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West Allis, Wis.
Continuation-in-part of application Ser. No.
610,567, Jan. 20, 1967, now abandoned.
This application Mar. 28, 1969, Ser. No.
814,511

[54] **GLASS-WASHING DEVICE**
2 Claims, 5 Drawing Figs.

[52] U.S. Cl. **134/56,**
134/96
 [51] Int. Cl. **A47I 15/46**
 [50] Field of Search. **134/56, 57,**
95, 96, 98, 103

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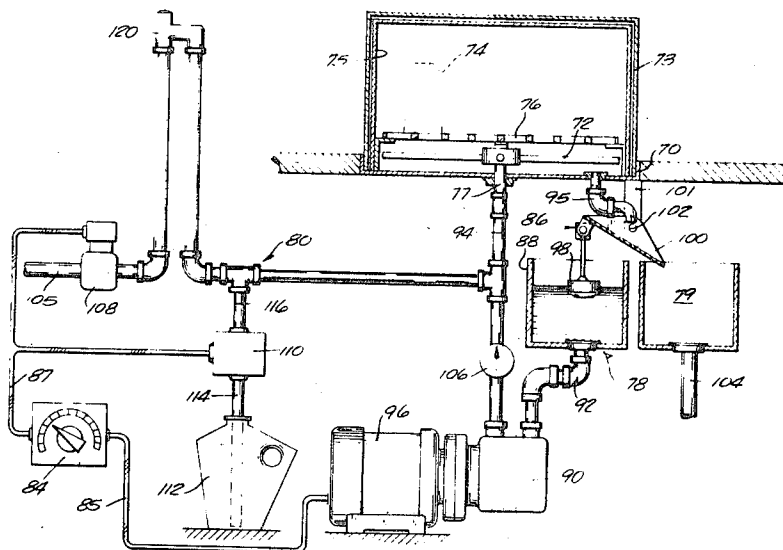
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ABSTRACT: An automatic glass-washing machine including a pressure-responsive spray bar positioned to direct liquid detergent upwardly within an enclosed hood, a liquid detergent system for supplying detergent under pressure to the spray bar, a fresh-water system for supplying rinse water under pressure to the spray bar, a sanitizer system for supplying sanitizer to the fresh-water system, a timer to actuate the systems in a timed sequence and a float actuated valve to recirculate the liquid detergent and to direct the rinse water to an overflow or drain line.



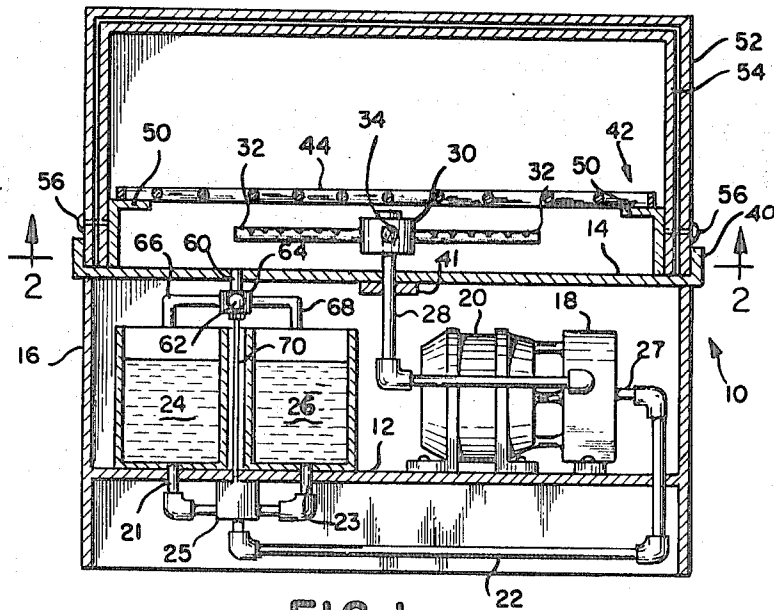


FIG. 1

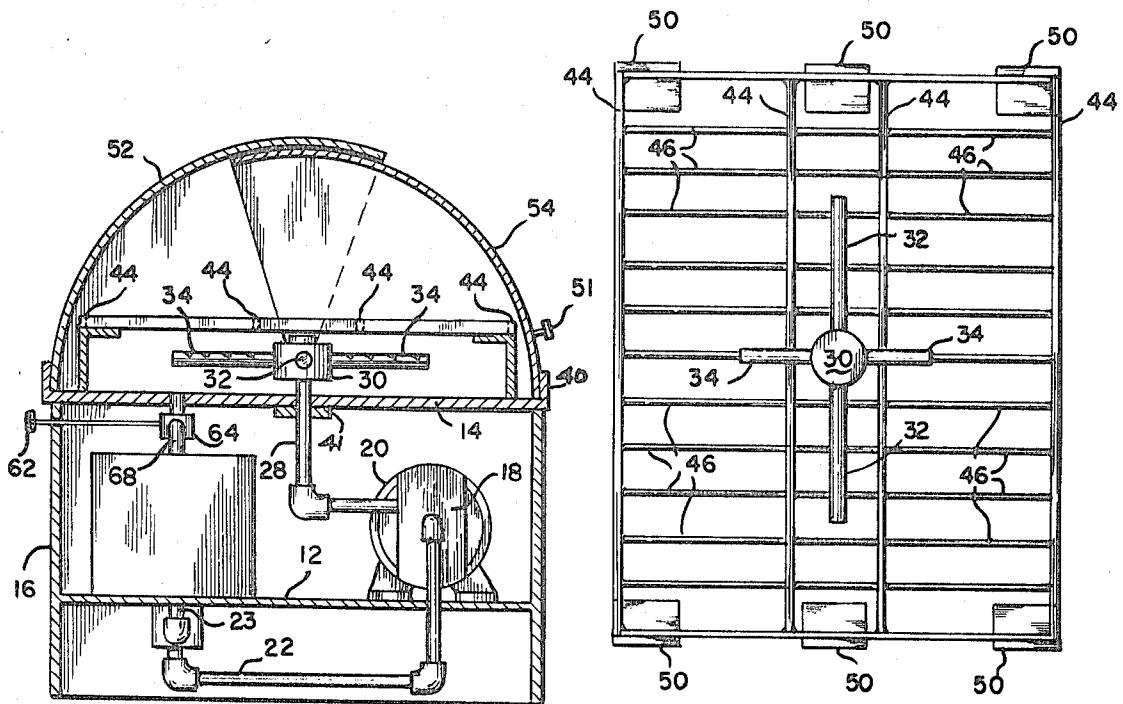


FIG. 2

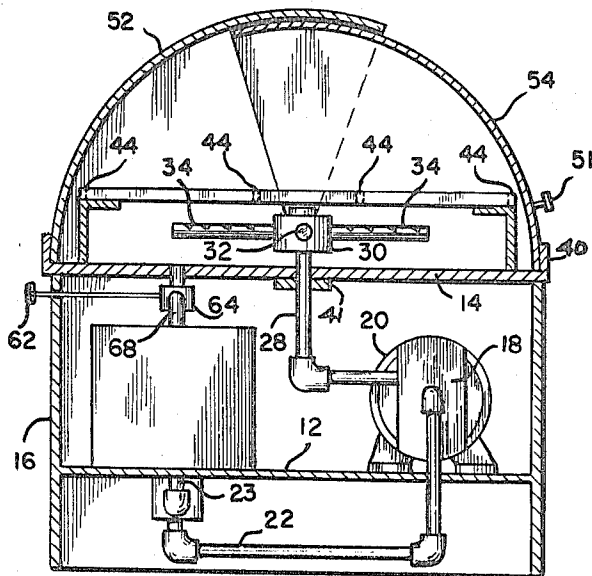


FIG. 3

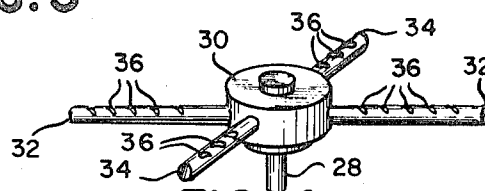
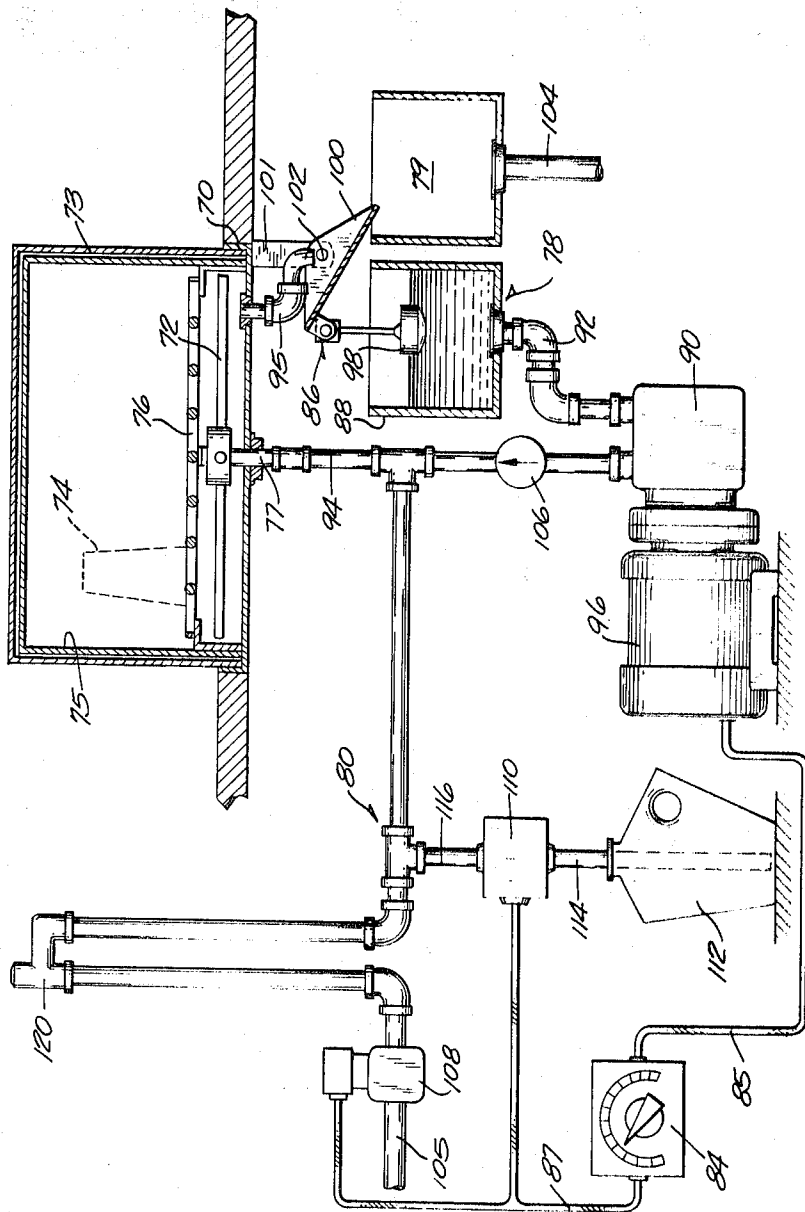


FIG. 4

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Fig. 5



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GLASS-WASHING DEVICE

RELATED APPLICATION

This application is a continuation-in-part application of my copending application, Ser. No. 610,567, filed Jan. 20, 1967, now abandoned.

BACKGROUND OF THE INVENTION

The number of glasses used in a restaurant or any other public eating or drinking establishment is considerable. Civic laws require that each glass be completely cleaned after each use, requiring elaborate equipment in order to maintain this standard of cleanliness. Extra help is often required to comply with this requirement as well as to operate and maintain the equipment used for this purpose. Present systems require that the operator dip his hands into the detergent each time a glass is to be washed. If the detergent is too strong, it will burn his hands and if too weak, it will not clean the glasses.

SUMMARY OF THE INVENTION

The automatic glass-washing machine of this invention includes a rack having a number of cross braces spaced at intervals for supporting a number of glasses. The rack is placed within a housing or hood that is closed during the washing operation. A rotary-type pressure-responsive sprayer is positioned beneath the rack and has a number of tubular spray bars projecting outward therefrom. Each spray bar has a number of angularly offset slots in its upper surface to direct a spray of water upward as the sprayer is rotated. Liquid detergent and fresh water are selectively connected to the spray bar with the pressure of the detergent and water being used to rotate the spray bar. The detergent and water will be forced upward into the bottom of the glasses and throughout the hood with considerable force so that the entire surface of the glass is first washed and the rinsed. An automatic float-actuated valve recirculates the liquid detergent to a liquid detergent reservoir and discharges rinse water to an overflow line. A sanitizer is automatically added to the rinse water.

Other objects and advantages will become more readily apparent from the following detailed description when read in connection with the accompanying drawings in which:

FIG. 1 is a front view in section showing the spray bar beneath a removable glass rack.

FIG. 2 is a top view taken on line 2—2 of FIG. 1 showing the spray bar.

FIG. 3 is an end view in section showing the improved glass-washing system.

FIG. 4 is an enlarged view of one of the spray bars.

FIG. 5 is a schematic view of the detergent and fresh-water systems for an alternate form of the invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIGS. 1 through 4 of the drawings, the improved glass washing device includes a frame 10 having a lower shelf 12 and an upper shelf 14 secured to supporting legs 16. A pump 18 is mounted on the lower shelf and is connected to and driven by a motor 20 also secured to the lower shelf. A pair of reservoirs 24 and 26 are mounted on the lower shelf with outlet pipes 21 and 23, respectively, connected to a common valve header 25 that is connected to the inlet 27 by the pump by line 22.

From the pump 18 the water is forced through line 28 to a pressure-responsive spinning-type hub 30 mounted on the end of pipe 28. Sprayer arms 32 and 34 extend outward from the hub 30. Each sprayer arm is provided with a number of slots 36 which are equally spaced along the length of the bar. The slots are offset at approximately a 45° angle to provide a better distribution of the water under the hood. The fan-type spray of water from each slot will overlap the adjacent spray of water providing a continuous screen of water across the length of the spray bar. It should be noted that with the hub rotating the spray of water from each slot will form a continuous screen of water across substantially the full length of the spray bar.

A sidewall 40 is formed around the outside edge of the upper shelf 14 to form a drain pan, and a seal 41 is used to seal the hole around pipe 28. A drain line 60 is connected to a return valve header 64 where the return water can be directed either through line 66 to reservoir 24 or line 68 to reservoir 26. A manual control handle 62 extends outward from the side of the frame to control the position of valve header 64. A mechanical link 70 is connected between the return valve header and the supply header 25 to synchronize the position of the valves. Rinse water will then be returned to the proper reservoir at the same time that rinse water is being pumped from the same reservoir. When the valves are changed over, wash water will be returned to the reservoir when wash water is being pumped out to the spray bars.

A removable glass rack 42 having longitudinal members 44 and crossmembers 46 is supported on brackets 50 located on shelf 14 immediately above the sprayer bar. A stationary arcuate hood 52 is used to cover approximately 100° of the area over the top of the rack and a second movable arcuate hood 54 is pivotally mounted on pins 56 for rotary motion inside of hood 52. A handle 51 on the front of hood 54 is used to raise and lower the hood.

In operation, glasses are placed on the rack and the rack positioned on the brackets 50. Hood 54 is rotated down to enclose the upper portion of the frame above the drain pan. A cold water wash or rinse, depending on the position of the valve headers 25 and 64 is sprayed from the reservoirs through pump 18 and line 28 to the sprayer bar hub 30. The cold water spray is returned through line 60 through valve 64 and line 66 to reservoir 24. After the cycle is completed, handle 62 is rotated to its alternate position to pump wash water through line 23 to the spray bars and then returned through line 68 to the other reservoir 26. After the wash and rinse cycles are completed the pump is turned off and the hood 54 is rotated into the hood 52. The rack is then removed and another rack can be placed within the hood.

It is also possible with the present invention to attach the valve control arm 62 to a timer that can be set to open the wash water valve and slow the pump for a predetermined time cycle. The timer would then shut the pump down for a predetermined time while the pan drains. The valves would then be reversed and the pump restarted for the next cycle.

If it becomes necessary because of sanitation requirements, a separate pump could be used for the rinse water with the original pump being used for the wash water only. Also, where the rinse water cannot be recycled, line 60 can be connected to an overflow or discharge line and fresh water supplied continually to the rinse water reservoir.

Referring to FIG. 5 another embodiment of the glass-washing machine is shown which includes a drain pan 70 supported on a counter or frame 71 and enclosed by means of a hood 73 having a pivotally openable door 75. Water is sprayed upwardly from the drain pan 70 by means of a spray bar 72 substantially as described previously mounted for rotation on a pipe 77 centrally positioned within the drain pan 70. A number of glasses 74 are supported within the hood by means of a rinse basket 76. A liquid-detergent-recirculating system 78 and a rinse-water-overflow system 80 are positioned beneath the drain pan 70 and connected to a pipe 94 for circulating liquid detergent and rinse water, respectively, to the spray bar 72. The liquid detergent and rinse water collected in the drain pan 70 are automatically separated and directed back to the detergent system or to an overflow tank 79 by means of a float-operated control valve 86.

More specifically, the liquid-detergent system 78 includes a reservoir 88 connected to a pump 90 by a pipe or conduit 92 and to the pipe 77 for the spray bar 72 by the pipe or conduit 94. The pump 90 is driven by means of a motor 96 to pump liquid detergent to the spray bar 72. The pump 96 is controlled by means of a timer 84 to operate at certain periods in a timed sequence. The liquid detergent collected in the drain pan 70 is drained by means of an outlet pipe 95.

The liquid detergent collected in the drain pan 70 is recirculated to the reservoir 88 by means of the float operated con-

trol valve 86 which includes a float 98 positioned in the liquid detergent reservoir 88 and connected to a valve plate 100 mounted for pivotal movement below the drain pipe 95 by means of a fixed bracket 101 and a pin 102. As liquid detergent is withdrawn from the reservoir 88, the float 98 will move downward in the reservoir 88 pivoting the valve plate 100 counterclockwise to direct liquid detergent draining out of the drain pan back into the reservoir 88. Liquid detergent collected in the drain pan 70 will recirculate back to the reservoir until the float 98 rises far enough to pivot the valve plate 100 clockwise directing the liquid into reservoir 79 which is connected to discharge line 104. A check valve 106 is provided in line 94 to prevent reverse flow of liquid detergent or water into the pump 90.

The freshwater system 80 includes a freshwater pipe 105 connected to the conduit 94 above the check valve 106. The flow of rinse or fresh water through the pipe 105 is controlled by means of a solenoid valve 108 provided in the conduit and connected to the timer 84 to allow fresh water to flow to the spray bar 72 during different portions of the time cycle. Fresh water delivered to the spray bar 72 will also drain out of the drain pan 70 through the drain pipe 95. The rinse water will be directed by the valve plate 100 to the overflow pipe 104.

Means are provided in the fresh-water system for adding a sanitizer in the form of a pump 110 connected by a pipe 114 to a container 112 for a sanitizer and to the fresh-water line 105 by a pipe 116. The feeder pump 110 is connected to the timer 84 for operation during the same portion of the time cycle as the solenoid valve 108. A venturi can be used in place of the pump 110 to draw sanitizer into the cold water line 105. A vacuum breaker 120 should be provided in the fresh water line to prevent the backflow of liquid detergent through the fresh water line.

The timer 84 is a conventional item connected to the motor 92 by lines 85 and to the solenoid valve 108 and feeder pump

110 by lines 87. The preferred time cycle for operating this system and to comply with most sanitation laws would be a 2-minute wash cycle and a half-minute rinse cycle with a short pause between cycles to allow the detergent to return to the reservoir 88. In areas where a complete wash and rinse cycle is required, a solenoid actuated latch can be provided to lock the hood closed until the cycle is completed.

Although only two embodiments of the present invention has been shown and described, it should be apparent that various changes can be made herein without departing from the scope of the appended claims.

What is claimed is:

1. A glass-washing apparatus comprising
 - a drain pan including a drain pipe,
 - a rack for supporting a number of glasses in said pan
 - a hood for enclosing said pan and rack,
 - a self-propelling spray bar having angularly offset spray slots for spraying water upwardly from said drain pan,
 - a liquid-detergent system connected to said sprayer means and including a reservoir positioned below said drain pipe,
 - a fresh-water system connected to said spray bar,
 - means for operating said liquid-detergent system and said fresh-water system in a timed sequence,
 - a valve plate pivotally connected to said drain pipe and a float connected to said valve plate and positioned in said reservoir to automatically recirculate the liquid detergent to said liquid detergent reservoir and to pivot said valve plate and discharge rinse water when said reservoir is full.
2. A glass-washing apparatus according to claim 4 including a sanitizer system connected to said fresh-water system and to said operating means to operate simultaneously with said fresh-water system.

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