

Jan. 1, 1963

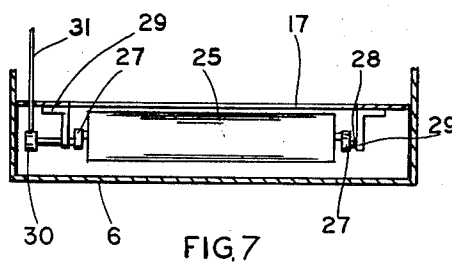
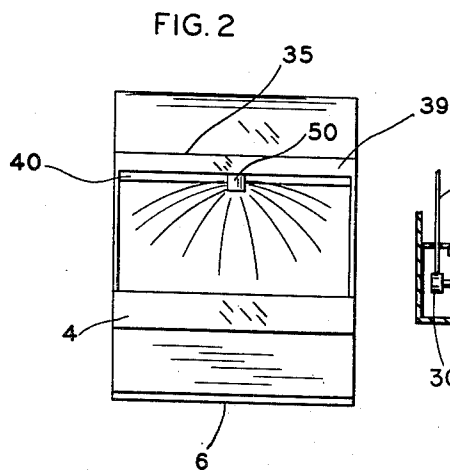
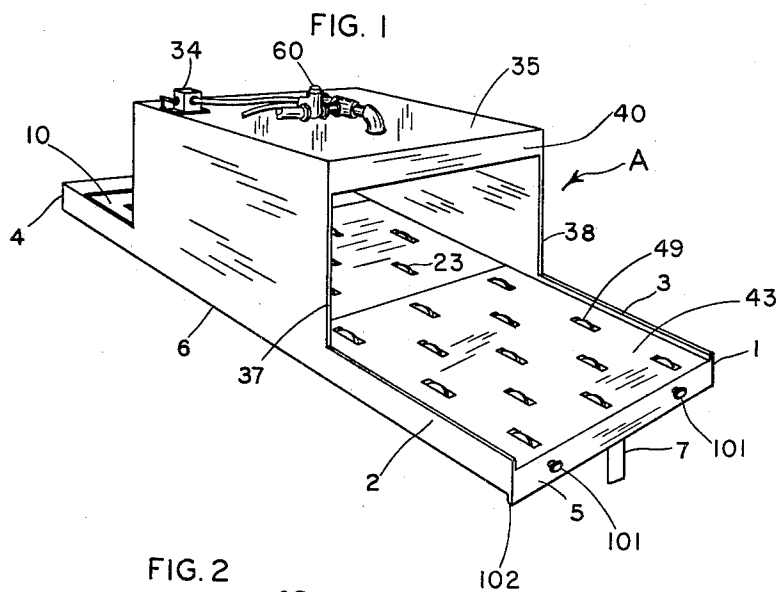
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3,071,144.

PRELIMINARY RINSING MACHINES

Filed March 3, 1958

4 Sheets-Sheet 1



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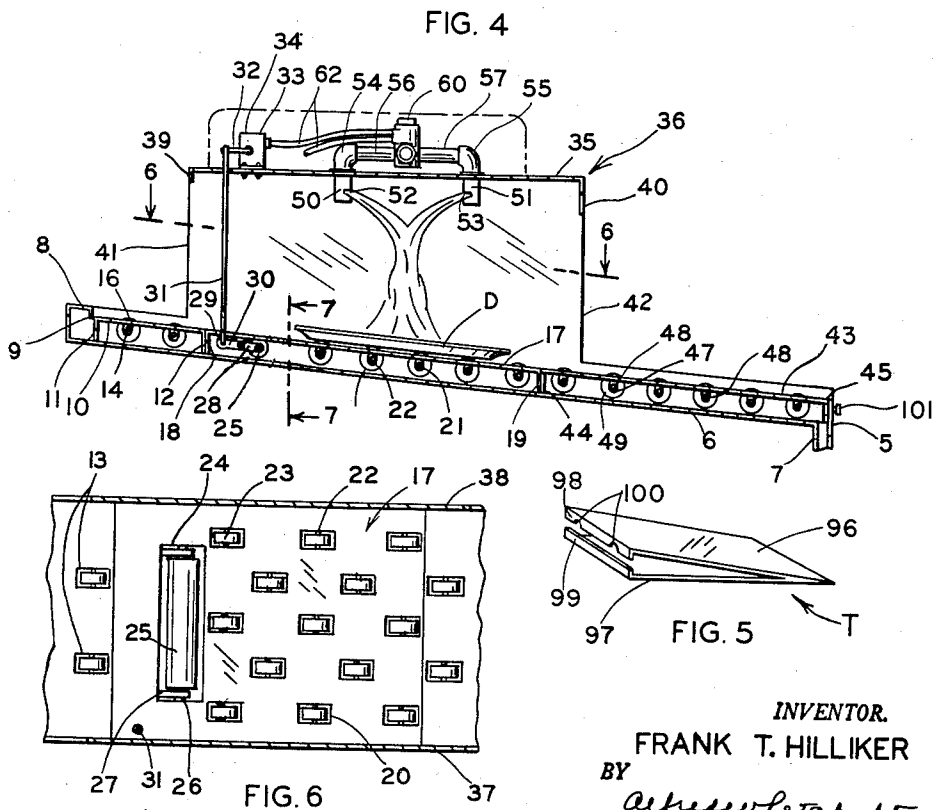
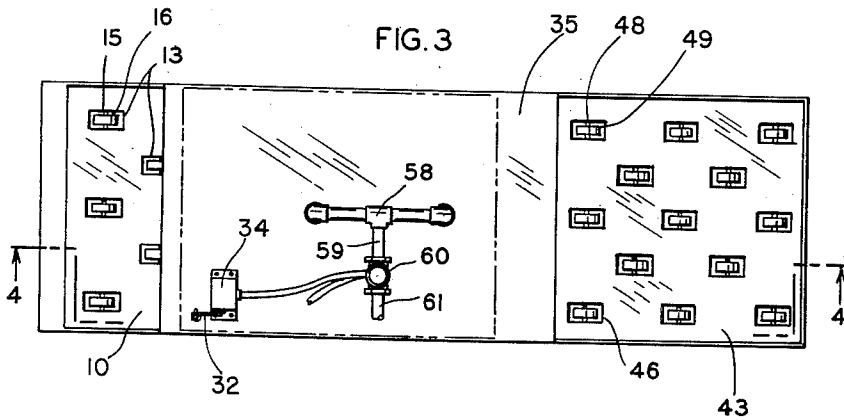
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PRELIMINARY RINSING MACHINES

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4 Sheets-Sheet 2



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PRELIMINARY RINSING MACHINES

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4 Sheets-Sheet 3

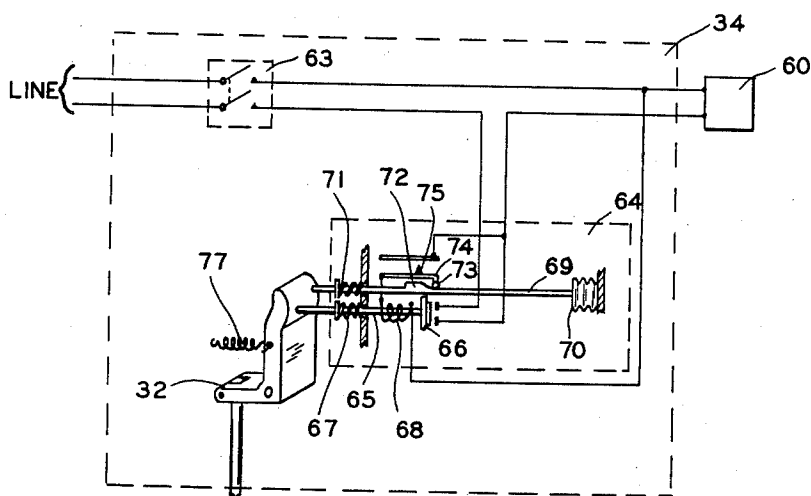


FIG. 8

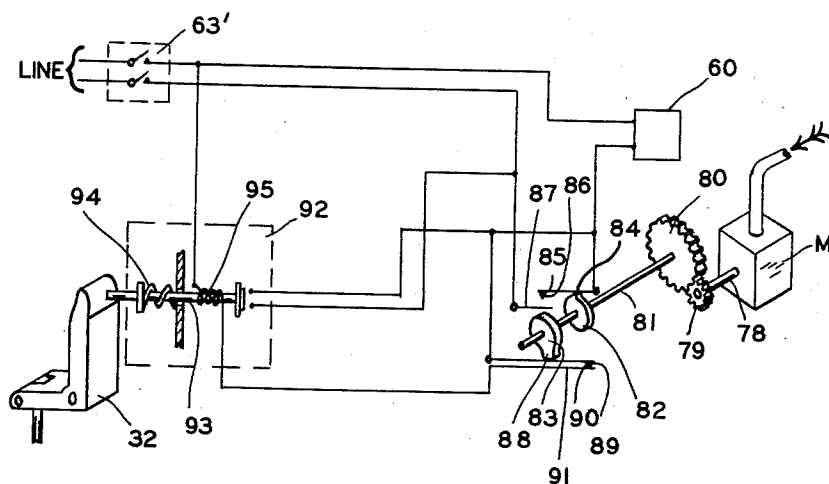


FIG. 9

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PRELIMINARY RINSING MACHINES

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4 Sheets-Sheet 4

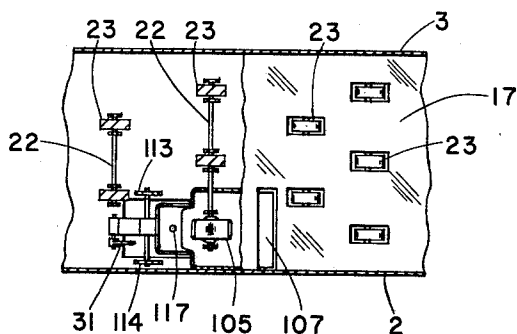
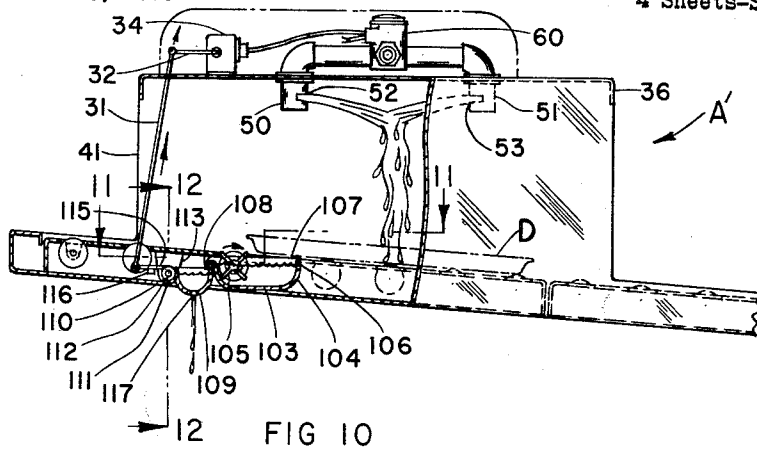


FIG 11

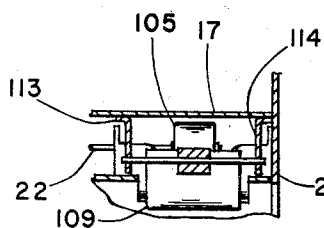


FIG 12

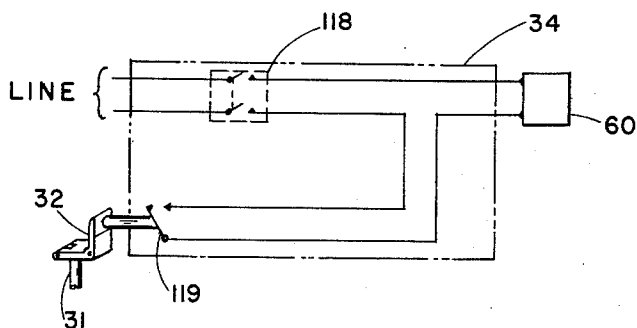


FIG 13

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3,071,144

PRELIMINARY RINSING MACHINES

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6 Claims. (Cl. 134-46)

This invention relates in general to certain new and useful improvements in dishwashing machinery and, more particularly, to a preliminary rinsing machine for soaking dishes and tableware prior to insertion into dishwashing equipment.

In the washing of dishes in restaurants, commercial establishments, institutions, and the like, the dishes are usually brought in by tray or other conventional means to a table known as a scrapping table. This table usually has a relatively large area so as to accommodate a reasonable number of dishes and is also provided with some kind of aperture or chute into which the garbage, debris, and other solid materials can be scraped. At the same time, the dish is usually held under a continuously flowing jet of water which, in theory at least, flushes some of the soil from the surface of the dish and aids in removing the garbage and other solid material.

One of the important ends to be accomplished in this preliminary procedure is to insure that the dish is thoroughly wetted before it is routed into the dishwasher because a dish which is dry, when placed in conventional types of dishwashers, is very difficult to wash thoroughly. On the other hand, if the dish is thoroughly wetted, it can be effectively washed and sterilized in almost any type of dishwasher. The significance of wetting the dish prior to introduction into the dishwasher has not been heretofore fully recognized and most certainly has been ignored or disregarded in actual practice. As a matter of fact, the flushing water which is available at the scrapping table is most often used merely as a means for removing solid material, such as garbage and bones from the plate, and flushing them down through the garbage disposal opening in the scrapping table. No effort is ordinarily made to take advantage of this stream of flushing water to wet the dishes thoroughly. Furthermore, in many scrapping table operations, the flushing water is omitted or turned off because the person carrying out this work usually considers it an extra and unnecessary chore to hold the dish under the stream of flushing water and does not understand the necessity of thoroughly wetting the dish prior to placing it in the dishwasher.

It is, therefore, the primary object of the present invention to provide a preliminary dish-rinsing machine which will thoroughly soak the dish prior to introduction thereof into the dishwasher.

It is another object of the present invention to provide a preliminary dish-rinsing machine which is simple and conventional in operation and automatically controls the amount and flow of flushing water as a dish moves there-through.

It is an additional object of the present invention to provide a preliminary dish-rinsing machine which can readily be interposed between the scrapping table and the dishwashing machine so that the dishes may be conveniently and steadily fed from the scrapping table through the preliminary rinsing machine on the way to the dishwasher.

It is a further object of the present invention to provide a preliminary dish-rinsing machine which is rugged, durable, and trouble-free in operation.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings (four sheets)—

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FIG. 1 is a perspective view of a preliminary dish-rinsing machine constructed in accordance with and embodying the present invention;

FIG. 2 is an end elevational view of the preliminary dish-rinsing machine;

FIG. 3 is a top plan view of the dish-rinsing machine;

FIG. 4 is a longitudinal sectional view taken along line 4-4 of FIG. 3;

FIG. 5 is a side elevational view of an auxiliary transfer plate forming a part of the present invention;

FIGS. 6 and 7 are fragmentary sectional views taken along lines 6-6 and 7-7, respectively, of FIG. 4;

FIG. 8 is a diagrammatic view of the control mechanism and circuitry forming a part of the present invention;

FIG. 9 is a modified form of the control mechanism and circuitry forming a part of the present invention;

FIG. 10 is a side elevational view, partially broken away and in section, of a modified form of preliminary dish-rinsing machine constructed in accordance with and embodying the present invention;

FIG. 11 is a fragmentary sectional view taken along line 11-11 of FIG. 10;

FIG. 12 is a fragmentary sectional view taken along line 12-12 of FIG. 10; and

FIG. 13 is a diagrammatic view of the control mechanism and circuitry for the machine shown in FIGS. 10-12.

Referring now in more detail and by reference characters to the drawings, which illustrate practical embodiments of the present invention, A designates a preliminary dish-rinsing machine comprising an oblong, rectangular table-like base 1 including spaced parallel longitudinal side walls 2, 3, integrally connected by transverse end walls 4, 5, and a bottom wall 6. As will be seen by reference to FIGS. 1 and 4, the base 1 is arranged so that it will be normally inclined downwardly at a substantial angle from the rearward transverse end wall 4 to the forward transverse end wall 5 and is provided at its lower end with a downwardly discharging drain pipe 7, which is conventionally connected to the sewer or any other suitable water disposal system.

Formed integrally with the rear transverse wall 4 and extending transversely between the side walls 2, 3, is a narrow flange 8 which lies in the plane of the upper margin of the side walls 2, 3, and is provided with a downwardly turned vertical lip 9. Disposed within the base 1 and extending transversely between the inner faces of the side walls 2, 3, is a receptor plate 10 provided along its transverse margins with vertical leg-forming flanges 11, 12, adapted to rest upon the upper face of the bottom wall 6, so as to support the receptor plate 10 in upwardly spaced relation thereto. The receptor plate 10 is provided with a series of staggered rows of rectangular apertures 13, each of which is provided along its two opposed parallel longitudinal margins with downwardly struck ears 14 for rotatably supporting short horizontal shafts 15, which are, in turn, provided with rubber-wheels 16. It will be noted by reference to FIGS. 1 and 4 that the roller-wheels 16 project upwardly through the apertures 13, so that dishes and tableware placed upon the receptor plate 10 will rest directly upon the roller-wheels 16, for purposes presently more fully appearing.

Similarly disposed between the inner faces of the side walls 2, 3, forwardly of, and in coplanar relation to, the receptor plate 10, is a rinse plate 17 having downwardly turned leg-forming flanges 18, 19, which rest upon the upper face of, and support the rinse plate 17 in upwardly spaced parallel relation to, the bottom wall 6. The flange 18, furthermore, is disposed in snug-fitting abutment against the flange 12 so that the upwardly presented surfaces of the receptor plate 10 and rinse plate 17 are sub-

stantially flush and continuous. The rinse plate 17 is, furthermore, provided with a plurality of rows of staggered rectangular apertures 20, each of which is provided along its opposed parallel longitudinal margins with downwardly struck ears 21 for supporting short horizontal shafts 22, which are, in turn, provided with roller-wheels 23 similar to the roller-wheels 16. As will be seen in FIG. 4, the roller-wheels 23 project slightly upwardly through the apertures 20 to support plates and similar tableware which pass over the rinse plate 17.

The rinse plate 17 is also provided, adjacent its rearward margin, with an elongated rectangular slot 24 which extends symmetrically across the longitudinal center line and spans a substantial portion of the width thereof for accommodating a roller 25 which is operatively mounted upon a shaft 26 journaled at its end in a pair of rock arms 27, the latter being rigidly fastened to a cross-shaft 28, which is, in turn, journaled in depending ears 29 welded or otherwise fastened upon the under side of the rinse plate 17. The shaft 28 projects outwardly through one of the ears 29 in the direction of the side wall 2 and is provided on such projecting end with a rigidly fastened crank arm 30 connected by means of a vertical rod 31 to a bell crank 32 rockably journaled in the side wall 33 of a control box 34. Mounted upon the top wall 35 of a tunnel-shaped hood 36 having side walls 37, 38, which are integrally joined at their lower margins to the upper margins of the side walls 2, 3, respectively, and support the top wall 35 in upwardly spaced relation to the base 1. The top wall 35 is also provided along its forward and rearward margins with depending flanges 39, 40, which add strength and rigidity to the top wall 35 and also serve to define the upper margins of entrance and discharge openings 41, 42.

It will also be noted by reference to FIG. 4 that the hood 36 extends lengthwise along the base 1 for the full length of the rinse plate 17 and projects forwardly and rearwardly thereof by a short distance so that the rinse plate 17 is entirely enveloped within the hood 36. Finally, the space within the base between the forward margin of the rinse plate 17 and the end wall 5 is, in effect, covered by a discharge plate 43 which is supported in upwardly spaced relation above the bottom wall 6 by a rear flange 44 which abuts the flange 19 of the rinse plate 17 and is of such height that the top surface of the discharge plate 43 is flush with the top surface of the rinse plate 17. At its forward margin, the discharge plate 43 rests upon a cross bar 45 fastened to the inner face of the end wall 5. The discharge plate 43 is provided with a plurality of rows of staggered rectangular apertures 46, each of which is provided along its longitudinal margins with depending ears 47 for supporting short shafts 48, which, in turn, operatively support roller-wheels 49, the latter being substantially similar in size, shape, and function to the previously described roller-wheels 16, 23.

Rigidly mounted in, and projecting through, the top wall 35 is a pair of longitudinally spaced flushing nozzles 50, 51 having opposed semi-circular orifices 52, 53, respectively. At their upper ends, the nozzles 50, 51, are connected by means of pipe-elbows 54, 55, nipples 56, 57, a T 58, and an auxiliary nipple 59, to a solenoid valve 60, which is, in turn, connected to a water supply line 61. The solenoid valve 60 is also connected by electrical wires 62 to the circuit within the control box 34.

Within the control box is a conventional manually operable main switch 63 which is connected to a source of electrical current in the usual manner. Also within the control box 34 is a time-delay relay 64 having a main plunger 65 provided with a conventional contactor 66 and being normally biased into "off" position by means of a spring 67. The plunger 65 is furthermore provided with a conventional holding coil 68 and is operatively engaged against the end of the bell crank 32. Similarly mounted within the relay 64 is an auxiliary plunger rod 69 which is rigidly connected at its inner end to a time-

delay bellows 70 and is biased outwardly by means of a spring 71 for operative engagement with the bell crank 32. The auxiliary plunger 69 is provided with a cam-track element 72 which co-operates with a roller 73 operatively mounted in the end of a microswitch blade 74 having a contactor button 75 adapted for making electrical contact with the companion switch blade 76. The switch blades 74, 76, are connected in series with the holding coil 68 in the manner shown in FIG. 8.

Thus, when a dish D is placed on the roller-wheels 16, it will slide downwardly slowly through the entrance opening 41 in the hood 36 and will initially pass over the roller 25, causing the roller 25 to swing downwardly. This downward swinging movement of the roller 25 is transmitted, through the shaft 28, to the rod 31 which, thereupon, moves upwardly, rocking the bell crank 32 inwardly, thereby shifting the plungers 65, 69, into circuit-closing position. The contactor 66 will then complete a circuit to the solenoid valve 60 and, at the same time, the cam-track 72 of the plunger 69 shifts inwardly, raising the roller 73 and bringing the contactor button 75 into circuit-closing engagement with the switch blade 76, thereby closing a circuit through the holding coil 68, which, in turn, holds the plunger 65 in circuit-closing position. As soon as the solenoid valve 60 is energized, copious streams of water will flow outwardly through the orifices 52, 53, and meet centrally of the hood 36, merging into a turbulent, downwardly directed, flood of rinsing water. Meanwhile, the dish D will have moved slowly downward on its course of travel through the hood 36 and pass beneath the rinsing water which will flush it and wet it thoroughly. As the dish D passes beyond the roller 25, the latter will swing upwardly as a result of the bias of a spring 77 conventionally associated with the bell crank 32. The plungers 65, 69, however, will not return to "off" position, since the time-delay bellows 70 will still hold the plunger 69 back and permit it to move outwardly to "off" position at a timed rate. Ultimately, after a predetermined interval, the plunger 69 will return to initial or "off" position; whereupon, the circuit to the microswitch blades 74, 75, will be opened and the holding coil 68 de-energized. Thereupon, the plunger 65 will also return to "off" position and the circuit to the solenoid valve 60 will be opened, cutting off the supply of water to the nozzles 50, 51. The interval of time-delay resulting from the operation of the bellows 70 should be sufficiently long to allow the dish D to travel slowly through the hood 36 and outwardly therefrom onto the roller-wheels 49 of the discharge plate 43, from which it can be manually removed and deposited in conventional dishwashing equipment (not shown). The rinsing water which floods over the dish D during the course of its travel through the hood 36 will flow downwardly through the aperture 20 into the tray-like base 1 and, thence, outwardly through the pipe 7. It will, of course, be obvious that the size and capacity of the pipe 7 should be large enough to handle the flow of rinsing water and prevent the base 1 from overflowing.

If desired, it is also possible to provide a modified form of control circuit, as shown in FIG. 9, which comprises a conventional water motor M interposed in the supply line to one or the other of the discharge nozzles 50, 51. The motor M is provided with an output shaft 78 having a driving pinion 79, which, in turn, meshes with a gear 80 keyed upon a short cam shaft 81. Pinned or otherwise suitably keyed in axially spaced relation upon the cam shaft 81 are two control cams 82, 83. The cam 82 is provided with a short-dwell lobe 84 bearing against a microswitch blade 85 having a contactor button 86 which is adapted to engage and make contact with a companion switch blade 87. Similarly, the cam 83 is provided with a long-dwell lobe 88, which bears against a microswitch blade 89 having a contactor button 90 adapted for contactive engagement with a companion switch blade 91. Also associated with the modified form

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of control circuit shown in FIG. 9 is a conventional main or line switch 63' and a relay 92 having a plunger 93 biased to "off" position by means of a spring 94. At its outer end, the plunger 93 bears against the bell crank 32 and, at its inner end, is provided with a holding coil 95. The relay 92 and the microswitch blades 85, 87, 89, 91, are connected in the manner shown in FIG. 8.

When the bell crank 32 swings inwardly responsive to the presence of a dish or similar article of tableware upon the roller 25, the plunger 93 will move to circuit-closing position, thereby completing a circuit to the solenoid valve 60 and turning on the rinsing water. As soon as the water begins to flow, the motor M will be energized and the cam shaft 81 will be rotated in the direction shown by the arrows in FIG. 9. This rotary movement will immediately shift the short-dwell lobe 84 of the cam 82 out of mechanical engagement with the microswitch blade 85 and a circuit will thus be closed through the contactor button 86 and the switch blade 87 to the solenoid valve 60, in effect bypassing the circuit through the relay 92. At the same time, the lobe 88 of the cam 83, which, in its initial position, holds the microswitch blade 89 in circuit-closing position, begins to travel around and, after a short interval, will move out of mechanical engagement with the microswitch blade 89, thereby opening the circuit through the holding coil 95 and allowing the plunger 93 of the relay 92 to return to initial or "off" position, which it is free to do since the dish will have passed beyond the roller 25 and, consequently, the bell crank 32 will be in its own "off" position, so to speak. Notwithstanding the opening of the circuit through the relay 92, as a result of the de-energization of the holding coil 95, the circuit to the solenoid 60 through the microswitch blades 85, 87, will continue to remain closed until the cam 82 has completed one full revolution. Thereupon, the lobe 84 will again mechanically engage the microswitch blade 85, returning it to "off" position, opening the solenoid valve circuit and causing the flow of water to be turned off. As the cam 82 completes its cycle of rotation, the cam 83 will have also returned to its initial position in which the microswitch blades 89, 91, are in circuit-closing contact and the holding coil 95 is, in effect, reset so as to become operative whenever the plunger 93 of the relay 92 is again shifted to circuit-closing position.

Provided for optional use with the preliminary rinsing machine A is an angularly bent or wedge-shaped transfer plate T which comprises a top member 96 and a bottom member 97 respectively provided along their rearward transverse margins with flanges 98, 99. The flange 98 is provided with a plurality of spaced notches 100 adapted to fit retentively over headed studs 101 set into the outwardly presented face of the end wall 5. The flange 99 is so arranged as to slip under the downward lip 102 of the end wall 5 or, if desired, can be fastened to the transverse end wall 5 by any suitable attachment means. The transfer plate T will, where necessary or desirable, span the gap between the preliminary rinsing machine A and some conventional type of dish-washing equipment (not shown). Since the transfer plate T is primarily a matter of convenience in adaptation of the preliminary rinsing machine A to various types of restaurant installations, it is not described in further detail.

It is also possible to provide a modified form of preliminary dish-rinsing machine A', as shown in FIGS. 10-13, which is similar to the machine A, previously described. In the machine A', a sump 103 is rigidly secured to the side wall 2 below the rinse plate 17 and is provided with a vertical wall 104 which terminates at the rinse plate 17 and is edgewise welded thereto. Extending across the sump 103 and adjacent the opening 41 is one of the roller-wheel shafts 22 having a paddle-wheel 105 rigidly secured thereto, which is adapted to project into the sump 103. As best seen by reference to FIG. 10,

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the vertical wall 104 is provided with an overflow hole 106 which is spaced downwardly from the rinse plate 17, the latter also being provided with a slot 107 overlying the sump 103. Opposite the wall 104, the sump 103 is integrally provided with a discharge lip 108 which is adapted to project into a small dip bucket 109 extending downwardly through a clearance slot 110 formed in the bottom wall 6. The dip bucket 109 is provided with a sleeve 111 for receiving a pin 112 which is journaled in spaced depending ears 113, 114, welded or otherwise rigidly secured to the downwardly presented surface of the rinse plate 17. Extending rearwardly from the sleeve 111 is an arm 115 which is pinned to the lower end of the vertical rod 31 and intermediate the sleeve 111 and vertical rod 31, the arm 115 is provided with a counterweight 116. Also formed in the bottom of the dip bucket 109 is a small drain hole 117 for purposes presently more fully appearing.

The control circuit for the machine A' is shown in FIG. 13 in which the control box 34 is provided with a line switch 118, similar to the switch 63 previously described. Connected in series with the solenoid valve 60 and line is a conventional switch 119 which may be of the spring-biased or snap-over-center type and is actuated by the bell crank 32.

In using the machine A', the rod 31 is manually lifted upwardly so as to close the switch 119 which, in turn, opens the solenoid valve 60 and allows water to flow from the flushing nozzles 50, 51. Some of the water will flow through the slot 107 and fill the sump 103 to the level of the overflow hole 106, at which time the rod 31 is released, thereby shutting off the water. When the dish D enters the hood 36, it passes over the shaft 22 upon which the paddle-wheel 105 is mounted, causing the paddle-wheel 105 to rotate and deliver water from the sump 103 to the dip bucket 109. As the dip bucket is progressively filled, the weight of the water therein will be sufficient to overcome the counterweight 116 and the bucket will rock downwardly shifting the rod 31 upwardly and closing the switch 119, thereby opening the solenoid valve 60 and causing streams of water to flow from the flushing nozzles 50, 51, onto the dish D. At the same time, sufficient water will also flow through the slot 107 and fill the sump 103. Meanwhile, water will slowly drain out of the dip bucket 109 through the drain hole 117 and, when sufficient water has drained from the dip bucket 109, the counterweight 116 will cause the dip bucket to return to its initial position, pulling the rod 31 downwardly, which, in turn, causes the switch 119 to open and thereby close the solenoid valve 60. The water will then be shut off until the next dish D passes over the shaft 22 on which the paddle-wheel 105 is mounted. The hole 117 is sized so that the time interval of delay resulting from the drainage of the water from the dip bucket 109 is sufficiently long to allow the water to remain on as the dish D travels slowly through the hood 36.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the preliminary rinsing machines may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A rinsing machine comprising a tunnel-like element having an inclined gravity feed conveyor, roller means projecting upwardly through said conveyor for conveying a dish therethrough, water supply means within the tunnel for flooding the dish with a copious stream of water, electrically actuated control means including a microswitch operatively associated with said roller means for turning on the water supply means when a dish enters the tunnel-like element, a normally biased off time-delay switch, said time-delay switch including a plunger element having a holding coil mounted thereon, said holding coil

operatively connecting said time-delay switch to said microswitch, and a pneumatic element operatively associated with said time-delay switch for causing the water supply means to remain on for a predetermined interval once it is turned on by the control means.

2. A rinsing machine comprising a tunnel-like element having an inclined gravity feed conveyor, roller means projecting upwardly through said conveyor for conveying a dish therethrough, water supply means within the tunnel for flooding the dish with a copious stream of water, electrically actuated control means including a microswitch operatively associated with said roller means for turning on the water supply means when a dish enters the tunnel-like element, a normally biased off time-delay switch, said time delay switch including a plunger element having a holding coil mounted thereon, said holding coil operatively connecting said time-delay switch to said microswitch, and a motor operatively associated with said time-delay switch for causing the water supply means to remain on for a predetermined interval once it is turned on by the control means.

3. A rinsing machine comprising a tunnel-like element having an inclined gravity feed conveyor, roller means projecting upwardly through said conveyor for conveying a dish therethrough, water supply means within the tunnel for flooding the dish with a copious stream of water, electrically actuated control means including a microswitch operatively associated with said roller means for turning on the water supply when a dish enters the tunnel-like element, a normally biased off time-delay switch, said time-delay switch including a plunger element having a holding coil mounted thereon, said holding coil operatively connecting said time-delay switch to said microswitch, and a fluid motor operatively associated with said time-delay switch for causing the water supply means to remain on for a predetermined interval once it is turned on by the control means.

4. A rising machine comprising a tunnel-like element having an inclined gravity feed conveyor, roller means projecting upwardly through said conveyor for conveying a dish therethrough, water supply means within the tunnel for flooding the dish with a copious stream of water, electrically actuated control means including a microswitch operatively associated with said roller means for turning on the water supply means when a dish enters the tunnel-like element, a normally biased off time-delay switch, said time-delay switch including a plunger element having a holding coil mounted thereon, said holding coil operatively connecting said time-delay switch to said microswitch, and a bellows element operatively associated with said time-delay switch for causing the water supply means to remain on for a predetermined interval once it is turned on by the control means.

5. A rinsing machine comprising a tunnel-like element, means for conveying a dish therethrough, water supply means within the tunnel for flooding the dish with a copious stream of water, electrically actuated control means for turning on the water supply means when a dish enters the tunnel-like element, said control means including a trip-element interposed in the path of the dish for actuation as the dish passes by, a normally biased off time-delay relay having a main plunger which is provided with a contactor element, said main plunger being oper-

atively engaged with said trip-element, a holding coil mounted on said plunger, said time-delay relay also being provided with an auxiliary plunger connected at one end to a time-delay bellows and spring biased into operative engagement with said trip-element, and a microswitch operatively associated with said auxiliary plunger, whereby said water supply means will be actuated when a dish actuates said trip-element and held open for a predetermined interval by said time-delay relay following actuation.

6. A rinsing machine comprising a tunnel-like element, means for conveying a dish therethrough, water supply means within the tunnel for flooding the dish with a copious stream of water, electrically actuated control means for turning on the water supply means when a dish enters the tunnel-like element, said control means including a trip-element interposed in the path of the dish for actuation as the dish passes by, a normally biased off time-delay relay having a main plunger which is provided with a contactor element, said main plunger being operatively engaged with said trip-element, a holding coil mounted on said plunger, said time-delay relay also being provided with an auxiliary plunger connected at one end to a time-delay bellows and spring biased into operative engagement with said trip-element, a cam-track element mounted on one end of said auxiliary plunger, said cam-track element being operatively associated with a roller element, and a microswitch operatively associated with said auxiliary plunger, said roller element being associated with said microswitch, whereby said water supply means will be actuated when a dish actuates said trip-element and held open for a predetermined interval by said time-delay relay following actuation.

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