Nov. 20, 1956 N. L. ETTEN 2,770,963

WRINGER

Filed Jan. 23, 1953 4 Sheets-Sheet 1

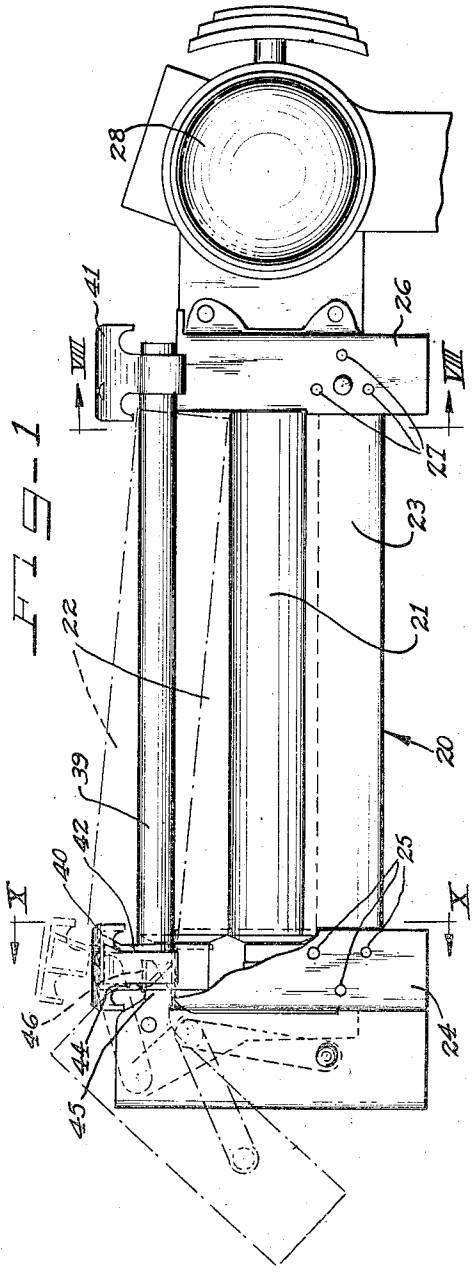


FIG. 1

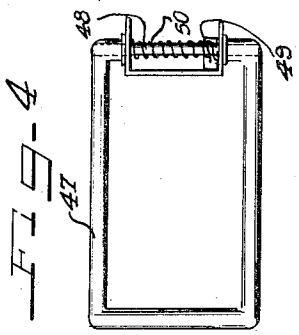


FIG. 4

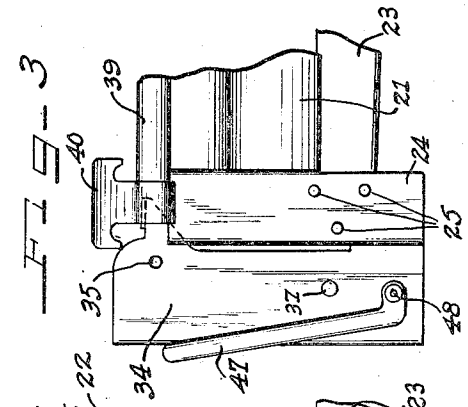


FIG. 3

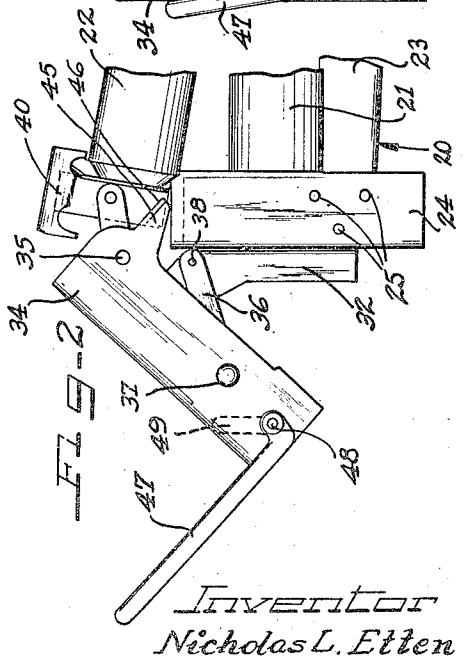


FIG. 2

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Nov. 20, 1956 N. L. ETTEN 2,770,963

WRINGER

Filed Jan. 23, 1953 4 Sheets-Sheet 2

FIG-5

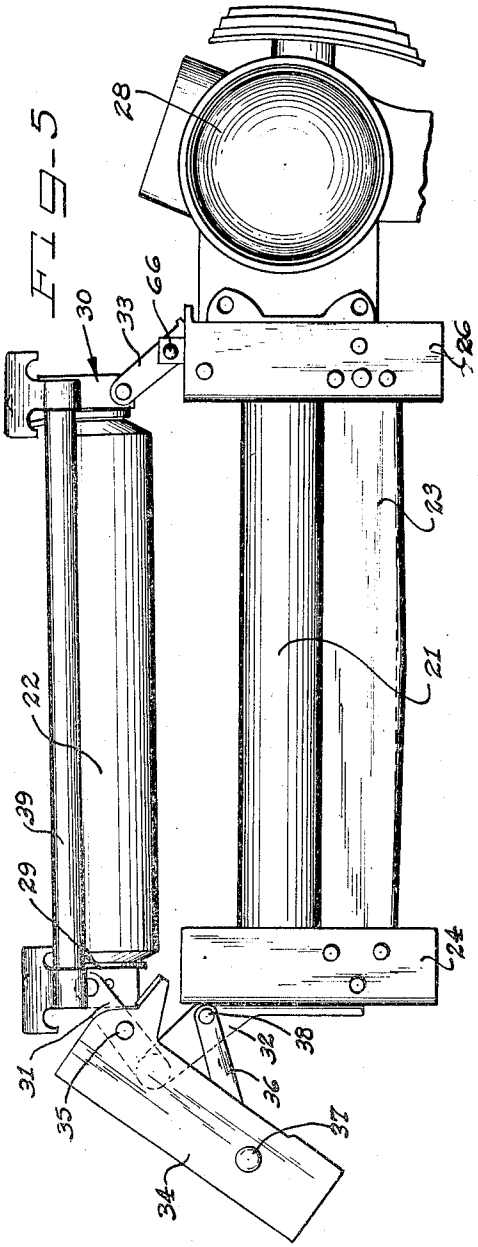


FIG-7

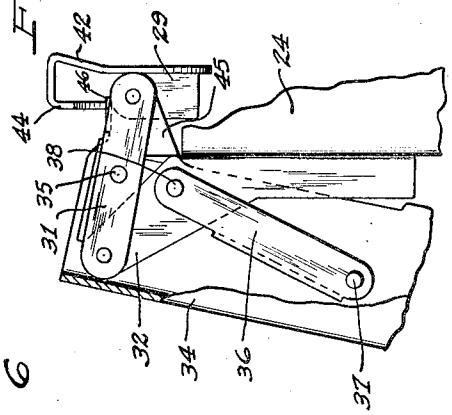
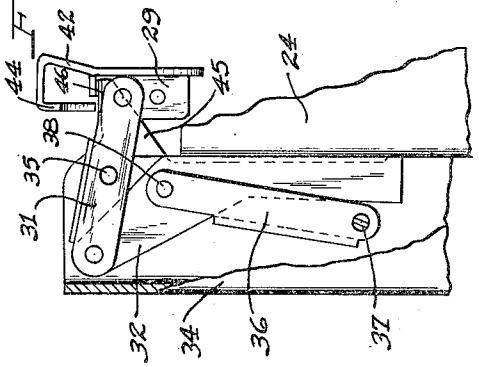


FIG-6



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Nov. 20, 1956 N. L. ETTEN 2,770,963

WRINGER

Filed Jan. 23, 1953 4 Sheets-Sheet 3

FIG. 8

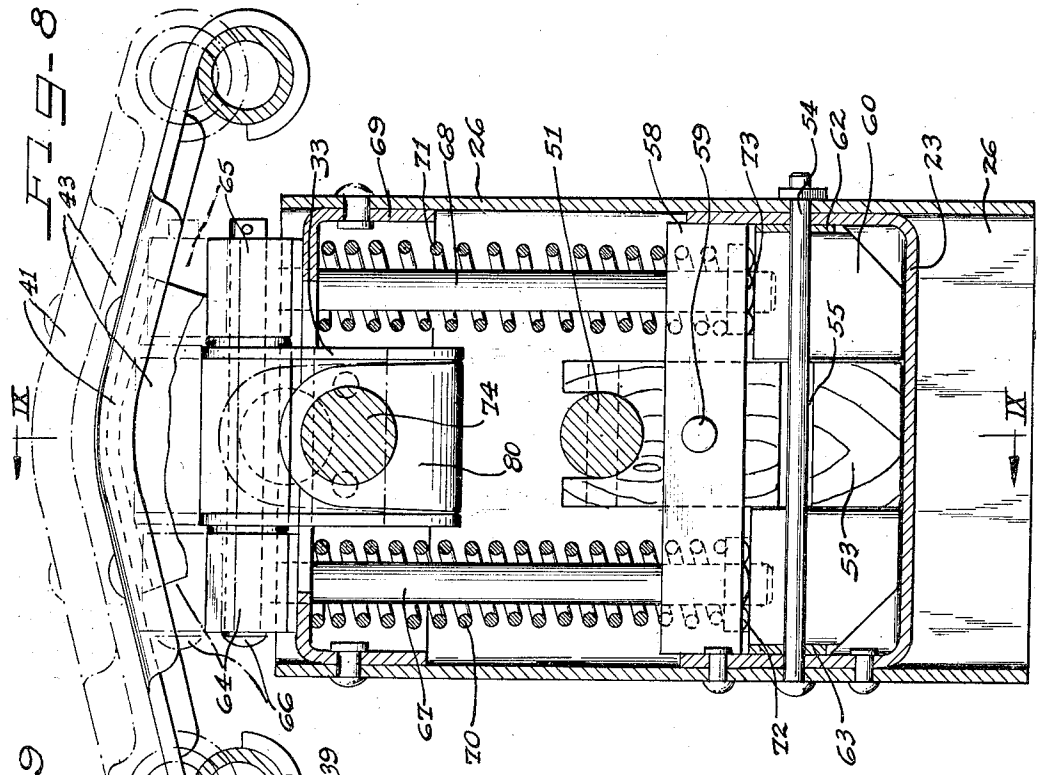
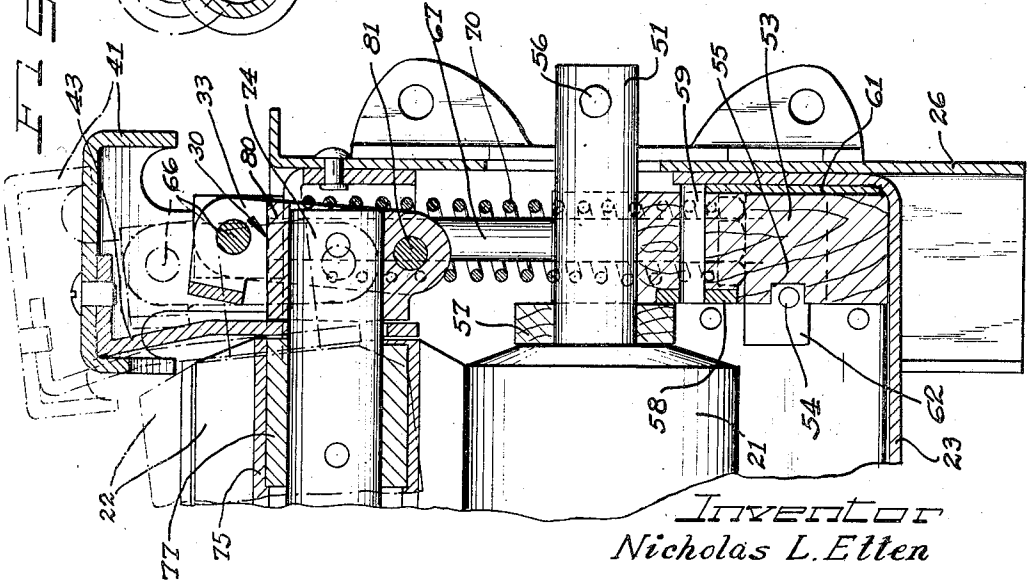


FIG. 9



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Nov. 20, 1956 N. L. ETTEN 2,770,963

WRINGER

Filed Jan. 23, 1953 4 Sheets-Sheet 4

FIG. 11

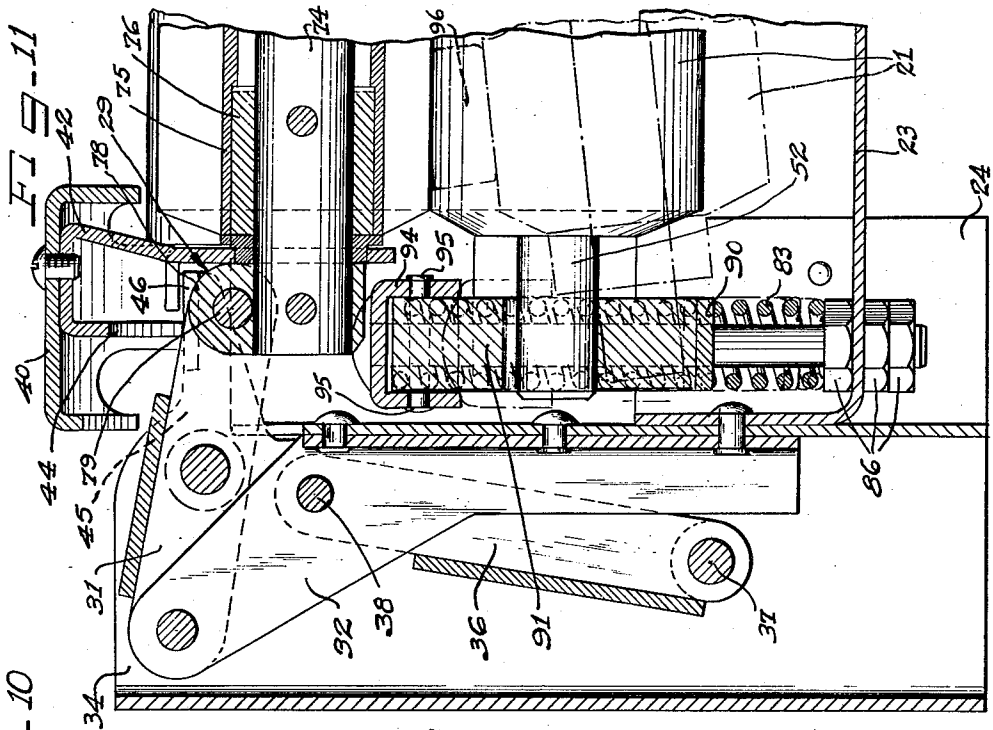
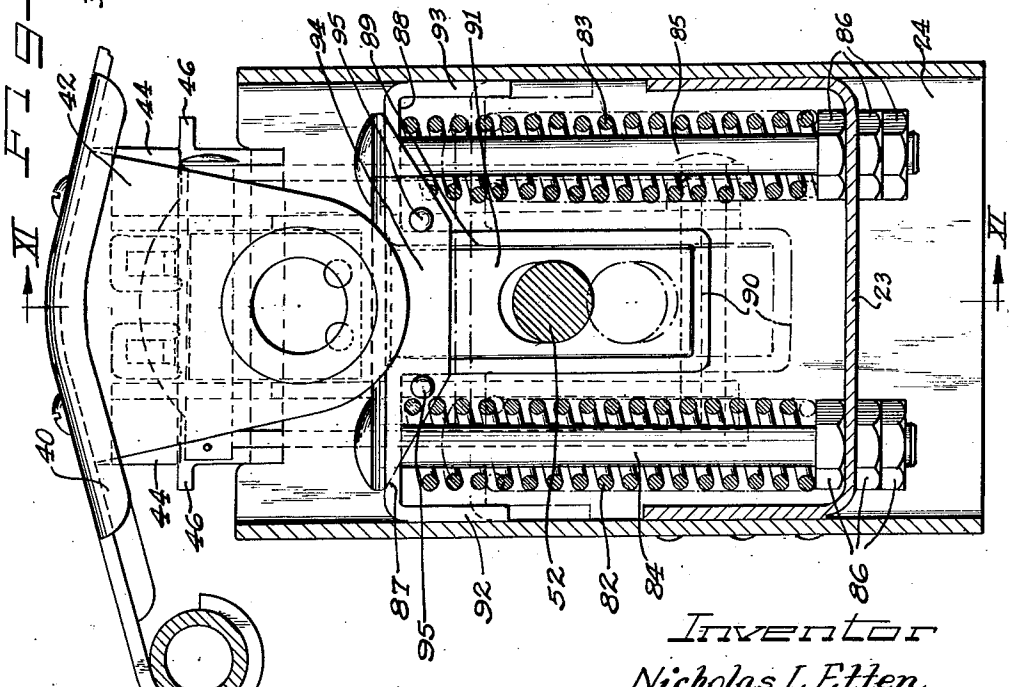


FIG. 10



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WRINGER

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Application January 23, 1953, Serial No. 332,841

7 Claims. (Cl. 68—262)

This invention relates to wringers and particularly to wringers for washing machines, although it will be apparent to those skilled in the art that the principles of this invention are applicable to other machines.

In the construction of a wringer, the objectives are to have an efficient wringing action with the wringer as simple as possible to operate and as safe as possible to operate. The wringer should be rugged and durable and able to withstand severe abuse and at the same time should be readily and economically manufactured and assembled.

According to this invention, a wringer is provided in which a lower roll is supported in a frame and an upper roll is supported only at its ends and is movable downwardly into pressure applied relation to the lower roll and upwardly in a pressure releasing direction with the upper roll in the open and readily accessible.

A particular feature of this invention is in the provision of an improved over-center reset handle acting at one end of an open top wringer for applying pressure between the rolls.

Another feature of this invention is in the provision of an improved safety release means which preferably includes a pair of release bars extending along both sides of the upper roll and supported on the axis of the upper roll by the upper roll support structure which thus serves a dual function.

A more specific feature is in the structural relation and cooperation of the safety release means with the reset mechanism by which an efficient and reliable operation is achieved with a minimum number of parts and with the parts readily manufactured and assembled.

A further and important feature of this invention is in the provision of positive bearing support at one end of the upper roll and at the end of the lower roll which is opposite the aforementioned one end of the upper roll and spring-supported bearings at the other ends of the upper and lower rolls coacting to apply pressure between the rolls. By this feature a highly efficient wringing action is achieved with the wringer economically manufacturable.

In accordance with a further specific feature of this invention, the lower roll is driven at the end thereof having a positive bearing support and hence, having very little movement during the wringing operation. The reset means acts at the opposite end of the wringer and on the positive bearing support of the one end of the upper roll. It will be appreciated that this arrangement greatly facilitates the construction of the wringer both from the standpoint of ruggedness and durability and from the standpoint of economy of manufacture and assembly.

This invention contemplates further objects, features and advantages which will become more fully apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate a preferred embodiment and in which:

Figure 1 is a side elevational view of a wringer constructed according to the principles of this invention;

Figure 2 is a side elevational view of a wringer similar to that of Figure 1, but having an extension arm on the reset handle, this view illustrating the wringer in pressure released position so as to illustrate the operation of the extension arm;

Figure 3 is a view similar to Figure 2, but with pressure applied between the rolls of the wringer;

Figure 4 is a bottom plan view of a portion of the wringer in the position of Figure 2 illustrating in detail the mounting of the extension arm on the reset handle;

Figure 5 is a view similar to Figure 1, but with the pressure released between the wringer rolls;

Figure 6 is a detail view of the reset mechanism in its position with pressure applied between the wringer rolls;

Figure 7 is a detail view of the reset mechanism similar to Figure 6, but with pressure released from the rolls of the wringer;

Figure 8 is a cross-sectional view, on an enlarged scale, taken substantially along lines VIII—VIII of Figure 1;

Figure 9 is a cross-sectional view taken substantially along lines IX—IX of Figure 8;

Figure 10 is an enlarged cross-sectional view taken substantially along lines X—X of Figure 1; and

Figure 11 is a sectional view taken substantially along lines XI—XI of Figure 10.

As shown on the drawings:

The wringer of this invention may comprise a frame **20** which supports a lower roll **21** and an upper roll **22**. The frame **20** preferably includes a horizontal upwardly open sheet steel channel **23**, a left upright inwardly open channel **24** secured to the horizontal channel **23** as by rivets **25** and a right upright inwardly open channel **26** secured to the righthand end of the horizontal channel **23** as by rivets **27**. The upright channel **26** may support the frame **20** from a washing machine or the like through a head **28** which may also house drive means connected to the right end of the lower roll **21**.

The lower roll **21** is journaled for rotation between the upright channels **24** and **26** and the upper roll **22** is journaled for rotation between supports **29** and **30** (Fig. 5) which are supported from the upright channels **24** and **26**, respectively, by means of a link **31** pivotally connected to the upright channel **24** through a bracket **32** and a link **33** pivotally connected to the upright channel **26** through a pressure applying spring arrangement which will be described in detail hereinafter. The upper roll **22** is movable between a position in pressure applying relation to the lower roll **21** as illustrated in full lines in Figure 1 through an intermediate pressure released position as illustrated in broken lines in Figure 1 to a position as illustrated in Figure 5 in which it is entirely separated from the lower roll **21**. In the latter position, it will be noted, the upper roll **22** is in the clear and readily accessible.

To apply pressure between the lower roll **21** and the upper roll **22**, a reset handle **34** is pivotally connected to an intermediate portion of the link **31** by a pin **35** and is connected to the fixed bracket **32** by a link **36** pivotally connected to the reset handle **34** by a pin **37** and to the bracket **32** by a pin **38**.

To apply pressure between the rolls, the reset handle **34** is pressed toward the upright channel **24** so as to move it from the position as illustrated in broken lines in Figure 1 to the position as illustrated in full lines in Figure 1. As best illustrated in Figures 6 and 7, the reset handle **34** pulls the link **31** downwardly, clockwise, to pull the support **29** downwardly and establish pressure between the rolls **21** and **22**. When the reset handle **34** is moved all

the way into engagement with the upright channel 24, it is locked in position by virtue of an over-center relation between the pins 35, 37 and 38 as is clearly illustrated in Figure 6.

It is essential that the pressure between the rolls be readily released in the event that the fingers or clothing of the operator should accidentally become engaged between the rolls 21 and 22. According to this invention, a safety release actuator acts directly on the reset handle and is supported about the axis of the upper roll 22. This actuator comprises a pair of release bars 39 extending on either side of the upper roll 22 and supported by end members 40 and 41 pivoted on the upper roll axis by hinges 42 and 43, respectively, which are adjacent the end supports 29 and 30. The hinge 42 has an integral down-turned portion providing a pair of legs 44 on either side of the upper roll axis and arranged to selectively engage arms 45 which are integral with and project inwardly from the reset handle 34. Upon either downward or upward movement of either of the release bars 39, the legs 44 will engage the arms 45 to move the reset handle 34 outwardly, clockwise, out of its over-center locked position. The arms 45 may preferably be provided with out-turned integral flanges or cleats 46 providing a more extensive surface for contact by the legs 44 of the hinge 42.

It will be appreciated that with the reset mechanism and safety release mechanism as above described, the construction is highly dependable in operation and yet is very rugged while being manufacturable from a minimum number of parts.

A feature of this invention is in the provision of an extension handle on the release handle 34. This is illustrated in Figures 2, 3 and 4 and comprises a bar 47 formed into a generally U-shape with the legs thereof embracing and pivoted on the end of the reset handle 34 by a pin 48. An arm 49 is fixed to the shaft 48 and is arranged to engage inside the reset handle 34 so as to move the reset handle inwardly toward the upright channel 24 when downward pressure is applied to the bar 47 as will be clear from Figure 2. The extension 47 is preferably returned automatically to a position against the reset handle and this is accomplished by a light coil spring 50 which is wrapped around the shaft 48 and is fixed at one end to the reset handle 34 and at the other end to the shaft 48.

A highly important feature of this invention resides in the provision of spring means acting at the right end of the upper roll and at the left end of the lower roll to apply pressure therebetween. It will be apparent that with this arrangement, the construction is greatly simplified since the support at the left end of the upper roll, where the reset mechanism operates, may be positive and the support of the right-hand end of the lower roll, where the driving means operate, may also be positive. At the same time, it has been discovered that a highly effective and efficient wringing operation is obtained.

More in detail, the lower roll 21 is fixed on a shaft having a portion 51 projecting from the right-hand end thereof as illustrated in Figures 8 and 9 and a portion 52 projecting from the left-hand end thereof as illustrated in Figures 10 and 11. As illustrated in Figures 8 and 9, the portion 51 is positively supported from the frame 20 through a bearing block 53, preferably of wood such as hard maple, which is seated in the horizontal upwardly facing channel 23 and is held in place by a pin 54 fixed between the legs of the channel 23. The block 53 may be notched as at 55 to receive the pin 54. This end 51 of the lower roll support shaft is thus positively supported from the frame and it has a pin 56 extending through the end thereof to provide a drive connection. If desired, a washer 57 may be disposed on the shaft portion 51 to separate the end of the roll 21 from the bearing block 53. To hold the bearing block 53 in properly centered position, a plate 58 may be affixed thereto by a pin 59, the plate 58 being of sufficient length to engage the upwardly projecting legs of the channel 23.

The bearing support block 53 may also be held in position by a sheet metal bracket member 60 having a central portion 61 formed into a generally U-shape to receive the bearing block 53 and having a pair of ears 62 and 63 engaging the opposite legs of the channel 23 and receiving the pin 54.

As briefly described above, the right-hand end support 30 is connected to the right upright channel 26 through the link 33 and through a spring means arranged to apply pressure between the rolls. This spring means is illustrated in Figures 8 and 9.

A pair of spring retainers 64 and 65 are disposed on opposite sides of the link 33 with a pin 66 extending through the spring retainers 64 and 65 and through the link 33. These spring retainers 64 and 65 are affixed on the ends of bolts 67 and 68, respectively, which extend through openings in a bracket plate 69 affixed within the upper end of the upright 26. A pair of helical compression springs 70 and 71 are disposed on the shafts 67 and 68, respectively, and are held thereon by nuts 72 and 73, respectively. When the upper roll 22 is moved down against the lower roll 21 by the reset mechanism, the spring retainers 64 and 65 will be lifted upwardly out of engagement with the bracket 69 to lift the bolts 67 and 68 and nuts 72 and 73 upwardly and further compress the springs 70 and 71, the compression of the springs 70 and 71 thus determining the pressure applied between the right ends of the wringer rolls. With a large object disposed between the rolls, the upper roll 22 and associated support means might be elevated to a position as illustrated in broken lines in Figures 8 and 9.

It should be noted that the upper roll 22 is rotatably supported on a shaft 74. The upper roll 22 has an inner sleeve 75 which rides on left-hand and right-hand bearings 76 and 77 affixed on the shaft 74. A left-hand bushing 78 (Fig. 11) is affixed to the shaft 74 and is pivotally connected to the link 31 by a pin 79 while a right-hand bushing 80 (Fig. 9) is also affixed to the shaft 74 and is pivotally connected to the link 33 by a pin 81.

The left-hand end portion 52 of the lower roll support shaft is resiliently supported from the frame 20, as briefly described above. In more detail, this resilient support comprises a pair of helical compression springs 82 and 83 disposed on upstanding bolts 84 and 85, respectively, which are secured to the horizontal channel 23 of the frame 20 by nuts 86. The springs 82 and 83 bear against spaced horizontal portions 87 and 88 of a bearing support saddle 89 which has a generally U-shaped central portion 90 receiving a bearing block 91, preferably of wood, which, in turn, receives the shaft portion 52. The saddle 89 may have a pair of down-turned ears 92 and 93 for engaging inside the opposite legs of the upright channel 24. A downwardly open generally channel-shaped member 94 is preferably fitted over the upper end of the saddle 89 and secured thereto by rivets 95 so as to strengthen the saddle 89 and also to hold the bearing block 91 in position.

When the reset mechanism is actuated to apply pressure between the rolls, the upper roll 22 will be moved downwardly against the lower roll 21 and the saddle 89 will be moved downwardly to compress the springs 82 and 83, the pressure between the rolls 21 and 22 at the left-hand end thereof being thus determined by the compression of the springs 82 and 83.

In Figure 11, the action of the resilient support of the left-hand outboard end of the lower roll 21 is indicated by the broken line position of this roll 21 which might be produced with a member 96 between the rolls. In this broken line position of the roll 21 the bearing 91 and saddle 89 are, of course, pushed downwardly against the compression of springs 83 while the left end of the upper roll 22 remains in position due to the positive support thereof.

It will thus be appreciated that a wringer is herein

provided which is safe and efficient in operation, durable and easily and economically manufacturable from a minimum number of component parts.

It will be understood that modifications and variations may be effected without departing from the spirit and scope of the novel concepts of the present invention.

I claim as my invention:

1. In a wringer including a frame and upper and lower rolls thereon relatively movable between a roll pressure released position and a roll pressure applied position, a roll-support member acting at one end of said upper roll, a link between said roll-support member and said frame, a reset member pivotally connected to said link, a second link between said reset member and said frame, said reset member being actuatable between a roll pressure releasing position and a roll pressure-applied position with the axes of pivotal connection between said first link and said frame and between said reset member and said first and second links lying in over-center locking relation, and release means supported with said upper roll for pivotal movement about the axis thereof and engageable with said reset member to actuate the same in a direction toward said pressure-releasing direction.

2. In a wringer including a frame having upper and lower rolls thereon relatively movable between a pressure applied position and a pressure released position, a spring-supported roll-support member acting at one end of said upper roll, a second roll-support member at the other end of said upper roll, a first link between said second roll-support member and said frame, a reset member pivotally connected to said first link, a second link between said reset member and said frame, said reset member being actuatable between a pressure releasing position and a pressure-applying position with the axes of pivotal connection between said first link and said frame and between said reset member and said first and second links lying in over-center locking relation, and release means supported with said upper roll and engageable with said reset member to actuate the same in a direction toward said pressure releasing position.

3. In a wringer, a frame, a lower roll in said frame, an upper roll movable to an operative position in pressure engagement with said lower roll, spring-supported support means for one end of said lower roll and for one end of said upper roll adjacent the other end of said lower roll, support means for said other end of said lower roll and for the other end of said upper roll having positions fixed with respect to said frame in said operative position of said upper roll, and means operative at said other end of said upper roll for moving said upper roll to said operative position.

4. In a wringer, a frame, a lower roll in said frame, an upper roll movable to an operative position in pressure engagement with said lower roll, spring supported support means for one end of said lower roll and for one end of said upper roll adjacent the other end of said lower roll, support means for said other end of said lower roll and for the other end of said upper roll having positions fixed with respect to said frame in said operative position of said upper roll, a drive connection to said lower roll at said other end thereof, and means operative at said other end of said upper roll for moving said upper roll to said operative position.

5. In a wringer, a frame, a lower roll journaled in said frame, an upper roll, means supporting said upper roll for rotation including a shaft portion at each end of said upper roll, means connected to said frame for acting on said supporting means and actuatable to an over-center locked position for applying pressure between said rolls and having portions on either side of said upper roll, and release means pivotally supported from at least one of said shaft portions and engageable with both of said portions of said pressure-applying means for actuating said pressure-applying means out of said over-center locked position in a pressure-releasing direction.

6. In a wringer, a frame, a lower roll supported in said frame, an upper roll, a shaft journalling said upper roll for rotation thereon, a pair of separate support means connecting the ends of said shaft to said frame for movement toward and away from the axis of said lower roll, reset means acting on one of said support means for moving said upper roll into pressure engagement with said lower roll, a pair of members journaled for pivotal movement on said shaft at the ends of said upper roll, and a pair of parallel bars between said members on opposite sides of said upper roll for pivoting said members, one of said members being arranged to release said reset means on pivotal movement thereof.

7. In a wringer, a frame, a lower roll supported in said frame, an upper roll, a shaft journalling said upper roll for rotation thereon, a pair of links pivoted to the opposite ends of said shaft and to said frame for supporting said shaft for movement toward and away from the axis of said lower roll, a reset member pivotally connected to an intermediate point of one of said links, and a third link disposed between said reset member and said frame and pivoted at one end to said reset member and at the opposite end to said frame, said reset member being actuatable to a position in which said one end of said third link and said intermediate point lie in over-center alignment with said opposite end of said third link to apply and maintain pressure between said rolls.

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