Aug. 14, 1956 J. P. FLANNERY ET AL 2,758,718

WASHING MACHINES

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FIG. 1.

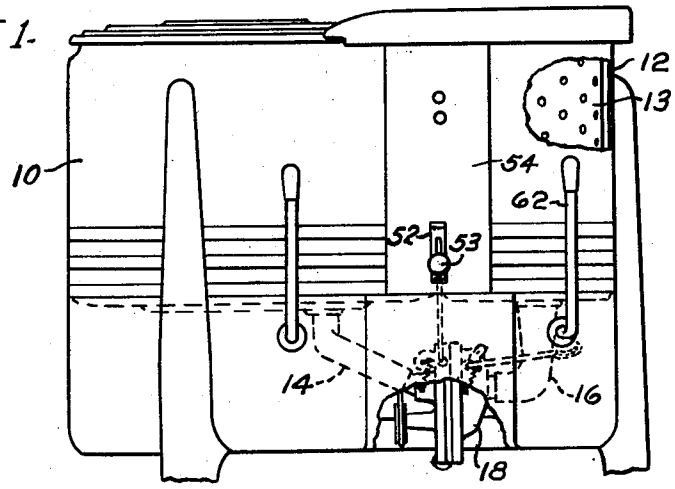


FIG. 2.

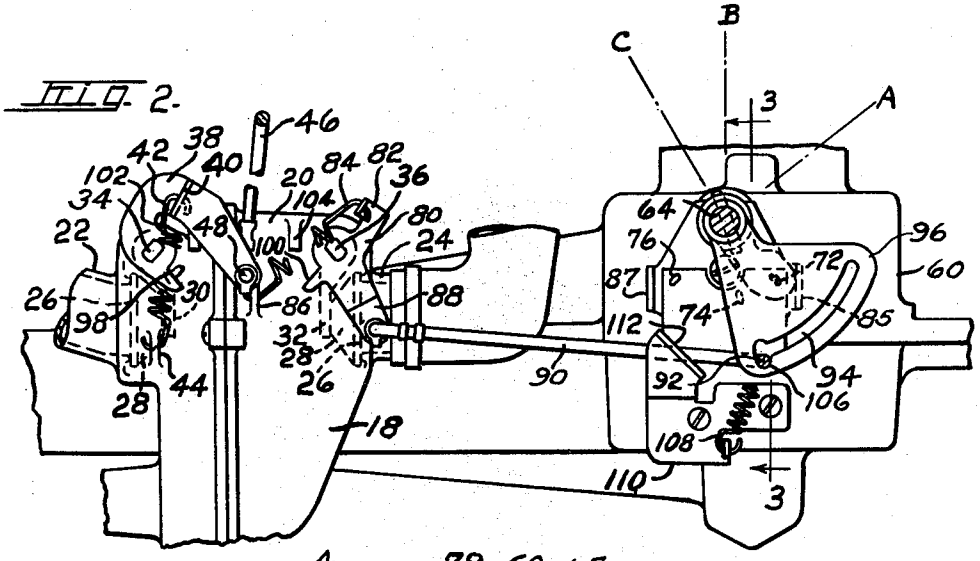
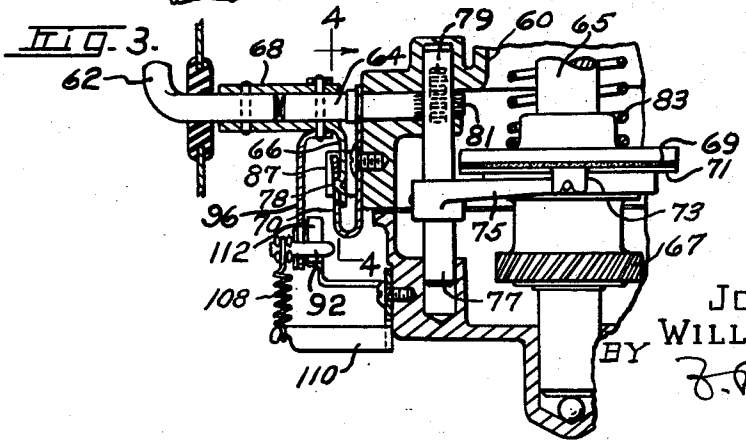


FIG. 3.



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FIG. 4.

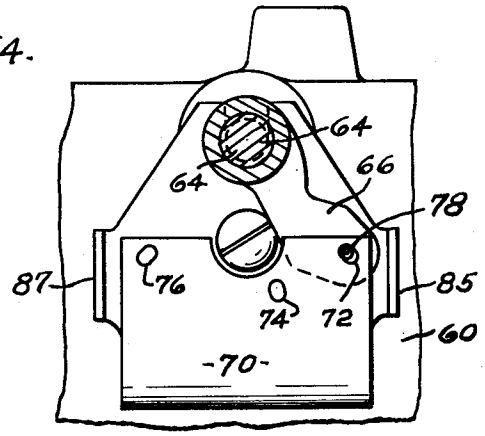


FIG. 5.

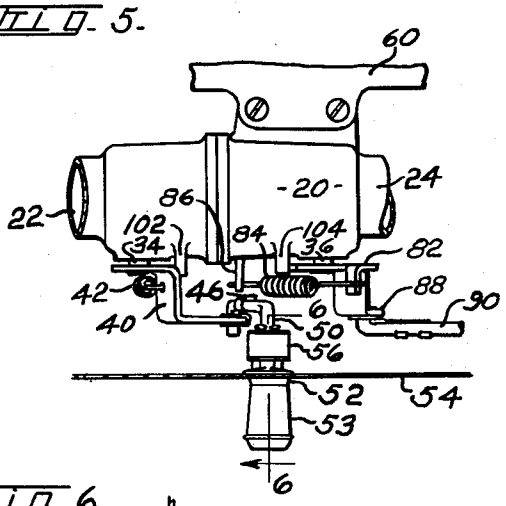
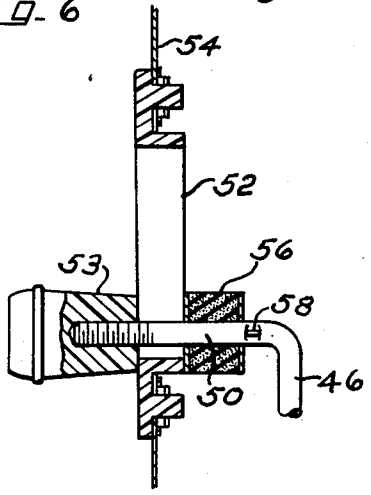


FIG. 6



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WASHING MACHINES

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Application April 18, 1952, Serial No. 282,968

1 Claim. (Cl. 210—63)

This invention relates to washing machines, and more particularly to a coordinated drain valve and centrifugal dryer control therefor.

In centrifugal extractor type washing machines, as generally disclosed in application Serial No. 66,280, filed December 20, 1948, now Patent No. 2,601,031, dated June 17, 1952, it has been the general practice to provide an extractor tub having a permanently open drain, for the prompt removal of extracted fluid. Such open drain prevents the use of the extractor tub for submerged rinsing prior to extraction. On the other hand, where a valve is provided for the outlet from such tub, as for example in application Serial No. 247,869, filed September 22, 1951, now Patent No. 2,669,932, there is always the possibility of commencing centrifuging while there remains in the tub, through failure to open the valve, sufficient water to result in a centrifugal discharge over the rim of the tub.

The present invention is directed toward combining the centrifugal dryer clutch control with a drain valve, whereby a unitary control is provided which will permit using the tub for submerged rinsing, but which will render certain that the drain valve is open before initiating centrifugal drying. The invention further has to do with providing in such a single control, suitable lost motion linkage to avoid overlapping of the valve opening movement with the clutch engagement movement of the same control. Additionally, the invention has to do with the simplification of the over-all control of a machine of the type described, affording utilization of an extractor tub drain valve without the apparent addition of any control therefor.

The above and other novel features of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawings. It is expressly understood that the drawings are employed for purposes of illustration only and are not designed as definition of the limits of the invention, reference being had for this purpose to the appended claim.

Referring to the drawings, wherein like reference characters indicate like parts:

Figure 1 is a side elevational view with parts broken away, of a washing machine having the control system;

Figure 2 is an enlarged fragmentary view of the valve and centrifugal dryer mechanism and immediate control linkage therefor;

Figure 3 is a sectional fragmentary view taken on the line 3—3 of Figure 2;

Figure 4 is a sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a top plan fragmentary view of the drain valve casing and valve controls and adjacent control panel; and

Figure 6 is a sectional view through the control panel taken on the line 6—6 of Figure 5.

Referring to Figure 1, there is shown a two-tub extractor type washing machine having a large tub 10 for

washing, and a small tub 12 for centrifugal extraction, in which there is positioned the usual centrifuge basket 13. The wash tub 10 and extraction tub are provided with drain outlets 14 and 16, respectively, which lead in the present disclosure to a combined valve and discharge pump assembly 18. Such assembly comprises an upper casing portion 20 constituting a valve chamber having nipples 22 and 24 for connecting to the respective tubs. Each of such nipples is provided with a valve seat 26 within the casing, adapted to be engaged by a conical resilient rubber-like valve element 28 carried on respective crank arms 30 and 32, which arms are mounted on rock shafts 34 and 36 projecting outside of the housing.

The rock shaft 34 is provided with a gooseneck lever 38, having an offset 40 for the reception of an over-center tension spring 42 extending to a casing ear 44. The lever may be activated by any suitable linkage as indicated in Figures 5 and 6, there being provided a direct control rod 46, having a bent end 48 pivoted in lever 38, and a bent end 50 riding in a guide slot frame 52 formed of plastic or other suitable material, and mounted in the panel 54. The bent end 50 may be provided with a knob 53 adapted to press lightly on the front of the guide frame 52, there being provided a resilient cushion 56 to the rear thereof suitably positioned by ears 58 to provide light frictional contact between knob and cushion on the frame 52.

Referring to Figure 2, there is shown a fragmentary part of the transmission casing 60 within which is housed a drive for a vertical spindle to drive the centrifugal extractor basket 13 within the tub 12, all of which is well-known in the art, and illustrated, for example, in application Serial No. 792,363, filed December 18, 1947, now Patent No. 2,627,175, issued February 3, 1953. Such spindle is provided with a clutch and brake mechanism for starting and stopping rotation of the centrifugal extractor, and to actutae the clutch and brake, there is provided a control lever 62 having a connection with a control shaft 64 extending into the transmission casing 60 for actuating such brake and clutch. Herein, such details as appear essential respecting the spindle drive upon which the basket 13 is supported are shown in Figure 3.

The spindle, indicated as at 65, has freely rotatably mounted thereon a constantly driven gear 67 having a clutch flange 73, adapted to engage a disk friction face 69, resiliently urged downward on spindle 65 by spring 83, but keyed for rotation with the spindle. The friction disk is adapted to be raised by the brake ring 71 out of engagement with the clutch flange 73, such brake ring being supported on a yoke 75 and laterally disposed slide rod 77. The latter, through rack teeth 79, is operated by pinion teeth 81 on shaft 64. The shaft 64 is provided with a sector or finger member 66 formed as a part of the shaft coupling 68 (see Figure 3), which sector member swings between a resilient U-member 70 attached to the transmission casing 60. Such U-member is provided with three apertures 72, 74, and 76, disposed on a circle concentric with the shaft 64, such apertures being angularly spaced and adapted to cooperate with a blister 78 on the sector member 66 so as to provide in effect resilient detent-like stops for three angular positions of the control shaft 64. The aperture 76 is adapted to hold the shaft 64 in clutch-engaged position (lever 62 in position A). The aperture 74 is adapted to hold the shaft in clutch-disengaged position with the brake applied (lever 62 in position B), and the aperture 72 is adapted to hold the shaft in a further position during which such clutch remains disengaged and the brake remains applied (lever 62 being in position C). The angular movement of the shaft 64 in moving the detent blister 78 from aperture 74 to 72 (B to C) is utilized to actuate the valve shaft 36, and control the drain of the extractor tub 12. Stops

to limit the over-all angular movement of shaft **64** are provided in the form of bent ears **85** and **87** on member **70**.

As illustrated in Figure 2, the extractor tub drain valve, shown in closed position, is provided with a lever **80** secured to the valve shaft **36**, such lever having an arm **82** to which is connected an over-center tension spring **84**, the other end of which is attached to lug **86** on the casing **18**.

A second arm **88** on the lever **80** is provided with a link **90** adapted to connect such lever with a sector-shaped lever **96** on the shaft **64**, such link having at its other end a right angle bend **92**, projecting through an arcuate slot **94** in the sector member **96**. The sector member **96** is securely fastened to the coupling sleeve **68**, so as to rotate angularly with the control shaft **64**. Both valve shafts **34** and **36** are adapted to rock from the closed valve positions shown to open valve positions where the ears **98** and **100** engage the valve casing stop lugs **102** and **104**, respectively.

The end **92** of link **90** is adapted to nest in a recess **106** in the end of the arcuate slot **94**, such link end being lightly biased to rest in such slot by a tension spring **108**, hooked at one end over the rod end **92** and attached at the other end to a bracket **110** fixed to the casing **60**.

As the shaft **64**, as viewed in Figures 2 and 4, is rocked clockwise to a position where the blister **78** engages aperture **74**, the link **90** actuates the valve shaft **36** and its valve **28** to an open position. Further clockwise movement of the shaft **64** causes the end **92** of the link **90** to engage a cam **112** formed as a part of the bracket **110** whereby the link end is moved first radially inward, to lift the end **92** from the recess **106**, after which the link **90** remains stationary, while the end **92** rides in the slot **94**, during movement of the control shaft from the clutch release brake-engaged position (B) to the clutch-engaged brake release position, at which point the blister **78** seats in the aperture **76** (position A).

By the arrangement thus shown, movement of the control shaft **64**, through actuation of the lever handle **62**, first causes the valve shaft **36** to swing to open position with respect to its valve, and thereafter, through the lost motion permitted by the riding of the link end **92** in the arcuate slot **94**, permits the extractor clutch to be engaged while disengaging the brake. When the extractor is to be stopped by moving the control lever **62** from position A to B, the link end **92** rides in the arcuate slot **94**, dropping into the recess **106** when position B is reached. Thereafter, movement to position C actuates the link **90**, to close the extractor drain valve. The valve shaft **36** is securely held in open or closed position by the over-center spring **84**.

By the arrangement thus provided, whenever the extractor is stationary, the extractor tub valve may be opened or closed, as desired, by suitable movement of the lever **62**. On the other hand, if it be desired to set the extractor in motion, assurance is had that the drain valve is opened before the engagement of the extractor drive clutch. Thus, not only is a single control provided for performing two functions heretofore requiring separate controls, but an interlock is provided preventing operation of the extractor, except when the extractor drain valve is open.

While a single embodiment of the invention has been illustrated and described, it is to be understood that the invention is not limited thereto. As various changes in the construction and arrangement may be made without departing from the spirit of the invention, as will be apparent to those skilled in the art, reference will be had to the appended claim for a definition of the limits of the invention.

What is claimed is:

In a centrifugal extractor washing machine, an extractor tub having a drain outlet, a valve for opening and closing the drain outlet, an extractor clutch control member, means for establishing an extractor spin position, an extractor stop position, and a valve open position for such control member, linkage connecting said control member with said valve for actuating said valve between an open and closed position, upon movement of said control from said valve open position to said extractor stop position, and lost motion means coacting with said linkage for rendering said linkage ineffective for movement of said valve upon movement of said control from the extractor stop position to the extractor spin position.

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