Jan. 2, 1934. T. H. McGOWAN 1,942,254

SHIRT PRESSING MACHINE

Filed March 3, 1930 5 Sheets-Sheet 1

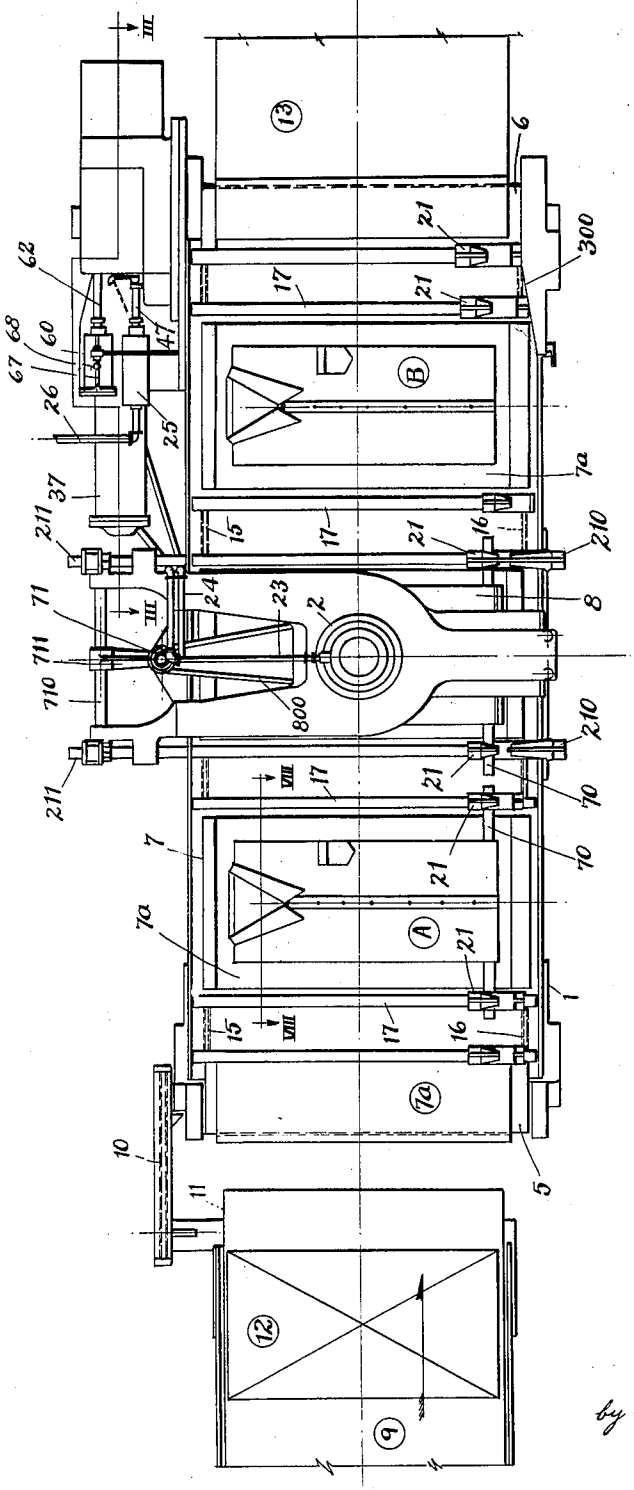


Fig. 1

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SHIRT PRESSING MACHINE

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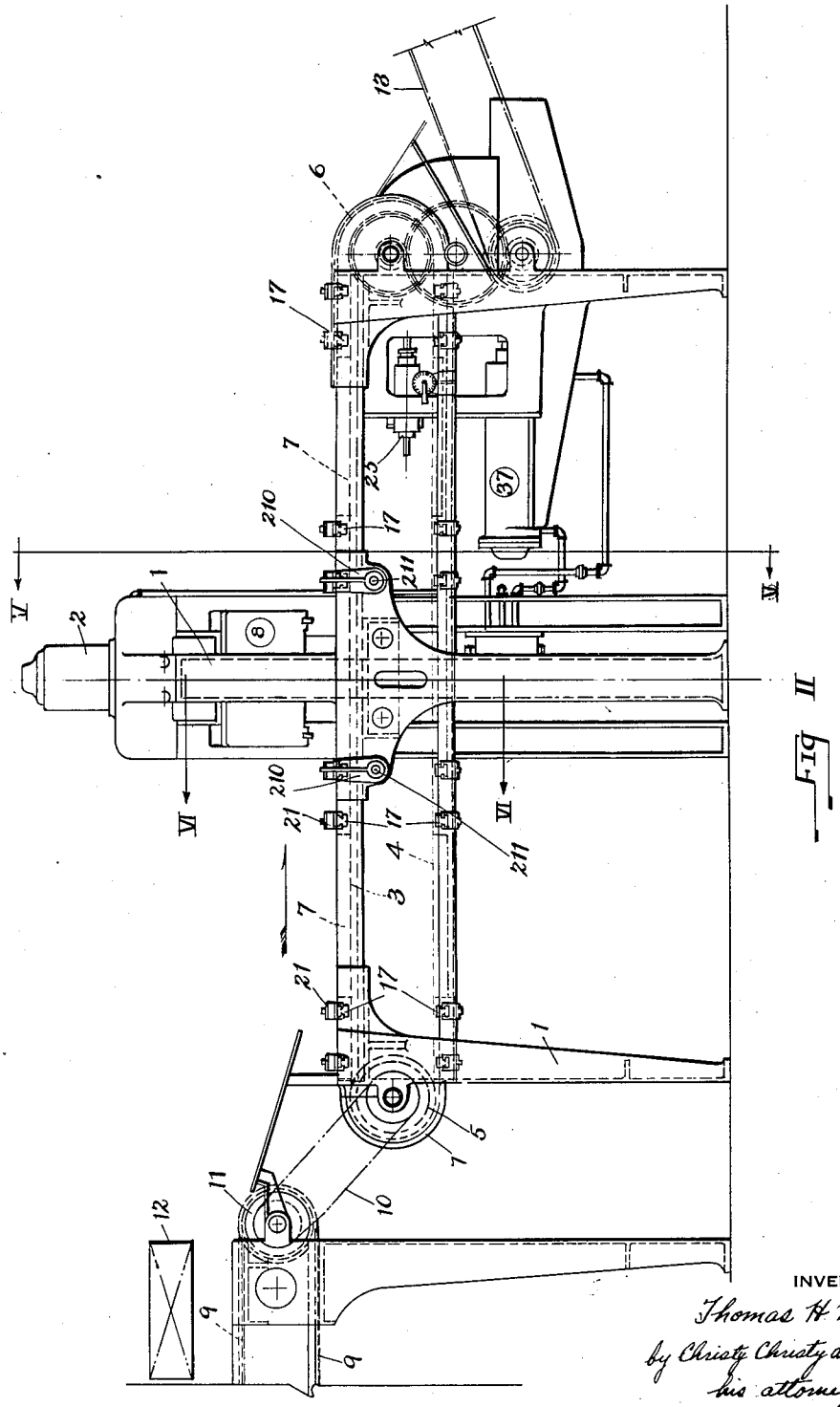


FIG 1

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SHIRT PRESSING MACHINE

Filed March 3, 1930 5 Sheets-Sheet 3

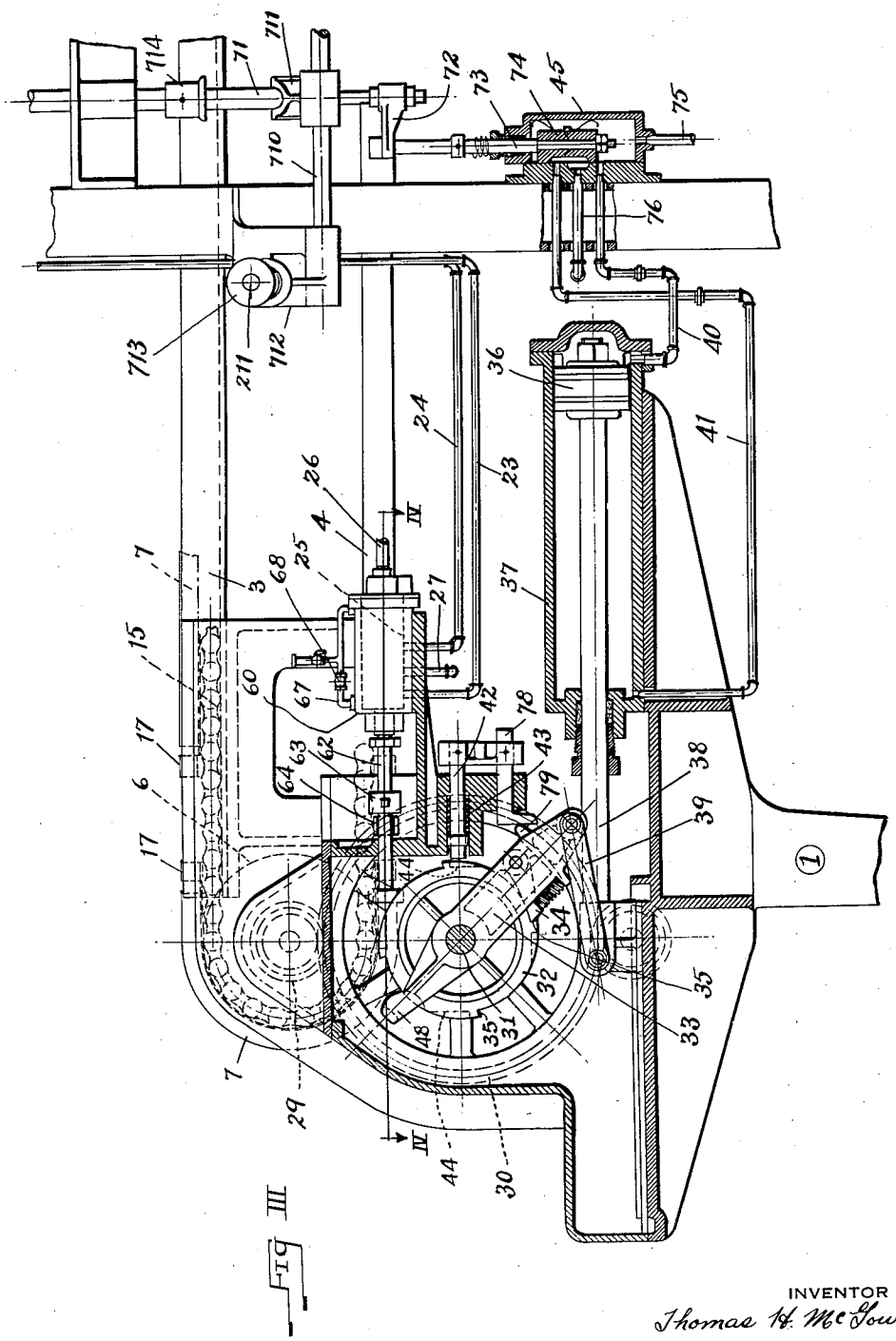


FIG. 3

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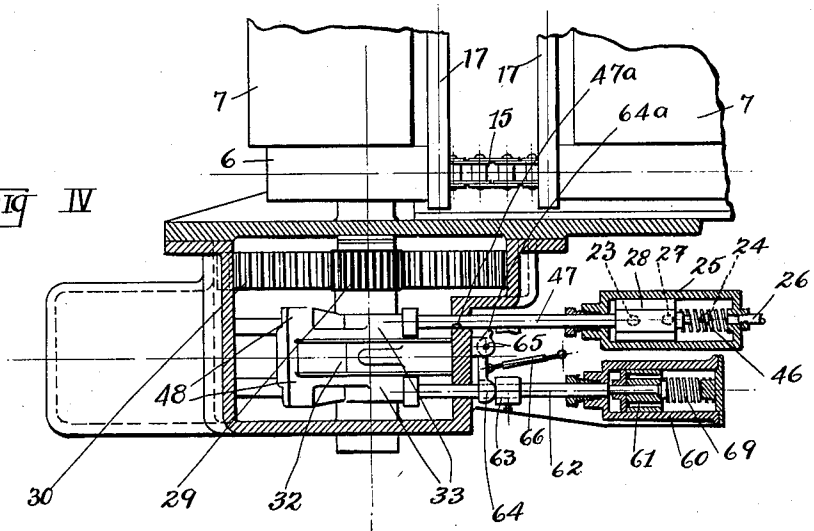
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Jan. 2, 1934. T. H. McGOWAN 1,942,254

SHIRT PRESSING MACHINE

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FIG IV



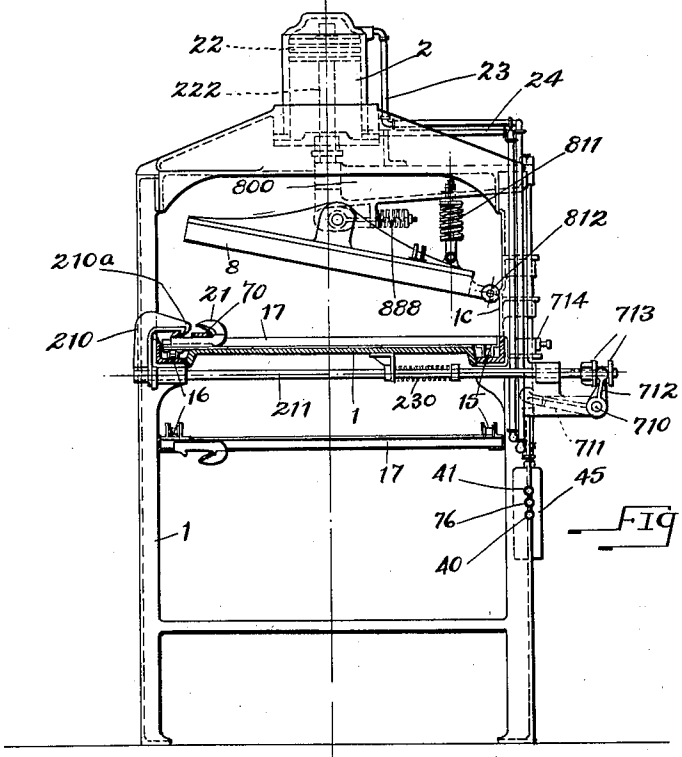


FIG V

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SHIRT PRESSING MACHINE

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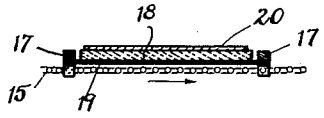


FIG VIII

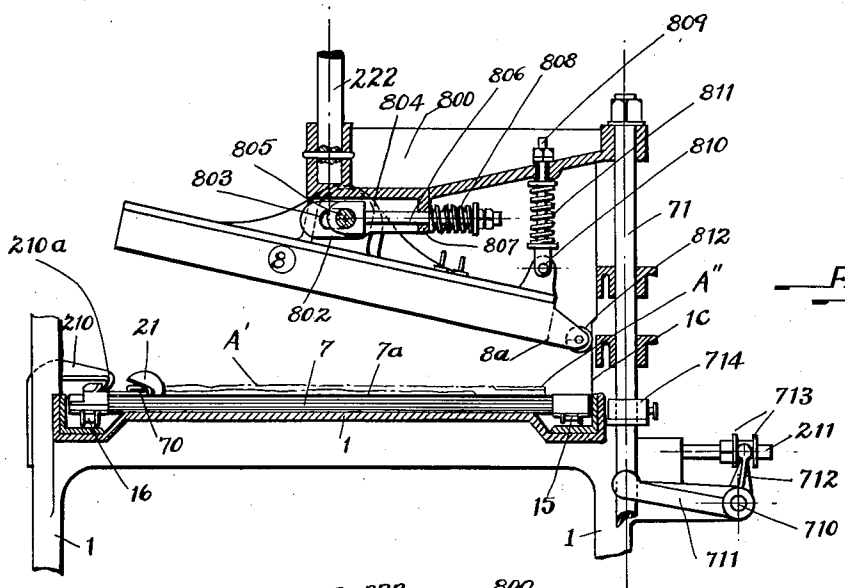


FIG VI

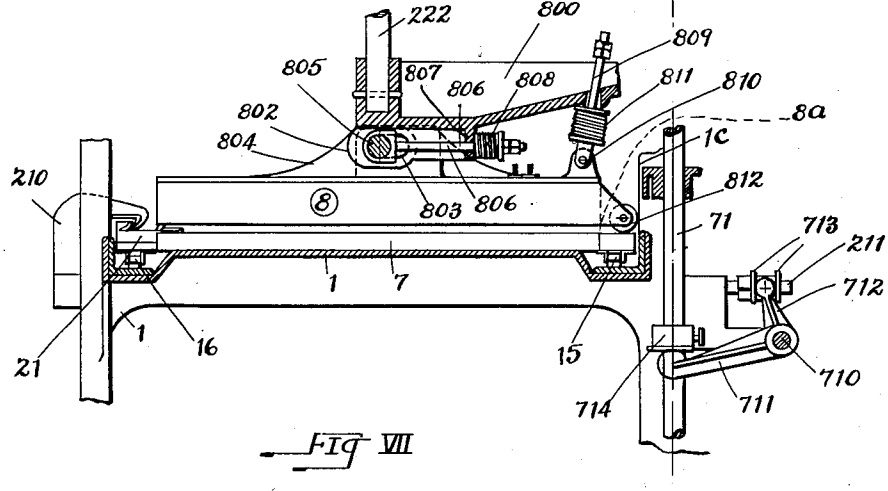


FIG VII

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Patented Jan. 2, 1934 1,942,254

UNITED STATES PATENT OFFICE

1,942,254

SHIRT PRESSING MACHINE

Thomas H. McGowan, Butler, Pa., assignor to Spaide Shirt Company, a corporation of Pennsylvania

Application March 3, 1930. Serial No. 432,771

23 Claims. (Cl. 68—9)

My invention relates to a shirt presser; a machine, that is to say, for automatically pressing or ironing shirts, or other articles of apparel.

In general, a shirt ironing machine consists of a heated pressing head which is adapted to be brought powerfully down upon a shirt, lying in appropriate arrangement on a suitable surface below the pressing head. In operating a pressing machine of the type employed hitherto, the attendant first arranges the shirt to be pressed on the pressing surface or ironing board. Having appropriately so arranged the shirt on the pressing surface, he next manipulates a treadle or other controller for causing the pressing head to lower and do its pressing. Such a machine requires constant and close supervision; manipulation of the machine is necessary for each pressing operation, and its work output is, accordingly, small. I provide a pressing machine which functions automatically—a pressing machine which does not require continual manipulation, and, in general, a machine in the operation of which the attendant has only to handle the shirts. In my pressing machine, invention is found in the means for automatically and successively feeding shirts to a position beneath the pressing head, and in the means for automatically operating the pressing head in synchronism with the automatic feeding of the shirts.

Upon remarking that other features of invention will hereinafter appear, I proceed with the description of the machine. In the accompanying drawings Fig. I is a plan view of my improved pressing machine; Fig. II is a view of the pressing machine in side elevation; Fig. III is a view, in cross-section, taken on the plane indicated by the line III—III of Fig. I, showing to larger scale certain of the controlling instrumentalities of the machine; Fig. IV is a cross-sectional view, taken on the plane IV—IV of Fig. III, and showing in further detail certain controlling instrumentalities of the machine; Fig. V is a cross-sectional view of the machine taken on the plane V—V of Fig. II; Fig. VI is a view in cross-section, taken on the plane VI—VI of Fig. II, showing the pressing head of the machine in elevated position, and showing fragmentarily the adjacent portions of the machine; Fig. VII is a view, similar to the view of Fig. VI, showing the pressing head in lowered position—in such position as to press a shirt; and Fig. VIII is a cross-sectional view, taken on the plane VIII—VIII of Fig. I, showing the structure of the shirt supporting members of the machine.

My machine consists essentially of a frame 1 which is adapted to support the several machine elements in the cooperative relation, presently to be described. A continuous carrier extends in upper and lower reaches 3 and 4 (Fig. II), and extends longitudinally of the machine, and passes over rollers 5 and 6 which are suitably trunnioned at each end of the frame 1 to move intermittently the carrier from one position to another. Secured to the carrier is a plurality of members 7, each of which presents a pressing surface 7*a* when it lies, during the movement of the carrier, in the upper reach 3. A pressing head 8 is supported by the frame 1, and is vertically movable in response to the action of a plunger in cylinder 2. Means are associated with the carrier for moving it intermittently to bring one after another the members 7 to a position beneath the head 8, and, after each member 7 is so brought to position, instrumentalities function to cause the pressing head 8 to be powerfully lowered on the surface 7*a* of that member 7 which at the particular moment lies below the pressing head. Before each member 7 moves with the carrier to a position below such pressing head, however, a shirt is placed thereon to be pressed. For example, the shirt A (Fig. I) has been so placed, and the next intermittent movement of the carrier will move this shirt together with the member 7 on which it is arranged to a position below the pressing head 8. It may be mentioned that a shirt-stretching bar 70 is inserted between the bodice and tail portions of the folded shirt which is placed on the member 7, and this bar 70 will be described in the following more detailed description of the machine. The head 8 which, by the way, is heated (conveniently by electrical means) to sufficient pressing temperature, thereupon lowers under the force of the plunger in cylinder 2, and presses the shirt. In combination with the mechanism above described, are instrumentalities for causing the plunger to hold the parts in pressing position for an interval of time, sufficient to obtain the desired pressing. The instrumentalities then operate to cause the plunger to lift the head, and to move the carrier to its next position. In so moving, the carrier brings the shirt to the position indicated by the letter B (Fig. I), whereupon the attendant removes the stretching bar 70 from the shirt.

The above outlined movements of the machine continue automatically; the attendant is stationed at the left-hand end of the machine (Figs. I and II), and arranges a shirt on each free pressing surface 7*a*, prior to the movement of such surface 7*a* to pressing position beneath the head

8. After each shirt has been so arranged the carrier presently advances it to pressing position, as explained. The attendant then steps toward the right-hand end of the machine, and removes the bar 70 from the shirt last leaving the pressing position. The procedure is repeated, and is so continued.

An endless conveyor 9, fragmentarily indicated in Figs. I and II, conveniently is utilized to conduct shirts to the attendant. Gearing or chain-belting 10 transmits movement from the carrier roll 5 of the machine proper to the motivating roll 11 of the conveyor 9; accordingly, the conveyor 9 moves step-by-step in harmony with the intermittent advances of the pressing surfaces 7*a*. Advantageously, a spraying device 12, which is diagrammatically indicated in the drawings, is organized to emit automatically moisture, and dampen the shirts preparatory to pressing. At the "leaving" end (right-hand end in Figs. I and II) of the pressing machine, there is another conveyor, 13, fragmentarily shown, which is geared to the driving means of the endless carrier, to move, as the conveyor 9 moves, in synchronism with the advances of the pressing surfaces 7*a*. As the surfaces 7*a*, that is, those of the surfaces 7*a* which bear pressed shirts from their position beneath the pressing head, move to the end of the upper reach 3, and are in such movement rounding the roll 6, the shirts drop to the conveyor 13, whence they are conducted to the desired location for ultimate disposition.

Thus, it will be understood that the pressing of shirts is performed automatically in my machine,—the "human element" is relied upon only in the positioning of the shirts and the shirt-stretching bars 70 upon the surfaces 7*a*, and in the removal of such bars from the pressed shirts. The movements of the instrumentalities which are combined to form my automatic pressing machine, are synchronized one with the other, and are adjustable to vary the speed of operation of the machine. That is to say, adjustment may be made to vary the interval of time during which the plunger remains in lowered position, or in which it is held in raised position: indeed, the machine is so adjustable that it may be rendered effective for all conditions which are met in shirt pressing. Having, in general, disclosed my machine and its operation, I shall now describe minutely certain of its important structural characteristics.

The carrier for moving the shirts into and from pressing position is a particularly effective structure. Such carrier consists of two endless, roller chains 15 and 16, between which there extend the several rods 17. These rods are secured at their ends to the chains 15 and 16, and are spaced apart at intervals along the extent of the chains, as may be seen in Figs. I and II. The members 7, which members afford the pressing surfaces 7*a*, are secured at their edges to, and extend between, each pair of these rods 17. Each member 7 is, advantageously, formed of a body of spongy rubber 18 (Fig. VIII), which body of rubber is secured, conveniently by vulcanizing, to a backing 19 of canvas. The canvas projects marginally from the rubber and is fastened at each side of the rubber body to its associated carrier rods 17. A fabric pad 20 overlies the top surface of the rubber, and on the pad the shirt immediately rests to be pressed. The members 7 are, manifestly, of yielding characteristics; that is to say, the structure of members 7 is such as to prevent shocks or jarring when the pressing head lowers suddenly upon a member 7 to press a shirt. The rubber body compensates, during pressing, for the various thicknesses of the folded shirt which is being pressed, and also permits the pressing head 8 to operate with great pressure upon the shirts, without breaking the buttons of the shirts.

As above mentioned, the pressing head 8 is moved to and from pressing position by means of a plunger in cylinder 2. Conveniently, a supply of air under pressure is communicated to the cylinder, and is so controlled as to effect the desired movement of the plunger (22) and the head 8 (Fig. V). Such communication of air for operating the plunger is had through two pipes, a pipe 23 connected to the upper end of the cylinder 2, and a pipe 24 connected to the lower end. These pipes terminate at their ends—the ends which are remote from the cylinder 2—in an air valve 25 (Figs. III and IV). A pipe 26 supplies air under pressure to the valve 25, and an exhaust pipe 27 is ported to the valve, whereupon, a valve block 28 in shifting from one position to another may feed alternately plunger-operating air through one of pipes 23 and 24, and exhaust air through the other of said pipes. For example, the valve block 28 is shown in such position in Fig. IV as to uncover the end of pipe 24 and supply operating air to the cylinder 2, below the plunger, and also to communicate pipe 23 to the discharge pipe 27. When the valve block 28 is moved into this position, the plunger 22 will be raised, carrying with it the pressing head 8. The plunger and pressing head will remain in raised position until the valve block has been shifted to its alternate position. When the valve block moves to its alternate position, pipe 23 is opened to the pressure or air supply, pipe 24 is ported to the exhaust pipe 27, and the plunger will be forced downwardly, carrying the head 8 to pressing position, where it will remain until the valve block is returned to its first described position. Means for shifting the valve block 28 from one position to the other are, however, dependent upon the movement of the means for causing the endless carrier to advance step-by-step. Means for controlling the movement of the endless carrier are in turn actuated in response to movement of the pressing head. Therefore, the means for actuating the endless shirt carrier will be described now, in order that the circle of mechanical movements, so to speak, may be closed or joined at the plunger-controlling valve 25.

Referring to Fig. III the roller 6 is provided with a pinion 29 which meshes with a gear 30. Gear 30 is keyed to a shaft 31, and on this shaft there is also keyed a ratchet wheel 32 which lies between the legs of a yoke shaped lever member 33. Lever 33 is freely rotatable on the shaft, but adjacent its lower end the lever includes a pawl 34 which is adapted to press against the surface of the ratchet wheel 32, and rest normally in one of the notches 35 of the ratchet wheel 32. Clockwise rotation of the lever 33 is effective to rotate the wheel 32. Manifestly, rotation of wheel 32 causes the shaft 31 to rotate together with gear 30 and pinion 29, and the carrier roller 6 will turn to advance the carrier with its shirt-supporting members 7 from one position to another. The rotation of lever 33, which rotation is required to move the shirt carrier the desired distance, is through 90 degrees. Means for obtaining such rotation, or more exactly, such oscillation of the lever 33 comprise a plunger 36 (reciprocable in cylinder 37) having the projecting end 38 of its plunger rod connected to a link

39, which link, as illustrated in Fig. III, is pivotally secured to the lower end of lever 33.

Again, air under pressure is convenient to use; that is to say, the plunger 36 is reciprocated by fluid pressure, and to this end a pipe 40 communicates with the head end of cylinder 37, and a pipe 41 with the tail end. Valving means 45 are responsive to the movement of the pressing head 8 to control pressure in pipes 40 and 41 for reciprocating the plunger 36. These valving means will be hereinafter described—for the present, suffice it to say, the plunger 36 intermittently moves from one end of the cylinder 37 to the other, and in so moving effects advancement of the shirt carrier of the machine in synchronism with the movements of the pressing head 8. Fig. III shows the plunger and the mechanism operated thereby in starting position, ready for carrier advancing movement. After the pressing head 8 has moved to its upper position—a shirt-pressing operation having been completed—the valve 45 for controlling movement of the plunger 36 functions to cause the plunger to move to the left-hand end of cylinder 37. This movement turns the lever 33 in clockwise direction, and the pawl 34, by reason of its engagement with a notch 35, is effective to move accordingly the ratchet wheel 32, shaft 31, gear 30, pinion 29, roller 6, and the carrier, together with its shirt-supporting members 7. Movement of lever 33 through an arc of 90 degrees is in the illustrated embodiment of my invention sufficient to advance the shirt-supporting members 7 the desired distance. To prevent movement of the parts past the point which determines such distance, a latch 42 is adapted to be moved by a spring 43 into the latch recess, which, of the several latch recesses 44, is opposite to the latch 42 upon completion of the movement of lever 33 through 90 degrees in a clockwise direction.

Referring again to the controlling valve 25 of the pressing head, it will be noted in Fig. IV that a spring 46 tends to maintain the valve block 28 in its illustrated position; that is, the position in which the pipe 24 is uncovered to effect the rise of plunger 22. The plunger 22 and the pressing head 8 will remain in raised position so long as the valve block 28 is in such position. Indeed, it is essential that the pressing head should be in raised position for an interval of time sufficient to permit the shirt carrier to advance and bring to pressing position an unpressed shirt. Let it be said, for example, that the plunger 22 and pressing head 8 have in the operation of the machine been moved to raised position. An actuating rod 71 is connected, as will presently appear, to move with the pressing head 8, and a link 72 secures the operating rod 73 of the valving means 45 to this rod 71, whereby the valve block 74 (Fig. III) moves to its illustrated position when the pressing head rises to its elevated position. Thus, it will be understood that the rise of the pressing head causes an opening of pipe 40 to the operating pressure (supplied by pipe 75), and connects pipe 41 to a discharge conduit 76. Immediately, the plunger 36 moves from right to left, and causes its associated elements to oscillate, and effect shirt-feeding movement of the endless carrier, as above described. It will be remembered that the valve block 28 must be shifted from its illustrated position (Fig. IV) to effect a discharging of pipe 24, to communicate pipe 23 with the air supply, and, thereby, to cause the plunger 22 to lower and to move the pressing head 8 into pressing position.

Lever 33 is, advantageously, adapted to so shift the valve block 28. The valve block is provided with a rod 47 which projects from the valve chamber 25, as shown in Fig. IV, and, as the lever 33 in rotating clockwise approaches the end of its movement, the upper portion 48 of the lever engages the end of rod 47 and causes the shifting of valve block 28 in a left-to-right direction (Fig. IV). Accordingly, the pipe 23 is unvalved to fluid pressure, and, as explained hereinbefore, the pressing head 8 is caused to assume a pressing position, where it must be maintained for a period of time sufficient to iron or flatten the fabric of which the shirt is formed. The required period of time varies for different fabrics, and, therefore, it is desirable that such time of pressing should be regulatory. To this end, I provide an adjustable timing device which comprises a cylinder 60. This cylinder includes a fluid, (conveniently, the fluid is light lubricating oil) and a plunger 61. The plunger 61 is secured to a plunger rod 62, upon which there is adjustably mounted a stop 63. A latch member 64 is pivotally attached at 65 to the frame of the machine, and a tension spring 66 is adapted to hold one end of the latch member against the stop 63, as may be seen in Fig. IV. A pipe 67 (Fig. III) interconnects the end portions of the cylinder 60; that is, the bore portions of the cylinder, which lie on opposite sides of the plunger 61, are in communication through pipe 67. A valve 68 is included in this pipe, and, since the cylinder is filled with oil, it will be understood that the plunger in moving from one end of the cylinder to the other displaces the oil, and, accordingly, must force the oil through the bypass pipe 67.

Adjustment of the valve 68 determines the rate of such by-pass flow of oil, and when the plunger is under a pressure (such, for example, as a spring 69 creates) the valve 68 controls the rate of movement of the plunger 61. The timing device thus described controls the duration of pressing as follows: The end 48 of lever 33, in rotating clockwise (Fig. III) to advance the shirt carrier strikes the end of rod 47 (Fig. IV) and moves the valve block 28, causing the pressing head to lower into pressing position. The end 48 of lever 33 also strikes the end of plunger rod 62, forcing the rod 62 to the right (Fig. IV), and moving the plunger 61 against the resistance of spring 69 to the right-hand end of cylinder 60. As a result of such movement, the stop 63 moves out of contact with the latch 64, and the latch is free to move pivotally under the influence of spring 66. It so moves, until the teat 64a of the latch is brought to a position against the surface of rod 47. The rod 47 slides with this latching teat 64a bearing against it, while the lever 33 moves the rod and its associated valve block 28 to its right-hand position. A notch 47a is provided in the rod 47, and when in such movement the notch reaches the teat, the teat swings with the latch member 64, under the influence of spring 66, into engagement with the notch. Obviously, this engagement affords a locking of the valve block 28 in its right-hand position.

The valve block 28, having been moved and locked in its right-hand position, causes the plunger 22 and pressing head 8 to lower into pressing position. The rod 71 lowers with the head, the valve block 74 is moved downwardly to its alternate position, pipe 40 is vented to the discharge conduit 76, pipe 41 is unvalved to the pressure supply, plunger 36 thereupon returns

from its position in the left-hand end of the cylinder 37 (Fig. III) to its illustrated position, and lever 33, pawl 34, ratchet wheel 32 are each returned to rest in the position in which they are illustrated. It will be recalled that, upon completion of the carrier-feeding or clockwise movement of the lever, the latch 42 slides under the influence of spring 43 into locking engagement with the wheel 32. Preparatory to a carrier-feeding movement of the lever 33, obviously, the latch 42 must be shifted from locking position, and to this end, I rigidly interconnect a tripping member 78 to the latch 42. On the lever 33, I include a protuberance 79 which is effective to shift the member 78 and withdraw the latch 42 from its locking position when the lever is moved to its illustrated position (Fig. III)—the position from which the lever moves to advance the shirt carrier.

At this point in the operation of the machine, the plunger 36 is at rest in its normal position, but the valve block 28 is locked, by the latch 64, in its right-hand position (Fig. IV). As long as the valve block is so positioned, the pressing head 8 will remain in pressing position. The valve block will remain so positioned, until the spring 69 has moved the plunger 61 and plunger rod 62 to such point that the stop 63 is effective to swing the latch 64 (against the resistance of spring 66) and remove the teat 64*a* from the notch 47*a*; whereupon, the valve block 28 is released to move under the energy of spring 46, which causes the valve block to shift to its left-hand position. In response to such shifting the pressing head rises, and is ready to repeat the operating cycle. Manifestly, the valve 68 may be adjusted to vary the rate of movement of the plunger 61, and correspondingly vary the duration of a pressing operation.

In proceeding to set forth certain desirable features of the pressing head, I shall describe the work of the attendant. As mentioned in the fore part of this specification, the attendant picks up the shirt which has been conducted by the conveyor 9 to him—the spraying device 12 having, of course, dampened the shirt before it is so handled by the attendant. He inserts a stretching bar 70 between the tail and bodice portions of the shirt, as shown in Fig. I, and the ends of the bar 70 are each slid into a stretching dog 21. Dogs 21 are provided on one end of each carrier rod 17, and each dog is in tongue-and-groove engagement with its associated rod 17. These dogs 21 are slidable in such engagement on the rod, and, as will presently appear, means are provided for effectuating movement thereof (together with the shirt-stretching bar 70 which is positioned therein) to draw taut the shirt to be pressed.

After he has slid the bar 70 into an appropriate pair of co-operating dogs 21, the attendant flattens or smooths the shirt upon the pressing surface 7*a*, that extends between the two rods 17 which bear this particular pair of stretching dogs. The shirt is now ready for pressing; shirt A in Fig. I is indicated as having been made ready in this manner for pressing. It will be understood that the attendant has made the shirt thus ready during the interval of time in which the pressing head remains in the lower of its alternate positions. Upon the ending of this interval of time the machine operates; that is to say, the instrumentalities, which have been previously described, function and cause the head 8 to rise, and the endless carrier to move that shirt which has last been arranged for pressing to a position beneath the head. Figs. V and VI show the pressing head in raised position, and in rising to this position the head 8 causes, as previously explained, the shifting of valve block 74, and the movement of the plunger 36, together with its associated mechanism for effecting the movement of the shirt carrier. Consequently, the shirt which has last been arranged for pressing is moved to pressing position; this shirt is indicated by the dotted lines A' in Fig. VI. Accompanying the movement of the shirt carrier is the shifting of the valve block 28, and accordingly air is supplied to the cylinder 2 to effect an immediate lowering of the pressing head upon the shirt.

It is important to note that the pressing head 8 does not lower flat upon the shirt, but lowers in such an inclined position as to pinch the collar portion A'' of the shirt between the pressing surface 7*a* and the inner edge 8*a* of the head (Fig. VI). When the shirt is so pinched, during the descent of the pressing head, means function to draw the shirt taut, as it is desired that it should be before pressing. Referring particularly to Fig. II, these means comprise two hook members 210 which are each secured to a rod 211. The rods 211 extend transversely of the machine, as may be seen in Fig. V, and are so disposed longitudinally of the machine that each of their associated hook members 210 are in alignment with one of the two dogs 21, which dogs co-operate to secure the stretching bar 70 in the shirt lying immediately below the pressing head. The shirt carrier, in advancing one shirt after another to a position beneath the pressing head, brings upon each of such advances a co-operating pair of dogs 21 to the position described, that is, one dog in alignment with each hook member. The hook members have inturned tips 210*a* (Fig. V) which are adapted to engage complementary portions on the dogs 21, so that in moving the rods 211 from right to left, Fig. V, the dogs 21 are caused to slide on their associated rods 17. Remembering that the shirt to be pressed is fixed at its collar end to the pressing surface, i. e., by the edge 8*a* of the pressing head, it will be manifest that such movement of the members 210 and of the dogs 21 will effect a stretching of the shirt. I have provided a shaft 710 to which there is secured an arm 711. Also on shaft 710 there are two arms 712, one arm 712 being associated with each rod 211. The upper ends of the arms 712 may, conveniently, be bifurcated to lie between the stop members 713 on the rods 211. A collar 714 is secured to the rod 71, which moves vertically with the pressing head, and when the pressing head lowers to pressing position, or more exactly, when the pressing head in lowering pinches the collar of the shirt, the collar 714 strikes the free end of lever 711. Continued downward movement of the pressing head and rod 71 effectuates a rotation of the shaft 710, and a corresponding movement of the arms 712. Thereupon, the shafts 211, members 210, dogs 21 and bar 70 are moved to stretch the shirt. It may be mentioned that suitable means, such as a spring 230, is organized with each rod 211 to return the rods and their members 210 to normal position upon the rise of the pressing head and the consequent rise of the collar 714. As may be seen in Fig. I, a cam surface 300 is positioned adjacent the leaving end of the machine, and this cam surface shifts or causes the return of the dogs 21 to their normal position; this shifting

is accomplished, however, after the stretching bar 70 has been removed from the pressed shirt and when in advancing with the carrier the dogs strike the cam.

The structure of the support for the pressing head is important. The plunger 222 of piston 22 is secured to a crosshead 800, and to this crosshead is secured the pressing head 8, as well as the rod 71. The head 8 is secured to the crosshead 800 by means of a pivotal, sliding pin coupling. The coupling consists of a pair of lugs 802, which lugs are integral with the cross-head 800, and are provided with elongate eyes 803. The pressing head also has a pair of supporting eye-lugs 804, arranged to abut laterally the lugs 802; and a pin 805 pivotally interconnects the several eye-lugs. The pin 805 also passes through the head of an eye-bolt 806. The bolt 806 extends through the web 807 of the cross-head, and has associated therewith a spring 808 which tends to hold the pin 805 in the right-hand end of the elongated eyes 803 of the lugs 802; that is, the spring 808 tends to hold the parts in the position in which they are indicated in Fig. VI.

Adjacent the inner end of the pressing head there is a supporting member 809, having a pivotal connection 810 with the pressing head. Between the cross-head and pressing head a compression spring 811 is arranged, and this spring together with the spring 808 serves to maintain (in its raised position) the pressing head in the inclined position, shown in Figs. V and VI. Near the edge 8*a* of the pressing head there is pivotally secured one or more rollers 812 which bear against the frame portions 1*c*, and guide and steady the pressing head during its vertical reciprocations. The specialized structure of the head-supporting means imparts an exceedingly effective motion to the pressing head as it lowers upon a shirt. That is to say, as the head 8 is caused to lower, the edge 8*a* thereof engages first the collar portion of the shirt. Continued lowering of the cross-head 800 moves the links 711, 712 and shaft 211 to effect a stretching of the shirt. During this lowering the head 8 closes upon the shirt with an angular movement about the edge 8*a* as a center, and with a slight lateral shifting of the head, which shifting is permitted by the slot 803, and resisted by the compressing spring 808. The movement of the pressing head, as it lowers from its raised position to pressing position (that is, from the position shown in Fig. VI to that shown in Fig. VII) is a combination of angular and sliding movements. Such pressing movement of the head 8 tends to prevent the forming of wrinkles while the shirt is being pressed.

I have described the pressing machine as it is adapted for the pressing of shirts. It is to be understood, however, that the machine of my invention may be employed to press collars, pockets and cuffs, or other portions of wearing apparel, and thereby to adapt such portions for assembly or sewing with other patterns of fabric to form completed garments.

What I claim is:

1. In a shirt-pressing machine the combination with a frame, of a plurality of shirt-bearing surfaces movably supported by said frame, a pressing head, means for moving said surfaces one after another to a position beneath said pressing head, said pressing head being movable to and from pressing position on the shirt-bearing surface which lies immediately beneath the head, fluid pressure means for effecting such movement of the pressing head, valving means for causing said fluid pressure means to maintain said head in pressing position for an interval of time sufficient to press a shirt, and adjustable controlling means associated with said valving means for varying such interval of time in which said head remains in pressing position.

2. In a shirt-pressing machine the combination with a frame, of a plurality of shirt-bearing surfaces movably supported by said frame, a pressing head, means for automatically and intermittently moving said shirt-bearing surfaces to bring them to a position one after another beneath said pressing head, said pressing head being movable to and from pressing position on the shirt-bearing surface which lies immediately therebeneath, fluid pressure means for effecting automatically such movement of the pressing head, valving means for causing said fluid pressure means to maintain said head in pressing position for an interval of time sufficient to press a shirt, and adjustable controlling means associated with said valving means for varying such interval of time in which said head remains in pressing position and correspondingly retarding the succession of movements of said shirt-bearing surfaces.

3. In a shirt-pressing machine the combination with a frame, of an endless carrier including a plurality of shirt-bearing surfaces which are movable in upper and lower reaches in said frame, a pressing head borne by the frame and adapted to be reciprocated, means for moving said carrier intermittently and bringing the shirt-bearing surfaces one after another to a position beneath said pressing head, fluid pressure means for effecting such reciprocation of said pressing head, and means for effecting said movement of the carrier, valving means for the fluid pressure means and said carrier-moving means, and adjustable controlling means for said valving means, whereby said carrier is automatically caused to move when said head is raised from pressing position.

4. In a shirt-pressing machine the combination with a frame, of an endless carrier including a plurality of shirt-bearing surfaces which are movable in upper and lower reaches in said frame, a pressing head borne by the frame and adapted to be reciprocated, means for moving said carried intermittently and bringing the shirt-bearing surfaces one after another to a position beneath said pressing head, means for effecting such reciprocation of said pressing head, means for controlling said movement of the carrier, the last mentioned means being in synchronism with the first mentioned means, whereby said carrier is automatically caused to move when said head is raised from pressing position, and an endless conveyor for transporting shirts to be pressed to the shirt-pressing machine, and connections from such machine to said conveyor for effecting movements of the conveyor in synchronism with the movements of said shirt-bearing surfaces.

5. In a shirt-pressing machine the combination with a frame, of an endless carrier including a plurality of shirt-bearing surfaces which are movable in upper and lower reaches in said frame, a pressing head borne by the frame and adapted to be reciprocated, means for moving said carrier intermittently and bringing the shirt-bearing surfaces one after another to a position beneath said pressing head, means for effecting such reciprocation of said pressing head, means for controlling said movement of the carrier, the last mentioned means being in synchro-

nism with the first mentioned means, whereby said carrier is automatically caused to move when said head is raised from pressing position, and an endless conveyor for transporting shirts to be pressed to the shirt-pressing machine, a shirt-spraying device adjacent the end of said conveyor, and connections from such machine to said conveyor and to the shirt-spraying device for rendering the conveyor and spraying device effective in synchronism with the movements of the aforesaid shirt-bearing surfaces.

6. In a shirt-pressing machine the combination with a frame, of an endless carrier including a plurality of shirt-bearing surfaces which are movable in upper and lower reaches in said frame, a pressing head borne by the frame and adapted to be reciprocated, means for moving said carrier intermittently and bringing the shirt-bearing surfaces one after another to a position beneath said pressing head, means for effecting such reciprocation of said pressing head, means for controlling said movement of the carrier, the last mentioned means being in synchronism with the first mentioned means, whereby said carrier is automatically caused to move when said head is raised from pressing position, and an endless conveyor for transporting shirts to be pressed to the shirt-pressing machine, an endless conveyor for transporting pressed shirts away from said machine, connection from the machine to each of said conveyors for moving them in synchronism with the movements of the aforesaid shirt-bearing surfaces, and a shirt-spraying device associated with the first mentioned conveyor and adapted to spray automatically the shirts which are conveyed thereby to the machine.

7. In a shirt-pressing machine the combination with a frame, of a plurality of shirt-bearing surfaces movably supported by said frame, a pressing head, means for automatically and intermittently moving said shirt-bearing surfaces to bring them to a position one after another beneath said pressing head, said pressing head being movable to and from pressing position on the shirt-bearing surface which lies immediately therebeneath, shirt-stretching elements associated with each shirt-bearing surface, complementary shirt-stretching elements mounted in said frame, whereby the shirt-stretching elements associated with said surfaces are severally brought into cooperative relation with said complementary elements, means for moving said pressing head, and means for moving said complementary shirt-stretching elements in synchronism with the movements of said pressing head.

8. In a shirt-pressing machine the combination with a frame, of a carrier bearing a plurality of pressing surfaces, a pressing head, means for moving said carrier to shift said surfaces one after another to a position beneath said pressing head, automatic means for moving said head into and from pressing position, stretching elements associated with each pressing surface, and complementary stretching mechanism operable in synchronism with said head, the stretching elements of the pressing surfaces, as the surfaces are severally brought to position beneath said head, being shifted into co-operative relation with said complementary stretching mechanism.

9. In a shirt-pressing machine the combination with a frame, of a shirt-bearing surface supported by said frame, a pressing head movable to and from pressing position on said surface, power means for so moving said pressing head, shirt-stretching means associated with said surface, means associated with said pressing head for causing it as it lowers into pressing position to secure along one edge a shirt which is arranged on said shirt-bearing surface, and actuating means for said shirt-stretching means which actuating means are responsive to movement of said head into such shirt-securing position.

10. In a shirt-pressing machine the combination with a frame, of a shirt-bearing surface supported by said frame, a pressing head movable to and from pressing position on said surface, power means for so moving said pressing head, shirt-stretching means associated with said surface, means for supporting said pressing head in inclined position as it lowers upon the shirt-bearing surface, whereby said head is adapted to secure along one edge a folded shirt which is arranged on said shirt-bearing surface, and actuating means for said shirt-stretching means, which actuating means are responsive to movement of said head, whereby the shirt is drawn taut while it is so secured.

11. In a shirt-pressing machine the combination with a frame, of a plurality of shirt-bearing surfaces movably supported by said frame, a pressing head borne by said frame, means for automatically and intermittently moving said shirt-bearing surfaces to bring successively each surface to a position beneath said pressing head, means for automatically causing said pressing head to move into and from pressing position upon the shirt-bearing surface which lies therebeneath, shirt-stretching members associated with each shirt-bearing surface, and automatically operable means for rendering effective the shirt-stretching members, which are associated with the shirt-bearing surface lying beneath said pressing head, before the pressing head lowers into pressing position.

12. In a shirt-pressing machine the combination with a frame, of a plurality of shirt-bearing surfaces movably supported by said frame, a pressing head borne by said frame, means for automatically and intermittently moving said shirt-bearing surfaces to bring successively each surface to a position beneath said pressing head, means for automatically moving said pressing head into pressing position upon the shirt-bearing surface which lies therebeneath and for maintaining the head in such position for an interval of time sufficient to press a shirt, an adjustable controlling device for varying the interval of time in which said head is so caused to remain in pressing position, shirt-stretching members associated with each shirt-bearing surface, and automatically operable means for rendering effective the shirt-stretching members, which are associated with the shirt-bearing surface lying beneath said pressing head, before the pressing head lowers into pressing position.

13. In a shirt-pressing machine the combination with a frame, of a plurality of shirt-bearing surfaces movably supported by said frame, each of such surfaces comprising a pad which is backed by a layer of compressible material, a pressing head borne by said frame, means for automatically and intermittently moving said shirt-bearing surfaces to bring successively each surface to a position beneath said pressing head, means for automatically moving said pressing head into pressing position upon the shirt-bearing surface which lies therebeneath and for maintaining the head in such position for an interval of time suffi-

cient to press a shirt, an adjustable controlling device for varying the interval of time in which said head is so caused to remain in pressing position, shirt-stretching members associated with each shirt-bearing surface, and automatically operable means for rendering effective the shirt-stretching members, which are associated with the shirt-bearing surface lying beneath said pressing head, before the pressing head lowers into pressing position.

14. In a shirt-pressing machine the combination with a frame, of a plurality of shirt-bearing surfaces movably supported by said frame, means for automatically and intermittently moving said shirt-bearing surfaces to bring successively each surface to a position beneath said pressing head, means for automatically causing said pressing head to move into and from pressing position upon the shirt-bearing surface which lies therebeneath, shirt-stretching members associated with each shirt-bearing surface, means for causing said pressing head, as it lowers into pressing position, to secure along one edge a shirt which is arranged on the shirt-bearing surface lying beneath said pressing head, and means responsive to such lowering movement of the head for rendering the shirt-stretching means effective to draw taut the shirt which is so secured by the pressing head.

15. In a shirt-pressing machine the combination with a frame, of a plurality of shirt-bearing surfaces movably supported by said frame, means for automatically and intermittently moving said shirt-bearing surfaces to bring successively each surface to a position beneath said pressing head, means for moving automatically said pressing head into pressing position upon the shirt-bearing surface which lies therebeneath and for maintaining the head in such position for an interval of time sufficient to press a shirt, an adjustable controlling device for varying the interval of time in which said head is so caused to remain in pressing position, shirt-stretching members associated with each shirt-bearing surface, means for causing said pressing head, as it lowers into pressing position, to secure along one edge a shirt which is arranged on the shirt-bearing surface lying beneath said pressing head, and means responsive to such lowering movement of the head for rendering the shirt-stretching means effective to draw taut the shirt which is so secured by the pressing head.

16. In a shirt-pressing machine the combination with a frame, of a shirt-bearing surface supported by said frame, a pressing head movable to and from pressing position on said surface, power means for moving said head into pressing position and for maintaining the head in such position for an interval of time sufficient to press a shirt, means for automatically controlling said power means, which controlling means are adjustable for regulating such interval of time, shirt-stretching means associated with said surface, means for supporting said pressing head in inclined position as it lowers to pressing position, whereby said head is adapted to secure along one edge a folded shirt which is arranged on said shirt-bearing surface, and means for causing said shirt-stretching means to draw taut the shirt while it is so secured.

17. In a shirt-pressing machine the combination with a frame, of a shirt-bearing surface supported by said frame, a crosshead, a pressing head, means for reciprocating the cross-head and moving the pressing head into and out of pressing position upon said shirt-bearing surface, and connecting means for securing said pressing head to said cross-head, and means for causing the pressing head to incline from the horizontal when the pressing head is out of pressing position, which last-mentioned means admit of angular closing of the pressing head upon the shirt-bearing surface when the cross-head is moving the pressing head into pressing position.

18. In a shirt-pressing machine the combination with a frame, of a shirt-bearing surface supported by said frame, a cross-head, a pressing head, means for reciprocating the cross-head and moving the pressing head into and out of pressing position upon said shirt-bearing surface, and connecting means for securing said pressing head to said cross-head, and means for causing the pressing head to incline from the horizontal when the pressing head is out of pressing position, which last-mentioned means admit of an angular closing of the pressing head upon the shirt-bearing surface when the cross-head is moving the pressing head into pressing position, and yielding means tending to maintain said pressing head in such inclined position.

19. In a shirt-pressing machine the combination with a frame, of a shirt-bearing surface supported by said frame, a cross-head, a pressing head, means for reciprocating the pressing head into and out of pressing position upon said shirt-bearing surface, and connecting means for securing said pressing head to said cross head, and means for causing the pressing head to incline from the horizontal when the pressing head is out of pressing position, which last-mentioned means includes a plurality of parts movable relatively to each other to admit of an angular movement of the pressing head and to admit of lateral movement between the cross-head and pressing head, when the cross-head is moving the pressing head into pressing position.

20. In a shirt-pressing machine the combination with a frame, of a shirt-bearing surface supported by said frame, a cross-head, a pressing head, means for reciprocating the cross-head and moving the pressing head into and out of pressing position upon said shirt-bearing surface, and connecting means for securing said pressing head to said cross-head, means for causing the pressing head to incline from the horizontal when the pressing head is out of pressing position, which last-mentioned means includes a plurality of parts movable relatively to each other to admit of an angular movement of the pressing head and to admit of a lateral movement between the cross-head and pressing head when the cross-head is moving the pressing head into pressing position, and yielding means tending to prevent such angular and lateral movements.

21. In a shirt-pressing machine the combination with a frame, of an endless carrier, a plurality of shirt-bearing surfaces on said carrier, a pressing head, fluid pressure means for moving the pressing head to and from a position upon one of said shirt-bearing surfaces, mechanism for producing intermittent advancement of said shirt-bearing surfaces, connections between said mechanism and said pressing head, whereby said mechanism is operated to effect an advance of the carrier when said pressing head moves upward.

22. In a shirt-pressing machine the combination with a frame, of an endless carrier, a plu-

rality of shirt-bearing surfaces on said carrier, a pressing head, fluid pressure means for moving said carrier intermittently to bring the shirt-bearing surfaces one after another to a position beneath said pressing head, fluid pressure means for lowering the pressing head upon the shirt-bearing surface which lies therebeneath and for raising the pressing head from its lowered position, connections between said head and the first-mentioned fluid pressure means, whereby an advance of the carrier is effected when said pressing head raises from its lowered position.

23. In a garment-pressing machine the combination with a frame, of a garment-bearing surface, a pressing head, fluid pressure means for moving said pressing head into and out of pressing position upon said surface, a valving device having two operative positions, which device in one of said positions renders the said fluid pressure means effective for moving the pressing head out of pressing position, and instrumentalities, responsive to the movement of said pressing head out of pressing position, for shifting the valving device to its second position and rendering the said fluid pressure means effective for moving the pressing head into pressing position, together wth an adjustable timing device associated with said valve device to regulate the time interval in which the pressing head remains in its lower position.

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