April 5, 1938. C. B. WILLIAMS 2,113,187

CLOTHES WRINGER

Filed Feb. 26, 1931 4 Sheets-Sheet 1

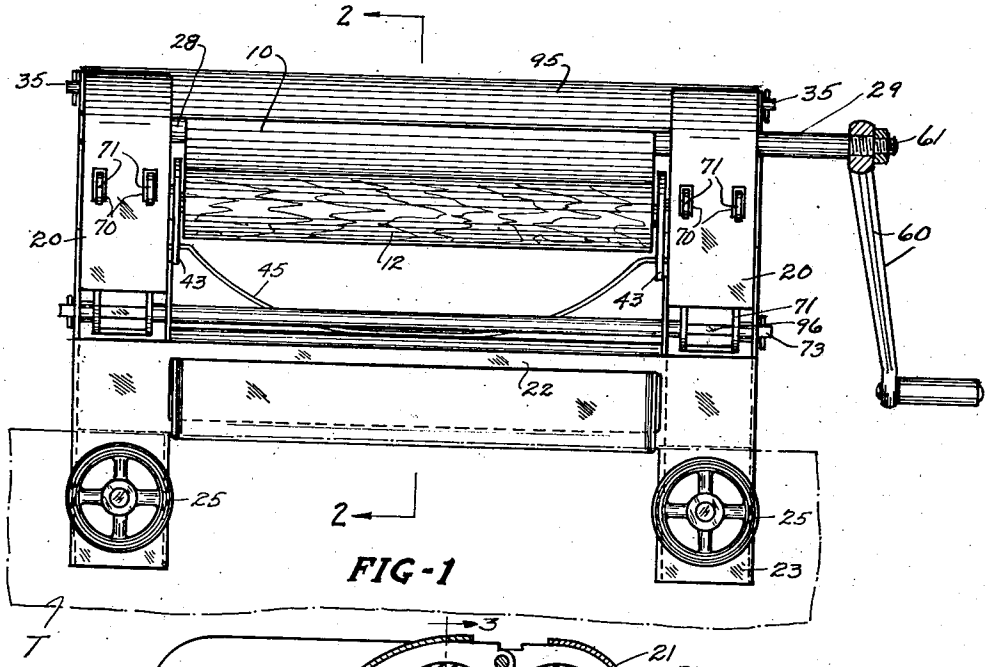


FIG-1

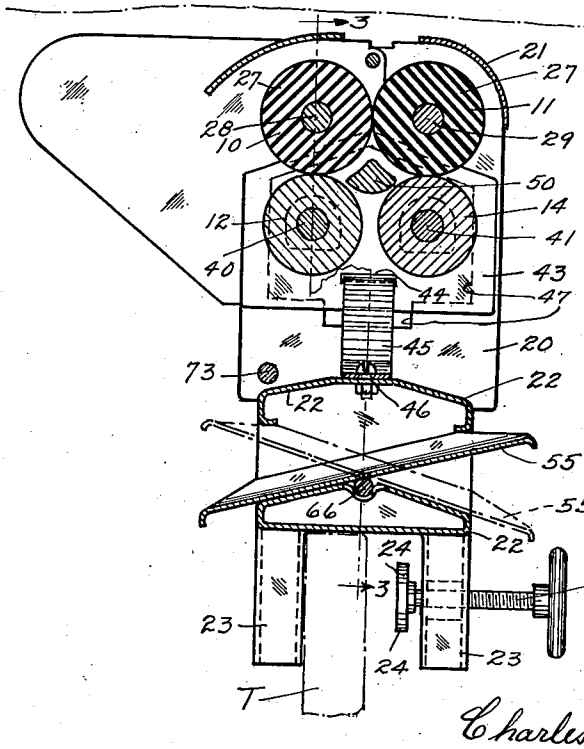


FIG-2

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April 5, 1938. C. B. WILLIAMS 2,113,187

CLOTHES WRINGER

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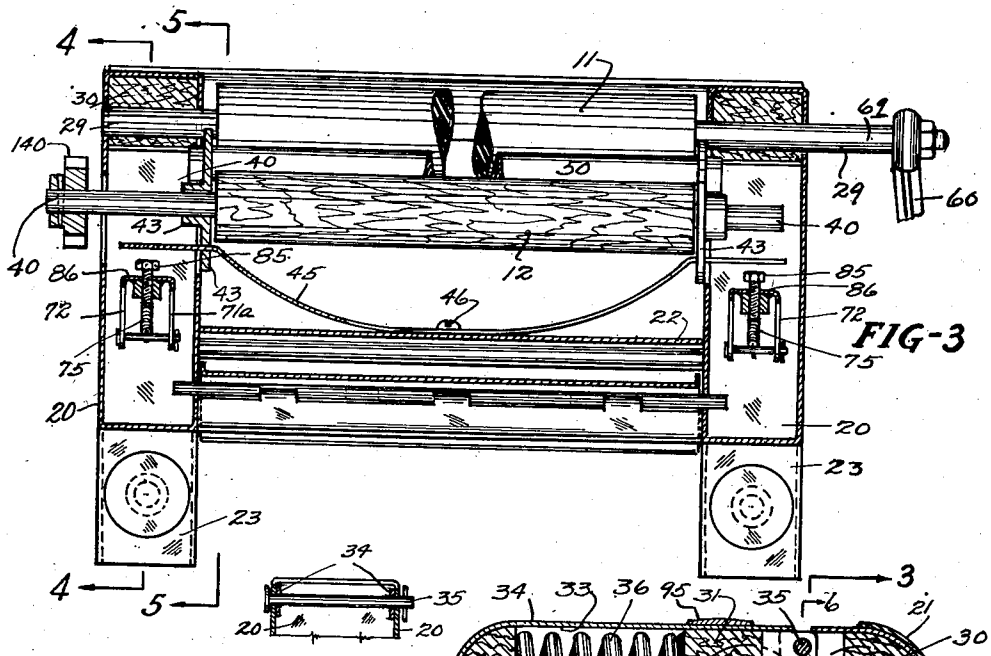


FIG-3

FIG-6

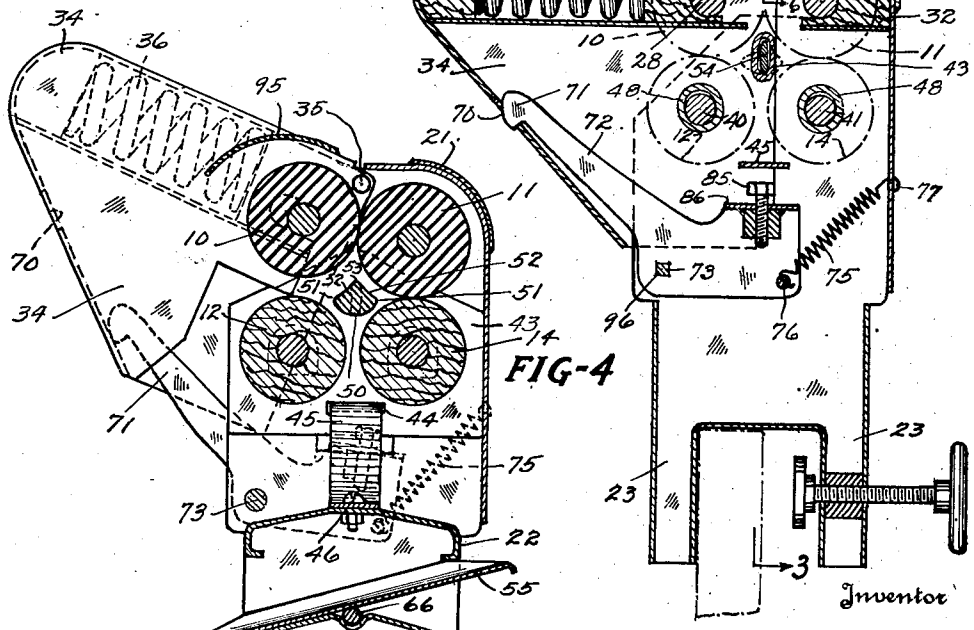


FIG-4

FIG-5

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April 5, 1938. C. B. WILLIAMS 2,113,187

CLOTHES WRINGER

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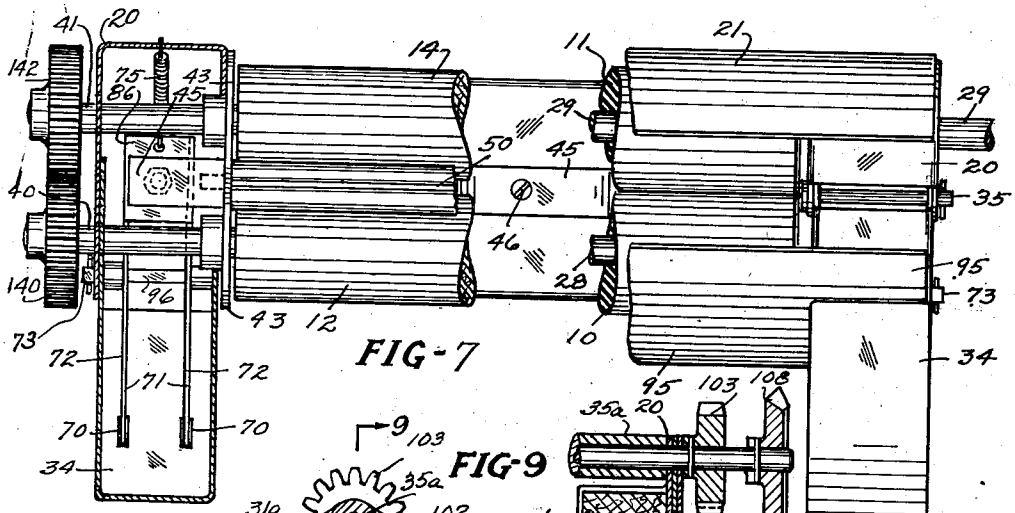


FIG-7

FIG-9

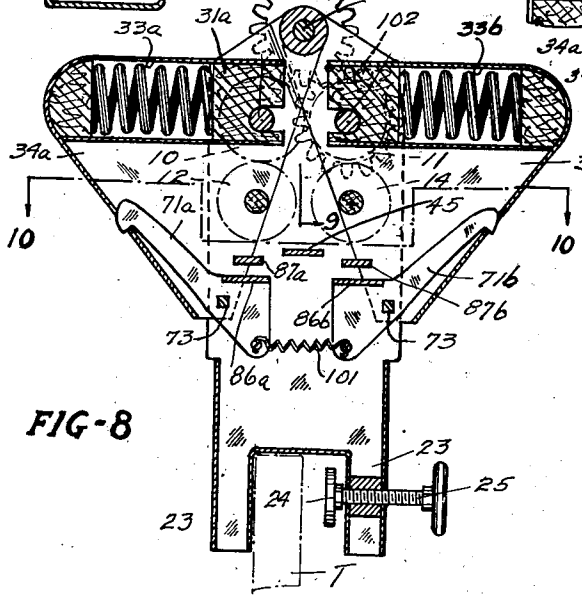


FIG-8

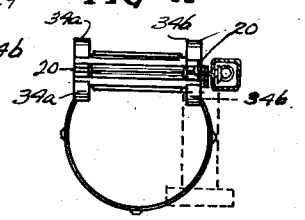


FIG-11

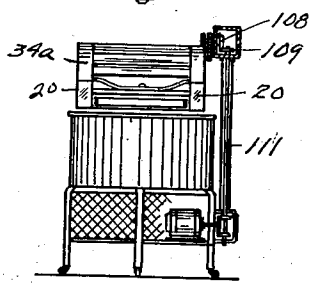


FIG-12

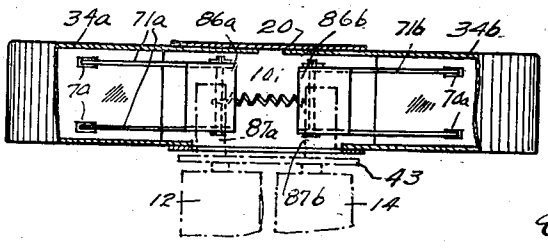


FIG-10

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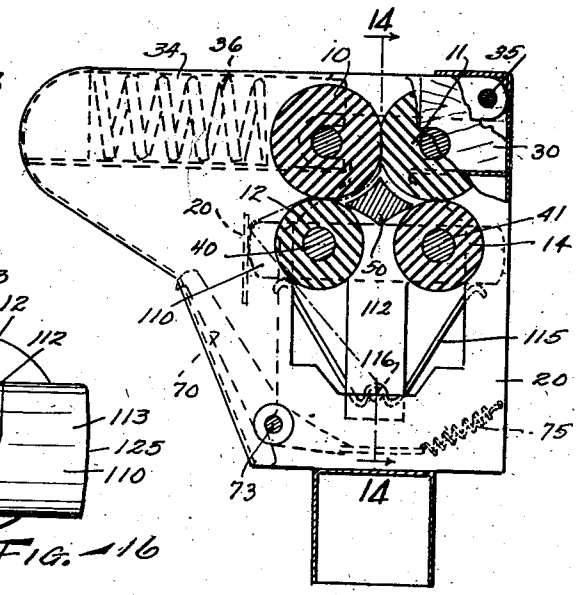
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April 5, 1938. C. B. WILLIAMS 2,113,187

CLOTHES WRINGER

Filed Feb. 26, 1931 4 Sheets-Sheet 4

FIG. - 13



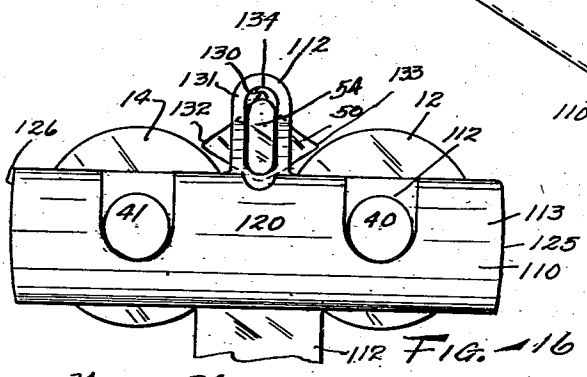


FIG. - 16

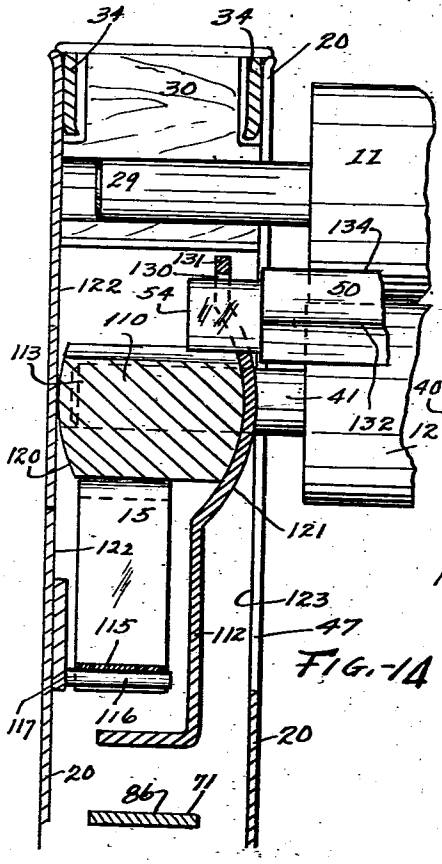


FIG. - 14

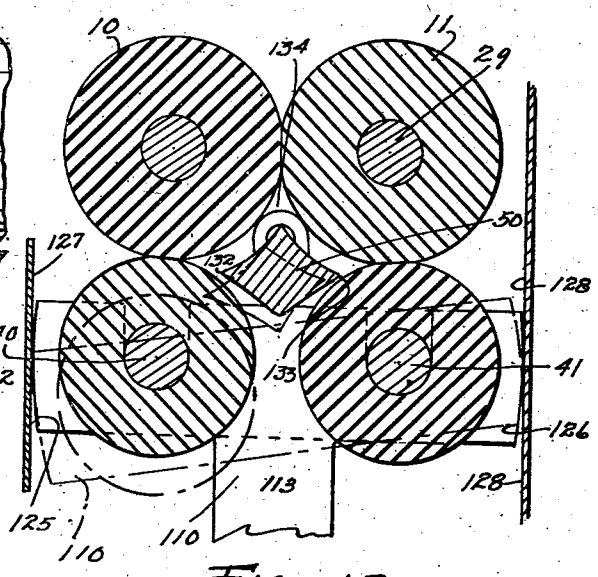


FIG. - 15

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Patented Apr. 5, 1938 2,113,187

UNITED STATES PATENT OFFICE

2,113,187

CLOTHES WRINGER

Charles B Williams, Shaker Heights, Ohio

Application February 26, 1931, Serial No. 518,415

9 Claims. (Cl. 68—32)

This invention relates to a wringer for laundry purposes, and especially to that type of wringer which utilizes rotating pressure rolls to squeeze the water from the garments. Heretofore, in wringers of the pressure roll type, the operator's fingers were sometimes gripped between the rolls, thereby causing injury thereto. Many safety devices have been added to these wringers, to permit the operator to separate the pressure rolls. However, such safety devices have relied upon manual operation after the fingers have caught and therefore they have not been entirely dependable in preventing injury to the operator. In such safety devices, an alarm is given to the operator by the catching of the fingers between the pressure rolls, and then the operator, with the other hand, reaches out to release a catch or trigger mechanism to separate the rolls, and when the wringer is power driven, the interval, between the entrance of the fingers between the rolls and the actual separation of the rolls, is of such a duration that the continuously rotating rolls sometimes draw the fingers and even the hand into their grip.

The general object of this invention, therefore, is to provide a wringer of the rotary roll type, which will prevent injury to the operator, therefore permitting the operator to straighten the clothing and fix the buttons without fear of such injury.

A further object is to provide a wringer of the pressure roll type, wherein garments will first be inserted between a guide roll and a pressure roll, and when the operator's fingers become caught between those, the two will automatically separate.

Another object is to provide a wringer having a pair of pressure rolls and a guide roll associated with one of the pressure rolls, wherein garments will first be inserted between a guide roll and a pressure roll, and when the operator's fingers become caught between those, the last named rolls, the pressure between the pressure rolls will automatically be relieved.

Another object of this invention is the provision of a wringer of the pressure roll type, wherein there is a supplemental roll which coacts with one of the pressure rolls, between which pressure roll and supplemental roll the garments are fed and wherein means are provided to automatically relieve the pressure between the two pressure rolls, as well as between the supplemental roll and its coacting pressure roll whenever the operator's fingers become caught therebetween.

Another object is to provide a roll mounting for a wringer of the type having a pair of pressure rolls, an independent supplemental roll adapted to contact with each pressure roll, and a guide member adapted to guide the garments from between either supplemental roll and its corresponding pressure roll into the bite of the two pressure rolls, which roll mounting permits both supplemental rolls and the guide to move as a unit in a compound rocking movement relative to the pressure rolls and wherein the supplemental rolls may rock relative to each other but wherein the guide will bear substantially the same relationship to each supplemental roll at all times.

Other objects of this invention will become apparent from the following description, relating to the accompanying drawings, and the essential, novel characteristics will be summarized in the claims.

In the drawings, Fig. 1 is a front elevation of my improved wringer; Fig. 2 is a vertical, transverse section through the wringer, and is indicated by the lines 2—2 on Fig. 1; Fig. 3 is a vertical section, and is indicated by the offset lines 3—3 on Fig. 2; Fig. 4 is a vertical transverse section, and is indicated by the lines 4—4 on Fig. 3; Fig. 5 is a vertical transverse section, indicated by the lines 5—5 on Fig. 3, and illustrates some of the parts in a different position than shown in Fig. 4; Fig. 6 is a detail and is indicated by the lines 6—6 on Fig. 4; Fig. 7 is a plan of the wringer, certain of the parts being broken away to more clearly illustrate the internal construction thereof; Fig. 8 is a section through a modified form of wringer, the section being substantially in the same plane as Fig. 4; Fig. 9 is a vertical section and is indicated by the lines 9—9 on Fig. 8; Fig. 10 is a horizontal section, and is indicated by the lines 10—10 on Fig. 8; Fig. 11 is a plan of my improved wringer, mounted upon a washing machine of the usual type, wherein the wringer is power driven; Fig. 12 is a side elevation of the wringer mechanism illustrated in Fig. 11; Fig. 13 is a vertical section through a modified form of wringer and illustrates a modified form of roll mounting; Fig. 14 is a vertical section through one end frame member, and is indicated by the lines 14—14 on Fig. 13; Fig. 15 is a transverse vertical sectional detail illustrating a rocking movement of the supplemental roll assembly; Fig. 16 is an end elevation of the supplemental roll and guide assembly.

Referring again to the drawings, it will be noted that my wringer comprises a pair of wringer or pressure rolls, 10 and 11, and a pair of auxiliary rolls, 12 and 14, one of which is associated with

each wringer roll, and so mounted that they may be separated therefrom.

As shown in the drawings, the wringer frame comprises a pair of end frame members 20, which are joined together by suitable cross-frame members 21 and 22. The end frame members are preferably of pressed metal and have, at their lower extremities, a pair of downwardly extending ears 23, between which the edge of the tub T may be gripped by any suitable means, such as gripping members 24, carried by suitable thumb screws 25, one of which is mounted in one of the ears 23 of each end frame member.

The rolls 10 and 11, which are the pressure rolls, are mounted in a horizontal plane, instead of a vertical plane as has been the custom in the past. The rolls 10 and 11 comprise the usual rubber wringer rolls 27, which are rigidly secured to suitable shafts 28 and 29. The shafts 28 and 29 are so mounted that the rolls may be resiliently urged into contact with each other, in a horizontal plane. As shown in Fig. 4, each end of the shaft 29 extends beyond the roll 27 and is journalled in a bearing block 30, while each end of the shaft 28 is journalled in a bearing block 31. The blocks 30, which carry the shaft 29, are supported in a pocket 32, formed in the end frames 20, while the blocks 31 are rectangular in form and are supported in suitable horizontally extending guideways 33, in bracket members 34, which are pivoted to their respective end frames 20, as indicated at 35 in Figs. 4 and 5. The bearing blocks 31 are slidably mounted in the guideways 33, and are urged towards the roll 11 by suitable compression springs 36 carried in the guideway.

The auxiliary rolls 12 and 14 serve to guide the clothes or garments into the bite of the pressure rolls 10 and 11. The rolls 12 and 14 are made of any suitable material, such as a comparatively soft rubber, and are secured to suitable shafts 40 and 41, which are journalled in bearing plates 43. The plates 43 are slidably mounted adjacent the inner faces of the end frame members 20, which are slotted to permit a compound rocking movement of the shafts 40 and 41.

The plates 43 and their associated rolls 12 and 14 are normally urged upwardly, so that the rolls contact with the pressure rolls, as shown in Fig. 2. To this end, each plate 43 has a slot 44, located below and intermediate the rolls 12 and 14. The slot 44 is adapted to receive the opposite ends of a leaf spring 45, which is secured to the frame member 22, as shown at 46 in Fig. 2. The spring 45 normally exerts only sufficient pressure on the rolls 12 and 14 to feed the garments between them and their associated pressure rolls, from where the garments are guided into the bite of the two pressure rolls, as will be hereinafter described. This pressure is such that it ordinarily will not injure the hand of the operator, if the hand should become caught between one of the rolls 12 or 14 and its associated pressure roll. Moreover, this pressure is such that the hand, when caught, may ordinarily be withdrawn without causing injury thereto.

As shown in the drawings, the rolls 12 and 14 are somewhat smaller than the rolls 10 and 11. However, I contemplate that they may be made either smaller, larger or of the same size. There is sufficient space provided between the four rolls to accommodate a guide member such as a bar 50, shown in Fig. 5. The bar or guide member 50 serves to guide the garment from the bite of a pressure roll 10 or 11, and its associated auxiliary roll 12 or 14 into the bite of the two pressure rolls, 10 and 11, and prevent the garments from becoming wrapped around either auxiliary roll. The guide member 50 extends the entire length of the rolls and is carried by the bearing plates 43, heretofore described. The guide member 50 is triangular in cross section, and its lower edges 51 lie adjacent the auxiliary rolls 12 and 14, and act to strip the garments from these rolls. From the edges 51 the bar extends inwardly and upwardly, forming concave surfaces 52, which follow the general contour of the pressure rolls 10 and 11. The faces 52 end in a common vertex 53, which lies between the pressure rolls 10 and 11. As the bar 50 strips the garments from the roll 12 or 14, the faces 52 retain them in contact with the pressure roll 10 or 11, until they enter the bite of the last named rolls.

The rolls 12 and 14 and the guide 50 are so mounted that they may move as a unit relative to the pressure rolls 10 and 11. To this end the slots 47, in the end frames 20, are of such size as to permit the projecting bearing boxes 48 of the plate 43 to move unrestricted therein. The plate 43 is held in contact with the inner faces of the end frame members 20 by the spring 45 and the guide 50, the ends of which are reduced in cross section, as indicated at 54 in Fig. 4. Due to the resiliency of the spring, and a slight amount of lose play in the bearings 48 for the shafts 40 and 41, and the guide 50, the rolls 12 and 14 may rock relative to each other. This permits the roll 14 to remain substantially horizontal and in contact with the pressure roll 11, while the roll 12 may be separated from its pressure roll 10, at one end only, thereby rocking the supplemental roll 12 relative to both the pressure roll 10 and the supplemental roll 14. The guide 50, because of the loose play in its bearings, will move with the end plate 43 and the edges 51 of the guide will bear substantially the same relationship to both supplemental rolls.

The construction just described is such that garments may be inserted in the wringer, from either side thereof, and regardless of their position lengthwise of the wringer rolls without placing any undue strain on the supplemental roll assembly, and with insurance that the guide 50 will strip the garments from the supplemental roll and guide them into the bite of the pressure rolls, regardless of the rocking movements of the supplemental rolls.

If desired, a suitable drain board 55 may be supported by a shaft or bar 66 immediately below the auxiliary roll, as indicated in Fig. 5 of the drawings. The shaft 56 is preferably supported by the end frame members 20 in such a manner that the drain board 55 may be tilted from one side to the other, depending upon the side from which the clothes are being fed into the wringer.

The wringer may be driven, as shown in Fig. 1, by a suitable hand crank 60, which is secured to the wringer shaft 29, one end of which 61 extends some distance beyond the outer face of one frame member 20.

The wringer is so constructed that when the operator's hand becomes gripped between the pressure roll 10 and its auxiliary roll 12, that the pressure between the rolls 10 and 11 will automatically be relieved, and the rolls 10 and 12 will be automatically separated, thereby reliev-

ing the feeding pressure upon the garments and preventing them from pulling the hand further into the bite of the two rolls (10 and 12) and into the bite of the pressure rolls 10 and 11. To this end, the roll 10 is mounted in brackets 34, and which, as heretofore described, are pivoted at 35 to the end frame members 20. The brackets 34 are normally held in position to cause the rolls 10 and 12 to contact with each other. As shown in Figs. 3 and 4, the brackets 34 are provided with suitable notches or openings 70, which are engaged by the latches 71, which are secured to a bar 73, mounted in the frame members 21. As shown in the drawings, each latch 71 is preferably a sheet metal member, comprising two arms 72, which are connected by the horizontal bridge 86. The latches 71 are held in engagement with the notches 70 in frame members 34 by suitable springs 75, one end of each spring being secured to the latches 71, as at 76, and the other end of which is secured to the frame members 20, as at 77.

The arrangement is such that a downward pressure upon the rearwardly extending arm or portion 80 of the levers 72 will cause the latch 71 to be disengaged from its notch 70, and thereby release the bracket 34, permitting the compression spring 36, heretofore described, to force the bracket 34 about the pivot 35, thereby relieving the pressure between the rolls 10 and 11, and causing the roll 10 to swing free or separate from its auxiliary roll 12. This separation is due to the fact that the compression spring acts through the medium of the pressure rolls 10 and 11, which lie in a plane below the pivots 35 of the bracket members 34.

When the operator's fingers are caught between the pressure roll 10 and its auxiliary roll 12, they cause the latter to be forced downwardly, carrying with it the plate 43, which carries the ends of the leaf spring 45. I utilize this movement for releasing the latch 71, thus permitting the spring 36 to relieve the pressure between the rolls 10 and 11 and cause the rolls 10 and 12 to separate. To this end, the springs 45 project some distance beyond the plates 43, and into the frame members 20. As shown in Figs. 3 and 4, the ends of this spring are adapted to engage suitable adjusting nuts 85, which are carried by horizontal portions 86 of the latches 71. Hence, as the rolls are separated a predetermined amount, depending upon the setting of the set screw 85, the spring 45 will contact with the set screw 85 and swing one of the latches 71 about its pivot and disengage it from its corresponding notch 70.

It is desirable that both brackets 34 swing simultaneously. Therefore, the brackets 34 are joined, adjacent their upper ends, by a cross frame member 95, and the latches 71 are mounted on squared portions 96 of the pivot bars 73, which are rotatively carried by the ends of frame members 20. Hence, if the rolls 10 and 12 are separated adjacent one end only, to an extent which will cause that end of the spring 45 to engage the adjusting nut 85 on that side of the wringer, and thereby release the latch 71 on that side of the wringer, it will rotate the bar 73, and thereby rotate the latch 71 on the other side of the wringer to be correspondingly moved or swung, and cause it to simultaneously be disengaged from its notch 70, thereby swinging both brackets 34 simultaneously and relieving the pressure of the spring 36 in each bracket 34, thereby entirely relieving the pressure between the rolls 10 and 11, and separating the rolls 10 and 12 throughout their entire lengths.

In the modified form of wringer shown in Figs. 8 to 12, inclusive, it will be noted that each pressure roll 28 and 29 is mounted in a pair of winging brackets 34a. In this instance, the roll shafts are mounted in bearings 31a, which are carried in slideways 33a in the brackets 34a. The brackets 34a extend from both faces of the wringer. The brackets 34a are similar to the brackets 34, shown in Fig. 4, and the brackets on each side are pivoted to the frames 20 on common pivots 25a. However, this construction permits the feeding of the garments from either face of the wringer, with the same degree of safety as is desirable in power machines, where the wringer may either be located in the position shown in full lines in Fig. 11, or in the position shown in dotted lines. Each bracket 34a is provided with latches 71a, having horizontal portions 86a, through each of which are positioned adjusting screws 100. The latches are held in engagement with the notches 80 by a suitable spring 101, one end of which is connected to each of the latches. Hence, if either auxiliary roll 12 or 14 is separated from its corresponding pressure roll, it will release either one of the latches, thereby causing the bracket 34a on that side to swing about its pivot, thereby separating the rolls.

In the modified form of wringer, shown in Figs. 8 to 12, inclusive, it will be noted that the pressure roll 10 is carried in a swinging bracket 34a, while the pressure roll 11 is carried in a swinging bracket 34b. The brackets 34a and 34b are similar to the bracket 34, heretofore described, and are pivoted to a common pivot bar 35a, which is carried by the end frame 20, the construction at either end of the wringer being the same as that shown in Fig. 8. This construction is such that if either auxiliary roll 12 or 14 is separated from its corresponding pressure roll, it will cause the pressure between the pressure rolls to be relieved, and likewise cause the pressure roll and its corresponding auxiliary roll 12 or 14 to separate.

The brackets 34a and 34b are provided with latches 71a and 71b, respectively, the latches having horizontal portions 86a and 86b, which are adapted to be engaged by lugs 87a and 87b, carried by the plates 43 immediately beneath the supplementary rolls 12 and 14, respectively. The latches 71a and 71b are normally held in engagement with notches 80, in the brackets 34a and 34b, by a suitable compression spring 101, one end of which is connected to each of the latches. The construction is such that if the supplementary roll 14, and the pressure roll 11 are separated a predetermined amount, the lugs 87b engage the horizontal portions 86b of the latch 71b, thereby causing it and the corresponding latch on the other end of the wringer to be swung about their pivot bars, thereby releasing the brackets 34b on that side of the wringer, causing the pressure between the pressure rolls 10 and 11 to be released, and causing the pressure roll 11 and the auxiliary roll 14 to separate.

It is noted that in the construction as shown, that were the rolls 10 and 12 separated a predetermined amount, the brackets 34a would be swung about their pivots by the spring 36, causing a similar relieving of the pressure between the pressure rolls 10 and 11, and the separation of the rolls 10 and 12.

The construction shown in Figs. 8 to 12 is especially adapted for power machines. In this instance, the shaft 29 extends beyond the end

frame 20, and carries rigid therewith a gear 102, which is adapted to mesh with a gear 103, carried by the pivot bar 35a on that side of the machine. The pivot bar 35a is then driven by a bevelled gear 108, which is driven from a bevelled gear 109, which is connected to a power shaft 111.

Figs. 13 to 16 inclusive illustrate a modified form of mounting ends for the auxiliary rolls 12 and 14, and the guide member 15. In this construction, supplementary rolls 12 and 14, and the guides 50, are supported at either end by bearing members 110, which are carried in ways 111 in each end frame member 20. This construction is such that it will prevent relative horizontal shifting of the bearing member and the rolls, but at the same time will permit the rolls to rock longitudinally relative to the pressure rolls and to each other. The brackets or bearing members 110 comprise a relatively thin metal plate 112, preferably of brass or other suitable bearing material, which carries the roll shafts 40 and 41 and the reduced end 54 of the guide 50. Rigidly secured to this plate is a suitable block 113 which may be of wood or other suitable material, and which is adapted to be supported by a leaf spring 115, carried by a pin 116, which is secured to the frame members 20, as at 117. It will be noted that the outer side of the blocks 113 and the plates 112 are curved, as at 120 and 121, respectively, to permit the latter to be rocked endwise relative to the axis of the shafts 40 and 41, and at the same time remain in engagement with the walls 122 and 123 of the end frame members 20. This permits the rocking of the supplementary rolls in a substantially vertical plane relative to their axes but prevents displacement of the guiding block and its associated bearing plate. Likewise, the ends of the block 113 are curved, as indicated at 125 and 126, and are adapted to engage the faces 127 and 128 respectively of the end plates 20. This construction permits the rocking of the bearing unit in a vertical plane, transverse to the axis of the shafts 40 and 41, and likewise permits the compound rocking movement of the shafts, whereby one supplementary roll and its shaft may be in a normal or horizontal plane, the roll being in contact with its associated pressure roll, while the other auxiliary roll and its shaft may be rocked, whereby one end of the roll may be separated from its associated pressure roll, while the other end may be in contact with the pressure roll.

This bearing arrangement is such that said compound rocking movement is readily had without any unnecessary displacement of the bearing unit, thereby insuring the fact that the auxiliary rolls will remain at all times substantially beneath their respective pressure rolls.

The ends of the guide 50 are loosely carried in openings 130 in an upwardly extending ear 131 of the plate 112, to permit the edges 132 and 133 of the guide 50 to remain at all times substantially the same distance from the rolls 12 and 14 respectively and at the same time permit the edge 134 to remain substantially the same distance from the roll 10 or 11, depending upon which roll is actively engaged with its corresponding auxiliary roll to guide the garments into the pressure rolls.

The supplemental rolls 12 and 14 may be geared together, or otherwise driven from each other. As heretofore described, when garments are fed between the roll 12 and the pressure roll 10, the two rolls separate, thereby decreasing the driving connection therebetween, and as the springs 45 or 115 (Figs. 3 or 16) exert a minimum amount of pressure on the supplemental rolls, it is desirable to positively drive the roll 12. To this end, a gear 140 is secured to one end of the shaft 40, which extends beyond the frame member 20, as shown in Fig. 3. The gear 140 meshes with a gear 142 under shaft 41. Hence, the roll 12 will be driven through the gearing 140 and 142, by the roll 14, which will be frictionally driven from the pressure roll 11, as the latter rolls remain in contact with each other, while the garments are being fed between the rolls 10 and 12, as heretofore described.

From the foregoing description, it will be seen that I have provided a wringer for laundry purposes, wherein pressure rolls are used to squeeze the water from the garments wherein the garments are inserted between an auxiliary roll and a pressure roll and automatically guided into the bite of the pressure rolls and wherein the pressure between the pressure rolls will be automatically relieved and the auxiliary roll and its corresponding pressure roll will become automatically separated when the operator's fingers become caught between the rolls.

I claim:

1. In a wringer, a main frame, a pair of supplemental frames pivoted to the main frame, a pressure roll carried by each supplemental frame, resilient means acting to move the pressure rolls in contact with each other and acting to cause the supplemental frames to rock about their pivots, a pair of auxiliary rolls carried by the main frame and arranged to contact or be separated from the respective pressure rolls and latches arranged to resist the movement of the supplemental frame and responsive to a predetermined separation between the auxiliary rolls and the associated pressure rolls to release the supplemental frames for movement about their pivots.

2. In a wringer, a frame, a pair of pressure rolls carried by said frame to provide an upwardly opening bite, resilient means bearing at one end against a pivoted wringer frame element and at the other against a pressure roll to force the two rolls into wringing relation and means to automatically rock the element at the end where the resilient means bears against said frame element to remove the pressure from the said pressure rolls upon feeding a predetermined thickness of material to the wringer.

3. In a wringer to which clothes may be fed from either side, a frame, a pair of pressure rolls carried by said frame to provide an upwardly opening bite, resilient means bearing at one end against a pivoted wringer frame element and at the other end against a pressure roll to force the two rolls into wringing relation, and means to automatically rock the element at the end where the resilient means bears against said frame element to remove the pressure from said pressure rolls upon feeding a predetermined thickness of material to the wringer from either side thereof.

4. In a wringer, a frame, a pressure roll carried by said frame, a sub-frame pivoted to said frame and carrying a second pressure roll, the pivot for said sub-frame lying between the axes of the coacting pressure rolls and means for automatically rocking said sub-frame about its pivot when a predetermined thickness of material is fed to said wringer.

5. In a wringer, a frame, a pressure roll carried by said frame, a sub-frame pivoted to said frame and carrying a pressure roll, the pivot

for said sub-frame lying between the axes of the coacting pressure rolls, an auxiliary roll disposed beneath one of the pressure rolls and adapted to coact therewith to provide an intake bite to said wringer and from which the material passes to the bite of the pressure rolls, and means for automatically rocking said sub-frame about its pivot when a predetermined thickness of material is fed to said intake bite.

6. In a wringer, a frame, a pressure roll carried by said frame, a sub-frame pivoted to the frame and carrying a second pressure roll, a spring bearing at one end against a pressure roll and at the other end against a sub-frame, the pivot for said sub-frame lying in such position with respect to the plane of the wringer rolls that the end of the spring bearing on the sub-frame may be rocked out of its active position to release the operating pressure on the pressure rolls, when a predetermined thickness of material is fed to said wringer.

7. In a wringer, a frame, a pair of pressure rolls carried by said frame and each movable away from the point of tangency of said rolls, guide means adjacent said rolls to guide clothes into the bite of the pressure rolls, resilient means to urge said guide means into coacting relation with said rolls, and means acting on a predetermined separation between the guide means and one of the pressure rolls to release the pressure thereon and permit shifting both of said pressure rolls from said point of common tangency.

8. In a wringer, a frame, a pair of pressure rolls carried by said frame, a pair of auxiliary rolls disposed beneath respective pressure rolls and adapted to coact therewith to provide an intake bite on each side of the wringer, resilient means to urge said auxiliary rolls and said pressure rolls together, resilient means to apply wringing pressure to said pressure rolls and mechanism operable when a predetermined thickness of clothes is fed to either side of the wringer to release the operating pressure from the said pressure rolls without substantially displacing them with respect to each other.

9. In a wringer, a frame and a sub-frame, a pressure roll carried in said frame and a second pressure roll carried in said sub-frame, resilient means to urge the two rolls into wringing relation, a pair of auxiliary rolls disposed beneath respective pressure rolls and adapted to provide a pair of intake bites therewith, and mechanism acting on a predetermined separation between either of said pressure rolls and its respective auxiliary roll to shift the resilient means without substantially shifting either of the pressure rolls to relieve the pressure from said pressure rolls.

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