

April 23, 1963

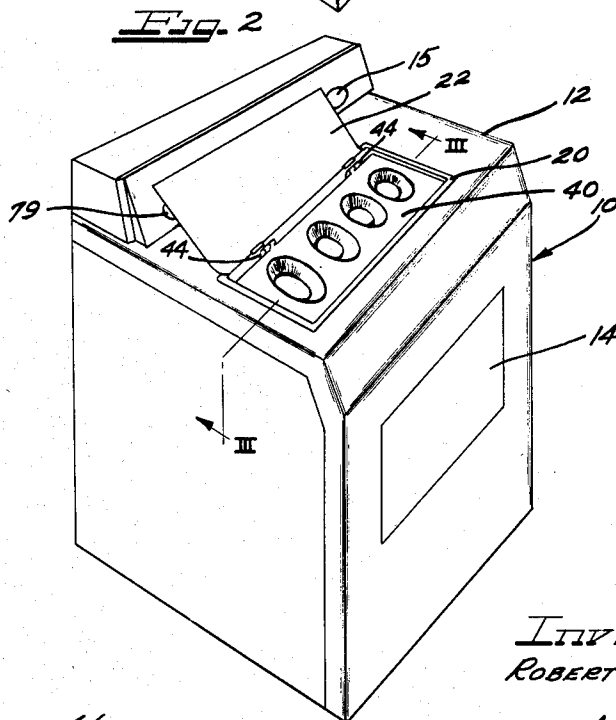
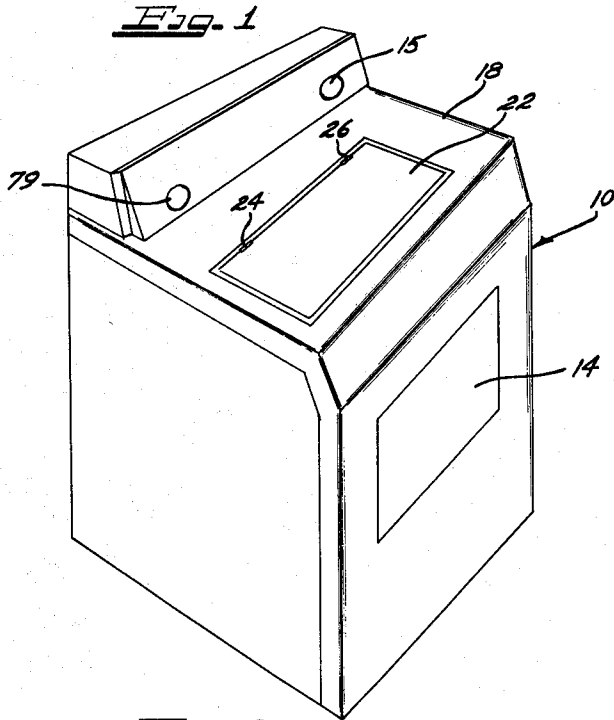
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ADDITIVE DISPENSING MEANS FOR A CLEANING MACHINE

Filed July 23, 1959

4 Sheets-Sheet 1



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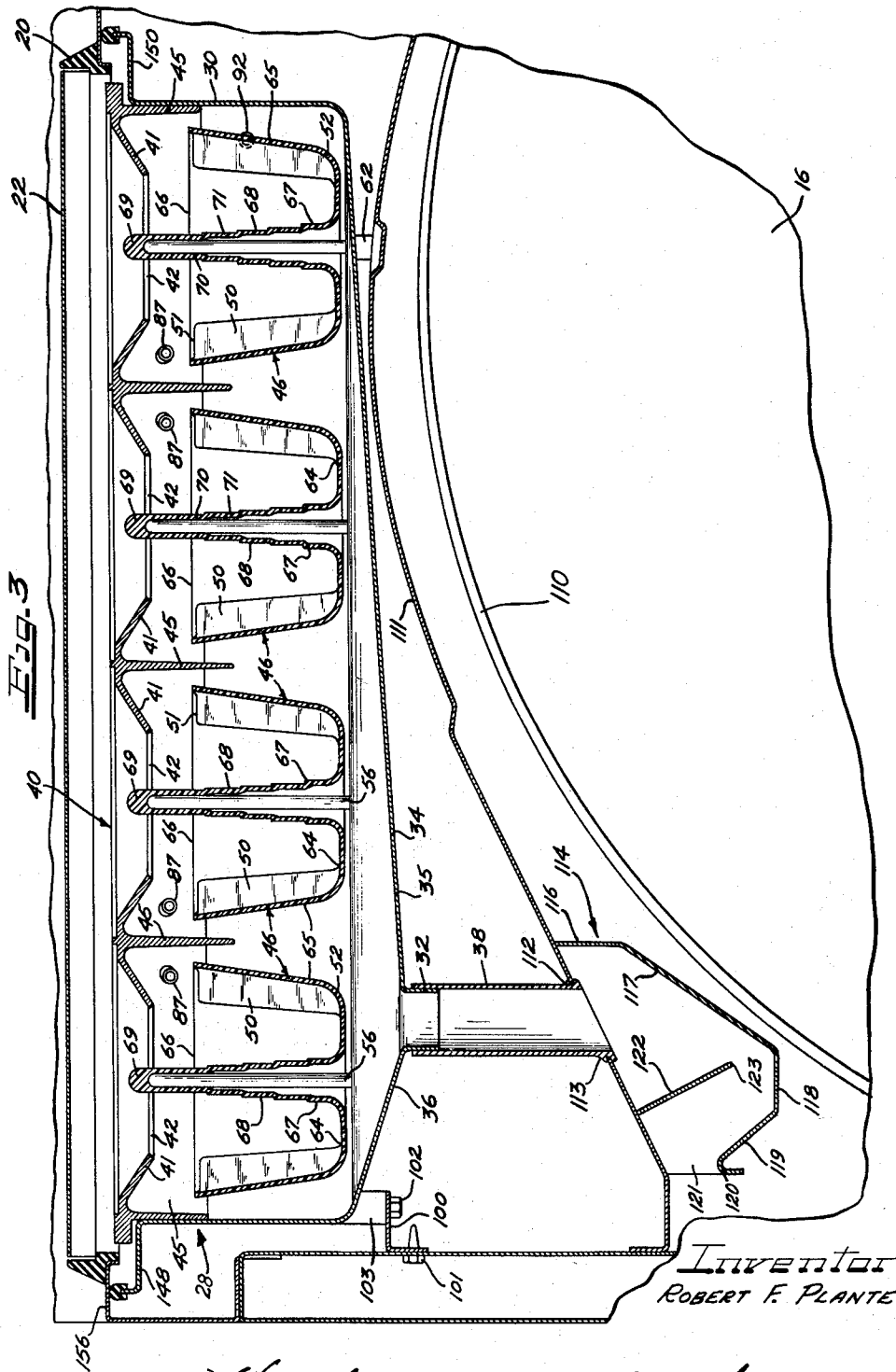
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ADDITIVE DISPENSING MEANS FOR A CLEANING MACHINE

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4 Sheets-Sheet 2



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ADDITIVE DISPENSING MEANS FOR A CLEANING MACHINE

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4 Sheets-Sheet 3

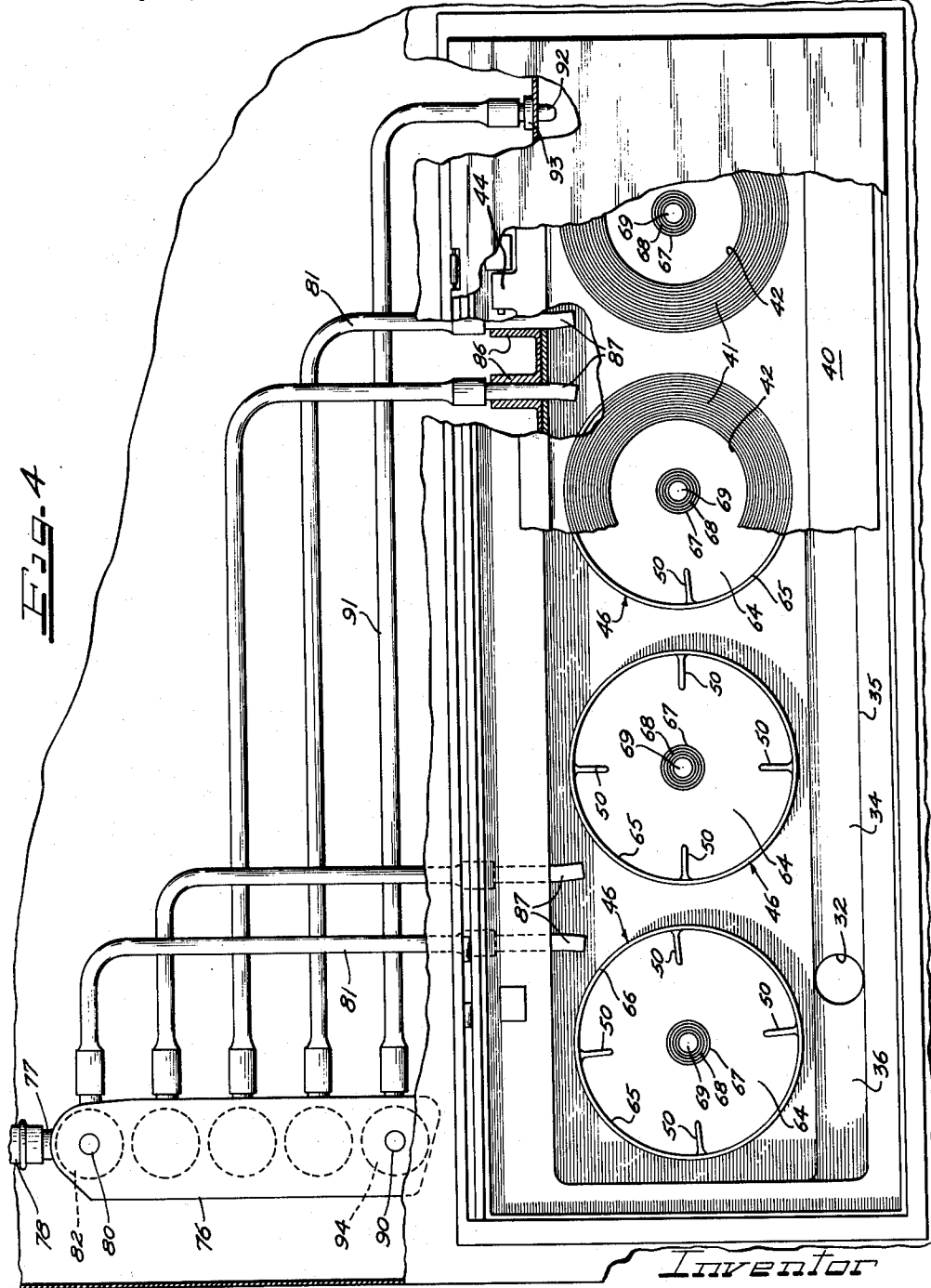


Fig. 4

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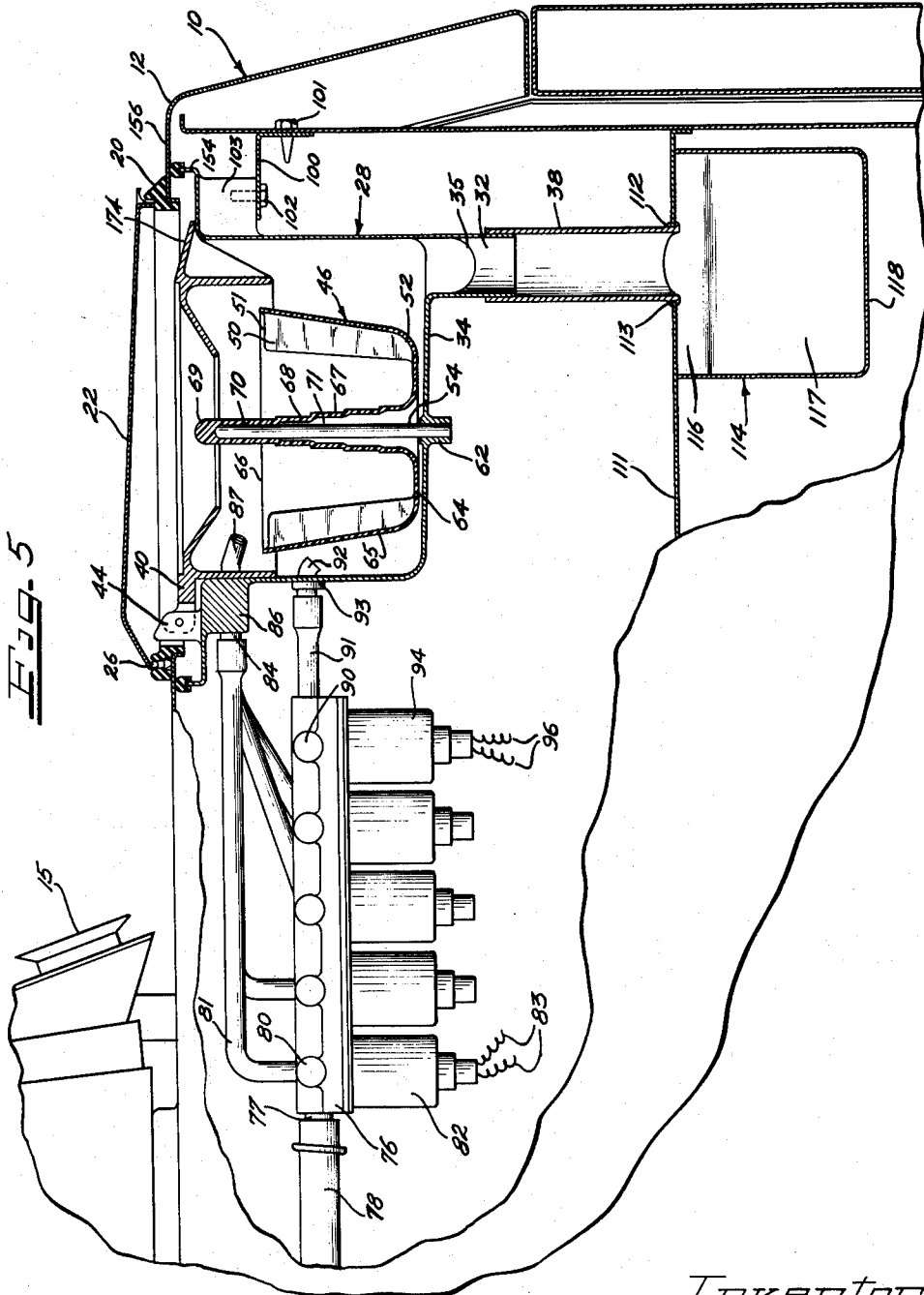
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4 Sheets-Sheet 4



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3,086,379
**ADDITIVE DISPENSING MEANS FOR A
 CLEANING MACHINE**

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This invention relates generally to dispenser apparatus and more particularly to a multiple dispenser adapted to be utilized in a domestic appliance such as a laundry machine or the like.

The dispenser apparatus of the present invention is a so-called single cycle loading system as opposed to a hopper storage system and is particularly suited for dispensing multiple materials such as liquid or powder detergent, bleach, water conditioner and fabric conditioner in the timed sequence of a presettable laundry program.

It is contemplated by the present invention that inlet water introduced into a washing machine will be jetted into a vaned cup holding the dispensable material, whereupon the action of the water jet will spin the cup and cause the material to be dispensed to be discharged centrifugally.

It is an object of the present invention, therefore, to provide a compound dispensing system for laundry equipment.

Another object of the present invention is to provide an improved multiple dispenser controlled by a sequential control means, thereby to dispense different materials at various periods in a time sequence of periods of a programmed cycle.

A further object of the present invention is to provide a dispenser having a rotatable storage compartment for discharging the contents of the dispenser centrifugally.

Yet another object of the invention is to provide a fluid-operated multiple dispenser which can be controlled by a sequential control means.

A still further object of the invention is to provide combined water inlet system and dispenser system for a laundry apparatus whereby a vacuum break is advantageously incorporated as a part of a liquid jet-producing arrangement for actuating the dispenser components.

A still further object of the present invention is to provide dispenser apparatus for laundry equipment which can be loaded either while positioned within the machine, or which may be removed and loaded outside of the machine.

Still another object of the present invention is to provide a dispenser apparatus utilizing multiple cups which can be calibrated for visual volume loading.

Another object of the present invention is to provide a multiple dispenser having cup-like storage compartments which may not only be removed for easy cleaning, but which may dispense liquids or powders interchangeably.

A still further object of the present invention is to provide a multiple dispenser utilizing storage compartments which are self-cleaning and which may be advantageously combined with the water inlet system of a laundry apparatus.

Yet another object of the present invention is to provide a laundry apparatus having a programmed multiple dispensing system so that any part of a cycle can be used alone.

A still further object of the present invention is to provide a laundry apparatus having a multiple dispensing system which permits the operator to preset the machine even for a combined prewash cycle and a subsequent conventional washing operation.

Yet another object of the present invention is to pro-

vide a water-actuated dispensing system which operates satisfactorily in laundry equipment serviced by a domestic water supply even though inlet pressure falls below normal line pressures.

Many other features, advantages and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description which follows and the accompanying sheets of drawings in which a preferred structural embodiment of a laundry apparatus incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

FIGURE 1 is a perspective view of a laundry machine incorporating the principles of the present invention;

FIGURE 2 is a view similar to FIGURE 1 but showing a cover member raised to reveal the loading parts of the dispensing mechanism of the present invention;

FIGURE 3 is a vertical cross-sectional view with parts broken away and with parts removed to illustrate additional details of construction and is taken on line III-III of FIGURE 2;

FIGURE 4 is a plan elevational view with parts broken away and with parts shown in cross-section of the structure shown in FIGURE 3; and

FIGURE 5 is a fragmentary end elevational view with parts broken away to show additional details of construction of the dispensing mechanism.

As shown on the drawings:

Although the principles of the present invention are of general utility in any multiple dispensing arrangement, a particularly useful applicability is found when applied to a domestic appliance such as a laundry machine as indicated at 10. It should be understood that when terms such as "laundering clothes" or "cleaning articles" are used herein, it is contemplated that such laundering or cleaning operations may occur either in a laundry machine, a dishwasher machine, a dry cleaner apparatus or any similar machine wherein additives are to be placed in conditioning contact with the contents of the machine. The machine 10 is illustrated as taking the form of an automatic washer or a combination washer-drier wherein a programmed cycle of separate washing, rinsing and extracting periods is selectively preset on a program timer such as a sequential control means indicated generally at 15. The machine 10 comprises a treatment zone wherein a batch of clothes may be subjected to successive washing, rinsing and extracting periods during the course of the cycle and such treatment zone is shown established by a compartment 16 formed within the machine 10. An access closure 14 is provided in the cabinet 12 for introducing and removing a batch of clothes into the treatment zone provided by the compartment 16.

In accordance with the principles of the present invention, the machine 10 incorporates a multiple dispensing system shown generally disposed subjacent a top wall 18 of the machine 10 having formed therein a generally rectangular opening 20 closed by a cover member 22 secured at one edge by hinge members 24 and 26 to the casing or cabinet 12.

Positioned in subjacent register with the opening 20 is a dispenser housing 28 which is of generally rectangular configuration and is provided with upstanding side walls 30 and a bottom wall 34. The bottom wall 34 is particularly characterized by the provision of a trough-shaped embossment 35 formed along one side of the bottom wall and sloping gradually from one end of the housing 28 towards an outlet 32, the embossment including a shorter portion 36 sloping from the other end of the housing 28 towards the outlet 32. As indicated in the drawings, the bottom wall 34 may be slightly pitched so that a good drain relation is established and so that all liquid within the housing 28 will be drained

into the drain trough, the opposite legs 34 and 36 of which converge to the outlet 32, which, in turn, is connected to an outlet pipe 38.

An inside cover member 40 is provided for the dispenser housing 28 and is pivotally mounted on the upper portion of the housing 28 by hinge means 44. The cover 40 preferably opens in the same direction as the cover 22, thereby to afford ready access to the dispenser housing 28 from the front of the machine 10.

Within the housing 28 are disposed separate means for centrifugally dispensing plural powders or fluids into the laundry machine. Such means include a plurality of dispenser cups 46, each supported for rotation about a vertical central axis by a corresponding plurality of spindles 56. Since the cups are of generally similar construction, only one need be described in detail, like reference numerals being applied to like parts.

Each spindle 56 may be secured to a corresponding boss 62 formed in the bottom wall 34 of the dispenser housing 28. Each cup is particularly characterized by the provision of a bottom wall 64 and outwardly diverging side walls 65 terminating in an upper edge 66.

Centrally of the bottom wall 64, each cup 46 is particularly characterized by the formation of an upstanding hollow center post 67. It will be noted from inspection of the drawings that the hollow center post 67 has a stepped outer peripheral surface indicated at 68 which terminates in a pin-like upper portion 69 prescribing interiorly thereof a recess 70 which is complementary in size and configuration to the end of a corresponding spindle 56. The recess part of the hollow center post 67 is enlarged as at 71, thereby to form a finder portion and facilitating location of the cup 46 on the spindle 56.

Extending inwardly into the interior of each cup 46 at circumferentially spaced points are a plurality of vanes each indicated at 50. The vanes 50 are generally co-extensive in length with the sloping side walls 65 and include upper edges 51 generally parallel to the plane of the edge 66 of the side walls 65. The lower end of each vane 50 blends into the curved transition portion between the bottom wall 64 and the side wall 65, as shown at 52 in FIGURE 5. This cup design may be modified under some circumstances to include vanes located partially or solely on the exterior of the cup. This modification may be necessitated by either the requirements for rotating the cup or the chemical or physical relationship of the material to be dispersed with the fluid stream for rotating the cup.

It will be noted that the pin portion 69 of the hollow center post 67 projects upwardly beyond the edge 66 of the side wall 65, thereby forming a convenient handle by which the cup 46 may be manually grasped and by means of which the cup 46 may be manipulated into and out of the dispenser housing 28.

Furthermore, the stepped peripheral surface indicated at 68 shows a plurality of steps arranged at different vertical levels. The steps are conveniently calibrated to designate different volumetric capacities corresponding to the depth of substance either in solid or fluid form confined within the interior of the cup 46. By virtue of such provision, the visual volume loading of the cup may be readily effected.

In order to rotatably drive each of the cups 46 of the dispensing system, the dispenser of the present invention is motorized or automated by combining the same into the water system or liquid system of the laundry appliance. Basically, the inlet water to the laundry appliance is jetted into the dispenser cups 46 and against the vanes 50, whereupon the material to be dispensed will be discharged centrifugally.

Referring specifically to the drawings, it will be noted that the liquid system of the machine 10 includes a manifold 76 connected to a domestic supply by an inlet conduit 77. It will be understood that the machine 10 may incorporate the usual mixing valves characteristic of an

automatic washing machine and that the domestic supply will include sources of water at normal temperature as well as at increased temperature, the mixed water being supplied through an appropriate flexible conduit indicated at 78 leading from the mixing valve to the inlet conduit 77 of the manifold 76. Appropriate controls are provided for selectively presetting the temperature of the laundry liquid desired to be used during the operation of the machine 10 and in this regard, an appropriate water control is indicated at 79 (FIGURES 1 and 2).

It will be appreciated that the principles of the present invention can be effectively employed with any selected plurality of individual dispensing cups and, accordingly, since the present exemplary disclosure shows four separate dispensing cups, the manifold 76 is provided with four separate fluid distributing and actuating systems, all of which are generally similar and each of which will bear like reference numerals. Thus, the manifold 76 is provided with a valve 80 which receives liquid from the conduit 77 and which has a conduit connected to its discharge outlet as indicated at 81. The valve 80 is regulated by a suitable motor means which may conveniently take the form of an electric solenoid 82 which may be integrated into an automatic control by appropriate electrical conductors 83 regulated by the sequential control means 15.

The conduit 81 is connected to a nipple 84 supported in a bracket 86 on one of the upper side walls of the dispenser housing 28. Inside of the dispenser housing 28, the nipple 84 is provided with a nozzle 87 which is aligned to discharge a jet of fluid for impingement against the registering vanes 50 of a corresponding dispenser cup 46.

In addition to the distributing and fluid actuator systems of the manifold 76 provided for each corresponding dispenser cup 46, there is provided one additional outlet controlled by a valve 90 and regulating the flow of liquid through a conduit 91 to a flushing nozzle 92 which is positioned in the side walls 30 of the dispenser housing 28 by means of a seal and connecting member 93 and which is aligned subjacent the top level of the dispenser cup 46 near the outermost end of the housing 28, thereby to flush materials to be dispensed out of the housing 28 and into the outlet 32 without impinging against or actuating any of the cups 46. The valve 90 is also electrically controlled by a solenoid indicated at 94 and having electrical conductor wires indicated at 96.

Material to be dispensed from each cup 46 will be discharged centrifugally by the overflow principle. Thus, whenever a jet of liquid is discharged by an appropriate nozzle 87 against the vanes 50, the dispenser cup 46 journaled on its corresponding shaft 56 will be rotatably driven whereupon material contained within the cup 46 will be moved radially outwardly under the influence of centrifugal force and will move upwardly along the divergent sloping walls 65 of the cup 46 until the material overflows the upper peripheral edge 66 of the cup 46 and into the housing 28, whereupon the material will move along the bottom wall 34 and into the outlet 32 with the aid of fluid from the actuating nozzle 87.

If the material to be dispensed constitutes a comminuted material, or a powder, or other particulate material, the liquid jet emanating from the nozzle 87 will act to either dissolve the material to be dispensed and place the same in solution or will otherwise liquefy the material so the same centrifugal action will occur and the material to be dispensed will overflow the top edge 66 of the corresponding cup 46 for discharge to the outlet 32. Thus, by combining the dispenser with the water inlet system of the machine, the cups 46 are not only rotatably driven at a desired speed for effecting a centrifugal discharge of the dispensed materials, but free mixing of these materials with the incoming fluid is also afforded. In the illustrated embodiment this mixing takes place both within cups 46 and within housing 28. If

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the nozzles 87 are directed outside the respective cups 46 against peripheral vanes in these cups, then the mixing would occur solely within housing 28. The materials to be dispensed and the actuating fluid may affect the choice of design.

It will be also evident that the spacing dimension between the nozzle 87 of each respective conduit 81 and a corresponding dispenser cup 46 is such that the distance therebetween provides the necessary vacuum break required to comply with the regulations specified in sanitary codes and other municipal regulations applicable to laundry equipment in a use environment.

In order to facilitate loading of the cups 46 without removing the same from the housing 28, the cover 40 is particularly characterized by the formation therein of an inwardly tapered flange 41 disposed in the configuration of an inverted frusto-conical section, thereby forming a funnel opening 42 in register with each corresponding dispenser cup 46.

Furthermore, in order to prevent intermingling of the different materials to be dispensed and to promote the dispensing efficiency of only a single material during a specified period of a washing cycle, the cover 40 is further characterized by the provision of depending flanges 45 which extend below the level of the upper edges 66 of the cups 46 and which are interposed between each respective pair of adjoining cups 46. The cover 40 is further provided with a peripheral flange 45 which closely embraces the side walls 30 of the housing 28, thereby further assisting in retaining all materials to be dispensed within the appropriate housing 28.

The dispenser housing 28 may be firmly assembled within the cabinet or casing 12 of the laundry appliance 20 at an upper portion thereof subjacent the opening 20 by means of appropriate flanged brackets 100 retained as at 101 to an inner wall of the casing 12 and connected as at 102 to a mounting boss 103 formed on one end of housing 28. (FIGURES 3 and 5.) Similar suitable connections (not shown) are provided for supporting the opposite end of housing 28.

Referring now to FIGURE 3, it will be noted that the treatment zone prescribed by the laundry compartment 16 is shown as containing a rotatable container 110 and an upper stationary wall is shown at 111 which is interposed between the dispenser housing 28 and the container 110.

At one side, the upper wall 111 is formed with an opening 112 in which is received an end portion 113 of the pipe 38. In register with the discharge end of the pipe 38, there is formed a trap indicated generally at 114. The trap conveniently comprises a lower wall portion having a vertical section 116 attached to the upper wall 111 and which blends in with a downwardly sloping section 117 terminating in a generally horizontal section indicated at 118. An upwardly sloping wall section 119 extends from the horizontal wall section 118 and terminates in a lip 120 underlying a trap outlet indicated at 121. A baffle member 122, extending across the complete width of trap 114, is attached to the upper wall 111 and extends into the trap to provide an edge portion 123 lying below the level of the lip 120, thereby to form an effective liquid trap for fluids discharged from the dispenser housing 28. Trap 114 prevents suds from entering housing 28 during the washing cycle and prevents the escape of air therethrough during the drying cycle.

The lip 120 and the outlet 121 of the trap 114 are positioned sufficiently to one side of the rotatable drum or container 110 so that all fluids discharged therefrom will pass into the sump of the laundering compartment without directly engaging the clothes being laundered within the machine. This is a desirable arrangement since some additives may constitute bleaches which are preferably fully mixed in the laundry liquid before being applied to the materials to be laundered.

Although variations in use may be readily effected with

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the structure described, a typical operational sequence will be described to illustrate the adaptability of the structure and the methods practiced pursuant to the provisions of the present invention.

First of all, a batch of clothes is loaded into the treatment zone through the access door 14 and, if desired, the compartment 16 may receive a charge of a pre-wash detergent.

In presetting the machine, the operator lifts the cover 22 and may charge each of the separate dispenser cups 46 with an appropriate material to be dispensed. For example, in one of the cups there could be provided a detergent for effecting the normal washing of the clothes to be laundered. In a second cup, there could be provided a bleaching substance. In the third cup, there could be provided a water softener. In the fourth cup, there could be provided a so-called fabric conditioner.

The operator further selects the desired water temperature on the control 79 and by presetting the presettable sequential control means 15, a program is established which will include a timed sequence of separate washing, rinsing and extracting periods, or, if the machine 10 comprises a combination washer and drier, additional drying periods. It will be understood that the dispenser cups 46 can be loaded through the funneled openings 41 of the cover 40, however, if desired, the cover 40 may be hingedly displaced in the same direction as the cover 22 and the individual dispenser cups 46 may be temporarily removed for hand loading.

After all of the dispenser cups 46 have been loaded and the presettable sequential control means have been adjusted to select the laundering program, the cycle is started.

First of all, the valve 90 is operated, thereby admitting inlet water through the nozzle 92 into the dispenser compartment 28, which inlet water mixes with the prewash detergent, thereby subjecting the clothes in the washing compartment to a prewashing soaking action.

When the machine 10 has been charged with a sufficient quantity of laundry liquid determined by a float switch or a pressure-sensitive switch as is customarily provided in automatic washers, the timer means of the sequential control means 15 advances to the completion of the prewash cycle and initiates the normal wash cycle. In connection with the normal washing period, an appropriate valve 80 under the control of its corresponding motor or solenoid 82 is actuated under the control of the sequential control means 15, thereby to jet a stream of inlet water through a nozzle 87 against the vanes 50 of the corresponding dispenser cup, thereby centrifugally discharging the contents of the cup containing detergent for the normal wash into the housing 28 for discharge into the washing compartment.

In the same manner, the cup containing the bleaching agent is also rotatably actuated by a jetted stream of inlet water.

After the washing period of the laundering cycle has been completed, the rinsing periods are initiated. For such portion of the cycle, the dispensing cup 46 containing the water softener is actuated. For the final rinse, the cup containing the fabric conditioner is actuated.

Accordingly, it will be appreciated that all of the various additives may be introduced at a properly correlated part of the laundering cycle and all of such additions take place fully automatically without requiring manual intervention of the operator following initial loading of the dispenser mechanism and presetting of the controls on the machine.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of this invention all such modifications as reasonably and properly come within the scope of my contribution to the art.

The embodiments of the invention in which an exclu-

sive property or privilege is claimed are defined as follows:

1. A laundry machine comprising, means for laundering materials, dispensing apparatus in said machine comprising a rotatable container for receiving and discharging substances therefrom into the laundry machine, and a fluid charging means for the laundry machine including discharge control means for directing a stream of the fluid against said container in driving relation therewith, said container being configured to centrifugally discharge the contents thereof into the machine upon rotation of said container by said stream for conditioning contact with the materials being laundered.

2. A laundry machine having a water inlet system, means for laundering materials in said machine, and dispensing apparatus in said machine comprising a rotatable cup-shaped container having side walls for receiving and discharging substances and discharge control means in the water inlet system for directing a stream of water into said container at an angle such that the walls of said container are engaged by said stream of water to simultaneously rotate said container and centrifugally flush said substances therefrom over the top edges of said side walls into the machine for conditioning contact with the articles being laundered.

3. A cleaning machine comprising, means for cleaning articles, dispensing apparatus in said machine comprising an open topped vaned cup for holding material to be dispensed, fluid inlet means for said machine including means mounted for jetting fluid into impingement with the vanes of said cup, through the open top of said cup, and means mounting the cup to spin in response to said jetting of fluid into impingement with the vanes, to centrifugally discharge material contained in the cup out of the open top of the cup into the machine for conditioning contact with the articles being cleaned.

4. A cleaning machine comprising means for cleaning articles, and a dispensing device in said machine comprising a cup having side walls, means supporting said cup for rotation about a central axis thereof, means to introduce fluid into said machine including means for impinging fluid against said side walls of said cup to rotatably drive said cup, thereby to discharge the contents thereof centrifugally into the machine for conditioning contact with the articles being cleaned.

5. A cleaning machine comprising, means for cleaning articles, a dispenser in said machine comprising a cup for containing materials to be dispensed and having an outwardly and upwardly tapering peripheral wall, means supporting said cup for rotation about a central axis thereof, and means for impinging a stream of fluid into said cup to rotate said cup and centrifugally discharge materials therefrom with the fluid into the machine for conditioning contact with the articles being cleaned.

6. A cleaning machine comprising, means for cleaning articles, a dispensing device in said machine comprising a cup, means for vertically supporting said cup for rotation about a central axis thereof, and means in said cup responsive to a stream of fluid directed into the cup through the top thereof to rotate the cup and dispense materials therefrom by centrifugal force out of the top of the cup into the machine for conditioning contact with the articles being cleaned.

7. A cleaning machine comprising, means for cleaning articles and a dispensing device in said machine comprising a cup having an upwardly and outwardly tapered peripheral wall, means for vertically supporting said cup for rotation about a central axis thereof, means for directing a stream of fluid into said cup, and means in said cup spaced radially outwardly of said central axis responsive to said stream of fluid to rotate the cup and dispense materials therefrom over said peripheral wall by centrifugal force into the machine for conditioning contact with the articles being cleaned.

8. A cleaning machine as defined in claim 7, said means for vertically supporting said cup comprising a hollow center post having an outer peripheral surface forming stepped wall portions and including a plurality of steps at different vertical levels to strengthen said hollow center post and to designate different volumetric capacities corresponding to the depth of materials in the cup.

9. A cleaning machine comprising, means for cleaning articles, a device in said machine for dispensing materials comprising a cup for retaining said materials, a central hollow shaft integral with a bottom wall of said cup, means rotatably supporting said cup including a shaft extending into said hollow shaft in journaling relation with respect thereto, and means for directing fluid into said cup but outwardly of said hollow shaft to rotate said cup and discharge said materials therefrom by centrifugal force into the machine for conditioning contact with the articles being cleaned.

10. A cleaning machine comprising, means for cleaning articles, a device in said machine for dispensing mobile substances into the machine comprising a cup for retaining said substances, a plurality of radially inwardly extending impeller vanes on the peripheral wall of said cup, means for supporting said cup for rotation about a central axis thereof, and inlet means for projecting a jet of fluid against said vanes to rotatably drive said cup and centrifugally discharge said substances from said cup into the machine for conditioning contact with the articles being cleaned.

11. In a laundry machine having a casing, a dispenser for additive materials comprising a dispenser housing having an outlet communicating with said casing, a cup in said housing, means supporting said cup in said housing for rotation about an axis, a plurality of angularly spaced vanes on said cup, means constructed to direct a stream of fluid against said vanes whereby said fluid and the contents of said cup will be discharged centrifugally into said housing, and means for controlling the flow of fluid from said dispenser housing into said casing.

12. In a laundry machine having a casing, a dispenser for additive materials comprising a dispenser housing having an outlet communicating with said casing, a cup in said housing adapted to be charged with a supply of additive, means supporting said cup in said housing for rotation about an axis of said cup, a plurality of angularly spaced vanes on a peripheral wall of said cup, and conduit means disposed to direct a stream of fluid against said vanes and rotatably drive said cup so that the fluid and the additive will be centrifugally discharged out of said cup into the housing for discharge through said outlet into said casing.

13. In a laundry machine having a casing, dispensing apparatus for discharging a plurality of substances into the casing comprising a dispenser housing having a drain outlet therein communicating with the casing, a plurality of rotatable dispenser cups, said cups being adapted to receive and retain individual substances, means mounting each of the cups for rotation about a vertical axis within said housing, and conduit means for each of the cups for directing an individual stream of fluid into the cup to rotate the cup, said cups being configured to centrifugally discharge the substances and fluid therein into the housing in response to said rotation, said housing providing passage means for passage of the discharged substances and fluid to the drain outlet.

14. The invention set forth in claim 13 in which each of said cups is provided with a set of internal vanes and each of said respective conduit means is directed obliquely toward a respective set of vanes to effect a rotation and flushing of each respective cup by said fluid.

15. The invention set forth in claim 14 in which each of said conduit means is provided with a control valve and said control valves are sequentially operated by a program controller for discharging said substances in a programmed sequence.

16. The invention of claim 14 in which a separate flushing conduit is directed into said housing to discharge a stream of fluid into said housing to bypass said cups and maintain said housing in a flushed condition.

17. In a laundry machine, a dispenser apparatus comprising a trough-shaped housing having side walls and a sloping bottom wall, said bottom wall having an outlet opening at the deepest portion thereof, a plurality of spindles carried by said bottom wall of said housing, a cup-shaped receptacle on each spindle, each receptacle having outwardly tapering side walls terminating in an upper rim and a bottom wall mounting an upstanding hollow center post, the inside of said post having a bearing surface formed therein to journal and support said receptacle on a corresponding spindle, a plurality of circumferentially spaced vanes in each said receptacle, each vane extending radially inwardly from said side walls but spaced outwardly of said center post, a nozzle for each receptacle aligned to direct a liquid stream against said vanes in said receptacle to rotate said receptacle and discharge the contents thereof over said rim into said housing for gravitational flow to said outlet, a conduit depending from said outlet and having a liquid trap at the free end thereof, a conduit for each nozzle having a valve therein in control of fluid flow to each respective nozzle, pre-settable program control means for regulating operation of said valves, thereby to actuate each respective receptacle pursuant to a preset program, a flushing nozzle in said housing for discharging liquid directly into said housing to flow liquid through said apparatus without actuating a receptacle, a separate valve regulated by said program control means for controlling fluid flow through said flushing nozzle, and a cover member for said housing having a funnel-shaped opening in register with each respective receptacle to facilitate loading of each corresponding receptacle, and depending flange means carried by said cover disposed to overlie the rims of each respective receptacle when in covering position to prevent discharge of one receptacle with another during operation of said dispenser apparatus.

18. In a laundry machine, a dispenser apparatus comprising a trough-shaped housing having side walls and a sloping bottom wall, said bottom wall having an outlet opening at the deepest portion thereof, a plurality of spindles carried by said bottom wall of said housing, a cup-shaped receptacle on each spindle, each receptacle having outwardly tapering side walls terminating in an upper annular rim and a bottom wall mounting an upstanding hollow center post, said post extending upwardly beyond the level of said rim and forming a handle by means of which said receptacle may be manipulated onto and off of a corresponding spindle, the inside of said post having a bearing surface formed therein to journal and support said receptacle on a corresponding spindle, a plurality of circumferentially spaced vanes in each said receptacle, each vane extending radially inwardly from said side walls but spaced outwardly of said center post and each vane having an upper edge parallel to the plane of said rim and having a lower portion blending in with said bottom wall of said receptacle, a nozzle for each receptacle aligned to direct a liquid stream against said vanes in said receptacle, whereby said receptacle is rotatably driven by said stream and the contents of said receptacle together with the liquid directed thereinto will overflow said rim under the influence of centrifugal force, whereupon the contents and the liquid will gravitationally flow to said outlet, a conduit depending from said outlet and having a liquid trap at the free end thereof, said trap comprising wall means forming adjacent downwardly and upwardly extending passages separated by a common partition having a flow opening between the passages, and said trap having a discharge opening formed in the upwardly extending passage above the level of said flow opening, thereby to keep a well of liquid in the trap, a

conduit for each nozzle having a valve therein in control of fluid flow to each respective nozzle, pre-settable program control means for regulating operation of said valves thereby to actuate each respective receptacle pursuant to a preset program, a flushing nozzle in said housing for discharging liquid directly into one end of said housing to flow liquid through said apparatus without actuating a receptacle, and a separate valve regulated by said program control means for controlling fluid flow through said flushing nozzle.

19. In a laundry machine, a dispenser apparatus comprising a generally rectangular trough-shaped housing having side walls and a sloping bottom wall, said bottom wall having an embossment formed therein providing a drainage collection passage and having an outlet opening at the deepest portion thereof, a plurality of spindles carried by said bottom wall and disposed in a longitudinal row along the length of said housing, a cup-shaped receptacle on each spindle, each receptacle having outwardly tapering side walls terminating in an upper annular rim and a bottom wall characterized by the formation therein of an integral upstanding hollow center post, said post extending upwardly beyond the level of said rim and forming a handle by means of which said receptacle may be manipulated onto and off of a corresponding spindle, the inside of said post having a bearing surface formed therein to journal and support said receptacle on a corresponding spindle, a plurality of circumferentially spaced vanes in each said receptacle, each vane extending radially inwardly from said side walls but spaced outwardly of said center post and each vane having an upper edge parallel to the plane of said rim and having a lower portion blending in with said bottom wall of said receptacle, and liquid stream-forming means arranged to direct a liquid stream against said vanes of each of said receptacles whereby each such receptacle is rotatably driven and the contents thereof together with the liquid stream directed into the receptacle will overflow said rim for drainage through said outlet.

20. In a laundry machine, a dispenser apparatus comprising a generally rectangular trough-shaped housing having side walls and a sloping bottom wall, said bottom wall having an embossment formed therein providing a drainage collection passage and having an outlet opening at the deepest portion thereof, a plurality of spindles carried by said bottom wall and disposed in a longitudinal row along the length of said housing, a cup-shaped receptacle on each spindle, each receptacle having outwardly tapering side walls terminating in an upper annular rim, conduit means arranged to direct a liquid stream into each respective receptacle and means in each receptacle engaged by the stream to rotatively drive the receptacle whereby the contents thereof will be discharged into said housing for drainage with the liquid stream through said outlet, said spindles being mounted so that said contents will be collected by said drainage collection passage for movement into said outlet opening, said laundry machine having a treatment zone receiving the contents from said outlet opening.

References Cited in the file of this patent

UNITED STATES PATENTS

742,115	Forbes	Oct. 20, 1903
766,261	Jebsen	Aug. 2, 1904
974,591	Patterson	Nov. 1, 1910
1,025,206	Rounds	May 7, 1912
1,581,904	Xardell	Apr. 20, 1926
1,603,599	Heibl	Oct. 29, 1926
1,769,764	Barker	July 1, 1930
1,825,651	Barrett	Oct. 6, 1931
1,869,510	Saunders	Aug. 2, 1932
1,950,732	Kirby	Mar. 13, 1934
2,034,527	Nelson	Mar. 17, 1936

(Other references on following page)

3,086,379

11

UNITED STATES PATENTS

2,119,918	Kirby -----	June 7, 1938	2,643,537
2,159,271	Janda -----	May 23, 1939	2,697,341
2,312,950	Zimarik -----	Mar. 2, 1943	
2,431,040	Harvey -----	Nov. 18, 1947	5 3,206
2,506,882	Lipscomb -----	May 9, 1950	19,030
2,523,799	Woodson -----	Sept. 26, 1950	300,623
2,534,014	Gayring -----	Dec. 12, 1950	688,113

12

Woodson -----	June 30, 1953
Thomas -----	Dec. 21, 1954

FOREIGN PATENTS

France -----	July 26, 1847
Great Britain -----	1898
Great Britain -----	1930
Great Britain -----	Feb. 25, 1953