

Dec. 17, 1957

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2,816,427

SOAP DISPENSER FOR WASHING MACHINE

Filed July 14, 1953

2 Sheets-Sheet 1

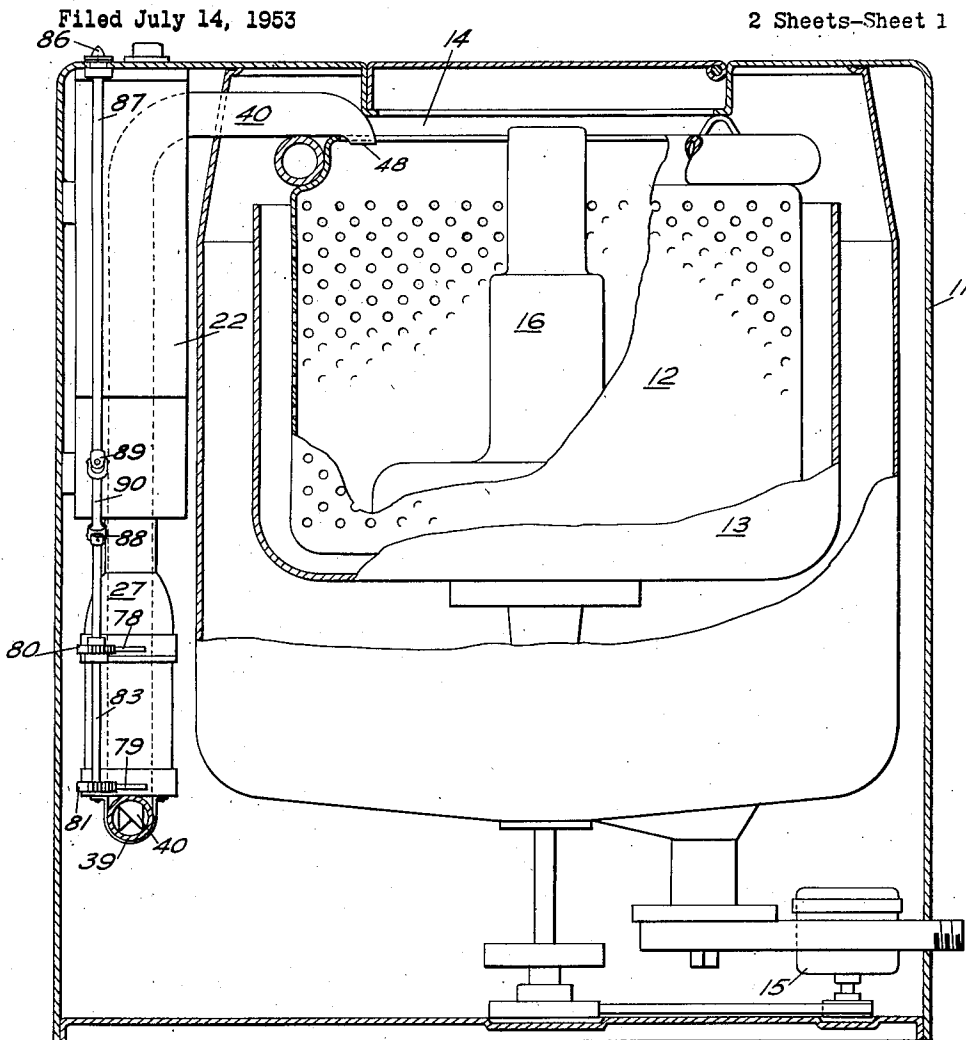
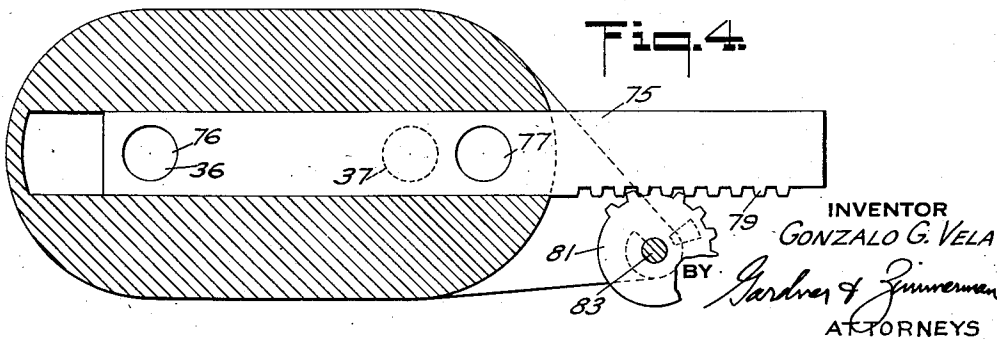


Fig. 1.



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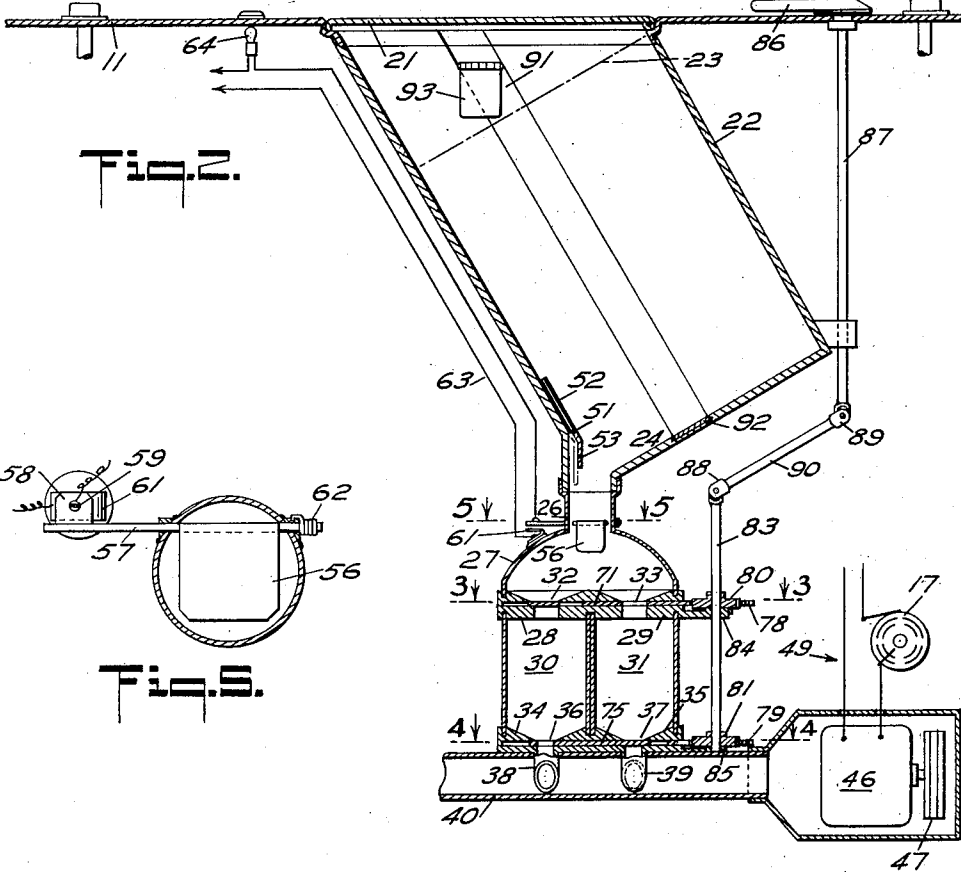


Fig. 2.

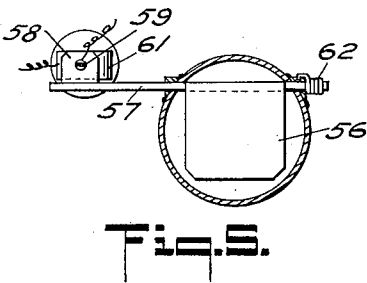


Fig. 5.

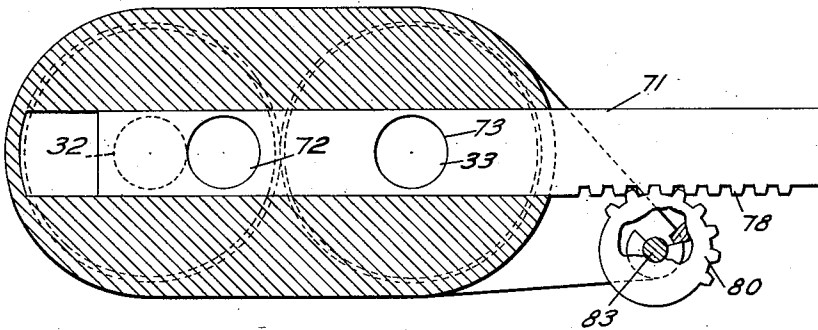


Fig. 3.

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SOAP DISPENSER FOR WASHING MACHINE

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2 Claims. (Cl. 68-17)

The present invention relates to soap dispenser for washing machine, and in more particular to a dispenser which will receive and open a package of soap powder and will upon operation deliver to the washing vessel of the machine discrete and measured quantities of soap powder.

There have been many devices for the measurement of soap powder and its conveyance to the washing vessel of a washing machine. However, most of these devices have required the manual filling of a measuring cup or receptacle with the proper amount of soap, which soap was later flushed into the washing vessel by all or a portion of the make-up water. Further, the pouring of powdered soap into a container has resulted in the getting of the powder into the air to the discomfort of adjacent persons. Also, many of the prior devices had not a hopper or container for the reception of the full contents of a package of soap powder.

Having in mind these defects of the prior devices, it is an object of the present invention to devise a powdered soap dispenser into which may be inserted a package of soap powder and which device will automatically open and remove the soap from the package.

Another object of the invention is association with a powdered soap storage box of means for dispensing to a washing vessel of measured and discrete amounts of soap powder.

Another object of the invention is the provision of indication means which will give timely notice that the amount of soap in storage is low in quantity.

A further object of the invention is the provision of novel means for conveying soap into a washing vessel.

A still further object of the invention is the provision of novel soap measuring means that is simple in construction and easily operated.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claims.

The above defects of the prior art are remedied and these objects attained by the construction of a powdered soap dispenser which may be easily placed in and adapted to most of the present domestic clothes washing machines as it does not require revision of the piping plans and may be located in most any part of the machine. Such construction involved the provision of a hopper box having a knife blade adjacent the hopper outlet and the shaping of the hopper, or box, to receive a soap package so that one corner of the package will enter or be adjacent such outlet and as such corner of the package is so positioned the package will be cut by the knife and the cut opened to allow the drainage of the powdered soap

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through the cut and the box opening. A chute receives the soap and conveys it to one or the other of a pair of feeding chambers having common inlet valves and common outlet valves which are inter-connected for simultaneous operation so that as one chamber discharges soap the other is filling. A balanced scale plate in the inlet chute operates an electric circuit which has a state indicator functioning when the supply of soap becomes low. Soap from the feeding chambers is conveyed by air flow through a duct to the washing vessel as it is discharged downwardly therein to the surface of the water in the vessel.

By the use of the terms "powdered soap" and "soap powder" is meant a detergent, true soap, water conditioner or softener, or a combination of substances which may be useful in the washing of fabrics, and which are or is in the form of discrete particles or solids, be such powder, granules, flakes, pieces, or otherwise.

A device constructed in accordance with the above outline is described in detail hereinafter and is illustrated in the accompanying drawings, wherein:

Figure 1 is a side view partly in section and broken away, of a domestic clothes washing machine having embodied therein a form of my invention.

Figure 2 is a detail view in elevational section of the hopper and the feeding chambers.

Figure 3 is a section on the line 3-3 of Figure 2 showing details of construction of the inlet slide valve of the feeding chambers.

Figure 4 is a section on the line 4-4 of Figure 2 showing details of construction of the outlet slide valve of the feeding chambers.

Figure 5 is a horizontal sectional view on the line 5-5 of Figure 2, showing a side view of the soap or detergent indicator.

In Figure 1 there is shown only so much of a conventional automatic washing machine of the domestic type as is deemed necessary for a clear understanding of the present invention. The main parts of the machine and of this invention are contained in a housing 11. Clothes to be washed are placed in a perforated spinnable drum 12 contained in an imperforate vessel 13. Access to the drum and vessel is had through a top opening 14. A suitable motor 15 is provided for operation of the drum, an agitator 16 located centrally thereof; and for rotatably driving an electrical timing disc 17, which later controls the sequence of the various functions of the machine.

A small cover 21 located in the top of the housing 11 when opened exposes a rectangular box 22, or hopper, for the reception and retention of a package 23 of powdered soap or detergent. The size of the box is made to snugly fit and to receive a standard package but if made to receive one of the larger sizes the device will operate satisfactorily with smaller ones. The box is arranged so that one of the short edges of the package will be the lowest part of the package, and the sides of the box adjacent to this lowest package edge, at the place where the lowest edge of the box would be if the sides of the box were to be so projected, are formed to provide an opening 24 which communicates with a downwardly extending chute 26. The lower end of this chute is flared into a plenum chamber 27 having a bottom wall that forms the tops 28, 29 of a pair of feeding chambers 30, 31. Each top wall 28, 29 is formed with an inlet opening 32, 33, and each chamber is provided with a bottom wall 34, 35 having formed therein an outlet opening 36, 37, which communicates by means of an outlet chute 38, 39 with a common discharge duct 40.

The entrance end of the discharge duct 40 is enlarged to form a housing in which is placed an electric motor 46 direct connected to a fan 47 which when activated will

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force air through the discharge duct 40 to the duct outlet 48 that is placed to discharge the air into and downwardly of the vessel 13. The velocity of the air in the duct is of a value to pick up and carry to the outlet 48 and there distribute the soap powder that is delivered to the duct from the feeding chambers and the box 22. Current is supplied to the motor 46 through a power circuit 49 that has therein in series a segment of the electrical timing disc 17 so that at an appropriate part of the machine cycle, usually during filling of the vessel 13 with water, the motor and fan 47 will be operated to move air through the discharge duct 40 and thereby convey soap to the vessel.

When a package of soap powder is inserted in the box 22 and the lowest edge progressed into the lower opening 24 of the box the package engages the cutting edge 51 of a knife blade 52 that is secured across the box and the opening 24. The cutting edge 51 is inclined to the direction of travel of the package to afford a slicing action on the package and make a cut therein for a distance of a couple of inches, more or less. A portion of the blade adjacent the trailing edge 53 of the knife 52 is bent laterally to provide a deflector that spreads apart the opposed edges of the cut made in the package by the cutting edge of the knife. This action opens the package and allows the soap to drain into the chute 26 which is in communication with the box and the plenum chamber 27 of the feeding chambers 30, 31.

The presence or absence of soap in the chute 26 is sensed by a balance platform 56 that is secured to a shaft 57 eccentrically of the platform, and the shaft is passed through and supported by the walls of the chute 26. One end of the shaft 57 is crossed by and secured to an arm 58 which has one end provided with an electric contact 59 that abuts against a fixed electric contact 61 serving as a stop against rotation of the arm 58 when the platform is across the chute 26, to which position it is urged by a spring 62 secured to the other end of the arm. A suitable power circuit 63 is provided with the contacts 59, 61 and a signal lamp 64 in series in the circuit so that when the contacts are closed the lamp is lit, and extinguished when the contacts are separated.

The flow of powdered soap through the feeding chambers 30, 31 is controlled by a pair of slide valves comprising inlet and outlet slides 71 and 75 respectively. The inlet slide 71 is common to the two chambers and is placed across and in the inlets 32, 33 of the chambers. The slide has formed therein two holes 72, 73 arranged for association with inlets 32 and 33 respectively, the holes being so placed that when the slide is moved across the chambers from one of its positions to the other, in one such position one of the holes will be in registry with the associated inlet opening, while the other hole will be entirely out of registration with its associated opening. Likewise when the slide is moved to its other position the hole previously out of registration is placed in registry with its associated inlet opening and the other hole moved entirely out of registration with its associated opening. Thus, only one of the chamber inlet openings is open at a time for the supply of soap to a chamber. In a similar manner, the outlet slide 75 has formed therein two holes 76 and 77 which are so positioned that as the slide is placed in one of its positions or the other only one of the holes is in registry with one of the outlet openings of the chambers. It is also arranged that whichever chamber has its inlet open, then the outlet of the other chamber is open, and that a chamber has only one opening clear at a time. The foregoing is provided for in the manner hereinafter described.

This functioning of the slide valves 71, 75 is due not only to the position of the holes therein but to the form and arrangement of the drive for moving such slides transversely of the chambers from a position where one of the holes in a slide is in registry with a chamber opening, to a position where the other hole in that slide

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is in registry with the opening in the other chamber. This drive is achieved by extending the adjacent ends of both slides beyond the chambers and providing each of the slides with a gear rack 78, 79 along one edge thereof. The rack 78 for the inlet slide meshes with a gear 80 which is similar to a gear 81 in mesh with the rack 79 formed in the edge of the outlet slide. The two racks and gears are one above the other, and the gears are secured to and mounted for rotation with a gear rod 83 which is held for rotation in suitable bearings 84, 85. The rod 83 is rotated by a handle 86 secured to the upper end of a handle rod 87. The handle is placed in a convenient position outside of and above the housing 11, and the position of the handle indicates which feeding chamber is feeding soap to the machine. The handle need be moved from one of its positions to the other only at the start of a machine cycle to insure the delivery of a measured and discrete charge of soap to the vessel of the machine. The gears 80 and 81 are fixed to the rod 83 with the parts as positioned in Figures 3 and 4, and in this manner in either of the positions aforesaid of handle 86, while one of the chambers 30, 31 is delivering soap to the discharge duct 40, the other chamber is receiving a charge of soap. The handle rod 87 is rotatably connected to the gear rod 83 by means of a pair of universal joints 88, 89 and an intermediate rod 90 having one of the joints at each end thereof.

If there is no soap in the machine, operation of the machine and the dispenser is had by placing a package 23 of soap in the box 22 so that it is cut and opened by the knife blade 52 to allow drainage of soap powder therefrom and down the inlet chute 26 where the weight of the soap on the balance platform 56 opens contacts in the circuit 63 of the signal lamp 64. Further flow of soap fills one of the chambers 30, 31. With soap delivered to the machine, the handle 86 is moved to open the just filled feeding chamber to release a charge of soap into the discharge duct 40. While soap is leaving one chamber the other is filling so that upon the start of another washing cycle, movement of the handle will again deliver a charge of soap to the discharge duct. At an appropriate time in the machine cycle, usually shortly after a new charge of water has been started into the vessel 13, rotation of the timing disc 17 by the main drive motor 15 brings one of the contacts of the disc 17 into the circuit 49 of the fan motor 46 to start operation of the motor and its fan 47 to force air through the discharge duct and to thereby pick up the soap in the duct and convey it to and distribute it around the drum 12 and the vessel 13. Such distribution insures the quick and even incorporation of the soap in the wash water in the vessel. The fan need operate for only a short time.

If desired means may be provided for facilitating the removal of the container 23 when empty. As shown in Figure 2, there is provided at one or both sides of the hopper 22 a strap 91 which is slidably mounted in a dovetail groove formed in the hopper. The lower end of the strap is provided with a transverse extension 92 against which the bottom of the container will engage when inserted in the hopper. To withdraw the container, it is merely necessary to lift up on a hinged handle 93 provided on the upper end of the strap.

Having thus disclosed and described the construction and operation of a device embodying my invention, I claim:

1. In a washing machine of the character described having a washing chamber, passage means for conveying water to the washing chamber of the machine, an air duct leading to the top of said chamber, a chamber for containing dry washing-powder, said air duct having an inlet for receiving powder from said second chamber, and an outlet to the washing chamber, means operating in one position to close said inlet and open said outlet and in another position to close said outlet and open said inlet,

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and means operating to blow air through said duct when said outlet is open.

2. In a washing machine of the character described having a washing chamber, passage means for conveying water to the washing chamber of the machine, a duct independent of said passage leading to the top of said chamber, a second chamber having an inlet for receiving a powdered washing material and an outlet communicating with said duct, means for opening and closing said outlet, means operative in the open position of said outlet for blowing air through said duct and thereby withdrawing the powder from said second chamber

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and conveying same to the washing chamber, and means operating to close said inlet when the outlet is open and to open the inlet when the outlet is closed.

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