Aug. 24, 1926. 1,596,880

W. E. JOHNSTON

WRINGER

Filed Feb. 5, 1921 2 Sheets-Sheet 1

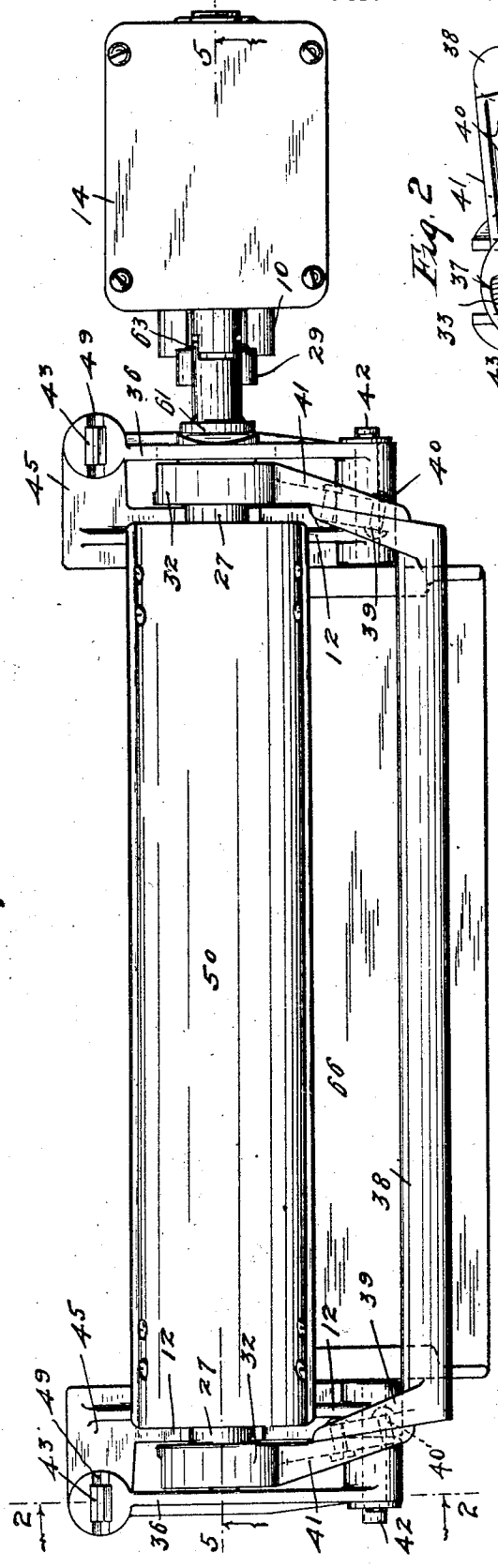


Fig. 1

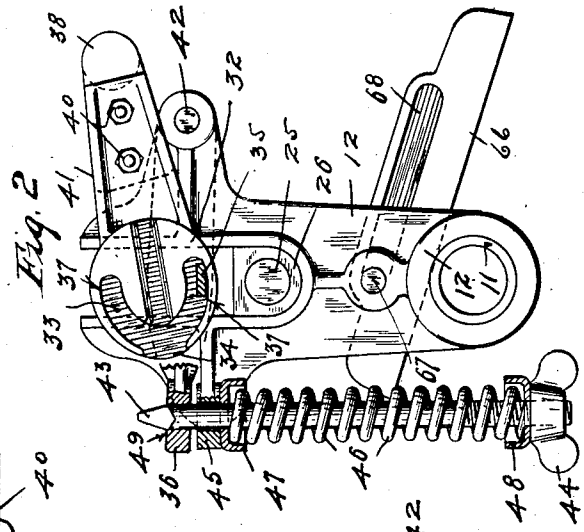


Fig. 2

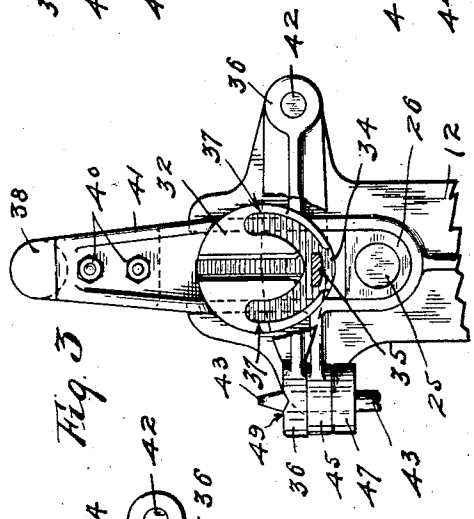


Fig. 3

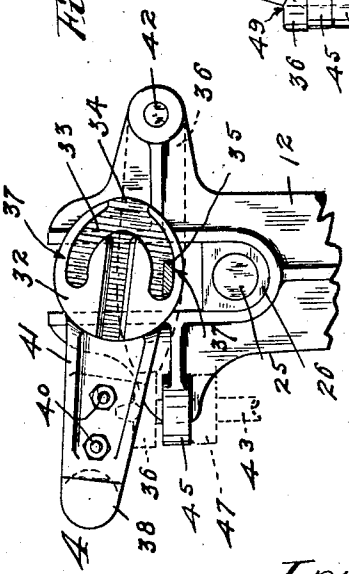


Fig. 4

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Filed Feb. 5, 1921. 2 Sheets-Sheet 2

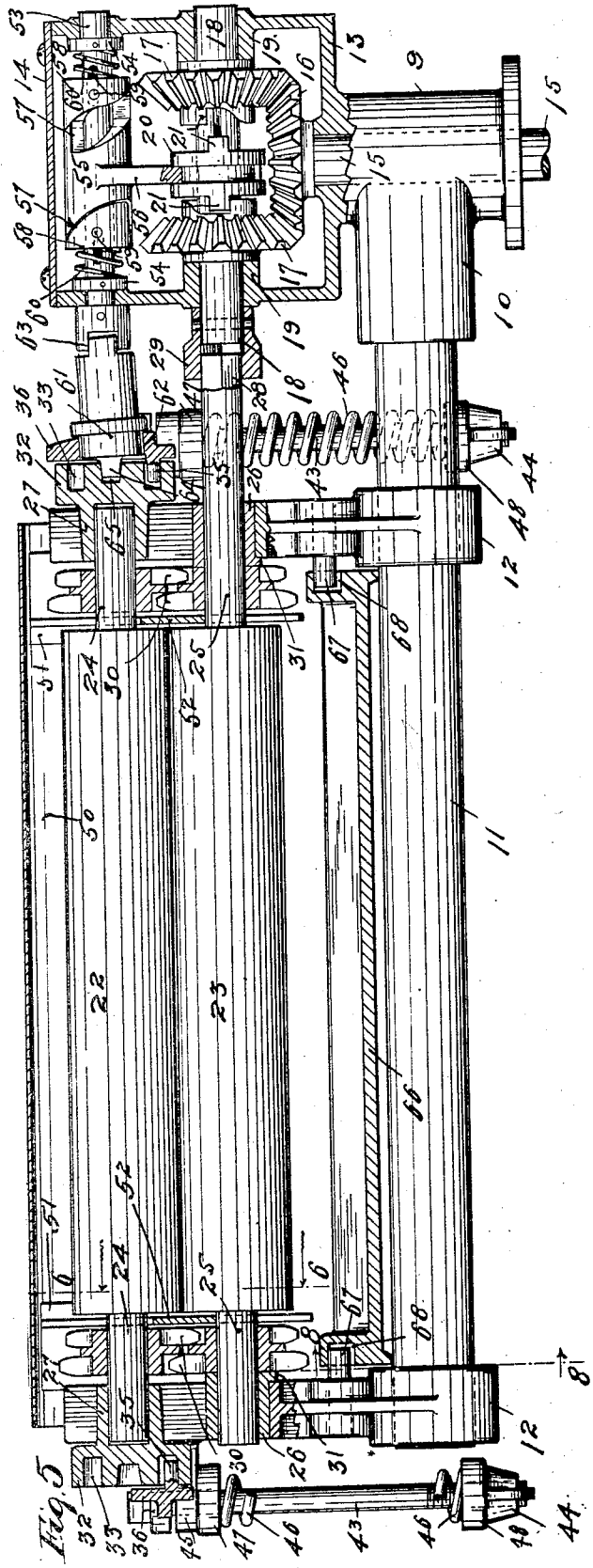


Fig. 5

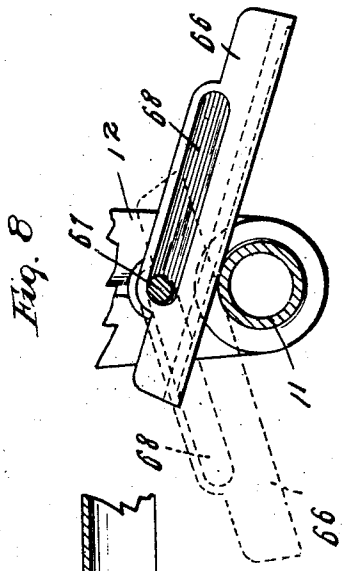


Fig. 8

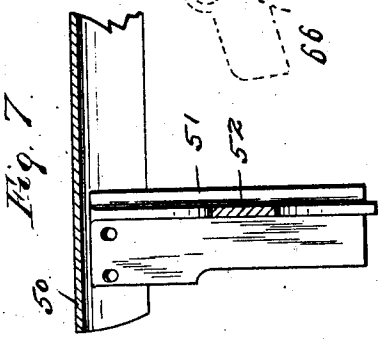


Fig. 7

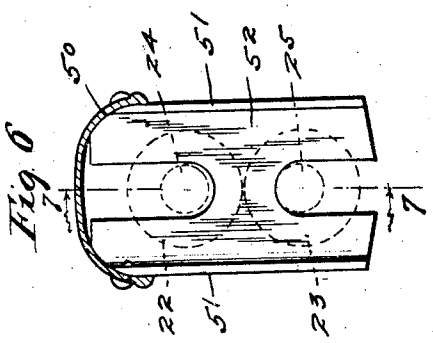


Fig. 6

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UNITED STATES PATENT OFFICE.

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WRINGER.

Application filed February 5, 1921. Serial No. 442,679.

My invention relates to improvements in power-operated wringers for clothes or similar articles, and has for its object to improve the same in the several particulars hereinafter noted.

To the above end, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In addition to certain other features hereinafter disclosed, this invention involves several highly important features believed to be broadly new and which may be briefly enumerated as follows: A so-called safety guard, which is movable from one feeding side of the rolls to the other, and operating devices which couple the rolls to the driving mechanism for the proper feeding movement in respect to the position of the guard. The safety guard, when in a predetermined position, which is preferably a central upturned position, uncouples one of the rolls from the other so that the rolls will separate and be relieved from pressure; and preferably, this same movement of the safety guard to neutral position uncouples the rolls from the driving mechanism, so that the roll-driving action will be stopped simultaneously with the release of the one roller from pressure toward the other. With this arrangement, it follows that the rolls cannot be driven in the one direction or the other, except when the safety guard is in proper position on the feeding side of said rolls. In the safety-guard-actuating connection for coupling the driving mechanism to the rolls, there is a yielding element which permits the safety guard to be thrown from one position to another at any time and which will subsequently come into action to couple the driving mechanism to the rolls.

In the drawings, I have illustrated a commercial form of the wringer, but it will, of course, be understood that I do not limit myself to the details of mechanism illustrated and described in connection with these drawings.

While the invention is especially adapted for use in connection with clothes wringers, it is, of course, capable of being used in connection with power driven rolls for various different uses.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a plan view of the improved wringer;

Fig. 2 is an end elevation sectioned substantially on the line 2—2 of Fig. 1;

Fig. 3 is a view corresponding to Fig. 2, with the exception that certain parts have been operated to release the pressure on the rolls and move the clutch into a position to stop the lower roll;

Fig. 4 is also a view corresponding to Fig. 2, with the exception that certain parts have been operated to reverse the direction of rotation of the rolls;

Fig. 5 is a view partly in side elevation and partly in central vertical section taken on the line 5—5 of Fig. 1;

Fig. 6 is a detail view partly in elevation and partly in transverse section taken on the line 6—6 of Fig. 5, with some parts diametrically illustrated by means of broken lines;

Fig. 7 is a detail view in section taken on the line 7—7 of Fig. 6; and

Fig. 8 is a fragmentary detail view with some parts sectioned on the line 8—8 of Fig. 5, with the drain board shown in a different position by means of broken lines.

The frame of the clothes wringer illustrated comprises a horizontal rotatable bearing head 9 having a socket 10 in which is rigidly secured one end of a horizontal tubular bar 11 to which, in turn, is rigidly secured a pair of laterally spaced bifurcated end brackets 12. Integrally formed with the bearing head 9 and extending thereabove, is a rectangular housing 13 having a removable cover plate 14 held in position by screws. Suitable mechanism, not shown, may be provided to lock the head 9 to the frame of a washing machine or other support to hold the wringer frame in any of several desired horizontally oscillated adjustments.

An upright driving shaft 15 is journaled in the bearing head 9 and has secured to its upper end, within the housing 13, a bevel gear 16 with which meshes, at diametrically opposite points, a pair of opposing reversing gears 17. These gears 17 are

loosely journaled on a short horizontal shaft 18 journaled in bearings 19 formed with the housing 13. A shipper collar 20 is keyed to the shaft 18 between the gears 17 with freedom for endwise sliding movement. Reversely formed one-way clutches 21 are formed on the opposing faces of the reversing gears 17 and the outer faces of the shipper collar 20. This shipper collar 20 may be operated to alternately connect the two clutches 21 to drive the shaft 18 either forward or backward or to set the clutches in neutral position.

Upper and lower pressure rolls 22 and 23, respectively, have their shafts 24 and 25, respectively, extended between the prongs of the frame end brackets 12. The shaft 25 is journaled in stationary bearings 26 removably seated between the prongs of the frame end brackets 12, and the shaft 24 is journaled in floating tubular bearings 27 turnably mounted between the prongs of the frame end brackets 12 above the stationary bearings 26. Both pairs of bearings 26 and 27 are removable from the frame end brackets 12 by a lifting movement. The shaft 25, of the lower roll 23, is axially aligned with the shaft 18 and is connected thereto for common rotation therewith by a separable connection formed by squaring the inner end of said shaft at 28 and seating the same in a correspondingly formed socket member 29 secured to the adjacent end of the shaft 18. Obviously, the lower roll 23 may be readily removed from the wringer frame by lifting the same bodily, to carry its bearings 26 from the frame end brackets 12, and, during this movement, a slight angular movement of said roll will carry its shaft 25 out of the socket member 29 and separate the same from the driving mechanism.

The upper roll 22 is driven from the shaft 25 of the lower roll 23 by pairs of intermeshing gears 30 on the shafts 24 and 25. These gears 30 are spaced from the ends of the rolls 22 and 23 to afford clearance, for a purpose that will presently appear. The bearings 26 are held in the frame end brackets 12 against endwise movement by forming on the inner ends thereof, flanges 31 which extend between said frame end brackets 12 and the gears 30 of the shaft 25.

The rolls 22 and 23 may be held together, under the desired pressure, by spring tension devices to which said upper roll may be connected, at will, by coupling heads 32 formed on the outer ends of the floating bearings 27. In the outer face of each coupling head 32 is formed a segmental channel 33 and a peripheral entrance passageway 34 which opens into the intermediate portion of said channel. The coupling heads 32 are connected to the spring tension devices by lugs 35 formed on the intermediate portions of levers 36 of said spring tension devices and arranged to enter the channels 33 through the passageways 34. These lugs 35 are arranged to be engaged by the outer walls or flanges of the channels 33, which extend on either side of said passageways, and preferably, as shown, these flanges are made eccentric to the axis of the shaft 24 to afford cam surfaces 37 which extend in opposite directions from the passageways 34 and arranged to lift the lugs 35 and, hence, the levers 36 when the coupling heads 32 are turned in either direction in respect to an intermediate position in which the lugs 35 are aligned with the passageways 34.

Referring now to the safety guard, as shown, it will be noted that said guard is in the form of an operating bar 38 having laterally bent ends 39 detachably secured by nut-equipped bolts 40 to radial arms 41 formed with the coupling heads 32 at diametrically opposite points from the passageways 34. This safety guard connects the coupling heads 32 for simultaneously oscillatory movement to start, stop or reverse the rolls 22 and 23.

The levers 36, of the spring pressure devices, are fulcrumed on studs 42 secured in the frame end brackets 12 and their free ends are apertured to receive and support depending headed bolts 43 having, on their lower ends, thumb nuts 44. These bolts 43 also loosely extend through apertured lugs 45 formed with the frame end brackets 12 and on which lugs the free ends of the levers 36 normally rest. Coiled springs 46, which encircle the bolts 43, are compressed between spring caps 47 and spring bases 48 through which said bolts extend. The spring caps 47 and spring bases 48 react against the lugs 45 and nuts 44, respectively, as bases of resistance. To prevent the bolts 43 from turning in the levers 36 during the adjustment of the nuts 44 to vary the tension of the spring 46, the under faces of the heads of said bolts are V-shaped in cross section and seated in correspondingly formed grooves 49 formed in said levers.

The gears 30 and upper roll 22 are covered by a segmental shield 50 which extends over the tops of the frame end brackets 12 and from one to the other thereof. This shield 50 is secured to and supported on laterally spaced pairs of guard flanges 51 for the gears 30. These guard flanges 51 are connected by webs 52, the upper and lower ends of which are bifurcated. These webs 52 extend between the ends of the rolls 22 and 23 and the gears 30 and the lower bifurcated ends thereof straddle the shaft 25 and support said webs together with the guard flanges 51 and shield 50 therefrom. The upper bifurcated ends of the webs 52 receive the shaft 24 with freedom for floating movement and also hold said webs in upright positions. The guard flanges 51 are

of such width as to overlap the frame end brackets 12 and the ends of the rolls 22 and 23 and thereby, together with portions of the shield 50, entirely cover the gears 30. These guard flanges 51 also prevent clothes, when passing between the rolls 22 and 23, from getting between the ends of said rolls and the gears 30.

The following mechanism is provided for automatically operating the shipper collar 20, by a movement of the safety guard 38, to render either of the clutches 21 operative, at will, to turn the rolls 22 and 23 either forward or backward or set both of said clutches in neutral position and thereby stop the driving power from the shaft 15 to the lower roll 23, to wit: A counter-shaft 53 is journaled in the housing 13 above the shaft 18 and held against axial movement by collars 54 pinned thereto for engagement with bosses on opposite walls of said housing. Loosely mounted on the shaft 53 is a sleeve-like head 55 having a depending bifurcated shipper lever 56 which straddles the shipper collar 20, extends into an annular channel formed therein and connects said head thereto. On opposite ends of the head 55 are cams 57 which co-operate with yielding cam abutments 58 mounted on the shaft 53 for slight endwise sliding movement but held for rotation therewith by pin-keys and key-ways 59. Coiled springs 60, which encircle the shaft 53, are compressed between the collars 54 and cam abutments 58 and yieldingly hold said cam abutments at their extreme movement toward each other.

The purpose of yieldingly mounting the cam abutment 58 is to permit the guard shield 38 to be operated to connect the upper roll 22 to the tension devices, irrespective of the positions of the clutches 21. In case the members of the clutch to be connected are not aligned when the safety guard 38 is operated to connect the shaft 25 to the driving mechanism, the abutment 58, away from which the shipper head 55 is moving, will yield to permit the required movement of said safety guard and clutch actuating mechanism. Immediately upon the alignment of the members of the respective clutch, the compressed spring, acting through its abutment 58 on the shipper head 55, will operate the shipper collar 20 and cause said members to interlock.

The shaft 53 is connected to the inner coupling head 32 by a flanged hub 61 turnably mounted in an annular seat 62 formed in an expanded intermediate portion of the adjacent pressure lever 36. This hub 61 is flexibly connected to the shaft 53 by a universal joint 63 and to said coupling head by forming, on said hub, a radially elongated lug 64 removably seated in a correspondingly formed channel 65 in said coupling head. The purpose of flexibly connecting the hub 61 to the shaft 53 is to permit the required raising and lowering movement of the upper roll 22.

When pressure is applied to the upper roll 22, the lug 64 extends substantially in a horizontal plane, but when said pressure is released, the lug 64 is in a vertical position so that, in lifting the upper roll from the frame end brackets 12, said lug will move out of the channel 65 and thereby, separate the upper roll 22 from the clutch actuating mechanism.

As shown, a cast metal drain board 66 is rockably supported on the frame bar 11 for movement from one side of the wringer frame to the other. This drain board 66 is connected to the frame end brackets 12 and held in either of its extreme positions, with freedom for movement from one side of the wringer frame to the other, by studs or pins 67 secured to said frame end brackets and extending into slots 68 formed in the upturned ends of said drain board.

The operation of the improved clothes wringer may be briefly described as follows:

When pressure is released from the upper roll 22, the safety guard 38 is in an intermediate or upright position, as shown in Fig. 3, and the clutches 21 held in neutral position by the clutch actuating mechanism. In this position of the safety guard 38, the passageways 34 are aligned with the lugs 35 of the spring pressure devices and the lug 64 is in a vertical position so that by lifting said safety guard, all of the parts carried by the shaft 24 may be lifted from the frame end brackets 12 and separated from the spring pressure devices and the clutch actuating mechanism. After the upper roll 22 has been removed from the frame end brackets 12, the lower roll 23 may be readily removed therefrom in a manner previously described.

When the safety guard 38 is positioned as indicated in Fig. 3, a movement thereof to the right, as shown in Fig. 2, will interlock the coupling heads 32 with the lugs 35 of the pressure devices and the cam surfaces 37 will lift the levers 36 and place the springs 46 under a further tension at which they are held by the thumb nuts 44, and thereby press the upper roll 22 onto the lower roll 23. This pressure may be varied, at will, by adjusting the thumb nuts 44. It is, of course, understood that the cam surfaces 37 may be dispensed with and the engaging walls of the channels 33 made concentric to the axis of the shaft 24, in which case the springs 46 will not be placed under further tension by the engagement of the coupling heads 32 with the lugs 35 of the spring tension devices.

During the movement of the safety guard 38 from its position shown in Fig. 3 to its position shown in Fig. 2, the clutch actuat-

ing mechanism is operated to move the clutches 21 from neutral position into a position as shown in Fig. 5, to thereby connect the left-hand gear 17 to the shaft 18 to drive the shaft 25 and thereby cause the rolls 22 and 23 to turn in a direction to feed clothes therebetween from the side of the wringer on which the safety guard 38 is positioned. To reverse the direction of the rotation of the rolls 22 and 23, the safety guard 38 is moved in the opposite side of the wringer, as shown in Fig. 4, and this movement of the safety guard automatically operates the shipper collar 20 to release the left-hand gear 17 and lock the right-hand gear 17 to said shaft. It is important to note that the safety guard 38 is always on the side of the wringer from which the clothes are being fed to the rolls 22 and 23. It is also important to note that the safety guard 38 is located only slightly above the plane of the engaging surfaces of the rolls so that in case the operator's fingers are caught between the rolls or in the clothes being fed to the rolls, the safety guard may be engaged by a slight upward movement of the hand and thereby lifted into an intermediate position so as to carry the passageways 34 of the coupling heads 32 into alignment with the lugs 35, thereby releasing the pressure on the upper roll 22 and permitting the same to lift and, at the same time, this movement of the safety guard 38 will operate the clutch actuating mechanism and cause the same to move the clutches 21 into neutral position and thereby stop the driving power to the rolls.

By providing only a single operating device for the wringer to release the pressure on the rolls and stop the driving power thereto, an operator never has to hesitate as to what to do in case of an emergency, as he has accustomed himself to the use of only a single operating device, which is in itself a safety device.

From the above description, it is evident that the bar 38 performs two independent and distinct functions, the one in which it affords means by which the pressure devices are operated to apply pressure to the rolls or release the same and by which the clutch is operated to start, stop or reverse the rolls, and the other function is to afford a safety guard which extends always on the feeding side of the rolls to protect the operator therefrom. By simply turning the safety guard 38 into an upright position and using the same as a handle, the upper roll 22 may be lifted from the frame end brackets 12 to permit the rolls to be cleaned. New rolls may be very easily and quickly substituted for worn out rolls, and in removing one or both of the rolls from the frame and again replacing the same, it is not necessary to change the adjustment of the spring tension devices or any other part of the wringer. It will be noted that there are no angular parts on the wringer on which articles might catch and be drawn between the rolls, and, furthermore, all of the movable parts of the wringer are covered so as to protect the operator and the clothes.

The improved wringer, while extremely simple to manufacture and easy to assemble, has, in actual usage, proven highly efficient for the purpose had in view.

What I claim is:

1. The combination with co-operating rolls, of means including a clutch for driving one of the rolls, a safety guard mounted for movement parallel to the rolls from an inoperative position over said rolls to one side thereof into an operative position in front of the contacting surfaces of the rolls, and connections from the safety guard to the clutch including a shipper lever, said shipper lever being arranged to actuate the clutch and thereby stop the driven roll by a movement of the safety guard into a position over the rolls and start said rolls by a movement of the safety guard onto one side of the rolls into an operative position in front of their contacting surfaces.

2. The combination with co-operating rolls, of means including a clutch for driving one of the rolls, a safety guard mounted for movement parallel to the rolls from an inoperative position over said rolls to either side thereof into an operative position in front of the contacting surfaces of the rolls, and connections from the safety guard to the clutch including a shipper lever, said shipper lever being arranged to actuate the clutch and thereby stop the driven roll by a movement of the safety guard into a position over the rolls, start said rolls by a movement of the safety guard onto one side of the rolls into an operative position in front of their contacting surfaces and reverse said rolls by a movement of the safety guard onto the other side of the rolls into an operative position in front of their contacting surfaces.

3. The combination with co-operating rolls, of pressure devices set under tension for one of the rolls, means including a clutch for driving one of the rolls, and a safety guard movable into operative positions in front of the contacting surface of the rolls from one feeding side thereof to the other, to place one of the rolls under the action of the pressure devices and actuate the clutch to start or reverse the driven roll and movable into an intermediate position to release the respective roll from the pressure devices and stop the driven roll.

4. The combination with co-operating rolls, of pressure devices set under tension, means including a clutch for driving one of the rolls, and a safety guard movable on

the feeding side of the rolls to an operative position in front of the contacting surface thereof to place one of the rolls under the action of the pressure devices and actuate said clutch to start the driven roll and movable into another position to release the driven roll from the pressure devices and release the clutch.

5. The combination with co-operating rolls, of pressure devices set under a variable tension, means for driving one of the rolls, and a safety guard on the feeding side of the rolls having connections with the pressure devices whereby it is movable to place one of the rolls under the action of the pressure devices and movable into another position to release said roll from the pressure devices, the operative position of said safety guard being immediately above the bite of the rolls.

6. The structure defined in claim 5 in further combination with cams actuated by the safety guard when placing said rolls under the action of said pressure devices to further increase the tension thereof.

7. The combination with a frame, of co-operating rolls, pressure devices including levers fulcrumed to the frame, bolts carried by the levers, adjustable abutments on said bolts and springs compressed between the frame and the abutments, coupling heads carried by one of the rolls, means for driving the other roll, and a safety guard connecting said coupling heads for movement into one position for engagement with said levers to position said safety guard on the feeding side of the rolls and place the respective roll under the action of the pressure devices and movable into another position to release the coupling heads from the tension devices.

8. The combination with a frame, of co-operating rolls, pressure devices including levers fulcrumed to the frame, bolts carried by the levers, adjustable abutments on said bolts and springs compressed between the frame and the abutments, coupling heads carried by one of the rolls, means for driving the other roll including a clutch, and a safety guard connecting said coupling heads for movement into one position for engagement with said levers to position the safety guard on the feeding side of the rolls and place the respective roll under the action of the pressure devices and actuate said clutch to drive the connected roll and movable into another position to release the coupling heads from the tension devices and actuate said clutch to stop the connected roll.

9. The combination with a frame, of co-operating rolls, pressure devices including levers fulcrumed to the frame, bolts carried by the levers, adjustable abutments on said bolts and springs compressed between the frame and the abutments, coupling heads carried by one of the rolls, means for driving the other roll including a clutch, and a safety guard connecting said coupling heads and movable into operative positions in front of the contacting surfaces of the rolls from one side thereof to the other to place the respective roll under the action of the pressure devices and actuate the clutch to start or reverse the connected roll, said safety guard being movable into an intermediate position to release the respective roll from the pressure devices and actuate the clutch to stop the connected roll.

10. The combination with a frame, of co-operating rolls, pressure devices including levers fulcrumed to the frame and having lock lugs, bolts carried by the levers and having adjustable abutments and springs compressed between the frame and abutments, oscillatory coupling heads carried by one of the rolls and having segmental lock flanges for co-operation with said lock lugs, and a safety guard on the feeding side of the rolls and connecting said coupling heads for simultaneous movement into one position to carry the lock flanges into interlocking engagement with the lock lugs and into another position to release the same therefrom.

11. The combination with co-operating rolls, of pressure devices including levers having lock lugs, oscillatory coupling heads carried by one of said rolls and having circumferentially extended lock flanges circumferentially spaced to afford passageways therebetween for the lock lugs, and a safety guard connecting said coupling heads for simultaneous movement, said safety guard being movable from one feeding side of the rolls to the other to alternately carry the lock flanges into engagement with the lock lugs to connect the respective roll to the pressure devices and movable into an intermediate position to register the lock lugs with said passageways to release said roll from the pressure devices.

12. The combination with co-operating rolls, of pressure devices set under tension and including levers having lock lugs, oscillatory heads carried by one of said rolls and having circumferentially extended cam-acting flanges, circumferentially spaced to afford passageways therebetween for the lock lugs, a safety guard connecting said coupling heads for simultaneous movement, said safety guard being movable from one feeding side of the rolls to the other to carry said flanges into engagement with the lock lugs to connect the respective roll to the pressure devices and place the same under further tension and movable into an intermediate position to register the lock lugs with said passageways to release said roll from the pressure devices.

13. The combination with upper and lower co-operating rolls, of a pressure device, means for driving the lower roll, a coupling head carried by the upper roll for connecting the same to the pressure device, means arranged to be actuated by the coupling head to start, stop or reverse the lower roll, and a safety guard carried by said coupling head and movable from one feeding side of the rolls to the other to connect the upper roll to the pressure device and start or reverse the lower roll or into an intermediate position to release the upper roll from the pressure device and stop the lower roll.

14. In a wringer, the combination with the rolls of a pair of upwardly extending pivotally mounted side pieces, one of said side pieces being located at each end of the wringer, a handle at the top connecting said side pieces, a driving shaft, and means controlled by the movement of said handle and side pieces about the axis of the side pieces for applying and releasing pressure between the rolls and for starting and stopping the rolls.

In testimony whereof I affix my signature.

WAYBURN E. JOHNSTON.