May 9, 1933. J. RODEWALD 1,908,617

DISHWASHER

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Fig. 1.

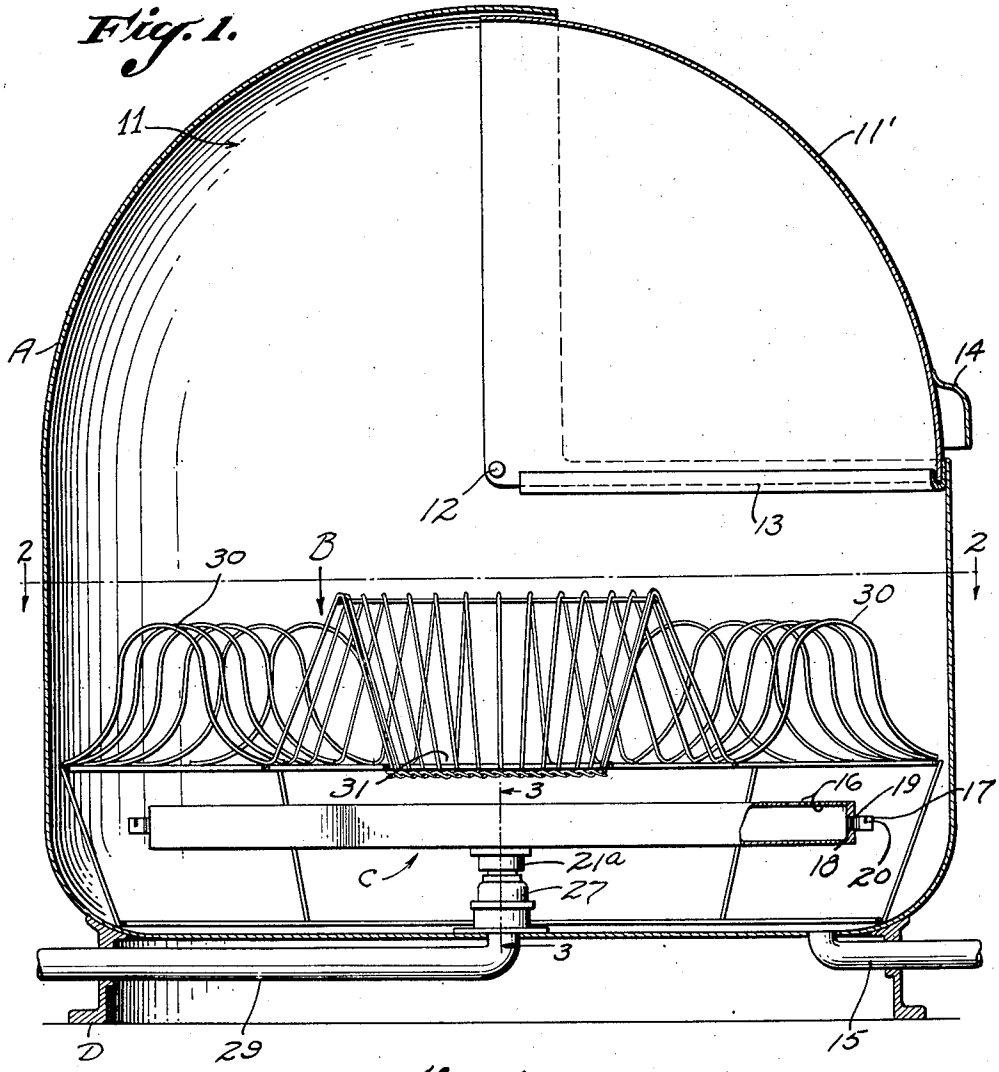
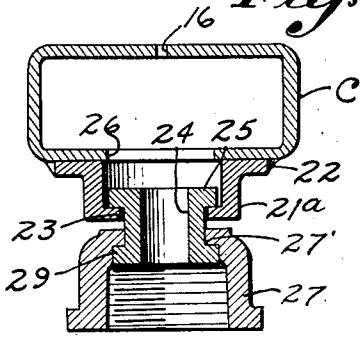


Fig. 3.



INVENTOR:
John Rodewald,
BY Frank Lahmeyer
ATTORNEY.

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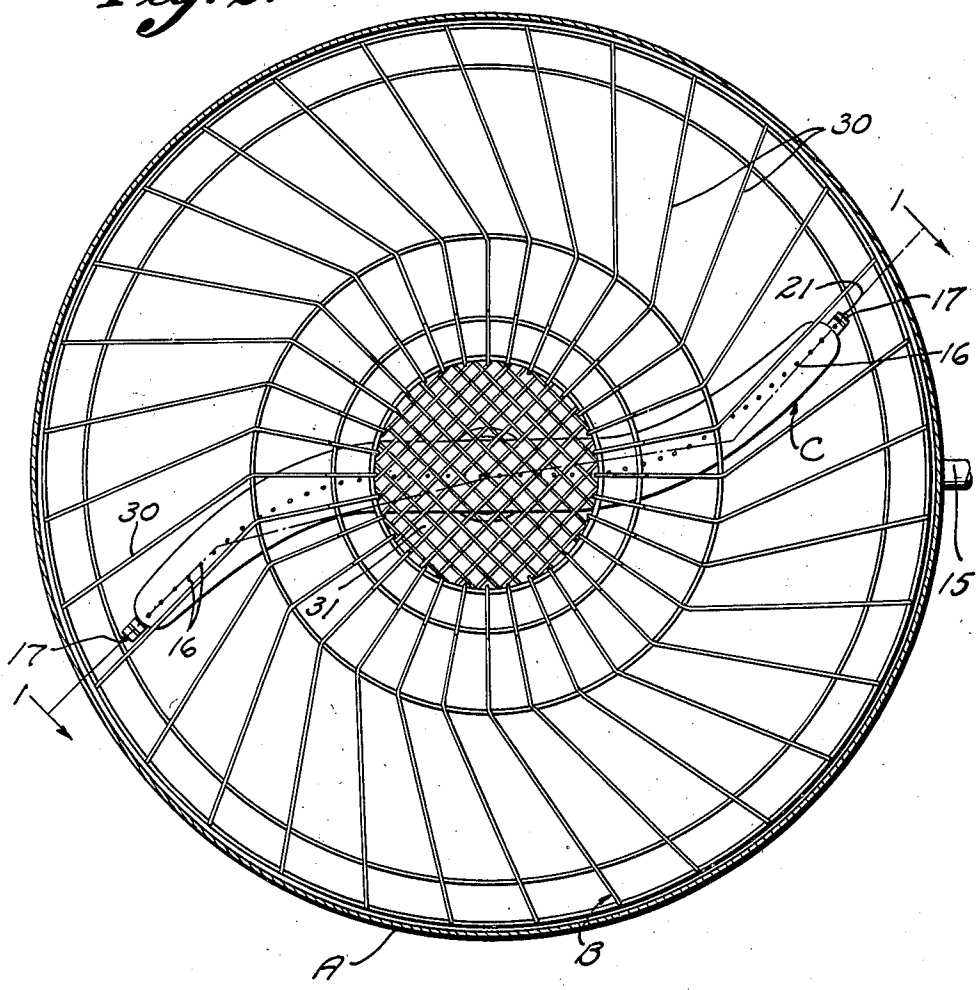
Fig. 2.



INVENTOR:
John Rodewald,
BY Russell Williamson
ATTORNEY.

Patented May 9, 1933 1,908,617

UNITED STATES PATENT OFFICE

JOHN RODEWALD, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO NATIONAL AUTOMATIC DISHWASHER CO., LTD., OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA

DISHWASHER

Application filed June 28, 1930. Serial No. 464,468.

This invention relates to dish washing machines, and deals particularly with hydraulically operated machines. The objects of this invention are to provide a dish washing machine characterized by being economical in the use of hot water, and capable of performing more efficient and faster work than the machines at present available. To accomplish these objects, I employ a rack arranged to hold dishes in a special predetermined position when stacked, and, in conjunction with said special arrangement of dishes, I use a specially shaped rotating sprayer. The sprayer is adapted to rotate under the force of expelled water, and is equipped with nozzles arranged to spray water against the dishes in a manner to produce a water sweeping action across the surface of each dish. The sweeping action of the water washes from one side of the dish to the other, and dislodges any foreign matter that may be upon the surface.

The purpose of forcing the water to travel as a sheet in one direction across the dish surface is to eliminate any countercurrents and any diminished washing effects, due to the interference of sprays or splashings when the sprays strike the dishes. It is evident that if the individual sprays were allowed to strike the dishes in a haphazard manner, a large percentage of washing efficiency would be lost, since a great deal of the kinetic energy of the water would be spent in striking a surface already covered with water. The washing action actually produced in my machine corresponds very closely to the action of a wash cloth moved over the surface of the dish.

A noteworthy feature of my arrangement resides in the provision of means on the rotatable sprayer for regulating the speed of rotation. Other features will become apparent in the following description taken in conjunction with the drawings in which—

Fig. 1 is a vertical section taken substantially on the line 1—1 of Fig. 2;

Fig. 2 is a horizontal plan section taken on the line 2—2 of Fig. 1; and

Fig. 3 is an enlarged fragmentary view taken on the line 3—3 of Fig. 1.

In the drawings, which illustrate one embodiment of my invention, I have shown a hood or container, generally designated A, having demountably mounted therein a rack, generally designated B, and a water propelled rotor, shown at C. Suitable means is provided for mounting the container upon a base, such as shown at D. The container A is equipped with a domed upper portion 11 having a closure 11′ which, in this instance, is shown as comprising substantially half of the dome 11, pivotally mounted at 12, and arranged to rotate in a manner to open substantially half the dome.

In respect to the opening and closing of the container, I may employ other means, such as flat lids, hinged lids, or any other suitable closure elements. Water sealing means is provided in conjunction with the closure 11′, and, as shown, comprises a lip 13 which is arranged to drain water back into the interior of the container. A closure grip 14 is also mounted upon the closure 11′, and provides a means of manually opening and closing the container. Means is also provided for draining the container, and comprises a pipe 15 suitably connected to the bottom of the container at any convenient location. More specifically describing the rotor element C, it is illustrated as being substantially S-shaped, i. e., the outwardly extending ends are curved in reverse directions. This feature is important and will be discussed later in connection with the arrangement for stacking dishes upon the rack B. The upper surface of the rotor C is provided with small holes 16 arranged to project fine vertical needle-like sprays of water. The jets or nozzle openings 16 are spaced longitudinally of the

rotor sprayer C, and a line passing through the center of the several openings 16 is substantially S-shaped, that is, the line follows the longitudinal contour of the rotor C. The outer ends of the rotor C are equipped with a member 17, which may be termed the driving member, This member, as illustrated in the broken-away section in Fig. 1, is provided with screw threads 18 adapted to engage a screw-threaded opening 19 in the rotor C. It is also provided with an aperture 20 adapted to project water for the purpose of driving the rotor. It is obvious that as the aperture 20 is rotated from a vertical angle to a horizontal angle, the speed of rotation will be correspondingly increased. In order that the members 17 may be properly rotated, they are formed with screw-driver slots 21 on the head thereof. In this respect, it may be stated that other expedients, such as thumb nuts, hexagonal nuts, or the like, may be employed for the same purpose.

Means is provided for rotatably mounting the rotor upon the bottom of the container, and, as shown in Fig. 3, comprises a member 21^a secured to the rotor C by means such as soldering or welding, as shown at 22, said member 21^a having an inwardly extending flange 23 arranged to rotatably support a sleeve 24 having an outwardly extending flange 25.

The member 21^a is fitted over an opening 26 in the rotor C. The sleeve 24 extends outwardly from the member 21^a and into a nut 27, the nut 27 being formed with an inwardly extending flange 27′, and the end of the sleeve 24 being crimped over the flange 27′, as shown at 29. The nut 27 may then be attached to any standard coupling on the bottom of the container. In assembling the structure just described, the sleeve 24 is first placed in the member 21^a, and the nut 27 is fitted over the outer end of the sleeve 24, and the end of the sleeve 24 is crimped as before stated. This structure clearly provides a rotatable water joint of simple, efficient, and durable construction, and one in which none of the parts are detachable and subject to misplacement. This is a feature of particular value in machines of this sort, since it often becomes necessary to remove the rotor for purposes of cleaning, etc. A conduit 29 is provided for conducting hot water to the rotor, and may be attached to the bottom of the container in any suitable manner. In conjunction with the rotor C, the rack B is designed to hold the dishes in the arrangement hereinbefore stated, i. e., in a position whereby the sprays projected from the holes 16 in the rotor C will sweep over the dishes in a progressively outward movement. For this purpose, I have arranged holding members or guides 30 set at such angles that the sprays emanating from the holes 16 will first contact the inner edges of objects set between the guides 30, and will then progress outwardly across the objects. This action will produce the hereinbefore stated washing action. This combination is best observed in Fig. 2 by comparing the relative spacing or the trend of the holes 16, in the outer end portions of the rotor C, to the direction of the guide members 30. The main outer portions of the members 30 are substantially tangential to a circle concentric with the axis of rotation of the sprayer C, and may be somewhat inwardly convergent one to the other, as illustrated in the drawings. In this connection it is also understood that the centrifugal force applied to the projected water is advantageous in forcing the sheet of water outwardly over the surface of the dish. In respect to the washing action of the water, I may cause the water to first contact the outer edge of the dishes and progress inwardly. In this arrangement the trend of the holes 16 with respect to the trend of the dishes in the rack would be such that the outer holes on the rotor C would be in advance of the inner holes. My invention is to be understood to include this arrangement also.

It is to be understood that means for holding silverware or other odd shaped articles may also be provided in conjunction with this particular type of rack and in the central part I have shown a receptacle 31, which may be utilized for holding cups or other small articles.

Although I have shown my rack as being formed of bent wires, nevertheless, I am aware that other materials may be used to produce the desired results, consequently, no detailed description of the method of forming the wires into a rack of this nature will be entered, deeming it sufficient to state that the guide members 30, which may be either of wire or any other material, are arranged to hold the dishes in the prescribed manner.

I am also aware that the hood or container A may take various forms, and that the rotor C may also be constructed of various materials. The only limitation that I desire to put upon the construction of the rotor C is with respect to the particular S shape of the rotor with adjustable means for varying the speed of the rotor.

In the foregoing, I have shown and described a specific embodiment of my invention, nevertheless, I reserve the right to make such alterations and modifications in the way of refinements that come within the scope of the disclosure and fall within the essence of the invention as expressed in the claims.

I claim as my invention:

1. A washing device of the character described including a rack having means for holding a plurality of objects so that each object is substantially vertical and non-coinci-

dent with any vertical plane passing through the center of the object and a given vertical axis, and a sprayer below the rack rotatable about said vertical axis, the sprayer having a plurality of radially spaced openings for discharging fluid upwardly against said objects, a line passing through the centers of said openings being curved whereby the openings are related to the rack to discharge fluid to successively strike each object in horizontal progression during rotation of the sprayer.

2. A washing device of the character described including, a rack having means for holding an object substantially vertical and non-coincident with any vertical plane passing through the center of the object and a given vertical axis, and a sprayer below the rack rotatable about said vertical axis, the sprayer being longitudinally curved to be substantially S-shaped in plan elevation and to have two curved radial arms, the arms having a plurality of longitudinally spaced openings, a line passing through the centers of said openings substantially following the plan configuration of the sprayer whereby the openings are related to the rack to project fluid upwardly to strike a surface of the object in horizontal progression as the sprayer rotates.

3. In a dish washer, a rack having means for holding dishes substantially vertically and positioning the dishes at angles less than 90° with respect to any vertical plane passing through the center of said rack and a dish, and an S shaped sprayer below said rack rotatably mounted between its ends to rotate about a vertical axis and to have two arcuately curved arms, there being a plurality of longitudinally spaced nozzles in each arm for discharging fluid upwardly against the dishes in the rack, a line passing through the centers of the nozzles of each arm being curved and the general trend of said curved line being related to the direction of rotation of the sprayer and to the position of the dishes in the rack so that the nozzles discharge streams of fluid to successively strike the surface of the dishes in horizontal progression in an outward direction as the sprayer rotates.

4. A dishwasher of the character described including, a circular rack having means for holding a plurality of dishes so that each dish is substantially vertical and at an angle of less than 90° to a vertical plane passing through the center of the rack and the center of the dish, the several dishes being held at substantially the same angles to such planes, a sprayer below the rack rotatable about a vertical axis coincident with the vertical center of the rack, the sprayer having arms projecting from its center each provided with a plurality of longitudinally spaced openings for discharging water upwardly against the dishes, and means for rotating the sprayer, lines extending through the centers of the openings in the arms being curved in a direction so that the openings are related to the rack and the direction of rotation of the sprayer to discharge streams of water to successively strike the surfaces of the dishes and move across the surface of the dishes in horizontal progression outwardly from the inner edges of the dishes.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 19 day of June 1930.

JOHN RODEWALD.