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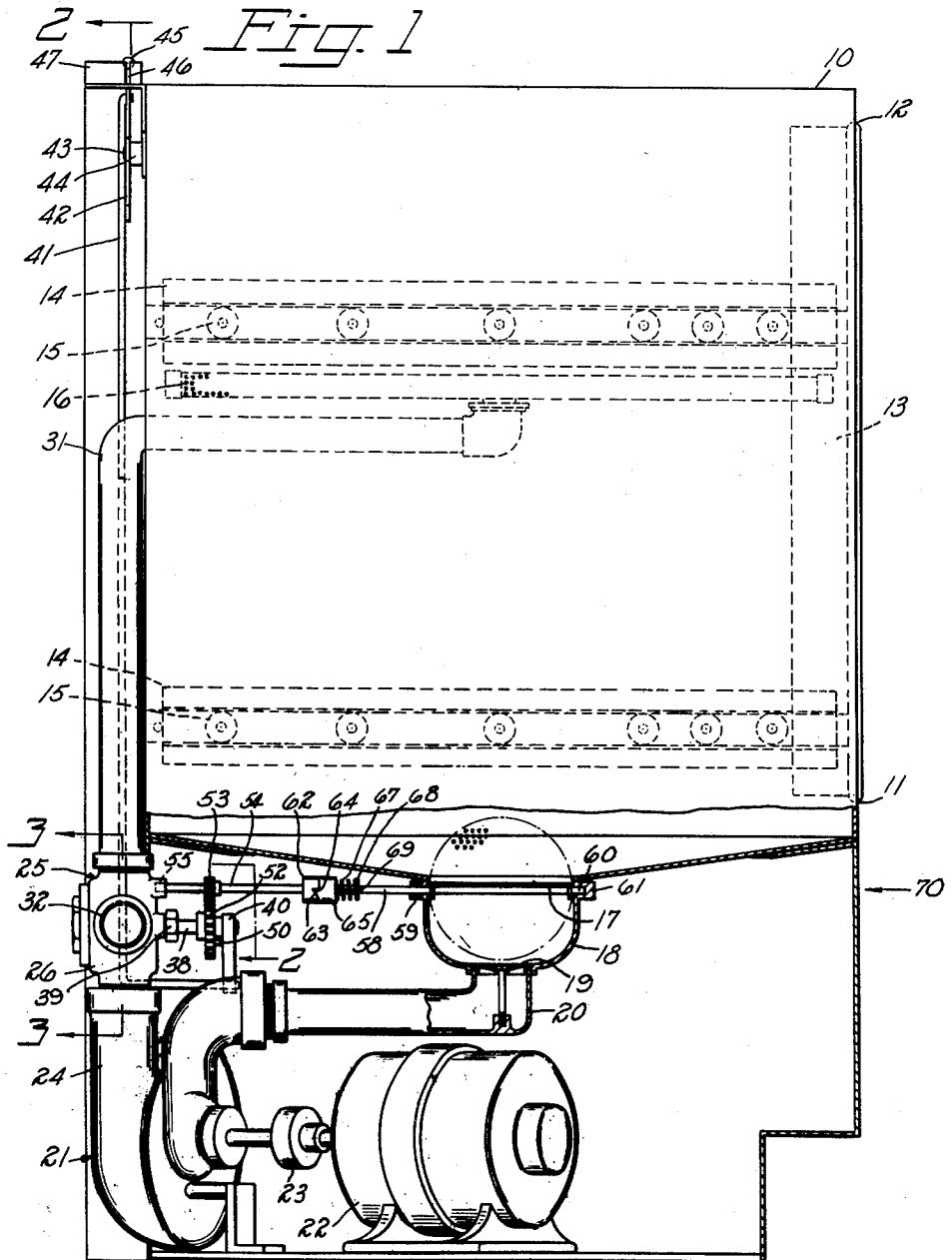
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2,629,390

DISHWASHING MACHINE

Filed Feb. 13, 1946

2 SHEETS—SHEET 1



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DISHWASHING MACHINE

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2 SHEETS—SHEET 2

Fig. 2

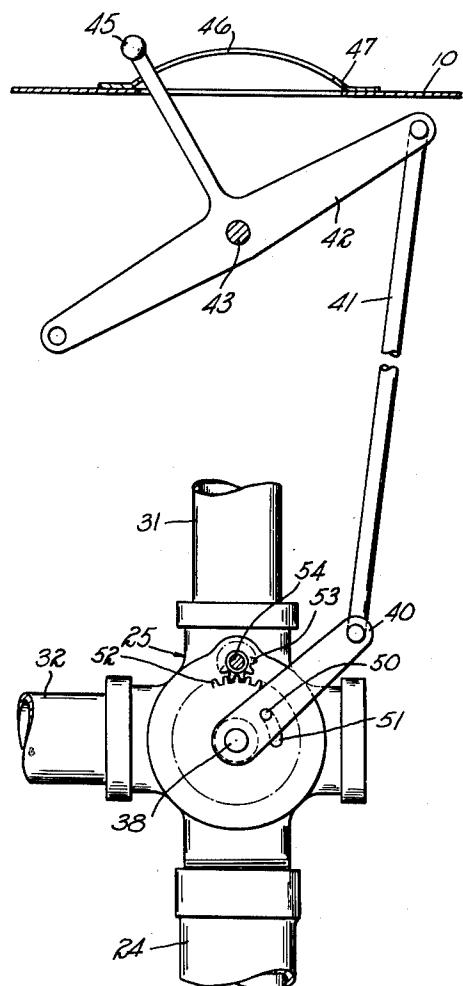


Fig. 3

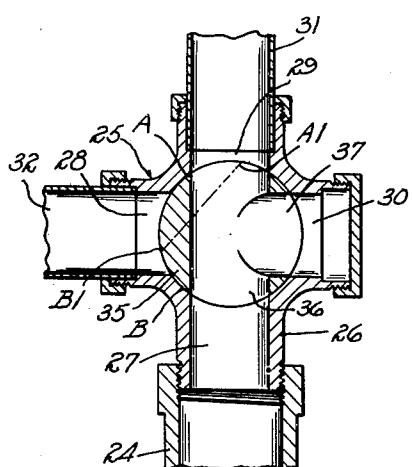
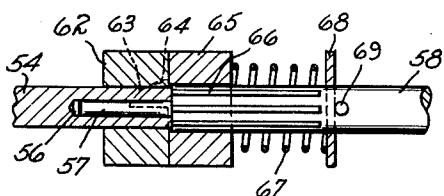


Fig. 4



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DISHWASHING MACHINE

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6 Claims. (Cl. 134—104)

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This invention relates to dishwashing apparatus in which dishes and utensils are cleaned by spraying hot cleaning solution thereon forced with substantial pressure by a fluid circulating pump. More particularly, the present invention relates to the type of apparatus in which the sump in the bottom of the dishwashing chamber is connected through a strainer with the inlet of the pump whose outlet can be connected by a valve either with the nozzle or with a drain into which undissolved particles of matter caught by the strainer can be discharged by the pump, when the strainer is dumped.

An object of the invention is to provide for the control of the valve and of the strainer by means operated by a single control member, said means being so constructed as to minimize the possibility of the clogging of the nozzle by undissolved matter removed from the dishes. In the disclosed embodiment of the invention, this object is accomplished by the combination of a strainer plate in the bottom of the sump and mounted to be rotated from a horizontal position to an inverted, horizontal position, a valve having a recirculating status for permitting solution to be withdrawn from the sump by a pump and forced to the spray nozzle and having a draining status in which the spray nozzle is disconnected from the pump and the pump is connected with the drain and means for operating the valve and for so controlling the strainer plate that the valve is shifted from recirculation status practically to draining status before the plate is inverted to dump the matter collected thereon whereby to insure that all of the dumped matter will be carried out of the drain and none will be carried to the spray nozzle.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the drawings—

Figure 1 is a side view partly in section of a dishwasher embodying the invention;

Fig. 2 is a view of the valve and strainer control mechanism as viewed on line 2—2 of Fig. 1;

Fig. 3 is a sectional view of the valve as viewed on line 3—3 of Fig. 1; and

Fig. 4 is an enlarged longitudinal sectional view of a one-way clutch for transmitting movement in one direction only to the strainer.

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Referring to Fig. 1, 10 designates a cabinet having a front opening extending from level 11 to level 12 and closed by a door 13 having water-sealing provisions not shown. Within the cabinet there are supported brackets 14 carrying rollers 15 for supporting wire baskets containing soiled dishes and utensils. Between the brackets 14, there is located a spray nozzle 16 for directing fine jets of cleansing fluid against the contents of the baskets resting upon the rollers 15. The spray fluid descends to a sump in the bottom of the cabinet below the level 11, from which the fluid passes through a finely perforated strainer plate 17, normally horizontal, into a cup 18 connected by a coarsely perforated disc 19 with the inlet pipe 20 of a fluid-circulating pump 21 driven by an electric motor 22 through a shaft coupling 23. The outlet 24 of the pump is connected with the housing 26 of a valve 25 (Fig. 3) having ports 27 and 29 connected, respectively, with pump outlet 24 and pipe 31 connected with nozzle 16 and having ports 28 and 30 either of which may be connected with a drain pipe 32. The housing 26 supports a rotary valve member 35 having a cross passage 36 and a side passage 37. Valve member 35 is connected with a shaft 38 (Fig. 1) extending through a packing gland 39 and provided with a lever or arm 40. Lever 40 is connected by a link 41 with a lever 42 pivoted at 43 upon a bracket 44 (Fig. 1) attached to the cabinet 10 adjacent the top and back thereof. The lever 42 has a control handle 45 extending through a slot 46 in a plate 47.

Lever 40 (Fig. 2) carries a pin 50 extending into an arcuate slot 51 in a gear 52 (loosely journaled on shaft 38) meshing with a gear 53 attached to a shaft 54 and journaled at its left end (Fig. 1) in a bearing 55 provided by the housing 26 of valve 25. The right end of shaft 54 has a bore 56 (Fig. 4) for receiving the reduced left end 57 of a shaft 58 journaled in a packing gland 59 attached to the strainer cup 18. Shaft 58 is connected with the strainer plate 17. The right-hand end 60 of the shaft 58 is journaled in a bearing 61 provided by the strainer cup 18.

Shaft 54 is connected with shaft 58 by a one-way clutch comprising a driving element 62 having diametrically opposite notches 63 cooperating with teeth 64 of a driven element 65 splinedly connected at 66 with the shaft 58. Element 65 is urged toward element 62 by a spring 67 retained under compression between the element 65 and a washer 68 retained by a pin 69 attached

to shaft 58. As viewed in the direction of arrow 70 (Fig. 1) and as viewed in Fig. 2, counterclockwise rotation of shaft 54 imparts counterclockwise movement to shaft 58 and strainer plate 17, but clockwise rotation of shaft 54 will not effect clockwise rotation of shaft 58 because the one-way clutch will slip due to the fact that the frictional resistance imposed by the packing gland 59 on shaft 58 is in excess of the frictional resistance imposed by spring 67 on the inclined engaging surfaces 63 of the clutch element 62 and the teeth 64 of element 65.

Counterclockwise rotation of shaft 54 for rotating the strainer plate 17 is effected by clockwise movement of gear 52 which begins after lever 40 has moved clockwise about 42° when the pin 50 engages the lower end of slot 51 in gear 52 and ends when the lever has moved 48° further to bring valve passage 36 into alignment with valve ports 28 and 30. The ratio of gears 52 and 53 being 1 to 3.75, plate 17 turns counterclockwise 180° while the valve member 35 is being rotated clockwise through said 48° of its movement. Using line A—B (Fig. 3) of the valve member 35 as a reference line, line A₁—B₁ represents the position of the member 35 when the strainer begins to move counterclockwise as viewed in the direction of arrow 70 (Fig. 1). As the valve member 35 is moved further clockwise, the flow through port 29 to the nozzle diminishes rapidly and will cease when the strainer has been tilted sufficiently to dump the undissolved matter from its upper surface into the stream of liquid being pumped from the sump to the drain. Therefore, by conditioning the valve to substantially draining status before the strainer begins to tilt from horizontal, the matter dumped by the strainer will not pass out through the port 29 to the nozzle but will be carried off with the liquid withdrawn from the sump. As the strainer is tilted to dumping position, the flow of liquid from the sump is sufficient to effect dislodgement of matter tending to cling to the strainer.

After cleaning, the motor is stopped, the valve is turned back to recirculating status, the sump is filled with hot water, and the motor is started in order to force rinse water through the nozzle. After rinsing the valve is turned to drain status to permit removal of the rinse water from the sump by operation of the pump; and the motor is stopped.

To condition the washer for a batch of soiled dishes, the valve is turned to recirculating status, the sump is filled with cleansing solution (cleaning powder dissolved in hot water), the dishes are placed in the cabinet, the door is closed and the motor is turned on.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. A dishwasher having a dish-receiving cabinet and providing a sump below the level of the dishes, said sump having an outlet at the bottom

thereof, a strainer tiltably mounted for inversion in the sump outlet, a pump having an inlet connected with the sump outlet, a nozzle for spraying cleansing solution upon the dishes, a valve actuatable either into a recirculating status for connecting the outlet of the pump only with the nozzle or into a draining status for connecting the outlet of the pump only with a drain, and a manually operated mechanism constructed and arranged to be operated to condition the valve for draining in advance of inverting the strainer and to invert the strainer for dumping.

2. A dishwasher having a dish-receiving cabinet and providing a sump below the level of the dishes, said sump having an outlet at the bottom thereof, a strainer tiltably mounted for inversion in the sump outlet, a pump having an inlet connected with the sump outlet, a nozzle for spraying cleansing solution upon the dishes, a valve actuatable either into a recirculating status for connecting the outlet of the pump only with the nozzle or into a draining status for connecting the outlet of the pump only with a drain, and a manually operated mechanism constructed and arranged to be operated for conditioning the valve for draining in advance of inverting the strainer for dumping, said manually operated mechanism comprising a lever for moving the valve member, a rotary member connected to the strainer and operable to invert it, and a lost motion connection between the lever and the rotary member.

3. A dishwasher having a dish-receiving cabinet and providing a sump below the level of the dishes, said sump having an outlet at the bottom thereof, a strainer tiltably mounted for inversion in the sump outlet, a pump having an inlet connected with the sump outlet, a nozzle for spraying cleansing solution upon the dishes, a valve actuatable in opposite directions either into a recirculating status for connecting the outlet of the pump only with the nozzle or into a draining status for connecting the outlet of the pump only with a drain, and a manually operated mechanism for actuating the valve partially into draining status and then operable to begin to tilt the strainer to inverted position, the tilting of the strainer continuing as the valve approaches complete draining status, circulation to the nozzle ceasing before the strainer dumps while being inverted, said mechanism causing the strainer to arrive at a completely inverted position when the valve has been moved completely into draining status, said mechanism also including means operable to impart motion to the strainer only when the valve is actuated in a direction to move it into draining status.

4. A dishwasher having a dish-receiving cabinet and providing a sump below the level of the dishes, said sump having an outlet in the bottom thereof, a circular, perforated strainer plate mounted in the sump outlet for rotation about a diametrical axis, a pump having an inlet connected with the sump outlet, a nozzle for spraying cleansing solution upon the dishes, a valve housing having through ports connected, respectively, with the pump outlet, with a drain and with the nozzle, a valve member for controlling the ports and movable into a recirculating position for connecting the pump outlet with the nozzle or into a draining position for connecting the pump outlet with the drain, and a manually operated mechanism for operating the valve member and the strainer plate and having provisions for moving the valve partially into draining

status before beginning to tilt the strainer plate, circulation to the nozzle being cut off when the strainer plate arrives at dumping position.

5. A dishwasher having a dish-receiving cabinet and providing a sump below the level of the dishes, said sump having an outlet in the bottom thereof, a circular, perforated strainer plate mounted in the sump outlet for rotation about a diametrical axis, a pump having an inlet connected with the sump outlet, a nozzle for spraying cleansing solution upon the dishes, a valve housing having through ports connected, respectively, with the pump outlet, with a drain and with the nozzle, a valve member for controlling the ports and movable into a recirculating position for connecting the pump outlet with the nozzle or into a draining position for connecting the pump outlet with the drain, a manually operable lever for moving said valve, a driven shaft connected to said strainer, a driving shaft, a one-way clutch between said shafts, and a lost motion connection between said lever and driving shaft.

6. A dishwasher having a dish-receiving cabinet and providing a sump below the level of the dishes, said sump having an outlet in the bottom thereof, a circular perforated strainer plate mounted in the sump outlet for rotation about a diametrical axis, a pump having an inlet connected with the sump outlet, a nozzle for spraying cleansing solution upon the dishes, a valve housing having through ports connected respectively with the pump outlet, with a drain and with the nozzle, a valve member for controlling the ports and rotatable into a re-circulating position for connecting the pump outlet with the nozzle or into a draining position for connecting the pump outlet with the drain, a

shaft connected with the valve member, a manually operated mechanism for operating the valve member and the strainer plate including a manually operated lever attached to the shaft, a gear loosely journaled on the shaft, a pin and slot lost motion connection between the lever and gear, a second gear meshing with the first gear, and means including a one-way clutch connecting the second gear with the strainer plate, said lost motion connection being such that the valve member is moved a substantial distance into draining status before the lost motion is taken up, the gear ratio of the meshing gears being such that completion of the movement by the lever of the valve member into draining status effects one-half revolution of the strainer plate, said clutch functioning upon reversal of movement of the gearing by the lever to allow the strainer to remain in revolved position.

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