Feb. 28, 1961 J. W. CROCKETT 2,973,077

CONTROL MECHANISM FOR AUTOMATIC APPLIANCES

Filed Oct. 29, 1951 2 Sheets-Sheet 1

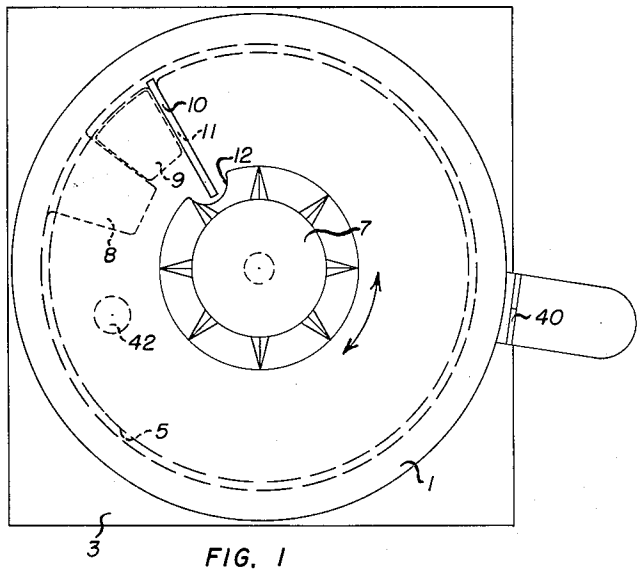


FIG. 1

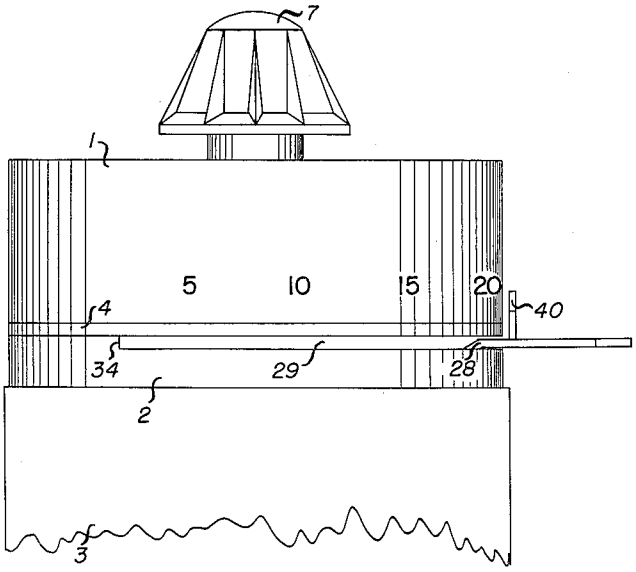


FIG. 2

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CONTROL MECHANISM FOR AUTOMATIC APPLIANCES

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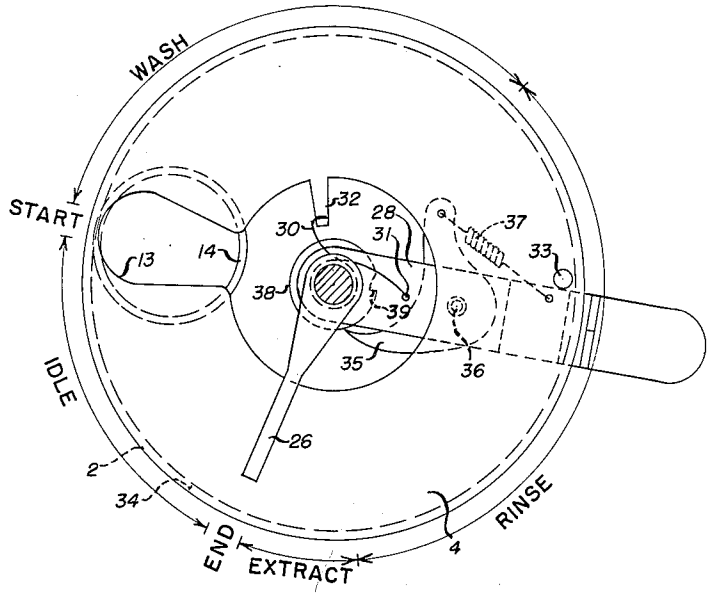


FIG. 3

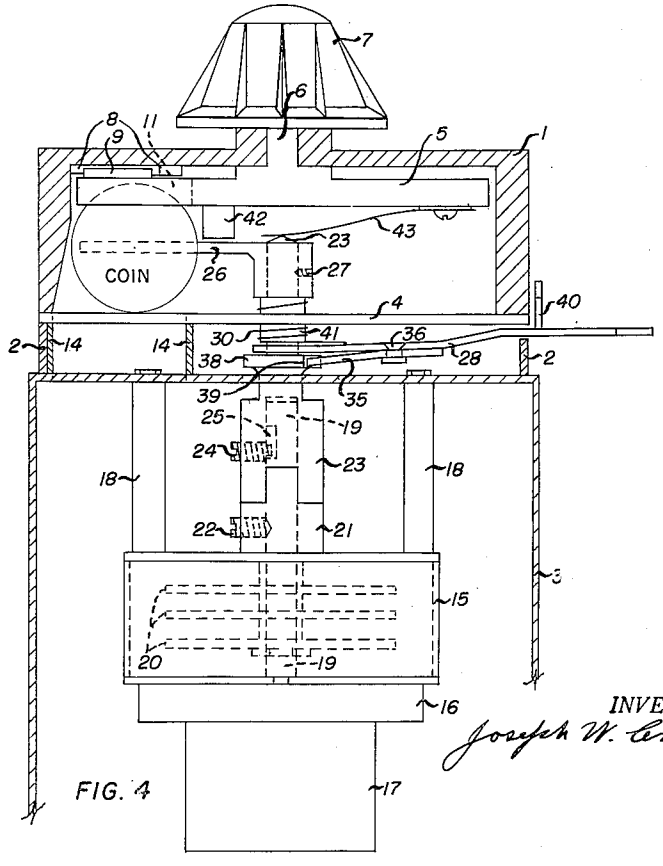


FIG. 4

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CONTROL MECHANISM FOR AUTOMATIC APPLIANCES

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6 Claims. (Cl. 194—84)

This invention relates to improvements in control mechanism for automatic appliances, and is illustrated in connection with a coin controlled mechanism for governing the operation of automatic washing machines.

In the past it was customary to control such machines by a coin controlled apparatus wherein a coin was inserted and a manipulative element operated to close an electric circuit so that the machine could have electric current for a predetermined length of time. The user then started the machine by turning the customary machine control dial to its machine starting position, the control dial having been connected directly to the main shaft of the so called "timing" mechanism that controlled the sequence of operation of the several components of the machine.

It was observed, however, that permitting the operators to use the control dial in operating the machine quite often produced unsatisfactory results. Inexperienced operators used the dial incorrectly, while others deliberately used the dial to shorten the machine cycle, to get two washings for one coin, thereby producing work of inferior quality and at times damaging the machine itself.

These improper uses of the control dial led the machine owners to employ a control mechanism wherein the control dial was replaced by a coin controlled mechanism wherein the insertion of a coin, followed by operation of a manipulative element, directly moved the main shaft of the timing mechanism to its machine starting position. With this arrangement, the user had no control over the machine operation, other than getting it started.

This type of control has proved to be definitely better than the previous type, but it too has not been completely satisfactory. One disadvantage has been that since different types of laundry should be washed different lengths of time, it should be possible for the user to set the timing mechanism so that the "wash" time will be appropriate for the work at hand. Another disadvantage has been that in testing a machine equipped with this type of control, a repairman has no way of quickly moving the timer through its cycle to the particular function in which he is interested, and after completing his test, of then quickly moving it to the end of the cycle.

It is an object of the present invention to overcome these objections by providing a manipulative element, accessible to the machine operator, that may be employed to set the "wash time" to the number of minutes desired by the operator. Another object is to provide a readily accessible control whereby a repairman may advance the timing mechanism quickly through the entire machine cycle, but which may not be employed by machine operators to start the machine without inserting a coin, or to run the machine through more than one cycle for a single coin.

With these and incidental objects in view I will now describe a preferred embodiment of my invention, reference being made to the accompanying drawings, in which:

Figure 1 is top plan view of the control mechanism, showing the actuating knob and coin carrying disk in coin receiving position.

Figure 2 is a front elevation of the control mechanism.

Figure 3 is a top plan view of details of several parts as seen with the control head and coin carrying disk removed, the parts being shown in the positions they assume at the end of a machine cycle.

Figure 4 is a front elevation of the control mechanism in detail, the control head, spacing ring, coin tube and cabinet being cut away. In this view the timer, timer escapement and timer motor are shown only diagrammatically.

Detailed description

The mechanism is housed in a control head 1, a spacing ring 2 and a cabinet 3, as shown in Figs. 1 and 2. A floor plate 4 fits between the control head 1 and the spacing ring 2. These four parts are secured together by any conventional means and constitute the framework of the mechanism.

A coin carrying disk 5, as in Fig. 4, has a shaft portion 6 extending through the top of the control head 1 and has an actuating knob 7 secured on its upper end. The parts 5, 6 and 7 may be rotated in the control head 1 to a limited extent, the degree of rotation being limited by a stationary block 8 (Figures 1 and 4) formed on the under side of the control head, and by a block 9 formed on the upper side of the disk 5. In Figure 1 the parts 5, 7 and 9 are shown in their farthest counterclockwise position, where block 9 rests against block 8. In this position a coin slot 11 in disk 5 lies directly under a corresponding slot 10 in the control head 1, and a notch 12 in the actuating knob uncovers the inner end of the slots so that a coin may be inserted when the parts are moved to this position. The inserted coin drops as far as the floor plate 4, but is held on its edge by disk 5. Subsequent operation of knob 7 in a clockwise direction moves disk 5 and the coin until block 9 comes in contact with the other edge (lower edge in Figure 1) of block 8. In this position slot 11 in disk 5 lies directly above a cut out portion 13 in floor plate 4 (Figure 3), so that the coin may drop through plate 4 and a coin tube 14 into cabinet 3.

A timer 15, escapement mechanism 16 and timer motor 17 of conventional design are rigidly supported in cabinet 3 by any suitable means such as support rods 18. A timer shaft 19 is rotatably supported in the timer 15 and carries the usual cam disks 20 to control the timing of operation of the several components of the machine. A collar 21 is secured to shaft 19 by a set screw 22 and is formed at its upper end to have a sliding fit with the lower end of an auxiliary shaft 23. A limiting screw 24 is mounted in shaft 23, and has a reduced inner end projecting into a cut-away area 25 in timer shaft 19. This connection permits a limited vertical movement of auxiliary shaft 23 on shaft 19, and at the same time retains the effective connection between the shafts for rotative movement of one by the other.

An actuator 26 is secured to the upper end of auxiliary shaft 23 by a set screw 27, and is so positioned radially that when it lies over the cut out portion 13 of floor plate 4, the cam disks 20 are in position to start a machine operation. Figure 3 illustrates the radial position of actuator 26 at the end of a machine operation.

A lever 28 is pivoted at one end on auxiliary shaft 23 and extends through a cut-away portion 29 (Figure 2) in the spacing ring 2. The lever 28 is tensioned counterclockwise about shaft 23 by a coiled spring 30 anchored to the lever at 31 and to an extension 32 on floor plate

4. A stop 33 limits counter-clockwise movement of lever 28. The lever may be moved clockwise about shaft 23 manually, the clockwise movement being limited by the end of the cut-away portion 29, at 34 (Figures 2 and 3). A pawl 35 is pivoted on lever 28 at 36, and is tensioned clockwise about its pivot by a spring 37 connected to the pawl and to lever 28. Clockwise rotation of the pawl is limited by its nose bearing against an enlarged portion 38 of shaft 23, the enlarged portion having a notch 39 into which the nose of pawl 35 drops when shaft 23 is rotated sufficiently to bring the notch opposite the nose. When pawl 35 is in engagement with notch 39, manual operation of lever 28 clockwise from its position in Figure 3 rotates actuator 26, auxiliary shaft 23, shaft 19 and cam disks 20 clockwise to advance the timer through a portion of its cycle. Upon release of lever 28 by the operator, spring 30 returns it to its normal position shown in Figure 3. Lever 28 carries a pointer 40 which, when used in combination with the numerals 5, 10, 15 and 20 inscribed on control head 1 (Figure 2), acts as a guide for the operator in advancing the timer.

A collar 41 fits around the auxiliary shaft 23 between actuator 26 and a small shoulder on the shaft, and is larger in diameter than the hole in the end of lever 28. The shoulder on shaft 23 is far enough above the enlarged portion 38 to allow lever 28 enough freedom between the parts to permit the auxiliary shaft to be raised when pressure is exerted downwardly by the operator upon the outer end of lever 28. Such downward pressure raises shaft 23 and actuator 26 until the inner end of limiting screw 24 strikes the upper end of the cut-away area 25 in shaft 19. This movement is sufficient to raise actuator 26 into the path of a projection 42 (Figures 1 and 4) on the coin carrying disk 5, and is made against the pressure of a leaf spring 43 secured to the disk 5 as shown. While the actuator 26 is held in this raised position by continued downward pressure by the operator on the outer end of lever 28, clockwise rotation of knob 7 and disk 5 will cause projection 42 to come into contact with and move actuator 26, shafts 23 and 19, and cam disks 20. Projection 42 is so located on disk 5 that rotation of the disk to its farthest clockwise position will permit the projection to move actuator 26 to its position shown in Figure 3, which carries the cam disks 20 through to the end of the timer cycle, where the machine stops.

Operation

To start the appliance, the operator turns knob 7 counter-clockwise as far as possible, which brings slot 11 in registry with slot 10. The operator then drops a coin in the slots, it coming to rest just below slot 10, and being held on edge by slot 11. The operator then turns knob 7 clockwise, the coin being carried around with disk 5. On its travel, the coin comes into contact with actuator 26 and moves it from its position shown in Figure 3 to the position marked "Start" in this figure. This movement of actuator 26 rotates the timer cam disks 20 to their machine starting position. When the operator releases knob 7, the coin drops through coin tube 14 into cabinet 3.

This movement of actuator 26 also brings notch 39 into registry with the nose of pawl 35, so that should the operator desire to select a wash period shorter than the maximum, it is only necessary to then move lever 28 clockwise the desired extent, the numerals "5," "10," "15" and "20" being used as a guide to select the number of minutes to be used in the wash period.

These movements of actuator 26, cams 20, and the intermediate parts are made without corresponding movements of the escapement 16 and timer motor 17, through the provision of an overrunning clutch (not shown) provided between the escapement 16 and the cams 20. This clutch is of conventional construction, and forms no part of the present invention.

After operation of lever 28 the desired amount it is released, spring 30 then returning it to its normal position shown in Figure 3. The timer motor 17 and escapement 16 then advance actuator 26, cams 20, and the intermediate parts step by step through the remainder of the wash period, then through the rinse and extraction periods, the parts coming to rest at the "End" position as illustrated by the position of actuator 26 in Figure 3.

When a repairman wishes to check a machine function, he inserts a coin and turns knob 7 clockwise to start the machine in the customary manner. He then returns knob 7 to its original position shown in Figure 1, and presses downwardly on lever 28, raising actuator 26 into the path of projection 42, against the force of spring 43. While holding lever 28 depressed, he slowly turns knob 7 clockwise, projection 42 coming into contact with actuator 26 at the "Start" position, and then moving it, as well as cams 20 and the intermediate parts through the cycle to the required machine function. After noting the functioning of the machine at that point, he continues to rotate knob 7 to its farthest clockwise position, during which travel projection 42 carries actuator 26 to its "End" position where the machine comes to rest. Upon release of lever 28, spring 43 lowers actuator 26 to its normal position shown in Figure 4, where it is ready for normal operation.

Having now described in detail a preferred embodiment of my invention, the part thereof which I claim as novel is set out in the claims which follow.

I claim:

1. In a control mechanism for automatic appliances including a timer having a control element operable through one cycle for each complete operation of the appliance, the combination of an actuator for the timer control element, a coin controlled mechanism operable, following the insertion of a coin, to advance the timer control element to a position where it is effective to start the appliance, the timer control element being advanced by contact of the actuator with the inserted coin, and a manipulative means operable to shift the actuator into the path of a part on the coin controlled mechanism, whereby further operation of the coin controlled mechanism further advances the timer control element, by engagement of the actuator with said part, to a position short of the appliance starting position but effective to permit a second normal operation of the coin control mechanism.

2. In a control mechanism for automatic appliances including a timer having a control element operable through one cycle for each complete operation of the appliance, the combination of an actuator for the timer control element, a coin controlled mechanism operable, following the insertion of a coin, to advance the timer control element to a position where it is effective to start the appliance, the timer control element being advanced by contact of the actuator with the inserted coin, and a manipulative means operable to shift the actuator into the path of a part on the coin controlled mechanism, whereby further operation of the coin controlled mechanism further advances the timer control element, by engagement of the actuator with said part, to a position short of the appliance starting position but through the cycle operation positions, the said part of the coin controlled mechanism being so situated that it is in position to engage the actuator only after the latter has been moved to its appliance starting position and then shifted.

3. A control mechanism, for an automatic appliance, having a timer provided with a control shaft and operable through one cycle for each complete operation of the appliance, comprising a first lever connected with said shaft; a coin controlled mechanism for moving said first lever to a position of said timer for starting said cycle of said appliance only after insertion of a coin therein; a second lever associated with said shaft and normally disconnected therefrom, said second lever, when connected to said shaft, being movable to move said

shaft to advance said timer so as to shorten at least a portion of said cycle; and a connection between said second lever and said shaft operative to connect said second lever with said shaft at a position of said shaft corresponding to the start of said cycle of said appliance.

4. A control mechanism for an automatic appliance, as defined in claim 3, wherein said connection between said second lever and said shaft includes an annular member on said shaft having a notch therein; and a pawl mounted on said second lever for engagement with said notch.

5. A control mechanism for an automatic appliance, as defined in claim 3, including means for limiting the movement of said second lever to correspond with a portion only of the rotation of said timer shaft for one complete cycle of operation of said appliance.

6. A control mechanism for an automatic appliance, as defined in claim 3, wherein said timer shaft is provided

with a portion on which said first lever is mounted and movable axially with respect to the remainder of the shaft while still connected therewith; said second lever is engageable with said movable shaft portion to move the same; and said coin controlled mechanism is provided with an abutment engageable with said first lever when said shaft portion is so moved.

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