Sept. 10, 1940. N. H. WATTS 2,214,095

WRINGER

Filed Oct. 11, 1937 3 Sheets-Sheet 1

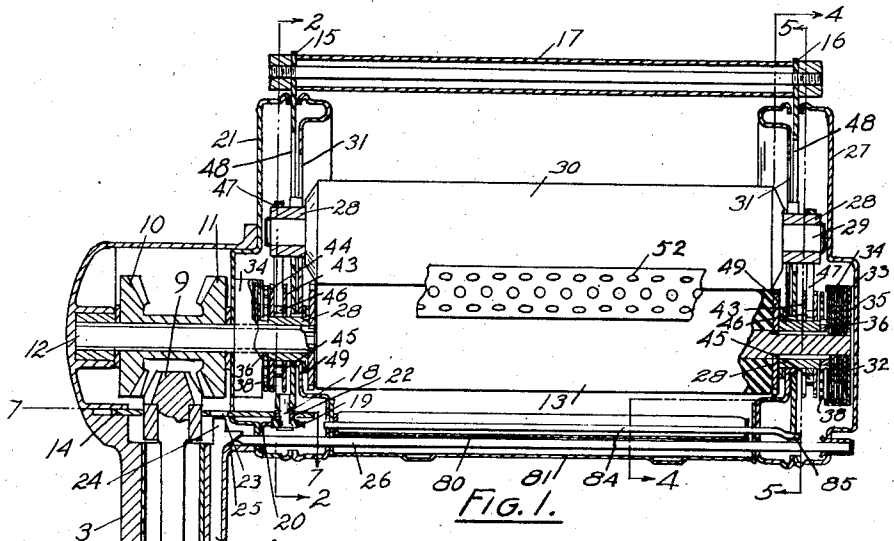


FIG. 1.

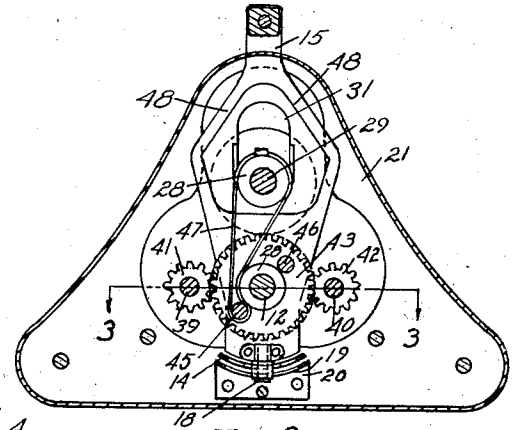


FIG. 2.

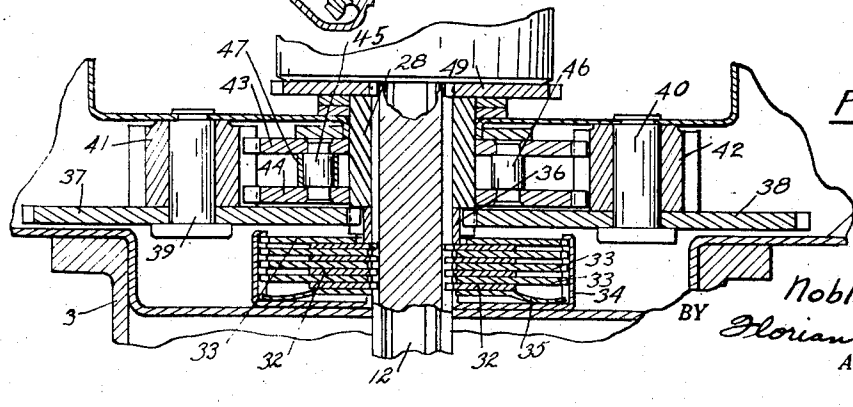


FIG. 3.

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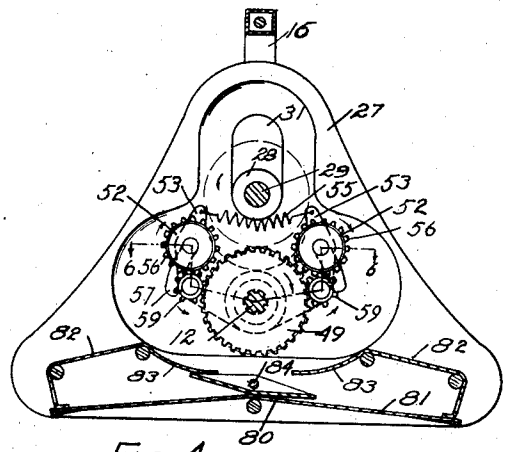


FIG. 4.

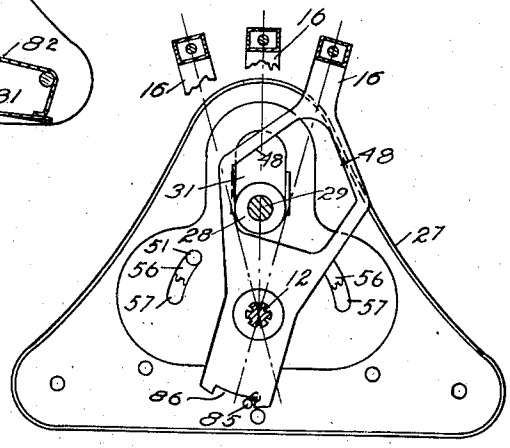


FIG. 5.

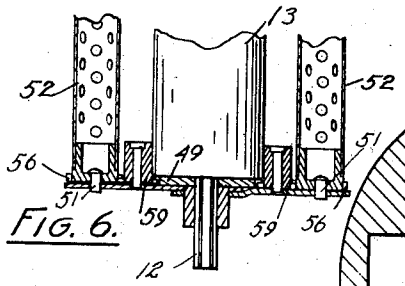


FIG. 6.

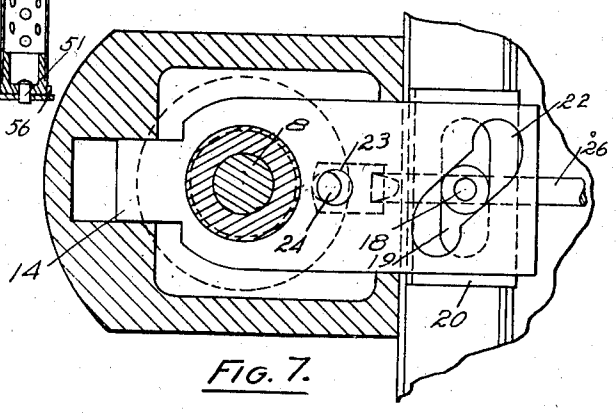


FIG. 7.

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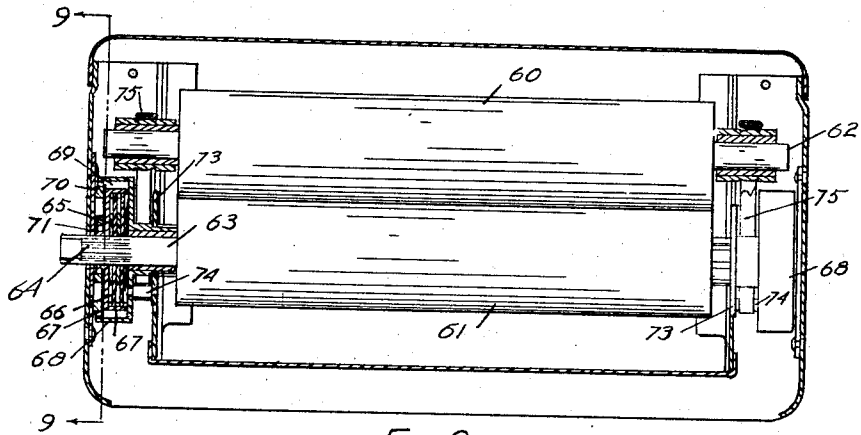


FIG. 8.

FIG. 9.

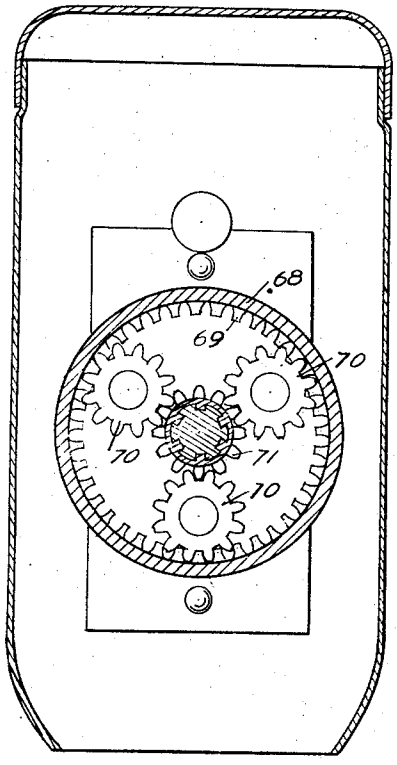
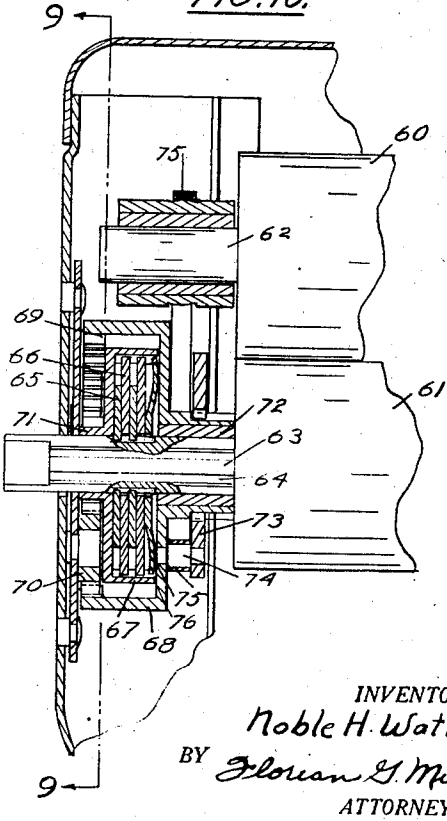


FIG. 10.



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UNITED STATES PATENT OFFICE

2,214,095

WRINGER

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Application October 11, 1937, Serial No. 168,433

9 Claims. (Cl. 68—253)

This invention relates generally to power wringers, and more particularly to novel driving, safety, and control means therefor.

All devices made according to the prior art, and with which I am familiar, have provided spring members to develop pressure between coacting pressure rolls thereby requiring a heavy frame to take care of the stresses developed resulting in a heavy, bulky frame requiring considerable space. Driving means for the rolls have been inefficient because of the method of driving setting up heavy stresses in localized areas of the wringer, and permitting the rolls to operate out of parallel relation with each other. Means of engaging the driving pinion with the motor mechanism has also been a problem in wringers in that the methods of engaging the members transferring power to the power shaft have been noisy, inefficient, and the cause of breakdowns due to broken teeth and the like.

It is, accordingly, an object of my invention to overcome the above, and other defects in wringers and more particularly provide a wringer which has a simple control means, safety means, driving means for the rolls, and simple means for engaging the driving pinion and driving gears.

Another object of my invention is to provide a wringer which is compact in size, efficient and safe in operation, cheap in cost, and economical in manufacture.

Another object of my invention is to provide a wringer which develops pressure between the coacting pressure rolls through the medium of means cooperating with one of the rolls.

Another object of my invention is to provide a wringer which permits automatical separation of the rolls upon upward movement of the upper pressure roll.

Another object of my invention is to provide safety feed rolls which are operated by a positive synchronous drive from the bottom roll.

Another object of my invention is to provide a wringer which develops pressure between coacting pressure rolls through the medium of a slip friction clutch, and to further provide novel gear means for cooperation with said clutch to develop the pressure between the pressure rolls.

Another object of my invention is to provide a wringer which permits engagement and disengagement of the pinion on the motor mechanism with the driving gears on the power roll shaft.

Another object of my invention is to provide a wringer which has means for automatically setting the control lever in a neutral position upon excessive upward movement of the top wringer roll.

Other objects of my invention will become evident from the following detailed description, taken in conjunction with the accompanying drawings, in which

Fig. 1 is a side elevational view in section of my novel wringer construction.

Fig. 2 is a view taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged view taken on the line 3—3 of Fig. 2.

Fig. 4 is a view taken on line 4—4 of Fig. 1.

Fig. 5 is a view taken on line 5—5 of Fig. 1.

Fig. 6 is a view taken on the line 6—6 of Fig. 4.

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 1.

Fig. 8 is a side elevation view partly in section of a modified form of my novel wringer.

Fig. 9 is a view taken on the line 9—9 of Fig. 8.

Fig. 10 is an enlarged fragmentary sectional view of the modified form of wringer shown in Fig. 8.

Referring to the drawings, Fig. 1 shows a wringer comprising a wringer post 1 having an annular flanged member 2 disposed therearound for supporting a standard 3 which rotates about the upper portion of the post 1. Power is transferred to the wringer by shaft 4 leading from motor mechanism (not shown), bevel gears 5, shaft 6, universal joint 7, shaft 8, driving pinion 9 disposed on the top of shaft 8, and gears 10 and 11 secured against rotation on the power shaft 12 which carries the lower wringer roll 13. The shaft 8 is disposed in the post 1 and is pivoted at its lower end by means of universal joint 7, this pivotal movement permitting the driving pinion 9 disposed on the top of the shaft 8 to move laterally through the medium of a slidable plate member 14 operated by the movement of the control lever 15. The control means generally for my wringer comprises control levers 15 and 16 rotatably mounted at each end of the power shaft 12, and connected at their extreme upper portions by a control bar 17. The lower portion of the lever 15 operates a pin member 18 which moves in a straight slot 19 provided in a flanged plate 20 mounted in the end member 21. A diagonally disposed slot 22 in the sliding plate 14 is superimposed over the straight slot 19 and the pin member 18 on the lever 15 moves in this slot 22. It will be evident that upon rotation of the lever 15, the pin 18 will move along the straight slot 19 and the sides of the diagonally disposed slot 22 in the sliding plate 14 will act as a cam surface and move the sliding plate 14 in a forward or re-

verse direction in accordance with the direction of rotation of the lever 15. The sliding plate 14 has an aperture 23 disposed centrally thereof through which a movable pin member 24 extends when it is desired to lock the sliding plate 14. When the driving gears are in neutral position, the opening 23 is in register over the pin 24. When the operating bar 26' is thrust endwise it acts upon cam surface 25 to raise the pin 24 to a position to lock the sliding plate 14 in neutral position and at the same time lifting the lower portion 24a of the pin 24 from the indexing slot in the flange 2. This operation permits the rotation of the wringer around the vertical wringer post 1 and prevents any powering of the rolls.

End members 21 and 27 of the wringer have journal bearings 28 for journalling the shafts 12 and 29 which carry the pressure rolls 13 and 30. The end members 21 and 27 are provided with elongated slots 31, which permit the upper pressure roll 30 to move away from the lower roll 13 under certain abnormal conditions. Pressure is maintained between the rolls 13 and 30 by means of a slip clutch, a system of gearing, and a looped pull tape in cooperative relation on each end of the shaft. The slip clutches on each end of the shaft 12 comprises clutch discs 32 splined to and movable with the shaft 12, clutch discs 33 freely mounted on the shaft 12 in frictional engagement with the clutch discs 32 and splined to and rotatable with a flanged housing 34, all of the discs 32 and 33 being housed in the housing 34. A spring member 35 urges the discs 32 and 33 in frictional engagement and the force which the spring member 35 exerts against the discs 32 and 33 determines the pressure between the coacting rolls 13 and 30. The outermost disc 33 engages a pinion 36 which meshes with two oppositely disposed gears 37 and 38 mounted on shafts 39 and 40, the shafts 39 and 40 also having considerably smaller sized gears 41 and 42 mounted thereon and meshing with two gears 43 and 44 mounted on journal bearing 28. The gears 43 and 44 are connected by laterally extending anchor pins 45 and 46. The pin 45 is utilized as an anchor point for a looped pull tape 47 which is disposed around the upper roll shaft journal 28. It will be evident that the means of yieldingly connecting the upper roll shaft 29 with the lower roll shaft 12 may be designed in many different forms without departing from the spirit of my invention. In operation, the discs 32 rotating with the lower shaft frictionally engage the discs 33 splined to the housing 34 and a rotational force is exerted on the discs 33 in proportion to the force which the spring member 35 exerts against the discs 32 and 33. This rotational force is exerted on the pinion 36 by the outermost disc 33 and through the system of gearing described, a downward force is exerted by the pin 45 on the pull tape 47, which in turn, exerts a downward force on the upper roll shaft 29. When the upper shaft moves upwardly in the slots 31 because of some abnormal condition such as a large bundle of clothes between the coacting rolls 13 and 30, the clutch slips and as the separation becomes greater, the pull tape 47 unwinds and the gear linkage is rotated backwards increasing the clutch slip speed. The upward movement of the roll shaft 29 will bring it in contact with the cam surface 48 of the control lever 15 to automatically move the lever 15 to a neutral position and disengage the driving mechanism. The yielding connection between shafts 12 and 29 provides a snubbing action to prevent sudden outward movement of the upper roll 30.

The gears 49 are splined on each end of the shaft 12 and rotate the perforated safety rolls 52 through pinion gears 59 and gears 56 on each end of the perforated rolls 52. The rolls 52 have bearing members 51 disposed in the ends thereof which move in arcuate slots 57 in the end frames 21 and 27. Pivoted members 53 are freely mounted on the journals 28 of the lower drive shaft 12 to support the safety rolls 52. Spring members 55 are connected to the upper portion of the pivoted members 53 to urge the oppositely disposed members 53 with their supported rolls 52 to a position adjacent the bite of the coacting rolls 13 and 30. A positive synchronous drive between the power pressure roll 13 and the safety rolls 52 is therefore provided. The safety rolls 52 are biased against the upper pressure roll 30 at a low pressure and act to guard the hands against entry into the high pressure wringing zone.

Figs. 8, 9, and 10 show a modified form of means for maintaining pressure between the pressure rolls of the wringer. A system of planetary gearing is utilized in cooperative relation with a slip clutch and yieldable means for connecting the upper and lower rolls. The usual upper and lower pressure rolls 60 and 61 with roll shafts 62 and 63 is provided, the lower roll shaft 63 having splines 64 formed on the ends thereof. Clutch discs 65 are splined on and driven by shaft 63 and frictionally engage the driven discs 66 which are splined to an inner flanged housing 67. An outer flanged housing 68 is disposed on the shaft 63 and houses the inner flanged housing 67. The outer flanged housing 68 has internally disposed teeth 69 for engaging the gears 70 of a planetary gear system which in turn mesh with a central pinion 71 driven by the frictional engagement of the clutch discs 65 and 66. The hub 72 of the outer flanged housing 68 has a plate member 73 secured thereon and rotatable therewith, the plate member 73 having mounted thereon a projecting anchor pin 74 for anchoring the pull tape 75 which extends around the upper roll shaft 62. A spring member 76 bears on the inner face of the outer flanged housing 68 and against the discs 65 and 66 to force them into frictional engagement, the force that the spring exerts against the discs 65 and 66 being proportional to the pressure exerted between the coacting rolls 60 and 61 through the cooperating planetary system of gears and pull tape 75 connecting the upper and lower shafts 62 and 63.

Fig. 4 shows a rocking drain board 80, water boards 81, arm rests 82, and arcuate formed portions 83 extending from the arm rests 82 for forming an open trough beneath the pressure rolls 13 and 30 leading to the rocking drain board 80. The drain board 80 is automatically tilted in the direction in which the lower roll is rotating to drain the water therefrom, by means of the rod 84 shown in Fig. 1 offset at 85 for engagement with the slotted lower portion 86 of the control lever 16. It will be apparent that upon any rotational movement of the control lever 16, the drain board will be tilted in the desired direction.

It will be evident from the foregoing description that I have provided a wringer which utilizes a minimum of space, which has a novel means of developing pressure between the coacting rolls, which is safe in operation, and which is economical in cost.

Various changes may be made in the specific

embodiment of the present invention without departing from the spirit thereof, or from the scope of the appended claims.

What I claim is:

1. In a wringer, a power shaft, power means for driving said shaft, a second shaft, coacting rolls disposed on said shafts, tension means linking said shafts, means operatively engaging said power shaft and said tension means to create pressure between said rolls, and a control lever mounted on said power shaft for controlling said power means having cam surfaces adapted to contact said second shaft when said second shaft moves a substantial distance away from said power shaft to move said control lever to a neutral position.

2. In a wringer, a power rotated shaft, a second shaft, coacting rolls disposed on said shafts, tension means for linking said shafts, means operatively engaged with said power shaft and said tension means for creating pressure between said rolls, laterally movable rolls disposed adjacent to said coacting rolls, gears disposed on each end of said laterally movable rolls, and gears mounted on said power shaft to transmit rotative force to said laterally disposed rolls.

3. In a wringer, a power shaft, a second shaft, coacting rolls disposed on said shafts, tension means for linking said shafts together, friction means having a part thereof rotated by said power shaft and a second part frictionally actuated by said first mentioned part and a system of gears for transmitting force from said second part to said tension means for exerting a pressure on said coacting rolls.

4. In a wringer, a power shaft, a second shaft, coacting rolls on said shafts, tension means for linking said shafts, friction means having a part thereof rotated by said power shaft and a second part frictionally actuated by said first mentioned part, and means interposed between said second part and said tension means for transmitting force therebetween, said friction means exerting a pre-determined force to provide a pre-determined pressure on said coacting rolls.

5. In a wringer, as claimed in claim 4, said friction means being a friction clutch.

6. In a wringer, a power shaft, means to rotate said power shaft, a second shaft, coacting rolls disposed on said shafts, tension means for linking said shafts, friction means having a part thereof empowered by said power shaft and a second part frictionally actuated by said first mentioned part and a reduction gear system for pressure linkage between said second part and said tension means to exert an increased predetermined pressure on said rolls.

7. In a wringer, a power shaft, means to rotate said power shaft, a second shaft, coacting rolls disposed on said shafts, tension means for linking said shafts, friction means having part thereof empowered by said power shaft and a second part frictionally actuated by said first mentioned part, and a system of gears for pressure linkage between said second part and said tension means for exerting an increased pressure on said coacting rolls.

8. In a wringer, a power shaft, means to rotate said power shaft, a second shaft, coacting rolls on said shafts, tension members for linking said shafts, and means for continuouly exerting tensional force on said tension members to provide a substantially uniform pressure at any point of separation of the rolls, comprising elements empowered by said power shaft, and means interposed between said elements empowered by said power shaft, and said tension members to transmit a force therebetween.

9. In a wringer, as set forth in claim 8, said elements empowered by said power shaft being frictional.

NOBLE H. WATTS.