

F. D. CLINTON.
REACTION SPRAYING MECHANISM FOR DISHWASHING MACHINES.
APPLICATION FILED JAN. 17, 1921.

1,408,077.

Patented Feb. 28, 1922.

2 SHEETS—SHEET 1.

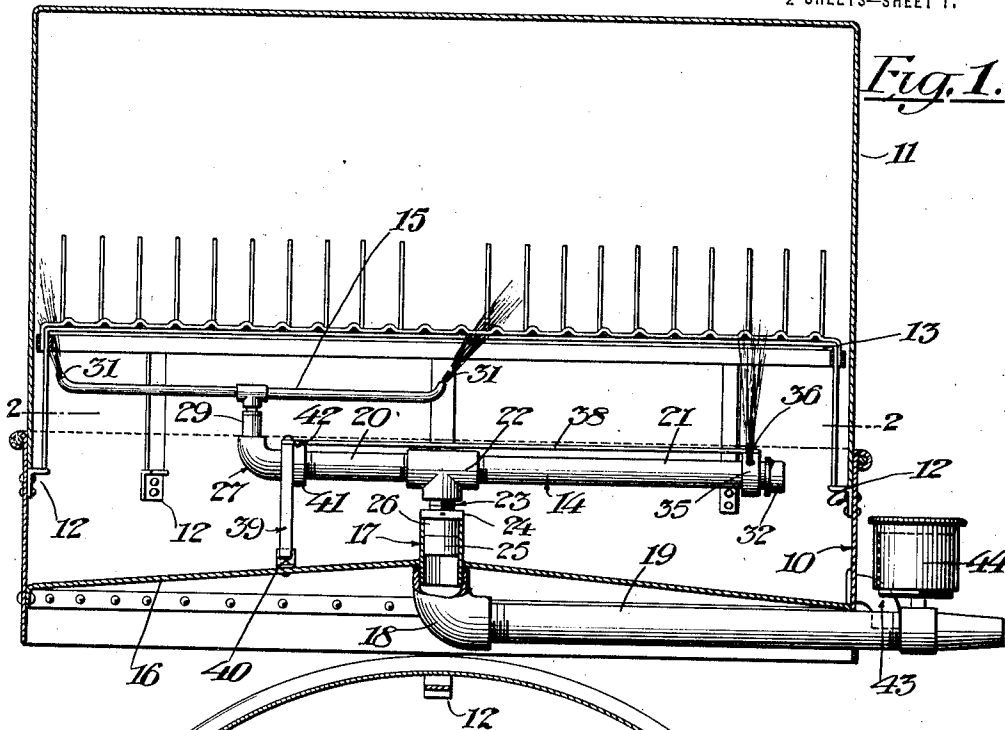


Fig. 1.

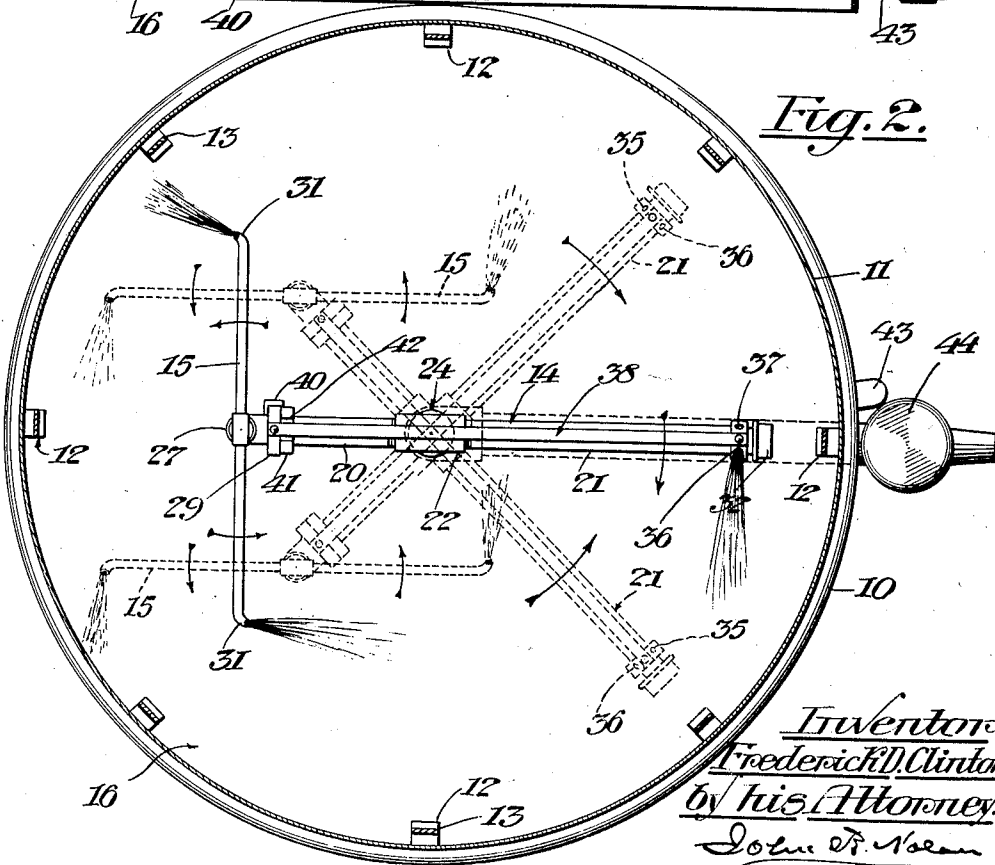


Fig. 2.

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

F. D. CLINTON.
REACTION SPRAYING MECHANISM FOR DISHWASHING MACHINES.
APPLICATION FILED JAN. 17, 1921.

1,408,077.

Patented Feb. 28, 1922.

2 SHEETS—SHEET 2.

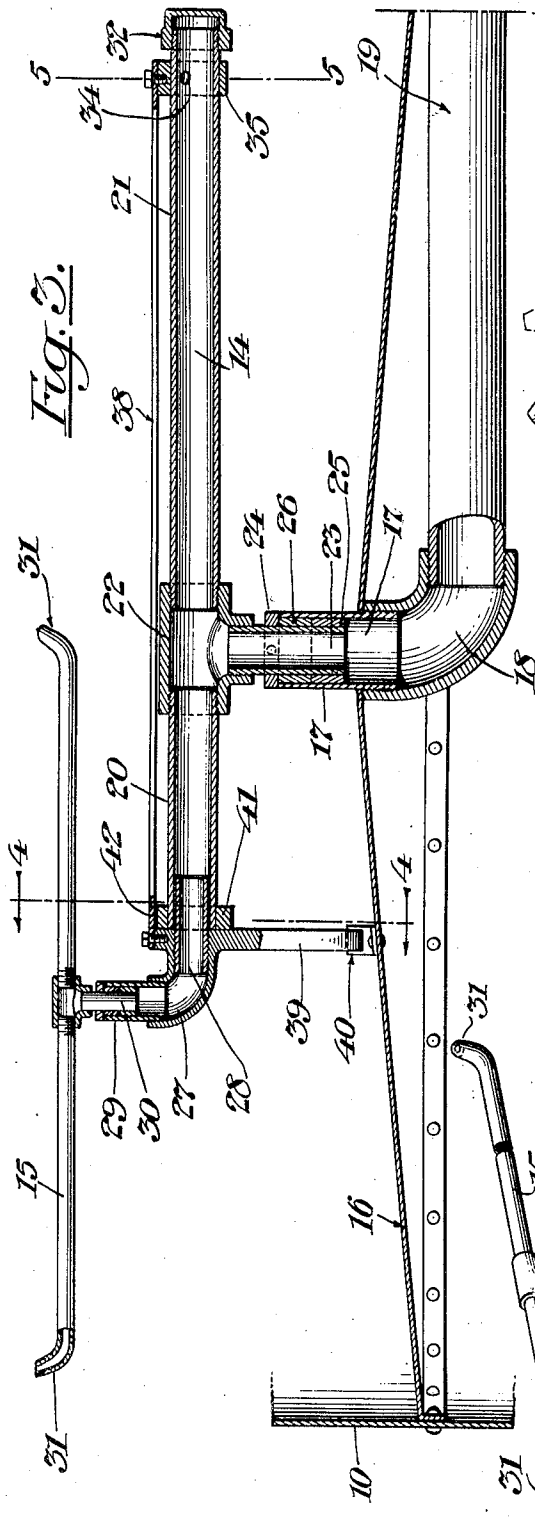


Fig. 3.

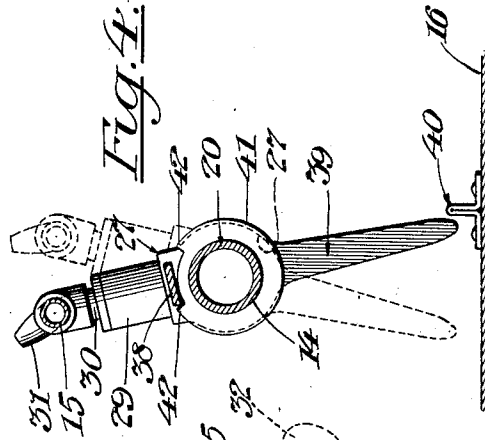


Fig. 4.

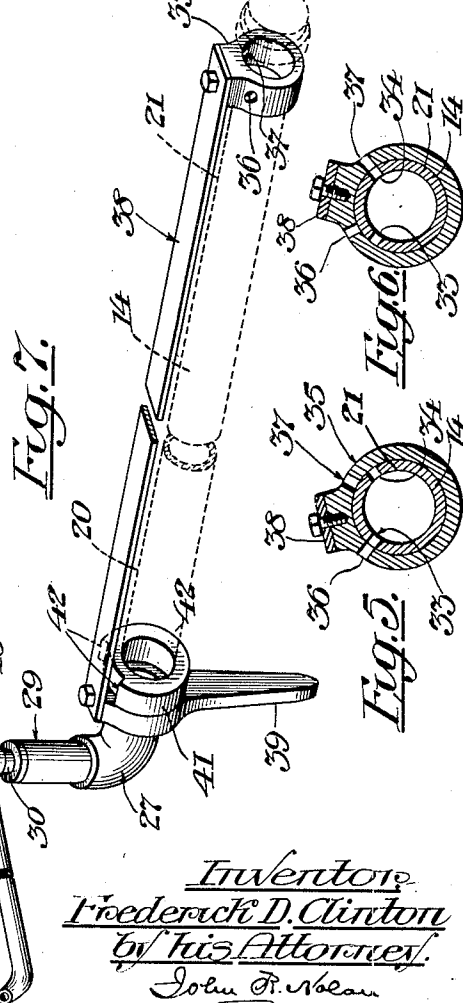


Fig. 5.

Inventor
Frederick D. Clinton
by his Attorney
John P. Moran

UNITED STATES PATENT OFFICE.

FREDERICK D. CLINTON, OF MILWAUKEE, WISCONSIN.

REACTION SPRAYING MECHANISM FOR DISHWASHING MACHINES.

1,408,077.

Specification of Letters Patent.

Patented Feb. 28, 1922.

Application filed January 17, 1921. Serial No. 437,665.

To all whom it may concern:

Be it known that I, FREDERICK D. CLINTON, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Reaction Spraying Mechanisms for Dishwashing Machines, of which the following is a specification.

10 This invention relates to multiple reaction spraying mechanisms for dish-washing machines, and its object is to provide a mechanism whereof the spraying members are of such character that cleansing fluid is distributed under pressure at various angles toward and against the respective sides of the articles to be cleansed, thereby ensuring a thorough and effective cleansing operation.

20 A feature of the invention consists in the provision of means whereby one of the spraying members is automatically oscillated and the other member is continuously rotated by the reaction of the water flowing through the said members under pressure; and another feature of the invention consists in the provision of means whereby the continuously rotating member is periodically tilted during its travel.

30 In the form of embodiment of my invention herein illustrated the spraying mechanism comprises a main spraying member mounted for horizontal oscillation and having oppositely related reaction ports at one end, a secondary or planetary spraying member rotatably mounted on and in communication with the opposite end of said main member, means whereby liquid under pressure is supplied to the main member and thereby delivered to the planetary member for discharge therefrom in a manner to rotate the latter member, and valve means whereby the ports of the main member are closed and opened at successive intervals to effect through the alternate reaction of the water escaping through the ports the bodily oscillation of the main member concurrently with the continuous rotation of the planetary member. This planetary member is tiltably mounted on the main member and connections are provided whereby the former member is bodily tilted as the main member approaches and reaches the end of each stroke, and whereby also the valve means for controlling the reaction ports of the main member are actuated

to effect a reversal of the direction of travel of the latter member.

The invention also comprises various novel features of construction and combinations of parts 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.

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

Fig. 3 is a vertical section, partly in elevation, of the spraying mechanism, and adjuncts.

Fig. 4 is a vertical section through the structure, as on the line 4—4 of Fig. 3, showing different angular positions of the planetary spraying member.

Fig. 5 is a transverse section through the oscillatory tubular member and its valve, as on the line 5—5 of Fig. 3, the valve being shown in position to open the left hand reaction port of said member.

Fig. 6 is a similar section showing the valve in the reverse position.

Fig. 7 is a perspective view of the planetary spraying member and its tappet-actuated elbow, together with the valve and its connection with the elbow.

Referring to the drawings, 10 and 11 designate lower and upper casing sections removably connected in order that access can be readily had to the interior of the casing, as occasion may require. The lower section of the casing is provided on its inner side with brackets 12 which not only afford a support for the lower edge of the upper section when the casing is closed, but also furnish a support for a removable dish rack 13 upon which the dishes to be washed can be spaced apart.

Within the casing are two rotary horizontally-disposed spraying members 14, 15, the former being mounted to oscillate about a vertical axis centrally of the casing, and the latter member being mounted to turn continuously on a variable angular axis at one end of the oscillatory member. These spraying members are relatively operated about their respective axes by the reaction of water escaping from the members under pressure, which water is supplied to the spraying member 14 from a suitable source of supply. The jets of water discharged from the spraying members forcibly im-

pinge against the respective surfaces of the dishes at varying angles and ensure a thorough cleansing operation, as will hereinafter appear.

5 In the particular construction illustrated the bottom 16 of the casing is provided with a central stand pipe 17, the lower end of which is connected by means of an elbow 18 with an inlet pipe 19. Rotatably coupled
10 to the upper portion of the stand pipe is the spraying member 14, which, in its preferred form, comprises two pipe sections 20, 21 of different lengths connected at their adjacent ends by a T-fitting 22 from which
15 depends into the pipe 17 a tubular nipple 23 having fast thereon upper and lower coupling collars 24, 25 which take against the respective ends of an interposed bearing collar 26 fast on the inner wall of the pipe
20 19. The nipple is thus freely rotatable within the pipe 17. The section 20, which is shorter than the section 21, is provided at its outer end with an upturned elbow 27, the horizontal branch of which, in the present
25 case, is equipped with a coupling nipple 28 having its projecting portion journaled within the adjacent end of the section 20. Fast on the upper end of the elbow 27 is a coupling nipple 29 within which is rotatably
30 supported the depending branch 30 of the spraying member 15. The horizontal limbs of this member are provided at their outer ends with upwardly-inclined nozzles 31 through which jets of water are discharged
35 and directed thence against the dishes supported by the rack. The nozzles are oppositely-disposed in relation to each other as shown, and hence the reaction of the water flowing therefrom rotates the spraying
40 member 15 rapidly about its axis in the elbow 27.

The outer end of the pipe section 21 is closed by means of a cap 32 and is provided with oppositely-related upwardly and out-
45 wardly inclined reaction ports 33, 34 under the control of a rotatable annular valve 35 on said section. This valve is provided on its respective sides with upwardly and outwardly extending ports 36, 37 which are
50 adapted to register in alternate succession with the ports 33, 34 when the valve is properly turned on the pipe section; that is to say, when the valve is turned to the left (Fig. 5) the left hand port 36 of the
55 valve registers with the adjacent port 33 of the pipe section 21 and the other ports 34, 37 are out of register, and when the valve is again turned to the right (Fig. 6) the right hand port 37 of the valve registers with the adjacent port 34 of the pipe
60 section 21 and the other ports 33, 36 are out of register.

Depending upon the position of the valve 35 and the particular port 33 or 34 of the
65 pipe section 21 which is open, the reaction

of the jet of water escaping through the open port bodily rotates the spraying member 14 about its vertical axis to the right or to the left. Hence by periodically shifting the valve at or about the end of each rotation of the spraying member 14, the direction
70 of movement of the said spraying member is positively reversed; thus effecting the bodily oscillation of the member 14 while the member 15 thereon rotates continuously in one
75 direction about its own axis of rotation on the elbow 27. The jets alternately discharged from the ports 33, 34 not only effect the oscillation of the spraying member 14 but they also during such motion
80 impinge against and contribute to the washing of the dishes on the rack.

As a simple and efficient means to shift the valve 35 automatically and positively at or about the end of each stroke of the
85 spraying member 14, I connect the valve 35 to the elbow 27 by means of a rod 38 which extends above and parallel with the member 14, and I provide the said elbow with a tappet arm 39 which depends near to the
90 bottom 16 of the casing. Suitably disposed on this bottom, in the path of the free lower end of the arm, is an upstanding stop 40 against which the arm forcibly impinges as the spraying member 14 approaches the
95 end of its path of rotation, said arm, together with the elbow, thus being positively tilted to the right or to the left according to the direction of movement of the spraying member 14, and thus, through the rod 38,
100 shifting the valve to a reverse position. Fast on the member 14, adjacent the elbow 27, is a collar 41 having a peripheral recess through which the rod extends. The ends of the recess provide spaced stops 42 which
105 limit the lateral movement of the rod, and perforce the valve, to the right or left as the case may be.

The tilting of the elbow 27 as above described bodily cants the continuously revolving spraying member 15 in opposite angular directions during the oscillation of the spraying member 14 as seen in Fig. 4, and, in consequence, the jets from the spraying member 15 are alternately directed
115 against opposite sides of the dishes and at varying effective angles, which operation in conjunction with that of the upwardly-directed jets from the ports of the oscillating spraying member, ensures a most thorough
120 cleansing of the surfaces of the dishes supported on the rack.

The bottom 16 of the casing is preferably inclined as shown, and a discharge pipe 43 is provided at its lowest edge to drain the
125 water from the casing.

A soap receptacle 44, similar in construction to a compression grease cup, may be connected to the inlet pipe 19 so as to provide a supply of soap to the cleansing water
130

flowing under pressure to the reaction spraying members within the casing.

It is to be understood that I do not limit my invention to the particular construction herein disclosed to exemplify the principle of my invention, as the mechanism may be modified within the scope of the appended claims.

I claim—

1. In multiple reaction spraying mechanism for dishwashing machines, a horizontally-disposed tubular member having a vertical axis of oscillation between its ends, one of the limbs of said member having two reaction ports opening upwardly in diverging planes, a spraying member in communication with and mounted for rotation on a vertical axis on the other limb of said member, means whereby liquid, under pressure, is supplied to said tubular member through its axis of oscillation, and means, including a valve, whereby the said ports are closed and opened in alternate succession to effect the bodily oscillation of the said tubular member and also to direct in upwardly diverging paths the liquid discharge from the respective ports.

2. In multiple reaction spraying mechanism for dishwashing machines, an oscillatory member having oppositely-related reaction ports, a spraying member carried by and independently rotatable on said oscillatory member, means for supplying water under pressure to said members, means whereby the said ports are closed and opened in alternate succession to effect the bodily oscillation of the said oscillatory member, and means whereby the said spraying member is bodily tilted at predetermined intervals.

3. In multiple reaction spraying mechanism for dishwashing machines, an oscillatory member, a spraying member carried by and independently rotatable on said oscillatory member, means for supplying water under pressure to said members, means whereby bodily oscillation of the oscillatory

member is effected, and means whereby the said spraying member is bodily tilted on its axis at predetermined intervals.

4. In multiple reaction spraying mechanism for dishwashing machines, an oscillatory member having oppositely-related reaction ports, a valve for controlling said ports, a spraying member carried by and independently rotatable on said oscillatory member, means for supplying water under pressure to said members, means whereby said spraying member is bodily tilted while rotating, and connections whereby the tilting of the spraying member effects the shifting of the said valve in relation to the reaction ports.

5. In multiple reaction spraying mechanism for dishwashing machines, an oscillatory tubular member having oppositely-related reaction ports therein, an elbow having one limb thereof rotatably mounted on said member, a spraying member rotatably mounted on the other limb of the elbow, a valve for opening and closing the said reaction ports, a connection between said valve and the elbow, a tappet member on the elbow, and an abutment arranged in the path of said tappet member.

6. In multiple reaction spraying mechanism for dishwashing machines, an oscillatory tubular member having oppositely-related reaction ports at one end thereof, an elbow having one limb thereof rotatably mounted on the opposite end of said member, a spraying member rotatably mounted on the other limb of the elbow, a rotary valve having two oppositely-related ports and mounted on the tubular member in operative relation to the reaction ports of the latter, a rod connecting the said valve with the elbow, a tappet arm depending from the elbow, and an abutment arranged in the path of the said arm.

Signed at Milwaukee, in the county of Milwaukee and State of Wisconsin, this 13th day of January, A. D. 1921.

FREDERICK D. CLINTON.