

Aug. 18, 1936.

H. E. PAGE

2,051,739

GARMENT PRESSING MACHINE

Filed Jan. 27, 1933

Fig. 1.

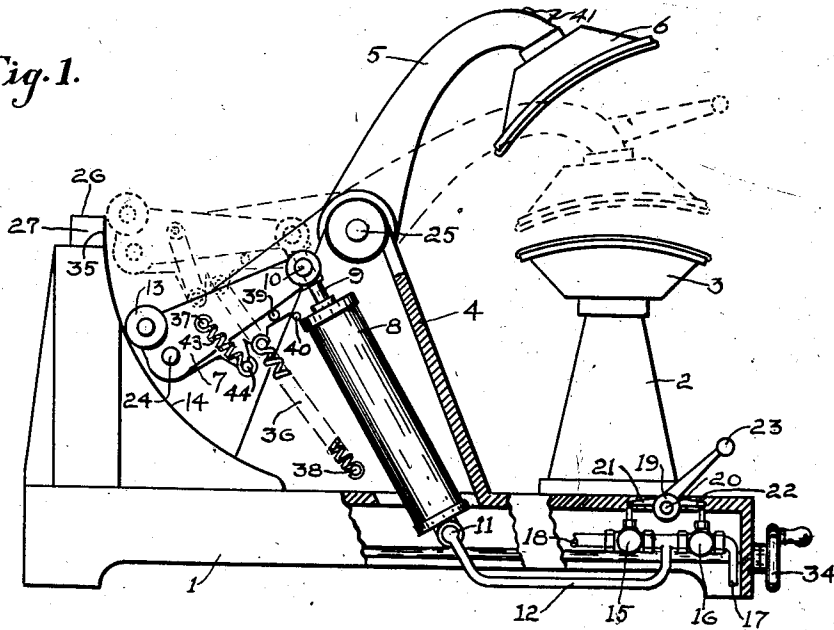
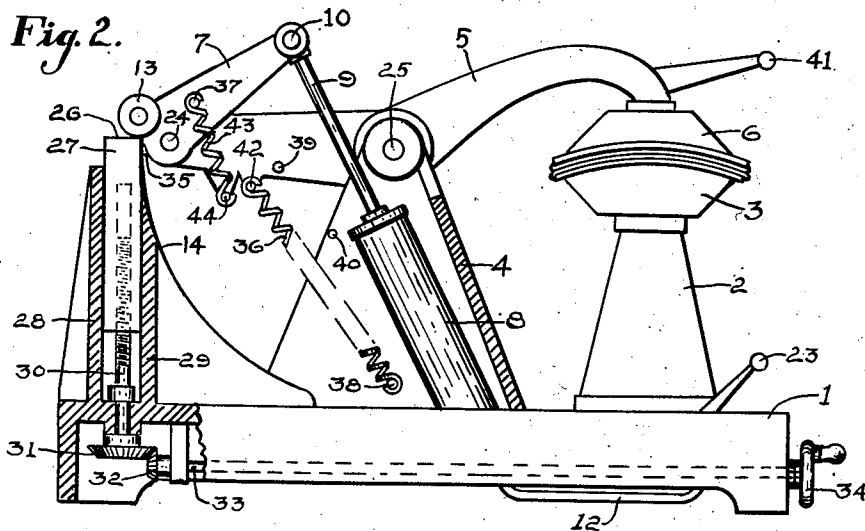


Fig. 2.



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UNITED STATES PATENT OFFICE

2,051,739

GARMENT PRESSING MACHINE

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Application January 27, 1933, Serial No. 653,880

7 Claims. (Cl. 38—41)

This invention pertains to a garment or ironing press, and more particularly to that type wherein motor means is employed to effect the pressure upon the articles being pressed.

One of the objects is to provide a simple and efficient means, actuated by a motor, to move the press head from its extreme open position to a point where it is almost in contact with the lower pressing surface or buck, using little power for this operation so as to reduce to a minimum the liability of injury should the operator become caught between the pressing surfaces.

Another object is to provide means, actuated by the same motor, for greatly increasing the pressure of the movable press head as it is brought into pressing position against the lower pressing surface or buck.

Another object is a lever mechanism which initially applies the power of an actuator to quickly preliminarily close the press with a small movement of the actuator through a comparatively low leverage and to finally close the press through a high, powerful leverage with a greater movement of the actuator, or a mechanism for transferring the movement of an actuator to the head carrying lever through a differential lever mechanism automatically operable to quickly close the press through one leverage and to shift to a more powerful leverage automatically to finally close the press when the press head encounters resistance.

Other objects and uses relating to specific parts of the machine will be brought out in the following description.

In the drawing:—

Figure 1 is a side elevation, partly in section, in which the movable pressing element and its actuated means is shown by full lines in a full open position and by dotted lines in a nearly closed position.

Figure 2 is a similar view, the press being closed and the parts in position to produce high pressure.

This pressing machine mechanism comprises, generally, cooperating pressing elements, that is, a buck and a head movable toward and from the buck, a head carrying lever pivoted between its ends to the frame of the machine and carrying the head on its front arm, means for actuating the lever including a motion transmitting part and connections between said part and the rear arm of the lever to successively apply power to said arm between its ends and at its rear end.

The motion transmitting part is here shown as a reciprocating rod, as a piston rod, and said con-

nections including a member carried by the rear arm of the head carrying lever and capable of movement therewith, as a unit, and also when permitted, relatively thereto, as a second lever pivoted between its ends to the rear arm of the head carrying lever between the ends thereof and preferably near the rear end thereof, the second lever extending lengthwise of the rear arm of the head carrying lever and the piston rod being connected to the front arm of the second lever.

The rear arm of the second lever normally coacts with means to hold it from pivotal movement so that it initially moves as a unit with the head carrying lever during preliminary closing of the press; and moves out of engagement with said means when the press approaches preliminary closed position and into engagement with a fulcrum on the frame to permit pivotal movement of the second lever relative to the head carrying lever and actuate the head carrying lever through a high, powerful leverage.

In said drawing, 1 is the base of the machine and is adapted to rest upon a table or bench and upon said base is mounted the buck support 2 and the buck 3.

Pivotally mounted at 25 on the upper end of a vertically extended projection 4 of the main base 1 is a head carrying lever 5 having mounted on its forward end the press head 6.

Said head and the buck 3 may be of any shape and equipped with the regular covering or finish required by the work undertaken.

To the rear arm of the lever 5, and preferably near its rear end, is pivotally secured a second lever 7.

Said second lever rests against the stop pin 39 located on the lever 5 when the press is in the positions as shown by the full and dotted lines of Figure 1.

The second lever 7 is adapted to be actuated by a fluid-pressure operated motor consisting in this instance of a cylinder 8 in which is reciprocally movable a piston, having an upwardly extending rod 9 connected at its upper end to the pin 10.

The cylinder 8 is pivoted on the frame 1 at its lower end at 11 to the adjacent end of a fluid pressure supply and exhaust conduit 12, Figure 1.

The rear arm of the head carrying lever 5 rests against the stop pin 40 located in projection 4 when the press is in the full open position as shown by the full lines in Figure 1.

The second lever 7 is provided with an exten-

sion at the rear carrying a roller 13 which is adapted to engage with the surface 14 as shown by the full lines in Figure 1 and also with the surface 35 on the side of the fulcrum member 27 as shown by the dotted lines in Figure 1.

The roller 13 can also engage with a fulcrum surface 26 located at the top of the sliding or vertically adjustable fulcrum member 27 as shown in Figure 2.

The fulcrum member 27 is mounted between the guides 28 and 29 located at the rear of the base 1 and said member is adapted to be raised or lowered by means of the threaded rod 30, Figure 2.

At the lower end of the rod 30 is mounted the bevel gear 31 which meshes with the bevel gear 32.

The gear 32 is attached to the shaft 33 at the forward end of which is mounted adjustment wheel 34.

Turning adjustment wheel 34 transmits this motion by means of the shaft 33 and the gears 32 and 31 to the threaded rod 30 and thus raises or lowers the fulcrum member 27, Figure 2.

A retracting spring 36 is attached at its upper end by means of the pin 42 to the rear arm of the lever 5 and at its lower end by the pin 38 to the vertically extended projection 4 of the main base 1, Figure 2.

A second retracting spring 43 is attached at its upper end by means of the pin 37 to the lever 7 and at its lower end by the pin 44 to the rear arm of the lever 5, Figure 2.

The conduit 12 is connected to and between a pair of similar fluid controlling valves 15 and 16, which may be of any self closing type, the intake valve 16 being connected by a conduit 17 to a source of supply for the fluid under pressure and the exhaust valve 15 is provided with an exhaust conduit adapted to be connected to any suitable waste pipe or to the atmosphere, Figure 1.

The valves 15 and 16 are adapted to be opened by an operating member 19 which is pivoted at 20 to the base 1 and is provided with an operating handle 23 at its upper end and with the projecting arm 21 and 22 for engaging the upper ends of the valve stems of the valves 15 and 16 and thereby opening one or the other of the valves as the member 19 is rocked in reverse directions about its pivot 20, it being understood that when the member 19 is rocked by the operator in one direction for opening one valve, the other valve will remain in its closed position and that these valves are of the self closing type and will close themselves and rock member 19 into a neutral position as shown in Figure 1 as soon as the operator removes operating pressure from the handle 23.

The operation of the piston of the motor for moving the press head 6 from the open position as shown by the full lines in Figure 1 to the closed position as shown by Figure 2 may be effected by steam or any other fluid under pressure conducted to the hinged end of the cylinder 8 through the conduit 12.

When the operator depresses the handle 23 the member 19 is caused to rotate about the pin 20 in a clockwise direction engaging the arm 22 with the upper end of the valve stem of the intake valve 16 thus opening said valve and allowing the exhaust valve 15 to remain closed and permitting fluid under pressure to flow through the conduit 12 and through the connection 11 into the adjacent end of the cylinder

8 thus causing the piston and the piston rod 9 to move upwardly from the position shown in full line in the Figure 1.

The upward movement of the piston rod 9 is transmitted to the forward end of the lever 7 through the pin connection 10 and tends to cause said lever to rotate in a counter-clockwise direction about the pin 24.

However, since the roller 13 is engaged with the surface 14 as shown by the full lines in Figure 1, such rotation is prevented or restrained and the upward movement of the piston rod 9 is therefore transmitted through the pin 24 to the rear arm of the lever 5 causing said lever to swing in a clock-wise direction about the pin 25 from the position as shown by the full lines in Figure 1 to the position as shown by the dotted line in Figure 1, and causing the roller 13 to roll from the surface 14 to the surface 35.

It is now clear that during this movement the movement of the piston rod 9 has been greatly restricted as compared with its full movement, as shown in Figure 2, and that this restriction is caused primarily by the roller 13 rolling on the surface 14, which surface may be of any shape suitable for the purpose but is shown in this instance as a radius from the center of the pin 25, and the surface 35 which acts as a continuation of the surface 14, and thus preventing the lever 7 from rotating about the pin 24.

It will, therefore, be understood that the moment arm of the force applied to the lever 7 is, in this case, the distance between the pin 10 and the pin 25 and, as this distance is only a fraction of the distance between the pin 25 and the surface of the head 6, said head during the movement from the position shown by the full lines to the position shown by the dotted lines in Figure 1, will not move with sufficient force to cause injury should the operator get caught between the pressing surfaces during this movement.

The dotted line of Figure 1 indicates the roller 13 as approaching the end of the restraining surface 35 and as the upward motion of the piston rod 9 continues the press mechanism moves from the position as shown by the dotted lines of Figure 1 to the position shown in Figure 2, and during this movement the roller 13, having reached the end of the restraining surface 35, rolls rearwardly to the surface 26, Figure 2, releasing the lever 7 and allowing said lever to rotate in a counter-clockwise direction about the pin 24.

The surface 26 now becomes the fulcrum for the lever 7 through the roller 13 and the force in lever 7 is transmitted through the pin 24 to the lever 5 and the press head 6 by means of the action of the roller 13 resting on the fulcrum surface 26.

By this means the original force of the piston rod 9 is now considerably multiplied by the time it reaches the press head 6, Figure 2.

It is now apparent that lowering the surface 26 increases the distance between the pressing surfaces of the head 6 and the buck 3 at which point the roller 13 rolls back on to the surface 26 and raising the surface 26 decreases said distance.

Therefore, raising or lowering the surface 26 by means of the hand wheel 34, as heretofore described, permits the press to accommodate various thicknesses of articles to be pressed between the pressing surfaces.

Furthermore, in Figure 1, if the surface 26 is raised by means of the hand wheel 34 to a point

where, although the pressing surfaces of the head 6 and the buck 3 are in contact with the article being pressed, the roller 13 is still on the surface 35 then, as previously explained, the pressure applied to the article being pressed will be relatively low.

Likewise, if the surface 26 is lowered to a point, such as in Figure 2, where the roller 13 is allowed to roll onto the surface 26 during the pressing operation, then the pressure applied to the article being pressed will be relatively high, therefore, the handwheel 34 permits the operator not only to adapt the press to accommodate articles of various thicknesses but also to vary the pressure on those articles.

After the press has assumed the position as shown in Figure 2 the operator may continue to depress the handle 23, thus allowing fluid under pressure to continue to flow into the cylinder 8 to compensate for any losses that might occur, due to leakage past the piston, or he can release the pressure he has maintained on the handle 23 and thus allow member 19 to return to its neutral position as shown in Figure 1.

This allows the intake valve 16 to close, as heretofore explained, and will trap the fluid remaining in the cylinder 8 and the conduit 12, keeping the press approximately in the position as shown in Figure 2.

After the press has assumed the closed position as shown in Figure 2, raising the handle 23 rocks member 19, Figure 1, in a counter-clockwise direction about the pin 20 engaging the arm 21, with the upper end of the valve stem of the exhaust valve 15, thus opening said valve and allowing the intake valve 16 to remain closed.

Opening the exhaust valve 15 allows the fluid that was trapped in the cylinder 8 and the conduit 12 to escape through the exhaust valve 15 and removes the pressure which the piston rod 9 has been exerting upwardly against the pin 10 and the lever 7.

As soon as this pressure has been relieved the retracting spring 43, which has been extended from the position shown by the full lines in Figure 1 to the position shown in Figure 2, rocks the lever 7 in a clockwise direction about the pin 24 until said lever 7 comes in contact with the stop pin 39, during which movement the roller 13 has rolled from the fulcrum surface 26 as shown in Figure 2, onto the surface 35, as shown by the dotted lines in Figure 1.

Further rotation of the lever 7 about the pin 24 is now prevented by the stop pin 39 and the force of the retracting spring 36 is now brought into play and this force is transmitted through the stop pin 39 to the lever 5, causing said lever to rotate in a counter-clockwise direction about the pin 25 until the lever 5 comes in contact with the stop pin 40 and the press assumes the open position as shown by the full lines in Figure 1.

It is often necessary, for certain pressing operations, to bring the press head 6 down upon the buck 3 manually by the operator pulling downward upon the handle 41 and heretofore this has required a great deal of effort on the part of the operator since it was necessary for him to overcome considerable friction due to all the moving parts and springs of the press having to be moved by him through their entire cycle of movement.

However, in this case, when the operator closes the press by grasping the handle 41 located at the end of the lever 5 and pulling down on said handle, it will be noted that the lever 7 will

not rotate about the pin 24 but will continue to rest against the stop pin 39 as it is held in place by retracting spring 43, Figure 1.

Also the movement of the piston rod 9 and the attached piston during the manual closing operation will be small because if the lever 7 does not rotate about the pin 24, the distance between the pin 10 and the pin 25 will remain the same throughout the movement and, as this distance is relatively small as compared with the distance between the pin 25 and the handle 41, any friction of the fluid motor will be easily overcome, and, since the retracting spring 43 will not be extended at all during such manual closing of the press, the operator can thus bring the head 6 down upon the buck 3 with a minimum of effort.

I claim:

1. In a garment pressing machine cooperating pressing elements, one of which is movable toward and from the other, a lever pivoted between its ends to the frame and carrying the movable element on one arm thereof, actuating mechanism for the lever including a motion transmitting part and connections between the motion transmitting part and the other arm of the lever to successively apply power to the latter arm between its ends at a fixed point and to the outer end of said arm, said connections including a second lever pivoted to said other arm of the first lever and extending lengthwise thereof, the motion transmitting part being connected to the second lever, means for initially holding the second lever from pivotal movement and a fulcrum arranged to coact with the second lever when the press is closed, whereby the second lever coacts with the fulcrum, after the press is closed and the second lever has passed out of engagement with its holding means.

2. In a garment pressing machine cooperating pressing elements, one of which is movable toward and from the other, a lever pivoted between its ends to the frame, and carrying the movable element on one arm thereof, actuating mechanism for the lever including a motion transmitting part, and differential connections between the motion transmitting part and the other arm of the lever, said connections including a second lever pivoted between its ends to the latter arm of the first lever and said part being pivoted to the arm extending toward the axis of the first lever, a track carried by the frame and coacting with the outer arm of the second lever to normally hold it from pivotal movement, and a fulcrum at the end of the track for coacting with the outer end of the second lever.

3. In a garment pressing machine cooperating pressing elements, one of which is movable toward and from the other, a lever pivoted between its ends to the frame, and carrying the movable element on one arm thereof, actuating mechanism for the lever including a motion transmitting part, and differential connections between the motion transmitting part and the other arm of the lever, said connections including a second lever pivoted between its ends to the latter arm of the first lever and said part being pivoted to the arm extending toward the axis of the first lever, a track carried by the frame and coacting with the outer arm of the second lever to normally hold it from pivotal movement, and a fulcrum at the end of the track for coacting with the outer end of the second

lever, and spring means tending to return the levers to their normal positions.

4. In a garment pressing machine, cooperating pressing elements, one of which is movable toward and from the other, a lever pivoted between its ends to the frame and carrying the movable element on one arm thereof, actuating mechanism for the lever including a motion transmitting part and differential connections between the motion transmitting part and the other arm of the lever, said connections including a second lever pivoted to the latter arm of the first lever, means for restraining the second lever from pivotal movement relative to the first lever during the preliminary closing of the press and for fulcruming the second lever independently of the first lever after the press has been preliminarily closed, and permitting relative movement of the second lever to the first lever by the actuating part, when the press is preliminarily closed.

5. In a garment pressing machine, a frame, cooperating pressing elements, one of which is movable toward and from the other, a lever pivoted between the ends to the frame and carrying the movable element on one arm thereof, actuating mechanism for the lever including a motor, a part actuated by the motor, a member mounted on the other arm of said lever to move about an axis and capable of movement therewith as a unit and relatively thereto about said axis, said member being connected to said part which is actuated by the motor to receive motion therefrom, and means for holding said member from movement about its axis relatively to the lever during the preliminary closing of the press and permitting movement thereof about its axis relative to the lever during the final closing of the press, said movement being effected by said part which is actuated by the motor, said means causing said relative movement to be transferred to said lever during the final closing of the press.

6. In a garment pressing machine, a suitable frame, cooperating pressing elements, one of which is movable toward and from the other, a lever pivoted between its ends to the frame and carrying the movable element on one arm thereof, actuating mechanism for the lever including a motion transmitting part and differential connections between the motion transmitting part and the other arm of the lever, said connections including a second lever pivoted to the latter arm of the first lever, means for restraining the second lever from pivotal movement relative to the first lever during the preliminary closing of the press and for fulcruming the second lever independently of the first lever and at a fixed point external of the actuating mechanism, after the press has been preliminarily closed and permitting relative movement of the second lever to the first lever by the actuating part, after the press is preliminarily closed.

7. In a garment pressing machine, a frame, cooperating pressing elements, one of which is movable toward and from the other, a lever pivoted between its ends to the frame and carrying the movable element on one arm thereof, actuating mechanism for the lever including a motor, a part actuated by the motor, a member mounted on the other arm of the said lever to move about an axis and capable of movement therewith, as a unit, and relatively thereto about said axis, said member being connected to said motor actuated part to receive motion therefrom, both when said member is held from pivotal movement relatively to the said lever and when moving about its pivot relative to said lever, and means for restraining the movement of said member about its axis relatively to the lever during the preliminary closing of the press and permitting movement thereof about its axis relatively to the lever during the final closing of the press.

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