

Oct. 29, 1929.

F. D. CLINTON

1,733,249

SPRAYING MECHANISM FOR DISHWASHING MACHINES

Filed Jan. 8, 1927

2 Sheets-Sheet 1

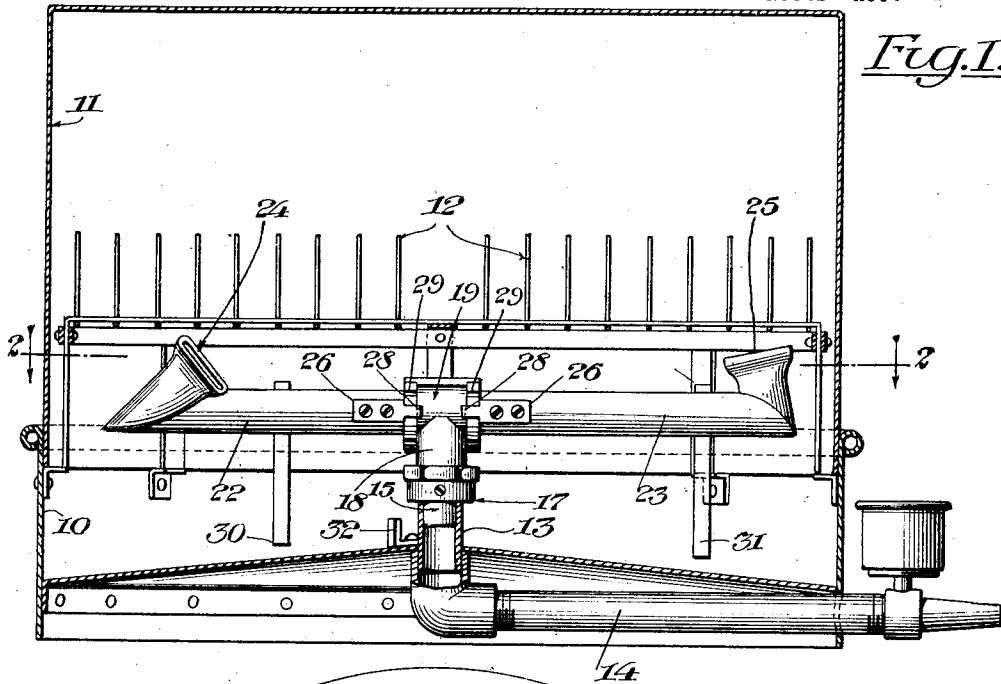


Fig. 1.

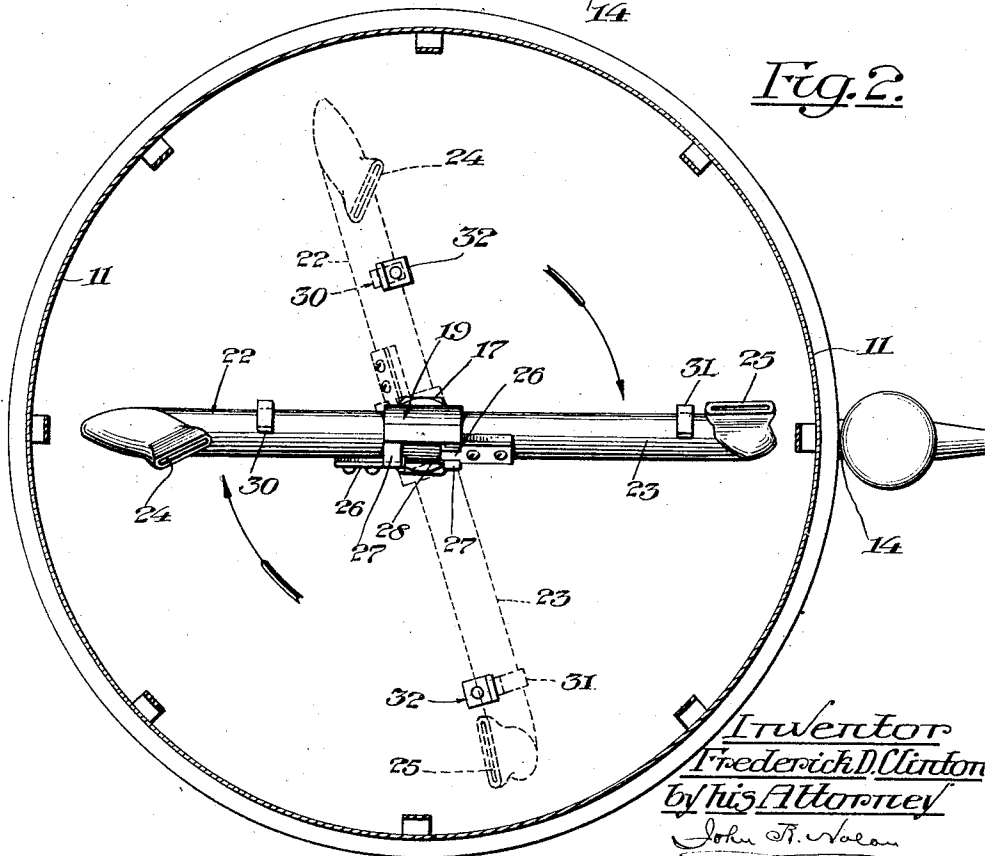


Fig. 2.

Inventor
Frederick D. Clinton
by his Attorney
John T. Valen

Oct. 29, 1929.

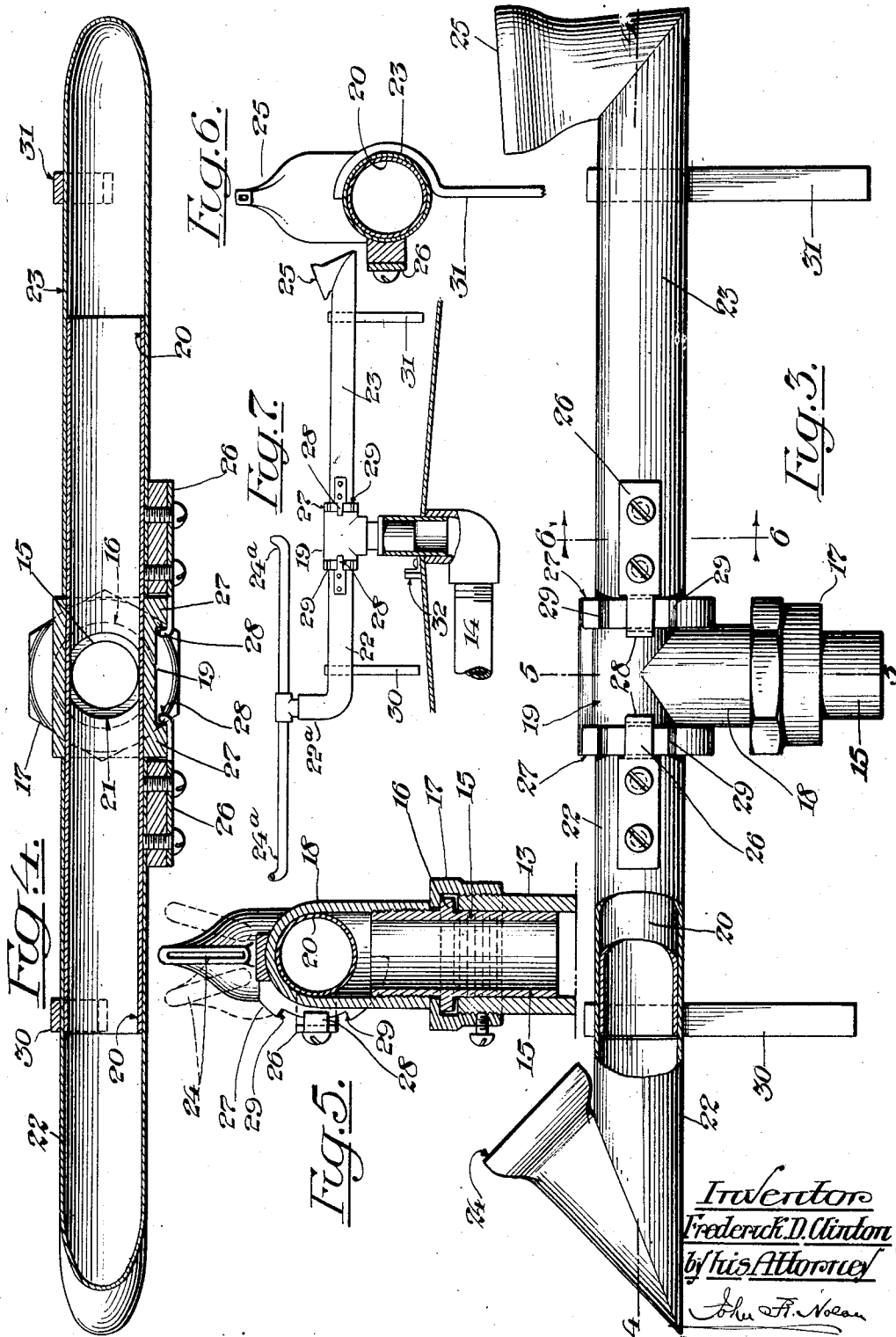
F. D. CLINTON

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2 Sheets-Sheet 2



Inventor
Frederick D. Clinton
by his Attorney
John F. Nolan

UNITED STATES PATENT OFFICE

FREDERICK D. CLINTON, OF MILWAUKEE, WISCONSIN

SPRAYING MECHANISM FOR DISHWASHING MACHINES

Application filed January 8, 1927. Serial No. 159,785.

This invention relates to spraying mechanism designed more especially for use in connection with dishwashing machines; and its main object is to provide a mechanism of simple and efficient construction wherein spraying members are operative to distribute cleansing fluid under pressure and at various angles toward and against the respective sides of the articles to be cleansed.

The embodiment of my invention herein illustrated comprises a rotatable inlet member for liquid under pressure, horizontal conduits mounted on said member for rotation therewith and having capacity for independent rotative movement on their longitudinal axes, reaction and spraying nozzles on said conduits, and means operable by the rotation of said conduits for partially turning them on their longitudinal axes and thus changing the angularity of the nozzles, whereby oscillatory travel of the nozzles, throughout a circular area, is attained.

The invention also comprises novel features of construction and combinations of parts, all of which will be hereinafter described and claimed.

In the drawings—

Figure 1 is a vertical section of a dishwashing machine equipped with spraying mechanism embodying my invention in its preferred form.

Fig. 2 is a horizontal section of the machine, as on the line 2—2 of Fig. 1.

Fig. 3 is an elevation, partly in section, of the spraying devices, and adjuncts, the conduits and their reaction nozzles being shown in an intermediate position, for clearness of illustration.

Fig. 4 is a horizontal section, as on the line 4—4 of Fig. 3.

Figs. 5 and 6 are transverse vertical sections, as on the lines 5—5 and 6—6 respectively of Fig. 3.

Fig. 7 is a view illustrating a modification of my invention.

Referring to the drawings, 10, 11 designate lower and upper cylindric casing sections, within which is suitably mounted a rack 12 for the support of the dishes to be washed.

Rising from the bottom of the casing is

a centrally-disposed nipple 13 to which leads an inlet pipe 14 from a suitable source of water supply under pressure. In the upper part of the nipple is rotatably fitted a tubular section 15 having a suitably-disposed collar 16 which is seated on the nipple. This section 15 is held to its seat by a union 17 which is screwed or otherwise affixed to the adjacent end of the nipple. Secured to the upper part of the section 15, so as to be rotatable therewith, is the vertical member 18 of a T-fitting 19, the horizontal member whereof supports a long tubular bearing member 20 midway between the ends of the latter. The wall of this tubular member has therein an opening 21 in communication with the vertical member of the T-fitting. This fitting thus constitutes an inlet member rotatable about a vertical axis and having tubular bearings at right angles to said axis and in axial alignment, longitudinally, with each other.

Telescopically mounted on the respective bearing portions of the tubular member 20, so as to have limited rotary motion thereon, independently of each other, are two conduits comprising tubes 22, 23, which extend outwardly from the respective ends of the T-fitting and terminate in reaction spraying nozzles 24, 25 which are preferably integral with the respective tubes 22, 23. These nozzles have elongated contracted outlets and are relatively disposed as shown, that is to say, the nozzle 25 extends radially outward and upward, and the nozzle 24 inclines inwardly and upward, both nozzles thus being directed at different angles toward the overlying rack.

The bearing member 20 affords extended supports for the tubes 22, 23, and ensures sufficient frictional contact between the telescoped members to maintain the tubes and their nozzles in the respective positions to which they may be independently rotated on the bearing portions, as hereinafter described.

As a simple and efficient means to hold the tubes on their respective bearings and also to limit their degree of rotation thereon, each of the tubes has suitably secured thereto, adjacent the T-fitting, a finger 26 which extends

across a recessed peripheral projection 27 formed on the horizontal member of the fitting, and has also an inturned end 28 which co-acts with the inner side of the projection.

5 The walls 29 of the recess are spaced apart to afford appropriate stops against which the finger abuts and thus determines the range of rotary motion of the adjacent tube on its longitudinal axis.

10 Fast on the respective tubes 22, 23 are tappet arms 30, 31 which depend near to the bottom of the casing, and are adapted, during the horizontal rotation of the bearing member 20 and the tubes, to abut against oppositely-disposed stop lugs 32, 33, respectively, mounted on the bottom of the casing, which stops thus serve to swing the respective arms 30, 31 and partially rotate the associated tubes on their longitudinal axes, either to the right or the left, according to the direction of horizontal rotation of the bearing member and the tubes.

The tappet arms and their respective stops are set at different radial positions, as shown, 25 so as to permit the nozzle tubes to make a complete rotation, in either direction, before the tappet arms engage their respective stops.

Assuming that the two tubes 22, 23 be positioned on their horizontal axes so that their 30 respective nozzles discharge in opposite directions, as indicated in Fig. 2, and that water, under pressure, be supplied to the nipple 13, it will be seen that the water flows through the fitting 19 into the respective tubes 22, 23 35 and is discharged in generally opposite directions through the nozzles, which discharge by its reaction rotates the tubes on their common vertical axis in a clockwise direction, as indicated by the arrows. This rotation continues until the tappet arms abut against the 40 respective stops 32, 33, whereupon, by the impact, the two tubes are partially turned in a manner to reverse the effective reaction positions of the nozzles. This done, the efflux of water from the nozzles effects the rotation of the tubes 22, 23 and their nozzles in a reverse or contra-clockwise direction on their vertical axis until the tappet arms again contact with their respective stops; and so on the 45 tubes and their nozzles are actuated to effect the alternate forward and backward rotations of the spraying devices throughout a complete circular area.

By virtue of the elongated narrow formation of the nozzles, and the relative angularity thereof, together with their described forward and backward rotation throughout a complete circle, the water, under pressure, is discharged from the nozzles in a wide 50 stream toward and against opposite sides of the dishes and at varying angles, thus ensuring a thorough cleansing of the dishes supported on the rack.

In Fig. 7 I have illustrated a modification 55 wherein, instead of the relatively fixed reac-

tion nozzle 24 on the conduit 22, reaction spray members 24^a are rotatably mounted on and in communication with an up-turned elbow 22^a at the outer end of such conduit. In this modification the water discharged under pressure from the spray members 24^a effects 70 their continuous rotation independently of the rotation of the conduits about their vertical axis, and such rotating members are angularly tilted coincidentally with the partial turning of the conduit by the impact of its depending arm 30 with the opposing stop 32.

It is to be understood that my invention is not limited to the particular construction herein disclosed, as the same may be modified 75 within the principle of my invention and the scope of the appended claims.

I claim—

1. In spraying mechanism, the combination with an inlet member rotatable about a 85 vertical axis and having tubular bearings at right angles to said axis and in longitudinal axial alignment with each other, said member also having recessed exterior portions, conduits independently rotatable on said 90 bearings and having discharge nozzles at their outer ends, members on said conduits coacting with the recessed portions of the inlet member to retain the conduits in place and to limit their independent rotation, 95 means for supplying liquid, under pressure, to the said conduits by way of the said inlet member, and impact means operable by the rotation of the conduits for partially turning said conduits about their longitudinal axes. 100

2. In spraying mechanism, the combination with an inlet member rotatable about a 105 vertical axis and having recessed exterior portions, a tube supported by, and having a wall opening in communication with the said inlet member, said tube providing elongated bearings, conduits independently rotatable on said bearings and having discharge nozzles at their outer ends, members on said conduits coacting with the recessed portions of the inlet member to retain the conduits in place and to limit their independent rotation, means for supplying liquid, under pressure, to the said conduits by way of the said inlet member, and impact means operable by the 110 rotation of the conduits for partially turning said conduits about their longitudinal axes. 115

3. In spraying mechanism, the combination with an inlet member rotatable about a 120 vertical axis, conduits independently rotatable on said member and having discharge nozzles at their outer ends, said nozzles having elongated narrow discharge openings and being arranged to discharge upwardly at different angles, means for supplying liquid, 125 under pressure, to the said conduits by way of the said inlet member, and impact means operable by the rotation of the conduits for partially turning said conduits about their longitudinal axes. 130

4. In spraying mechanism, the combination with an inlet member rotatable about a vertical axis, and having a plurality of laterally extending outlet portions, of an independently rotatable conduit on each of said outlet portions and having a reaction nozzle at its outer end, co-acting means on said inlet member and conduits for limiting the range of independent rotative movement of said conduits about their longitudinal axes, means for supplying liquid, under pressure, to said conduits by way of the inlet member, and impact means operable by the rotation of the said conduits about the vertical axis for partially turning the said conduits bodily about their longitudinal axes at each complete rotation about the vertical axis and thereby reversing the reaction position of at least one of the nozzles.

5. In spraying mechanism, the combination with an inlet member rotatable about a vertical axis, of laterally extending conduits independently rotatable on said member about horizontal axes, one of said conduits having an angularly disposed reaction nozzle at its outer end, a hollow member rotatable about a vertical axis on the other conduit, a plurality of conduits extending from said hollow member, an angularly disposed nozzle at the end of each of said last mentioned conduits, co-acting means on said first mentioned conduits, and inlet member for limiting the range of independent rotative movement of said first mentioned conduits, means for supplying liquid, under pressure, to the said first mentioned conduits by way of the inlet member, tappet arms depending from the first mentioned conduits, and separate stops with which the respective arms contact to effect the partial turning of the first mentioned conduits bodily on their longitudinal axes, said arms and stops being so located that each of the arms can freely pass the stop for the other arm.

6. In spraying mechanism, the combination with an inlet member rotatable about a vertical axis, of conduits independently rotatable on said member and having angularly disposed discharge nozzles at their outer ends, means for supplying liquid, under pressure, to the said conduits by way of the said inlet member, and separate impact means so arranged in relation to the vertical axis and to each other that at the end of each complete rotation of the conduits they are simultaneously actuated to effect the partial turning bodily of the conduits in opposite directions on their longitudinal axes.

7. In spraying mechanism, the combination with an inlet member rotatable about a vertical axis, of conduits independently rotatable on said member and having angularly disposed discharge nozzles at their outer ends, means for supplying liquid, under pressure, to the said conduits by way of the said

inlet member, tappet arms carried by the respective conduits, and separate stops with which said arms respectively contact to effect the partial bodily turning of said conduits and so located that each of the arms can freely pass the stop for the other arm and contact with its own stop at the end of each complete rotation of the conduits about the vertical axis.

8. In spraying mechanism, the combination with an inlet member rotatable about a vertical axis, of conduits independently rotatable on said member, angularly disposed discharge nozzles at their outer ends, means for supplying liquid, under pressure, to the said conduits by way of the said inlet member, tappet arms depending from said conduits at different distances from the vertical axis, and stops with which said arms simultaneously contact to effect the partial bodily turning of said conduits at the end of each complete rotation of the conduits about the vertical axis.

9. In spraying mechanism, the combination with an inlet member rotatable about a vertical axis, of conduits independently rotatable on said member and having angularly disposed discharge nozzles at their outer ends, co-acting means on said conduits and inlet member for limiting the range of independent rotative movement of said conduits, means for supplying liquid, under pressure, to the said conduits by way of the said inlet member, and separate impact means so arranged in relation to the vertical axis and to each other that at the end of each complete rotation of the conduits they are simultaneously actuated to effect the partial turning bodily of the conduits in opposite directions on their longitudinal axes.

Signed at Milwaukee, in the county of Milwaukee and State of Wisconsin this 3rd day of January A. D. 1927.

FREDERICK D. CLINTON.