Aug. 30, 1927. 1,641,131

F. E. BAKER ET AL

GARMENT PRESSING MACHINE

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FIG. 1.

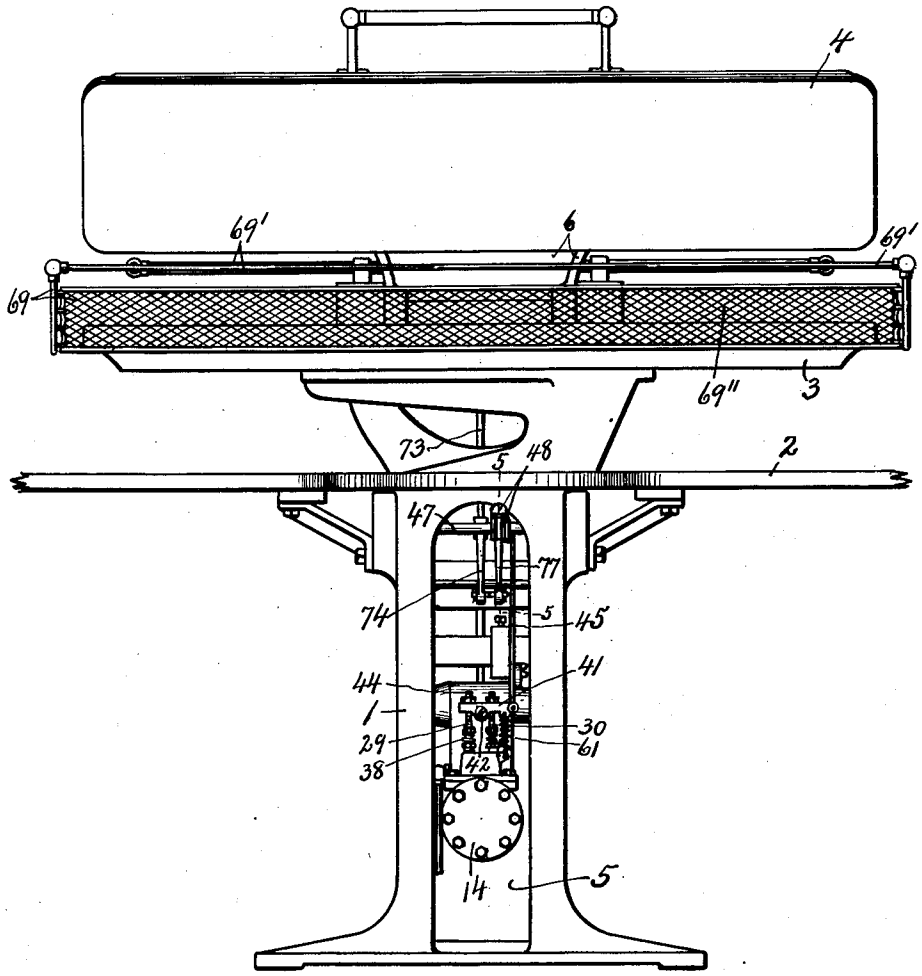

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FIG. 2.

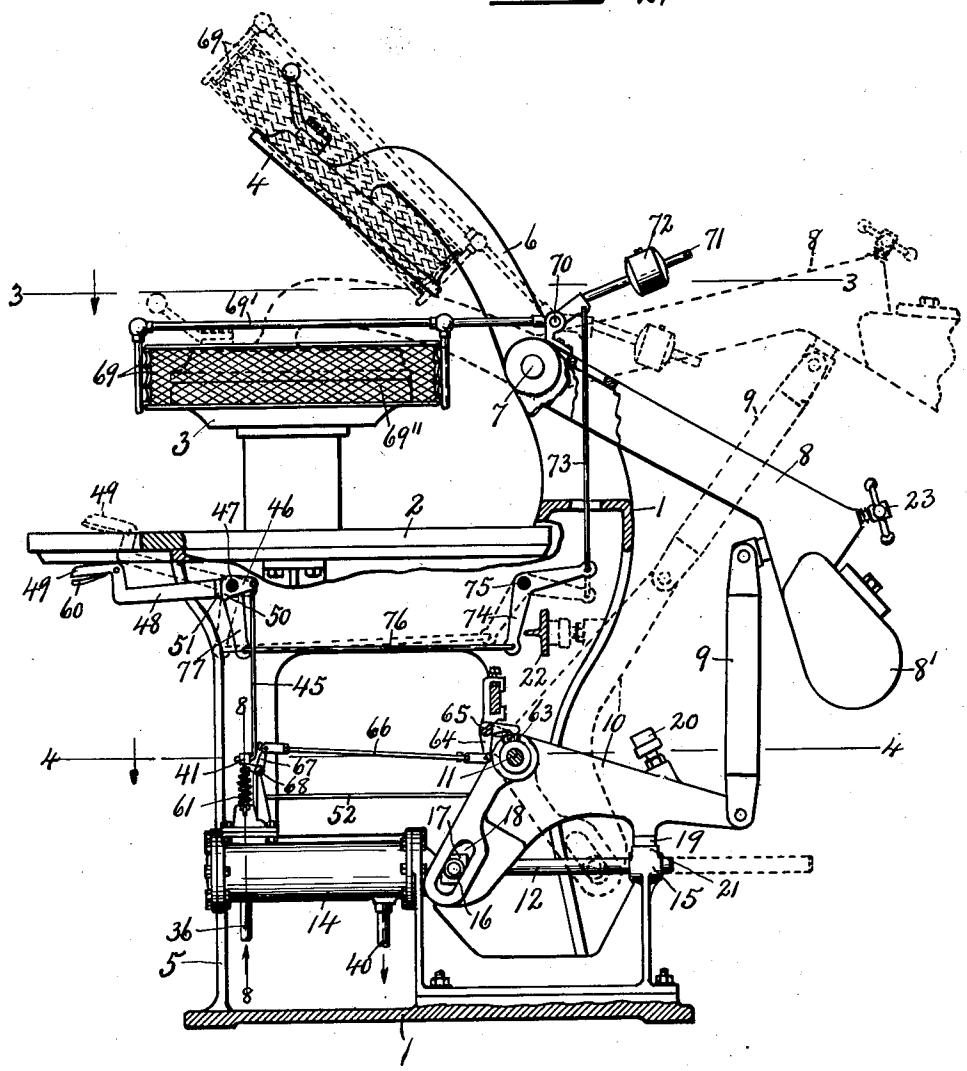

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Fig. 3.

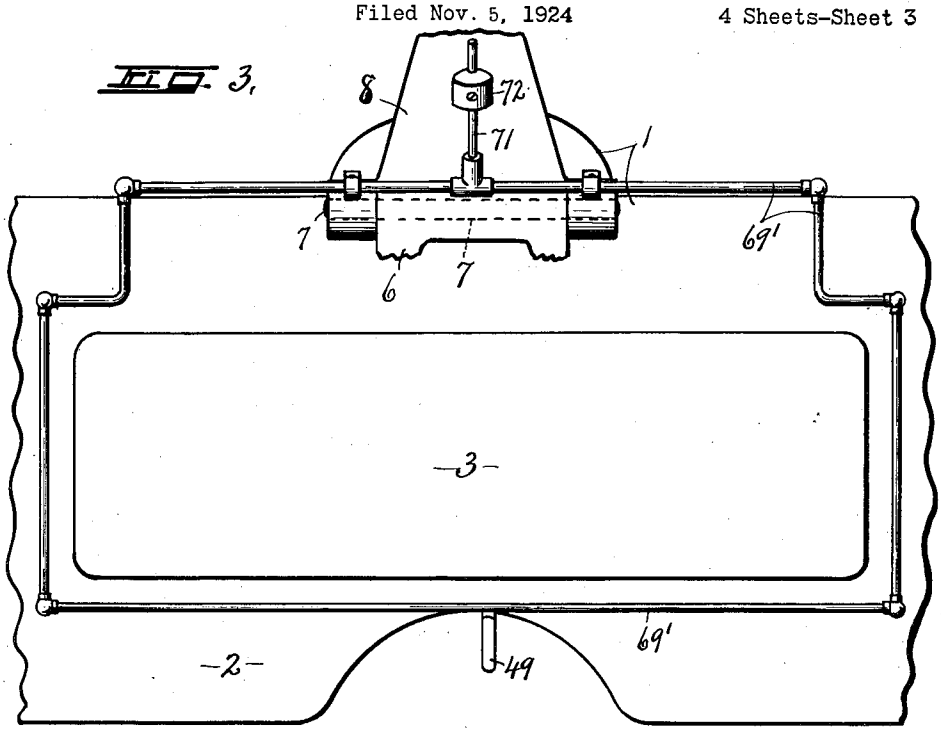


Fig. 4.

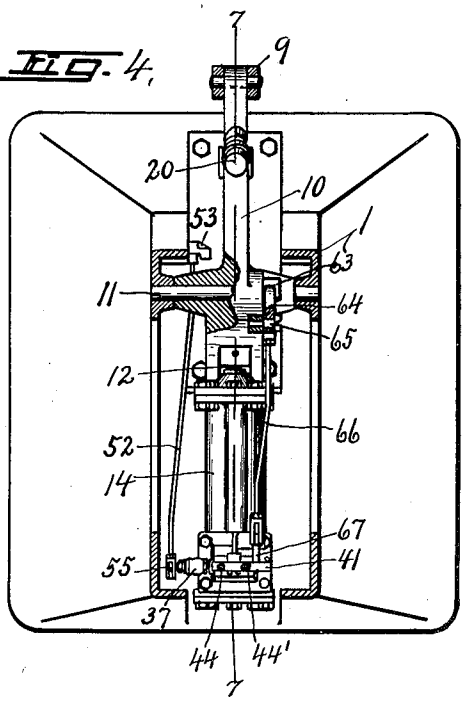


Fig. 5

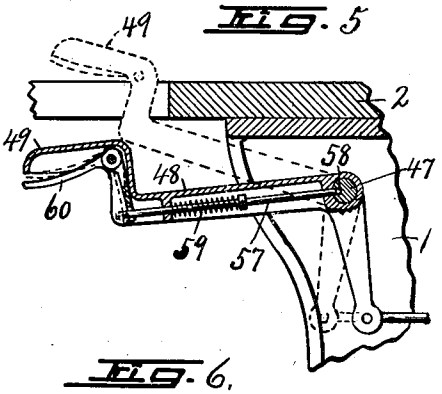
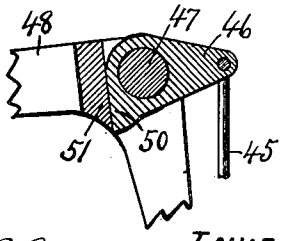


Fig. 6.



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GARMENT PRESSING MACHINE

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FIG. 7.

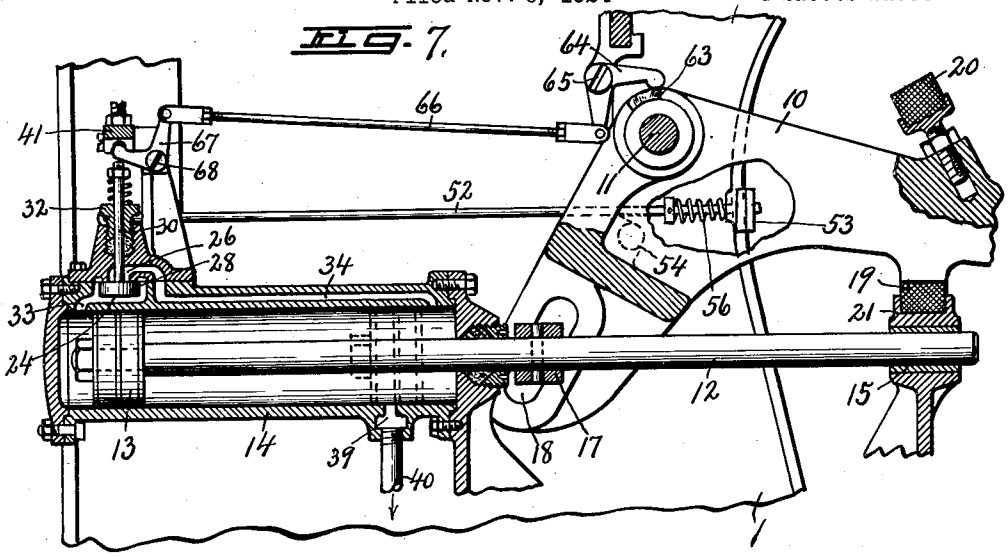
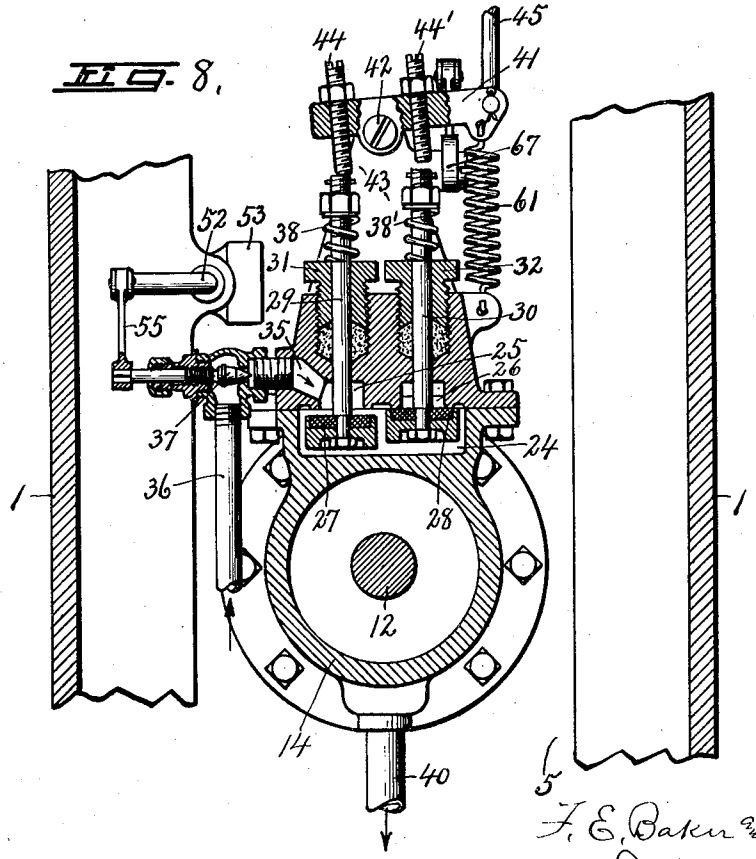


FIG. 8.



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Patented Aug. 30, 1927. 1,641,131

UNITED STATES PATENT OFFICE.

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GARMENT-PRESSING MACHINE.

Application filed November 5, 1924. Serial No. 747,969.

This invention relates to a garment pressing machine involving the use of cooperative pressing elements, one of which is movable toward and from the other, and suitable steam operated means for moving the pressing element to and from its pressing position, and means for supplying steam to the garment for moistening purposes.

In this class of machine the lower pressing element commonly known as a "buck" is secured in fixed relation to a stationary frame while the upper pressing element commonly known as the "head" is movable toward and from the upper face of the buck about an axis some distance to the rear and parallel with the longitudinal center of said buck, thus permitting the garments to be spread out by hand upon the upper face of the buck and assuring a clearer vision thereof when the head is raised preparatory to pressing.

In the operation of machines of this type the head is usually counter-balanced in such manner as to normally hold it in its extreme open position from which it is drawn downwardly by hand to approximately its pressing position and then subjected to additional pressure by means of a pedal or power operated device to produce a maximum final pressure.

The main object of my present invention is to provide steam-power-operated means for moving the head through its entire arc of movement both from its extreme open position to its extreme pressing position and if desired, from its pressing position to its extreme open position.

Another object is to provide a shield operable by hand in advance of the pressing movement of the head and across the front side and, if necessary, the ends of the buck to protect the hands of the operator against being caught between the pressing elements during the pressing operation.

A further object is to utilize this hand operation of the sheild as a part of the means for controlling the operation of the steam power device so that the press head will not be brought to its pressing position by said power device until the shield is lowered to its protective position.

A still further object is to arrange the power device and various other controlling elements in a horizontal position below the table and out of the way of the operator so as not to interfere with the free use of the operator's hands in properly arranging the garments on the buck preparatory to pressing.

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

In the drawings:—

Figure 1 is a front elevation of a garment pressing machine embodying the various features of this invention.

Figure 2 is a transverse vertical sectional view of the same machine, the head being shown by full lines in its extreme open position and the shield in its protective position, said shield being also shown by dotted lines in its elevated position in Figure 2.

Figures 3 and 4 are fragmentary plan and horizontal sectional views taken respectively in the planes of lines 3—3 and 4—4, Figure 2, portions of the frame and table being broken away in Figure 3.

Figure 5 is an enlarged transverse vertical sectional view taken on line 5—5, Figure 1.

Figure 6 is an enlarged detail sectional view of a portion of the hand lever for operating the shield, and the adjacent portion of its connections with the steam controlling valve of the power device.

Figure 7 is an enlarged transverse vertical sectional view taken in the plane of line 7—7, Figure 4.

Figure 8 is an enlarged longitudinal sectional view taken in the plane of line 8—8, Figure 2.

As illustrated this machine comprises a main supporting frame —1— for receiving and supporting a table —2—, a buck —3—, and a press head —4— together with suitable steam operated means for operating the press head and other devices used in the operation of pressing garments.

The frame —1— is adapted to be supported on the floor in an upright position and is provided with a forwardly and rearwardly extending opening —5— below the table —2— in which the power device is arranged in a manner hereinafter described.

The table —2— is secured in a horizontal position to the intermediate portion of the frame below the buck —3— so as to extend forwardly from the frame for receiving and temporarily supporting the various articles which are to be pressed and forms what may be termed a "work table" commonly used in

connection with machines of this character.

The buck —3— is secured to the frame —1— in a horizontal position and is preferably elongated laterally to afford considerable area for the pressing of garments thereon, the upper face of the buck being usually padded in any suitable manner well known in the art.

The press head —4— is mounted in any suitable manner upon the upper front end of a rock arm —6— which is fulcrumed at —7— upon the frame —1— some distance to the rear and parallel with the longitudinal center of the buck —3— to swing toward and from the upper face of the buck, said rock arm or lever —6— being provided with a rearwardly extending arm —8— carrying a counterweight —8'— sufficient to normally elevate the head —4— to its extreme open position.

The buck —3— or head —4— or both the buck and the head may be provided with the usual means for heating the same and for supplying steam to the garment to be pressed when properly arranged upon the buck and inasmuch as the steam heating and moistening means is common in this type of machine, it is believed to be unnecessary to herein illustrate and describe the same as the said means forms no part of the present invention.

Head operating means.

The rear end of the lever —8— is connected by a toggle link —9— to an underlying toggle lever —10— of the bell-crank type which is fulcrumed at —11— on the frame —1— and has its other end operatively connected to the rod —12— of a steam operated piston —13— which is movable in a cylinder —14— carried by the frame —1— some distance below the table —2— and preferably extending forwardly and rearwardly within the opening —5—. That is, the cylinder —14— and its piston rod —12— are disposed in a horizontal position, the rear end of the rod —12— being guided in a suitable bearing —15— to prevent vibratory movement of the piston. A cross head —17— is secured to the rod —12— at the rear end of the cylinder —14— and is provided with opposite laterally projecting rollers —16— which are arranged in elongated slots —18— in the adjacent arm of the lever —10— below the fulcrum —11— for imparting movement to said lever as the piston —13— and its rod —12— are reciprocated axially and thereby transmitting corresponding motion to the press head —4— through the medium of the toggle link —9— and extension —8— of the rock arm —6—.

The rearwardly extending arm of the bell-crank lever —10— is provided with lower and upper elastic buffers —19— and —20— adapted to engage suitable stops —21— and —22— for limiting the movement of said lever and incidentally limiting the movement of the press head in its extreme open position and also in its extreme closed position, the stops —22— and buffer —20— being used more particularly to prevent the passing of the toggle joint beyond a straight position when the head is closed and thereby to facilitate the breaking of the toggle joint in lowering the head.

The degree of pressure of the press head upon the buck may be regulated as usual by means of an adjusting screw —23— to which the upper end of the toggle link —9— is connected.

The piston —13— is operated by steam supplied from the same source which supplies steam to the buck or head for heating and moistening purposes.

The cylinder —14— is provided with a valve chamber —24— and separate ports —25— and —26— connected to the valve chamber and controlled by separate valves —27— and —28—, said valves being provided with upwardly extending stems —29— and —30— guided in glands —31— and —32—, Figure 8, to be operated in a manner presently described.

The valve chamber —24— is connected by a passage —33— to the interior of one end of the cylinder —14— at the corresponding end of the piston while the port —26— is connected by a passage —34— to the interior of the other end of the cylinder at the corresponding end of the piston, the port —25— being provided with a steam inlet passage —35— which in turn is connected to a supply pipe —36— leading to the source of steam supply.

The steam supply pipe —36— is provided with a needle valve —37— which is open at all times but may be adjusted to regulate the flow of steam to the port —25— as may be required to move the piston —13— rearwardly and thereby to operate the press head from its extreme open position to its pressing position through the medium of the toggle members —9— and —10— and against the action of the counterweight —8'—.

The valves —27— and —28— are normally held in their closed positions by coiled springs —38— and —38'— surrounding the adjacent portions of their respective valve stems —29— and —30— between the upper ends of the corresponding glands —31— and —32— and suitable shoulders on the upper ends of the valve stems.

The cylinder —14— is also provided with an exhaust port —39— opening into a suitable waste pipe —40—, Figure 7, for relieving the pressure in the rear end of the cylinder as the piston is moved rearwardly under steam pressure at its front end.

When it is desired to move the press head

from its elevated position to its pressing position the valve —27— will be opened thereby admitting steam from the inlet —35— to the valve chamber —24— and thence through the passage —33— to the front end of the cylinder for driving the piston rearwardly, thereby operating the lever —10— from the position shown by full lines in Figures 2 and 7, to the position shown by dotted lines in Figure 2 and effecting a corresponding movement of the head —4— through the medium of the toggle link —9—, the air or steam in the rear end of the cylinder being exhausted through the passage —39— and pipe —40—.

The exhaust port —39— is located a short distance from the rear end of the cylinder to allow the piston to close the port and thereby to trap the air or steam in the adjacent end of the cylinder for a purpose presently described.

This rearward movement of the piston —13— causes the toggle members —9— and —10— to assume a substantially straight line between the fulcrum —11— and point of connection of the link —9— with the extension —8— for temporarily locking the press head —4— in its pressing position or in pressing coaction with the buck —3— and to remain in that position as long as the valve —27— is open, depending upon the length of time it may be necessary to impart a single pressure to the garment or upon the condition of the garment.

When the valve —27— is released and closed by its spring —38— the air or steam which has been previously compressed in the rear end of the cylinder by reason of the closing of the exhaust port —39— by the rearwardly moving piston reacts under its own expansive force upon said piston to impart a sufficient forward movement thereto to operate the lever —10— and thereby to break the toggle lock or rather to flex the toggle joint rearwardly thereby permitting the counterweight —8'— to return the press head to its normal open position as shown by full lines in Figure 2, it being understood that during the rearward movement of the piston for effecting the pressing operation the valve —28— remains closed.

In case extra power should be required to start the piston upon its return movement and thereby to effect the rearward flexing of the toggle joint between the members —9— and —10—, the valve —28— may be temporarily opened in a manner hereinafter described, thereby allowing the more or less live steam in the front end of the cylinder to escape through the passage —33— and thence through the opened port —26— and passage —34— to the rear end of the cylinder to give additional impetus to the return movement of the piston until the latter passes forwardly beyond the port —39—, the valve 28 being left open during the return of the piston to allow the steam from the front end of the cylinder to escape through the exhaust —39—.

It is evident, however, that the escape of steam from the front end of the cylinder during the return movement of the piston by the action of the counterweight —8'— in restoring the head —4— to its elevated position will be more or less gradual thereby serving to retard the sudden return of the piston and press head to their starting positions following which the valve —28— will be again closed, or if desired the valve —28— may be closed shortly before the piston reaches the limit of its return movement thereby trapping the steam in the front end of the cylinder for cushioning the complete return movement of the piston and the press head.

The means for opening the valves —27— and —28— against the action of their retracting springs —38— and —38' comprises a lever —41— of the first kind fulcrumed at —42— upon a suitable standard —43— on the cylinder —14— so as to extend across the upper ends of the stems —29— and —30— of both valves as shown in Figure 8, said lever being provided with adjustable end thrust bearing screws —44— and —44'— adapted to engage the upper ends of their respective valve stems —29— and —30— which, together with the screws, are located at opposite sides of the fulcrum —42— so that when the lever —41 —is operated in one direction it will open the valve —27— or when operated in a reverse direction will open the valve —28—.

One end of the lever —41— is connected by an upwardly extending rod —45— to an overlying rock arm —46— which is pivotally mounted at —47— upon the main frame —1— of the machine coaxial with a hand lever —48— which is fulcrumed on the same pivotal pin —47— to extend forwardly therefrom and is provided at its front end with a handle —49—, Figures 2 and 5.

The rock arm —46— is provided with a forwardly and downwardly projecting heel —50— normally resting against a shoulder —51— on the adjacent portion of the lever —48— to cause said lever and rock arm to move in unison when the lever is depressed and to allow both of those parts to move upwardly independently of each other for a purpose hereinafter described.

It may be desirable to supply extra steam to the cylinder for moving the piston rearwardly and thereby exerting greater pressure between the pressing elements when the press head reaches its pressing position and for this purpose is provided a horizontal forwardly and rearwardly movable slide rod —52— guided in suitable bearings on the frame —1— and having its rear end pro-

vided with a head —53— which is disposed in the path of movement of lug —54— on the lower arm of the lever —10— as shown by dotted lines in Figure 7 whereby the rearward rocking movement of said lever as produced by the rearward movement of the piston in forcing the press head to its pressing position causes the shoulder —54— to engage the head —53— and to draw the rod —52— rearwardly at about the time the press head reaches its pressing position. The front end of the rod is connected to a crank arm —55— on the stem of the screw valve —37— for additionally and automatically opening said valve when the rod —52— is moved rearwardly, thereby supplying extra steam to the piston —13— as the latter approaches the limit of its rearward movement, the rod —52— and valve —37— being returned to their normal positions by a spring —56— which, in this instance, surrounds the rear end of the rod between its adjacent guide bearing and a suitable shoulder on the rod as shown in Figure 7.

During the pressing operation the hand lever —48— may be locked in its depressed position for opening the valve —27— by means of a locking bolt —57— engaging in a recess or notch —58— in the pivotal bolt or pin —47— Figure 5, said bolt being spring pressed to its locking position by means of a spring —59— and may be opened by an additional hand lever —60— which together with the locking bolt —57— are mounted upon the hand lever —48—.

Immediately following each pressing operation the hand lever —48— may be unlocked and returned to its normal up position as shown by dotted lines in Figures 2 and 5, thus relieving the pressure upon the rock arm —46— and permitting the valve —27— to be closed by its retracting spring —38— and also permitting the operation of the lever —41— by its retracting spring —61— which may be of sufficient tension to cause its end thrust screw —44'— to engage and depress the valve stem —30— and thereby to open the valve —28— for allowing the steam in front of the piston to return through the passage —34— to the rear end of the piston for starting the return of the piston and also for permitting the steam to exhaust through the port —39— during the return of said piston by the action of the counterweight —8'— which also returns the press head to its open position rearwardly for the repetition of the pressing operation previously described.

As previously stated it is desired to produce a steam cushion in the front end of the cylinder just before the piston reaches the limit of its extreme forward movement and for this purpose the hub of the bell crank lever —10— is provided with a peripheral cam —63— adapted to engage one arm of the bell crank lever —64— which is fulcrumed at —65— upon the frame of the machine and has its other arm connected by a rod —66— to one arm of another bell crank lever —67—, the latter being fulcrumed at —68— upon the frame of the cylinder —14— and having its other arm extended under the longer arm of the lever —41— for engagement therewith against the action of the retracting spring —61—.

The cam —63— is arranged to engage the adjacent arm of the bell crank lever —64— for slightly raising the long arm of the lever —41— carrying the thrust screw —44'— just preceding the end of the forward stroke of the piston —13— so as to allow the valve —28— to close and thereby to permit the formation of a steam cushion between the front end of the cylinder and piston after the latter reaches the limit of its forward movement, at which time both valves —27— and —28— will be closed and the lever —41— will be free to be operated by the lifting of the rod —45— for opening the valve —27— and allowing the steam to enter the cylinder for repeating the press-closing operation of the piston.

In machines of this character there is always more or less danger of injury to the hands of the operator by their being caught between the pressing elements and suitable means is provided for reducing this liability consisting in this instance of a shield —69— extending across the front side and the opposite ends of the pressing elements and preferably hinged at —70— to the frame of the machine to swing about an axis parallel with that of the rock arm —6—.

This shield preferably consists of a frame —69'— and a woven wire netting —69''— extending across the ends and along the front side of the buck and head when the press head is in its pressing position, the frame —69'— constituting the supporting means for the woven wire fabric —69''— and preferably extends rearwardly over the pivotal stud or bolt —7— and across the outer sides of the arm —6—.

The frame —69'— is provided with an extension —71— projecting rearwardly from the pivot —70— and carrying a counterweight —72— adapted to counterbalance the main body of the shield —69— and to normally elevate the same to the plane of the open head —4— as shown in Figure 2.

The front bar of the frame —69'— extends along the front side of the head —4— and beyond the opposite ends thereof and constitutes a handle by which the shield may be drawn downwardly to its protective position preceding the downward movement of the press head.

The opening of the valve —27— which controls the movement of the piston —13— for closing the press head —4— upon the

buck is preferably made dependent upon the operation of the shield —69— from its normal open position to its protective position so as to prevent the insertion of the hands of the operator between the pressing elements during the pressing operation and for this purpose the rearward extension —71— of the frame —69'— is connected by a downwardly extending link —73— to one arm of a bell crank lever —74— which is pivoted at —75— to the frame of the machine to swing forwardly and rearwardly and has its other end connected by a forwardly extending link —76— to a crank arm —77— on the hand lever —48— thereby affording two means for opening the valve —27—, one through the medium of the hand lever —48— and the other through the downward movement of the shield —69— by hand.

For example, assuming that the hand lever —48— is in its normal position shown by dotted lines in Figure 2 and that it is desired to operate the press head, the shield —69— is drawn downwardly by hand to its protective position shown by full lines in Figure 2 thereby elevating the extension —71— and causing a rearward movement of the link —76— and the crank arm —77— which incidentally draws the hand lever —48— downwardly and causes the valve operating rod —45— to operate the lever —41— for opening the valve —27—, which in turn allows the steam to enter the cylinder for operating the piston rearwardly and causes a corresponding downward movement of the press head immediately following the downward movement of the shield —69—.

The hand lever —48— is fulcrumed directly over the front portion of the table —2— and has its handle —49— offset upwardly to pass through an opening in the front edge of the table and normally above the upper face thereof so that the depression of the handle —49— from its normal position will effect the depression of the shield —69— from its elevated position to its protective position and also will cause the opening of the valve —27— in substantially the same manner as just described.

When the hand lever and shield are depressed to the limit of their downward movements the lever will be automatically locked against return upward movement by the engagement of the bolt —57— in the notch —58—, Figure 5, thereby causing the valve —27— to remain open and the press head to remain in its pressing position until the hand lever is unlocked, the press head being additionally held in its closed position by the straightening of the toggle levers —9— and —10— as shown by dotted lines in Figure 2.

During this operation the valve —28— remains closed and, as the toggle levers approach their straightened position the lug —54— on the lever —10— engages the head —53— on the rod —52— thereby producing a slight rearward movement of said rod for additionally unscrewing the valve —37— through the medium of the crank arm —55— for supplying additional steam to the front end of the piston and thereby exerting greater pressure as the press head reaches its pressing position, it being understood that the steam or air at the rear of the piston is exhausted through the port —39— until the latter is covered by the piston, at which time the steam will be trapped at the rear of the piston for cushioning the closing action of the press head.

The shield —69— will also remain in its protective position until the hand lever —48— is unlocked by the withdrawal of the bolt —57— through the medium of the hand lever —60—, at which time the hand lever —48— and shield —69— will be returned to their normal positions by the action of the counter weight —72— aided by the spring —61— acting upon the lever —41— to which the hand lever is connected by the rod —45—.

This return movement of the hand lever —48— and the valve operating lever —41— permits the closing of the valve —27— by its retracting spring —38— to cut off the supply of steam to the front end of the cylinder and, immediately following this closing of the valve —27— the longer end of the lever —41— will be drawn downwardly by the spring —61— to cause the opening of the valve —28— thereby placing the front end of the cylinder in communication with the passage —34— to permit live steam at the front end of the piston to pass through the passage —34— to the rear end of the piston for moving the latter forwardly sufficiently to flex the toggle joint from a straightened position and to allow the press head to be returned to its normal position by the counterweight —8'— and thereby to restore the piston to its forward starting position through the medium of the toggle members —9— and —10—.

As the piston approaches the limit of its forward movement the rear arm of the lever —64— is rocked upwardly by the engagement of the cam —63— therewith, thereby causing the lever —67— to engage the under side of the long arm of the lever —41— to lift the latter against the action of the spring —61— a sufficient distance to release the valve —28— and allow it to be closed by its retracting spring —38'—, thereby trapping a relatively small portion of the steam in front of the piston at the end of the stroke and cushioning the return of the press head to its open position through the medium of the toggle levers, it being understood that the cam —63— is ar-

ranged to operate the lever —64— for permitting the closing of the valve —28— only when the piston reaches approximately the end of its forward stroke and is also of just sufficient height or radial depth to permit the lever —41— to assume a neutral position with both valves —27— and —28— closed, without in any way interfering with the free upward movement of the longer arm of the lever —41— when operated by the depression of the hand lever —48— or shield —69— for opening the valve —27— to repeat the pressing operation in the manner previously described.

This free upward movement of the longer arm of the lever —41— by the bell crank lever —67— through the medium of the cam —63— is permitted by reason of the fact that the arm —46—, Figure 6, is free to rock upwardly independently of the hand lever —48—.

What we claim is:

1. In a steam-power-operated garment pressing machine, a frame, cooperative pressing elements, one of which is movable toward and from the other, toggle connections between the frame and movable pressing element, a steam cylinder, a piston movable in the cylinder and provided with a rod extending through one end of the cylinder and connected to one of the toggle members, means for introducing steam into the cylinder for operating the piston and means for controlling the admission of steam to said cylinder, said means including a valve and means actuated by one of the toggle members when approaching its straightened position for opening said valve an increased amount as the piston approaches the limit of its pressure stroke.

2. In a garment pressing machine a frame, cooperative pressing elements one of which is movable toward and from the other, toggle connections between the frame and movable element, steam-operated means for moving the toggle toward a straightened position and thereby operating the movable element toward its pressing position and means actuated by one of the toggle members when approaching its straightened position for increasing the amount of steam admission to said steam-operated means as the movable element approaches its pressing position.

3. In a garment pressing machine, cooperative pressing elements, one of which is movable toward and from the other, a fluid-pressure-operated piston-motor having an intake passage, a valve for controlling the intake passage, means actuated by the motor for operating the movable element toward the other element, means operable at will for opening said valve for operating the motor to force the movable element to its pressing position, an additional valve controlling a supply of the fluid to the intake passage, and means actuated by the first-named means for increasing the opening of the additional valve as the piston approaches the limit of its pressure stroke.

4. In a garment pressing machine, cooperative pressing elements, one of which is movable toward and from the other, a fluid-pressure-operated piston-motor, a valve controlling the passage of fluid to said motor for operating the same, means actuated by the motor for operating the movable element, and means actuated by the first-named means for increasing the opening of said valve when the piston approaches the limit of its pressure stroke.

5. In a garment pressing machine, cooperative pressing elements, one of which is movable toward and from the other, a fluid-pressure-operated piston-motor, a valve controlling the passage of fluid to said motor for operating the same, means actuated by the motor for operating the movable element, and means actuated by the first-named means for increasing the opening of said valve when the piston approaches the limit of its pressure stroke, an additional valve for controlling the passage of the fluid from the first-named valve to the motor, and means operable at will for opening said additional valve.

6. In a garment pressing machine, cooperative pressing elements, one of which is movable toward and from the other, a fluid-pressure-operated piston-motor, means actuated by the motor for operating the movable element, a self-closing valve controlling the passage of fluid to the motor, means operable at will for opening said valve, and means controlled by the first-named means for producing a fluid cushion for the piston as it approaches the end of its pressure stroke.

7. In a garment pressing machine a frame, cooperative pressing elements, one of which is movable toward and from the other, toggle connections between the frame and movable element, a steam cylinder having a piston movable therein and operatively connected to one of the toggle members for moving said members toward a straightened position as the piston is moved in one direction for operating the movable element toward its pressing position, means for restoring the movable pressing element and its operating means to their starting positions, a self-closing valve for controlling the admission of the steam to the cylinder for operating the piston, means for opening said valve and additional means actuated by one of the toggle members for displacing a part of the valve opening means to permit the valve to close as the movable pressing element approaches its extreme open position.

8. In a garment pressing machine, a frame, cooperative pressing elements one of which is movable toward and from the other,

fluid-pressure-operated means for closing the movable element, means for returning said movable element and its closing means, a self-closing valve for controlling the pressure-fluid, means for opening said valve, and additional means actuated by one of the moving parts for displacing the valve-opening means as the movable element and its operating means approach the limit of their return movement.

9. In a garment pressing machine, a frame, cooperative pressing elements one of which is movable toward and from the other, toggle connections between the movable element and frame, a steam cylinder having a valve chamber communicating through a passage with one end of the cylinder and provided with a steam inlet port and with an additional port communicating through a separate passage with the opposite end of the cylinder, a piston movable in the cylinder between said passages, separate self-closing valves for said ports, means operable at will for opening the valve for the first named port to admit steam through the first named passage for operating the piston in one direction, an exhaust port communicating with the cylinder between the ends of said passages, means for operating said valve operating means to release the first named valve and to open the second named valve as the piston reaches the limit of its steam operated stroke for allowing the steam to pass from the valve chamber through the second named passage to the cylinder for partially returning the piston and connections between the piston and one of the toggles for imparting motion from one to the other.

In witness whereof we have hereunto set our hands this 28th day of October, 1924.

FRANK E. BAKER.
WILLARD L. TAYLOR.