Nov. 6, 1934. H. L. JOHNSTON 1,980,065

WASHING MACHINE

Original Filed March 31, 1928 4 Sheets-Sheet 1

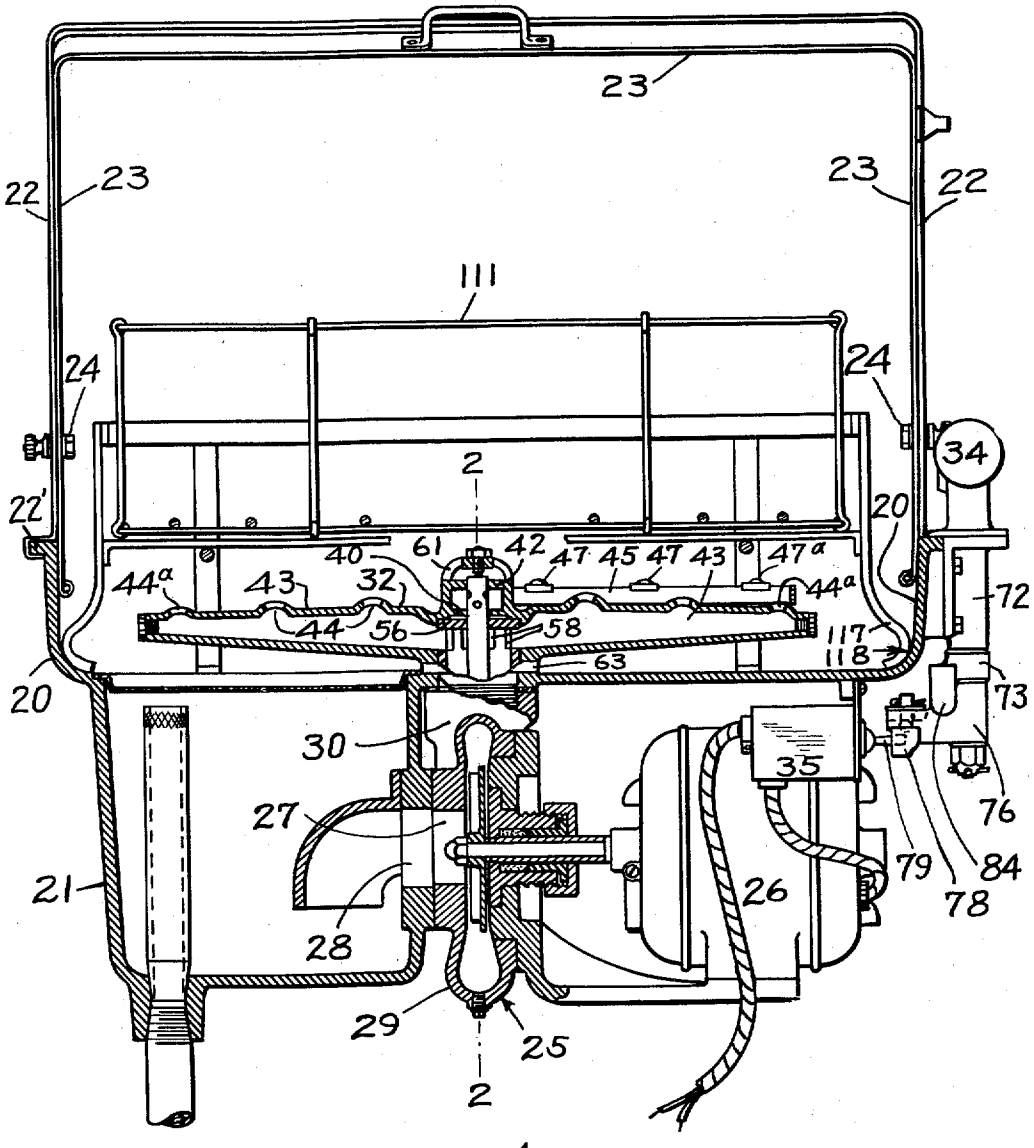



Fig.-1

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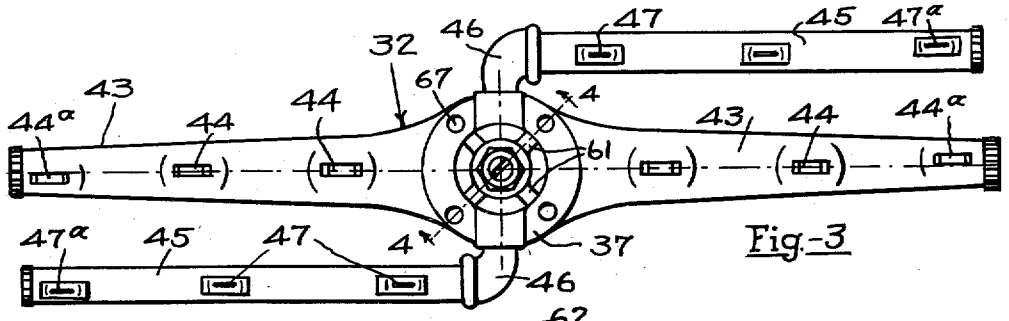



Fig.-3

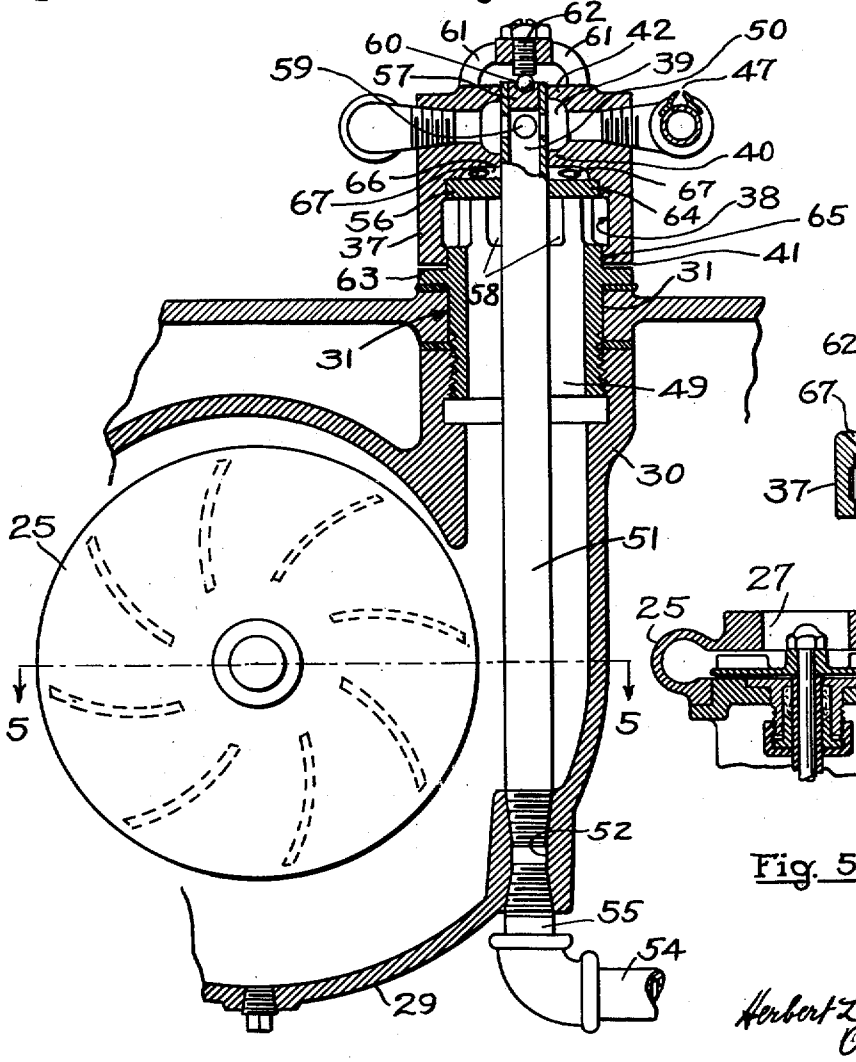



Fig.-2

Fig. 4

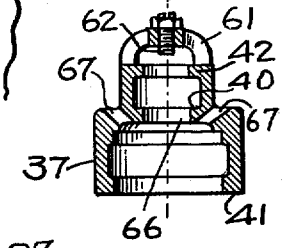






Fig. 5

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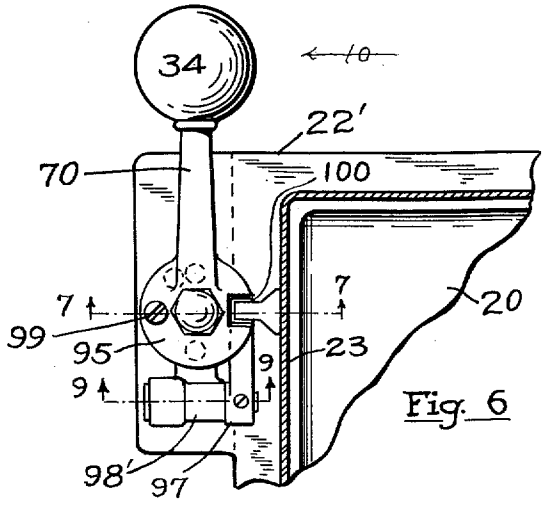



Fig. 6

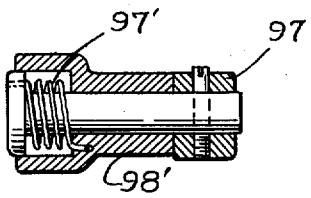



Fig. 9

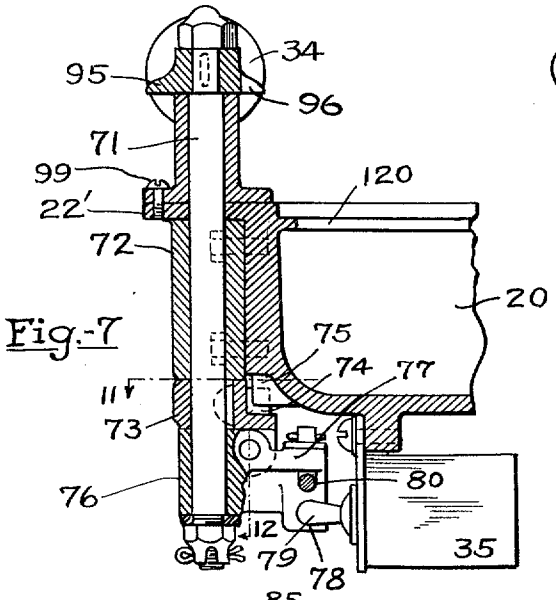



Fig.-7

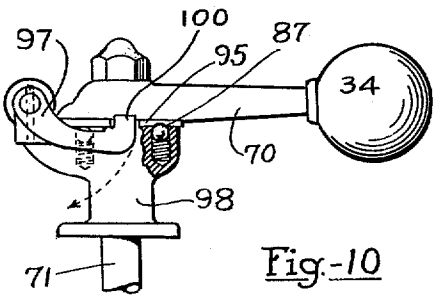



Fig.-10

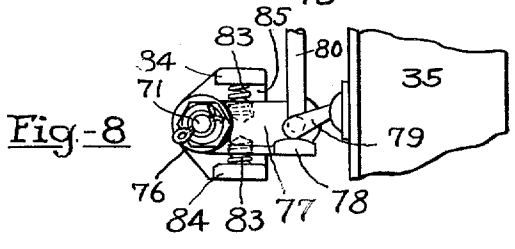



Fig.-8

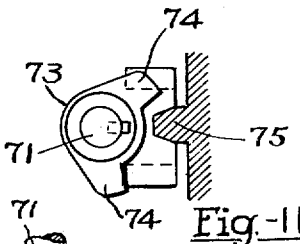



Fig.-11

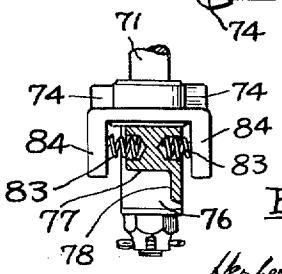



Fig.-12

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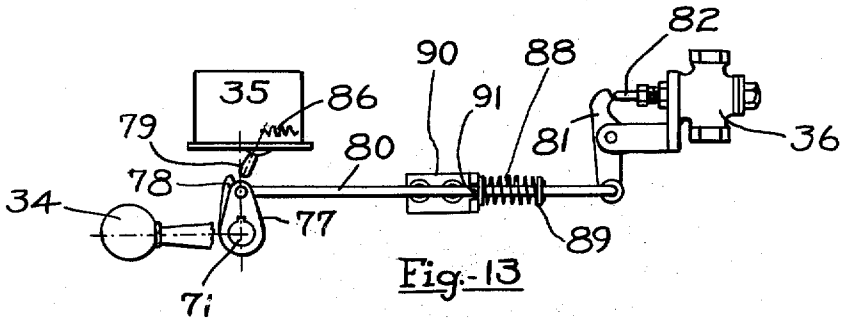



Fig.-13

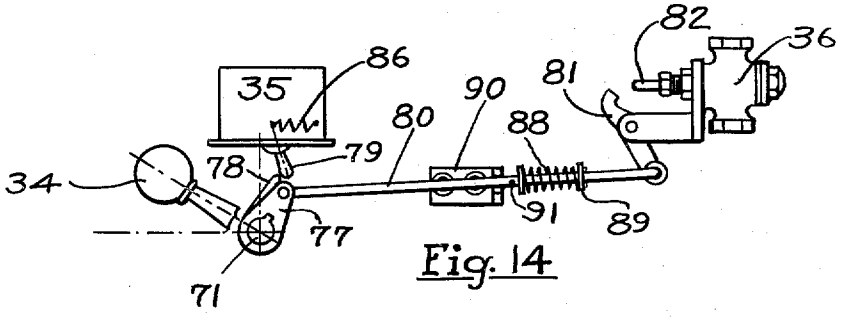



Fig. 14

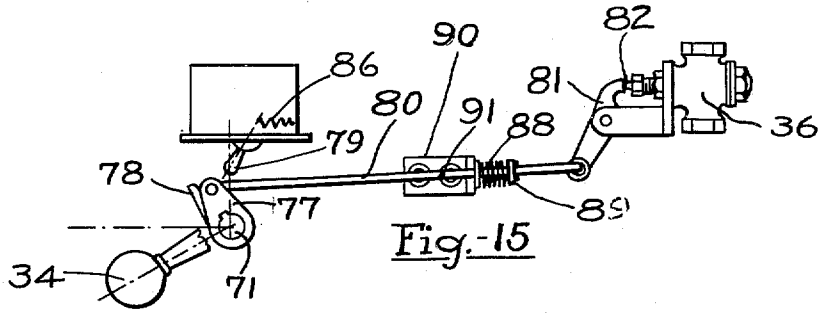



Fig.-15

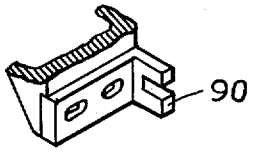



Fig.-16

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Patented Nov. 6, 1934 1,980,065

# UNITED STATES PATENT OFFICE

1,980,065

## WASHING MACHINE

Herbert L. Johnston, Troy, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio, a corporation of Ohio

Original application March 31, 1928, Serial No. 266,258. Divided and this application March 20, 1929, Serial No. 348,629

17 Claims. (Cl. 299—70)

This invention relates to washing machines and aims to provide a simple, inexpensive, compact and effective dishwashing machine particularly adapted for use in lunch counters, soda fountains and small restaurants, and for household use.

A particular object of the invention is to provide for effective washing and rinsing of dishes with the use of a minimum quantity of hot water, which may be supplied under a comparatively low pressure.

This is a division of my copending application, Serial No. 266,258, filed March 31, 1928, for Washing machines.

In previous small dishwashing machines, it has been customary to use the same distributing system for the wash water and the rinse water. This arrangement possesses the disadvantage of causing some contamination of the rinse water by dirt contained in the wash water, and the further disadvantage that the reservoir of the machine must be completely filled twice to wash and rinse each batch of dishes. In larger dishwashing machines, it has been customary to provide a separate distributing system for the rinse water, but, in such machines, it has been necessary to have a source of clean hot water under a comparatively high pressure and to use a considerable quantity of such water in order to secure effective rinsing. Both types of machines have, therefore, required the use of large quantities of clean hot water. To overcome this disadvantage, and to provide an effective machine requiring a very small quantity of clean hot water, I have invented means for utilizing energy developed in the distribution of pumped wash water to distribute rinse water supplied in small quantity and under low pressure and I have accomplished this without any contamination of the rinse water by the wash water.

An illustrative example of the means by which I have accomplished this important result will be given in connection with a detailed description of a small washing machine embodying this and other features of my invention and illustrated in the accompanying drawings in which:

Fig. 1 is an enlarged central vertical section of the machine;

Fig. 2 is a further enlarged fragmentary vertical section taken on the line 2—2 of Fig. 1 and showing a part of the pump and the distributor;

Fig. 3 is a plan view of the combined wash and rinse distributor of the machine on a still larger scale;

Fig. 4 is a vertical section of the hub of the distributor on the line 4—4 of Fig. 3;

Fig. 5 is a horizontal section of the pump taken on the line 5—5 of Fig. 2 and on a smaller scale;

Fig. 6 is a fragmentary plan view of one corner of the tank of the machine showing the control handle and lock, and showing in section the cover of the machine in closed position;

Fig. 7 is a fragmentary vertical section taken on the line 7—7 of Fig. 6, showing the control shaft and the mechanism mounted thereon;

Fig. 8 is a bottom view of the control shaft and mechanism mounted thereon;

Fig. 9 is a fragmentary vertical section on the line 9—9 of Fig. 6 showing the pivot and spring of the lock;

Fig. 10 is a side elevation of the control handle and lock, looking in the direction of the arrow 10 of Fig. 6;

Fig. 11 is a fragmentary horizontal section on the line 11 of Fig. 7 showing the stop limiting the movement of the control shaft;

Fig. 12 is a fragmentary vertical section on the line 12 of Fig. 7;

Figs. 13 14 and 15 are diagrammatic plan views of the control mechanism, Fig. 13 representing this mechanism in "off" or neutral position, Fig. 14 in wash position, and Fig. 15 in rinse position; and

Fig. 16 is a perspective view of a part of the control mechanism.

The washing machine illustrated has a shallow tank 20 provided with a well 21, which serves as a reservoir. The tank 20 is covered by a casing consisting of a fixed cylindrically curved section 22, whose lower edge is turned around an external flange 22' at the upper edge of the tank 20, and a movable cylindrically curved section or cover 23 which is secured within the fixed section 22 by pivots 24 lying on the common axis of the sections. A centrifugal pump 25 is mounted under the tank 20 on the inner side of the well 21. The pump is driven by an electric motor 26 carried by the pump casing 29. The central intake opening 27 of the pump communicates with the well or reservoir 21 through an opening 28 in the side of the reservoir. The tangential discharge neck 30 of the involute casing 29 of the pump extends through a central opening 31 in the bottom of the tank 20. At the top of the discharge neck 30, is rotatably mounted a combined wash and rinse distributor 32, hereinafter described in detail. The dishes

or other articles to be washed are supported in a basket 111 above the distributor.

In the operation of a machine, wash water contained in the reservoir 21 is forced through the distributor 32 by the pump 25 and returns to the reservoir for re-use. Then clean hot rinse water, supplied through a pipe 51, is admitted to the distributor 32 to rinse the dishes. The machine is provided with a control handle 34 which controls the washing operation by movement of a switch 35 in the circuit of the motor 26 and controls the rinsing operation by opening and closing a valve 36 in an extension 54 of the rinse supply pipe 51.

I will now describe in detail specific parts of the machine illustrated.

The combined distributor 32 (Figs. 1, 2, 3, 4) is in effect two distinct rotary distributors having their hubs integrally connected so that they are compelled to rotate as a unit. Thus the combined distributor has a hub 37 containing two distinct chambers 38, 39 separated by a horizontal wall 40. The hub has an open lower end 41 and a closed upper end 42. A pair of hollow wash arms 43 extend radially outward from the lower part of the hub 37. The inner ends of these arms open into the lower chamber 38 of the hub. The wash arms have relatively large discharge nozzles 44 along their upper surfaces. The nozzles 44*a* nearest the ends of the arms are inclined so that liquid issuing from them tends to rotate the hub and arms by reaction. Two hollow rinse arms 45 extend outwardly from the upper part of the hub 37 with their inner ends in communication with the upper chamber 39 of the hub. These arms may contain elbows 46 so that the rinse arms 45 are parallel to the wash arms 43 but are spaced laterally therefrom. This is, however, not essential, as the rinse arms 45 may extend from the hub in any direction so long as they do not lie directly over the wash arms so as to obstruct the jets of liquid issuing from the wash arm nozzles 44. The rinse arms 45 are provided on their upper surfaces with relatively small nozzles 47 so that forcible streams may be projected from them even when liquid is supplied to them at a slow rate and under low pressure. The outer rinse nozzles 47*a* are inclined in the same direction as the outer wash nozzles 44*a*.

Wash water from the pump 25 is supplied to the lower chamber 38 of the hub and thus to the wash arms 43, and rinse water from the pipe 51 is supplied to the upper chamber 39 of the hub and thus to the rinse arm 45. For this purpose the pump discharge neck 30 is provided with an annular wash water passage 49 and a central rinse water passage 50 which extends through the pump casing 29. The rinse passage is in the pipe 51, located centrally in the discharge neck 30 and tangential to a circle concentric with the impeller of the pump, so that it does not retard the flow of the wash water. In the form illustrated, the lower end of this pipe is screwed in the upper part of a vertical threaded hole 52 extending through the pump casing 29. Rinse water is supplied to the lower end of the pipe 51 from the rinse supply pipe 54 whose end 55 is screwed into the outer portion of the threaded hole 52. The pipe 51 extends through and projects beyond a closure 56 carried by a cylindrical extension threadedly connected to the upper end of the discharge neck 30 and forming an extension of the discharge neck 30 with the bottom wall of the washing machine casing clamped therebetween. The pipe 51 has a closure 57 at its upper end. Just below the closure 56, the neck 30 is provided with lateral discharge openings 58, which are surrounded by the lower portion of the hub in which the lower chamber 38 is formed. The projecting portion of the pipe 51 is provided with lateral discharge openings 59 which are surrounded by the upper portion of the hub 37 and communicate with the upper chamber 39 in the hub. The lower portion of the hub fits loosely around the upper end of the discharge neck 30 above and below the lateral openings 58 while the top 42 of the hub and the horizontal wall 40 contain central holes fitting loosely around the projecting portion of the pipe 51 above and below the lateral openings 59.

The entire distributor 32 is suspended from a one-point bearing provided by a hardened ball 60, seated in the closure 57 at the upper end of the rinse pipe 51. The upper end 42 of the hub is provided with a cage 61 having a flat vertically adjustable central bearing 62 resting on the ball 60. This bearing is so adjusted that clearances are provided between the hub and an external flange 63 on the neck 30 and the upper end 56 of the neck 30, so that the entire weight of the distributor is carried by the central bearing ball 60. The distributor bearing 62 is directly over, and well above, the center of gravity of the distributor, and the wash and rinse nozzles are each symmetrically located, so that there is substantially no friction between the hub and the sides of the neck 30 and rinse pipe 51. The suspension of the distributor from a central one-point bearing reduces friction to a minimum. It is so effective that, if the distributor once be placed in rotation, it will continue to rotate for several minutes after the force which started its rotation has ceased to act.

The mounting of the hub is such that the whole distributor may be freely lifted from the discharge neck 30 and rinse pipe 51, and may be replaced in operative position by merely dropping the hub over the ends of the neck and rinse pipe. This greatly facilitates cleaning of the machine. In order that the distributor may safely be mounted in this freely removable manner, means are provided for preventing the creation, in the chambers of the hub, of unbalanced fluid pressures which would tend to blow the distributor off the ends of the discharge neck and rinse pipe. For this purpose, both chambers in the hub are provided with upper openings as large as their lower openings. So far as the upper chamber 39 is concerned, this is accomplished by making the hole in the top 42 of the hub of the same diameter as that in the horizontal wall 40. To prevent an unbalanced upward pressure in the lower chamber 38, this chamber is provided at its top with an opening 64 fitting loosely around the closed upper end of the neck 30 and of the same diameter as the opening 65 at the lower end of the hub. The opening 64 leads to an intermediate chamber 66 enclosed between the horizontal wall 40 of the hub and the closure 56 at the end of the discharge neck 30. Relief passages 67 extend from this chamber 66 through to the outer wall of the distributor to permit the escape of wash water as fast as it leaks into the chamber 66 through the opening 64 around closure 56, and thus to prevent building up liquid

pressure against the lower side of the horizontal wall 40. The relief passages 67 are best shown in Fig. 4. These relief passages 67, which prevent the building up of pressure in the intermediate chamber 66, serve, not only to prevent blowing off of the distributor, but also to prevent the wash water from forcing its way into the upper chamber 39 of the hub around the rinse pipe 51 and thus contaminating the rinse water.

From the description of the operation of the machine given above, it will be understood that wash water is first supplied to the lower chamber 38 and wash arms 43 of the distributor through the annular passage 49, and that, thereafter, rinse water is supplied to the upper chamber 39 and the rinse arms 45 of the distributor through the rinse pipe 51. As the wash water is pumped, it may easily be supplied at a rapid rate and under considerable pressure; and, issuing in large streams through the inclined nozzles 44*a*, it sets the distributor into rotation and maintains its rotation during the washing operation. The distributor continues to rotate under its own momentum after the supply of wash water to it is stopped, and, by its rotation, serves to distribute the rinse water subsequently supplied to the rinse arms 45. It is therefore, not necessary to supply the rinse water at a sufficient rate and under sufficient pressure to initiate the rotation of the distributor; and, in fact, the entire rinsing operation may be completed while the distributor is still rotating under the momentum given to it by the wash water. The inclination of the nozzles 47*a* is, such as to tend to maintain the speed of rotation of the distributor during the rinsing operation. As the direction of the rinse liquid discharge is such that it does not set up reaction forces which oppose the rotation of the distributor, the momentum and kinetic energy of the distributor acquired during the wash liquid discharge is advantageously utilized in the distribution of the rinse liquid.

In order that the momentum of the distributor, obtained during the washing operation, may be effectively utilized to distribute the rinse water, the common control handle 34 is so connected that, by a single movement of it, the supply of wash water to the distributor may be stopped and the supply of rinse water started.

The control mechanism is shown in detail in Figs. 6 to 16. The control handle 34 is at the end of an arm 70 fixed on the upper end of a vertical shaft 71 journalled in the bearing 72 secured to the side of the tank 20 near one corner of the tank (Figs. 1, 6, 7). A sleeve 73 keyed on the shaft 71 has two short arms 74 which cooperate with a stop 75 projecting from the side wall of the tank to limit the turning of the shaft 71 and the handle 34 (Figs. 7, 11). A sleeve 76 on the shaft 71 carries an arm 77 whose movements are utilized to actuate the switch 35 and the rinse valve 36. For the former purpose, the arm has a depending part 78 positioned to engage a handle 79 of the switch 35. For the latter purpose, the arm 77 is connected by a rod 80 to a lever 81 positioned to open the rinse valve 36 by depressing its stem 82.

The sleeve 76 and the arm 77 share the turning of the shaft 71 and may be rigidly connected thereto; but, in order to prevent injury to the switch 35 in case of an inaccurate adjustment of the parts, I prefer to provide a resilient connection between the arm 77 and the shaft 71. This is accomplished in the form shown by mounting the sleeve 76 loosely about the shaft and resiliently connecting this sleeve with the keyed sleeve 73 by means of two compression springs 83 reacting between the sides of the arm 77 and two depending skirts 84 provided on a shelf 85 on the sleeve 73 (Figs. 8, 12).

The operation of the control mechanism which has just been described is best shown in the diagrammatic views, Figs. 13, 14, 15. Fig. 13 shows the neutral or inoperative position of the handle 34 and the operating mechanism, in which the switch 35 is held open by a spring 86 contained therein and the rinse valve 36 held closed by a spring contained therein. The handle is held in this position by a spring latch 87 (Fig. 10). Fig. 14 shows the handle 34 thrown to the left which turns the shaft 71 so as to cause the part 78 of the arm 77 to engage the switch handle 79 bringing the motor, pump, and wash arms into operation. The handle may be left in this position as long as may be necessary to clean the dishes, as the switch spring 86 has not sufficient strength to turn the shaft 71. When the washing is completed, the handle 34 is thrown from its extreme left-hand position shown in Fig. 14, to its extreme right-hand position, shown in Fig. 15. This movement of the handle 34 brings the part 78 of the arm 77 away from the switch handle 79, permitting the switch spring 86 to open the switch, and thus stopping the motor and pump; and causes the arm 77, acting through the connecting rod 80, to tip the lever 81 to depress the stem 82 of the rinse valve 36, and open the rinse valve to supply rinse water to the rinse arms while the distributor is still rotating under its momentum. The rinsing takes only a few moments, during which time the handle 34 is held in the position shown in Fig. 15. As soon as the handle is released, the rinse valve spring and a spring 88 on the connecting rod 80, reacting between a disc 89 fixed on the rod and an abutment 90 on the tank, return the handle 34 to its neutral position shown in Fig. 13. It should be noted that these springs cannot turn the handle beyond its neutral position, for, at the time the handle reaches this position, the valve stem 82 is all the way out, and the thrust of the spring 88 is taken by a pin 91 in the connecting rod 80, so that this spring no longer reacts against the bracket 90.

What I claim is:

1. In a washing machine, a combined wash and rinse distributor having wash and rinse spray nozzles and formed to provide a central upper rinse chamber in communication with the rinse nozzles and having holes of equal diameter in its top and bottom, a central lower wash chamber in communication with the wash nozzles and having larger holes of equal diameter in its top and bottom, an intermediate chamber in communication with the rinse chamber through the lower hole thereof and in communication with the wash chamber through the upper hole thereof, and a relief passage extending from said intermediate chamber through the outer wall of the distributor.

2. In a washing machine, a combined wash and rinse distributor having wash and rinse nozzles and formed to provide a central upper rinse chamber in communication with the rinse nozzles and having holes of equal diameter in its

top and bottom, a central lower wash chamber in communication with the wash nozzles and having larger holes of equal diameter in its top and bottom, an intermediate chamber in communication with the rinse chamber through the lower hole thereof and in communication with the wash chamber through the upper opening thereof, and a relief passage extending from said intermediate chamber through the outer wall of the distributor; a wash supply conduit having a closed upper end, extending through the lower and upper holes of the wash chamber, and containing lateral discharge openings within the wash chamber; and a rinse conduit extending within the wash conduit, projecting through the lower and upper holes of the rinse chamber and having a closed upper end, and containing lateral discharge openings located within the rinse chamber.

3. In a washing machine, an outer supply conduit having a closed upper end and lateral openings near its upper end, an inner conduit projecting through the upper end of the outer conduit and having a closed upper end and lateral passage openings in its projecting portion, a distributor for the liquids supplied through each conduit, comprising a hollow hub surrounding the lateral openings of both conduits, and a horizontal wall in said hub between the lateral openings in the inner conduit and the closed end of the outer conduit, the hub having a relief passage extending from the space between said horizontal wall and the closed end of the outer conduit.

4. In a washing machine, a hollow distributor having a plurality of separate chambers therein and balanced as to vertical pressures and having a central opening in its bottom wall communicating with one of said chambers, an inner liquid supply conduit entering said opening and communicating with another, an axial bearing on said distributor above its center of gravity and above said opening and engaging said inner supply conduit in such manner that the distributor is free to lift therefrom, and an outer liquid supply conduit surrounding the lower part of said inner supply conduit and communicating with said opening in the distributor.

5. In a washing machine, a vertical supply conduit containing lateral discharge openings, a distributor containing holes in its upper and lower walls loosely surrounding said supply conduit, a downwardly facing bearing above the upper opening in the distributor resting on the upper end of the supply conduit, and a rigid connection between said bearing and the distributor containing openings permitting the escape of liquid leaking out through the upper opening in the distributor.

6. In a washing machine of the character described, a source of supply of a washing liquid, means for supplying said washing liquid under pressure, and a source of supply of a pressure liquid of different character; a rotary distributor having communication with said means for supplying washing liquid, said distributor being adapted to be rotated when washing liquid is supplied thereto by said supplying means, a member adapted to rotate with said rotary distributor and in communication with said source of supply of the pressure liquid of a different character, the washing liquid supply being maintained entirely separate from the different pressure liquid supply, means controlling the supply of said liquids so that only one liquid is supplied at a time, said means having provisions arranged to cut off the supply of washing liquid to said distributor and to rapidly turn on the supply of the pressure liquid of different character to said member, whereby momentum of the rotary distributor and member produced during washing operation is used to assist in the distribution of the pressure liquid of different character after the washing liquid is cut off, and jets carried by said member so arranged and directed that reactive force of liquid discharged under pressure through said jets after the washing operation does not oppose the continued rotative movement of the distributor and member due to momentum acquired during the washing operation.

7. In a washing machine of the character described, a source of supply of a washing liquid, means for supplying said washing liquid under pressure, and a source of supply of a pressure liquid of different character; a rotary distributor having communication with said means for supplying washing liquid, said distributor being adapted to be rotated when washing liquid is supplied thereto by said supplying means, a member adapted to rotate with said rotary distributor and in communication with said source of supply of the said pressure liquid of a different character, the washing liquid supply being maintained entirely separate from the different pressure liquid supply, a single means arranged to cut off the supply of washing liquid to said distributor and to rapidly turn on the supply of the pressure liquid of different character to said member, whereby momentum of the rotary distributor and member produced during washing operation is used to assist in the distribution of the pressure liquid of different character after the washing liquid is cut off, and means associated with said second member for creating a force when the said liquid of different character is supplied under pressure to said member in a direction to add to the momentum of rotation of the distributor resulting from the washing operation.

8. In a washing machine of the character described, a source of supply of a washing liquid, means for supplying said washing liquid under pressure and a source of supply of a rinsing liquid under pressure; a combined rotary wash and rinse distributor having a centrally arranged hub formed with separate wash liquid and rinse liquid chambers therein in communication respectively with the said source of supply of wash liquid and the said source of supply of pressure rinse liquid, a pair of outwardly extending wash arms carried by said hub in communication with said wash liquid chamber, a pair of separate outwardly extending rinse arms carried by said hub in communication with said rinse liquid chamber and arranged in substantially the same plane of rotation as said wash arms, and elbows connecting one of said pairs of arms to said hub so that said rinse arms are spaced from said wash arms and extend generally parallel with respect thereto, and nozzles carried by said wash arms and rinse arms inclined in the same direction with respect to the direction of rotation of said distributor.

9. In a washing machine of the character described, a source of supply of a washing liquid, means for supplying said washing liquid under pressure, and a source of supply of a rinse liquid under pressure; a combined rotary wash and

rinse distributor having separate wash liquid and rinse liquid chambers and distributing arms in communication respectively with said source of supply of washing liquid and said source of supply of rinsing liquid, said distributor being adapted to be rotated when washing liquid is supplied thereto by said supply means, means for controlling the supply of washing liquid to said distributor, separate means for controlling the supply of rinse liquid to said distributor, the arrangement being such that said wash and rinse liquid supplies are maintained separate and the rinse liquid is maintained free from contamination by the wash liquid, a single control member for operating both said control means arranged to cut off the supply of wash liquid to the distributor and then immediately turn on the supply of rinse liquid to the distributor, whereby momentum of the rotary distributor acquired during washing operation is used to assist in the distribution of the pressure rinse liquid after the washing liquid is cut off, and means associated with said distributor for creating a force when the rinse liquid is supplied thereto under pressure in a direction to add to the momentum of rotation of the distributor resulting from the washing operation to thereby maintain the continued rotation thereof during the rinsing operation.

10. In a washing machine, an outer conduit and an inner conduit projecting through the upper end of the outer conduit, a hollow distributor mounted about the upper ends of said conduits and containing separate passages in communication with said conduits for distribution of liquids supplied under pressure through said conduits, said distributor and said conduits being formed to provide a chamber positioned intermediate said distributor passages to receive leakage from the junction of each distributor passage and its respective conduit, said intermediate chamber having a direct outlet to the exterior of the distributor.

11. In a washing machine, an outer conduit having a cap portion closing the end thereof, an inner conduit projecting through the cap portion of the outer conduit, said conduits each containing an opening through the wall thereof, a hollow distributor mounted about the ends of said conduits, said distributor containing separate chambers in communication respectively with the said openings through the walls of said conduits for distribution of liquids supplied through said conduits, said distributor and said conduits also being formed to provide a relief passage positioned intermediate said distributor chambers and between said cap portion of the outer conduit and the adjacent wall of the distributor, said passage having a direct outlet to the exterior of the distributor to prevent the building up of pressure in said passage against the wall of the distributor due to leakage from said outer conduit past said cap portion thereof such as to produce an unbalanced force tending to force the distributor from its normal operating position about the ends of said conduits.

12. In a washing machine, an upwardly projecting outer conduit and an inner conduit projecting upwardly through the upper end of said outer conduit, a freely removable hollow distributor rotatably suspended from the upper end of said inner conduit and enclosing the upper ends of said conduits, said distributor containing separate chambers in communicating relationship with said conduits to receive liquid under pressure from said conduits, said distributor being maintained in position by the force of gravity exerted on the distributor, said distributor and said conduits being formed to provide a relief passage positioned to receive leakage from at least one of said distributor chambers, said relief passage having a direct outlet to the exterior of the distributor.

13. In a washing machine, an outer conduit and an inner conduit projecting through the upper end of said outer conduit, a hollow distributor having a hub mounted about the upper ends of said conduits and containing separate chambers in communication with said conduits for distribution of liquids under pressure supplied through said conduits, said hub also having a relief passage formed therein having a direct outlet to the exterior of said distributor and adapted to provide for the discharge of leakage liquid from one of said chambers and thereby tend to avoid the production of unbalanced forces tending to force the distributor from its mounting about the upper ends of said conduits.

14. A distributor having vertically spaced upper and lower chambers, an upstanding support therefor comprising a conduit having an opening communicating with the upper chamber, a vertically adjustable one point suspension bearing positioned on the exterior of said upper chamber and supporting said distributor on the end of the upstanding support, said distributor having an opening in the lower end thereof providing communication with the lower chamber, and a conduit positioned concentrically with the upstanding support and terminating in a flanged end portion cooperatively spaced from the said lower end of the distributor.

15. In a washing machine, a distributor having a hub provided with vertically spaced upper and lower chambers therein, an upstanding support therefor comprising a conduit having an opening communicating with the upper chamber in said distributor hub for supplying liquid thereto, said conduit extending vertically beyond the said upper chamber, said distributor and said conduit having cooperating closely spaced surfaces both above and below said upper chamber to restrain liquid leakage, an adjustable one point suspension bearing between the upper end of said conduit and said distributor arranged above the said cooperating closely spaced surfaces above the upper chamber for rotatably supporting the distributor, said distributor having an opening in the lower end thereof providing communication with the lower chamber therein, and a pipe positioned concentrically about the first mentioned conduit and having an open upper end cooperating in close vertical spacing with the said lower end of said distributor for supplying liquid to the said lower chamber in said distributor hub.

16. The method in the distributing of different liquids, which comprises supplying a liquid under pressure from one source to and discharging it from a movable distributor in such a manner as to cause the flow of liquid through said distributor to effect movement thereof to thereby distribute the liquid over a predetermined area, cutting off the supply of said liquid to the distributor, and promptly supplying another liquid from a different and separate source to and discharging it from the distributor while it is still moving due to the momentum

imparted to it during the first operation in such a manner that the flow of liquid through said distributor avoids overcoming the inertia of the distributor and adds to its retained momentum to thereby maintain the movement of the distributor so as to distribute said other liquid over substantially the same area while utilizing a relatively small quantity of said other liquid.

17. In a washing machine, the combination of a rotatably mounted distributor having large and small nozzles inclined in the same direction and separate passages leading thereto, means for controlling the admission of liquids to said passages, and operating means arranged to actuate said controlling means in quick succession to cut off the supply of liquid to the large nozzles and supply liquid to the small nozzles; whereby the distributor may be set into rotation by the reaction of a washing liquid supplied at a relatively high rate to the large nozzles, and the momentum of the distributor thus acquired may be utilized to distribute a rinsing liquid supplied at a relatively slow rate to the small nozzles.

HERBERT L. JOHNSTON.

## CERTIFICATE OF CORRECTION.

**Patent No. 1,980,065.** **November 6, 1934.**

**HERBERT L. JOHNSTSON.**

**It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, line 41, claim 4, after "another" and before the comma, insert the words of said chambers; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.**

**Signed and sealed this 5th day of February, A. D. 1935.**

**Leslie Frazer**

**(Seal)** **Acting Commissioner of Patents.**

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