

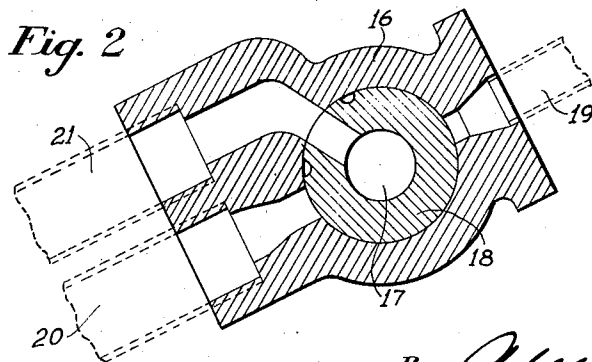
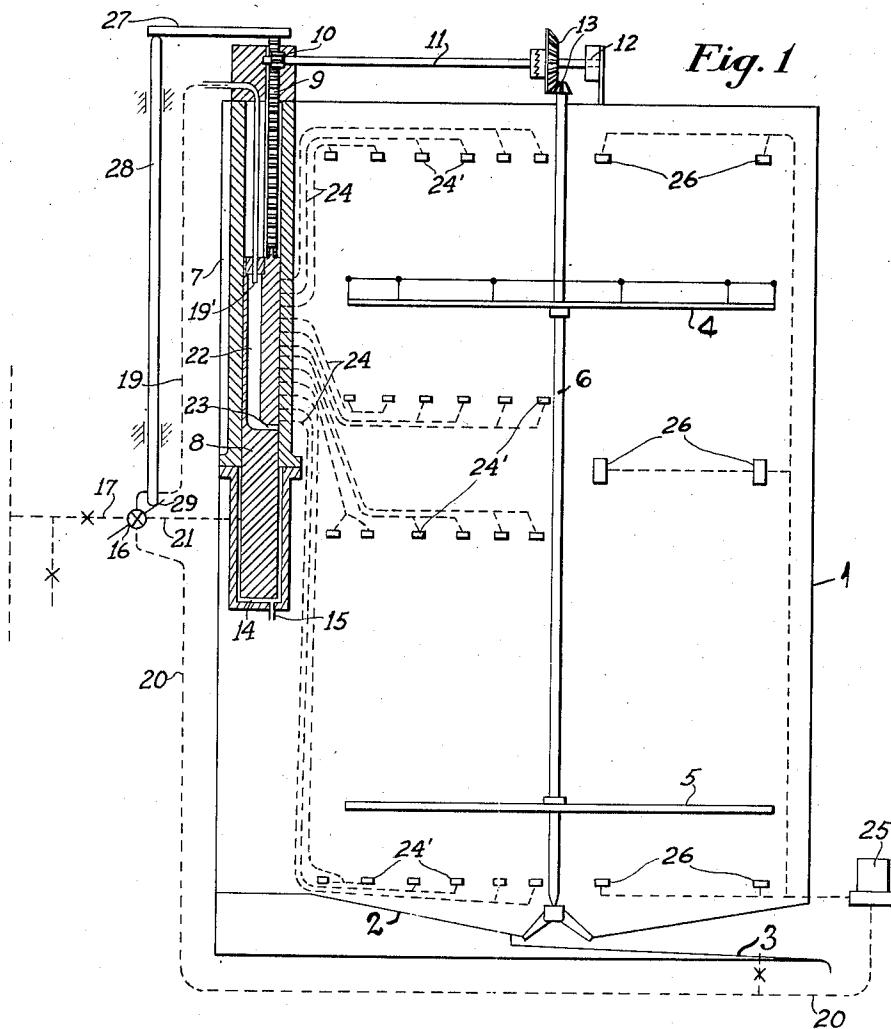
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DISHWASHING MACHINE, PRIMARILY FOR HOUSEHOLD USE

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DISHWASHING MACHINE, PRIMARILY FOR
HOUSEHOLD USEJørgen Hertz, Copenhagen, Denmark; vested in
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1 Claim. (Cl. 141—9)

This invention relates to a dishwashing machine constructed primarily for household use and of that kind which has one or several liquid discharge openings, nozzles or groups of such through which cleansing fluid or rinsing water is discharged periodically under the pressure from a house water main and through the intervention of control means, in such a manner that the machine comprises in any case certain nozzles or nozzle groups which are periodically brought into action mutually, and what in the first place characterizes the invention is the feature that the control means which bring about the periodical liquid supply to the said nozzles or nozzle groups are actuated by such means that the durations of the periods of squirting, which periods need not be of equal duration, is regulated independently of whether utensils are inserted in the machine or not. The control means employed according to the invention may be driven, for example, by a driving spring or other separate driving means similar to a clock or watch, or by other driving means, for example a small electromagnetic motor device or, possibly, a driving device operating with compressed air or water pressure and constructed, for example in the form of a small turbine. The simplest way is to employ a driving spring or a small water turbine driven by water from the house water main, which will not materially reduce the pressure in the latter. The nature proper of the control means, or the power by which they are actuated have no bearing upon the main principle of the invention.

The invention makes it possible to determine the directions in which the jets are to be ejected from the nozzles, considering solely the attainment of the greatest possible mechanical rinsing effect (detaching effect by jet action).

Seeing that in any case certain of the machine's nozzles are periodically in action mutually, the said nozzles are, according to the invention, disposed and adjusted in such a manner that each of them oversquirts with full mechanical rinsing effect only a portion of the machine's chamber holding the utensils, but still in such a manner that the periodically active nozzles do collectively and with full mechanical rinsing effect command either the whole of the said chamber or larger portions of the same, for example a vertical middle section through the chamber, extending only to the chamber's middle axis.

It is primarily only the rinsing water which is ejected through nozzles of which in any case certain are periodically in action mutually, and

if the rinsing water nozzles command the whole of the machine's chamber for utensils, then the machine may be constructed with a fixed carrying frame for the utensils. If the rinsing water nozzles collectively command only a cross section through the machine, or only the one half of such a section, the machine is constructed with a rotating carrying frame for the utensils, this passing during the rotation through that zone in the machine which is commanded by the nozzles with full mechanical rinsing effect. The aforesaid zone need not constitute an integral surface.

Generally, the said mutually periodically active nozzles will be employed, possibly such nozzles in conjunction with one or more constantly active nozzles intended solely for the squirting of the utensils with rinsing water, whereas for the squirting of the utensils with cleansing fluid constantly active nozzles are primarily employed. There is, however, nothing to prevent the employment of nozzles, all of which or some of which are periodically active mutually, for the ejection of cleansing fluid also.

The squirting with cleansing fluid is usually effected prior to the squirting with water, and for the squirting of the utensils with cleansing fluid a special system of nozzles is used, this discharging finer jets, seeing that the squirting of the utensils with cleansing fluid shall serve, in a major degree, as a kind of maceration of the impurities on the utensils.

As explained, the machine is of the kind, whose nozzles for rinsing water or cleansing fluid eject through the pressure from a house water main. The cleansing agent must therefore be introduced at a place in the pipe or pipes which connect the house water main with the nozzle or nozzles which are intended for the ejection of cleansing fluid. This is effected in that a supply device for a cleansing agent, for example soap in solid or fluid form is in a per se known manner inserted in the said pipe or pipes.

Normally, the machine according to the invention is constructed so as to comprise both cleansing fluid nozzles and rinsing water nozzles.

The drawing shows what is needful for the comprehension of the invention.

In the drawing:

Fig. 1 is a vertical section through a form of the dishwashing machine embodying the invention.

Fig. 2 is a section through the control valve for supplying water from the house water main to the machine.

The machine has the chamber 1 with bottom 2 with drain pipe 3. In the chamber 1, there are the trays 4 and 5 for carrying dishes or other articles to be washed, which are carried by a vertical rotatable shaft 6 suitably journaled in the chamber 1. Suitably disposed inside of the chamber 1 is the cylinder 7 in which is slidably mounted the plunger 8 provided on its upper end with a rack 9 extending out of the top of the cylinder 7. This rack 9 meshes with a pinion 10 on a shaft 11 suitably journaled on the top of the chamber 1, and provided with a coil spring 12. The shaft 11 and the shaft 6 are connected by inter-meshing pinions 13. The cylinder 7 is provided in its lower end 14 with a small bleed opening 15. The valve 16 (shown in detail in Fig. 2) is provided for controlling the flow of water from the house main 17 to the machine. The main 17 is connected to the plug 18 of valve 16, which controls the flow of water from main 17 to the pipes 19, 20 and 21. The pipe 19 has its end 19' connected with a conduit 22 in the plunger 8, by a packed joint, the plunger 8 being slidable along the end 19' of pipe 19. Conduit 22 has, at its lower end, an outlet opening 23. A series of pipes 24 are provided with their ends opening through the side of cylinder 7 in such a way that the opening 23 successively connects the conduit 22 with pipes 24 as the plunger 8 moves axially of the cylinder 7. These pipes 24 are connected respectively with nozzles 24' suitably disposed in the chamber 1 to spray water on articles carried by the trays 4 and 5. The pipe 20 passes through a container 25 for any suitable form of cleansing agent, and connects this container 25 with nozzles 26 suitably disposed in the chamber 1 to spray on the articles carried by the trays 4 and 5 a cleansing fluid formed by the water and the cleansing agent. The rack 9 is provided with an arm 27 co-operating with a rod 28 to operate a crank 29 on plug 18 of valve 16.

The machine operates as follows. When the parts of the machine are in the positions shown in the figures of the drawing, valve 16 is adjusted to connect the house water main 17 with the pipe 21. When water under pressure in main 17 is admitted through pipe 21, it flows into the lower end 14 of cylinder 7, thereby forcing plunger 8 upwardly. This upward movement of plunger 8 rotates shaft 11, through rack 9 and pinion 10, and winds up coil spring 12 to place it under compression. Valve 16 is then adjusted so that main 17 is connected to pipe 20, and pipe 21 is closed thereby relieving pressure on plunger 8. The spring 12, having been compressed, re-acts as soon as pressure on plunger 8 is relieved, and operating through shaft 11, pinion 10 and rack 9, forces plunger 8 downwardly, the water in cylinder 7 below plunger 8 being slowly evacuated through the bleed opening 15, so that plunger 8

will move downwardly slowly and uniformly. Action of spring 12 causes shaft 11, through pinions 13 to rotate shaft 6 thereby rotating trays 4 and 5, while the cleansing fluid is sprayed on the articles carried by trays 4 and 5, since water under pressure now flows through pipe 20. The return of plunger 8 to its lower position, through arm 27, rod 28 and crank 29 adjusts valve 16 to close pipe 20 thereby stopping the spraying of the cleansing fluid. Valve 16 is then adjusted so that main 17 is again connected to pipe 20 and the above described action, under such circumstances, is repeated. When the plunger 8 has reached its upper limit of travel, valve 16 is adjusted to connect main 17 with pipe 19, and to close pipe 21. Again the plunger 8 is moved downwardly under action of spring 12. Water under pressure is supplied by pipe 19 and conduit 22 in plunger 8, through outlet opening 23, to the pipes 24 successively as the downward movement of plunger 8 brings the opening 23 into communication with pipes 24. Through pipes 24 the water is supplied to nozzles 24' to spray the water on the articles carried by the trays 4 and 5 which rotate under action of spring 12 while this spraying occurs. When the plunger 8 reaches its lower position, arm 27, rod 28 and crank 29 adjust valve 16 to close pipe 19 and cut off the water from nozzles 24'.

I claim:

In a dishwashing machine for operation in connection with water from a domestic supply main, the combination of a chamber for receiving the dishes to be washed; a rotating frame for supporting the dishes; a series of nozzles for periodically spraying liquid under pressure of the water main; a liquid control device controlling the supply of liquid to said nozzles, said device being constituted at least in part by two members having relative motion in the axial direction, one of said members having at least one outlet opening; means for supplying liquid to said opening, under the pressure of the water supply main, the other member having a plurality of distributing openings; pipes connecting the distributing openings with different nozzles, the distributing openings being brought into communication with the outlet opening or openings in succession during relative movement of said members, whereby for each spraying period only certain of said nozzles are rendered operative and substantially the full force of the pressure in the water supply main is utilized for the nozzle spray; and control means interposed between the liquid control device and the rotating frame, said control means including a rack and a toothed wheel-co-operating therewith, said rack moving axially with the liquid control device and said toothed wheel being operatively connected to the rotating frame.

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