July 31, 1928. 1,678,850

W. L. DEMING

ROTARY CLEANSER

Filed July 27, 1925 5 Sheets-Sheet 1

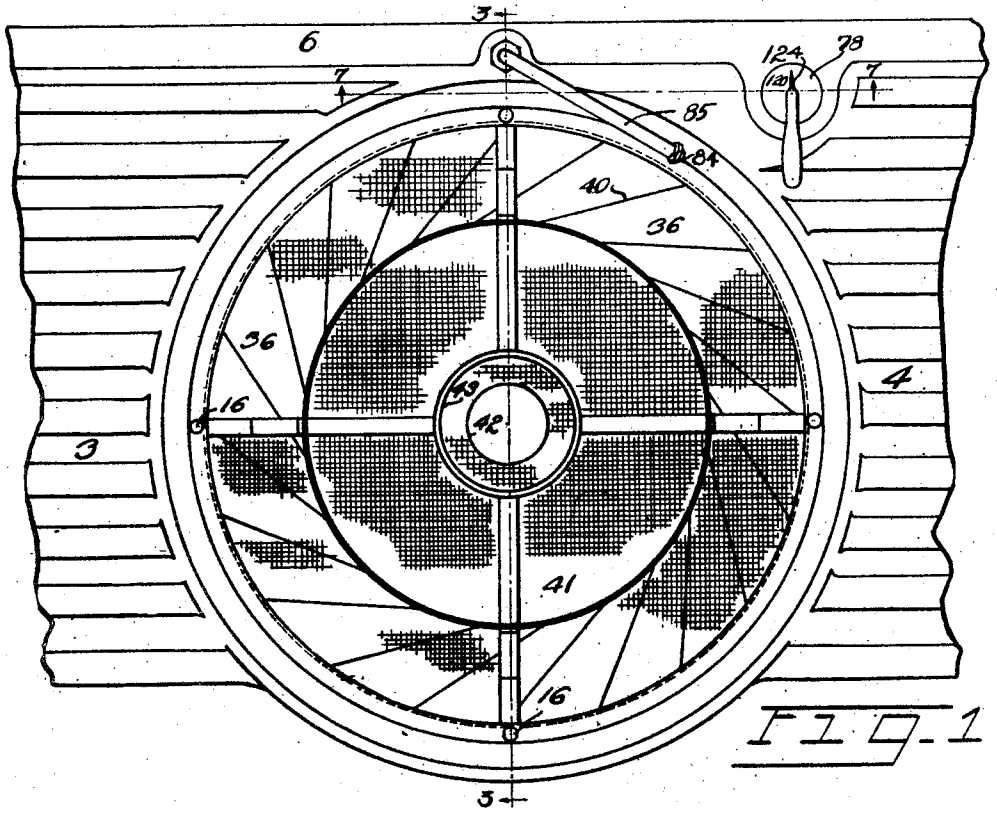


FIG. 1

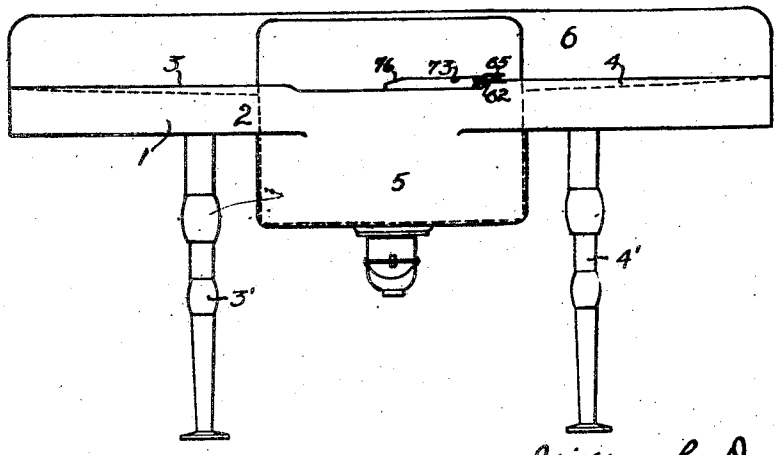


FIG. 2

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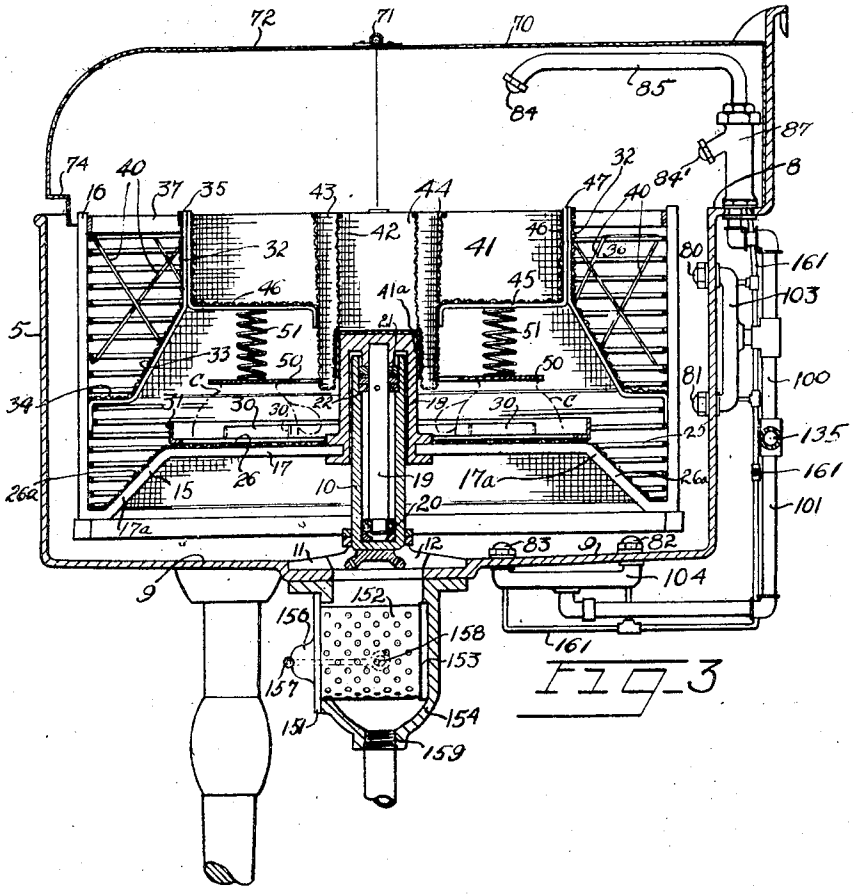


FIG. 3

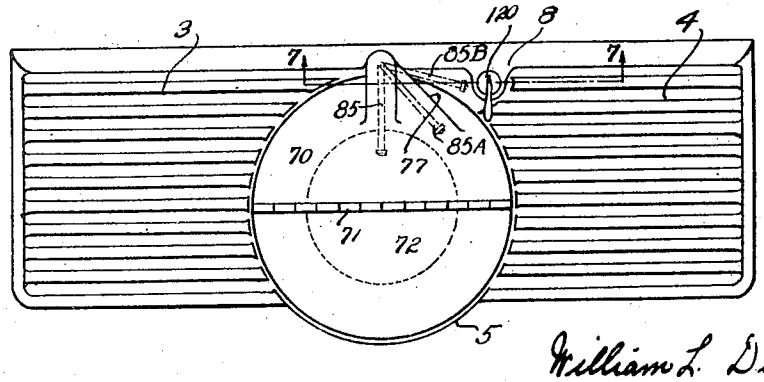


FIG. 4

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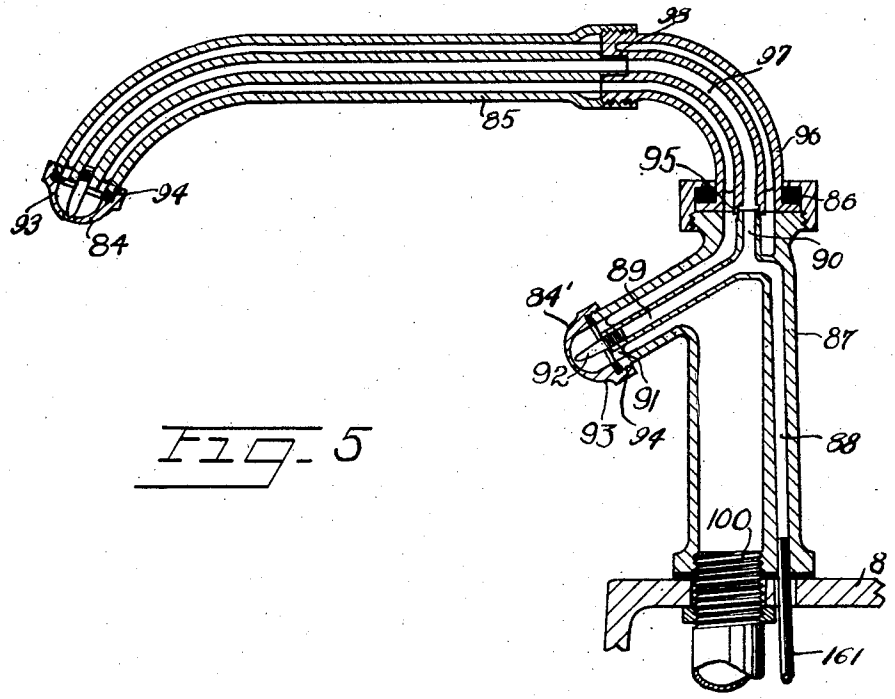


Fig. 5

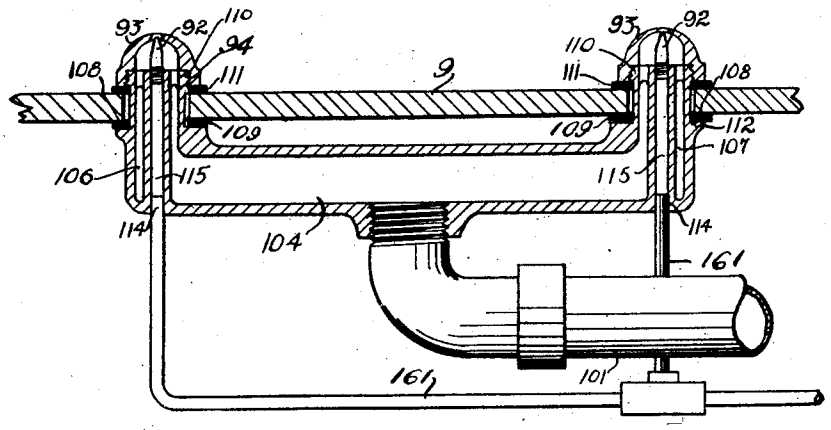


Fig. 6

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ROTARY CLEANSER

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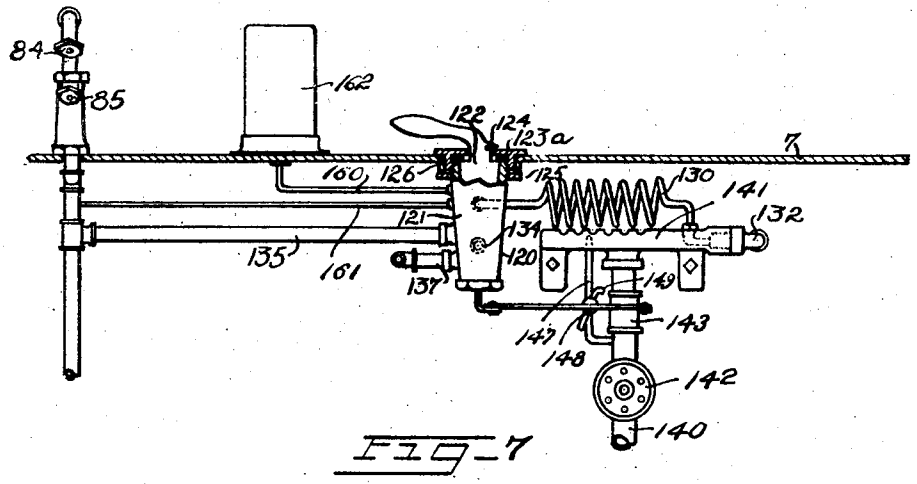


FIG-7

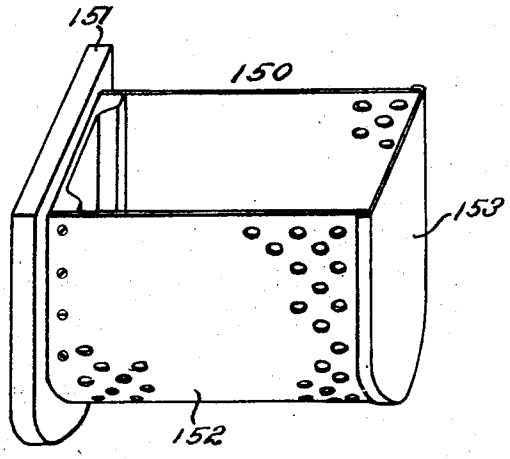


FIG-10

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ROTARY CLEANSER

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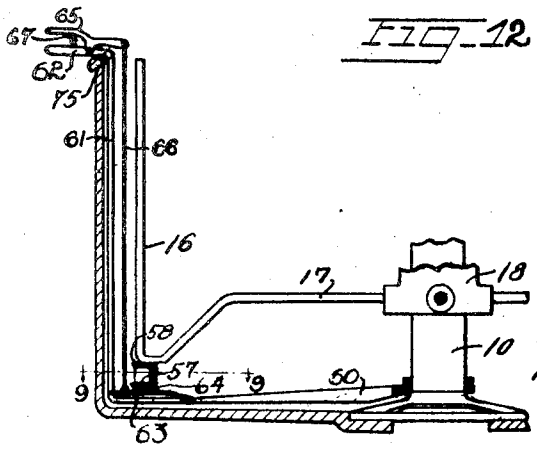


Fig. 8

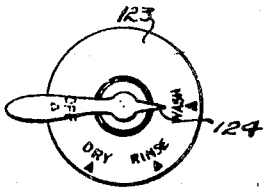


Fig. 12

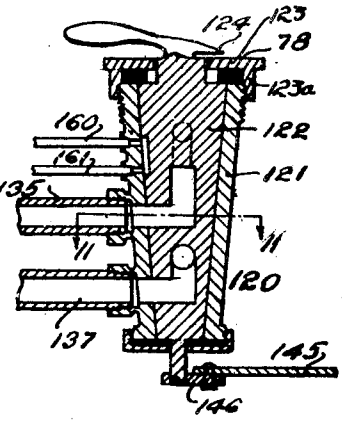


Fig. 13

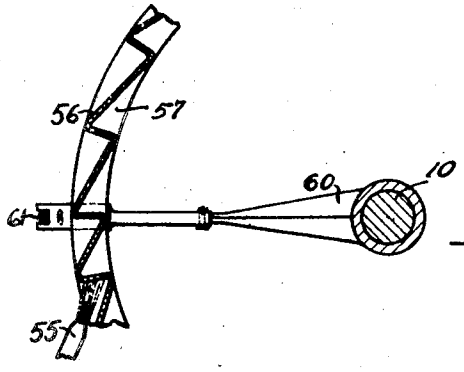


Fig. 9

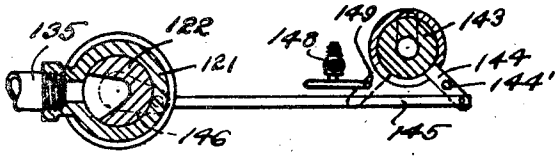


Fig. 11

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UNITED STATES PATENT OFFICE.

WILLIAM L. DEMING, OF SALEM, OHIO.

ROTARY CLEANSER.

Application filed July 27, 1925. Serial No. 46,240.

This invention relates to machines for cleaning cooking and dining utensils and the general object is to provide a compact, simplified and easily cleaned dishwashing machine. Further objects include the provision of a machine of this character which may be embodied in a supporting stand and provided with a drain board for the utensils when taken from the machine whereby a complete dishwashing outfit may be had which will be extremely useful as a permanent kitchen fixture.

Other objects and features will appear in the further description which relates to the accompanying drawings. The essential characteristics will be summarized in the claims.

In the drawings Fig. 1 is a fragmentary plan of my preferred form of machine, the end portions of the drain board being broken away and the top cover removed; Fig. 2 is a front elevation of the entire machine; Fig. 3 is a central transverse section taken along the lines 3—3 in Fig. 1; Fig. 4 is a plan of the entire machine; Fig. 5 is a longitudinal central sectional detail through a preferred form of overhead spray nozzle arrangement; Fig. 6 is a central longitudinal section through the nozzle arrangement adapted to be used on the side and bottom of the main washing chamber; Fig. 7 is a fragmentary section taken along the line 7—7 on Fig. 4 showing the preferred arrangement of pipe and valve connection from the plumbing system to my machine and my preferred form of super-heating means for cleansing water; Fig. 8 is a fragmentary section of a portion of my rotary cleanser showing a preferred form of starting and stopping mechanism; Fig. 9 is a fragmentary sectional detail as indicated by the line 9—9 on Fig. 8; Fig. 10 is a perspective showing a preferred form of a strainer device for the drain of my machine; Fig. 11 is a sectional detail through the main liquid control valve and the gas control valve showing the arrangement for connecting the two; Fig. 12 is a detail plan view of the main liquid control valve; Fig. 13 is a cross section through the main liquid control valve.

The invention is in the nature of an improvement over the rotary cleanser shown, described and claimed in my prior Patent No. 1,261,778 patented April 9th, 1918, to which reference may be had for certain details of the present invention not herein set out in detail. The cleanser employs a rotary cage or container for utensils adapted to be supported upon a standard having annular and radial bearings, the standard rising from the bottom of a circular casing which in the present embodiment is shown as integral with the drain board and general frame members. The cage is provided with suitable compartments which are in turn provided with retaining means whereby each compartment is especially adapted to support articles of various classes such as plates, cups, saucers, drinking glasses and knives and forks. Articles in all of these compartments are arranged to be sprayed by nozzles suitably placed which carry hot water and liquid detergent into direct contact with the articles to be cleansed. A main water valve is so positioned as to be within convenient reach of the operator and provides for regulating the amount of water admitted to the spray nozzles and to a turbine turning means for the cage.

Referring in detail to the drawings and indicating the various parts by numerals, 1 indicates a suitable frame having a front apron portion 2 extending downwardly from a pair of drain boards 3 and 4 arranged to slope inwardly to either side of a substantially cylindrical receptacle 5 which is arranged to house and support my rotary cleanser. The frame has also a back panel 6 extending above the drain board to serve as a splash panel and provide for attaching the machine to the wall of a kitchen. The frame may be conveniently supported by legs such as shown at 3′ and 4′ arranged to rest on the floor and engage the frame beneath the drain board portion.

Within the chamber or receptacle 5 as shown in Fig. 3, I have shown a tubular standard 10 having a base portion 11, open at 12 to provide for draining the receptacle. Surrounding and rotatably supported by this standard I have shown a utensil supporting cage including preferably a frame 15 formed of a plurality of bent bars having vertical portions 16 and a horizontally

extending portion 17, the bars being carried by an inverted cup-shaped member 18. This cup member has preferably a shaft 19 rigid therewith and extending downwardly into engagement with anti-friction bearings carried by the member 10. The bearing arrangement as shown comprises an annular ball bearing 20 with inner and outer races carried by the shaft and member 10 respectively, and a horizontally placed thrust bearing 21 surrounding the upper end of the shaft. The lower race of this latter bearing is shown as supported by a shoulder 22 in the hollow member 10. By this arrangement I am enabled to rigidly support the cage so that it may be rotated at high speed without wobbling while the construction permits the whole cage to be easily removed from the top of the receptacle 5. As shown, the bearings are so arranged that they may be withdrawn with the shaft 19 when the main container is removed.

Supported by the frame members 15 and the member 18, I have shown various compartments for various types of utensils to be cleansed. The outer walls as shown in Fig. 3 consist preferably of spirally wound turns of wire 25 secured in any convenient manner to the uprights 16. This arrangement permits water thrown toward the cage from certain spray nozzles to be later described, to impinge against plates etc. supported near the outer wall, with almost full force. The floor of the cage may be formed of open wire mesh indicated at 26 and shown as supported by the horizontally extending members 17. The members 17 are shown as extending downwardly at 17^a so that the mesh at 26^a is in the form of the frustum of a cone against which may rest saucers or small plates. Cups are adapted to be inverted as shown at C upon the horizontal stretch of the mesh 26. Radial upright webs 30 and a circular wall 31 suitably secured in the position shown may provide against lateral shifting of the cups. Suitable means such as an annular plate 50 suspended from a separable portion of the cage by coil springs 51 may further serve to prevent the cups from being thrown outwardly when the cage is rotated.

For supporting large plates and the like I have shown an annular partition member having vertical and tapering sides 32 and 33 respectively, and a horizontally disposed bottom portion 34 which joins the side wall of the cage. This partition member may be formed of wire mesh and be supported by a series of brackets 35 preferably joined to the upright 16. The side walls of the cage cooperate with this annular member to form a receptacle as shown in Fig. 1 at 36. In order to provide against too much shifting of the plates I may employ partitions formed of criss-crossed wire stretches 40 woven in and out from the walls of the receptacle 36 as shown in Fig. 3 and secured in place in any convenient manner.

Supported by the inverted cup member 18 and by the vertically disposed wall 32, I have shown a circular inner basket member 41 having separate compartments suitable for drinking glasses and the like and for knives, forks etc. This basket as shown has a cup member 41^a arranged to slidably engage the upper end of the member 18 which cup serves as a support for a double upright annular container 44 with spaces 42 and 43, the former for spoons and the like, the latter for knives and longer cooking utensils. Frame members 45 are shown as secured to the container 44 and extending upwardly at 47 into engagement with the walls 32 and these may be covered with mesh for supporting drinking glasses etc. The basket 41 may be removed as a unit to permit access to the lower part of the cage.

I have arranged for connecting the machine to the hot and cold water inlets from the usual plumbing system and have provided for delivering either hot water alone or mixed with liquid detergent from a single valve 120 which also regulates the supply of cold water for rotating the cage. The valve is essentially the same as that shown in my prior patent above mentioned to which reference may be had for the exact operation.

The valve as shown in Fig. 7 comprises a body portion 121 and a plug 122, the plug being apertured to provide the necessary passages which are presented to the various outlet openings in the body as the valve is turned. A pointer 124 registers with indications shown on the dial 123 to indicate the position of the plug. The valve may be secured to the portion 7 of the main frame by a nut 125 engaging a downwardly flanged portion 126 of the member 7 with the packing nut 123^a resting on the upper surface of the portion 7.

Hot water is conducted to the valve through a coil 130 arranged to be superheated by a gas jet indicated at 141, the coil communicating with the hot water inlet 132 of the plumbing system. Cold water may be led to the valve through an opening 134 directly back of the valve, and delivered to the machine through an outlet pipe 137 for rotating the cage, as will be hereinafter described, as soon as the valve is turned to admit hot water to the nozzles.

I have shown means whereby the hot water may be superheated by gas led through a suitable conduit 140 to the jet 141 which I have shown as supported beneath the coil 130. The supply may be completely controlled by a main service valve 142 In order that the gas may be turned on as soon as the machine starts op-

erating, I have shown a second valve 143 having an operating arm 144 connected by a link 145 to an arm 146 rigid with the plug of the main water valve 120. As shown in Fig. 11 when the water valve is turned to "Wash" position the gas is automatically turned on.

A pilot by-pass 147 leading from the gas line below the valve 143 may be lighted at all times to ignite the main jet when turned on as just described. However, in case it is desired, the pilot may be also turned out by means of a valve 148. The operating handle of this valve has a hook 149 which, assuming the main water valve is in "Off" position will engage a hole 144′ in the arms 144 and thus prevent movement of the water valve 120 and consequent turning on of the gas at 143 until the pilot is again turned on manually. Danger of turning on the gas without its being lighted would therefore be very unlikely to occur.

The valve 120 when turned to "Wash" position turns on hot and cold water, the hot water being admitted through a conduit 135 to a spray nozzle system to be presently described. As shown in Figs. 7 and 13, this position also opens communication between small tubes 160 and 161, the former of which leads from a supply of liquid soap or other detergent contained in a suitable tank 162; the latter leads to various parts of the nozzle system. It may be here remarked that when in "Rinse" position, hot water alone is admitted and the soap is cut off, and when in "Dry" position both hot water and soap are cut off and cold water alone is admitted through the separate line 137 to a nozzle 55 where as in the other two positions just mentioned it continues to impinge against blades formed by a corrugated strip 56 positioned between annular plates 57 and 58 secured to the lower rim of the rotatable cage. During this rotation, centrifugal force aids the natural evaporation from the hot utensils by throwing off the accumulated water. Suitable openings in the casing may be provided such as shown in my prior patent to allow the air to circulate freely to further insure rapid drying.

I may provide cleansing nozzles in any desired position, but my preferred arrangement as shown, particularly in Fig. 3 consists in positioning pairs of nozzles 80 and 81, and 82 and 83 so as to project inwardly from the side and bottom of the receptacle toward the cage. Similar nozzles 84 and 84′ are carried somewhat above the top level of the cage in position to wash articles which project from the top thereof. The nozzle 84 is preferably supported by a pivotally mounted hollow arm 85 shown as having a swivel connection 86 with a fixture 87. This fixture is mounted on the horizontally disposed portion 8 of the frame even with the drain board. The position of this swivel member is preferably directly behind the axis of the rotating cage and as shown in Fig. 4, the member 85 may be turned aside as shown at 85ª when it is desired to take out the central basket or turned still farther to 85ᵇ when it is desired to remove the entire cage.

The coping or cover member which I preferably use consists of a hinged two-part dome having a rearward portion 70 adapted to fit over substantially half the cage, and a forward portion 72 hinged at 71 completes the cover. The rear portion conceals the swingable nozzle member 85. To permit this member to be turned aside to the position 85ª without disturbing the rear half of the cover, the portion 70 as shown in Fig. 3 may be formed with a pocket, as at 77. Ordinarily only the front half of the cover need be lifted to place the utensils in the cage since this permits the removal of the central basket 41.

Best results are obtained by leading the liquid detergent to the end of the nozzles where the suction of the water being sprayed therethrough will draw the required amount into the spray, and disintegrate it.

As shown in Figs. 5 and 6, means for leading the soap to the end of the nozzles may comprise separate tubes which project through the castings forming the various nozzles. Portions of the tubes may be cast integral with the water conduit castings as at 89 in the member 87 (Fig. 5). As shown in Fig. 5, a branch of the supply tube 161 leads through the floor member, designated 8, into a channel 88 at the back of the member 87, which communicates with passages 89 and 90 in the casting. A web member 91 may be provided near the nozzle for supporting tips 92 which carry the channel forward to the dome-like members 93 shown as screwed over the threaded ends 94 of each casting. The channel 90 communicates through a telescoping joint 95 with a central tube 97 in an elbow which forms the base of the swivel arm 85 and through a similar joint 98 to the nozzle 84.

A line of pipe including the sections 100 and 101 intercommunicate between the injector tubes just described and the nozzle supporting members 103 and 104 for the nozzles 80, 81, 82 and 83. The members 103 and 104 are substantially alike and comprise branches 106 and 107 shouldered at 108 for a shim 109 interposed between the casting and the bottom (or side) of the main receptacle 5. The members 103 and 104 have reduced portions 110 extending through the walls of the receptacle which are threaded on their ends to receive the nozzle members 93. Beneath the cap I may provide gaskets 111 to prevent the escape of water through the opening in the container wall. The

tubes for liquid detergent extend into the casting at 114 which is then carried by tubes 115 preferably integral with the castings 104.

In order that the cage may be rotated by hand at the start, since otherwise a stream of water from the duct 135 would start the rotation very slowly, I preferably provide an arm 60 pivotally secured to the member 10 and having an upright portion 61, and a handle portion 62 extending outwardly from the brim of the receptacle. The arm 60 carries a pivoted brake member 63 having a shoe of suitable material 64 adapted to rub against the lowermost plate 57 previously mentioned in connection with the container rotating means. For operating this brake I may employ a lever 65 pivoted to the handle 62 and connected to the brake by a rod 66. Means such as a spring 67 underneath the outwardly projecting portion of the lever may serve to hold the brake normally out of contact with the flange 57

The forward portion of the coping member 72 is cut away as shown in Fig. 2 at 73 to allow the necessary movement of the starting arm 62 and is provided with an inwardly extending apron 74 to prevent the water from being splashed out through the opening. The arm normally occupies a right hand side of the opening as shown in Fig. 2 and to start the cage rotating, the members 62 and 65 may be conveniently grasped by the right hand and pulled to the left. A suitable roller 75 carried by the arm 62 bearing against the upper edge of the receptacle 5 prevents the abrasing of its enameled surface. As the lever approaches the extreme left-hand end of the opening, the inner end of the lever 65 is carried against a cam surface 76, thus causing the brake to be released from the flange on the cage and allowing the cage to proceed on its way. In using the just described device as a brake, the members 62 and 65 are merely grasped by the hand and held in any position until the cage comes to a stop.

In Figs. 3 and 10, I show means whereby a strainer may be positioned in the main central drain and easily and quickly removed and emptied when necessary. This member may be secured within a dome shaped housing 154 rigidly secured to the bottom of the main receptacle 5 shown as provided with a threaded opening 159 for effecting a connection to the usual sink trap; thus the liquid draining from the receptacle 5 into the housing 154 will be strained by the wall 152 so that the outlet pipes of the plumbing system will not be clogged. To provide for easy removal of the strainer, I preferably form an ear 156 on the member 151, which ear is engaged by a bail 157 pivoted at 158 to the side of the housing 154 in such a manner that it might be slightly sprung to release the strainer and so that it will merely drop idly against the drain pipe when so released to allow the strainer to be removed.

From the foregoing description, it will be seen that I have provided a very compact and efficient dish washing machine which is well adapted to form a permanent part of the kitchen and which will be suitable for both domestic use and for restaurants and hotels. I am aware that the machine is capable of being considerably varied and I do not wish to limit myself in carrying out my invention to the particular form shown.

Having thus described my invention I claim:

1. In a cleansing machine in combination, a casing having an inwardly sloping bottom portion, an upwardly extending member rigidly and centrally supported by the casing, a rotary container adapted to support articles to be cleansed, a shaft rigid with the container, upper and lower bearings for the container shaft supported by the upwardly extending member, the base of said member comprising webs joined with the bottom of the container and the said bottom having an opening below the webs whereby central drainage from the casing may be had.

2. In a device of the character described, a casing, a container adapted to support articles to be cleansed, a hollow standard rising from the bottom of the casing, a shaft carried by the container and extending downwardly into the standard, a radial thrust bearing carried by the lower end of the shaft and bearing laterally against the standard, and a vertical thrust bearing carried by the top of the shaft and supported by the standard, both bearings being removable with the shaft when the container is removed.

3. In a cleansing machine having a casing, and a rotatable container for articles to be cleansed mounted in the casing, water power means for rotating the container, friction operated means for manually starting and stopping the rotation of the container and operatively connected thereto and having portions thereof extending outside of the casing, whereby the connection between the friction means and the container may be manually established and means carried by the casing and cooperating with one of said portions for automatically releasing the frictional connection when said portions have been moved a predetermined distance.

4. In a cleansing machine, a casing, a container for articles to be cleansed rotatably mounted in the casing, water power means for rotating the container, and manually operated friction means for starting and

stopping the container comprising an arm pivoted about the axis of rotation of the container, a friction shoe carried thereby adapted to engage the container, a lever connected with the shoe, said lever being carried by the arm and extending through the casing wall, said wall having a slot to permit movement of the lever and said slot having a cam portion coacting with the lever to automatically disengage the friction shoe upon predetermined movement of the said arm.

In testimony whereof, I hereunto affix my signature.

WILLIAM L. DEMING.