June 28, 1938. C. T. ALLME 2,121,849

GARMENT PRESSER

Original Filed Aug. 19, 1935 3 Sheets-Sheet 1

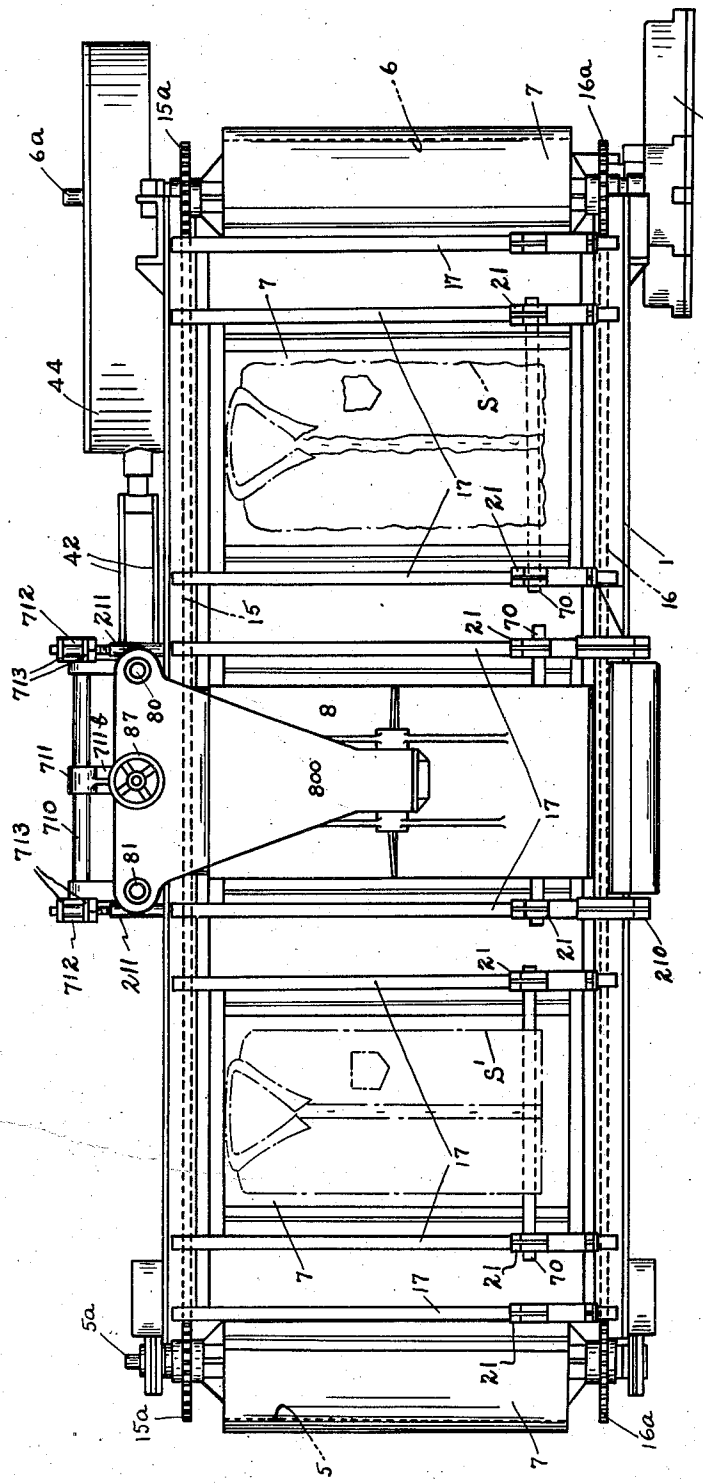


Fig. I

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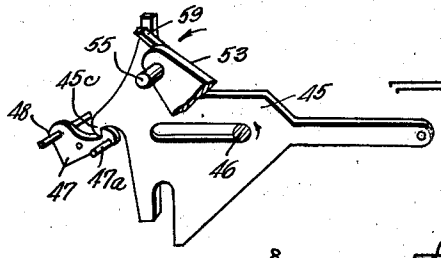


Fig. IIIa.

Fig. II.

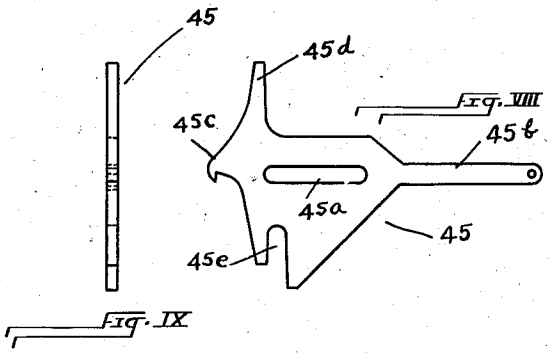


Fig. VIII

Fig. IX

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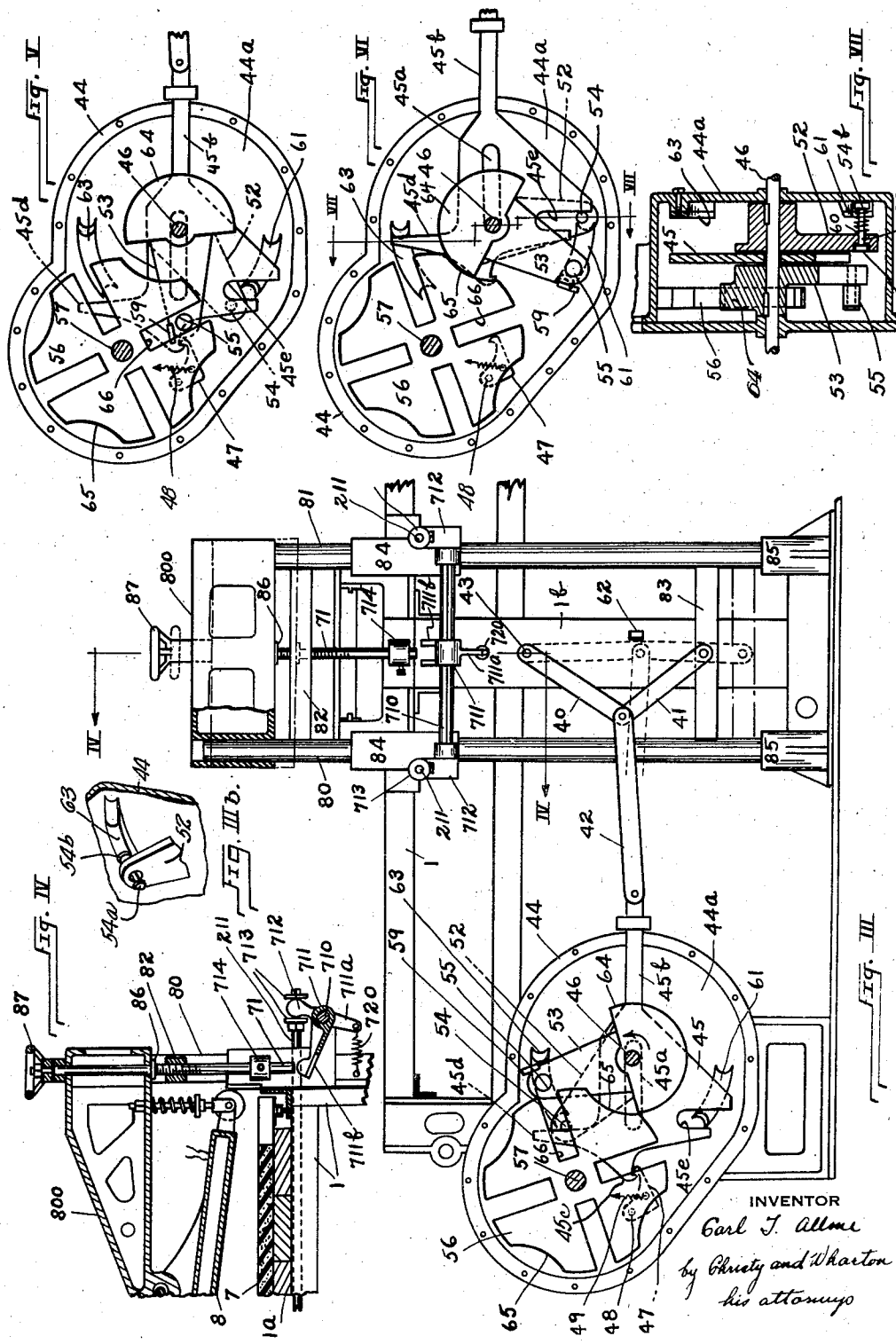
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June 28, 1938. C. T. ALLME 2,121,849

GARMENT PRESSER

Original Filed Aug. 19, 1935 3 Sheets-Sheet 3



Patented June 28, 1938 2,121,849

UNITED STATES PATENT OFFICE

2,121,849

GARMENT PRESSER

Carl T. Allme, Meadville, Pa., assignor to Spaide Shirt Company, a corporation of Pennsylvania

Application August 19, 1935, Serial No. 36,816
Renewed June 22, 1937

10 Claims. (Cl. 38—10)

My invention relates to garment-pressing machines, and is particularly, although not exclusively, directed to a machine of the sort disclosed in United States Letters Patent No. 1,942,254, granted January 2, 1934, to Thomas H. McGowan.

The patented machine embodies a heated pressing head, and a series of work-supporting pads. The pads are laterally interconnected in closed or endless series, and means are provided for advancing such endless series step-by-step, whereby the pads are brought, one after another, into a position of momentary rest beneath the head. The attendant places garments to be pressed upon the pads, as they advance into such position, and, in the interval between each pad-advancing movement, the pressing head automatically descends and presses the garment lying upon the pad beneath it. Upon remaining in pressing engagement with the garment for a predetermined interval of time, the pressing head is automatically raised, and the series of pads is moved a step forward, carrying the pressed garment from beneath the head, and moving another into pressing position.

These various coordinated operations of the machine have been effected by pneumatic means—means operated by compressed air, as described in the above-noted patent. Good work is done by the machine so operated, but certain practical objections attend its operation. For example, an air compressor, an air receiver, and a compressor motor, are essential to provide the operating power or medium for the machine; a relatively complex system of air conduits, and several pneumatic motors, and timing and governing devices, are essentially embodied in the machine. In service, air leakage tends to develop in the conduits, timing devices, and pneumatic motors. Thus, it will be understood that the use of the machine is attended with a problem of maintenance, which, together with the relatively high initial investment required, impairs its otherwise great value.

The object of my invention is to provide mechanical means for effecting the several coordinated and automatic operations of a pressing machine of the type alluded to. It is further my aim that such means shall be of relatively simple structure, inexpensive, certain in operation, and durable in service.

In the accompanying drawings, Fig. I is a view in plan from above of a pressing machine embodying the invention; Fig. II is an end view of the machine, the plane of view being on the right of Fig. I; Fig. III is a fragmentary view of the apparatus, taken on the plane III—III of Fig. II, and showing in side elevation particular elements of the operating mechanism, and Figs. IIIa and IIIb are views in perspective of structural details; Fig. IV is a fragmentary view, showing the pressing head mounting in section, on the plane IV—IV of Fig. III; Figs. V and VI are fragmentary views, comparable with Fig. III, and showing the particular elements of the operating mechanism in progressive positions of operation; Fig. VII is a sectional view of such mechanism, taken on the plane VII—VII of Fig. VI; and Figs. VIII and IX, respectively, are views in side and end elevations of one of the elements of the operating mechanism.

Referring to the drawings, the machine consists of a frame 1, in which a pressing head 8 is organized. An endless carrier, including in this case a series of pad members 7, is movable longitudinally of the machine; the movement of the carrier is intermittent, and the pad members 7 (or other work-bearing surfaces) are carried one after another into a position immediately beneath the head, and in such position each pad member is held for a predetermined time interval. The head 8 forcefully descends upon each pad member coming to rest beneath it; the head remains in lowered position for a predetermined interval of time and then rises, and, as the pressing head rises, the carrier automatically advances the next succeeding pad into a position of rest beneath the head. Thus, the step-by-step operation of the carrier is coordinated with the vertical reciprocations of the pressing head.

An attendant introduces to the machine the garments to be pressed. A garment (a shirt in this case) is placed upon each pad member, before it is moved by the carrier into a position beneath the pressing head, and the shirt, or other garment, is properly folded and flattened for pressing upon the pad member, as indicated at S in Fig. I. When the shirt-bearing pad member, in consequence of the already described travel of the carrier, comes to a position beneath the head 8, the head descends and forcefully compresses the shirt upon the pad member. The head 8 is heated (by known means) to proper pressing temperature, and means operate to hold the pressing head in shirt-compressing position for an interval of time sufficient to effect the desired pressing or ironing of the shirt. Upon the rise of the head, the pad member 7 bearing the pressed shirt S′ is moved from beneath the head, as shown in Fig. I, while the next succeeding pad

member carries an unpressed shirt S into position beneath said head.

As in the case of the structure disclosed in the above-noted patent, the travelling carrier consists of two continuous roller chains 15 and 16; the roller chains are spaced apart transversely of the machine, and are each trained over a pair of sprocket-wheels 15*a*, 16*a*, mounted on shafts 5*a* and 6*a* that are rotatably trunnioned in the frame 1 at opposite ends of the machine. Cross-rods 17 are secured at their opposite ends to the chains 15 and 16, and such rods are arranged in paired relation, the rods of each pair supporting between them a pad member 7. Thus, an endless series of work-supporting members 7 are mounted on the endless chains 15 and 16, providing a carrier structure that extends in upper and lower reaches between the opposite ends of the machine, and, manifestly, powerful rotation of either shaft 5*a* or 6*a* will produce travel of the series. As noted in the said patent, the pad members 7 are flexible, to afford an advantageous yielding under the action of the pressing head, and to facilitate the movement of the pads between the upper and lower reaches of the carrier structure. Indeed, the shafts 5*a* and 6*a* are each provided with a roller, 5 and 6 respectively, to support the flexible pads in the regions at the opposite ends of the machine where the chains 15 and 16 round their sprocket-wheels. And, as may be observed in Fig. IV, the frame 1 includes a stationary platform 1*a* for rigidly supporting the pad members 7 in flat position beneath the pressing head 8.

Turning now to a consideration of the structure in which my invention is found, it will be observed in Figs. III and IV that the pressing head 8 is mounted upon a cantilever member 800. Two parallel, vertical shafts 80 and 81, rigidly integrated by cross-bars 82 and 83, are arranged to slide vertically in bearings 84 and 85 in the machine frame, and the cantilever member 800 is mounted upon the upper ends of these shafts 80, 81, as is clearly indicated in Fig. III. The vertical position of the cantilever member upon the shafts may be adjusted, by means of a rod 71 that extends through the cross-bar 82 and in threaded engagement therewith. The rod 71 extends upward through the body of cantilever member 800, and is secured against axial movement relatively thereto, by means of a collar 86 and a hand-wheel 87, each firmly fixed to the rod above and below the cantilever member, as shown in Fig. IV. By virtue of such structure, the cantilever support (800) for the pressing head 8, mounted upon and reciprocable integrally with shafts 80, 81, is adjustable in its mounting. The normally fixed vertical position of the cantilever support upon such shafts, or the normal position of the pressing head, may be adjusted by turning the hand-wheel 87 and rotating the rod 71 in said threaded engagement with the cross-bar 82.

Means are provided for vertically reciprocating the shafts 80, 81, to move the pressing head 8 to and from engagement with the shirt-bearing pad members successively moved into position beneath it. The range of such reciprocation is normally constant, and it will be understood that the means for adjusting the cantilever member axially of the shafts 80, 81 advantageously permits regulation of the normal pressure of the head against the yielding pad members 7, and the shirts lying thereon. It will be understood that shirts of various fabrics are of various thicknesses when folded for pressing, and the various fabrics require various pressures beneath the heated head to obtain the desired pressing or ironing. These various conditions of service are readily provided for in the adjusting means above described.

The means for reciprocating the shafts 80, 81 consist in a toggle linkage, comprising two links 40 and 41 mutually pivoted at their inner ends to a connecting rod 42, note Fig. III. The outer end of link 40 is pivotally connected, at 43, to a stationary frame element 1*b*, while the corresponding end of the link 41 is pivotally secured to the cross-bar 83 that unites the lower ends of the shafts 80, 81. Within a stationary housing 44 a special cam plate 45 is organized with means for effecting its horizontal reciprocation. The cam plate is provided with a slot 45*a* through which projects a rotary shaft 46, trunnioned in the side walls of housing 44; an extension 45*b* projects from the cam plate through the wall of the housing 44, and is pivotally secured to the connecting rod 42. When the pressing head is in elevated position, the cam plate 45 lies at one end of its range of horizontal reciprocation, and toggle linkage 40—42 rests in the full-line position shown in Fig. III. The cam plate 45 includes a hook portion 45*c*, see Figs. III and III*a*, which normally is engaged by the distal end of a latch-arm 47 that is pivotally mounted on a pin 48 carried by the housing 44; the latch-arm is normally held in engagement with hook portion 45*c*, by means of a spring 49, see Figs. III and V, and thus the toggle mechanism is stayed in the position in which it sustains the pressing head in elevated position.

An electric motor 50 (Fig. II) is connected through a train of reduction gears in housing 51 to the shaft 46 (Fig. III), and such shaft is continuously rotated in a counter-clockwise direction, as viewed in Fig. III. On the inner side of the cam plate 45, an arm 52 is keyed to the shaft 46 (see Fig. VII), and on the outer side of such plate an arm 53 is keyed to the shaft. As viewed axially of the shaft, the two arms extend angularly to one another (see Fig. III), and the inner arm 52 carries an extensible and retractible element—a pin 54—which cooperates immediately with the cam plate, while the outer arm 53 carries a pin or roller 55 that cooperates with a Geneva stop or cam 56. The Geneva cam is secured to a shaft 57. The shaft 57 extends from the housing 44 and is connected through gearing in housing 58 (see Fig. II) to the sprocket shaft 6*a*. During each rotation of the shaft 46, the arms 52, 53 and their associated elements effect in accurately timed sequence a quarter revolution of the Geneva cam and a complete reciprocation of the cam plate 45. The gearing in housing 58 is so designed that each quarter revolution of the cam shaft 57 effects the advance of the work-supporting carrier through a distance equal to the center-to-center distance between the pad members 7 mounted thereon, and, as will more fully appear below, each horizontal reciprocation of the cam plate 45 effects a pressing operation of the head 8. Thus, both the carrier and the pressing head derive their operating movements from the constantly rotating shaft 46, and, by virtue of such feature, it is possible accurately and positively to coordinate the intermittent travel of the carrier with the vertical reciprocations of the pressing head.

While the arms 52 and 53 (secured to constantly rotating shaft 46) are slowly sweeping through the positions in which they are shown in Fig. III, the pressing head is sustained in its elevated posi-

tion, and the work-supporting carrier is at rest. Continued (counter-clockwise) rotation of the shaft **46** carries the arms downward, and a rigid finger **59** (Fig. III*a*) projecting from the arm **53** engages a pin **47***a* projecting laterally from the catch **47** and swings the catch from engagement with the hook portion **45***c* of the cam plate **45**. As may be perceived in Fig. VII, the pin **54** which is carried at the distal end of arm **52** includes a head **54***a* that normally nests in a socket provided therefor in such arm, whereby, save as hereinafter described, the pin offers no obstruction to the free rotation of the arm relatively to the cam plate. It will be further observed that the pin **54** projects through the body of the arm **52** and terminates in a foot **54***b*, between which foot and the body of the arm a compression spring **60** is organized. The spring **60** tends to hold the pin in its retracted position—the position in which the head **54***a* of the pin nests within the body of the arm. On the side wall **44***a* of the housing **44** an arcuate cam **61** is secured; in the course of the rotation of the arm **52**, the foot **54***b* of the pin engages this cam, and thereby is shifted against the restraint of spring **60**; thus, the head **54***a* of the pin is caused to project outward (to the left in Fig. VII) from the arm, and is held in such projecting position so long as its foot **54***b* rides in contact with arcuate cam **61**. Upon referring to Fig. V, it will be seen that the cam plate **45** is provided with a peripheral slot **45***e*, and it will be understood that the organization of the mechanism is such that the foot of the pin **54** engages the arcuate cam **61**, and projects the head **54***a* of the pin into the slot **45***e*, at the precise moment the finger **59** effects the disengagement of the latch **47** from the hook portion **45***c* of the cam plate. Accordingly, the cam plate **45** is released, and, by virtue of the engagement of pin **54** in slot **45***e* (Fig. VI), the powerful rotation of the shaft **46** effects the left-to-right travel of the cam plate. In consequence, the toggle linkage **40—42** (Fig. III) is shifted from full-line position to dotted-line position; the cross-bar **83** is forced downward, carrying the shafts **80**, **81** and cantilever member **800** with it, and thereby moving the head **8** into pressing engagement with the shirt supported beneath it.

The moment the pressing head enters pressing position, the foot of pin **54** reaches the end of cam **61**, and the pin, under the influence of spring **60**, is automatically withdrawn from engagement with the cam plate slot **45***e*. The rotation of the shaft **46** continues, but the cam plate, freed of engagement by the pin, remains at rest, the toggle links **40** and **41** having been moved past center and into abutment with a stop **62**, as shown in dotted lines in Fig. III. That is to say, the pressing head **8** is stayed in pressing position, when the pin **54** is disengaged from slot **45***e*. The arms **52** and **53** continue their counter-clockwise rotation.

The side wall of the housing **44** carries a second arcuate cam, and this cam **63**, is effective to shift the pin **54** into projecting position a second time during each rotation of the arm **52**. In this case the cam **63** is disposed, in the direction of arm rotation, slightly more than 180° from the cam **61**, whereby, when the pin **54** moves from engagement with the cam **61**, and is thus disengaged from the cam plate **45**, the arm **52** turns through 180°, more or less, before the pin **54** engages the cam **63**. The cam plate **45** remains at the right-hand end of its range of reciprocation, and the head **8** remains in pressing position, while the continuously rotating arm moves from cam **61** to cam **63**.

The cam plate **45** is provided with an upwardly projecting portion **45***d*, and, when the outer end of rotating arm **52** reaches the cam **63**, the foot **54***b* of pin **54** engages the cam, causing the head **54***a* of the pin to project from the arm **52** (Fig. III*b*) in such manner as to engage cam plate portion **45***d*, whereby, rotation of the arm continuing, the cam plate is shifted to the left. In consequence, the toggle linkage is restored to its full-line position (Fig. III), and the pressing head is elevated. As the cam plate **45** reaches the left-hand end of its range of movement, the latch **47** engages the cam plate portion **45***c*, and the pin **54** reaches the end of arcuate cam **63** and is automatically retracted from engagement with the cam plate portion **45***d*. Thus, it will be perceived that the pin **54** comprises a clutch device that operates automatically and in coordination with the constantly rotating shaft **46**.

In the above-described manner, the pressing head is lowered; it is held in pressing position during the interval in which the end of arm **52** swings from cam **61** to cam **63**; and at the end of such interval the head is restored to and secured in its normal elevated position. And it will be understood that, by adjusting the arcuate distance between cams **61** and **63**, the time of active engagement of the pressing head with the rock may be regulated. I contemplate that the cam **63** may be detachably mounted upon the wall of housing **44**, and that cam elements of various lengths may be interchangeably employed to obtain such regulation of active pressing time.

In accordance with well-known mechanical practice, the shaft **46** carries a semi-circular plate or disc **64** (conveniently of one piece with arm **53**) that in usual way engages successively the arcuate recesses **65** formed in the periphery of the Geneva cam **56**, normally to secure the cam against rotation. The disc **64** rotates in unison with the continuously rotating arm **53**, but the Geneva cam and shaft **57** remain idle, and, of course, the work carrier is positively held at rest, so long as the rotating disc remains in engagement with a recess **65**. The Geneva cam is further provided, in accordance with usual practice, with radial slots **66**—there being four slots **66** and four intervening peripheral recesses **65** in this case. The organization of the various elements of the mechanism is such that, when the cam plate **45** is latched at the left-hand end of its range of travel and the pressing head is held in elevated position, the roller **55** carried by arm **53** enters one of the Geneva cam slots **66**, and the disc **64** reaches the end of its sweep over the corresponding adjacent recess **65**. (Note Fig. III.) As the arm **53** continues its counter-clockwise rotation, the Geneva cam, engaged by roller **55** at the end of the arm, is rotated, first with acceleration and then retardation in angular velocity, effecting the rotation of shaft **57** and the travel of the work carrier in the manner already described. When the cam **56** has been thus rotated through 90°, the roller **55** passes outward from the engaged slot **66**, and the disc **64** enters engagement with the next adjacent recess **65**. Accordingly, while the arm **53** is passing downward from the cam **63** to the cam **61** (that is, in the interval between successive operations of the pressing head), the Geneva cam is released, rotated through precisely 90°, and then locked again. In such manner the work carrier, as positively engaged by sprocket-wheels **15***a*, **16***a*,

is caused to advance between each vertical reciprocation of the pressing head. In each advance the velocity of the carrier is, by virtue of the Geneva cam, first accelerated and then retarded within a positively limited range of travel, and thus the shirt-bearing pad members 7 on the positively engaged carrier are successively moved into a position of precise registry with the pressing head, and with the cooperating shirt-stretching means, described below.

It will be perceived that I have provided relatively simple means for effecting the operation of an automatic pressing machine. The means are essentially mechanical in nature, as distinguished from pneumatic; yet the desired automatic coordination of the several positively effected operations is obtained.

The pressing head 8 is normally sustained in inclined position, as shown in Figs. II and IV, and in the manner described in the above-noted patent, the pressing head, during its descent into pressing position, first engages and pinches at one end (the collar end) the folded shirt that lies on the pad member 7 beneath it, and, while cooperating means immediately function to stretch the shirt taut upon its supporting pad member 7. Then, during its continued descent, the pressing head moves angularly of the support 800, against the resistance of interposed springs, and closes angularly upon the taut shirt, and presses it against its supporting pad member 7. This operation is fully described in the patent, and need not be herein repeated, save in the following details:

A dog 21 is slideably secured to each carrier bar 17, and a hook member 210 is mounted upon each of two rods 211. The rods 211 extend transversely of the machine, and are slideably mounted in the frame 1 beneath the pressing head. The attendant inserts a stretching bar 70 between the bodice and tail portions of each folded shirt introduced to the machine, and, as may be seen in Figs. I and II, the opposite ends of the stretching rod are engaged by the dogs 21, carried on the particular pair of carrier rods 17 between which the shirt is laid. As each shirt-bearing pad member moves into pressing position, the dogs 21 mounted on its two supporting bars 17 enter engagement with the hook members 210, see Figs. I and II, and, when the pressing head descends and "bites" the collar of the shirt, the rods 211 are automatically shifted, carrying the engaged dogs 21 and bar 70 outward. Thus, the shirt is automatically stretched while the pressing head descends and angularly closes upon it.

The means for effecting such shirt-stretching operation of the rods 211, in synchronism with my operating mechanism, are found in two arms 712, keyed upon a rocker shaft 710, and having bifurcated upper ends severally embracing the ends of rods 211 between collars 713 that are adjustably secured to the rods. Between the two arms 712, a bell-crank lever 711 is fixed upon the shaft 710; one arm, 711*a*, of the lever extends downward, and is organized with a tension spring 720 that tends to rotate the rocker shaft 710 clockwise (Fig. IV), and thereby to urge the rods 211 into normal, retracted position; and the other arm 711*b* of said lever inclines upward from the shaft, and is forked at its distal end. The threaded rod 71 is aligned with the forked end of lever 711, as may be noted in Fig. III, and a collar 714 is adjustably secured to such rod. During the head-lowering operation of my mechanism, the rod 71 is carried downward, and the collar 714 engages the distal end of arm 711*b* of the bell-crank lever. In consequence, the rocker shaft 710 and arms 712 turn counter-clockwise (Fig. IV), and the rods 211 are shifted to the left, thereby moving the hook members 210, together with the engaged dogs 21 and bar 70, and in so doing effecting the stretching of the shirt that lies beneath the descending head.

As has been already mentioned, the hand-wheel 87 affords adjustment of the operating pressure of the pressing head. And the fixed position of collar 714 on rod 71 may be adjusted, whereby the shirt-stretching operation of the rods 211 may be accurately coordinated and timed with respect to the pressing head, as it descends and angularly and progressively engages the shirt beneath it. Furthermore, the degree of tension exerted upon the shirt is variable by such adjustment, inasmuch as the range of right-to-left shift of rods 211 and of hooks 210 is thus adjustable. Thus, the operation of the shirt-stretching instrumentalities may be minutely controlled and synchronized with the other coordinated operations of my mechanically actuated, automatic pressing machine.

Notice is given of my co-pending application Serial No. 92,121, filed July 23, 1936.

I claim as my invention:

1. In an automatic pressing machine including a pressing head, means for advancing articles to be pressed to a position of registry with said head, and a driving motor; the combination of driving mechanism including an element movable in opposite directions for raising and lowering said head, a continuously rotating member, and a clutch device automatically shifted between engaged and disengaged positions for intermittently connecting said continuously rotating member with said element, whereby such element is alternately shifted in opposite directions, as described.

2. In an automatic pressing machine including a pressing head, means for advancing articles to be pressed to a position of registry with said head, and a driving motor; the combination of driving mechanism including a sliding element reciprocable in opposite directions for raising and lowering said head, a continuously rotating member, and a clutch device automatically shifted between engaged and disengaged positions for intermittently connecting said continuously rotating member with said sliding element, whereby such element is alternately shifted in opposite directions, as described.

3. The structure of claim 1, in which said clutch device consists in an extensible and retractible pin carried by said continuously rotating member, and means cooperating with said rotating member for intermittently shifting said pin into and from engagement with the element which is movable in opposite directions, as described.

4. In a pressing machine including a pressing head and an endless conveyor for carrying work to position beneath said head, the combination of mechanism for automatically operating said machine, said mechanism including a continuously rotating shaft, a mechanical linkage including a reciprocable element for raising and lowering said head, a mechanical linkage including a rotary element for advancing said conveyor, and means carried by said continuously rotating shaft for intermittently engaging said reciprocable element and said rotary element in predetermined coordination, whereby said mechanical

linkages are severally operated to effect the travel of said conveyor in desired synchronism with the raising and lowering of said head.

5. In a pressing machine including a reciprocable pressing head and means for advancing articles to be pressed to a position beneath said head, the combination of a continuously rotating member, rotary means including a Geneva cam responsive intermittently to said rotary member for moving said article-advancing means, and means including a connecting rod responsive to said rotary member for reciprocating said pressing head, said last-mentioned means including a clutch device, and means for automatically moving said clutch device between engaged and disengaged positions in coordination with the angular movement of said rotary member.

6. In a pressing machine including a reciprocable pressing head and means for advancing articles to be pressed to a position beneath said head, the combination of a continuously rotating member, rotary means including a Geneva cam responsive intermittently to said rotary member for moving said article-advancing means, and means operable in coordination with said rotary member for lowering and holding said head in pressing engagement with the article beneath it and then raising the head from such engagement, and cam means for automatically timing the period of said pressing engagement.

7. In a pressing machine including a reciprocable pressing head and means for advancing articles to be pressed to a position beneath said head, the combination of a continuously rotating member, rotary means intermittently responsive to said rotary member for operating said article-advancing means, means for reciprocating said head, a cam, and automatic means subject to said cam for intermittently connecting said head-reciprocating means with, and disconnecting the same from, said rotary member.

8. In a pressing machine including a reciprocable pressing head and means for advancing articles to be pressed to a position beneath said head, the combination of a continuously rotating member, rotary means intermittently responsive to said rotary member for operating said article-advancing means, means for reciprocating said head, a lock for normally holding said head-reciprocating means stationary, means for periodically and automatically releasing said lock, and means for connecting said head-reciprocating means with said rotary member when said lock is released.

9. In an automatic pressing machine including a pressing head, an endless work-carrier, means for intermittently advancing said carrier, and means operable in synchronism with carrier advance for raising and lowering said pressing head, the combination of work-stretching means, means for operating said last-mentioned means in coordination with the movements of said pressing head, means for regulating the operating pressure of said head upon the work, and means for making compensating adjustment of said work-stretching means while maintaining said coordination.

10. In an automatic pressing machine including a pressing head, an endless work-carrier, means for intermittently advancing said carrier, and means operable in synchronism with carrier advance for raising and lowering said pressing head, the combination of means for normally locking said head in elevated position, and means operable in coordination with said head-operating means for automatically releasing said lock, whereby said head is lowered into pressing position.

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