Feb. 7, 1933. G. W. JOHNSON 1,896,518

CONTROL MECHANISM FOR PRESSING MACHINES

Filed Oct. 20, 1930 3 Sheets-Sheet 1

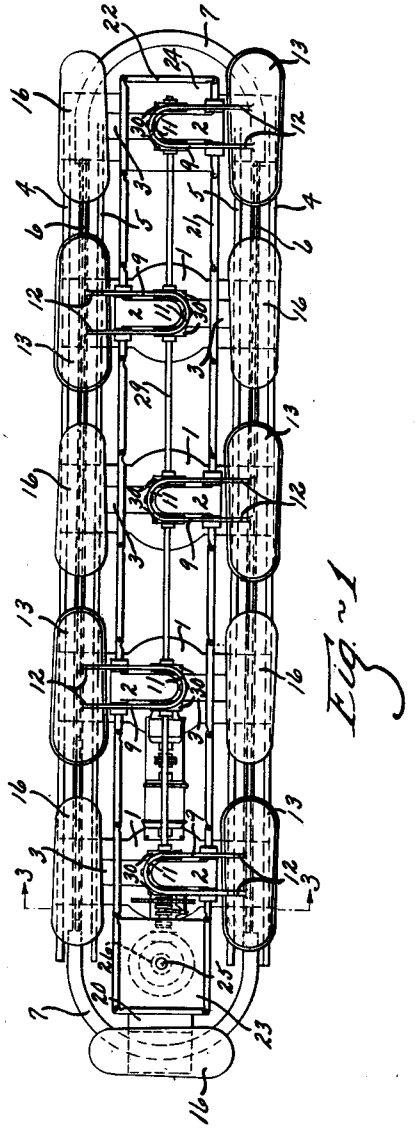

Fig. 1

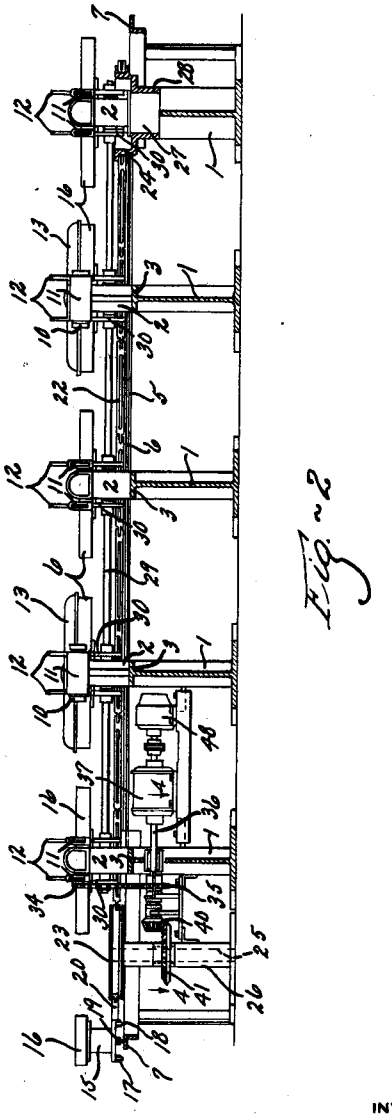

Fig. 2

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CONTROL MECHANISM FOR PRESSING MACHINES

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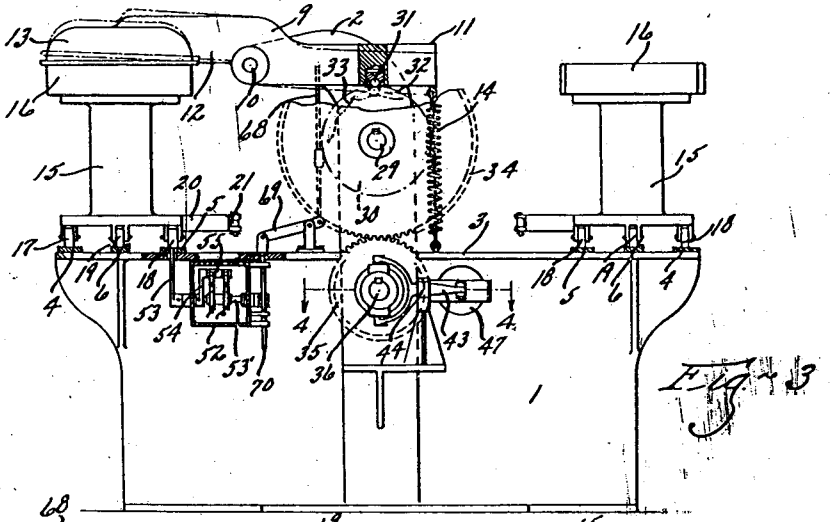

Fig. 4

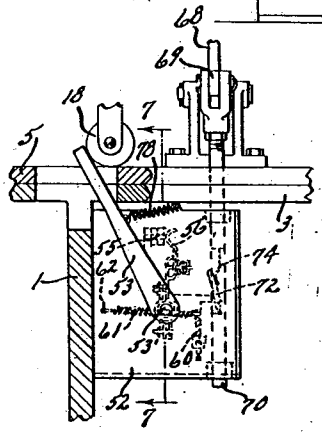

Fig. 5

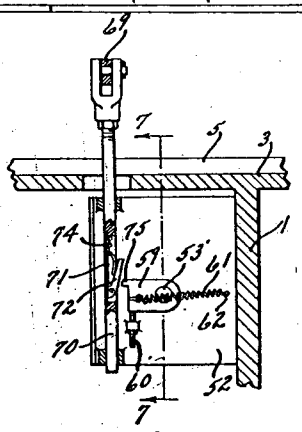

Fig. 6

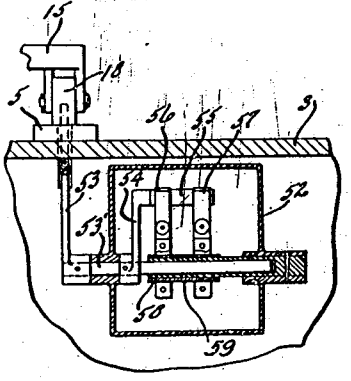

Fig. 7

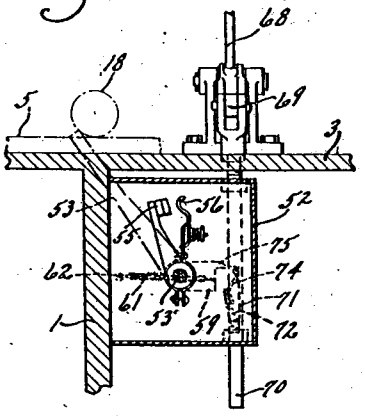

Fig. 8

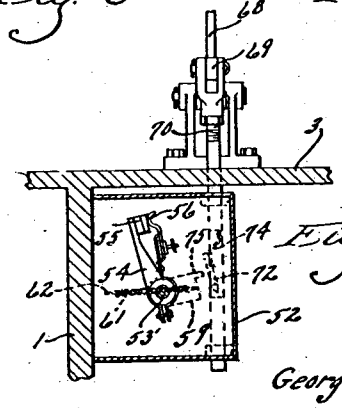

Fig. 9

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CONTROL MECHANISM FOR PRESSING MACHINES

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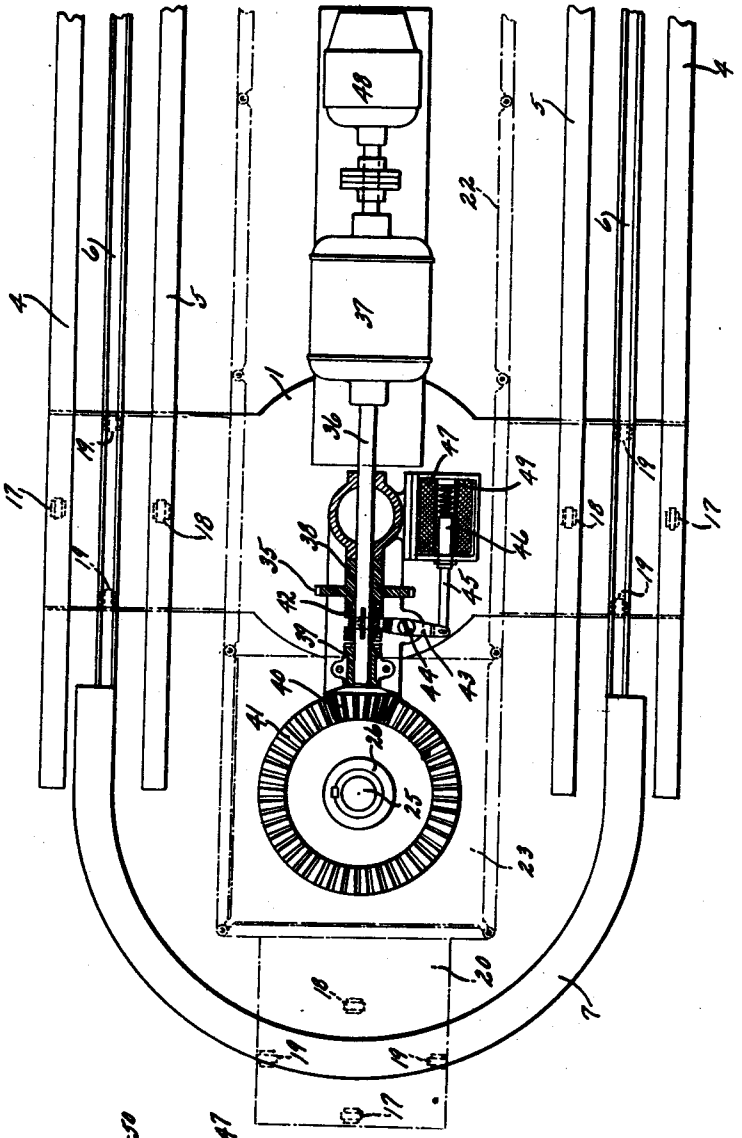

Fig. 1A

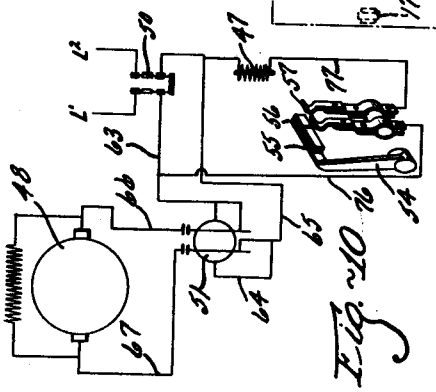

Fig. 10

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UNITED STATES PATENT OFFICE

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CONTROL MECHANISM FOR PRESSING MACHINES

Application filed October 20, 1930. Serial No. 489,894.

My invention relates to improvements in laundry apparatus and more particularly, to pressing and ironing apparatus of the continuous type together with operating mechanism and control mechanism therefor to bring about automatic operation of the apparatus.

The general object of the invention is the provision of an automatic operating and control mechanism for a pressing and ironing apparatus of the continuous type wherein a plurality of work supporting bucks are connected in a gang and moved step by step to bring the bucks to operator stations for loading, unloading and work arranging purposes and to pressing stations wherein they are subjected to pressing operations by pressing heads moved downardly into engagement therewith. The work receiving bucks are preferably so arranged as to permit concentrating of the mechanism necessary to move both the bucks and the heads.

As shown, the apparatus of the present application includes a generally oval-shaped trackway along which move, automatically and step by step, a plurality of work supporting bucks connected in a gang. Cooperating with these bucks are a plurality of automatically operating pressing heads preferably arranged for engaging each buck in the gang as they come to rest thereunder while the next adjacent or companion bucks are in a position between adjacent heads whereby the exposed bucks may be used as loading, unloading or work arranging stations.

In accordance with my invention, the use of a single power means for automatically and intermittently moving the bucks step by step in their oval-shaped path or circuit and for moving the pressing heads automatically into and out of pressing engagement with a buck in registry therewith together with suitable timing mechanism for regulating the upward and downward movement of the pressing heads and the intermittent step by step movement of the bucks is contemplated.

Various objects and advantageous features of my invention will be seen in the following description and one embodiment thereof may be seen in the accompanying drawings wherein similar characters of reference designate corresponding parts, and wherein:

Fig. 1 is a plan view of a pressing and ironing apparatus embodying operating and control mechanism in accordance with my invention; Fig. 2 is a longitudinal sectional view of the apparatus shown in Fig. 1; Fig. 3 is a transverse sectional view of the apparatus on the line 3—3, Fig. 1; Fig. 4 is a horizontal sectional view of the driving mechanism of the apparatus, on the lines 4—4, Figs. 2 and 3, the conveyor chain mechanism and the buck structures connected thereto being shown in dash-dot lines; Fig. 5 is a detailed vertical sectional view of the switch mechanism prior to its being actuated by the buck conveying mechanism; Fig. 6 is a similar view, illustrating particularly a head controlled switch actuating rod; Fig. 7 is a detailed vertical sectional view of the switch mechanism on the lines 7—7, Figs. 5 and 6; Fig. 8 is a view similar to Fig. 5 but showing a different position of the switch parts; Fig. 9 is a view similar to Fig. 8 but showing the switch parts in the position in which they are in Fig. 5; and Fig. 10 is an electrical diagram of the control mechanism.

In the drawings, I have shown my control mechanism as applied to a pressing apparatus embodying a plurality of frame structures 1 arranged side by side and in generally parallel arrangement, each of these frame structures being provided with an upwardly extending press head supporting arm 2 and at each side thereof with a flat track supporting bed 3. A trackway consisting of an outer track 4, an inner track 5 and a middle channel shaped track 6 is mounted on the track supporting beds. The two middle tracks 6 are connected at their ends by U-shaped tracks 7 with the result that an oval-shaped trackway is provided with two straight sides along the sides of the apparatus and two curved ends at the opposite ends thereof.

As shown in Fig. 3, a head lever 9 is pivotally mounted as at 10 on each of the frame arms 2, the head lever 9 consisting of a rear arm 11 and a forward arm 12 which carries a suitable pressing head 13. Each of the frame arms 2 is curved toward one side of

the frame and the several frames 1 and frame arms 2 are arranged so that the frame arms 2 extend alternately in opposite directions. In other words, as shown in Figs. 1 and 2, the arms of three of the frames are curved in one direction and the arms of the other two frames are curved in the opposite direction with the pressing heads 13 arranged on the sides towards which the frame arms are curved so that the apparatus will have three pressing heads on one side and two pressing heads on the other. Each of the pressing heads 13 is normally maintained in raised position, or the dot-dash position shown in Fig. 3, by means of a spring 14 connected to the rear arm 11 of the head lever 9 and the bed 3 of the frame.

A plurality of pedestals 15 supporting bucks 16 are arranged for movement along the trackway formed by the side tracks 4, 5 and 6 and the end track 7, there being eleven such pedestals and five pressing heads in the arrangement shown. Each pedestal 15 is mounted upon four rollers as shown in Figs. 3 and 4, an outer roller 17 which travels on the track 4, an inner roller 18 which travels on the track 5 and two middle rollers 19 which travel on the track 6. In addition, the middle rollers 19 move along the tracks 7 as the pedestals and bucks are traveling around the ends thereof. An arm 20 extends inwardly from the base of each pedestal and has its inner end connected to a link 21 of a conveyor chain 22. Such chain is driven by a sprocket 23 at one end of the apparatus and passes around an idle sprocket 24 at the other end thereof, the driving sprocket being mounted on the upper end of a shaft 25 rotatably mounted in a vertical bearing 26 while the idle sprocket 24 is provided with a suitable bearing portion 27 arranged upon a base support 28 carried by the frame 1 at that end of the apparatus. With such construction, the pedestals and bucks travel with the chain and along the oval-shaped trackway.

It is well known that the several heads 13 must be moved downwardly into pressing engagement with the bucks 16 that are in registry therewith to complete a pressing operation and, in this instance, the means for so moving the heads downwardly consists of a shaft 29 that extends practically full length of the apparatus as shown in Figs. 1 and 2 and is mounted in suitable bearings in the frame arms 2. Such shaft carries a plurality of cams 30, or one cam for each head lever 9, which cooperate with the rear arm 11 of the head lever that is provided with suitable bands 31 for engagement with the cams. As shown, each cam is provided with a pressure producing area 32 and a dwell or relief area 33, the relief area being provided to permit the rearward arms 11 of the head levers 9 to be lowered by the springs 14 and the front arms 12 of the lever to be correspondingly raised, and hence the pressing heads 13 to be moved out of pressing engagement with the buck 16.

The shaft 29 is driven by a gear 34 that is rigidly mounted thereon and a pinion 35 loosely mounted upon the shaft 36 that extends outwardly from a gear reduction unit 37, the pinion 35 forming a part of a clutch member 38 mounted upon the shaft 36. Opposite the clutch member 38 is another clutch member 39 that forms a part of the apparatus for moving the pedestals and bucks along the tracks 4, 5, 6 and 7, this clutch member taking the form of a sleeve loosely mounted on the shaft 36 and carrying a bevel pinion 40 in mesh with a bevel gear 41 which is rigidly mounted on and drives the shaft 26 and the sprocket 23. A double ended clutch member 42 is splined on the shaft 36 and is adapted to be operated by the forked end of a clutch operating lever 43 pivotally mounted as at 44 and having its free outer end connected to a solenoid rod 45 a part of which forms the core or armature 46 of a solenoid 47. As shown in Figs. 1, 2, and 4, a suitable motor or power unit 48 drives the shaft 36 through reduction gearing 37.

In the operation of this part of the apparatus, it will be seen that when the motor 48 is set in operation, power is transmitted to and through the reduction gearing 37 to the shaft 36 and thence to the shaft 29 by way of the double ended clutch mechanism 42, pinion 35 and gear 34 when the solenoid 47 is de-energized and the double ended clutch member 42 is thrown into engagement with the clutch member 38 by the action of a spring 49 that pushes the rod 45 outwardly and moves the operating lever 43 about its pivot as shown in Fig. 4. In other words, the clutch member 42 has coupled the motor or power unit 48 with the shaft 29 whereby the shaft will be rotated and the cams 30 rotated to bring the heads 13 into pressing engagement with the bucks 16 in registry therewith. However, when the solenoid 47 is energized in a manner hereinafter described, the clutch member 42 will be shifted into engagement with the sleeve 39 to cause rotation of the gear 23 and movement of the conveyor chain 22 and the pedestals and bucks attached thereto by way of the bevel pinion 40 bevel gear 41 and shaft 25. In other words, the pressure producing mechanism will be uncoupled from the power unit and the bed moving mechanism will be coupled thereto. Thus a means is provided for moving various beds into registry with various heads.

To control the operation of this mechanism and produce an intermittent step by step movement of the pressing bed 16 into and out of registry with successive pressing heads and synchronized intermittent operation of the pressing heads, suitable control mechanism is provided that, generally speaking, is

of the electro-type and includes a double pole main line switch 50, a double pole contactor 51, and a switch mechanism operable by movement of both the beds and heads, all of this mechanism being diagrammatically shown in Fig. 10.

The switch mechanism operable by movement of both the beds and heads includes a suitable casing or box 52 as shown in Figs. 3 and 5–9 inclusive, that is mounted in any suitable manner on the frame and supports a main switch shaft 53′ extending out through one side of the casing or box and provided with a trip lever 53 that extends upwardly through the track supporting bed 3 and into the path of each inner roller 18 that forms a part of the pedestal and bed support.

As the roller 18 moves along the track 5, it being assumed that the operating mechanism is in such position as to move the beds along the track as hereinbefore described, it strikes and moves the lever 53 to one side as shown in Figs. 5 and 8 and brings about a rocking movement of the shaft 53′ which is provided within the housing 52 with a bridge arm 54 that carries a current conducting bridge member 55 insulated from the arm 54 and adapted to make connection with a pair of contact fingers 56 and 57 carried by a sleeve 58 disposed over the shaft 53′.

Such sleeve 58 extends outwardly through the side of the casing 52 and is provided with a sleeve arm 59 as shown in Fig. 6 that is normally held in the position there shown by an adjustable stop 60 and a spring 61 that is secured to the arm 59, crosses the axis of the sleeve 58, and is secured to the frame as at 62 in such position that, when the arm 59 is in engagement with the stop 60, the spring will hold the arm in engagement with the stop or will move the arm 59 and sleeve 58 in a clockwise direction as shown in Fig. 6 when the arm is moved to such position as to move the spring 61 across and to the other side of the axis of the sleeve 58. Thus, both the current conducting bridge member 55 and the contact fingers 56 and 57 are movable and so located that at the proper time they may be brought into cooperative relation in the establishment of a circuit for operating the solenoid 47 or moved out of cooperative relation to break the operating circuit for the solenoid.

An electrical circuit formed by the movement of the current conducting arm 55 and the contact fingers 56 and 57 and the operation of the apparatus resulting from such circuits will now be described with particular reference to a diagrammatic showing in Fig. 10 of the drawings. It will be noted that the lines L1 and L2 are connected to the poles of the main line switch 50 and when this switch 50 is closed a circuit is established from the line L1 through the main line 63 to the double pole contactor 51, through the line 64, and line 65 to the double pole switch 50 and L2. A circuit is also established from L1 through the line 63 to the motor lead 66, thence to the motor 48, and from the motor through lead 67, double pole contactor 51 and line 65 to the double pole switch 50 and L2 whereby the motor 48 is operated and the shaft 29 rotated. This circuit is established when the parts are in the position shown in Fig. 4 wherein the clutch member 42 is in engagement with the member 38 to drive the gears 35 and 34 and rotate the shaft 29 which carries the cams 30, the solenoid 47 being deenergized at this time and the contacting fingers 56 and 57 being out of engagement with the current conducting arm 55.

The pressing operation having been completed due to engagement of the pressure producing area 32 of the cam 30 with the band 31 on the rearward portion 11 of the arm 9 and the band having entered the dwell or relief area 33 of the cam 30, the pressing heads 13 rise under the action of the springs 14 and this motion is utilized for varyng the circuit to energize the solenoid 47 and move the clutch member 42 into bed moving position or into engagement with the sleeve 39 by providing one of the lever arms 9 with an operating rod 68 as shown in Figs. 3, 8 and 9 that extends downwardly and is connected to the rear arm of a lever 69 pivotally mounted on the track supporting bed 3 and having its forward arm connected to a trip rod 70 mounted in suitable brackets carried by the switch housing 52. Such rod 70 is arranged close to the sleeve arm 59 and is equipped with a recessed portion 71 that contains a pawl 72 having a portion adapted to engage the bottom of the recess 71 and limit the outward movement of the upper end of the pawl as shown in Fig. 6. The pawl is normally moved outwardly to its greatest extent by a spring 74 so that when the rod 70 is lowered by the downward movement of the head 13 into pressing engagement with the bed 16 and then raised again by upward movement of the head 13 by reason of the band 31 entering the dwell or relief area 33 of the cam 30 as hereinbefore described, the upper end of the pawl will meet and engage a cooperating tooth or shoulder 75 on the sleeve arm 59. Then, continued upward movement of the rod 70 will cause rotation of the sleeve arm 59 and sleeve 58 until the spring 61 crosses the axis of the sleeve as hereinbefore described and rotates the sleeve to such an extent that the contact fingers 56 and 57 will be moved from the position shown in Fig. 8 to the contacting position shown in Fig. 9, the pawl 74 passing out of engagement with the tooth 75 and the spring 61 holding the contact fingers in engagement with the current conducting arm.

This contact of the fingers and arm completes a circuit from L1 through the line 63,

line 76, through contact finger 56, across bridge contact 55, through contact finger 57, and through line 77, to and through the solenoid coil 47 that forms a part of the solenoid 47, and line 65 to L2. Thus, the solenoid 47 is energized which will cause the operating rod 45 to be drawn into the solenoid against the resistance of the spring 49 to thereby move the clutch operating lever 43 to disengage the clutch member 42 from the member 38 and throw it into engagement with the member 39 to move the conveyor chain, pedestals and beds in the manner hereinbefore described.

Prior to the beginning of movement of the pedestals and beds, the roller 18 on the pedestal is in contact with and maintaining the lever arm 53 and bridging arm 55 in the position shown in Fig. 8 against the tension of a spring 78 which tends to move the lever arm 53 and bridge arm 55 to the position shown in Fig. 5. Then, upon beginning of movement of the pedestal and beds, the roller 18 is disengaged from the lever arm 53 which is returned to its normal position as shown in Fig. 5 by the spring 78, this return serving to move the contact fingers 56 and 57 to the vertical position in Figs. 5 and 8 and the spring 61 across the axis of the sleeve arm 59 to hold the sleeve arm against the stop 60 as shown in Figs. 5 and 6. However, the contact between the contacts 56 and 57 and the bridge member 55 is maintained as is clearly shown in Fig. 5. Such movement of the pedestals and beds will then continue and the solenoid 47 will be maintained energized until the roller on the next succeeding pedestal strikes the lever arm 53 and moves it to the position shown in Fig. 8 wherein the contact between the contact fingers 56 and 57 and the bridge arm 55 will be broken to de-energize the solenoid whereby the clutch hereinbefore described will be moved into engagement with the parts that cause the pressing operation, the contact fingers 56 and 57 being held upright by reason of the fact that the spring 61 is not moved across the horizontal axis of the sleeve arm 59. Thus, it will be seen that a control means is provided which will cause the bed moving operation and pressing operation automatically and step by step without intervention of the operator.

With the construction just described, an operator or operators at the unloading and loading station may start a garment through the machine by performing the first lay at this point. After the lay has been accomplished which, by the way, must be accomplished in the time allotted by the machine, the heads are raised and the beds are moved as a gang through one step to a position wherein the exposed beds are moved under succeeding heads. The initial operator lays another garment with the same lay upon the exposed bed before him and with the next shifting of the bed previously pressed garments are passed to the operator at the next gap or station between the heads where this operator performs its second lay. Third, fourth and as many other lays as desired are simultaneously made at succeeding gaps or stations and by providing operators around the machine at various gaps between adjacent heads, the garment may be completely finished through a plurality of lays by operators performing only a single lay operation each, the machine operating automatically and completely finishing the garment.

What I claim is:

1. A pressing machine comprising spaced pressing beds arranged in a gang and adapted to travel about a loop with straight sides, spaced pressing heads arranged about said loop and in the path of travel of said beds, said pressing heads being spaced apart with the distance between the centers of the heads substantially twice the distance between the centers of companion beds, whereby only one of a pair of beds may be in registry with a head while the companion bed is in exposed position, means for progressively moving said beds about said path to move each of said beds successively into and out of exposed position and into and out of registry with a head, and means for producing pressing engagement between the registered heads and beds.

2. A pressing machine of the class described in claim 1 wherein the pressing heads on one side of the loop are in staggered position relative to the pressing heads on the other side of said loop.

3. A pressing machine of the class described in claim 1 wherein a greater number of pressing heads are arranged on one side of the loop than the other with the heads in relative staggered relation to provide a loading station at the end of the loop.

4. A pressing machine of the class described in claim 1 wherein a single motor means is provided for moving the beds as a gang and for producing pressing engagement of the heads and beds, together with actuating means for moving said beds about the loop, means for actuating said heads into and out of pressing engagement with the beds in registry therewith, and control means for selectively coupling the motor means to one or the other of said actuating means.

5. A pressing machine of the class described in claim 1 wherein a single motor means is provided for moving the beds as a gang and for producing pressing engagement of the heads and beds, together with actuating means for moving said beds about said loop, actuating means for causing pressing engagement between said heads and beds in registry, and control means for selectively coupling the motor means to one or the other

of said actuating means, said control means including an electrical control mechanism rendered effective by movement of said beds into and out of registry with said heads and movement of said heads and beds into and out of pressing engagement.

6. A pressing machine of the class described in claim 1 wherein a single motor means is provided for moving the beds as a gang and for producing pressing engagement of the heads and beds, together with actuating means for moving said beds about said loop, actuating means for causing pressing engagement between said heads and beds in registry, control means for selectively coupling the motor means to one or the other of said actuating means, said control means including an electrical control mechanism rendered effective by movement of said beds into and out of registry with said heads and movement of said heads and beds into and out of pressing engagement, a clutch associated with each of said actuating means, and a solenoid operating means for said clutch operatively interconnected with said electrical control means.

In testimony whereof I hereby affix my signature.

GEORGE W. JOHNSON.