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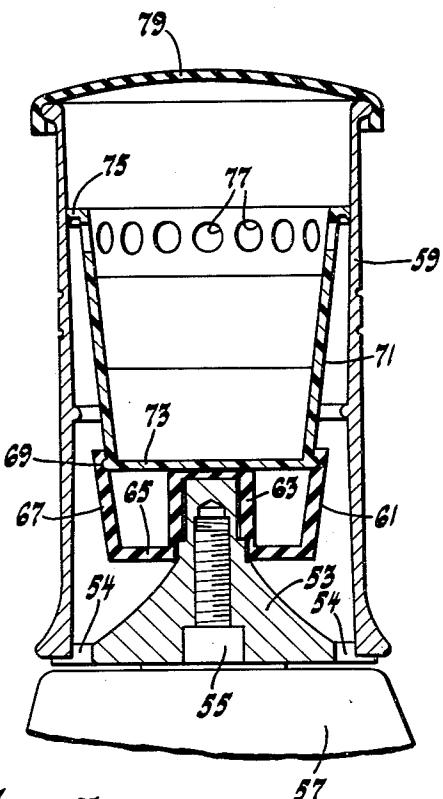


Fig. 3

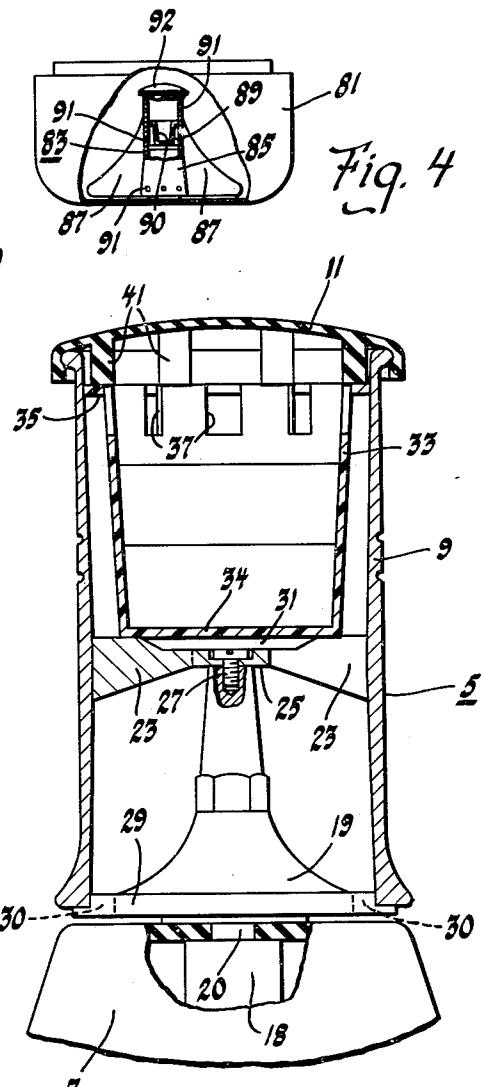


Fig. 4

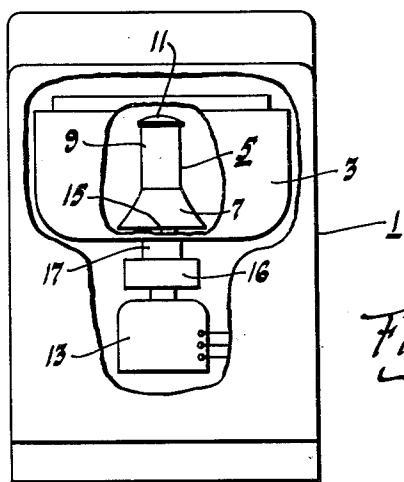


Fig. 1

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1

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**WASHING MACHINE DISPENSING CUP**

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5 Claims. (Cl. 68—17)

This invention relates to a domestic appliance and more particularly to a washing machine that is provided with means for dispensing a liquid bleach or the like into the tub of the washing machine.

The dispensing of bleach into the tub of a washing machine raises peculiar problems not encountered in the dispensing of detergents and the like into a washing machine, in that it is imperative that the bleach not directly contact the clothes before the clothes are submerged in water. In order to dispense the bleach into the washing machine after the tub has been filled with water, it is necessary to provide some sort of dispensing means that will not leak bleach into the tub before the same is filled, the dispensing means preferably being as simple as possible so that the operator of the machine may make use of the dispenser with a minimum amount of effort.

It is therefore an object of this invention to provide a washing machine with a dispenser that will dispense liquid bleach or the like into the tub of the washing machine, the water in the tub and the bleach being mixed slowly so as to preclude injuring the clothes to be washed.

A more specific object is to provide a cup that is associated with the agitator of a washing machine, the cup being adapted to contain a quantity of liquid bleach or the like and to dispense the same into the tub when the agitator is set in motion.

A further object is to provide a cup adapted to contain a liquid bleach that is easily inserted and removed from within an agitator of a washing machine.

Further objects and advantages will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Figure 1 is a front view, partly in section, of a washing machine constructed in accordance with this invention;

Figure 2 is a sectional view of the agitator shown in Fig. 1;

Figure 3 is a sectional view of a modified agitator adapted to be used with the washing machine shown in Figure 1; and

Figure 4 is a front view of a modified washing machine having a bleach dispenser mounted in the agitator thereof.

Referring now to Fig. 1, a washing machine generally designated by reference numeral 1, is shown and includes a tub 3 and an agitator generally denoted by reference numeral 5. The agitator has a lower substantially conically shaped portion 7 and an upper tubular portion 9. The upper end of the tubular portion 9 is open and is closable by a cap 11. The agitator 5 is connected to an electric motor 13 by means of a gear-box 16 and a shaft 15, while the tub is connected to the electric motor by gear-box 16 and a shaft 17. The mechanical connections 15, 16 and 17 between the electric motor 13 and agitator 5 are shown diagrammatically and are preferably constructed as shown in the patent to Clark,

2

No. 2,366,236. As disclosed in the Clark patent, the electric motor will vertically reciprocate the agitator 5 during certain periods of energization. The tub and agitator, during other periods of energization of the

electric motor, will rotate at high speed, as also taught in the Clark patent. It is to be understood that the washing machine is arranged with water supply and drain means together with timing means for controlling the energization of electric motor 13 and for controlling

10 the supply of water and drain of water from tub 3. The timer and water supply means may be as disclosed in the above-mentioned Clark patent. With this arrangement the timer controls the operation of the washing machine so that the tube is first filled with hot water to a pre-determined level. The timer then operates to start the agitation cycle wherein the agitator 5 is vertically reciprocated upwardly and downwardly for a predetermined period. When the agitation or washing cycle is

20 finished the agitator and tub are rotated at high speed whereupon the water is spun out of the tub and carried away by suitable drain means (not shown). The cycle of operation, after the water is spun out of the tub, may include one or more rinse periods and a spin-drying period where the tub and agitator are spun at high speed.

25 Referring now to Fig. 2, the lower portion 7 of agitator 5 is connected to a vertically reciprocable shaft 18 by a nut 19. The nut 19 is threaded onto shaft 18 and holds the agitator 7 against reduced portion 20 of shaft 18. It is to be understood that shaft 18 is connected with an electric motor and is vertically oscillated, as described hereinbefore. The tubular portion 9 of agitator 5 is made of rubber, a molded phenolic composition or any other suitable material and is formed with a plurality of radially extending integral webs 23 having a center portion 25. The center portion 25 has a bolt hole through which passes a bolt 27 that secures webs 23 and tubular portion 9 to nut 19. The tubular portion 9 also abuts the lower portion of nut 19 along an annular rim portion 29. The annular rim portion 29 is provided with a plurality of vertically extending slots 30 that connect the interior of tubular portion 9 with the interior of tub 3.

30 The webs 23 are recessed as at 31 and support a bleach or dispensing cup 33. The cup 33 is preferably made of a molded polyethylene material but may be made of any suitable material that will not be attacked by liquid bleach or the like. The bleach cup includes a bottom wall 34 and has an annular rim portion 35 disposed at the top of the cup. A plurality of slots 37 are formed in the side wall of the cup 33 and connect the interior of the cup with the interior of the tubular portion 9 of the agitator. A closure cap 11 is mounted over the open end of tubular portion 9 and has a plurality of downwardly extending lugs 41 that engage the annular rim 35 of the cup. The lugs 41 prevent the cup 33 from moving with respect to tubular portion 9 when agitator 5 is vertically reciprocated. The annular rim 35 may also be made with a sufficient diameter so that the cup will tightly engage the inner wall of tubular portion 9. It has been found that a tight fit between rim 35 and tubular portion 9 by itself will effectively preclude movement of cup 33, but it is preferable to make use of a closure cap having downwardly depending lugs to insure that cup 33 will not move vertically, particularly where cup 33 only loosely fits within tubular portion 9. The closure cap 11 may be made of rubber and preferably snaps over the outer periphery of tubular portion 9.

35 The operation of the dispenser shown in Fig. 2 will now be described. The operator of the washing machine may remove cup 33 and fill the same with a quantity of bleach or other washing agent that is desired to be dispensed into tub 3. The cup, after being filled, is placed in the

tubular portion 9 with the bottom of the cup resting on webs 23. The closure cap 11 is then secured to the tubular portion 9 and the washing machine may then be set into operation. The washing machine, as noted above, first fills with hot water to a predetermined level. It is preferred that the tub not fill to a point where the cup 33 will be submerged. After the tub is filled the agitation cycle begins, whereupon the agitator 5 and tubular portion 9 are reciprocated upwardly and downwardly. It should be noted that the interior of tub 3 communicates with the interior of cup 33 via slots 30 formed in nut 19 and slots 37 formed in cup 33. Thus, during the vertical reciprocation of agitator 5 water is forced through slots 30, past webs 23, along the outer periphery of cup 33, and into and out of slots 37. It has been found that this vertical reciprocation forces water into and out of cup 33 via the path described above, thus dispensing the bleach into the tub at a slow rate during the agitation cycle of the washing machine. By this method of dispensing, the bleach is slowly mixed with the washing water and does not directly contact the clothes, until it is diluted with water.

A modified bleach or detergent dispenser is shown in Fig. 3. In this figure a nut 53 having a plurality of vertically disposed slots 54 is secured to a shaft 55 that is driven by an electric motor, as shown in Fig. 1. The agitator shown in Fig. 3 includes a lower substantially conically shaped portion 57 and an upper tubular portion 59. A cup 61 having a tubular portion 63 is press-fitted or otherwise secured to nut 53. The cup is preferably made of rubber or other flexible material and includes a lower wall 65 and a tubular side wall portion 67. The tubular side wall portion has a circumferential groove 69 that engages a lower rim portion of a second cup 71. The lower wall 73 of cup 71 forms a top wall of lower cup 61, although the top wall of cup 61 might comprise a sheet of rubber and need not necessarily be formed by the lower wall of a second cup. The cup 71 is generally similar to cup 33 shown in Fig. 2 and has an annular rim 75 and a plurality of apertures 77 that connect the interior of the cup with the interior of agitator tube 59. The cup 71 is preferably made of a flexible material such as molded polyethylene and the annular rim 75 tightly engages tubular member 59 in order to fix the cup in position. A closure cap 79 is adapted to snap over the open end of tubular member 59. The cup 61 is adapted to be filled with a softener, while the cup 71 may be filled with a liquid bleach or the like. With this construction, the cup 71 will dispense bleach into tub 3 when the agitator is vertically reciprocated in a manner similar to the dispensing of bleach from cup 33 shown in Fig. 2. When the agitation cycle is completed, the tub and agitator as described above are rotated at high speed. This rotation will move outer wall 67 of cup 61 away from cup 71 under the action of centrifugal force, whereupon the softener in cup 61 will flow out of cup 61 and through slots 54 into tub 3.

Referring now to Fig. 4, a washing machine tub 81 is shown. An agitator 83 is disposed within the tub and comprises a vertically extending tubular portion 85 to which are fixed a plurality of vanes 87. The agitator is adapted to be driven by a gear-box connected to an electric motor (not shown), of the type wherein the agitator is oscillated about a vertical axis, as contrasted to the type wherein the agitator is vertically reciprocated, as shown in Fig. 1. A dispensing cup 89 identical with cup 33, shown in Fig. 2, is press-fitted within tubular member 85 and rests on a perforated horizontal support 90 fixed to the tubular member 85. The tubular member has a plurality of apertures 91 disposed at the bottom of tubular member 85 and in the vicinity of the dispenser cup. A closure cap 92 is fitted onto the top of tubular member 85. When the agitator is oscillated back and forth around a vertical axis, the water in tub 81 will flow into and out of bleach cup 90, thereby dispensing bleach into tub 81.

The dispensing action will be the same as that of the washer shown in Figs. 1, 2 and 3 except that in this case the agitator is oscillated around a vertical axis rather than along a vertical axis.

5 While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

- 10 1. In combination a washing machine having a tub and an agitator, power means for rotating said agitator, an imperforate flexible cup connected to said agitator and movable therewith and adapted to contain a fluid washing agent, said cup having a bottom wall and an integral tubular wall portion having an upper open valve end extending upwardly therefrom, a top wall extending across the open end of said cup and engaging said valve end, the tubular wall portion of said cup being adapted to distend under the influence of centrifugal force where-  
20 by said valve end disengages said top wall to permit flow of washing agent into said tub when said agitator is rotated at high speed.
2. In combination a washing machine having a tub, a hollow agitator in said tub, passage means in said agitator connecting the interior of said agitator with said tub, power means for oscillating said agitator at certain times and for rotating said agitator at high speed at other times, a first flexible cup adapted to contain a washing agent or the like located within said agitator and movable therewith, said cup having a bottom wall and an integral tubular wall portion having an upper open end extending upwardly therefrom, and a second flexible cup adapted to contain a liquid bleach or the like having a lower wall closing the upper open end of said first cup,  
30 35 the tubular wall portion of said first cup being adapted to move away from the lower wall of said second cup under the influence of centrifugal force to permit flow of washing agent or the like into said tub when said agitator is rotated at high speed.
- 40 3. In combination a washing machine having a tub, a hollow agitator in said tub, passage means in said agitator connecting the interior of said agitator with said tub, power means for oscillating said agitator at certain times and for rotating said agitator at high speed at other times, a first flexible cup adapted to contain a washing agent or the like located within said agitator and movable therewith, said first cup including means movable upon rotation of said agitator at a predetermined speed for permitting the dispensing of said washing agent or the like, and a second cup adapted to contain liquid bleach or the like resting on said first cup, said second cup having upper passage means connecting the interior of said second cup with the interior of said agitator.
- 45 4. In combination, a fabric washing machine having a tub adapted to contain a fluid, an agitator in said tub having an inner chamber above said fluid, fluid passage means connecting said chamber to said tub, means for vertically reciprocating said agitator to cause said fluid pulsingly to enter said passage means and said chamber, a washing agent cup removably mounted in said chamber in the path of said pulsingly entering fluid, said cup having an imperforate bottom wall and a side wall extending upwardly therefrom, said side wall having an imperforate portion separating said agent from said fluid and a perforated portion solely at the top of said side wall and permanently remote from said fabric for permitting regulated interchange of said pulsingly entering fluid and said agent between said fluid passage means and said cup when said agitator is reciprocated.
- 50 5. In combination, a fabric washing machine having a tub adapted to contain a fluid, an agitator in said tub having an inner chamber above said fluid, a cap for said agitator having a lug extending into said chamber, fluid passage means connecting said chamber to said tub, means for vertically reciprocating said agitator to cause

said fluid pulsingly to enter said passage means and said chamber, a washing agent cup removably mounted in said chamber in the path of said pulsingly entering fluid, said cup having an imperforate bottom wall and a side wall extending upwardly therefrom, said side wall having an imperforate portion separating said agent from said fluid and a perforated portion substantially at the top of said side wall and permanently remote from said fabric for permitting regulated interchange of said pulsingly entering fluid and said agent between said fluid 10 passage means and said cup when said agitator is reciprocated, said perforated portion engaging said lug to restrain said cup during said reciprocation.

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