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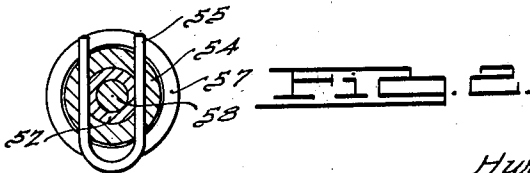
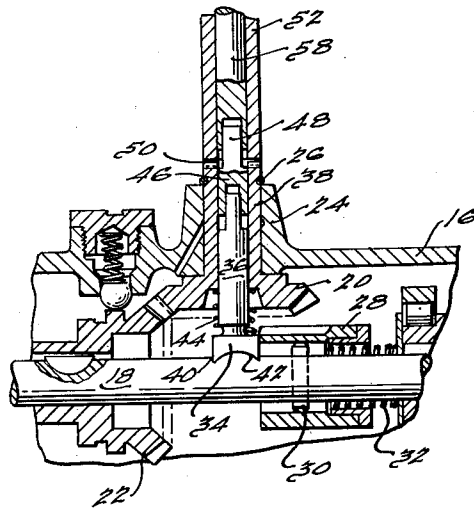
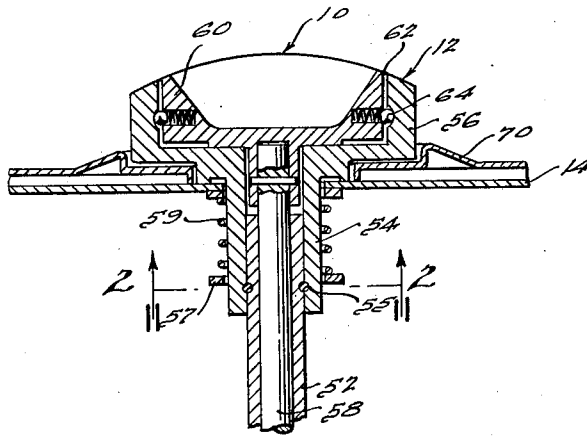
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CONTROL KNOB

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FIG. 1.



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CONTROL KNOB

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Original application January 18, 1945, Serial No. 573,362. Divided and this application March 29, 1946, Serial No. 658,287

2 Claims. (Cl. 74-479)

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The present invention relates to control mechanisms and more particularly to a mechanical control mechanism for controlling two independent operations.

The present application constitutes a division of my copending application for patent, Serial No. 573,362, filed January 18, 1945, and entitled "Automatic washing machine."

The principal objects of the present invention are to provide control mechanisms of the above generally indicated type which are simple in arrangement, economical of manufacture and assembly and which are reliable and efficient in operation; to provide an improved control mechanism in two parts, each of which parts is operable independently of said other part and without effecting the operation controlled by said other parts; to provide an improved control mechanism of the above generally indicated type, the parts of which are arranged to occupy a minimum of space; and to generally improve the construction and operation of control mechanisms of the above generally indicated type.

With the above as well as other objects in view, which appear in the following description, the accompanying drawing and the appended claims, a preferred but illustrative embodiment of the invention is shown in the accompanying drawing throughout the several views of which corresponding reference characters are used to designate corresponding parts, and wherein:

Fig. 1 is a cross-sectional view showing a control mechanism constructed according to one form of the invention and installed in an automatic washing machine; and

Fig. 2 is a cross-sectional view taken substantially along line 2-2 of Fig. 1.

It will be appreciated from a complete understanding of the present invention that the improvements thereof may be embodied in control mechanisms of widely differing types and sizes and designs for numerous different applications. In an illustrative but not in a limiting sense the present improvements are herein disclosed as being embodied in a control mechanism which, by way of example, is well adapted for use in an automatic washing machine, an example of which is disclosed and claimed in applicant's copending application Serial No. 573,362, filed January 18, 1945.

In the illustrated application, one part of the control mechanism is employed to control other mechanism which determines the temperature of the water employed in a washing machine, and the other part of the control mechanism is

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employed to control additional mechanism which determines the number, sequence, and duration of the various operations through which the automatic washing machine passes during its complete cycle, and to advance said cycle of operations. These operations may include washings, rinsings and dryings of various number and duration.

Referring to the drawing, the control mechanism comprises generally two parts, an inner part 10 and an outer part 12. The control mechanism is illustrated as mounted on the upper wall 14 of the cabinet of an automatic washing machine and extending downwardly into a casing 16 housing the principal operating mechanism of the washing machine. Turning of the shaft 18 controls the various operations in the cycle of the washing machine and advances said cycle of operations, and displacement of the cam 28 axially of the shaft 18 controls the temperature of the water supplied.

The shaft 18 is turned by the outer part 12 of the control mechanism through a bevel gear 20 provided at its lower end which engages a bevel gear 22 mounted on the shaft 18 and has a hub 38 journaled in a boss 24 integrally formed on a casing 16, and supported therein by a snap ring 26. The cam 28 is keyed to the shaft 18 for movement axially thereof by a pin 30. A spring 32 normally urges the cam 28 against a head 34 on the lower end of the inner part 10 of the control mechanism. The head 34 is substantially rectangularly shaped and integrally formed on the lower end of a pin 36 which is turnable in the hub 38 of the gear 20. The head 34 has its lower face provided with two concave recesses 40 and 42 which intersect each other at right angles, and these recesses are adapted selectively to engage the upper portion of the shaft 18. When the head 34 is in the position illustrated in the drawing, the recess 40 engages the shaft 18 and when in a position at right angles to the position shown the recess 42 engages the shaft 18.

The pin 36 is urged downwardly by a spring 44 which presses against the end of hub 38 and against the upper surface of the head 34 so that the latter is resiliently held against the shaft 18. As seen in the drawing, the cam 28 is held against the longer side of the head 34 and therefore has a fixed axial position on the shaft 18 but if the pin 36 is turned, it will rise sufficiently to permit a 90° movement and then the longer recess 42 snaps into engagement with the upper side of the shaft. This movement shifts the cam 28 to a

point substantially to the right as viewed in the drawing, and it is held in that position until the pin 36 is again turned 90°. It will be observed that the pin 36 can move upwardly through the hub 38 and that it has a key connection at its upper end to a turning element 46 which projects above the end of the hub 38 and has a squared end portion 48 by means of which it may be rotated. As brought out in the copending application for patent mentioned, the cam 28 in one axial position causes water to be supplied to the washing machine under one set of temperature conditions, whereas with the cam in its other axial position a different set of temperature conditions prevails.

The upper end of the hub 38 of the bevel gear 20 extends above the boss 24 on the casing 16 and has a toothed connection indicated at 50 with a tubular member 52 which extends to a point adjacent the upper wall 14 of the washing machine cabinet, where it is connected to a tubular extension 54 extending through the cabinet wall 14 and having a knob 56 on its upper end.

This connection of the tubular member 52 to the tubular extension 54 on the knob 56 is effected by a U-shaped shackle 55 extending through said tubular member 52 and tubular extension 54, and supporting a washer 57. A coil spring 59 surrounds the tubular extension 54 and engages the upper surface of the washer 57 and the under surface of the wall 14 of the washing machine to urge the tubular member 52 downwardly against the hub 38 of the bevel gear 20 and thereby maintain the toothed connection therebetween indicated at 50. This construction permits the knob 56 to be raised slightly from the wall 14 against the pressure of the spring 59 and adjusted to any desired position, for example, to correspond to indicia disposed on a cap 70 secured to the upper surface of the cabinet wall 14 and shaped to conform to the under surface of the outer knob 56. It will now be appreciated that, by turning the knob 56, the hub 38, and consequently the gear 20 on the lower end thereof, may be turned as desired.

The squared end portion 48 on the turning element 46 which is keyed to the pin 36 fits into a socket on the lower end of a rod 58 which is turnable in the tubular member 52. This rod 58 at its upper end extends through the tubular extension 54 on the knob 56 and is connected to a second knob 60 which is turnable within a recess 62 on the first knob 56. The two knobs 56 and 60 are held together by spring pressed balls 64 seating in complementary grooves in adjacent faces of the knob, but the groove in the inner knob 60 is sufficiently tapered so as to permit radial contraction of the spring and, hence, assembly and disassembly when necessary. This spring permits relative turning of the knobs 56 and 60 so that either part of the control mechanism may be operated independently of the other.

It will now be appreciated that by turning the knob 60 the pin 36 and the rectangularly shaped head 34 formed at its lower end may be turned as desired.

Although only one form of the invention has been illustrated and described in detail, it will be apparent to those skilled in the art that various modifications may be made without departing from the spirit of the invention, and from the scope of the appended claims.

What is claimed is:

1. In a washing machine having a shaft which may be turned to advance the cycle of operations of said machine and a cam mounted on said shaft which controls, by its position axially of said shaft, the temperature of the inlet water, a control mechanism comprising an inner part and an outer part, said outer part being operable to turn said shaft to control the cycle of operations of said washing machine and comprising a tubular member having a knob mounted on one end and means connected to its other end cooperable with means mounted on said shaft for turning said shaft upon rotation of said knob, said inner part being operable to vary the position of said cam axially of said shaft, and comprising an inner knob received within a recess formed in said knob, a rod disposed within said tubular member and having said inner knob mounted on one end thereof, and means operatively connected to its other end for varying the position of said cam axially of said shaft upon rotation of said inner knob.

2. In a washing machine having a shaft which may be turned to advance the cycle of operations of said machine and a cam mounted on said shaft which controls, by its position axially of said shaft, the temperature of the inlet water, a control mechanism comprising an inner part and an outer part, said outer part being operable to turn said shaft to control the cycle of operations of said washing machine and comprising a tubular member having a knob mounted on one end, and gear means connected to its other end cooperable with means mounted on said shaft for turning said shaft upon rotation of said knob, said inner part being operable to vary the position of said cam axially of said shaft and comprising an inner knob received within a recess formed in said knob, a rod disposed within said tubular member and having said inner knob mounted on one end thereof, a pin connected to the other end of said rod and having a plurality of angularly spaced grooves formed in its lower surface adapted to engage said shaft, and means effective to maintain said cam in a plurality of positions corresponding to said plurality of grooves on said pin.

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REFERENCES CITED

The following references are of record in the file of this patent:

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