March 18, 1952 N. L. ETTEN 2,589,354

WRINGER

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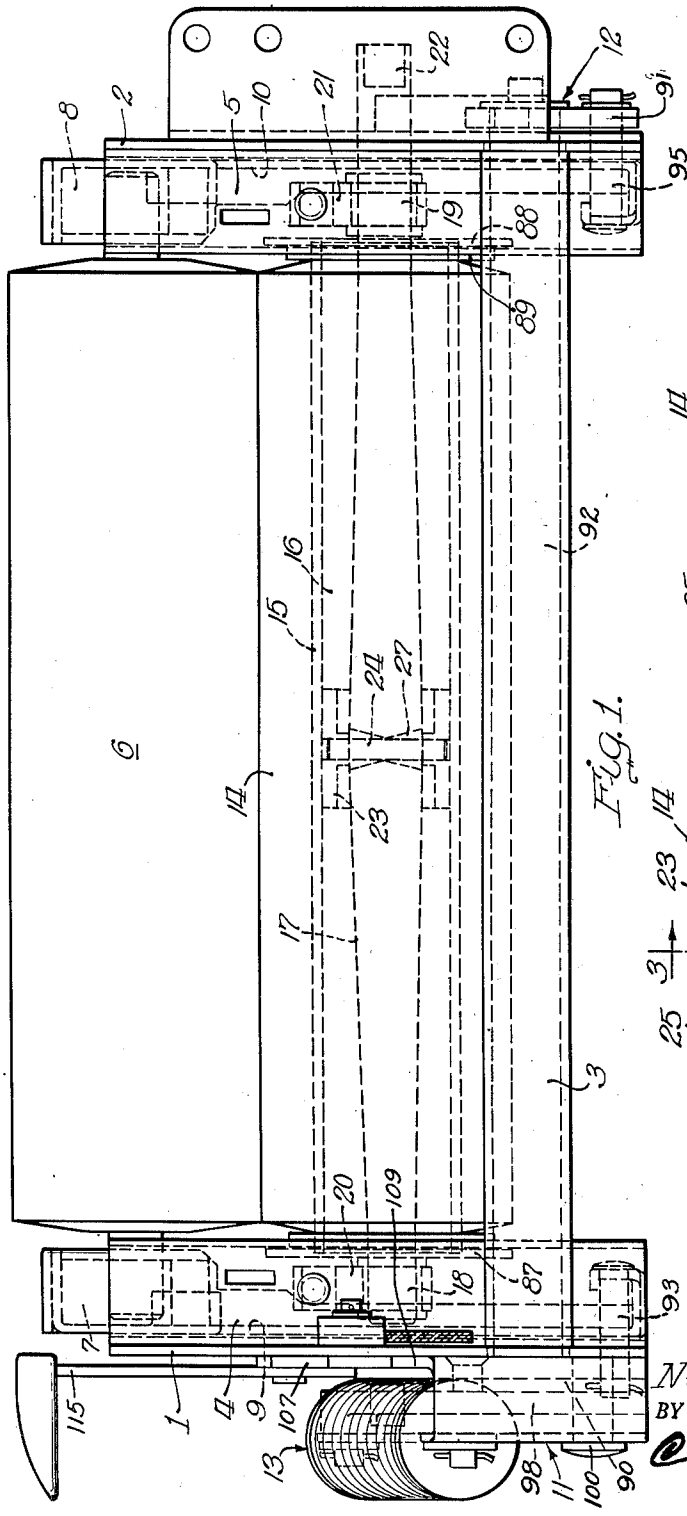


Fig. 1.

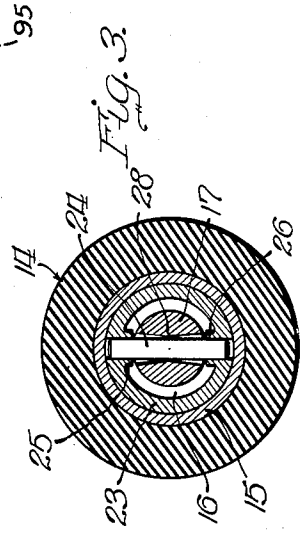


Fig. 3.

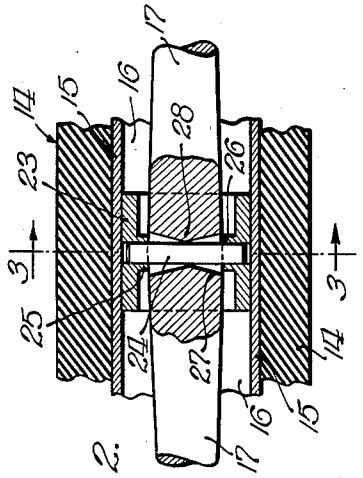


Fig. 2.

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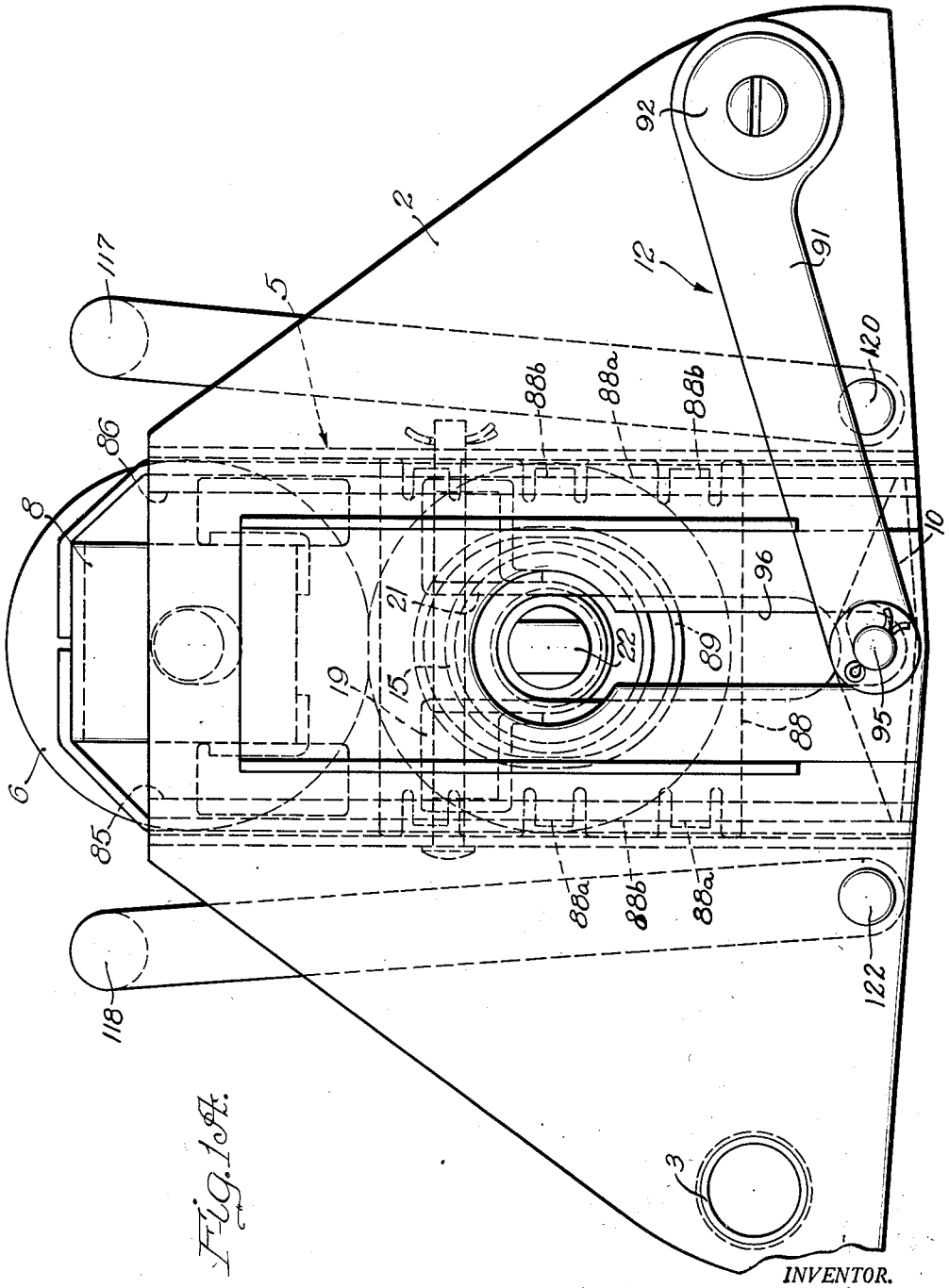


Fig. 1st.

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Fig. 4.

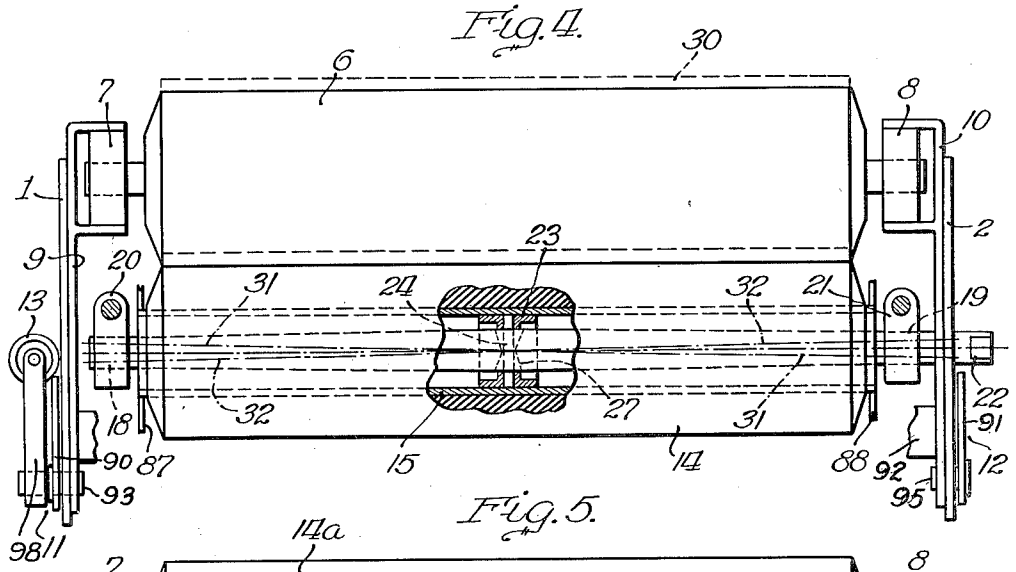
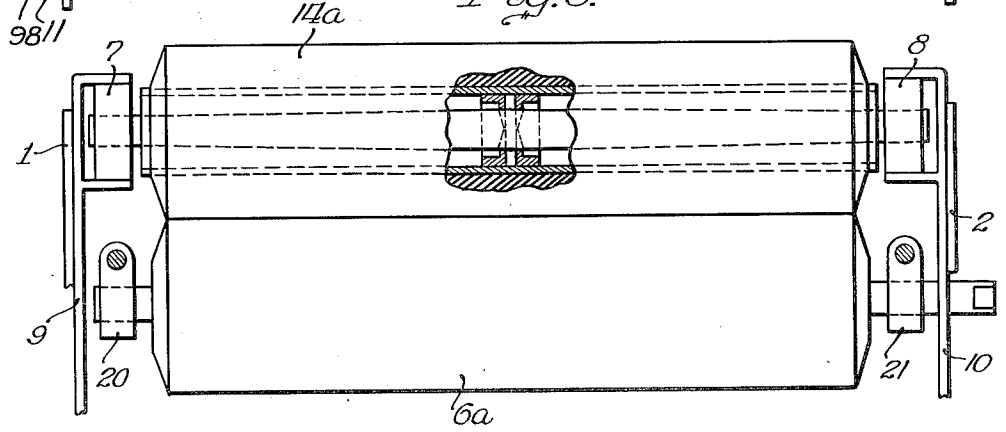


Fig. 5.



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Fig. 6

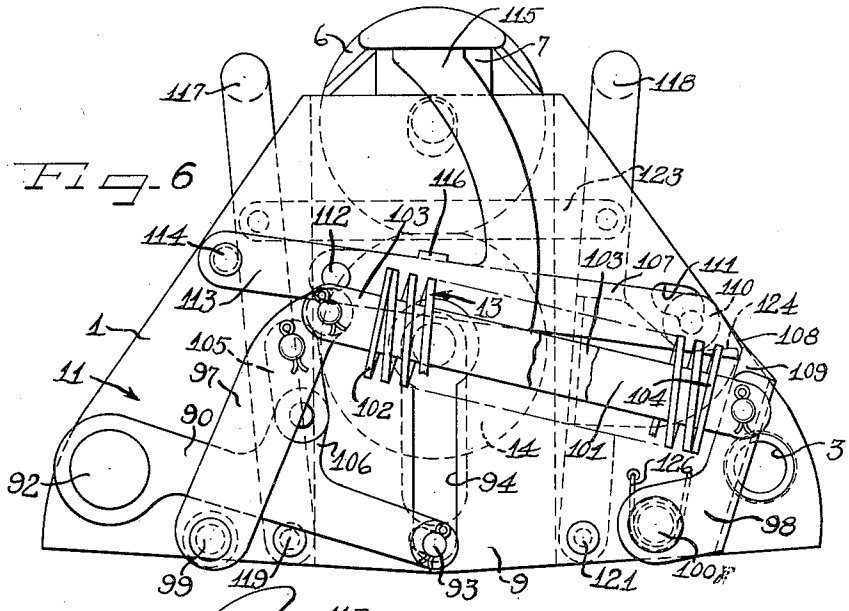
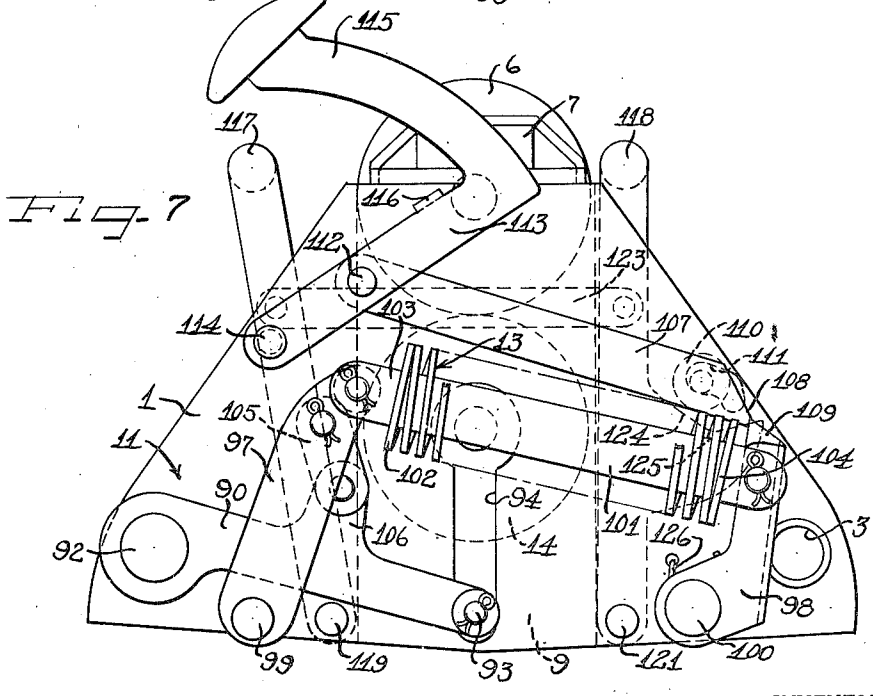


Fig. 7



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UNITED STATES PATENT OFFICE

2,589,354

WRINGER

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Application November 23, 1945, Serial No. 630,178

9 Claims. (Cl. 68—256)

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This invention is directed to a wringer embodying a tiltable wringer roll through the instrumentality of a newly designed roll mounting. One or more rolls of this construction mounted in accordance with the principles of the present invention may be incorporated into any type of wringer structure wherein it will function in the manner stipulated independently of any particular style or arrangement of wringer construction. For the purposes of explaining one particular adaptation of the roll of the present invention mounted for tilting action, the same has been incorporated into a wringer structure of the kind shown and described in my copending application Serial No. 630,176 filed of even date herewith. Reference to this structure will clarify details of the wringer illustrated although any wringer structure, conventional or special, will provide the proper means for the reception of a roll of the present design.

One of the main objects of the present invention is to provide a roll mounting structure so arranged as to permit longitudinal tilting of the associated roll while the wringer is in operation. Thus, the normal squeezing action of coacting wringer rolls are tensioned by suitable spring means to maintain such rolls in a predetermined pressure contact, adding thereto the normal resiliency of the rolls per se, is supplemented under normal wringer action by introducing one or more rolls that are tiltable relative to their normal axis of rotation thereby creating a quick adjustment of the rolls to bunching of clothes, preventing jerky or uneven separation of such rolls beyond a point of efficiency, and at the same time maintaining the necessary tension throughout the line contact between the wringer rolls when the same are acting upon clothes being fed therethrough.

Another object of the present invention is to incorporate the novel roll mounting means into the stationary roll or movable roll. In other words, the new structure may be incorporated into the roll which normally rotates about a fixed axis although such roll by such means is capable of tilting longitudinally with the roll axis deviating angularly from its normal axis of rotation. The same applies with the new structure embodied into the movable roll although the latter has an axis of rotation which moves bodily vertically.

A further object of the present invention is to provide a roll as indicated in the paragraph immediately above wherein the axis, namely, the

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rotational axis and the roll axis are adapted to relatively adjust themselves angularly under various conditions of operation as imparted by clothes acting upon the roll surface but carrying on such angular separation of the axes mentioned while at all times maintaining such axes intersecting at a predetermined point along the length of the roll. This always maintains the roll in a predetermined relation with respect to its cooperating wringer roll and also permits the roll axis to coincide with the rotational axis when the roll is in normal operative horizontal position. This action always, therefore, maintains the bite of the rolls in a definite relationship with respect to the wringer during all conditions of operation and at the same time permits the tilting of the roll described to carry on the equalizing and leveling-off function of the roll bite while clothes are being fed through the wringer.

This wringer further embodies means for guiding the ends of the tiltable roll to maintain the latter in operative contact with the coacting roll by keeping the two rolls in a common vertical plane.

Another object of the present invention is to provide such roll tilting mechanism in the form of universal means disposed normally centrally with respect to the length of the associated roll and to incorporate such means in either one of the two wringer rolls whether such rolls are adapted for rotation upon a normal fixed axis or for rotation upon a floating axis, such selection being governed mostly by the general construction and attributes of the wringer generally.

It is a further object of the present invention to provide modified means for carrying out the tilting action of a roll in a wringer structure thereby illustrating various ways in which this invention may be applied to special or conventional wringers.

All other objects and advantages relating to the invention herein disclosed and described shall hereinafter appear in the following detailed description thereof having reference to the accompanying drawings which illustrate the application of the invention and the manner in which the same may be applied and used in wringers.

In the drawings:

Fig. 1 is a general side elevational view of a wringer embodying a roll mounted according to the principles indicated in the objects above;

Fig. 1A is an end elevational view of the wringer taken from the right hand side of Fig. 1 to illustrate the relationship of the coacting wringer

rolls and the guide mechanism for the tiltable wringer roll;

Fig. 2 is a fragmentary sectional view of the central portion of the lower roll in Fig. 1 illustrating certain details of construction;

Fig. 3 is a transverse sectional view taken substantially along the line 3—3 in Fig. 2;

Fig. 4 is a general diagrammatic illustration of the roll structure illustrated in Fig. 1 to better show the principles of operation involved and clarifying the new features of the tiltable roll and its operation;

Fig. 5 is another diagrammatic illustration such as Fig. 4 showing, however, a modified arrangement of tiltable roll;

Fig. 6 is a fragmentary end elevational view taken from the left hand side of Fig. 1, with parts broken away, illustrating a pressure applying, pressure release, and pressure reset mechanism; and

Fig. 7 is a view of the same character as Fig. 6, but illustrating the parts just prior to the completion of the pressure reset operation.

Fig. 8 is another diagrammatic showing of a wringer-roll structure depicting another arrangement that may be employed for supporting one of the rolls of a wringer for tilting movement relative to the other roll and the wringer structure;

Fig. 9 is another diagrammatic illustration of still a further modified arrangement which may be provided to tiltably support one of the wringer rolls.

Although the wringer in Fig. 1 is better illustrated and described in my copending application, this structure will be briefly described to clarify the mounting of the rolls. This wringer is provided with end plates 1 and 2 connected by tubing, such as 3, the plates carrying the vertical guide housings 4 and 5 for accommodating the roll bearings. The upper roll 6 is journalled in bearings 7 and 8 which are secured respectively to the shiftable brackets 9 and 10 to move directly therewith. Brackets 9 and 10 are connected with link mechanisms generally indicated by numerals 11 and 12 which operate synchronously through connecting shaft means in the rear of the wringer but which has not been shown in Fig. 1. The link mechanism 11 is suitably connected with a spring means 13, and the latter acting through the link mechanism 11 and the connecting shaft means at the rear side of the wringer and the link mechanism 12 is adapted for normally urging the brackets 9 and 10 simultaneously downwardly to urge the roll 6 into operative line engagement with the lower roll 14. Roll 6 in this particular wringer structure moves in parallel shiftable relationship with respect to the roll 14.

The roll 14 in the construction illustrated in Figs. 1 and 4 comprises the tiltable roll which is adapted to tilt upon its normal axis of rotation producing a roll bite together with roll 6 having a greater equalizing effect in conjunction with the resiliency of the roll rubber thereby carrying out swiftly and smoothly the clothes wringer operation.

As illustrated in Figs. 1, 2 and 3, roll 14 is provided with a tubular sleeve 15 establishing a hollow core 16 through which a shaft 17 extends and projects outwardly from the ends of such tube 15. The ends 18 and 19 of shaft 17 are journalled in bearings 20 and 21 suitably secured to the guide housings 4 and 5 thereby supporting shaft 17 for rotation upon an axis which is fixed with respect to the wringer structure. The shaft end 19 is extended as at 22 to provide a driving connection for rotating shaft 17 and the wringer rolls as will be understood from the following description.

The midpoint of roll 14 is provided with a sleeve 23 secured to the tube 15 and a pin 24 is mounted with its ends carried within suitably aligned openings in the sleeve 23. A pair of bosses 25 and 26 provide additional bearing reinforcement for the pin 24 and also terminate substantially adjacent the outer surface of the shaft 17 thereby centralizing shaft 17 at this point with respect to the hollow bore 16 as best illustrated in Figs. 2 and 3.

Pin 24 also extends through an opening 27 provided in the central portion of the shaft 17, such opening flaring outwardly from the axial center of the shaft as illustrated in Fig. 2 but having its central or axial diameter portion 28 substantially of the same diameter as the pin 24.

Rotation of shaft 17 therefore imparts driving torque to the roll 14 through the pin 24 to the sleeve 23 and subsequently or simultaneously to the tube 15 which carries the roll rubber. Whenever the roll 14 is in true horizontal alignment as shown in Fig. 1, the roll axis will coincide with the shaft axis. In the event roll 14 is tilted on its longitudinal axis with respect to the normal rotational axis of the shaft 17, such tilting action occurs through the universal means illustrated in Figs. 2 and 3 in view of the fact that the pin 24 can operate in the flared opening in such shaft. Furthermore, the driving torque is continuously transmitted through shaft 17 to the roll 14 and consequently, by contact, to the upper roll 6 in a known manner.

Referring to Fig. 1, it should be noted that shaft 17 has its greatest diameter at the universal fulcrum means that connects the shaft 17 and the roll 14, and that the shaft 17 tapers outwardly to a reduced diameter at each end providing the bearing ends 18 and 19. By so doing, the shaft 17 presents its greatest torsional and supporting strength at the center point thereof and also provides sufficient clearance toward its ends to accommodate the tilting of the roll 14, thereby preventing the tube 15 from striking the shaft 17 under all normal conditions of operation.

Fig. 4 illustrates the main elements described in Fig. 1 and also shows how the upper roll 6 moves vertically in parallel relation by means of the dotted lines 30. Also, the longitudinal tilting action of the lower roll 14 into different angular relationships in out-of-line positions apart from where the roll axis and shaft axis coincide is indicated by the dot and dash lines 31 and 32, respectively.

Fig. 5 illustrates a modified arrangement wherein the rolls 6 and 14 have been interchanged and are here indicated as 14*a* and 6*a*. In this case, the roll 6*a* revolves upon a fixed axis and comprises a driven roll connected with the wringer drive mechanism for driving the roll 14*a* through aligned contact at the bite of the rolls. Furthermore, roll 14*a* is tiltable in this arrangement and also is vertically movable in the same manner in which roll 6 operated in the structures of Figs. 1 and 4. It is believed that the operation of the roll structure in Fig. 5 is understood without further explanation thereof.

In the constructions shown and described it is desirable to maintain the tiltable roll operating in a vertical plane common to both rolls to efficiently carry out the wringing function. This may be accomplished in various ways, and one arrangement for carrying out this vertical

guiding action is disclosed in Figs. 1 and 1A, and this design or similar designs can be used with tiltable wringer rolls of the kind described.

In Figs. 1 and 1A the vertical guide housings 4 and 5 for the roll bearings 7 and 8 are each of strap iron construction forming a hollow cage and each cage is provided with inturned edges forming ways 85 and 86 facing each other as best seen in Fig. 1A. Guide brackets 87 and 88 positioned as shown in Fig. 4 with bracket 88 better illustrated in dotted lines in Fig. 1A, each have fore and aft staggered fingers 88*a* and 88*b* arranged to straddle the ways 85 and 86 and are slidably mounted in this fashion upon the ways for vertical movement. Each bracket has a flanged opening 89 therein, such opening being somewhat elongated vertically for clearance purposes.

The tubular sleeve 15 projects beyond the ends of the roll 14 and rides within the openings 89 in the guide brackets 87 and 88, respectively, the openings 89 being of a width substantially equal to or slightly larger than the outside diameter of the roll sleeve 15. Thus, the ends of the tiltable roll can move vertically with respect to the brackets 4 and 5 but are substantially held against movement laterally out of the vertical plane common to both of the wringer rolls 6 and 14.

Therefore, in general, the present invention provides a means in a wringer having rolls suspended for operation between fixed bearings and movable bearings wherein one of the rolls is carried for tiltable action with respect to one of the sets of bearings to obtain the equalizing action which is quick and efficient in leveling off bunched clothing augmenting the normal spring urged squeezing action of the wringer rolls together with the normal resiliency of the rubber surfaces of such rolls.

The pressure applying, release and resetting means are more fully disclosed, described, and claimed in my aforesaid copending application. These means are best illustrated in the instant case in Figs. 6 and 7.

Referring now to these figures, as well as Figs. 1 and 1A, it will be seen that pressure is applied to the rolls by a linkage system mounted on the outer face of the end plate 1 and a lesser linkage system on the outer face of the end plate 2 at the opposite end of the wringer, these being the link mechanisms generally indicated by numerals 11 and 12. Such linkage system includes a pair of arms 90 and 91 both of which are fixedly connected to a cross shaft 92 extending the length of the wringer. The other end of the link or arm 90 (Fig. 6) is pivoted as at 93 to the aforesaid bracket 9 supporting the bearing 7 for the upper roll 6, the pivotal connection acting through a suitable slot 94 in the end plate 1. Similarly, the link or arm 91 on the opposite end has its other end pivoted as at 95 to the aforesaid shiftable bracket 10 carrying the bearing 8 for the upper roll 6, this linkage connection acting through a suitable slot 96 in the bearing plate 2 as seen clearly in Fig. 1A. Obviously, when the link 90 is moved clockwise as seen in Figs. 6 and 7, the link 91 must be moved counterclockwise as seen in Fig. 1A, and the upper roll is urged downwardly against the lower roll.

Pressure is applied to the arms 90 and 91 by means of a spring carrying linkage system on the end plate 1 as seen in Figs. 6 and 7. A pair of spaced links 97 and 98 are provided at one end to the end plate 1 as at 99 and 100, respectively.

The link 98 is of channel shape and to the outer wall of this channel shape link 98 one end of a transversely extending link 101 is pivoted. At its outer free terminus this link 101 carries a fixed spring seat washer 102. A similar link 103 is pivoted at one end to the free end of the link 97 and at its outer and free terminus this link carries a fixed spring seat washer 104. Surrounding both links 101 and 103 and bearing against the spring seat washers 102 and 104 is the coil pressure applying spring generally indicated by numeral 13. The links 101 and 103 are substantially parallel and are free to move substantially lengthwise relatively to each other inside the spring 13 in accordance with variations in spring pressure.

Since the link 98 is prevented from counterclockwise movement as seen in Figs. 6 and 7 by a latch means to be later described when pressure is applied, the spring 13 bearing against the fixed washer 104 tends to urge the link 97 clockwise and by means of a link 105 pivotally connected to one end of the link 97 and at the other end to an extension 106 on the aforesaid arm 90, tends to force the arm 90 clockwise as seen in Figs. 6 and 7 to apply pressure to the wringer rolls as above described.

As seen best in Fig. 6, the parts are held in pressure applying position by means of a latch arm 107 which is provided with a tapering latch engaging nose 108 the flat end of which engages an extension in the form of a latch 109 on the inner part of the channel-shaped link 98. These parts are held engaged, of course, by the action of the spring 13 urging the link 101 and consequently the link 98 to the left as viewed in Figs. 6 and 7. Pivoted to the latch arm 107 adjacent the latching end thereof is a roller 110, the shank of which operates in an inverted L shape aperture or slot 111 in the end plate 1. The other end of this latch arm 107 is pivoted as at 112 to an intermediate part of an arm 113 in turn pivoted as at 114 to the end plate 1. This arm 113 is integral with an angularly disposed reset lever 115, and the arm 113 also carries an abutment 116 the outer end of which is visible in Figs. 6 and 7 and which extends inwardly at right angle to arm 113 to bear against the latch arm 107 when the reset lever is pushed downwardly to the position seen in Fig. 6. With the parts in this position as seen in Fig. 6, the lever 98 is prevented from moving counterclockwise, and the pressure of the spring 13 is to the right to actuate the arm 90 and consequently the arm 91 on the opposite side of the wringer clockwise to exert pressure on the rolls.

Pressure release is effected in times of emergency by a pair of inverted U-shaped rockable frames 117 and 118 seen clearly in Figs. 1A, 6 and 7. The frame 117 is pivoted to the end plate 1 near the bottom thereof as at 119 and to the opposite end plate 2 as at 120, while the frame 118 is similarly pivoted to the plate 1 as at 121, and to the end plate 2 as at 122. The two frames are connected together for simultaneous movement by a cross link 123 whereby either frame 117 or 118 may be pushed or pulled to effect pressure release. This pressure release is effected by a hook 124 carried by one of the end members of the frame 118. As seen clearly in Figs. 6 and 7, especially Fig. 7, the hook has a recessed upper portion defined by converging edges to form a notch 125 in which the aforesaid roller 110 may seat when the parts are in pressure applying position. Any movement of either frame 117 or

118 inwardly or outwardly causes a portion of the hook 124 to elevate the roller 110 into the upper portion of the slot 111 as seen in Fig. 7, and thus elevate the nose 108 of the latch arm 107 out of engagement with the latch 109 on the link 98. Very little movement is required to disengage these latch elements, and permit the link 98 to swing counterclockwise, releasing pressure on the rolls. This results in a very minute upward movement of the reset lever 115 from its position in Fig. 6 which upward movement is far less than this lever must be moved to reach the position seen in Fig. 7.

When it is desired to reset the pressure, it is a simple expedient to move the reset lever 115 first counterclockwise to a position beyond that seen in Fig. 7. This permits a coiled spring 126 acting against the link 98 to move the linkage element clockwise sufficiently to permit the nose 108 of the latch arm 107 to engage behind the latch 109 on the link 98, this spring 126 being effective for this purpose when the spring 13 is not exerting pressure. Such initial engagement is seen in Fig. 7. Then, downward pressure on the reset lever 115 causes the lug 116 to engage the latch arm 107, and force this latch arm to a slightly over-center position seen in Fig. 6 so that pressure is again applied to the rolls.

Other changes and modifications may be made in the structures disclosed and described without departing from the general concept of the present invention. Therefore, this invention is not to be limited to the exact form, parts, or combination of elements herein disclosed and described excepting insofar as the same shall be governed by the breadth and scope of the appended claims directed thereto.

What I claim is:

1. In a wringer, a first wringer roll, bearing means arranged to support said wringer roll for normal rotation upon an axis, a second wringer roll, and second bearing means arranged to support said second wringer roll for rotation upon a floating axis, said first roll bearing means including a drive shaft, and fulcrum means interposed between said drive shaft and said first roll to allow the latter roll to tilt endwise.

2. In a wringer, a first wringer roll, bearing means arranged to support said wringer roll for normal rotation upon an axis, a second wringer roll, and second bearing means arranged to support said second wringer roll for rotation upon a floating axis, said first roll bearing means including a drive shaft, and fulcrum means interposed between said drive shaft and said first roll to allow the latter roll to tilt endwise, said first roll and said drive shaft having coacting means cooperating to transmit the drive from said shaft to said tiltable first roll.

3. In a wringer, a first wringer roll, bearing means arranged to support said wringer roll for normal rotation upon an axis, a second wringer roll, and second bearing means arranged to support said second wringer roll for rotation upon a floating axis, and releasable tension mechanism connected with said second bearing means to normally urge said second wringer roll toward said first wringer roll, said first roll bearing means including a drive shaft, and fulcrum means interposed between said drive shaft and said first roll to allow the latter roll to tilt endwise while under pressure from said tension means.

4. In a wringer, a bodily shiftable wringer roll, and a second wringer roll coacting therewith, said second wringer roll having means arranged to support the same for endwise tilting comprising a drive shaft mounted for rotation upon a fixed axis and projecting through said second roll, and a fulcrum unit carried by said shaft and connected with said second roll intermediate the ends thereof to allow said latter roll to tilt relative to the axis of said shaft.

5. In a wringer, a bodily shiftable wringer roll, and a second wringer roll coacting therewith, said second wringer roll having means arranged to support the same for endwise tilting comprising a drive shaft mounted for rotation upon a fixed axis and projecting through said second roll, and a fulcrum unit carried by said shaft and connected with said second roll intermediate the ends thereof to allow said second roll to tilt relative to the axis of said shaft, said fulcrum unit and said second roll having coacting means to transmit the driving torque from said shaft to said second roll independently of the tilting of that roll.

6. In a wringer, a bodily shiftable wringer roll, a second wringer roll coacting therewith, said second wringer roll being hollow and having fulcrum means arranged to support the same for bodily tilting movement on its long axis and relative to the shiftable wringer roll, said fulcrum means comprising a drive shaft extending through said hollow second roll, bearings supporting the ends of said shaft, and universal mechanism carried upon said shaft and connected with the midpoint of said hollow second wringer roll, said universal mechanism including coacting parts on said second wringer roll and said drive shaft respectively to transmit the driving torque directly from said shaft to that roll.

7. A tiltable mechanism for longitudinally tilting a wringer roll having a shaft adapted for mounting in wringer bearings, said mechanism comprising fulcrum means interposed between said shaft and said roll consisting of a pin connected with the roll, and said shaft having an aperture therein to receive said pin, said aperture being substantially of pin diameter centrally of the shaft and flaring outwardly toward the surface of the shaft to permit rocking of the pin relative to the shaft and tilting of the wringer roll.

8. A tiltable mechanism for longitudinally tilting a wringer roll having a shaft adapted for mounting in wringer bearings, said mechanism comprising fulcrum means interposed between said shaft and said roll consisting of a pin connected with the roll, said shaft having an aperture therein to receive said pin, said aperture being substantially of pin diameter centrally of the shaft and flaring outwardly toward the surface of the shaft to permit rocking of the pin relative to the shaft and tilting of the wringer roll, and means disposed between said wringer roll and said shaft to maintain the wringer roll axis coincident with the shaft axis at said fulcrum mechanism.

9. In a wringer, a main frame, a first wringer roll, fixed bearings to support said wringer roll, a second wringer roll, support bearings for said second wringer roll, guide means on said frame for said second roll support bearings to allow said latter roll to ride toward or away from said first roll, means interposed between one of said rolls and its connected bearings to allow said one roll to tilt bodily and independently of its supporting bearings, and shiftable brackets carried

upon said guide means and coacting with said tiltable roll to confine the tilting movements of the latter to a predetermined plane of operation.

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