Oct. 27, 1942. C. W. WILLIAMS 2,299,777

WRINGER

Filed Oct. 13, 1937 2 Sheets-Sheet 1

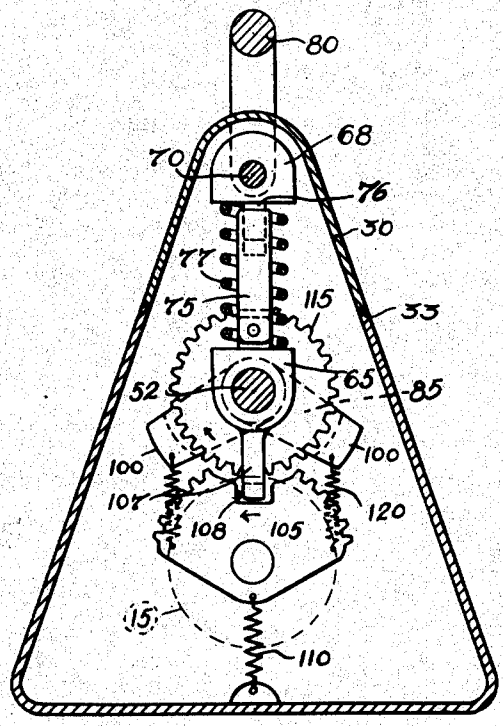


Fig. 4

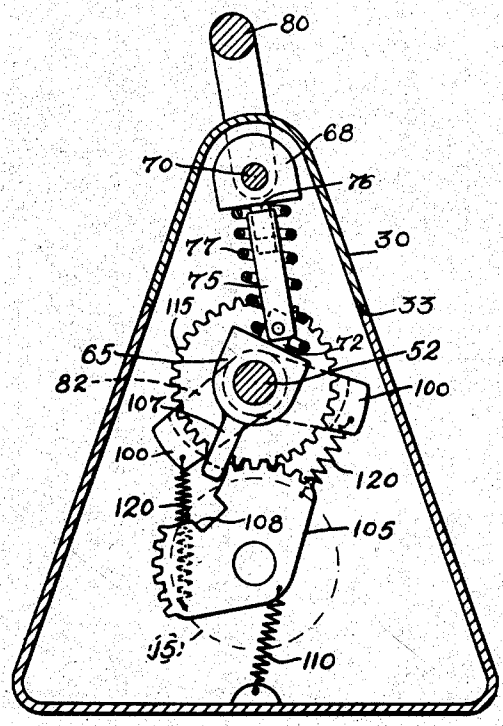


Fig. 5

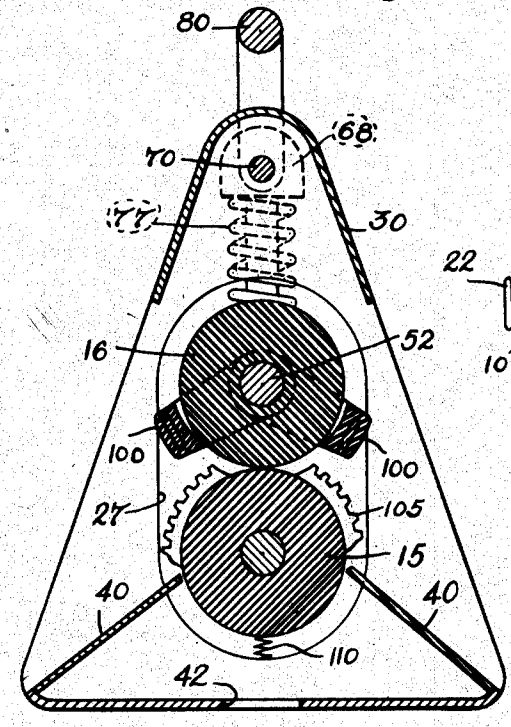


Fig. 3

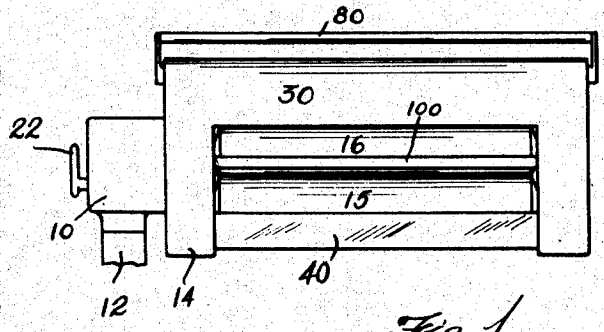


Fig. 1

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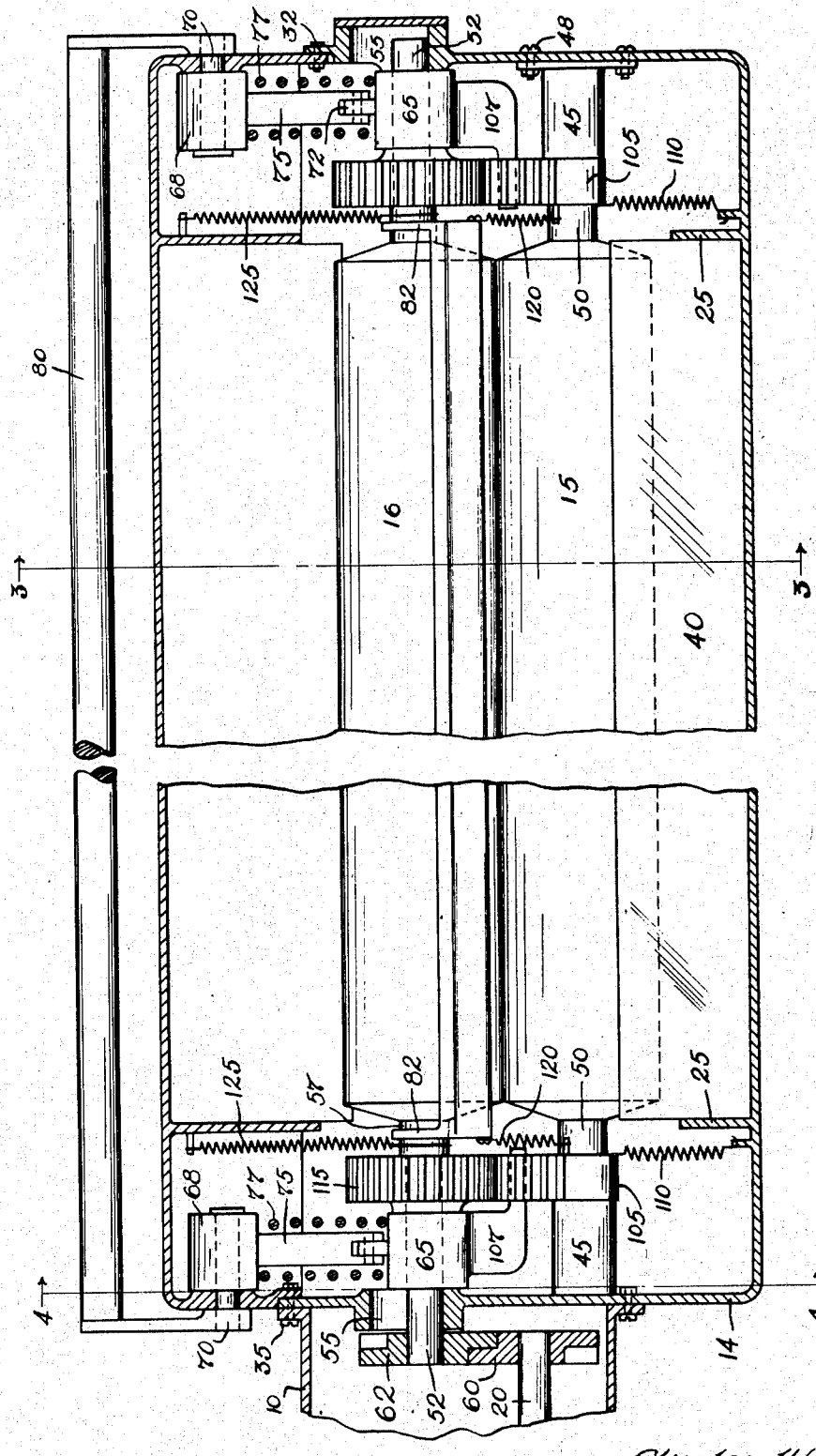


Fig. 2

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UNITED STATES PATENT OFFICE

2,299,777

WRINGER

Charles W. Williams, Cleveland Heights, Ohio, assignor to Automatic Safety Wringer Company, a partnership

Application October 13, 1937, Serial No. 168,734

11 Claims. (Cl. 68—253)

This invention relates to clothes wringers and more particularly to the type adapted for household use with the ordinary domestic washing machine.

The cardinal objection to clothes wringers generally has been their dangerous features, often resulting in serious injury to the user.

The wringing pressure rolls are urged together with so much pressure that permanent injury almost invariably results if a person becomes caught between the bite of the rolls. Since many clothes wringers are power operated it is apparent that if a person's hands become caught between the rolls, unless some safety measure is provided, there is practically no possibility of release before serious injury results.

The chief object of this invention has been to design a clothes wringer affording a high degree of safety to the operator. Mechanism has been provided to stop the roll rotation if the operator becomes caught therein and also to release the wringing pressure between the rolls to prevent further injury.

An additional object of the invention has been to adapt this invention to a conventional two-roll wringer, although it will be apparent that certain features of the invention can be applied to wringers employing more than two rolls.

Still another object of the invention has been to provide the aforementioned safety mechanism in a simple and efficient construction, operative either automatically or manually.

An additional object of the invention has been to employ the operating power of the wringer to actuate the safety mechanism.

Other objects of the invention will become apparent from the specification and drawings and from the appended claims in which the novel features are summarized.

In said annexed drawings:

Fig. 1 is a small scale side elevation showing my improved wringer;

Fig. 2 is a vertical section through the wringer in a plane parallel to Fig. 1;

Fig. 3 is a transverse section as indicated by the lines 3—3 of Fig. 2;

Fig. 4 is a transverse section as indicated by the lines 4—4 of Fig. 2; and Fig. 5 is a section similar to Fig. 4, but showing the safety mechanism in a released position.

In general my invention comprises a wringer head 10 carried on a suitable washing machine post 12 and supporting the wringer 14. A pair of rolls 15 and 16 are carried in the wringer and accomplish the wringing action in a manner hereafter explained.

Power drive for the wringer is taken from the post 12 into the head 10. By means of the conventional arrangement of a pair of bevel gears alternately connected with a driven bevel gear a stub shaft 20 in the head may be rotated in either direction. A conventional clutch, operated by a handle 22, effects an engagement between the driven bevel gear and either of the other two gears to drive the shaft 20.

The main wringer frame 14 is supported by and secured to the head by suitable bolts. As shown in Fig. 2, the frame comprises a pair of end portions, each of which supports and conceals the operating mechanism to actuate the rolls. The end portions are respectively formed by the frame end plates and interior web plates 25. It will be noted that the web plates are provided with an elongated aperture 27 to facilitate assembly and permit operation of the rolls. The main frame 14 is surmounted by a cap or top frame 30, which is secured to the main frame by suitable bolts, indicated at 32. In Figs. 4 and 5 the break lines between the top and main frame on either side are shown at 33. It will be noticed in Fig. 2 that the main frame and the top frame are joined together by the same bolts that connect the top of the head 10, and which bolts are indicated at 35.

Feed tables 40, Figs. 2 and 3, are provided, carried by the main frame 14, to facilitate feeding clothes to the wringer rolls 15 and 16 and aid in removal of liquid extracted by the rolls. Since much of the liquid extracted passes between the roll 15 and the feed tables 40 to the interior of the main frame 14, a drain hole 42 is provided. If desired, a conventional drain board, shiftable to divert liquid from one side of the wringer to the other, may be provided in a well-known manner.

The lower roll 15, aside from its ability to rotate, is fixedly carried in the frame 14. To this end a pair of journals 45 are provided supporting the roll 15 for rotation in either direction desired. To facilitate assembly the right-hand bearing 45 is removable from the frame and secured thereto by bolts 48. To limit axial movement of the roll 15 and the bearings 45 the shaft thereof is of sufficient length to substantially abut the bottoms of the bearings at each end. Collars 50 are provided on the shaft of the roll 15 to maintain part of the safety mechanism in position as hereafter explained.

Carried directly above the roll 15 is the shift-

ably mounted pressure roll 16. This roll includes a shaft 52 journaled in the frame in supporting bearings, as indicated at 55. It will be noted that the top of the bearing 55 is elongated to permit the roll 16 to rise and fall as clothes are fed through the wringing bite. As hereafter explained, spacing collars 57 are provided at each end of the shaft 52. Axial movement of the shaft 16 is prevented by the position of the various parts carried on the shafts and the blocks 65, hereafter described, which are in abutting relation with the bearings 55.

To drive the rolls 15 and 16 a gear 60 is provided on the shaft 20 which in turn is rotated in either direction as heretofore described. The gear 60 meshes with a mating gear 62, carried by the left-hand end of the shaft 52 (Fig. 2). As shown in that figure, these two gears are of the staggered tooth type well known in the washing machine art, and each comprise two sets of gear teeth staggered with respect to each other so that the space between two teeth of one set is opposite a tooth of the oher set.

As above indicated, the roll 16 can rise in the bearings 55 as clothes are fed between this roll and roll 15. If the roll 16 is forced upwardly far enough in the bearings 55 driving engagement between the gears 60 and 62 will cease. This feature is utilized as hereafter described to automatically stop the pressure rolls when an excess thickness of material or the operator's hand is caught between the said rolls.

To maintain wringing pressure between the two rolls suitable spring mechanism is provided at each end of the wringer and carried by the top portion 30. This mechanism is best shown in Figs. 2, 4 and 5 and comprises a journal block 65 carried at each end of the roll 16. A pair of cooperating spring blocks, designated at 68, are rigidly secured to stub shaft 70 journaled in the top 30. The blocks 68 and the journal blocks 65 are linked together by an ear 72 on the blocks 65 pivotally connected to a link 75, which in turn is telescopically carried by a member 76 rigid with the blocks 68. A pressure spring 77 is secured between each block 68 and its corresponding journal 65 and, due to the compression in the spring, applies wringing pressure between the rolls 15 and 16. The telescopically carried member 75 is furnished to permit reapplication of wringing pressure on the roll 16 after the mechanism has assumed the position shown in Fig. 5 and as hereafter explained. To rock the spring members 77 and the telescopically carried member 75 together with the journal blocks 65 from the position of Fig. 5 to that of Fig. 4, a handle 80, rigidly secured to the stub shaft 70, is provided.

The safety features of the wringer are actuated by either of a pair of guard members 100, as shown in Fig. 3. Each guard member is supported on a pair of ears 82 at each end of the roll 16 and in such manner that either guard member may be moved independently of the other. A steel bar connects the ears 82, as shown in Fig. 3, and is surrounded by a comparatively soft rubber structure which, at the lower end adjacent the roll 16, bears thereagainst to effect a stripping action when the material tends to become wrapped around the rolls. The rubber portion is necessary to resiliently maintain the stripping action and to prevent injury to the operator upon coming in contact with the release guard mechanism 100.

As shown in Figs. 2, 4 and 5 there is carried a segment of a gear 105 on the shaft of the roll 15 between respective journals and the collars 50. Referring to Fig. 4 it will be seen that a tongue, indicated at 107, carried by the journals 65, lies within a slot 108 of the aforementioned segment gear 105. These gear segments are idly carried on the shaft of the roll 15 and are normally maintained in the position shown in Fig. 4 by the coil springs 110 connected to them and to a lug in the base of the frame. It is to be noted that the pitch diameter of the teeth on the segments 105 is considerably greater than the diameter of the roll 15.

Directly above the teeth of the segments 105 at each end of the wringer, is carried a gear 115 pinned to the shaft 52 and rotated thereby. These gears are preferably about equal in pitch diameter to the diameter of the roll 16. Springs 120 connect each end of each gear segment 105 to a corresponding end of each guard member 100, as indicated in Figs. 2, 4 and 5.

The operation of the safety mechanism is as follows. When a situation arises demanding release of the wringing pressure and stopping of the roll rotation the guard member 100 at the feed inside of the wringer is shifted upwardly. This may be done either manually by the operator or automatically due to the excess thickness of material forced between the guard and the lower roll 15, as best shown in Fig. 3. As this movement of the guard member occurs and the same is rocked upwardly the spring member 120, due to sufficient tension in the spring pulls the guard segment 105 about its pivot on the shaft 52 until the teeth of the gears 115 and segments 105 engage. As soon as this takes place the driving power in the wringing rolls pulls the gear segment around into the position shown in Fig. 5. Due to the difference between the pitch diameter of the segment 105 and the diameter of the roll 15, the upper roll 16 is urged upwardly, thus providing a gap between the rolls and relieving any pressure on the operator's fingers. At the same time this action is taking place the tongues 107 lying in the slots 108 are rocked by movement of the gear segment from the position of Fig. 4 to the position of Fig. 5. As will be seen, this buckles the toggle formed by the telescopic members 75 and the ears 72 and snaps the pressure spring 77 to a position where any tendency on the part of the spring to urge the rolls 15 and 16 together is removed.

The separation of the rolls 15 and 16 is accomplished by the upward movement of roll 16 generally vertical to the line of the wringer. I call such movement a straight line motion to distinguish from a case where roll 16 is rocked, in an arc of short radius, away from roll 16.

As above described, actuation of the guard member 100 not only forces the pressure rolls apart, but releases the operating pressure tending to urge them together. It is important to note that these operations are effected by the power drive from the washing machine motor and are not dependent upon any manual pressure exerted by the operator unless the guard member 100 is manually rocked to initiate the throw-out mechanism. The actual throw-out, however, in all cases is accomplished in the wringer drive.

Simultaneously with the release of the operating pressure and a forcing apart of the pressure rolls there is established a break in the drive to the roll 16. As the segments 105, together with the gears 115, force the roll 16 upwardly the gears 60 and 62 are forced out of driving engagement with each other. After this release is

effected, due to the inoperative position of the pressure spring 77, the lower gear 60 rotates idly past the upturned gear 62. If it is desired to completely separate the gears 60 and 62 this may easily be accomplished by a pair of light springs 125 secured at one end about the shaft 52 of the roll 16 and at the other end to pins carried by the top 30. These springs are strong enough to support the weight of roll 16 and its associated mechanism. It thus follows that as soon as the main pressure springs 77 are rendered inactive due to the breaking of the toggle the comparatively light springs 125 are free to maintain the roll 16 in a raised position, thus effectively disengaging the gears 60 and 62 and maintaining a substantial gap between the rolls 15 and 16.

After the safety mechanism has acted and the rolls are separated, the rotation is stopped and the wringing pressure released, operation may be reinstated in a very simple manner. This is accomplished merely by rocking the member 80 from the position shown in Fig. 5 back to the upright position of Fig. 4. It will be seen that this compresses the spring 77 and urges the rolls 15 and 16 into wringing relation with each other, at the same time reengaging the gears 60 and 62. This arrangement is possible because the gear 60 is constantly rotating and thus will easily ride into engagement with the mating gear. Simultaneously with the reestablishment of pressure and drive, the gear segments 105 are rocked in the neutral position of Fig. 4 by the springs 110. The guard members 100 return to their normal position due to the tension in the springs 120. It is noted that as the guard member 100 on the one side of the wringer is raised and the gear segments rock to the position shown in Fig. 5, the left-hand guard 100 need not be drawn downwardly. Instead, the corresponding springs 120 are elongated if there is resistance to the pulling of said guard toward the gear segment.

It will be seen from the foregoing description that I have provided an improved wringer with features affording increased safety to the operator and which features are of very simple construction and operation.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the form or construction herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a wringer, a frame, a pair of rolls carried by said frame, power means to rotate said rolls, resilient means to urge said rolls together and mechanism operable automatically by said power means on feeding an excess thickness of material to the wringer to shift the roll axes with respect to each other and simultaneously release the normal operating pressure on the rolls.

2. In a wringer, a frame, a roll shiftably carried by the frame, a second roll carried by the frame, power drive means to rotate said rolls, resilient means to urge said rolls together to provide a clothes gripping bite, power operated means to separate said rolls against the action of said resilient means, release the clothes gripping pressure thereon and stop the roll rotation, and automatic mechanism to operate said power operated means consequent upon feeding an excess thickness of material to the wringer.

3. In a wringer, a frame, a roll shiftably carried by the frame, a second roll carried by the frame, power drive means to rotate said rolls, resilient means to urge said rolls together to provide a clothes gripping bite, power operated means to separate said rolls against the action of said resilient means and automatic mechanism to operate said power means consequent upon feeding an excess thickness of material to the wringer.

4. In a wringer, a frame, a roll shiftably carried by the frame, a second roll carried by the frame, power drive means to rotate said rolls, resilient means to urge said rolls together to provide a clothes gripping bite, a guard member parallel with and adjacent one of said rolls, a gear rotatably carried on an axis coincident with the axis of one of the rolls, a toothed member idly carried coincident with the other roll axis and operably connected with said guard member and with the sum of the radii of the gear and toothed member greater than the sum of the radii of the two rolls, said guard member operating to shift said toothed member into engagement with said gear to force said rolls apart.

5. In a wringer, a frame, a roll shiftably carried by the frame, a second roll carried by the frame, power drive means to rotate said rolls, resilient means to urge said rolls together to provide a clothes gripping bite, a guard member parallel with and adjacent one of said rolls, a gear rotatably carried on an axis coincident with the axis of one of the rolls, a toothed member operably connected to said guard member and idly carried coincident with the other roll axis and with said teeth lying along a segment of a pitch circle of greater diameter than the diameter of the supporting roll, said guard member operating to shift said toothed member into engagement with said gear to force said rolls apart.

6. In a wringer, a frame, a roll shiftably carried by the frame, a second roll carried by the frame, power drive means to rotate said rolls, resilient means to urge said rolls together to provide a clothes gripping bite, a guard member parallel with and adjacent one of said rolls, a gear rotatably carried on an axis coincident with the axis of one of the rolls, a toothed member operably connected to said guard member and idly carried coincident with the other roll axis and with said teeth lying along a segment of a pitch circle of greater diameter than the diameter of the supporting roll, said guard member operating to shift said toothed member into engagement with said gear to force said rolls apart, release the resilient pressure means establishing said clothes gripping bite and stop the rotation of said rolls.

7. In a wringer, a frame, a pair of rolls carried by said frame, power means including a reversible connection to rotate said rolls in either direction desired, and mechanism operable from either side of the wringer during rotation in either direction to force said rolls apart in a substantially straight line motion by said power means.

8. In a wringer, a frame, a roll shiftably carried by the frame, a second roll carried by the frame, said rolls mounted for rotation in either direction to receive clothes from either side of the wringer, power driven means including a reversible connection to rotate said rolls in either direction desired, resilient means to urge said rolls together to provide a clothes gripping bite, a toothed member rotatably carried by one of the roll shafts, a toothed member idly carried by the other roll shaft and with the sum of the radii of

said toothed members greater than the sum of the radii of said rolls, and mechanism operable during roll rotation in either direction to shift said toothed members into engagement with each other to force said rolls apart.

9. In a wringer, a frame, a roll shiftably carried by the frame, a second roll carried by the frame, said rolls mounted for rotation in either direction to receive clothes from either side of the wringer, power drive means including a reversible connection to rotate said rolls in either direction desired, resilient means to urge said rolls together to provide a clothes gripping bite, a gear rotatably carried by one of the roll shafts, a toothed member idly carried by the other roll shaft and with said teeth lying along a segment of a pitch circle of greater diameter than the diameter of the supporting roll such that the sum of the radii of said gear and said toothed member is greater than the radii of said rolls, and mechanism operable from either side of the wringer during roll rotation in either direction to shift said toothed member into engagement with said gear to force said rolls apart.

10. In a wringer, a frame, a roll shiftably carried by the frame, a second roll carried by the frame, said rolls mounted for rotation in either direction to receive clothes from either side of the wringer, power drive means including a reversible connection to rotate said rolls in either direction desired, resilient means to urge said rolls together to provide a clothes gripping bite, separating means adapted to engage each other and in the engaged position force the two rolls apart against the action of said resilient means, mechanism connected with the power drive to operate said separating means, and a member shiftable from either side of the wringer and during roll rotation in either direction to operate said separating means by the power drive.

11. In a wringer, a frame, an upper and a lower roll carried by said frame, resilient means to urge said rolls together including a two-part toggle mechanism, one of said parts being mounted coaxially with the upper roll, power means to rotate said rolls and means operable upon feeding of excess thickness to the wringer to break said toggle means and release the normal operating pressure on said rolls.

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