July 29, 1947. J. PEDERSEN 2,424,770

DISHWASHING MACHINE

Filed March 4, 1943 2 Sheets-Sheet 1

FIG. 4.

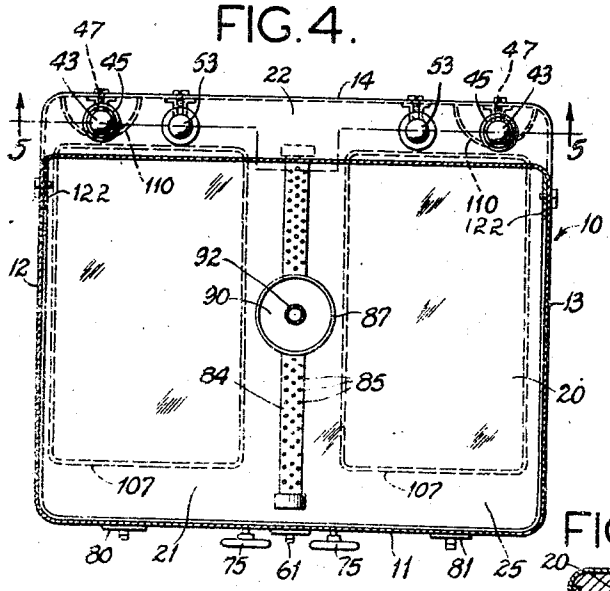


FIG. 1.

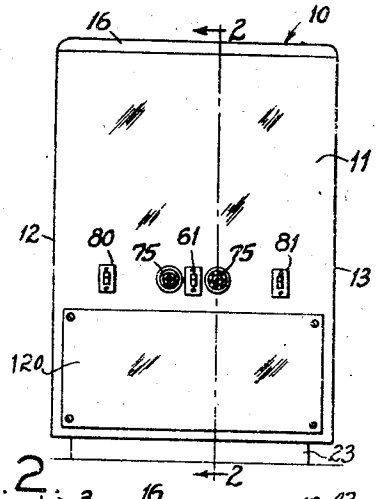


FIG. 3.

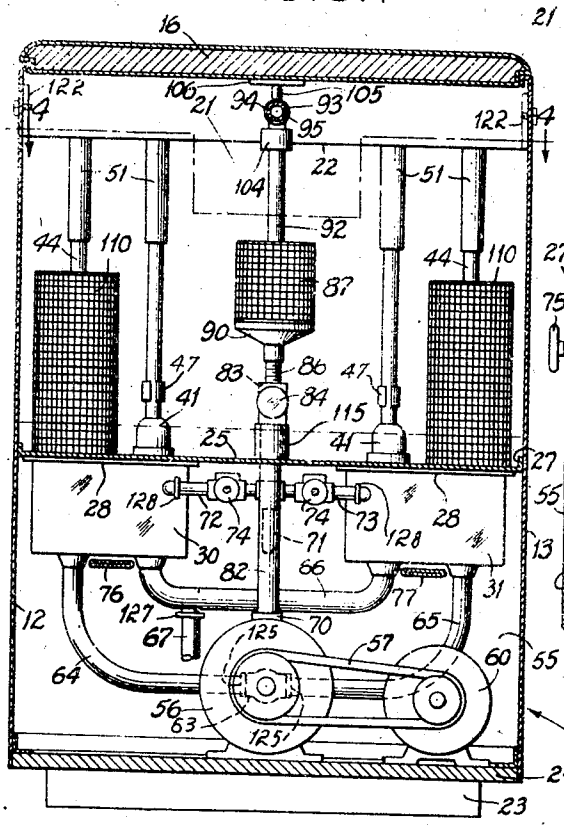
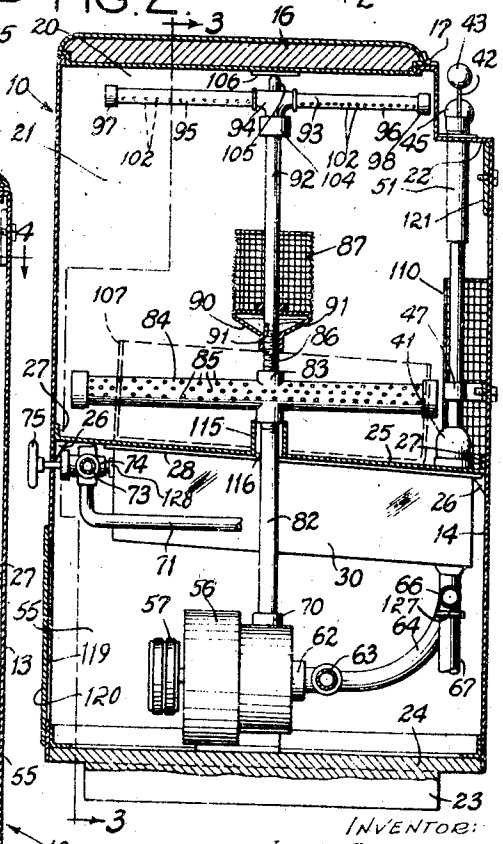


FIG. 2.



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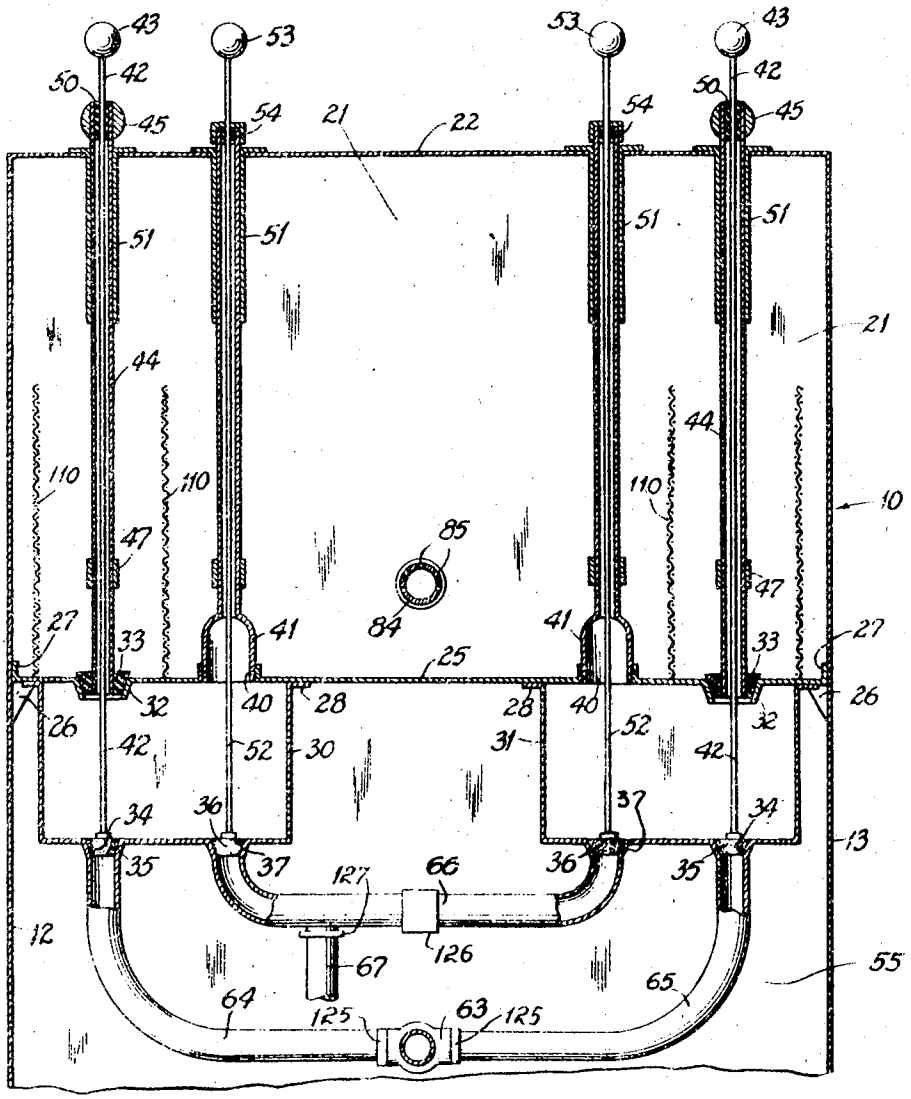
ATTORNEY.

July 29, 1947. J. PEDERSEN 2,424,770

DISHWASHING MACHINE

Filed March 4, 1943 2 Sheets-Sheet 2

FIG.5.



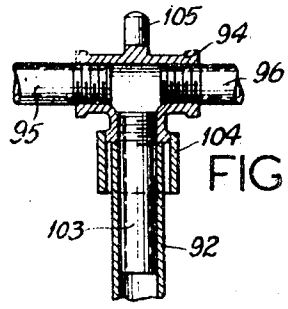


FIG.6

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2,424,770

DISHWASHING MACHINE

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7 Claims. (Cl. 134—186)

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This invention relates to improvements in dishwashing machines, and more particularly to an improved assembly for the semi-automatic cleansing of dishes or similar groups of relatively small units. A number of machines of a great variety have heretofore been devised for the minimization of the substantial time and effort involved in the manual cleansing of dishes, both for domestic use and in commercial establishments; so far as is known, however, none of the machines thus far devised has met with any considerable commercial success or public favor. The shortcomings of existing designs to date include a high first cost, inordinate expense for service attention and repair, difficulty of frequent cleansing of machine without considerable effort and a protracted out-of-service period and, probably most importantly, inefficient cleansing operations. There has heretofore been required, in use of older machines, an expected supplemental manual washing of queen's ware, silverware and like articles. The present invention has as its general object, to overcome entirely, or at least to minimize the several objections heretofore noted in respect to former designs of dishwashing machines of the type noted.

More particularly stated, the present invention objectively attains an improved arrangement of parts in a semi-portable washing cabinet, such that all parts of the machine necessary to be cleaned, or requiring service attention, may easily be removed from the enclosing cabinet for these purposes, and as readily replaced to restore the apparatus to service.

Yet another object of the invention is attained in an improved design and arrangement of all piping and liquid-containing elements of the apparatus so that, except at very wide intervals, the entire assembly may readliy be cleaned manually or with the aid of cleaning brushes, by manual access from the exterior of the enclosing cabinet.

Perhaps a most important objective of the invention is attained in apparatus for the purpose noted which possesses an unusually thorough cleansing action on the articles or units washed therein.

A still further object of the invention is attained in an improved arrangement of valved ports or passages for the washing liquid, enabling easy manual access to the ports and the valves therefor, and facilitating brush cleaning of these parts.

Akin to the foregoing object is noted an improved arrangement of all conduits and piping such that sharply angular bends are avoided, as are undesirable dirt traps, pockets, and other zones of accumulation of foreign matter in a device of the type in which the improvements are embodied.

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There may be further mentioned as objectively attained in the present design, a structurally and mechanically simplified arrangement of but few necessary moving parts, and an assembly which lends itself to production almost entirely with readily available stock materials, and which requires but a minimum of tooling expense for production and assembly.

The foregoing and numerous additional objects will more clearly appear from the following detailed description of parts of an exemplary embodiment of the invention, particularly when considered in connection with the accompanying drawing, in which:

Fig. 1 is a somewhat reduced front elevation of the assembly as housed in a vertical cabinet;

Fig. 2 is a vertical sectional elevation taken approximately on line 2—2 of Fig. 1, and drawn to a somewhat larger scale;

Fig. 3 is a vertical sectional elevation as viewed along line 3—3 of Fig. 2;

Fig. 4 is a horizontal sectional elevation as viewed along line 4—4 of Fig. 3;

Fig. 5 is an enlarged vertical sectional elevation as taken along line 5—5 of Fig. 4, and

Fig. 6 is a vertical section of a fragmentary upper portion of a central riser pipe and portions of a rotatable spray manifold in the upper part of the washing compartment of the device.

Referring now by characters of reference to the drawing, the structure is by preference enclosed in a cabinet or the like which is characterized by a minimum of external protuberances or control elements in order to make for cleanness of appearance and ease of external cleansing attention. The cabinet, indicated generally at 10, includes a front wall 11, side walls 12 and 13, a rear wall 14, and a hinged upper lid or top closure 16. The latter is swingably mounted by hinge elements 17 along its rear margin, as shown by Fig. 2, so as to permit the lid to be raised upwardly to clear an access opening 20. As will appear, this opening serves to permit the introduction of dishes to, and their removal from an upper washing compartment 21 within the cabinet.

As a preference, the upper rearmost marginal portion of the cabinet is of stepped construction resulting in a somewhat lowered, narrow inturned step or ledge 22, removably located just to the rear of the door 16, and serving a purpose hereinafter referred to. A supporting base structure 23 is optionally provided, on which is mounted the bottom member 24 of the cabinet.

The internal construction of the cabinet and arrangement of parts therein is perhaps best shown by Figs. 2, 3 and 5, wherein appears a substantially horizontal or transverse partition exemplified by the deck structure 25. This is by preference given a slight slope toward the rear

wall 14 of the cabinet. Since the deck 25 serves as the bottom member of the washing compartment 21, this slope serves to assure at times a flow of the accumulation of washing liquid to valved ports for the return thereof into the circulation system as will later more fully appear.

The deck structure 25, together with the conduit and tank elements associated therewith, may be made removable as a unit from the cabinet, as for service or cleaning. Triangular supports such as 26 (Fig. 5) may serve as rests for the deck; if the latter be made removable, flanges 27 may be formed upwardly of the deck, to extend the full height of compartment 21. If deck 25 be affixed in place, a shorter flange may be secured in water tight relation within the cabinet, and serve to receive screws, bolts or the like, which (not shown) may be employed to fix the flanges and deck in assembled position. The brackets 26 may, for example, be welded interiorly of the walls 11, 12, 13 and 14.

Supported by and shown in suspended relation to the deck 25 are a pair of reservoirs such as tanks 30 and 31, each provided with flanges 28 on its upper margin, through which the tanks are secured as by welding (or detachably by bolts if desired), to the deck structure. The tanks 30 and 31 are or may be similar in construction and arrangement, and substantial duplicates of each other, hence a description of one will suffice for both. As preferred, each of the tanks is air vented in any suitable manner (not shown), and is provided in assembly with a valved port or passage 32, controlled preferably by a tapered plug valve 33. Immediately below and aligned with the valve port 32 is a similar valve port 34 controlled through a plug valve 35. Spaced laterally from the aforesaid valve assembly is a further plug valve 36 controlling a valve passage 37. Above and in line with the valve seat 37 is a considerably larger opening 40, normally closed as by a threaded closure element 41. It will be noted as a preference that the opening or passage 40 is of substantial size, preferably such that, upon removal of the closure 41, hand cleaning of the tank may be easily and readily effected.

As an arrangement for actuating the paired plug valves 33 and 35, it is preferred to provide valve 35, the smaller and lowermost of the paired plug valves, with an actuating rod 42 which extends upwardly to a zone of convenient access just above the stepped portion of the cabinet, where it is provided, for example, with an actuating knob or ball 43. The plug valve 33, reciprocally operable like valve 35, is actuated by a hollow rod or tubular element 44 which similarly projects to a point above the stepped portion 22 of the cabinet and is provided at its upper end with a ball-like actuating knob 45. The reciprocal valve actuating elements are preferably provided with steady brackets 47. These may be formed of a resilient material such as tempered strip metal, and provided in the form of clip elements such as the clips 47 shown in Fig. 3, in engagement with the tubular upward extensions of the closure elements 41, so as to provide for the frictional retention of hollow rod 44 in either a valve-closing, or any valve-open position. A guide 50 of a resilient or compressible material and contained in the knob 45 serves this purpose in respect to the valve rod 42. The elements 47 being of clip form are such that the valve operating assemblies may be readily removed therefrom when desired, and the members 47 readily removed from the back wall 14 of the cabinet on which they are detachably

supported as by bolting indicated in Figs. 2 and 4. In order further to facilitate removal of the valves and valve actuating assemblies, the step portion 22 near the upper part of the cabinet is preferably made removable, and in this ledge, for further guiding and supporting effect on the valve operating assemblies, there are provided a plurality of bushings or thimbles 51. The step portion 22 is removably attached to the cabinet wall 14 through bolting of the step flange 121 to the wall (Fig. 2), and through bolting of the step side flanges 122 to the opposite cabinet walls 12 and 13, as such is indicated in Fig. 4.

Similar to valve rod 42 there is provided for each valve 36 a reciprocal valve-actuating element such as rod 52, which extends outwardly of the cabinet in the same manner as rod 42, and is preferably surmounted with a hand knob or ball 53. A compressible or resilient collar 54 serves to retain the rod 52 in adjusted position.

It has been noted that the washing compartment 21 is defined by the walls of the cabinet including the top, and the deck 25. The latter serves as a transverse partition to form a lower or mechanical compartment 55 in the bottom of the cabinet, in which there is mounted on the cabinet base 24 a pump 56 driven as by a belt or other suitable connection 57 by a motor 60. The latter is conveniently controlled as by a motor switch 61 located in an accessible position on the front of the cabinet, the wiring and connections to the motor being of any suitable or conventional arrangement. The pump 56 is preferably of peripheral or rotary type and of relatively high speed, moderate pressure, high volume delivery characteristics. It is provided for example, with a center inlet eye or fitting 62 adjacent which is a T connection 63. Branch return pipes 64 and 65 are connected respectively to the valved return passages 34 of the tanks 30 and 31, whereby, according to position of the respective valves 35, either or both tanks 30 and 31 may be put in communication with the pump inlet. Each of the return pipes 64 and 65 is removably connected to T connection 63 in any suitable manner, as by the coupling elements 125 (Fig. 5). It is here noted that the valves 36 controlling valve seats or ports 37, serve to establish drain connections from either or both tanks 30 and 31, through a wide-radius return connection 66 directed as through fitting 67, to waste. Conduit 66 is divided preferably centrally intermediate the tank ends thereof, and has its ports detachably connected as by a suitable coupling 126. Further, waste pipe 67 preferably is detachably connected to conduit 66 by a coupling 127. Attention is also particularly directed to the wide-radius bends formed in the pump return piping elements 64 and 65 whereby each of these, as well as the drain conduit 66—67 may be easily brush-cleaned by access through the washing compartment and ports 32 and 40.

The pump 56 is by further preference provided with a central discharge connection 70, connected as will later appear, to the spray system. The fresh washing liquid, such as hot water for example, is preferably introduced through a water line 71, thence to a supply line consisting of two branches 72 and 73 each supplied with a control valve 74. The actuating handles 75 of these valves extend through the front wall 11 of the cabinet, whereby to enable separate control of supply flow into the respective tanks 30 and 31. In order to permit ready connection and disconnection of the branches or pipe sections 72 and 73 relative to the respective tanks 30 and 31, each is

detachably connected to its tank by a coupling 128 as indicated in Figs. 2 and 3, which may be of any suitable, well known character.

It should here be noted that the device is fully operative according to intended function, by utilizing only a single one of the tanks 30 or 31. Although the preference is to duplicate these tanks with their individually appurtenant elements whereby one such tank may be employed for soapy water and the other for clear water for rinsing purposes, either tank may be so employed for either purpose. In the events either that no extraneous supply of hot water is readily available, or in case the machine is used for extended times as in commercial usage, it is desirable to raise or to maintain the temperature of either or both washing and rinsing water. There is provided for this purpose a pair of heating elements 76 and 77 (Fig. 3) shown as electric heater units, and controlled respectively by the switches 80 and 81 on the front panel 11 of the cabinet just above the mechanical compartment (Fig. 1).

Proceeding now to a description of the spray assembly in a preferred form, it will appear from Fig. 2 that in fluid connection with the pump outlet fitting 70, is a vertical column or riser pipe 82. The whole column assembly extends vertically from the pump, and preferably in a straight line to the upper portion of washing compartment 21. By preference also the column or riser 82 is formed of a plurality of threadedly connected, hence readily detachable sections, the lowermost of which is secured directly to the pump, an intermediate portion of which, indicated at 83, consists of a cross connection forming part of a horizontal, stationary manifold element 84, provided with a number of upwardly presented spray openings 85. The spray openings 85 are formed in rows over say the upper one-half of the cylindrical surface of the manifold, so as forcibly to project a great number of spray streams both upwardly and laterally of the lower portion of the washing compartment 21.

Above the threaded section 83 of manifold 84 is a nipple extension 86 on which is threadedly carried a reticulate container such as a wire basket 87 provided with an inverted conical bottom 90 constituting an inverted spray head to which water is supplied by pressure through openings 91 in the pipe section 86. The basket 87 is preferably employed during dish washing, as a receptacle for silverware or other smaller articles. Extended upwardly of the pipe element 86 either integrally therewith or threaded thereto, is an upper riser section 92 surmounted by a rotatable, horizontal, upper spray manifold 93. The manifold 93 is most economically constructed of a central special T element 94 (Fig. 6) threaded into which are a pair of rectilinear horizontal arms 95 and 96, the outer ends of which are closed as by threaded caps 97 and 98. The rectilinear character of the manifold, and the easy removal of caps 97 and 98 are preferred so as to facilitate brush-cleaning of these parts when desired.

The manifold arms 95 and 96 are each characterized by at least one, but preferably a small plurality of rows of spray openings 102 which are so disposed by rotation of the arms 95 and 96 each about its longitudinal axis in assembly, so as to project their streams on relatively opposite sides of the arms, whereby to set up a turning moment when water pressure is supplied to the manifold. By varying the disposition of the ports or openings of each arm, this turning moment, hence the speed of manifold rotation may be regulated within moderate limits.

A low cost and satisfactory provision for the aforesaid rotation of the manifold 93 is made by the arrangement shown in Fig. 6 for journalling the manifold on the riser section 92. The lower threaded portion of T94 is provided with a downward extension 103 a few inches in length, so that the latter telescopes within the pipe 92. A bushing or collar 104 is externally secured to this same T portion 94, so that a journal is in effect provided between parts 103 and 104 on pipe end 92. It will further appear that, as a preference, there is no threaded connection between this upper manifold assembly 93 and the pipe 92, but that the manifold is supported by its own weight. In order to obviate any tendency of high water pressures to lift the upper manifold from pipe 92 there is preferably provided a journal extension 105 having a rounded outer face which normally seats within a journal socket element 106 carried on the under surface and near the center of the cover 16 of the cabinet. Thus when cover 16 is closed, the manifold 93 is automatically positioned in journalled relation on the riser element 92.

The arrangement of auxiliary containers for dishes or the like within compartment 21 is a matter of particular requirements of usage, but it may be noted that in addition to the silverware basket 87 there are preferably provided a plurality of wire baskets or the like such as 107. These may be partitioned as desired by cross members (not shown) whereby to support the dishes at a substantial angle, say at 80° to the horizontal, whereby to obtain the most favorable action of the sprays.

Numerous accessories and fittings may desirably be employed but need not be detailed herein. It may however be noted as a preference, in order to prevent accumulation of excessive amounts of foreign material such as food particles in the tanks and drainage piping, to provide about the valves, valve passages, etc. related to ports 32, wire guards which may be semi-cylindrical in form as indicated at 110. These are mounted so as to be readily removable for cleaning.

It will have appeared as practically desirable to avoid escape of liquid downwardly along the riser pipe 82 where the latter extends through the deck 25. This may obviously be cared for by packing of any suitable type, but it has been found entirely satisfactory to provide a short standpipe or wall element 115 surmounting the opening 116 through which extends the riser.

The manner of usage and function of the apparatus is now thought to have been fully apparent from the detailed description of parts, but for briefness may be reviewed as follows:

The first step of supplying a suitable quantity of water may obviously be effected by control of one or both of the valves 35, or if desired, by direct introduction of water to the washing chamber 21. Suitable gauge means (not shown) may be provided for either or both of the tanks 30 or 31. Assuming both tanks to be employed, say tank 30 as a soapy water reservoir and tank 31 as a rinse water reservoir, if the water be initially introduced to chamber 21, opening of both valves 33 will serve to admit substantially equal amounts of water to the two tanks 30 and 31 with valves 35 and 36 closed in each tank. Each of the tanks will now contain, as gauged, the requisite amount of liquid. A measured amount of a suitable soap powder may then advantageously be introduced say into tank 30,

either directly or through chamber 21. The soap employed is of a variety which will minimize soap curd and will dissolve readily so as to obviate any effect of larger soap particles in obstructing the smaller nozzle openings of the spray manifolds. The agitation of first pumping and circulation will usually be sufficient to effect a complete solution of the soap powder. Prior to starting the pump motor as through switch 61, plug valve 33 to tank 31 will be closed, and valve 35 of tank 30 will be opened as will valve 33 to tank 30. The pump is now started, the pump being supplied with liquid through suction pipe 64, and will deliver the washing liquid to and through the column elements 82, 83, 86 and 92, to the manifold 93, through the spray head 90, and through the manifold 84. From these three elements the water or soap solution will be forcibly sprayed both upwardly and downwardly, and to some extent laterally upon the dishes or similar units arranged in wire baskets or the like in chamber 21. It may be desirable also to arrange a plurality of wire shelves (not shown) disposed generally parallel to the manifold 84. These may advantageously be hinged to the side walls 12 and 13 interiorly of the compartment 21.

As the spray continues to emanate from manifolds 84, 93 and upwardly into the wire basket 87, thorough cleansing of the dishes usually occurs in a period of one to two minutes time, but may be continued as long as necessary or desirable, and, as is usual, succeeded by the step of rinsing the dishes.

The rinsing step is initiated by breaking the motor circuit through switch 61, thereby stopping the motor and pump, terminating the spray and thereafter permitting all of the soap water in chamber 21, to drain back into tank 30. At this juncture plug valves 33 and 35 of tank 30 are closed, and plug valves 33 and 35 of tank 31 are opened. The pump is again started, and the clear rinse water in tank 31 will now be circulated by the pump through the pump suction line 65 and again upwardly through the spray assembly into the several manifolds and spray head 90 into chamber 21. This cycle is continued for a sufficient length of time, based on experience, to complete a thorough rinsing of the dishes. A rinse period of one-half minute is usually sufficient, so that the total time required for a complete cycle of washing and rinsing need not require more than three or four minutes.

Should it be desired to make a further usage of either or both the soap water in tank 30 and rinse water in tank 31, the temperature thereof may be kept up as desired, through the electric heating units 76 and 77. In case no re-use of liquids is contemplated, valves 36 in each of tanks 30 and 31 may be opened, permitting the water in both of these tanks to pass to waste through the drain piping 66 and 67.

As making for ease of service attention, cleaning and replacement of parts, although the latter is necessary only at wide intervals, the present construction is adapted to permit such work in the average household without expensive service calls. It will have been observed that upon lifting the removable step element 22 of the cabinet and release of the valve actuating members from the steady brackets 47, it may be easily possible to clear the deck structure 25 of these valve-operating members and their adjuncts. The provision, for example, of a larger valve port 32 above a smaller one 34 in each of the tanks, enables a ready withdrawal of the paired valves through the upper and larger opening. This feature works to advantage not only in the ease of removal and assembly of valves and valve actuating members, but enables the deck 25 to be cleared of these parts so that the tanks, deck and piping may more readily be removed as a unit from the interior of the cabinet. To accomplish this removal the pipe connection of riser 82 into the pump as shown at 70, is readily unthreaded, as is also the connection of the paired pump suction pipes 64 and 65, through the couplings at the T connection therebetween, and the pump inlet 62. Similarly, the supply pipes may be disconnected from the tanks 30 and 31, as by unthreading the couplings in short sections between the valves and the respective tanks. Ready access to chamber 55 for removal of the elements above indicated, is afforded through a cabinet opening 119 (Fig. 2), the opening normally being closed by a removable panel or cover 120 (Figs. 1 and 2). Any fastenings employed between the flanges 27 of desk 25 and the walls of the cabinet, should be of readily detachable type. These are detached, following which the upper manifold 93 is lifted from riser 92 for convenience in handling the deck structure 25 and all appurtenances. The assembly is then tilted somewhat, and withdrawn as a unit through the top of the cabinet, whereby to facilitate any bench cleaning, repair or replacement attention found necessary.

A review of the objectives of the present design as above expressly stated and as further implied from the more detailed description, will indicate that the design fully attains each and all of the purposes and objectives in the present embodiment thereof.

Although the invention has been described by making detailed reference to a single preferred example, the detail of description is to be understood solely in a descriptive, and not in any limiting sense, numerous changes in the parts, their combinations and arrangements being possible within the scope of the claims hereunto appended.

I claim as my invention:

1. In a machine for washing dishes and the like, an enclosing structure, a partition separating the structure into an upper washing compartment and a lower mechanical compartment, a water container below said partition, a pump and pump-operating means in the mechanical compartment, a spray structure in the washing compartment, a conduit from the pump to the spray structure, means providing a port for establishing communication between the washing compartment and the water container and further means providing a port to establish a connection from the water container to the pump, a pair of aligned, reciprocally actuable valves coacting with the respective ports, a hollow reciprocally actuable element for operating one of said valves, and a second reciprocally actuable element for operating the other of said valves, extended through said hollow element, the valve operating elements being disposed substantially at one side of said washing compartment, and extending outwardly of said compartment to a position to facilitate manual access in a zone exterior to the enclosing structure.

2. In a machine for washing dishes and the like, an enclosing cabinet, a substantially horizontal deck structure supported within the cabinet walls, a tank suspended from the deck

structure, a liquid supply column extending vertically of and within the cabinet, the cabinet being divided by the deck structure into an upper washing compartment and a lower mechanical compartment, a pump in the mechanical compartment, a connection between said tank and the pump intake, a connection from the pump to said supply column for supplying washing liquid to the washing compartment, a plurality of reciprocally operable valves and coacting valve ports in said deck structure and tank, the ports and valves coacting to control communication between the washing compartment and the tank and to control flow from the tank to the pump, coaxially arranged, independently operable valve-actuating rods one connected to each of said valves, said rods extending upwardly through said washing compartment and terminating exteriorly of the cabinet in operating handles, and means operatively associated with each rod for retaining the rod in any operated position.

3. In a machine for washing dishes or the like, a cabinet provided with a top opening and door therefor, an intermediate deck serving to separate the cabinet into an upper washing compartment and a lower mechanical compartment, spray means in the washing compartment, a pump and pump operating means in the mechanical compartment, a water reservoir or tank just below the deck, conduit means between said tank and pump and between the pump and said spray means, said tank being provided with a large top-access opening into the tank, a detachable closure for said opening, removable to permit cleaning access to the tank, through said tank opening by way of the top opening of the cabinet, said closure including a hollow extension projecting upwardly through said washing compartment, an opening in the bottom of said tank in vertical alignment with said top-access opening into the tank, a plug valve for said bottom opening, and a valve operating rod connected to said plug valve and extending upwardly through said tank top-access opening, said closure and said hollow closure extension, the upper end of said rod terminating in an operating handle.

4. In a dish washing machine, a cabinet, a transverse partition serving to divide the cabinet into an upper washing compartment and a lower mechanical compartment, spray means in the washing compartment, a pump in the mechanical compartment connected to the spray means, a tank for water or other washing liquid disposed just below the partition, return piping from the tank to the pump and drain piping directed away from the tank, the elements of said piping being characterized by wide radius bends, the partition and tank being provided with upwardly presented valved openings, those in the tank being in communication with said return and drain piping, a plurality of said valved openings being arranged in axial alignment whereby to facilitate brush-cleaning of the associated circulation system, said aligned valved openings each being provided with an upwardly removable plug type valve element, and coaxially arranged, independently operable valve actuating rods connected to said plug valve elements and extending upwardly through said washing compartment to a zone exteriorly of said cabinet.

5. In a dish washing machine, a cabinet, a transverse partition serving to divide the cabinet into an upper washing compartment and a lower mechanical compartment, spray means in the washing compartment, a pump in the mechanical

compartment connected to the spray means, a tank for water or other washing liquid disposed just below the partition, return piping from the tank to the pump, drain piping directed away from the tank, the elements of said piping being characterized by wide radius bends, and the partition and tank being provided with upwardly presented openings arranged in groups, with those of each group in axial alignment and the tank openings of said groups being in communication with said return and drain piping whereby to facilitate brush cleaning of the entire circulation system, the openings of at least one aligned group thereof, each being provided with an upwardly removable, plug type valve element, coaxially arranged, independently operable valve actuating rods connected to said plug valve elements and extending upwardly through said washing compartment to a zone exteriorly of said cabinet, and the cabinet being provided with a top opening provided with a closure proportioned to permit cleaning access therethrough, to the several openings and piping.

6. In a machine for washing dishes or like units, a cabinet, a washing compartment in the cabinet, a tank for washing liquid, a spray in the washing compartment, a pump arranged to supply liquid to the spray, a passage from the washing compartment to the tank, a second passage from the tank to the pump, a plug type valve assembly for each of said passages, the passages being aligned with each other in vertical relation, the valve assembly for the lowermost of said passages being of lesser area than the valve for the uppermost of said passages, a hollow valve operating rod for the uppermost valve plug, a rod for the lowermost valve plug extending coaxially through the said hollow operating rod, and rod-actuating elements, the actuating element for said hollow valve operating rod being adapted for engagement with said rod for the lowermost valve plug whereby to enable conjoint actuation of both valves through movement of said hollow rod actuating element.

7. The combination and arrangement of valved passages in combination with a dish washing machine and cabinet as recited in claim 6, further characterized in that the paired valve plugs and operating assemblies are adapted for removal or reinsertion, conjointly as a unit, to facilitate cleaning of the valves and operating assemblies outside of the cabinet, the alignment of the valve passages further facilitating brush cleaning of the passages by personal access from without the cabinet.

JOHN PEDERSEN.

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