May 5, 1942. T. J. LITLE, JR 2,281,885

WRINGER ROLL STOP MECHANISM

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FIG. 1.

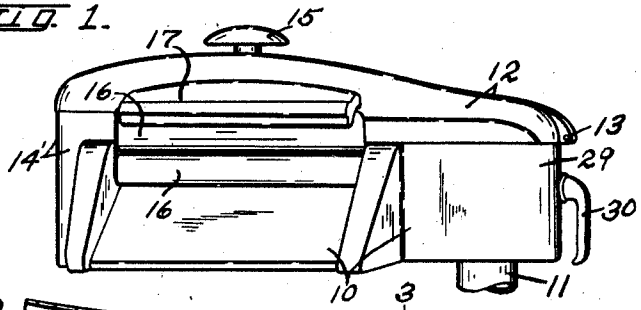


FIG. 2.

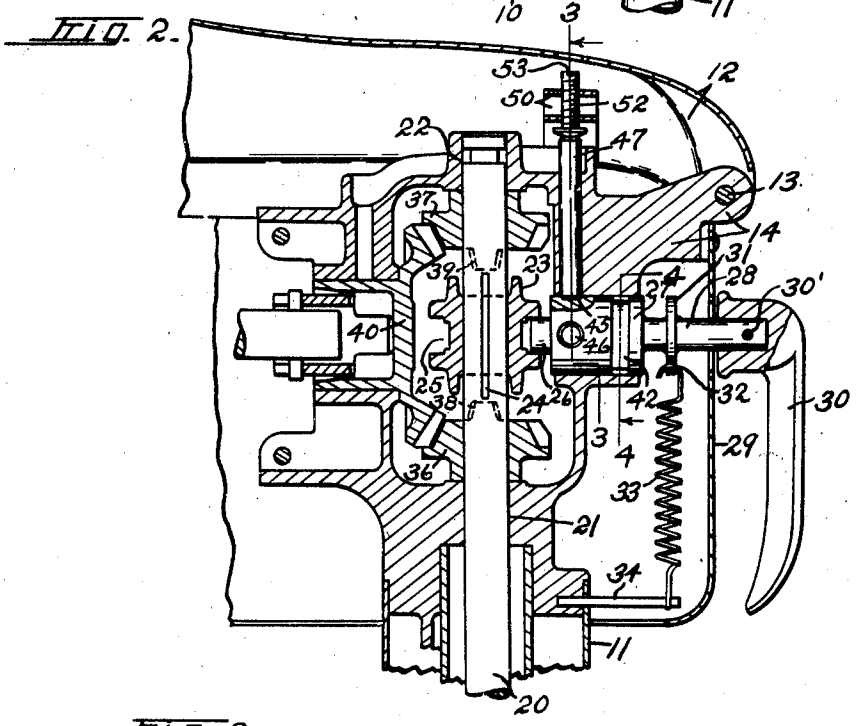


FIG. 3.

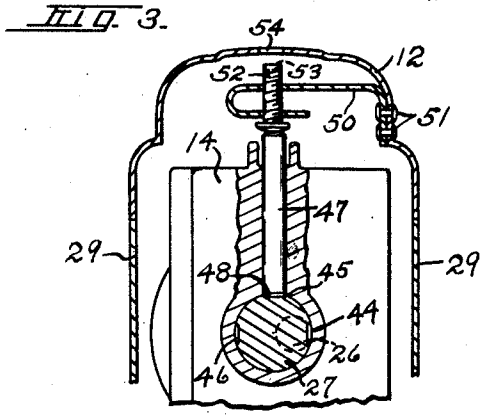
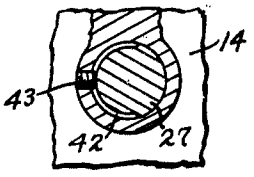


FIG. 4.



INVENTOR
THOMAS J. LITLE, JR.

BY Theodore G. Simonton
ATTORNEY

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FIG. 5.

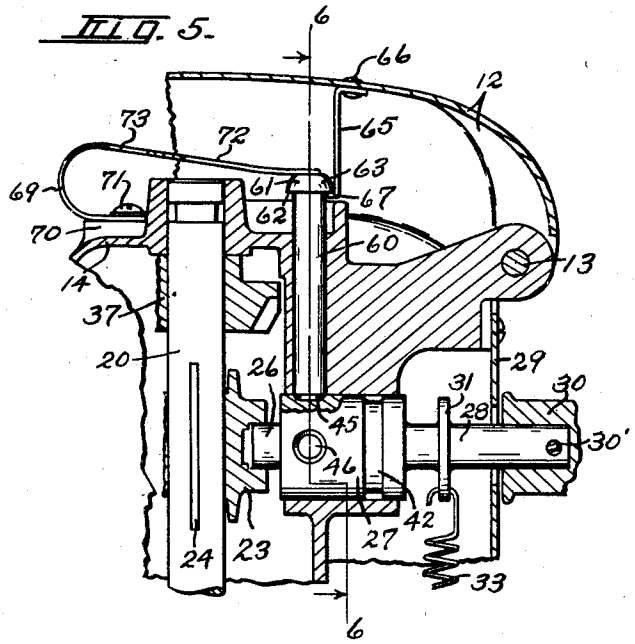
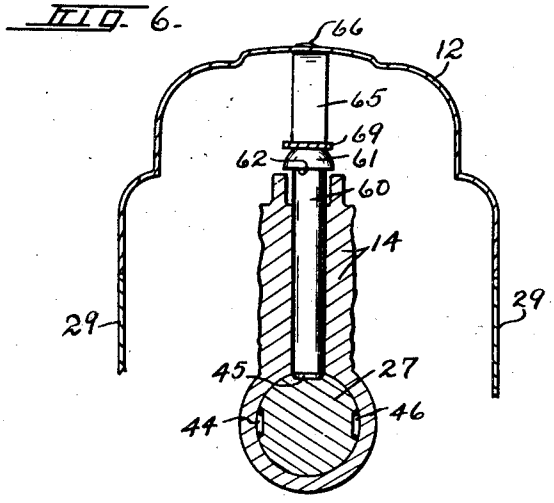


FIG. 6.



INVENTOR
THOMAS J. LITLE, JR.

BY
Theodore C. Simonton
ATTORNEY

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UNITED STATES PATENT OFFICE

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WRINGER ROLL STOP MECHANISM

Thomas J. Litle, Jr., Syracuse, N. Y., assignor to Easy Washing Machine Corporation, Syracuse, N. Y., a corporation of Delaware

Application August 22, 1939, Serial No. 291,373

4 Claims. (Cl. 68—253)

My invention relates to a power driven wringer for use in connection with a washing machine and is specifically directed to a safety roll stop mechanism.

The operation of a power driven wringer is not free from danger and many serious accidents have occurred in the past because adequate safety devices were lacking. Nearly all modern power wringers are equipped with some safety means for releasing the pressure between the rolls in an emergency. Under some circumstances, however, the release of pressure between the rolls may not alone be sufficient to prevent serious injury. For example, if the clothing or the hair of an operator becomes wrapped around a roll that continues to revolve after the roll pressure is released, the garment or the hair may continue to be drawn into the machine with unfortunate consequences. The necessity for providing an emergency roll stop mechanism has been recognized and a number of devices have been developed to this end. Further, various schemes have been devised for operating the safety roll stop mechanism and safety roll pressure release mechanism simultaneously through a single emergency control. The mechanisms employed, however, have all been expensive to build, embrace a large number of parts, thus adding to the possibility of failure through complication, and some existing devices are not always positive in action. My invention accomplishes the task of stopping the rolls effectively while employing mainly parts that are already provided in the ordinary wringer reverse mechanism with the addition of a minimum number of new parts. I thus take advantage of an existing train of mechanism to use such train for a double function with the greatest economy and effectiveness.

An object of my invention is to provide an economical design for an emergency roll stop mechanism.

Another object of my invention is to provide a simple, effective mechanism to disconnect the rolls from the power shaft when the roll pressure release mechanism is operated.

A still further object of my invention is to provide a roll stop mechanism that will be positive in action.

Still another object of my invention is to combine the automatic roll stop mechanism with the manual control for operating the wringer rolls, thus reducing the number of parts required.

Still another object of my invention is to eliminate all complicated connections between the roll pressure release mechanism and the roll stop mechanism and to provide a simple, direct connection.

In the accompanying drawings,

Figure 1 is a perspective view of a power driven wringer.

Figure 2 is a detail section, parts being broken away, of a wringer reverse mechanism embodying my invention.

Figure 3 is a section, parts being broken away, taken on the line 3—3 of Figure 2.

Figure 4 is a section, parts being broken away, taken on the line 4—4 of Figure 2.

Figure 5 is a vertical section, parts being broken away, of a wringer reverse mechanism showing a modification of my invention.

Figure 6 is a section, parts being broken away, taken on the line 6—6 of Figure 5.

Referring now to the drawings, 10 is a wringer of known design supported on a tubular standard 11 which is suitably fastened to a washing machine (not shown). A movable head 12 is pivoted at one end by means of a pin 13 to a gear casing 14 and is latched at the other end to the body 14' of the wringer by a safety release mechanism which is fully disclosed in my co-pending application Serial No. 155,664, filed July 26, 1937, issued March 25, 1941, as Patent No. 2,236,319. A handle 15, rotatably mounted in head 12, is provided for adjusting the pressure between the wringer rolls 16—16. A striking bar 17 is suitably connected to the latch release mechanism so that upon striking the bar 17, the movable head 12 is unlocked and allowed to rise, pivoting about the pin 13, and thus releasing the pressure between the wringer rolls.

Referring more particularly to Figure 2, a drive shaft 20 is suitably journaled in the gear casing 14, as shown at 21 and 22. A movable clutch element 23 is feathered to the shaft 20, as indicated by the key slot 24. A circumferential slot 25 is provided in the clutch element 23 to accommodate a cam roller 26. The cam roller 26 is mounted off center on the end of a stub shaft 27 which in turn is suitably journaled in the gear casing 14. The stub shaft 27 is provided with an extension 28 which projects outward through the shroud 29. A control handle 30 is secured to the end of the extension 28 by suitable means, here shown as a pin 30'. Fastened on the extension 28 and intermediate the stub shaft 27 and the handle 30 is a disk 31 which may be formed integrally with shaft extension 28. The disk 31 is provided with an aperture 32 into which one end of a spring 33 is se-

cured. The other end of spring 33 is hooked over a pin 34 which is supported in the gear casing 14. Bevel gears 36 and 37, loosely mounted on the shaft 20, are provided with elements 38 and 39 adapted to cooperate with complementary portions of the clutch element 23. Bevel gear 40, rotatably mounted in the gear casing 14, is arranged constantly to mesh with gears 36 and 37. The bevel gear 40 is adapted to drive one of the wringer rolls through a suitable drive connection.

In the preferred form, the cam 26, aperture 32 and handle 30 are so positioned that the clutch element 23 will be held in the neutral position by means of the spring 33, with the handle 30 downward. Swinging the handle 30 either forward or backward will throw the clutch element 23 into cooperative engagement with either bevel gear 36 or 37 as may be desired, to rotate the wringer rolls either forward or backward. Stub shaft 27 is provided with a circumferential slot 42 which extends slightly more than half way around the circumference of the shaft. The set screw 43 is threaded into the gear casing 14 and extends into the slot 42 preventing endwise movement of the stub shaft 27 and providing a limit stop to the movement of the control handle 30.

Adjacent the inside end of the stub shaft 27 are three recesses 44, 45 and 46 arranged in spaced circumferential relation to correspond with the neutral and two operating positions of the clutch element 23. A bolt 47 is slidably mounted in the frame 14 in radial alignment with the recesses 44, 45 and 46 and is adapted to engage with any one of the three recesses upon rotation of the handle 30. The lower end of bolt 47 is chamfered off, as at 48, for a purpose presently to be described. A spring 50 is attached to the movable head 12 by suitable means, here shown as rivets 51. A screw 52 is threaded into the spring 51 and positioned so as to be in vertical alignment with the bolt 47 when the head 12 is latched in the operating position. A slot 53 is provided in the upper end of the screw 52 to accommodate a screwdriver or suitable tool. An aperture 54 is provided in head 12 directly above the screw 52 in order that a tool may be inserted through the aperture to adjust the screw 52.

With the head 12 latched in the operating position, a tool is inserted through the aperture 54 into the slot 53 in the screw 52 and the screw 52 adjusted so as to place the spring 50 under sufficient tension to force the bolt 47 against the stub shaft 27 and into the recess 45. The handle 30 is then raised to an operating position. Due to the shape of the chamfered end 48 of pin 47, upon rotation of the stub shaft 27 the bolt 47 is cammed out of the recess 45. When the handle 30 reaches the full operating position, the bolt 47 will be forced into recess 46 or 44 depending upon whether the operating handle 30 is thrown forward or backward.

In the neutral position, the spring 33 which is under an initial tension, simply exerts a straight downward pull on the shaft 28 through the disk 31. When the handle 30 is rotated to an operating position, the disk 31 is likewise rotated and the pull of spring 33 is then eccentric to the center line of the shaft 27 and thus exerts a rotational force upon the stub shaft 27 through the disk 31, tending to return the stub shaft 27 to the initial or neutral position. Rotation of the stub shaft 27 moves the eccentric cam roller 26 either up or down depending upon the direction of rotation, thus throwing the clutch member 23 into cooperation with one of the gears 36 and 37 for driving the wringer rolls. The adjustment of screw 52 is such as to put sufficient tension upon the spring 50 to hold the bolt 47 in the recess 48 or 44 with sufficient force to resist the turning moment due to spring 33.

Upon striking the roll pressure safety release bar 17, head 12 is unlatched and, under the influence of the roll spring, is forced upward about its pivot 13. The upward movement of the head 12 carries spring 50 with it, with the result that the spring load on the bolt 47 is removed. Spring 33, exerting its force through the disk 31 will turn the stub shaft 27, cam the bolt 47 out of the operating recess 46 or 44, as the case may be, and throw the stub shaft back to the neutral position carrying the clutch piece 23 out of engagement with bevel gear 37 or 38, thus stopping the rolls.

Figure 5 shows a modification of my invention wherein the bolt 60 is provided with a mushroom head 61, the under surface of which is finished square, as at 62, while the upper surface is a flattened hemisphere or a truncated cone, as indicated at 63. A spring hook member 65 is fastened to the head 12 by suitable means, here shown as a rivet 66, and extends downwardly and terminates in a hook 67 which is adapted to catch under the mushroom head 61 of the bolt 60. A U-shaped spring 69, having arms of unequal length, is fastened to a boss 70 provided on the gear case 14 by means of a screw stud 71. The long arm 72 of the spring 69 extends over to press down upon the head of the bolt 60. An aperture 73 is provided in the spring arm 72 to allow the insertion of a suitable tool for tightening the fastening 71. In the modified scheme shown in Figure 5, the operation of all the parts is similar, with the exception of the bolt 60, spring 69 and the hook member 65.

With the head 12 in the latched or operating position, hook 67 of the hook member 65 is beneath shoulder 62 of the mushroom head 61 of bolt 60. The spring 69 is of sufficient strength to force bolt 60 into recess 46 or 44 when the control handle 30 is moved to either operating position and to hold the bolt in the recess against the influence of spring 33. When the head 12 is released upon striking the safety release bar 17 and the head moves upward about its pivot 13, piece 65, being fastened to the head, rises with it and the hook 67 lifts the bolt 60 out of engagement with the recess 46 or 44, thus allowing the spring 33 to throw the control mechanism back to the neutral position. If the head 12 is raised sufficiently high, the hook 67 will be withdrawn from beneath the shoulder 62, thus allowing spring 69 to force bolt 60 back into operating engagement with the recess 45 of stub shaft 27. When head 12 is again forced down, piece 65 will be cammed outward over the conical surface 63 of the bolt head 61 until the hook 67 is below the bolt head when it will spring back under the shoulder 62, thus being ready for future operation.

Although I have shown and particularly described the preferred embodiments of my invention, I do not wish to be limited to the exact constructions shown as various changes in the form and relation of parts thereof may readily be made without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. The combination with a safety device for releasing the roll pressure of a roll wringing mechanism having a power drive mechanism including a clutch for rotating the wringer rolls and a manual control including a rotatable cam shaft for operating said clutch, of separate power means for constantly urging said clutch to a neutral position, a plurality of recesses in said shaft positioned in spaced circumferential relation to each other, said recesses corresponding to operating positions of said control, a bolt, means for urging said bolt toward said shaft to engage with said recesses to yieldingly latch said control in an operating position against the action of said separate power means while permitting manual operation of said control, and bolt releasing means operated by said safety device for unlatching said control, thereby permitting said separate power means to return said clutch to the neutral position and stop said rolls.

2. A device as described in claim 1 wherein said bolt releasing means is so constructed and arranged as to positively withdraw said bolt from engagement with said cam shaft.

3. In a washing machine wringer having a pair of rolls, power means for driving said rolls, a reversing mechanism adapted to drive said rolls in either direction or to disconnect said rolls from said power means and a manual control including a rotatable shaft for operating said reversing mechanism, in combination, separate power means for constantly urging said reversing mechanism into the disconnected position, a plurality of recesses in said shaft positioned in spaced circumferential relation to each other, said recesses corresponding to operating positions of said control, a bolt, means for urging said bolt toward said shaft to engage with said recesses to yieldingly latch said control in an operating position against the action of said separate power means, and separate bolt releasing means for unlatching said control, thereby permitting said separate power means to return said reversing mechanism to the disconnected position and stop said roll.

4. A device as described in claim 3 wherein said bolt releasing means is so constructed and arranged as to positively withdraw said bolt from engagement with said shaft.

THOMAS J. LITLE, JR.