Feb. 4, 1930. T. B. RICE, JR 1,746,053

SAFETY GUARD

Filed July 16, 1926 2 Sheets-Sheet 1

Fig. 1.

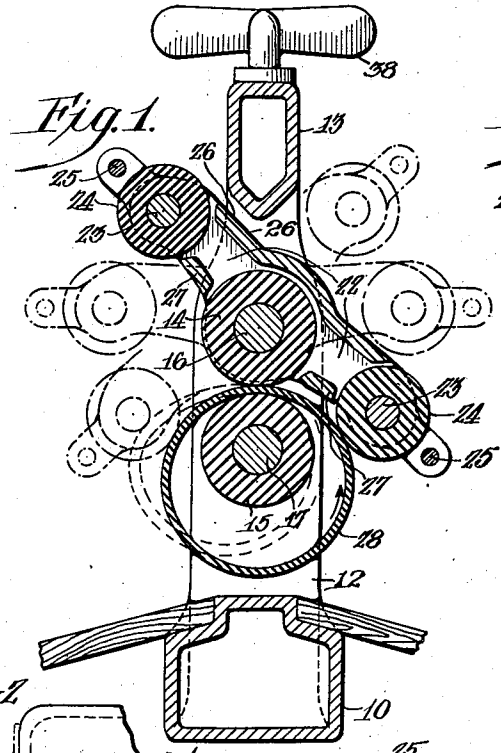


Fig. 2.

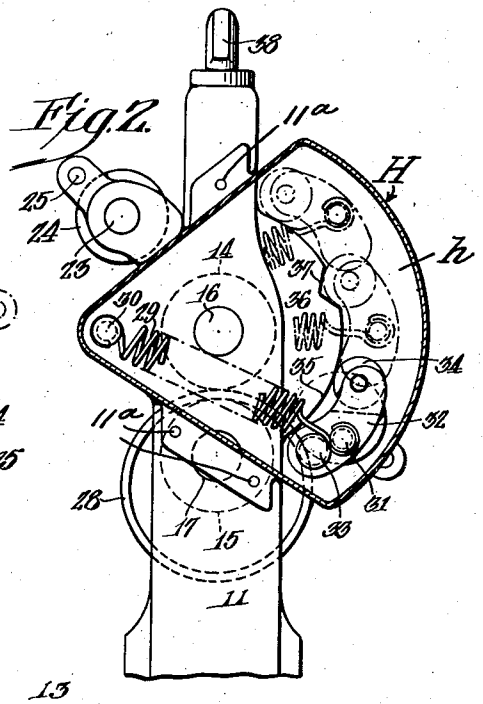
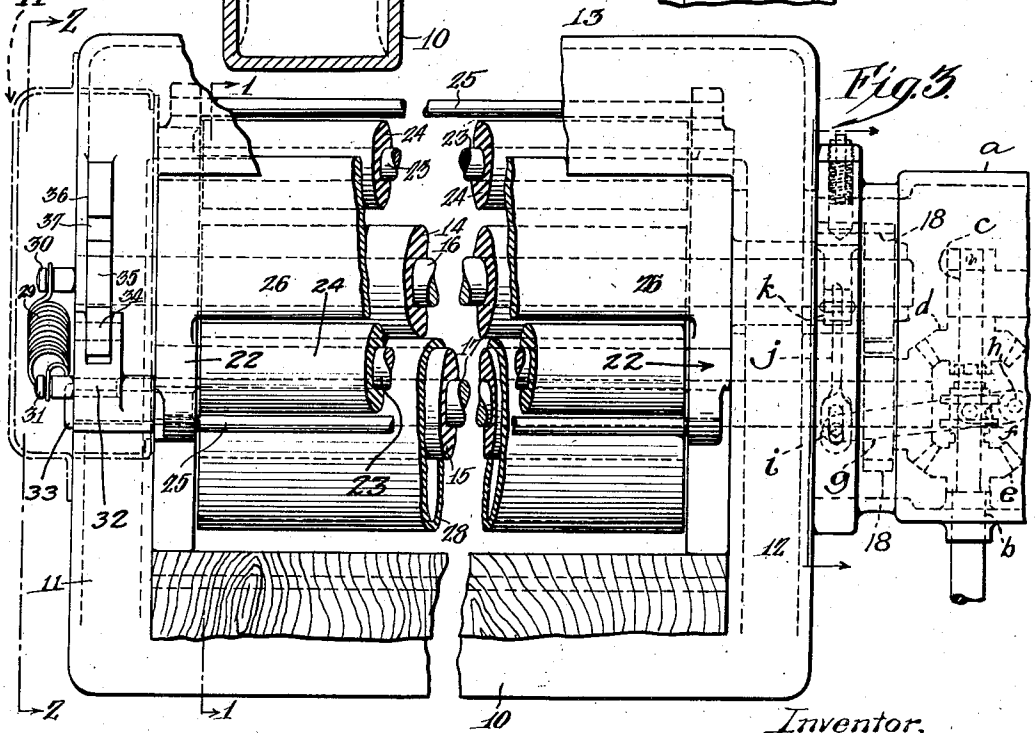


Fig. 3.



Inventor,
Thomas B. Rice, Jr.,
by Stuart Freeman,
Attorney.

Feb. 4, 1930. T. B. RICE, JR 1,746,053

SAFETY GUARD

Filed July 16, 1926 2 Sheets-Sheet 2

Fig. 4.

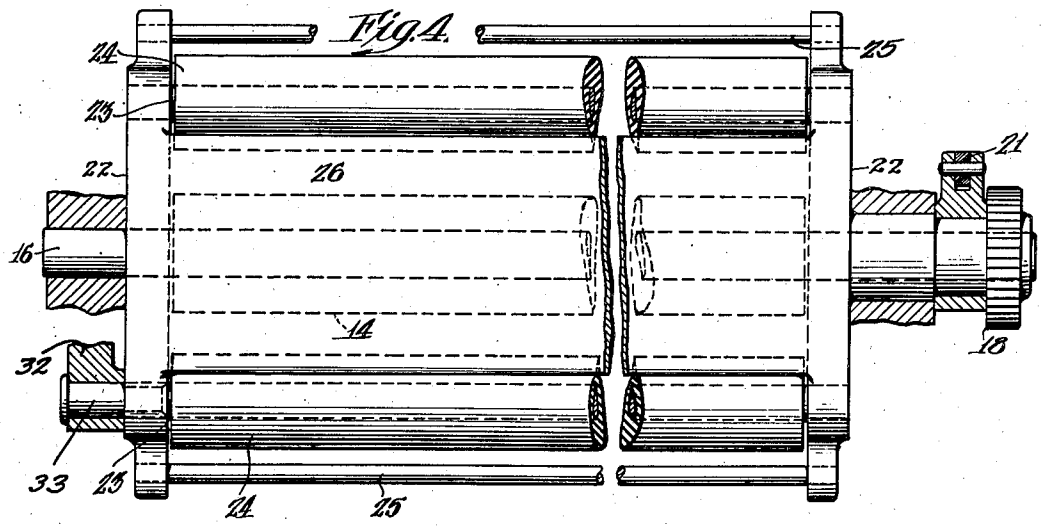


Fig. 7.

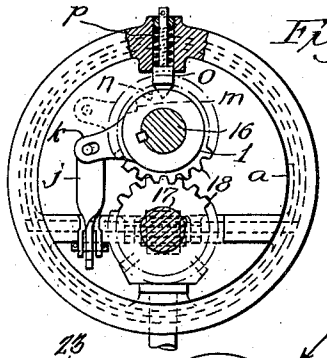
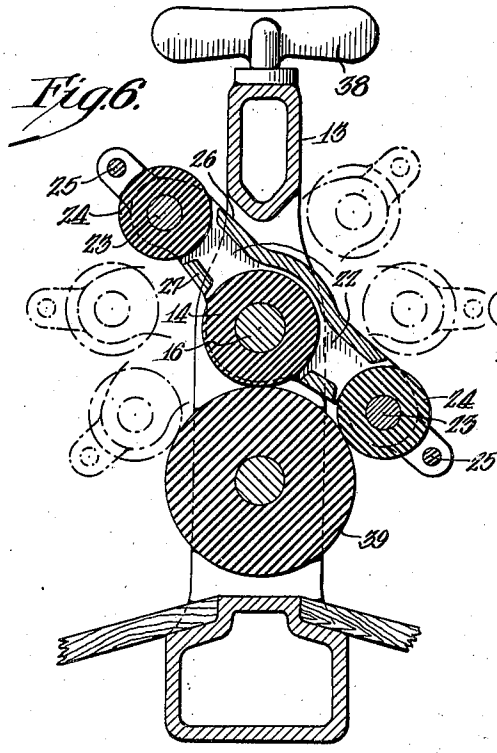


Fig. 6.



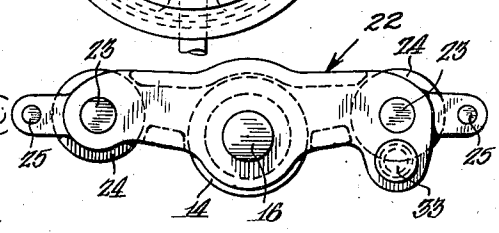


Fig. 5.

Inventor,
Thomas B. Rice, Jr.,
by J. Stuart Freeman,
Attorney.

Patented Feb. 4, 1930 1,746,053

UNITED STATES PATENT OFFICE

THOMAS B. RICE, JR., OF PHILADELPHIA, PENNSYLVANIA

SAFETY GUARD

Application filed July 16, 1926. Serial No. 123,000.

One object of this invention is to provide improvements in guards, capable of many variations in design and general construction and adapted for use in conjunction with an infinite number of machines, where, for instance, articles are manually fed between rollers and there is otherwise danger of the operator accidentally catching his fingers between the rollers or the moving material and drawing his fingers therebetween.

While it is understood that this device as above stated is capable of many uses without limiting the scope of the invention in any degree, it will be hereinafter described as applied to a clothes-wringer, having particularly in mind the wringers which are used either jointly with or independently of the washing-machines so widely distributed today among the residences of the country and driven by electricity, water, etc.

At the outset it should be realized that these wringers are almost in every instance used by women with but relatively little technical training, and who use the devices so infrequently as to prevent their becoming experts in their operation, while in probably more than half of the homes where such wringers are present, there are children who know nothing of the danger of playing with the revolving rolls, and who, in addition to adults, have so frequently gotten their hands caught between the rolls and thus causing disastrous results.

Another object of the invention, therefore, is to provide a guard which in no way interferes with the most efficient operation of the wringer rolls, but is merely an accessory thereto and comprises at least one auxiliary roll, which permits any desired article to be fed between the wringer-rolls but prevents one's hands from entering the rolls with such article.

Still another object is to provide means whereby, if one's hand does positively encounter the guard roll, the latter is immediately shifted into another position, and the rotation of the wringer-rolls is immediately stopped before one's hand can possibly have progressed to the danger point.

A further object is to provide in conjunction with a pair of wringer-rolls a pair of oscillatably mounted yokes extending laterally upon the opposite sides of one of said rolls, while a plurality of guard rolls extend rotatably between the corresponding arms of said yoke, together with clutch means or the like whereby the yokes are in one position and one guard roll protects the entrance between the wringer-rolls, the latter rotating in one direction, movement of said guard roll a short distance in one direction being operative to move said yokes into a neutral position and thereby stop all movement of the wringer-rolls, and a still further movement of said guard roll and yokes being operative to reverse the movement of the wringer-rolls and to bring the other of said guard rolls into operative position with respect to the wringer-rolls.

And a still further object is to provide a suitable resilient means operative to maintain the guard rolls and the yokes upon which they are mounted yieldingly in either extreme position, together with means to also yieldingly maintain said rolls in a neutral position.

Still again, there has been provided a hollow cylinder of preferably yielding material, such as rubber, surrounding one of the wringer-rolls and normally pressing against the operative guard-roll, the construction being such that material to be wrung is caught between the guard roll and the cylindrical member and without requiring further manual propulsion. Said material is conveyed between the other wringer-roll and the said cylinder as the latter passes between the co-operating wringer-rolls, the resiliency or the degree of rigidity of said cylinder being such that when in co-operation with the guard roll, the material is taken from one's hands, but if the hands or even the fingers enter with the material, the cylinder is capable of yielding to such an extent as to permit the ready withdrawal of the hand or fingers without restriction.

With these and other objects in view, the present invention comprises additional further novel details of construction and operation hereinafter fully brought out in the fol-

lowing description, when read in conjunction with the accompanying drawings, in which:

Fig. 1 is a vertical transverse section on the line 1—1, Fig. 3;

Fig. 2 is a similar section on the line 2—2, Fig. 3;

Fig. 3 is a front elevation of a wringer, comprising a frame, a pair of wringer-rolls, and the improvements embodied in the present invention;

Fig. 4 is a fragmentary detail view of the guard rolls, the yokes upon which they are mounted, and the adjacent portions of the device;

Fig. 5 is a detail end elevation of one of the yokes, together with the adjacent wringer-roll and the two guard rolls;

Fig. 6 is a vertical section similar to Fig. 1, but illustrating the use of an enlarged lower wringer-roller in lieu of the smaller wringer-roller and the surrounding cylindrical member illustrated in Fig. 1 and

Fig. 7 is a sectional view on the line 7—7 of Fig. 3 and showing the clutch-actuating mechanism.

Referring to the drawings, all types of wringer-frames are represented by the frame therein illustrated, and which in this instance comprises an O-shaped member having a base 10, side columns 11 and 12, and an upper section 13 connecting said columns. Between said columns extend the usual upper and lower rubber or similar wringer-rolls 14 and 15 mounted upon shafts 16 and 17, said shafts being connected together in the usual manner by gears 18 within a housing 19, and driven by a drive-shaft 20 through any well-known type of clutch mechanism, shown in Figs. 3 and 6.

The clutch mechanism may be constructed as follows:—

The driving shaft 20 extends into the casing *a* through a journal bearing *b* and an internally positioned bearing *c*. Two bevel gears *d* and *e* are loosely mounted upon said shaft and to the latter is keyed a longitudinally movable collar *f* adapted to engage either of said bevel gears or to rotate freely between and independently of them. The position of said collar is shifted by a lever *g*, pivotally carried at *h* by the casing *a* and engaged at its free end *i* by a link *j*, which extends and is pivotally connected to an arm *k* carried by a collar *l* which is keyed to the shaft 16. Said collar is provided with two spaced indentations or recesses *m* and an intermediate recess *n*. A pin *o*, slidable within a housing *p*, is normally pressed by means of a spring *q* into one of said recesses. When said pin is in one of the recesses *m* the clutch collar *f* is in engagement with the gear *e* and the shaft 20 is permitted to drive the roll 15 in one given direction; when said pin is in the other of the recesses *m* the roll 15 is rotated in the opposite direction by virtue of the clutch collar engaging the other of said gears *d*; and when the pin is in the intermediate recess *n* the clutch is free of engagement with either of said gears and the shaft 20 is free to rotate without causing rotation of said roll 15 in either direction.

Oscillatably positioned upon the opposite end portions of the shaft 16, immediately within the columns 11 and 12, is a support having yokes comprising oppositely extending arms 22, between the end portions of which extend shafts 23 carrying either rubber or similar rolls 24, while the extreme outer end portions of said yokes are connected by rods 25, which in turn act as guards to protect in general the guard rolls and also as a means for manually engaging and oscillating said yokes into one of the positions shown in Figs. 1 and 6.

Located between said yokes there is preferably a shield or plate 26, extending transversely and substantially the entire distance between the guard rolls, while other relatively abbreviated shields or plates 27 also extend between said yokes, and transversely are respectively positioned between the wringer-roll and each of the said guard rolls.

Around the lower wringer-roll 15 there is preferably positioned a radially and transversely yielding rubber or similar cylindrical gripping member 28, against which one of the guard rolls 24 normally presses as shown in the drawings, depending upon the direction in which the wringer-rolls are rotated.

Situated in any suitable position, but in this instance within a casing or housing H fastened as at 11^a to the outer surface of the column 11, is a contractile spring 29 having one end secured to a pin 30 on said casing H, while the other end is secured to a lug 31 carried upon a link 32. One end of said link is pivotally mounted on a pin 33 on the adjacent yoke 22, and the other end of said link is provided with a roller 34 which normally bears upon the curved edge 35 of a segment 36 fastened on the said column 11. Said edge 35 is interrupted by a notch 37. Said casing or housing H at the inner side is primarily open as at *h* to enable the link 32, segment 36 and associated parts to be located within the casing and afford clearance for movement of the adjacent parts. The curvature of this segment may be co-axial with the axis of the upper wringer-roll, or preferably eccentric thereto, as shown in the drawing, so that the tension of the spring 29 tends to positively maintain the adjacent link 32 and thereby the yokes 22 in either lower or uppermost positions (referring to Fig. 2), said yokes being temporarily maintained in an intermediate position when the roller 34 enters the notch 37, and will remain in this position until manually shifted therefrom.

The tension existing between the two wringer-rollers may be adjusted in any de-

sired manner, and the tensioning member is conventionally represented by the thumb-screw 38. Furthermore, if for any reason it is desired to eliminate the yielding cylindrical member 28 and still maintain the desirable advantages of the present invention, a relatively larger lower wringer-roll may be employed, as shown in Fig. 6, said last-named roll and the usual upper roll 14 being geared together, so that their relative speeds of rotation are correct for insuring the same surface speed at their line of contact.

In the operation of this device and from the structure hereinbefore described, it will be seen that in the normal use of the invention as illustrated in the drawings, particularly Fig. 1, clothes or other articles may be fed beneath the guard roll 24 and as soon as they are caught and gripped between said roll and the laterally yielding cylindrical member 28, they are drawn without further manual effort beneath the shield 27 and thence between the wringer roll 14 and the cylinder 28 at its point of support by the lower wringer roll 15. The ability of the cylinder 28 to flex laterally readily permits articles to be fed between it and said guard roll without forcing the arms 22 so far angularly as to cause disengagement of the pin from one of the recesses *m* and engagement of such pin and the neutral recess *n*. However, if an article which is relatively bulky or if one's hands or fingers should be caught between the roll 24 and cooperating cylinder 28, said roll would be forced angularly upward a sufficient distance for said pin and neutral recess *n* to engage which position corresponds with the horizontal dot-and-dash position of the arms 22 and guard rolls 24 shown in Fig. 1, the clutch collar *f* having in the meantime been withdrawn from cooperative engagement with the bevel gear *e* with the result that the rotating shaft 20 ceases to drive the roll 15 and will not again do so until the arms 22 and guard rolls carried thereby are again shifted into the full line positions shown in Fig. 1. Or the guard rolls and supporting arms may be angularly oscillated into the diagonally extending dot-and-dash position shown in Fig. 1, in which case the clutch collar *f* engages the other of said bevel gears *d* and by rotating the wringer roll 15 the opposite or clock-wise direction (as viewed in Fig. 1), the device is adapted to receive material for wringing purposes between the lowermost dot-and-dash position of the left-hand guard roll 24 and said flexible cylinder 28.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States is:—

1. The combination of a plurality of cooperating rollers, means to drive the same in opposite directions, a pair of oscillatable members mounted coaxially with one of said first rollers, a guard roller extending between and supported by said members for movement from normal position upon slippage of one's hand in the direction of feed of the material, said guard roller and one of the first rollers being arranged to jointly grip and feed material to pass between the first rollers, and means connected with said members and operative upon said guard roller being moved from its normal position to stop the operation of said driving means.

2. The combination of a plurality of cooperating rollers, means to drive the same in opposite directions, a hollow cylinder surrounding one roller and bearing directly against the other roller, a guard roller normally resting yieldingly against said cylinder to draw material between said first rollers, and means connecting said guard roller with said driving means, whereby, when said guard roller is moved more than a predetermined distance from its normal position, said driving means ceases to drive said first rollers.

3. The combination of a plurality of cooperating rollers, means to drive the same in relatively opposite directions, a hollow cylinder surrounding one roller and bearing directly against the other roller, a guard roller, and resilient means to cause said guard roller to yieldingly engage one of said first rollers.

4. The combination of a plurality of cooperating rollers, means to drive the same in relatively opposite directions, a hollow cylinder surrounding one roller and bearing directly against the other roller, a guard roller, resilient means to cause said guard roller to yieldingly engage one of said first rollers, and means operative upon a movement of said guard roller beyond a predetermined extent to stop said driving means from actuating said first rollers.

5. The combination of a plurality of cooperating rollers, means to drive the same simultaneously in relatively opposite directions, a pair of oscillatable yokes extending upon the opposite sides of said rollers, a guard roller upon each side of said first rollers extending between the corresponding ends of said yokes, resilient means operative to maintain either one of said guard rollers yieldingly positioned for displacement thereof should one's hand slip in the direction of feed of the material to said first rollers, and means connecting said yokes with said driving means, whereby movement of said yokes and said guard rollers starts, stops and reverses the direction of rotation of said first rollers, depending upon which of said guard rollers is in operative position.

6. The combination of a plurality of cooperating rollers, a pair of oscillatable yokes extending upon the opposite sides of said rollers, a guard roller upon each side of said first rollers and rotatably carried by said yokes, one of said guard rollers being nor-

mally in co-operation with one of said first rollers, and resilient means operative to maintain either one of said guard rollers yieldingly positioned for displacement thereof should one's hand slip in the direction of feed of the material to said first rollers, the operative positioning of said guard rollers changing with the direction of rotation of said first rollers.

7. The combination of a plurality of movable members, with an oscillatable support, a guard roller carried by said support, said guard roller and one of said members being arranged to jointly grip and feed material so as to pass between said members, and for movement from normal position upon slippage of one's hand in the line of feed of the material.

8. The combination of a plurality of co-operating rollers, with a pair of oscillatable members, a guard roller, carried by said members for movement from normal position upon slippage of one's hand in the direction of feed of the material, said guard roller and one of said first rollers being arranged to jointly grip and feed material so as to pass between said first rollers, and means connected with said guard roller and operative upon said movement of said guard roller to stop the rotation of said first rollers.

9. The combination of a plurality of co-operating rollers, means to drive the same in opposite directions, a guard roller arranged to grip and feed material jointly with one of said first rollers so as to pass between the first rollers and for movement from normal position upon slippage of one's hand in the line of feed of the material, and means whereby when said guard roller is moved from its normal position, said driving means ceases to actuate said first rollers.

In testimony whereof I have affixed my signature.

THOMAS B. RICE, JR.