Dec. 3, 1940. W. B. HUTCHINGS 2,224,019

STARCHING MECHANISM

Filed Sept. 20, 1937 2 Sheets-Sheet 1

Fig. 1.

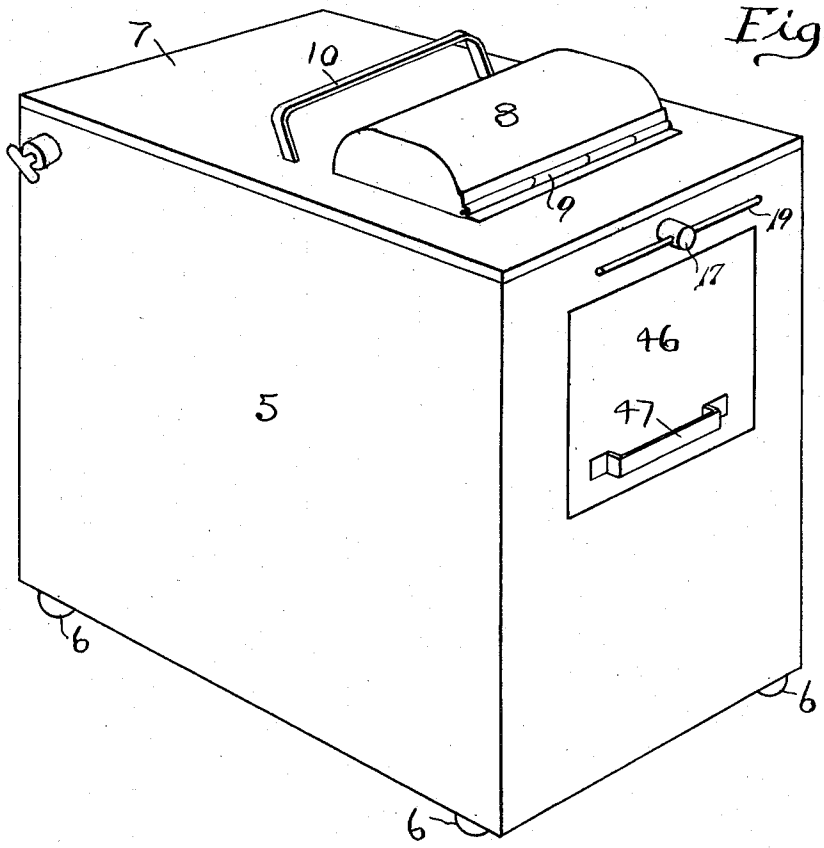
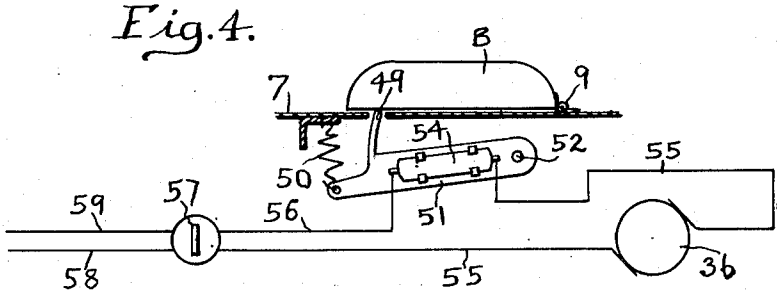


Fig. 4.



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Fig. 2.

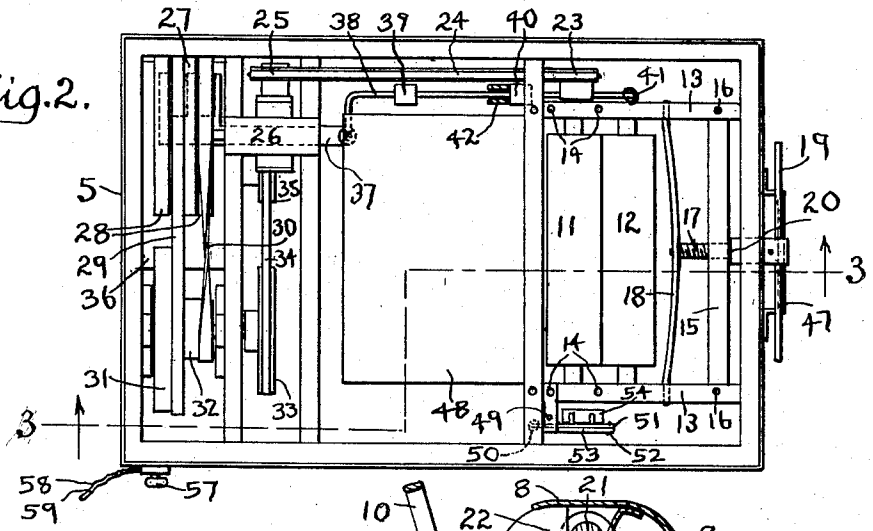
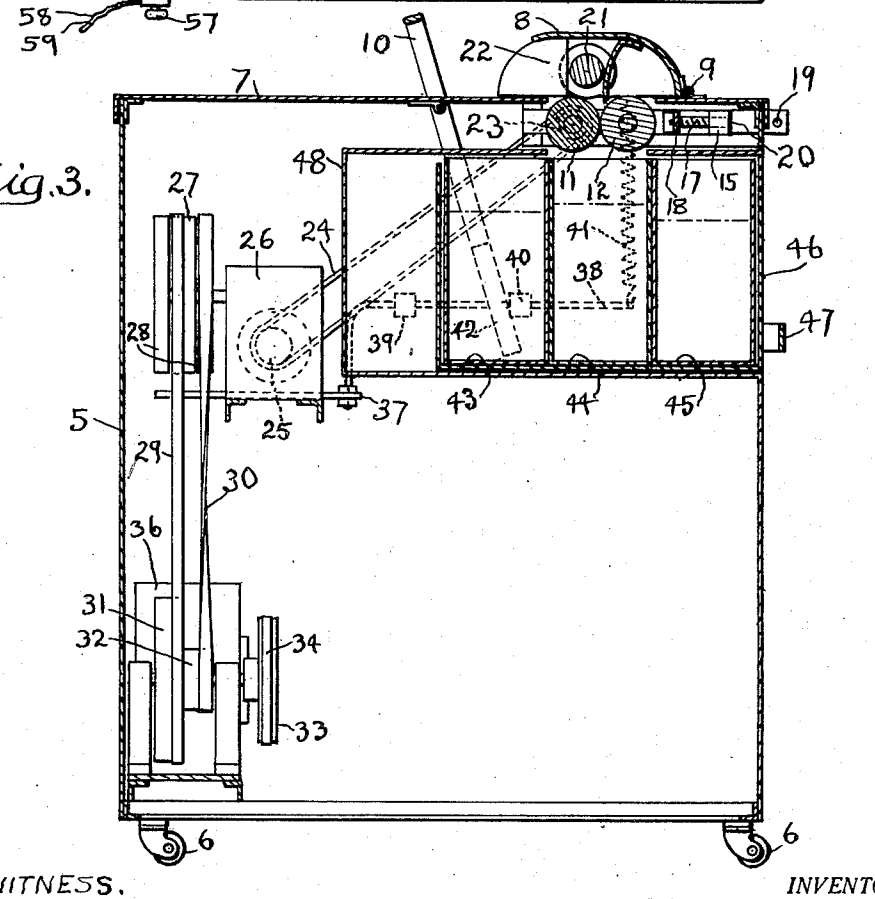


Fig. 3.



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2,224,019

UNITED STATES PATENT OFFICE

2,224,019

STARCHING MECHANISM

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Application September 20, 1937, Serial No. 164,617

10 Claims. (Cl. 91—31)

This invention relates to the starching of garments and mechanism for use in starching garments. In the machine shown in the drawings the garment, in a vertical plane, is immersed in liquid starch, and is then immediately placed under pressure as it is withdrawn from the liquid starch. To effectively, easily, and quickly carry out this process of starching garments I have constructed a machine consisting of two rubber rolls constantly pressed tightly together and free to rotate; the one roll being driven to rotate first in one direction and then in the reverse direction, the other roll being driven by frictional contact with the driven roll also to rotate first in one direction and then in the opposite direction.

The mechanism for feeding the garments between said two rolls is novel and provides for reversing the rotation of the rolls when any object thicker than is desired approaches the two rolls. This mechanism is provided with a safety device so that the operator or any other person cannot place the fingers in a dangerous position. The rolls are preferably driven by electric motor power and are made of rubber. When the machine is in normal operation the rolls are constantly rotating in one direction or the other and are tightly pressed together preferably by a spring the pressure of which can be relieved when the machine is not in use, and means of course is provided to shut off the electric motor when the machine is not in use.

To describe the machine used to carry out the process I have illustrated the same on the accompanying two sheets of drawings forming a part of this specification and in which Figure 1 is a perspective view showing the complete machine; Fig. 2 is a plan view of same with the top cover removed; Fig. 3 is a sectional view on line 3—3 of Fig. 2, and Fig. 4 is a detail view partly diagrammatical showing the safety device to prevent harm to an individual.

Similar reference characters refer to similar parts throughout the several views.

Referring to the drawings 5 is the outer case or cabinet which is shown provided with suitable castors 6, and with a cover 7. The cover 7 is provided with a hood 8 which is hinged to the cover at 9 so that its free front edge can be lifted at will. The cover 7 is also provided with an operating lever 10 a short distance in front of the hood 8 and above the top of the cover and which is pivoted to the under side of the cover. The ends of the lever 10 are bent down and extend through holes provided therefor in the cover. Two rubber wringer rollers 11 and 12 are pivoted to the frame of the case 5 and have their upper sides about in the same plane as the top of cover 7. The bearings of roller 11 are rigidly secured to the frame 13 by suitable bolts 14, and the bearings of roller 12 are mounted to slide in the frame 13 toward and away from the bearings of roller 11. A suitable cross brace 15 is rigidly secured to frame 13 by bolts 16 and has a hole in its center into which is threaded a screw 17, one end of which bears against the center of a leaf spring 18 whose ends bear against the movable bearings of rubber roller 12. The other end of screw 17 is provided with a handle 19 outside the case 5. The screw 17 extends through a hole in the case 5 and is provided with a shoulder 20 which serves as a stop against the cross bar 15 so that the screw 17 cannot be turned in too far.

Loosely pivoted in the hood 8 is a roller 21 which normally supports the free edge of the hood. The roller 21 is spool-shaped, having the greater portion of its middle reduced to a smaller diameter and only the larger portion at each end of this roller rests or rolls on the roller 11. The cut-out middle portion of the roller 21 determines how far said middle portion is from the roller 11 and also determines how thick a piece of goods or other article can pass between roller 11 and roller 21 without lifting the hood 8. Hence if a person's finger is placed between said two rollers 11 and 21 the hood 8 will be lifted up about its pivot 9. The front portion of the hood 8 where the garments are fed in is preferably provided with a rigid shield 22 at each end to prevent any portion of the garment coming in contact with the ends of the roller 11 while the same is being fed into the machine. A fixed guide back of the reduced-diameter portion of roll 21 aids in directing the work downwardly between the rolls 11 and 12.

One end of the shaft of roller 11 extends through its bearing and has rigidly secured thereon a small sprocket 23 connected by an endless chain 24 to the sprocket 25 of a reduction gear box 26 whose fast running shaft carries the rigid pulley 27. The customary loose pulleys 28 are pivotally mounted adjacent the pulley 27 over which the belts pass when not on the pulley 27. Two belts 29 and 30 extend from pulleys 27 and 28 to pulleys 31 and 32 which are rigid on the same shaft with pulley 33. A belt 34 connects pulley 33 with pulley 35 of electric motor 36. The belt shifting lever 37 is mounted to slide below the gear box 26 and has rigidly secured to its

one end the rod 38 carrying on its free end the two adjustable stops 39 and 40 which are properly positioned and then held in such position by set screws or otherwise. The extreme free end of the rod 38 is connected to the frame of the case 5 by a coiled contracting spring 41 to cause sufficient friction between the shifting lever 37 and its bearing to hold the same in any position it is moved to.

The shifting lever 37 is moved from one position to the other to shift belts 29 and 30 by the operator pulling the lever 10 forward or pushing said lever backward about its pivot. One downwardly bent end 42 of operating lever 10 is made sufficiently long to extend between the two stops 39 and 40 on rod 38, and as rod 10 is moved forward, to the left as seen in Fig. 3, the shifting lever 37 is moved to the right and as rod 10 is moved backward, to the right as seen in Fig. 3, the shifting lever 37 is moved to the left. The several parts are so arranged that when the operating rod 10 is pulled forward rubber roller 11 will turn clockwise as seen in Fig. 3, and when rod 10 is moved back towards hood 8 the roller 11 will rotate counterclockwise as seen in Fig. 3.

Suitable starch containers 43, 44 and 45 are arranged in a tray 46 having a handle 47. The tray 46 is arranged to slide into a closed compartment 48 rigidly secured to the case 5 and provided with an open slot below the junction of rollers 11 and 12.

The free end of the hood 8 is made to depress a small rod 49 extending a short distance above the cover 7 and yieldingly held up by a spring 50 as seen in Fig. 4. The rod 49 is rigid with lever 51 pivotally mounted at 52 on a bracket 53 rigid with the frame of case 5. As seen in Fig. 4, the lever 51 carries a mercury switch 54 making or breaking contact between the wires 55 and 56 extending from the switch 57 located at some convenient place on case 5 to motor 36. The usual wires 58 and 59 extend from the switch 57 to a source of power.

In operation, after the switch 57 is turned to start the motor 36 the operator observes that rod 10 is in a backward position which will rotate roller 11 counterclockwise. The garment is fed in until it touches the roller 11; the lever or operating handle 10 is then pulled forward or to the left as seen in Fig. 3, which rotates roller 11 clockwise and feeds the garment down into the starch in one of the containers 43, 44 or 45; when the garment has been fed in a sufficient distance the operator pushes the rod 10 back or to the right as seen in Fig. 3, which causes roller 11 to turn counterclockwise and feeds the garment out from the starch. Thus the operation is repeated. It will be noted that the rubber rollers 11 and 12 are continually forced together under tension of spring 18 and therefore the garments are fed into the starch under pressure and are withdrawn from the starch under pressure.

Should a large bunch of a garment or any person's hand be fed into the machine at any time the roller 21 will be lifted up and since said roller is pivotally mounted in the hood 8 the hood will be lifted up about its hinges 9 and the small rod 49 will be released to permit spring 50 to swing mercury switch 54 on its pivot and break the connection between the conductors 55 and 56 thus stopping the motor 36.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a device of the class described, two rollers constantly pressed together, means for rotating said rollers first in one direction and then in the opposite direction, a third roller resting by gravity on one of said two rollers having the greater center portion of reduced diameter, a switch to control the operation of said two rollers and means whereby said switch will be operated by said third roller being lifted.

2. In a device of the class described, rotatable driven rollers between which the work is fed, a movable hood over said rollers and carrying a third roller, and means operated by lifting the hood for stopping the driven rollers.

3. In a device of the class described, rotatable driven rollers between which the work is fed, a movable hood over said rollers and carrying a third roller, a motor driving the rotatable rollers and a switch controlling said motor and operated by lifting the hood for stopping the driven rollers.

4. A starching machine comprising a starch container, rollers yieldingly pressed together above said container, a motor, means for driving the rollers from the motor, manually-controlled means for reversing the direction the rollers are driven by said driving means, and means for guiding work between said rollers, said guiding means being connected to stop the rollers upon the approach of an article of unusual thickness.

5. A starching machine comprising a starch container, rollers yieldingly pressed together above said container, a motor, means for driving the rollers from the motor, manually-controlled means for reversing the direction the rollers are driven by said driving means, and means for guiding work between said rollers, said guiding means including a hood pivotally mounted above said rollers and carrying a third roller resting by gravity on one of the first rollers.

6. A starching machine comprising a starch container, rollers yieldingly pressed together above said container, a motor, means for driving the rollers from the motor, manually-controlled means for reversing the direction the rollers are driven by said driving means, and means for guiding work between said rollers, said guiding means including a hood pivotally mounted above said rollers and carrying a third roller resting by gravity on one of the first rollers, together with means operated by separation of the third roller and said one of the first named rollers beyond a predetermined amount to stop said yieldingly-pressed rollers.

7. A starching machine comprising a casing, a plurality of starch containers arranged in said casing for movement as a unit, feed rollers above said unit below which the containers can be brought selectively by moving said unit, and manually-controlled means for reversibly driving said rollers.

8. A starching machine comprising a casing, a plurality of starch containers arranged in said casing for movement as a unit, feed rollers above said unit below which the containers can be brought selectively by moving said unit, manually-controlled means for reversibly driving said rollers, a swinging guard above the rollers lifted by the approach of an article of unusual thickness, and means operated by lifting the guard for stopping the rollers.

9. A starching machine comprising a casing, a plurality of starch containers arranged in said casing for movement as a unit, feed rollers above said unit below which the containers can be brought selectively by moving said unit,

manually-controlled means for reversibly driving said rollers, a guard above the rollers carrying a third roller resting by gravity on one of the first rollers and lifted by the approach of an article of unusual thickness, and means operated by lifting the third roller for stopping the feed rollers.

10. A machine having spring-pressed driven rollers, a guard mounted above the rollers and having a third roller resting by gravity on one of the first rollers, and means actuated by lifting the third roller for stopping the driven rollers.

WALTER B. HUTCHINGS.