

Aug. 1, 1967

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3,333,739

MATERIAL DISPENSING MEANS FOR A WASHING APPARATUS

Filed June 22, 1965

2 Sheets-Sheet 1

Fig. 1

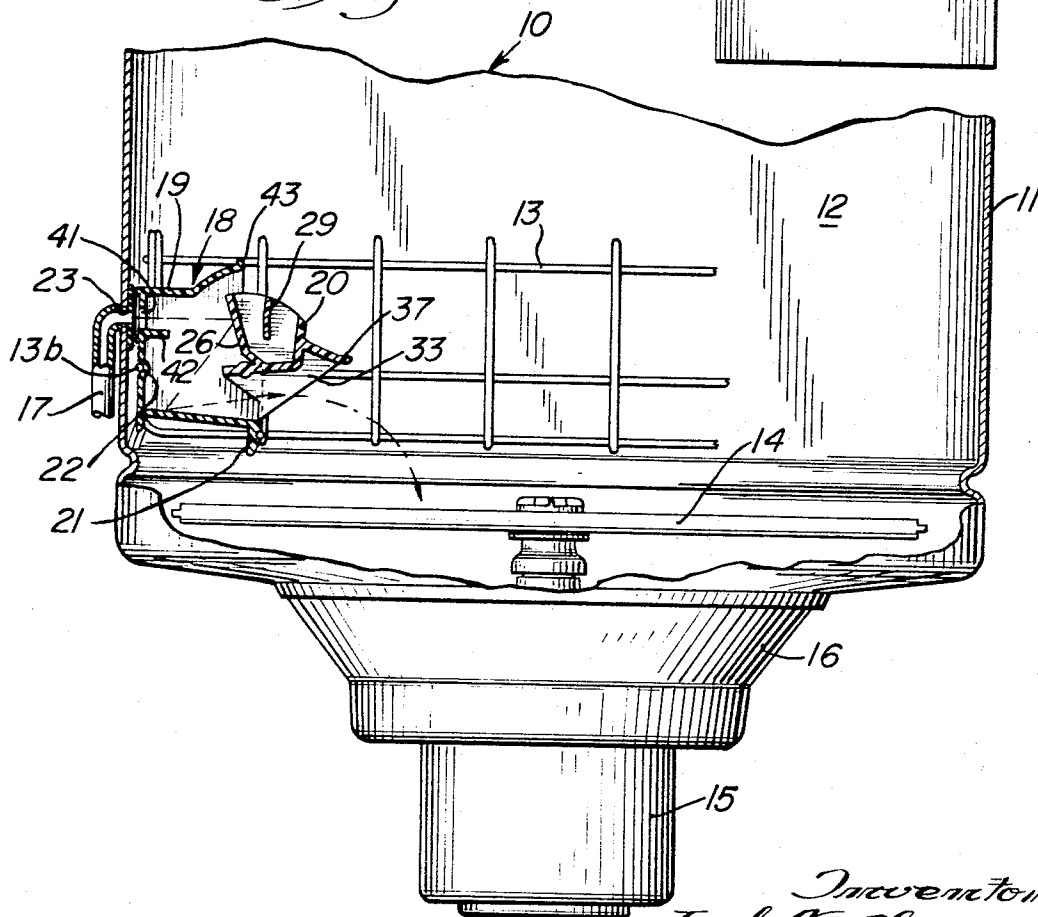
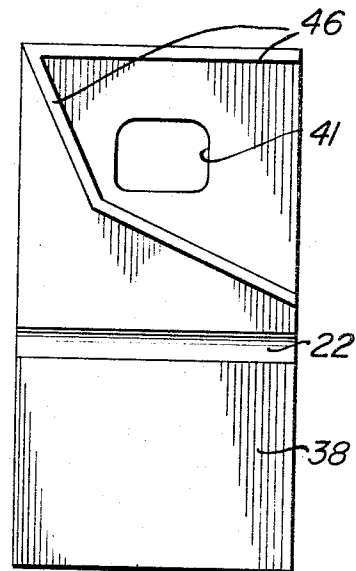


Fig. 2



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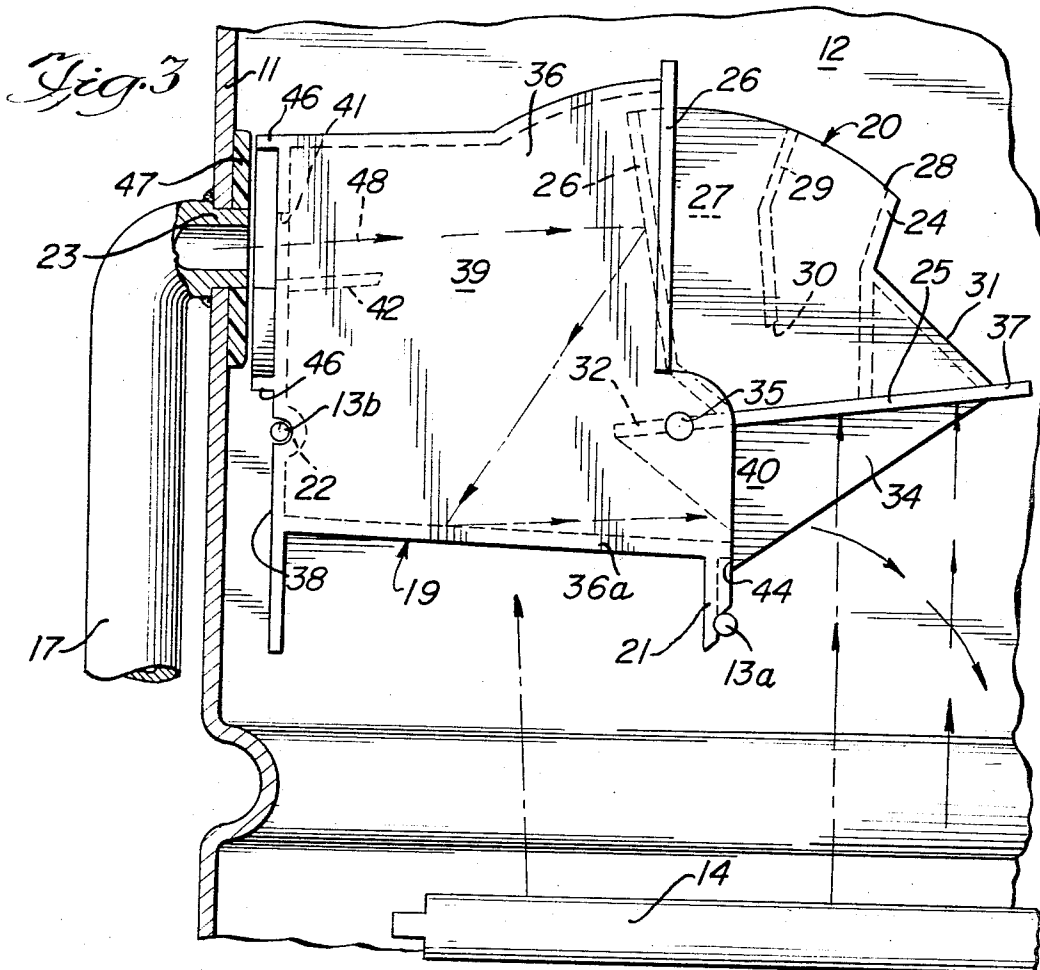
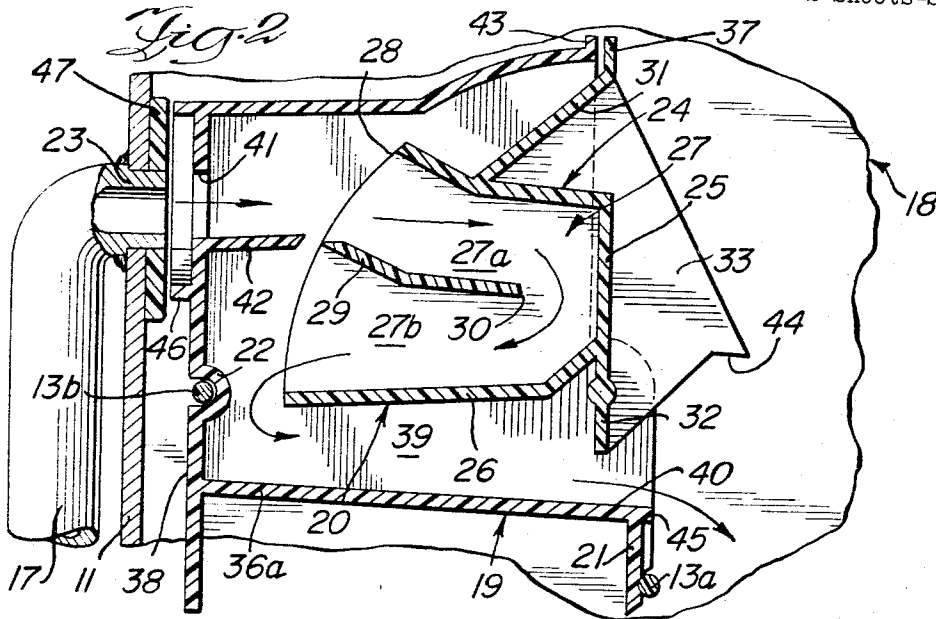
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MATERIAL DISPENSING MEANS FOR A WASHING APPARATUS

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Filed June 22, 1965, Ser. No. 465,969

7 Claims. (Cl. 222-166)

ABSTRACT OF THE DISCLOSURE

A dispenser for a washing apparatus such as a dishwasher for dispensing a material such as a detergent into the washing apparatus with the dispenser being movable from a nondispensing position, where incoming liquid does not contact the material, to a dispensing position, where the liquid does contact the material, by the force of impelled washing liquid during a portion of the washing cycle.

This invention relates to washing apparatus and in particular to means for dispensing materials in such apparatus.

In one conventional form of washing apparatus for use in washing dishes and the like, the washing liquid is sprayed upwardly by means of a spray arm to impinge upon and resultingly wash dishes and the like carried in a suitable basket in the washing chamber. It is desirable to provide a cycle of operation of such a dishwasher wherein the dishes are prerinsed, or prewashed, and subsequently thoroughly washed after pumping out the pre-rinse or prewash liquid. To provide the washing step, it is necessary to provide a washing liquid having a suitable cleaning agent such as detergent or the like. Heretofore, a number of different devices have been employed in such dishwashers for dispensing the cleaning, or washing, material into the washing liquid in the wash step. The known devices, however, have had the serious disadvantages of relative complexity, relatively high cost, and impositive operation. The present invention comprehends an improved dispensing means for use in such washing apparatus eliminating each of the above discussed disadvantages of the known devices, in a novel and simple manner.

Thus, a principal feature of the present invention is the provision of a new and improved dispensing means for use in washing apparatus.

Another feature of the invention is the provision of such a dispensing means for use in a dishwasher or the like wherein the dispensing of cleaning material such as detergent or the like into the washing liquid is effected automatically as a function of the liquid delivery and impelling functions of the apparatus.

A further feature of the invention is the provision of such dispensing means including a container movably carried in the washing chamber for selective positioning to receive the washing material, to be repositioned by the forcibly impelled washing liquid during a first spray operation of the apparatus, and to subsequently receive washing liquid entering the washing chamber to thereby dispense into the washing liquid the washing material previously received therein.

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Still another feature of the invention is the provision of such dispensing means wherein the container is pivotally mounted on the means for supporting the objects to be washed, such as dishes and the like, in the washing chamber.

Another feature of the invention is the provision of such dispensing means which is extremely simple and economical of construction.

Other features and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

FIGURE 1 is a fragmentary side elevation of a washer, with portions thereof broken away to facilitate illustration thereof, and provided with a dispensing means embodying the invention;

FIGURE 2 is a fragmentary enlarged vertical section of the dispensing means with the container disposed in the dispensing position;

FIGURE 3 is a fragmentary vertical section of the washer with the dispensing means shown in elevation and with the container thereof in the loading position; and

FIGURE 4 is an end view of the dispensing means.

In the exemplary embodiment of the invention as disclosed in the drawing, a washing apparatus generally designated 10 is shown to comprise a dishwasher having a tub 11 defining a washing chamber 12 in which is received a dish supporting basket 13 spaced superjacent a spray arm 14 rotatably driven by a suitable electric motor 15 carried on the bottom wall 16 of the tub 11. Washing liquid such as hot water is delivered to the washing chamber 12 through an inlet conduit 17. Herein the conduit enters the chamber in the lower portion thereof laterally adjacent the basket 13.

As indicated briefly above, the present invention comprehends an improved means for dispensing washing material such as detergent and the like into the washing liquid. Herein, the dispensing means is generally designated 18 and is shown to comprise a housing 19 and a container 20 movably mounted on the housing. The housing is provided with suitable mounting portions 21 and 22 for installation on the wire basket 13 adjacent the inlet end 23 of conduit 17.

Referring now to FIGURES 2 and 3, the container 20 comprises a cup member 24 having a bottom wall 25 and a side wall 26 (when the cup is in material holding position of FIGURE 3) defining a space 27 having an open outer end 28. A baffle wall 29 extends across the space 27 inwardly from open end 28 and has its inner end 30 spaced from bottom wall 25 to divide space 27 into a liquid inlet chamber 27a and an outlet chamber 27b in communication at an area between the baffle end 30 and bottom wall 25 to define a continuous passage into and out of the cup member.

The container 20 is further provided with laterally outwardly extending flange portions 31 and 32 and a pair of depending side flanges 33 and 34. Flange 32 is provided with a pair of opposed cylindrical pivots 35 for pivotally mounting container 20 on the side wall 36 of the housing 19. The flange 31 is provided with a turned outer end 37 defining a stop and handle for use in manipulating the container and for limiting the movement thereof.

Housing 19 comprises a generally cup-shaped member having a bottom wall 36a cooperating with the side wall 36 to define a space 39 having an open outer end 40. Front wall 38 is provided with an opening 41 which, when

the housing is mounted on the basket wires 13a and 13b of the basket 13, is aligned with inlet 23 of the hot water supply to admit incoming hot water into the space 39. A short baffle wall 42 is provided adjacent the opening 41 for cooperation with the rear wall 38 and the side wall 36 in guiding the incoming water into space 39. The side wall 36 is provided at its outer end with a small turned flange 43 for engagement by the stop handle 37 to limit the pivotal movement of the container 20 in a counterclockwise direction to the dispensing position as seen in FIGURE 2. The side flanges 33 and 34 are provided with a stop shoulder 44 engaging an outer stop shoulder 45 on housing 19 adjacent wire engaging portion 21 to limit the pivotal movement of container 20 in a clockwise direction to the material holding position of FIGURE 3.

As best seen in FIGURE 2, housing 19 may be further provided with a flange 46 upstanding from wall 38 circumjacent the opening 41.

In use, the dispensing means 18 is installed on wires 13a and 13b of the wire basket 13 by snapped engagement of portions 21 and 22 of the housing 19 therewith to dispose opening 41 of the housing in alignment with inlet 23 of the hot water supply conduit 17. Container 20 is manipulated to the loading position wherein the open end 28 is uppermost, as seen in FIGURE 3. A suitable amount of detergent or the like is then placed in the space 27 within the cup member 24.

Hot water is then admitted into the washing chamber 12 through the inlet 23 such as in a prerinse, or prewash, step of the washing cycle. (In the prerinse step, no cleaning material is provided in the water, whereas in a prewash step, detergent may be provided in the water as by placing a preselected quantity thereof in the bottom of the washing chamber 12.) During this introduction of the hot water, the flow path 48 of the liquid is similar to that schematically shown by the arrowed line in FIGURE 3 wherein the water is directed firstly against the side wall 26 of the cup member 24 and thence downwardly through the space 39 within the housing 19 to flow outwardly from the space 39 into the washing chamber 12 through an outlet opening 40 between the bottom wall 36a of the housing 19 and the bottom wall 25 of the cup member 24, as shown in FIGURE 3. The side wall 26 of the cup member effectively precludes the incoming washing liquid from entering into the cup member during this step of the washing cycle.

Upon completion of the hot water delivery, the washing liquid is then sprayed upwardly by the spray arm 14 in the conventional dishwashing manner. The forcibly impelled washing liquid impinges upwardly against bottom wall 25, and flanges 33 and 34 of container 20, thereby causing the container to pivot in a counterclockwise direction from the position of FIGURE 3 to the position of FIGURE 2 wherein the cup member 24 is effectively recessed within the reversely opening cup-shaped housing 19, thereby preventing the forcibly impelled washing liquid from entering the cup member 24 and thereby maintaining substantially dry the washing material previously placed in the cup therein.

Upon completion of the prerinse, or prewash, step, the washing liquid is suitably withdrawn from the washing chamber 12 and further hot water is then delivered through inlet 23. At this time, however, the open end 28 of cup member 24 is disposed in the path of flow of the incoming hot water (FIGURE 2) so that the hot water enters the inlet portion 27a of the cup member space 27, flows around the bottom end 30 of the baffle 29, and then flows outwardly from the outlet space 27b of the cup member, carrying the cleaning material with it. The resultant washing liquid is then directed along the bottom of the side wall 36 of housing 19 into the washing chamber 12 under the flange 32 of the container 20. As substantially all of the incoming hot water is directed through the cup member space 37, the cleaning material is effectively complete-

ly dispensed into the hot water delivered into the washing chamber 12 automatically as a result of the delivery of the hot water. The washing cycle is then continued by the forceful impelling of the washing liquid by spray arm 14, as previously described.

For subsequent refilling the cup member 24, the user merely manipulates handle 37 with his fingers to pivot cup member 24 to the loading position of FIGURE 3 whereupon a new cycle of operation as discussed above may be effected.

The dispensing means 18 may be economically formed of a suitable plastic material as by molding. While we have illustrated the disposition of the dispensing means on the wire basket 13, it is obvious that it may be disposed as desired within the washing chamber 12 with the inlet 23 of the hot water conduit 17 suitably positioned relative thereto, as long as the container 20 is disposed in position to be engaged by the forcibly impelled washing liquid during the operation of the spray arm.

While we have shown and described one embodiment of our invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as defined in the appended claims.

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

1. In a washer having means defining a washing chamber, means for flowing washing liquid in a preselected flow path into said chamber, and means for forcibly impelling washing liquid through said washing chamber, means for dispensing a preselected quantity of material into the washing liquid in said chamber comprising:

means defining a container for holding a preselected quantity of material;

means movably mounting said container in said chamber in said flow path and to be engaged by liquid impelled by said impelling means, said mounting means being constructed to carry said container serially in a first, loading position wherein the material is held in the container and liquid flowing through said inlet into said washing chamber is precluded from entering the container, and in a second, dispense position wherein the interior of the container is disposed to receive liquid flowed in said flow path, said mounting means carrying said container so that it is moved by the impelled liquid from said first position to said second position.

2. The dispensing means of claim 1 wherein said impelling means comprises a spray arm impelling the liquid upwardly and said container opens upwardly in said first position and toward said chamber defining means in said second position.

3. The dispensing means of claim 1 wherein said container is provided with deflector means extending laterally therefrom for providing additional area for engagement by the impelled liquid to move said container.

4. The dispensing means of claim 1 wherein said container carries with it means for blocking contact of said material with said liquid impelled by said impelling means when the container is in said second position.

5. In a washer, a container having a bottom wall and a side wall defining a space having an open end, a baffle in said space extending from said open end and terminating short of said bottom wall to divide said space into an inlet portion and an outlet portion communicating with each other between said baffle and said bottom wall;

pivot means on said container for pivotally mounting said container with said open end uppermost in a material receiving position and with said open end horizontal in a dispensing position; and

means for directing liquid selectively against said side wall to maintain said container in said material re-

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ceiving position and against said bottom wall to dispose said container in said dispensing position.

6. The washer of claim 5 further including wall means extending laterally outwardly from said side wall and said liquid directing means being arranged to direct said liquid against said laterally outwardly extending wall means for disposing the container in said dispensing position. 5

7. In a washer having means defining a washing chamber, means for dispensing a preselected quantity of material, comprising:

a first cup-shaped member having an inner end opening horizontally into said washing chamber;

a second cup-shaped member movably carried on said first cup-shaped member at said open inner end and having an open end; and

means for conducting liquid into said first cup member to flow therethrough toward said open end thereof, said second cup member being selectively positionable with its said open end uppermost and sub-

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stantially fully outwardly of said open end of said first cup member and with said open end of said second cup member opening horizontally away from said open end of the first cup member with the second cup member being received substantially fully within said first cup member.

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