. During the travel of the trays through the rinsing water, the upper edges thereof are directed inward, toward the axis of the drum 5, by the outer guide rails 23 and said trays tipped inward onto the inner guide rails 22, which turns their open sides downward so that all water will drain from the trays. As the trays are elevated by the reel on the inner guide rails 22, the same are carried thereby, onto the deflecting board 12 a sufficient distance to permit the reel extensions 21 to pass the same and leave the trays where they will be successively engaged by the next following trays and automatically moved onto the delivery shelf 11 in inverted and nested positions where they may be removed by the attendant. Preferably, as shown, the drain pipe 14 is covered with a screen.

The above described invention is extremely simple in its action and requires only a single attendant to feed soiled trays thereto and remove the same therefrom, after having been thoroughly washed and rinsed. The rinsing water may be heated to a temperature which will thoroughly scald the trays and thereby sterilize the same, and as all of the water is drained from the trays, after passing the rinsing device, they will dry without wiping. In place of the gas heater shown in the drawings, the water may be heated in any other suitable manner.

What we claim is:—

1. The combination with a water-containing receptacle, of inner and outer laterally spaced pairs of tray guides in the receptacle, and a reel working at one side of the guides and having means working between the inner pair of guides, said means being arranged to move successive trays on the outer pair of guides through the water and thereabove, said inner and outer guides being arranged to cause the trays to move under the action of gravity from the outer pair of guides onto the inner pair of guides into draining position.

2. The combination with a water-containing receptacle, of inner and outer tray guides in the receptacle, a reel having radial arms working at one side of the guides, the outer end portions of said arms being extended laterally and arranged to travel within the inner guides, and means on the

laterally extended end portions of the arms working between the inner guides and arranged to move successive trays on the outer guides through the water and thereabove into draining position on the inner guides.

3. The combination with a water-containing receptacle, of inner and outer laterally spaced pairs of guides in the receptacle arranged to direct trays through the water, and a reel having radial arms working at one side of the pairs of guides, the outer ends of said arms being extended horizontally inward of the inner pair of guides and provided with tray engaging extension working between the inner pair of guides.

4. The combination with a water-containing receptacle, of concentric laterally spaced pairs of guides in the receptacle arranged to direct trays through the water, and a revoluble reel having radial arms working at one side of the pairs of guides, the outer ends of said arms being extended horizontally inward of the inner pair of guides and provided with U-shaped tray-engaging extensions working between the inner pair of guides.

In testimony whereof we affix our signatures.

CARL J. ULRICH.
WYMAN A. MILLER.