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SUDS DEPRESSER

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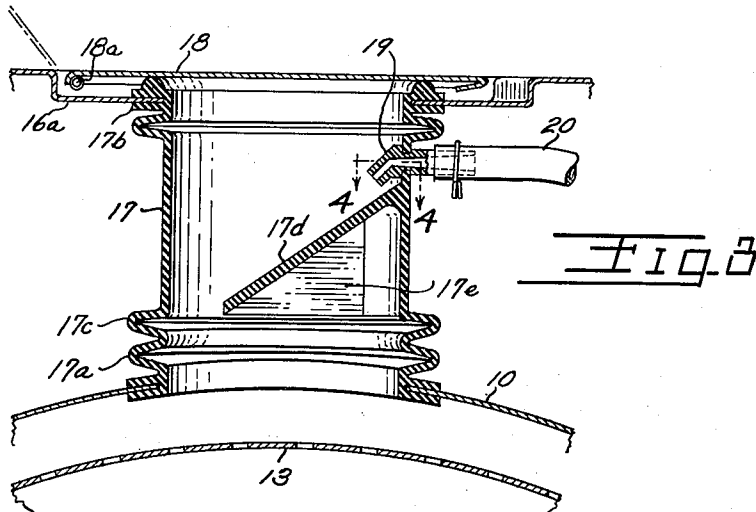


FIG. 3

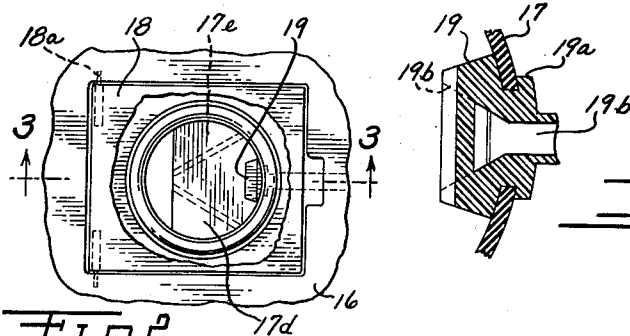


FIG. 4

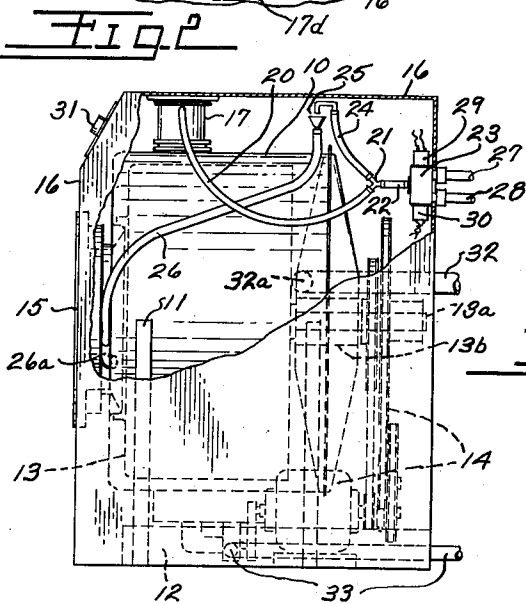


FIG. 1

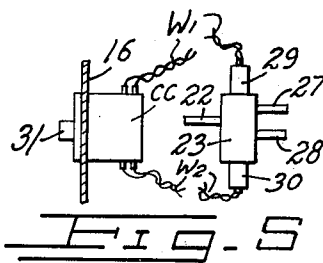


FIG. 5

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1

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The invention relates to washing machines and more especially to machines of the automatic washer-extractor type in which a cyclic sequence of steps comprises the complete washing operation. One such type is the familiar coin-operated machine used in establishments available for non-professional operation by the general public.

More specifically, this invention relates to improvements in suds depresser means in washing machines. As is known to those familiar with the operation of machines using suds-developing detergents, an over-abundance of suds is undesirable. Excess suds, as the build-up increases, hinders proper operation, creates drag, and may spill out of the machine if unrestricted.

One object of the present invention is to provide novel and improved means for depressing and dissipating excess suds.

Another object of the invention is to provide means of the character indicated in the last preceding paragraph, wherein said means is simultaneously utilizable for flushing supplies, such as soap powder and the like, into the tub.

Another object of the invention is to provide means for preventing excess suds from escaping to the exterior of the washing machine.

Other objects and advantages will be apparent from a study of the following description of one embodiment of the invention, in conjunction with the accompanying drawings in which:

FIGURE 1 is a side elevation of an open-end, horizontal axis washer-extractor equipped with means embodying my invention, the housing being partly broken away to the water connections.

FIGURE 2 is a plan view of a part of the machine top, showing the supply pocket and water injection nozzle.

FIGURE 3 is a vertical sectional elevation through the supply pocket and nozzle, taken on the line 3-3 of FIGURE 2.

FIGURE 4 is a horizontal sectional view of the nozzle, on line 4-4 of FIGURE 3.

FIGURE 5 is a diagrammatic showing of mixing valve control means.

The figures in their numerical order are on successively larger scales.

The washer-extractor is of a conventional type, comprising a tub 10 solidly supported by a cradle or legs 11 on a base 12. Within the tub is a perforated cylinder or basket 13, with a shaft 13a journaled in a bearing structure indicated at 13b at the rear of the tub, and provided with a suitable drive means 14 to produce either low or high speed rotation. The tub and the basket have aligned circular access openings at the front, which is at the left in FIG. 1, the tub opening being provided with a door 15. The machine structure is enclosed in a housing or cabinet 16.

The supply pocket is at the top of the washer, and consists of a cylindrical rubber boot or neck 17 connecting an opening in the tub with an opening in the housing. A section 17a at the bottom of the boot is in the nature of an outwardly extending flange with a deep slit therein, to receive the peripheral edge of a circular opening in the tub top. At the top, another such circular flange 17b fits a suitable opening in the cabinet, the latter being depressed or dished in this area at 16a. A door or cover 18 is hinged or pivoted at 18a, and rests on the top edge

2

of the boot, this top edge being in the form of a bead of semi-circular cross section. The boot is of moulded construction and includes peripheral corrugations or pleats 17c. In a washer-extractor of the fixed or rigid tub design, as compared with the pivoted or floating type, there is, of course, no necessity for a great deal of flexibility in the boot. However, there is always vibration and a certain small degree of relative motion between the tub and the housing, and this rubber boot, with corrugations, permits these movements with little stress at the connection points. Also, it provides some latitude for structural misalignment and facilitates assembly of the machine.

Within the boot or pocket is an inclined baffle 17d, integral with the boot wall, stiffened beneath by a pair of ribs 17e. A plastic nozzle 19 is located above the upper end of the baffle, fitted through a slot in the boot wall, a back rim or flange portion 19a retaining it in position as best seen in FIG. 4. The liquid passage 19b is flared toward the outlet, and water, coming by way of hose 20, discharges in a flat stream along the surface of the baffle, flushing down the washing supplies such as soap powder, bleach, and the like.

Hose 20 connects, by way of Y connector 21 and a short section of hose 22, to valve 23. Also branching off from the Y connector is a hose 24 which goes to a suitable vacuum breaker arrangement, such as the air gap type 25 here indicated. This is a health code requirement for preventing the possible drawing of contaminated water into the main water line. From here, a hose 26 goes to the inlet 26a at the front of the tub, and is suitably located and oriented to direct the water into the front opening of the basket. The valve 23 is here indicated as a temperature control or mixing valve, being connected to hot and cold water lines 27, 28, and operated by solenoids 29, 30 as determined by the temperature setting and the signals from the automatic cycle control. Referring to FIG. 5 I show diagrammatically a cycle controller CC which can be mounted on or beneath the housing panel 16, and which is connected by wiring W1 and W2 respectively to solenoids 29 and 30. Operating parts of the cycle controller are not shown in detail since such devices are available commercially. Factors such as time intervals, temperatures, etc., can be controlled by pre-settable knobs 31 on the front of the panel.

There are many washer-extractors of this type, using various cycles or formulas, according to conventional practices. In the present machine the cycle comprises the following steps:

- (1) Fill and wash
- (2) Spray rinse
- (3) Drain
- (4) First short extraction
- (5) First rinse
- (6) Drain
- (7) Second short extraction
- (8) Second rinse
- (9) Drain
- (10) Final extraction for drying

The cycle timer CC turns on the water and maintains flow during steps (1), (2), (4), (5), and (8). Whenever the water is turned on it goes, of course, to both the supply pocket nozzle on top, and the main inlet at the front, and in this respect, the former acts as a secondary inlet.

If too much soap is put in, the suds may build up during the washing period until they entirely fill the tub. Like some other machines of this type, the present machine is provided with a suds overflow pipe 32 communicating with the tub at 32a. While this will dispose of some of the suds, it may not always be adequate. If

the suds reach the supply pocket, the baffle presents an obstruction across the greater part of the area, tending to hold them back.

At the spray rinse, step number (2) above, the water is turned on while the soap bath is going out through drain means 33. The water stream (so-called spray) from the front inlet impinges against the load, which is tumbling at slow speed. The fan-shaped stream from nozzle 19 cuts through the suds at the supply pocket zone and scatters down into the region below. Thereafter, the water is turned off and the tub empties.

The basket then is speeded up for a first extraction period, step No. (4). This is only for about a minute, the purpose being to throw out additional soapy liquid from the clothes so that subsequent rinsing will have less to remove. The water is turned on during this soap extraction and has the effect of a further spray rinse. The centrifugal effect concentrates suds in the space between the basket and tub, which would normally cause drag on the basket and tend to force the suds out through the supply pocket, but while the water from the front inlet is passing through the soapy clothes, the water from nozzle 19 goes directly into the area in question and eliminates or reduces the suds congestion.

After this, there is a first regular rinse, step No. (5) above, by which is meant a rinse in a bath or pool of clean water, and this removes practically all of the remaining suds. Therefore in the short extraction between this and the final rinse bath the water spray may be dispensed with.

By means of the invention above described I have provided means having a plurality of useful functions since, in addition to the utilization and control of a water stream as a suds depressant, the nozzle furnishing the stream is located in the supply port so as to wash down and mix the supplies, and the water stream acts in conjunction with a strategically placed baffle to present an obstacle to the escape of suds.

What is claimed is:

1. A washing machine of the character described wherein articles are washed in suds-generating detergent, said machine comprising a tub, a tubular port forming an inlet passage in an upper wall of said tub, a baffle member disposed transversely across said port whereby to obstruct eruption of excess suds therethrough, and means for directing a liquid spray across a surface of said baffle.

2. A washing machine of the character described wherein articles are washed in suds-generating detergent, said machine comprising a tub, a tubular port forming an inlet passage in an upper wall of said tub, a baffle member disposed transversely across said port whereby to obstruct eruption of excess suds therethrough, and means for directing a water spray across the upper surface of said baffle.

3. A washing machine of the character described wherein articles are washed in suds-generating detergent,

said machine comprising a tub, a tubular port forming an inlet passage in an upper wall of said tub, a baffle member disposed transversely across said port whereby to obstruct eruption of excess suds therethrough, and means for intermittently directing a water spray across the upper surface of said baffle at predetermined times in the washing cycle.

4. A washing machine of the character described wherein articles are washed in a series of automatically controlled steps in a washing cycle including use of a suds-generating detergent said machine comprising a tub adapted to receive and retain said detergent for a suitable part of the cycle, a port defined by a tubular wall forming an inlet passage through an upper wall portion of the tub adapted to receive liquid and supplies, a baffle member disposed partially across said passage and downwardly inclined whereby to obstruct eruption of excess suds through said passage, and means for directing a water spray downwardly across the upper surface of said baffle whereby to dissipate suds and wash supplies downwardly into said tub.

5. Apparatus as defined in claim 4 wherein said baffle is integral with a major peripheral portion of the inner wall of said tubular port.

6. Apparatus as defined in claim 4 wherein said baffle is supported in part by an underlying fin integral with said baffle and with the peripheral wall of said tubular port.

7. A washing machine of the character described wherein articles are washed in a series of automatically controlled steps in a washing cycle including use of a suds-generating detergent in some of the steps, said machine comprising a tub, a stationary housing surrounding and generally spaced from said tub, an inlet port defined by a tubular wall providing an inlet passage into the top wall of said tub and spanning the gap between said housing and said tub, said tubular wall being formed from resilient material to accommodate for relative operating vibration between said housing and said tub, said port being adapted to receive water and supplies, a baffle disposed within and partially across said passage and downwardly inclined whereby to intercept and obstruct discharge of excess suds upwardly through said passage, and means insertable through the wall of said passage for discharging a water spray downwardly along the upper surface of said baffle whereby to dissipate suds and wash supplies downwardly into said tub.

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