

May 14, 1946.

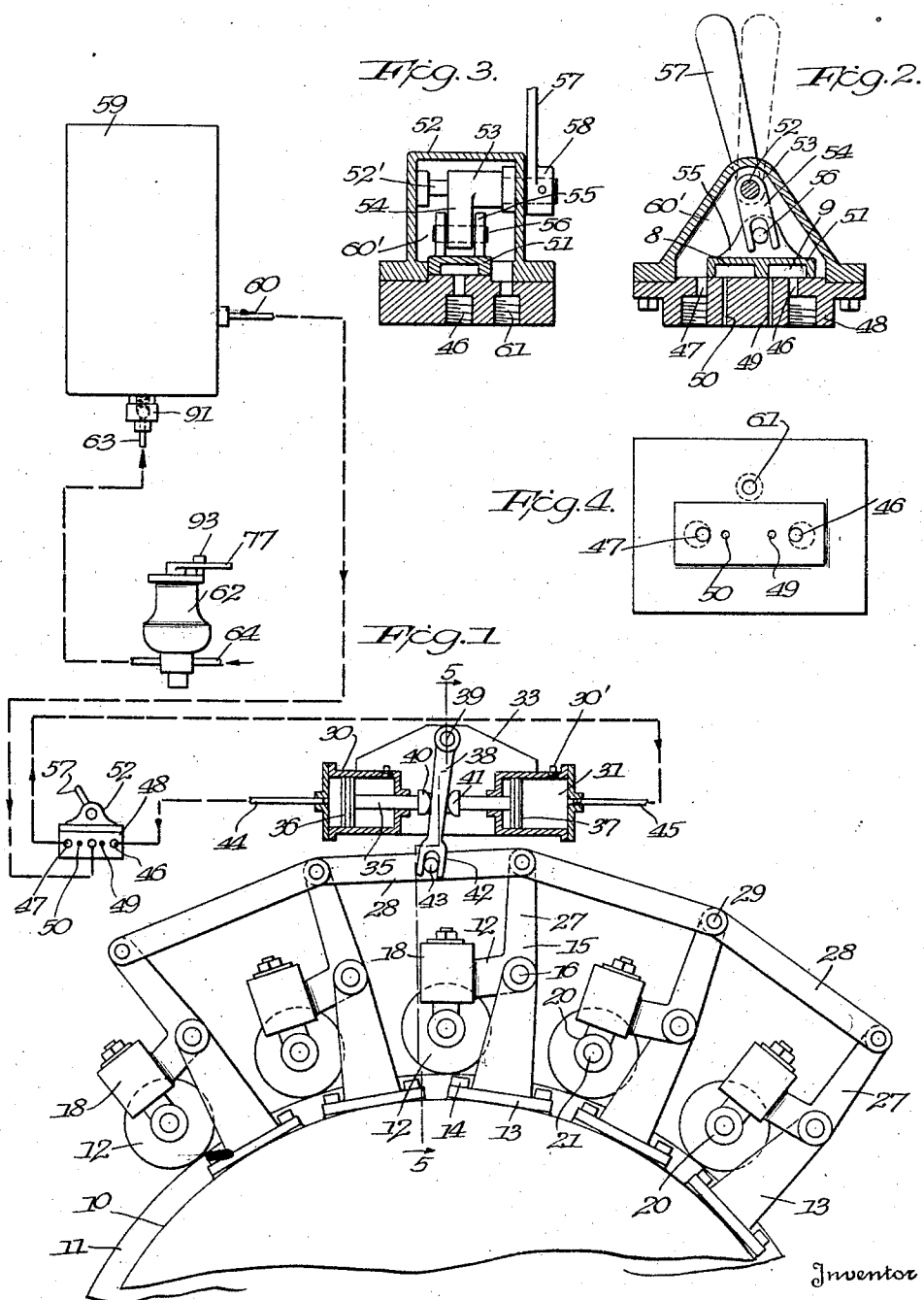
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2,400,233

ROLLER IRONER

Filed Dec. 6, 1943

5 Sheets-Sheet 1



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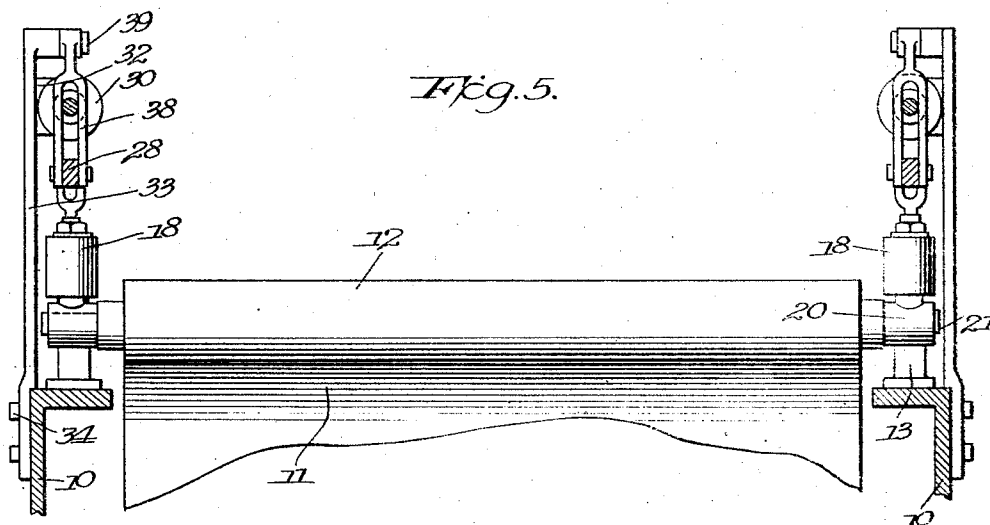
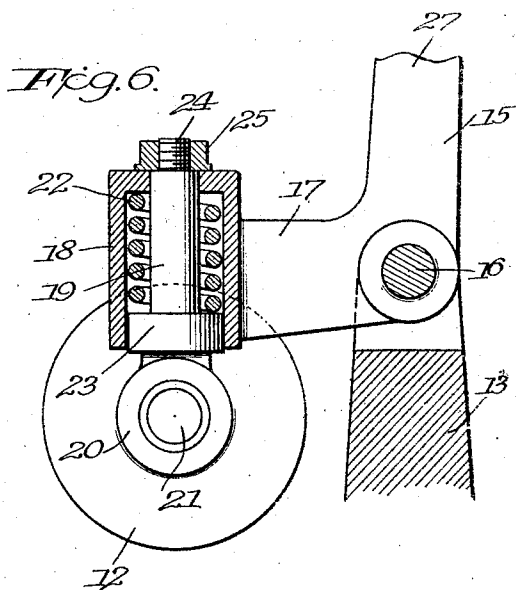
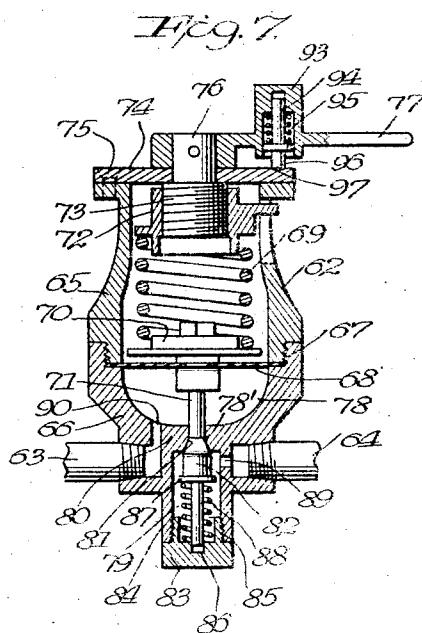
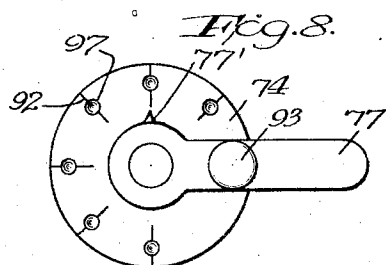
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ROLLER IRONER

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5 Sheets-Sheet 2



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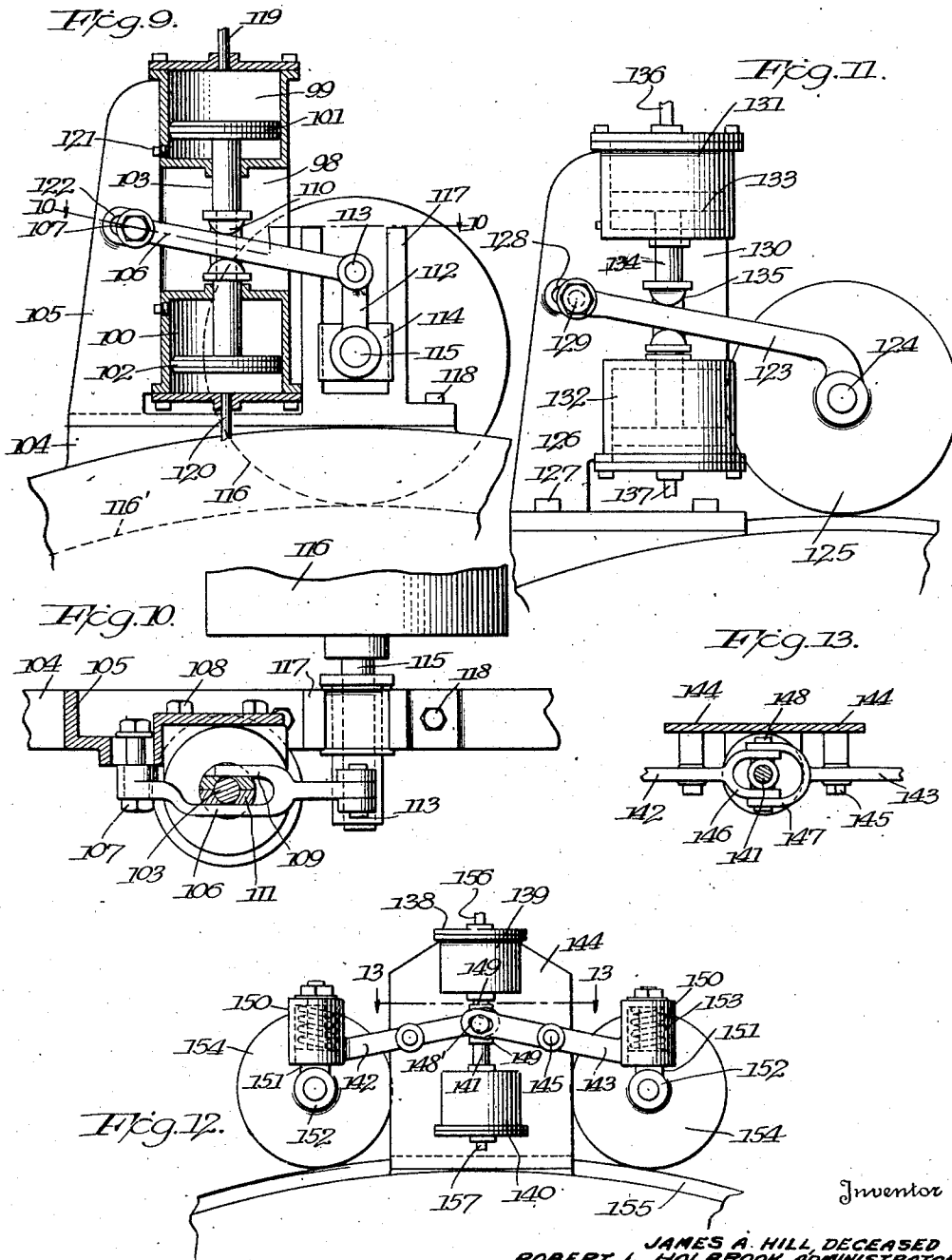
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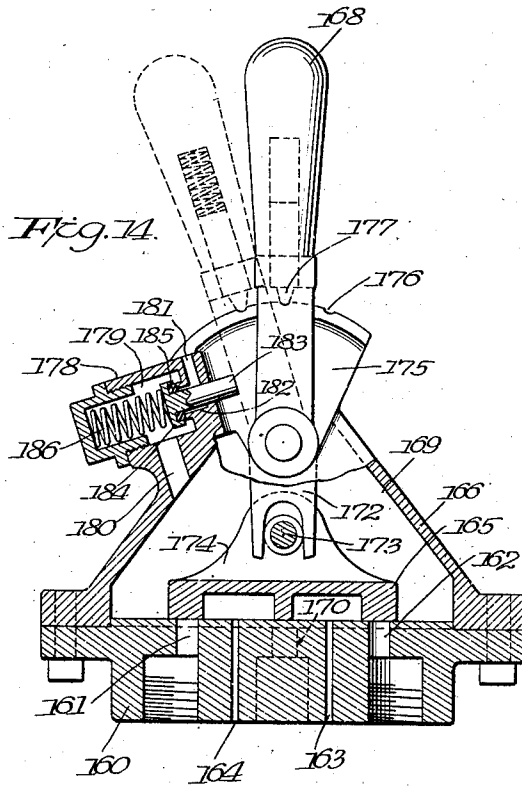
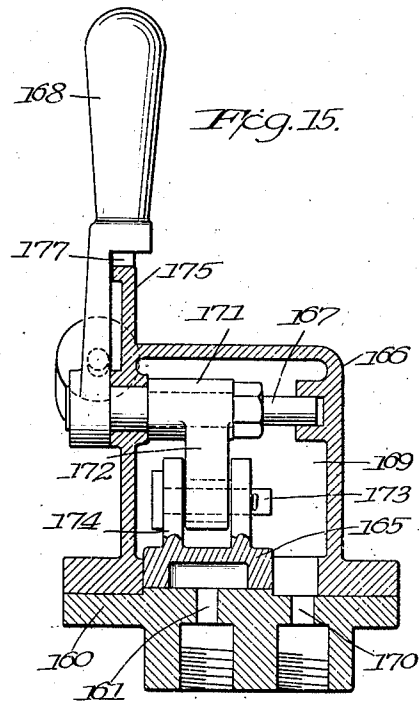
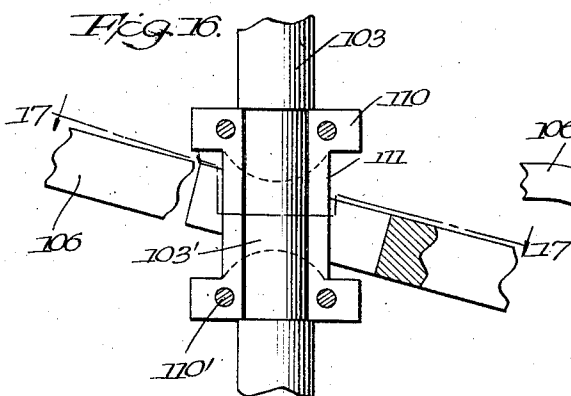
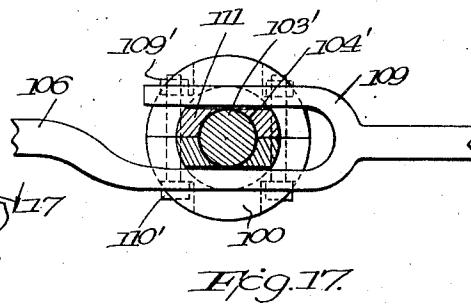
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5 Sheets-Sheet 4



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ROLLER IRONER

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5 Sheets-Sheet 5

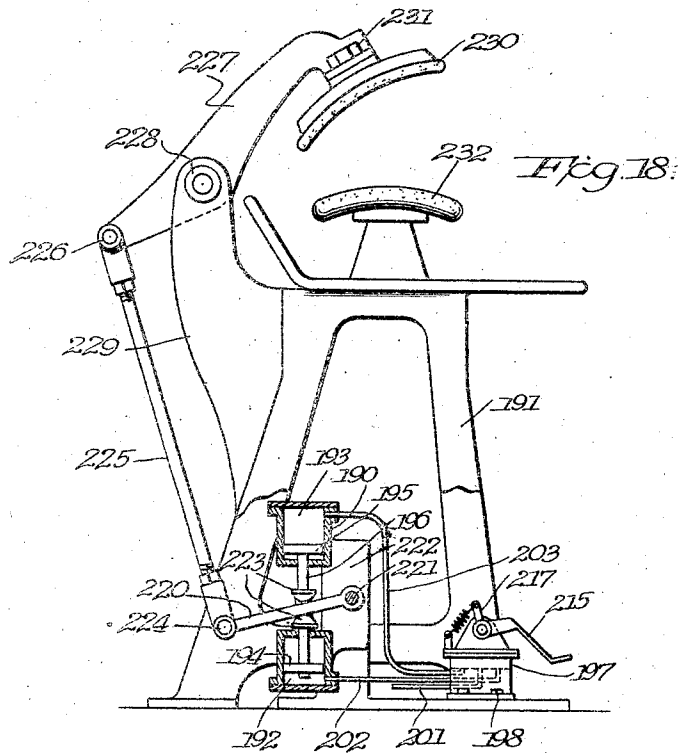


Fig. 18.

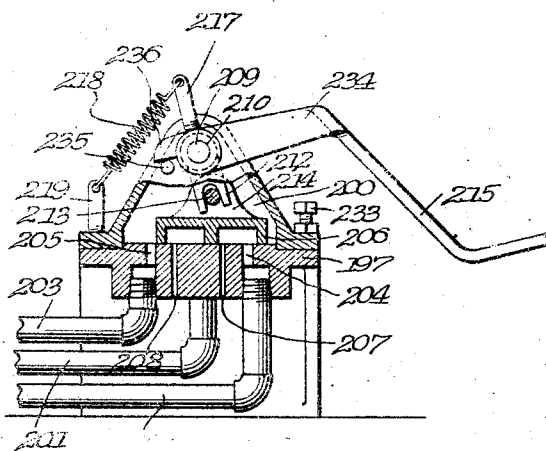


Fig. 19.

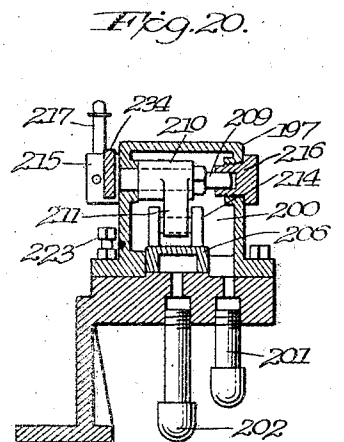


Fig. 20.

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UNITED STATES PATENT OFFICE

2,400,233

ROLLER IRONER

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Application December 6, 1943, Serial No. 513,206

9 Claims. (Cl. 38—40)

The present invention relates to an attachment or unit arranged to be connected to ironing or pressing machines and more particularly to improved means for selectively controlling the pressures applied to the rollers or a movable press head during the ironing or pressing operation.

An essential feature of the invention is to provide means to insure a flexible and positive operation of an ironer irrespective of the size or shape of the material being ironed. This is effected by operatively connecting a twin piston unit to each end of the pressure rollers, one of which pistons constitutes a pressure piston and the other a lifting piston for the rollers. Compressed air or gas for propelling the pistons is admitted to one side only of each piston, while the opposite or non-pressure side may be provided with means to insure smooth and indefinite use of the pistons.

A further object consists in providing a governor which is operatively connected to the twin piston unit for selectively controlling the different pressures applied to an operable member.

Another object consists in associating a control valve with the twin pistons which is provided with means to prevent the vibration of the pistons when shifting the pressure from the lifting side to the compression side or vice versa, during the operation of the rollers.

Another object of the invention is to provide twin air pistons for controlling the application and withdrawal of the pressure applied to an operable member in which the pistons are lubricated by dry graphite, thus eliminating stuffing boxes and all composition packing so that the pistons and piston rods may operate indefinitely without repair or requiring further lubrication and without danger of leakage of the lubricant, which incidentally is a common defect in oil lubricants.

Other objects and advantages of the invention will become apparent from the following description when taken in conjunction with the accompanying claims and drawings.

Referring to the drawings in which are shown several preferred embodiments of the invention;

Figure 1 is a diagrammatic side view of an ironing machine with parts in section and showing the various units associated with the machine for selectively controlling the pressure applied to the rollers.

Figure 2 is an enlarged vertical sectional view of the control valve.

Figure 3 is a sectional view taken substantially at right angles to Figure 2.

Figure 4 is a plan view of the slide valve body.

Figure 5 is a sectional view taken substantially along the line 5—5 of Figure 1.

Figure 6 is a detailed enlarged side view with parts in section of one of the roller supports.

Figure 7 is a vertical sectional view of the governor valve.

Figure 8 is a plan view of Figure 7.

Figure 9 is a side view of a modified form of the invention, with parts in section.

Figure 10 is a sectional view taken substantially along the line 10—10 of Figure 9.

Figure 11 is a side elevation of a further modification.

Figure 12 is a side view of another modification in which a single piston unit is arranged to operatively control rollers positioned on opposite sides of the cylinder.

Figure 13 is a sectional view taken substantially along the line 13—13 of Figure 12.

Figure 14 is a vertical sectional view of a modified form of a control valve provided with means for lowering the pressure applied to the roller.

Figure 15 is a sectional view taken substantially at right angles to Figure 14.

Figure 16 is an enlarged detail side view with parts in section of the piston rod and control lever shown in Figure 9.

Figure 17 is a sectional view taken substantially along the line 17—17 of Figure 16.

Figure 18 is a side view with parts in section of a garment press showing my invention applied thereto.

Figure 19 is a sectional detail view of the control valve mechanism shown in Figure 18.

Figure 20 is a sectional view taken substantially at right angles to Figure 19.

Referring to the drawings in which like numerals indicate like parts in the several views, 10 designates the side frames of an ironing machine (Fig. 5) to which are journaled the ends of a cylinder or ironing drum 11 in any well known manner (not shown).

Pressure rollers 12, preferably five in number, coact with the periphery of the drum 11 for yieldably pressing the fabric against the drum during the ironing operation. Associated with each of the rollers is a supporting bracket 13 secured to the adjacent side frame 10 in any suitable manner such as by the bolts or rivets 14 (Fig. 1). A bell crank lever 15 is pivoted at 16 to the bracket 13 (Fig. 6) and has its horizontal arm 17 formed with a housing 18 which slidably receives the stem or arm 19 of the bearing block 20.

Each of the rollers 12 is provided with a shaft

21, the ends of which are journaled in the bearing blocks 20. A coil spring 22 is confined between one end of the housing 18 and a collar 23 on the stem 19, so as to provide yieldable means for permitting the rollers 12 to ride over uneven surfaces that may be formed in the fabric. The stem 19 has an outer reduced threaded portion 24 which receives a retaining nut 25 for limiting the downward movement of the roller 12. Each of the bearing blocks 20 may also be provided with means to insure proper lubrication of the ends of the shaft 21.

The vertical arms 27 of the bell cranks 15 are connected to links 28 by the pins 29 so as to simultaneously actuate the rollers 12 to move the same into and out of contact with the periphery of the drum 11.

In order to insure a flexible and positive operation of the ironer, the pressure applied to the rollers is controlled by a twin piston air unit which preferably comprises the spaced cylinders 30 and 31, mounted on the arms 32 (Fig. 5) carried by the brackets 33 which in turn are secured by the bolts 34 to the side frames 10. A piston rod 35 common to each of the cylinders 30 and 31, has a piston 36 at one end mounted in the cylinder 30 and a piston 37 connected at its opposite end and slidable in the cylinder 31. A lever 38 pivoted at 39 to the bracket 33 engages the spaced collars 40 and 41 on the piston rod 35 and has its forked lower end 42 engaging a pin 43 on the adjacent link 28. As shown, the cylinder 31 constitutes the pressure cylinder for the rollers 12, while the cylinder 30 constitutes the lifting cylinder for moving the rollers away from the drum. Lubricant, such as dry graphite, may be supplied to the non-pressure side of the cylinders by removable plugs 30'. Fluid pressure such as air is introduced into the cylinders on one side of the pistons 36 and 37 through the pipes 44 and 45 respectively, which in turn communicate with the inlet ports 46 and 47 of the control valve body 48. The body 48 has an exhaust port 49 for discharging the air from the cylinder 30 to the atmosphere and also has an exhaust port 50 for discharging the air from the cylinder 31. A slide valve 51 is associated with the valve body 48 and is formed with spaced chambers 8 and 9 which when the slide valve is in its neutral position, overlaps the inlet and exhaust ports so as to prevent air being conducted to the twin piston cylinders. A casing or hood 52 mounted on the valve body 48 carries a transversely disposed shaft 52' to which is connected a sleeve 53 (Fig. 3) having a depending forked arm 54 pivotally connected to the lugs 55 on the slide valve 51 by the pin 56. The shaft 52' has one end extending outside of the hood 52 to which is secured an operating handle 57 as at 58. An air volume reservoir 59 communicates through the pipe 60 and the port 61 in the valve body 48 with a chamber 60' in the hood 52. The port 61 is located to one side of the slide valve 51 so that upon the selective movement of the slide valve, either the inlet port 46 can be brought into communication with the lifting cylinder 30, or the inlet port 47 can communicate with the pressure cylinder 31. A graduating pressure feed valve or governor 62 (Fig. 7) communicates through the pipe 63 with the reservoir 59. The valve 62 also communicates through a pipe 64 with an air compressor or the like (not shown).

The valve 62 preferably comprises a two-piece housing formed with an upper section 65 and a lower section 66 which are threaded together as

at 67 and between which is clamped a diaphragm 68. A governor spring 69 is confined within the section 65 between a collar 70 on the diaphragm spindle 71 and a sleeve 72 threaded to a regulating nut 73. A dial plate 74 fastened to the top of the valve 62 by any suitable means such as the bolts 75, is provided with a central opening through which extends a reduced portion 76 of the nut 73. An operating handle 77 is fastened to the portion 76 for rotating the nut 73 so as to move the sleeve 73 axially to vary the pressure applied by the spring 69 to the diaphragm 68.

The lower section 66 of the valve body has a chamber 78 communicating with an air receiving chamber 79 through an opening 78' in the web 80. The wall of the opening 78' has a valve seat 81 controlled by a valve 82 on the diaphragm spindle 71 which extends through the web 80 into the chamber 79. A cap nut 83 is threaded to a depending portion 84 of the section 66 as at 85 and has a slot 86 for receiving the lower end of the spindle 71. The spindle 71 below the valve seat 81 preferably carries a collar 87 between which and the nut 83 is confined, a coil spring 88 for the purpose of normally maintaining the valve 82 against its seat. Air from the compressor is initially introduced into the chamber 79 through the pipe 64 and the port 89 and is allowed when the valve 82 is moved away from its seat by the actuation of the diaphragm 68, to escape into the chamber 78 from where it passes through the port 90 and the pipe 63 to the reservoir 59. A non-return check valve 91 (Fig. 1) is connected to the pipe 63 between the valve body 62 and the reservoir 59 to maintain a constant supply of air in the reservoir and to prevent the escape of air from the reservoir back into the valve body 62.

The dial plate 74 of the valve body 62 is provided with markers or indicia 92 (Fig. 8) to indicate the amount of air pressure in pounds applied to the spring 69 when the pointer or finger 77' on the handle 77 is moved into registration with each of these markers. In order to maintain the handle 77 in any predetermined fixed position, it may have a boss 93 (Fig. 7) which carries a plunger 94 arranged to be normally urged downwardly and outwardly by a spring 95 so as yieldably to maintain its lower end 96 in engagement with spaced notches 97 formed in the plate 74 adjacent the markers 92.

In operation, the finger 77' on the handle 77 is moved into registration with the proper marker on the plate 74. This movement rotates the nut 73, which in turn moves the sleeve 72 axially to exert the desired pressure on the spring 69, thus displacing the diaphragm 69 which in turn moves the valve 82 away from its seat 81, so as to allow the air from the main compressor to flow from the chamber 79 into the chamber 78, port 90, pipe 63 to the reservoir 59 until the pressure in the reservoir 59 overcomes the pressure of the spring 69. When this occurs, the diaphragm 68 is returned to its normal position, thus moving the valve 82 to its closed position. Assuming that it is desired to apply a pressure of five pounds to an operable member, such as the rollers 12, the handle 57 of the control valve 48 is moved to the position shown in Figure 2 which actuates the slide valve 51 to establish communication of the air reservoir 59 with the compression cylinder 31 through the pipe 60, chamber 60', and the port 47 which communicates through the pipe 45 with the intake end of the cylinder 31, thus moving the pistons and their associated parts to the position as shown in Figure 1. This movement causes the

actuation of the links 28 which in turn move the bell-cranks 15 to apply an equal amount of pressure to the rollers 12. In this position, air is exhausted from the lifting cylinder 30 through pipe 44, port 46, chamber 9 and exhaust port 49. As the exhaust ports are smaller than the feed ports, the escape of the air is retarded, thus preventing the vibrating of the piston when the pressure is changed from the pressure piston to the lifting piston. Conversely, the same desired results are effected when the pressure is transferred from the pressure piston to the lifting piston.

It will be seen that the position of the handle 57 for controlling the slide valve 51 automatically controls the graduated pressure applied to the rollers 12 in accordance with the pressure required to properly iron the fabric. Upon the movement of the handle 57 to the position as shown in dotted lines in Figure 2, the slide valve 51 and its associated parts are moved to permit the exhaust port 50 to communicate with the cylinder 31 to permit the air to escape from the pressure piston and at the same time, air from the reservoir 59 is conducted to the lifting piston 30 to move and maintain the rollers 12 away from the periphery of the drum 11 a proper distance to insure the cooling of the rollers, and in such a manner as to prevent vibration of the piston during the transfer of the pressure from one cylinder to the other. When the handle 57 is moved to its vertical or neutral position, the valve 51 closes communication between the inlet ports 46 and 47 with the chamber 60'.

The location of the non-return check valve 91 between the air reservoir 59 and the pressure feed valve 62 is for the purpose of preventing the depreciation of the reservoir pressure so as to maintain the rollers in their raised or cooled position in case the main source of pressure is discontinued. In other words, the air is trapped in the reservoir 59 and is precluded by the check valve 91 from escaping or returning through the pipe 63 to the control valve 62 and into the compressor which manifestly would reduce the pressure applied to the piston 30 and cause the rollers to be moved closer to the drum, thus delaying the cooling of the rollers.

Instead of associating a twin piston unit with the ends of a series of rollers, such as previously described, there is shown in Figure 9 a modification of the invention, in which a vertically disposed twin piston unit 98 has a pressure cylinder 99 and a spaced lifting cylinder 100. A piston 101 in the cylinder 99 is connected to a piston 102 in the cylinder 100 by a common piston rod 103. The frame 104 of the machine has mounted thereon a bracket 105 to which is pivotally connected an operating lever or arm 106 by the pin or bolt 107. The twin piston unit 98 may also be secured to the bracket 105 by the bolts 108. The lever 106 has an offset spaced arm 109 which constitutes a yoke for loosely receiving the piston rod 103 and which engages the spaced collars or flanges 110 on the sectional sleeves or members 111 which embrace the reduced portion 103' (Fig. 16) of the piston rod 103. The sleeves 111 are clamped together by the spaced threaded bolts 110' and the nuts 109' (Fig. 17) and are spaced from the reduced portion 103' of the piston rod to provide a clearance 104' which permits the piston rod to turn in its operation, so as to insure equal wear on the pistons 101 and 102. The spaced collars or flanges 110 engage the opposite sides of the lever 106 so that upon the actuation of the pistons 101 and 102, the lever

106 is moved to control the movement of the roller 116 relative to the drum 116' or surface with which it is associated.

A depending arm 112 pivotally mounted as at 113 to the lever 106, carries a bearing block 114 for each end of the roller shaft 115. A pressure roller 116 is journaled on the shaft 115 and is arranged to be moved in and out of engagement with the drum. The blocks 114 are slidably mounted in the spaced guides 117 which may be fastened to the frame of the machine by the bolts 118. The pressure cylinder 99 communicates through the pipe 119 with the inlet port 47 of the control valve 48, while the lifting cylinder 100 is connected to the inlet port 46 of the control valve through the pipe 120 so as to be operable in substantially the same manner as the twin pistons previously described. Lubricant, such as dry graphite, is supplied to the cylinders 99 and 100 through the plugs 121 to insure a smooth operation of the pistons.

The bracket 105 may be provided with an elongated slot 122 for receiving the pin 107 and thus provide means for adjusting or shortening the length of the lever 106 so as to increase the pressure applied to the roller 116. Thus, when the twin piston units 98 are associated with each of a series of rollers, the first or grab roller of the series, may be provided with increased pressure by shortening the length of the lever 106 while the remaining or succeeding rollers may have their levers 106 of the same length and therefore impart the same pressure to the rollers to which they are associated. It will be seen that when the lever connected to the grab roller is shortened and the other levers are of the same length, the first roller, due to its increased pressure, will act to temporarily hold the fabric while the next roller which has a slightly reduced pressure, will tend to draw the fabric and thus stretch it, with the result that the fabric is properly positioned to effectively iron the same. It will be understood that any number of spaced rollers 116 may be associated with a drum or a flat ironing surface, and that each roller may be operatively connected at its ends with a twin piston such as 98, and also to a graduating feed pressure valve and governor for the purpose of applying a graduated pressure to the rollers during the ironing operation.

The form of the invention shown in Figure 11 is substantially similar to the disclosure in Figure 9 with the exception that the operating lever 123 is directly connected to the shaft 124 of the roller 125, thus dispensing with the use of link connections and guides for the roller. A supporting bracket 126 fastened to the frame by the bolts 127 may be provided with an elongated slot 128 to which the lever 123 is adjustably connected by the retaining bolt or pin 129 so that if desired, the feed roller of a series of rollers, may have its pressure increased by shortening the length of the lever 123 as compared with the lengths of the levers 123 connected to the other rollers of the series. The twin piston unit 130 has a pressure cylinder 131 and a lifting cylinder 132 in which are mounted the pistons 133 carried by the piston rod 134 so as to operate in substantially the same manner as the twin piston unit 98. Additionally, the piston rod 134 carries the spaced flanges or collars 135 which engage the lever 123 to actuate the same upon the movement of the pistons. The pressure cylinder 131 may communicate through the pipe 136 with the inlet port 47 of the control valve 48, while

the lifting cylinder 132 may be connected with the inlet port 46 of the control valve 48, through the pipe 137 so as to operate in substantially the same manner as the forms previously described.

In the modified form of the invention shown in Figure 12, a twin piston unit 138 is provided with a pressure cylinder 139 and a space lifting cylinder 140 into which extends a piston rod 141 having a piston at each end, so as to be operable in substantially the same manner as the twin piston mechanism disclosed in Figure 11. A pair of operating levers 142 and 143 are pivoted to a supporting bracket 144 by the pins 145 (Fig. 13) and have their inner ends forked as at 146 and 147 so as to be loosely connected by the pins 148 which extend into elongated slots 148' formed in each of the fork arms of the levers. The piston rod 141 extends between the bifurcated portions 146 and 147 of the levers and has the spaced collars 149 arranged to engage the adjacent sides of the bifurcated portions so as to actuate the levers upon the movement of the piston rod. The outer ends of each of the levers 142 and 143 is provided with a housing 150 in which extends a spindle 151 of the roller bearing 152. A coil spring 153 is confined within the housing 150 so as to yieldably maintain the roller 154 in contact with the periphery of the drum or cylinder 155. The housing 150 and its associated parts are substantially similar in construction to the housing shown in Figure 6.

By associating a pair of operating levers with each of the twin pistons, the graduated pressure applied to a pair of rollers may be controlled by a single piston rod as contrasted to a piston rod for each of the rollers as shown in certain of the forms previously described. If desired, one of the levers and its pressure roller may be omitted without in any way affecting the efficient operation of the piston rod and its associated parts. This is a desirable feature especially in constructions where for the purpose of economy, it is desired to operate the rollers as inexpensively as possible.

The pressure cylinder 139 is connected to one of the inlet ports of the control valve 48 through a pipe 156 while the cylinder 140 communicates through a pipe 157 with the other feed port of the valve 48, so that the pressure applied to the rollers may be automatically graduated as desired.

In order to equalize the pressure in the reservoir 59 in any instance in which the pressure in the feed valve or governor 52 has been changed from a greater to a lesser pressure, there is disclosed in Figures 14 and 15, a modification of the control valve 52, for exhausting or reducing this pressure. As shown, the valve body 160 is substantially similar in construction and operation to the control valve body 48 (Fig. 2) previously described, and may have the inlet ports 161 and 162 communicating with the pressure cylinder 31 and the lifting cylinder 30 respectively of the twin piston unit shown in Figure 1, and the exhaust ports 163 and 164, discharging to the atmosphere. A slide valve 165 is arranged selectively to control the admission and discharge of the air through these ports. The slide valve and the ports are enclosed by a housing or hood 166 in which is revolvably mounted a shaft 167 that extends outwardly at one side of the casing and has fastened thereto an operating handle 168. The casing 166 has a chamber 169 into which air from the reservoir 59 is introduced through the pipe 60 and the port 170 in the valve body 160.

A sleeve 171 fastened to the shaft 167 has a depending forked arm 172 which engages a pin 173 fastened to the spaced lugs 174 on the slide valve 165 so that upon the actuation of the handle, the slide valve will be moved selectively to overlap the ports for the purpose of actuating the pistons in the pressure and lifting cylinders as may be desired.

The housing 166 is preferably formed with a segmental portion 175 provided with spaced notches 176 arranged to receive a spring actuated plunger 177 mounted in the handle 168 so as to maintain the same and the slide valve 165 in a predetermined position. The housing 166 has also mounted therein, a valve casing 178 provided with a chamber 179 which communicates through the passage 180 with the chamber 169. A port 181 in the valve casing communicates with the chamber 179 through an axially disposed opening 182 in which is reciprocally mounted, a valve stem 183 that is provided at its inner end with a valve 184 normally urged in engagement with the seat 185 by a spring 186. The opposite end of the valve stem extends outwardly to engage the operating handle 168 when the latter is moved in a counter-clockwise direction from the position shown in dotted lines in Figure 14. It will be seen that upon this movement of the operating handle, the valve stem 183 is moved inwardly to permit the air in the chamber 169 to escape to the atmosphere through the port 180, chamber 179, opening 182 and exhaust port 181.

In other words, assuming that the governor 62 has initially been set to supply a pressure of fifty pounds to the air in the reservoir 59 and it becomes necessary or desirable to lower this pressure, say to a pressure of ten pounds to lessen the pressure on the rollers 12, the governor 62 is reset to the lower pressure and the handle 188 which is now in the position shown in dotted lines in Figure 14, is moved counter-clockwise to operate the valve stem 183 to permit the escape of air from the hood 166 through the ports 180, chamber 179 and port 181 to the atmosphere, whereupon the pressure of the air in the reservoir 59 and the chamber 169 will be immediately exhausted to equal the pressure at which the governor has been reset, thus transmitting a lighter predetermined pressure to the rollers 12. This simple and efficient means for reducing the pressure applied to the rollers 12 through the actuation of the handle 168 which operates the bleed valve 178, permits the machine to be used with various kinds and sizes of work to be ironed and allows the pressure to be changed at a minimum expenditure of time and effort.

By reason of the present invention, simple, efficient and positive means are provided for applying graduated pressures through the twin pistons to either ironing rollers or a movable press head without the necessity of using manually controlled means for adjusting the equipment. Dry graphite is used solely as a lubricant, so that the cylinders and bearings will stand high temperature and indefinite long service. Moreover, the twin pistons dispense with the use of soft packing, thus eliminating the danger of leaks and maintenance cost. Further, as the pressure on the rollers may be selectively graduated as desired, means are provided for preventing damage to new covered rollers.

In the form of the invention shown in Figures 18, 19 and 20, the twin piston unit 190 which is substantially similar in construction and operation to the units previously described, is associ-

ated with the frame 191 of a garment or laundry press, and has a pressing cylinder 192 and a lifting cylinder 193 in which are mounted the pistons 194 and 195 connected by a common piston rod 196. A control valve 197 may be secured by the bolts 198 to the press frame 191 and is substantially similar in operation to the control valve 48 previously described. Air from the reservoir 59 (Fig. 1) is conducted to the chamber 200 of the control valve through the pipe 201 and is selectively delivered to either the cylinder 192 or 193 through the pipes 202 and 203 which communicate with the chamber 200 through the ports 204 and 205 respectively (Fig. 19). A slide valve 206 controls the flow of the air from the chamber 200 to the cylinders 192 and 193, and also permits the exhaust of the air from these cylinders through the ports 207 and 208.

The slide valve 206 is controlled by a revoluble shaft 209 on which is fixed a sleeve 210 having a depending arm 211 forked at its lower end as at 212 to engage a pin 213 carried by the spaced lugs 214 on the top of the slide valve 206. One end of the shaft 209 projects from the control valve casing and has secured thereto a foot pedal 215. The opposite end of the shaft 209 may be journaled in a threaded cap nut 216 secured to the side of the valve casing. An arm 217 extends upwardly from the shaft 209 and is connected by a coil spring 218 to a fixed lug 219 on the valve casing, so as to provide yieldable means for normally maintaining the foot pedal 215 in its raised or inoperative condition and the slide valve 206 moved to establish communication of the lifting cylinder 193 with the chamber 200 through the pipe 203.

A control lever 220 fastened at one end by the pin 221 to a bracket or plate 222 extends between the spaced flanges 223 on the piston rod 196 and has its opposite end connected as at 224 to a rod 225 which is secured at its upper end as at 226 to a lever 227, which in turn is pivoted at 228 to an extended portion 229 of the press frame. A press head 230 is secured by the bolts 231 to the lever 227 and is arranged to be moved in pressing engagement with a fixed buck or lower press jaw 232 secured to the top of the press frame 191 during the operation of the presser.

Instead of providing means for maintaining the slide valve 206 in a neutral position, the same is preferably moved by the spring 218 to establish communication of the chamber 200 with the lifting cylinder 193 so that the piston 195 causes the lever 220 and its associated parts to be moved normally to raise the head 230 away from the buck 232. It will be seen that in this position, the pressing cylinder 192 communicates with the atmosphere through the pipe 202 and the port 207. Upon the depression of the foot pedal 215, the slide valve 206 is moved from the position shown in Figure 19 to the left, to close communication of the lifting cylinder 193 with the chamber 200 and allow the air in this cylinder to escape through the pipe 203 and port 208 to the atmosphere. At the same time, communication is established between the chamber 200 and the pressing cylinder 192 through the pipe 202, which raises the piston rod 196 and actuates the lever 220 and its associated parts to move the head in pressing engagement with the buck 232. As the pressure applied by the head 230 is controlled by the governor 62, it will be seen that this pressure may be varied by setting the lever 77 on the governor so that the garment may be pressed by a controlled or regulated pressure applied to

the head 230. An adjustable stop 233 (Fig. 19) is arranged to be engaged by an end portion 234 of the foot pedal 215 to limit the movement of the slide valve 206 towards the left when the foot pedal is depressed to engage the stop 233. A pin 235 may be provided to coact with a shoulder 236 on the end of the portion 234 of the foot pedal for limiting the upward movement of its outer or exposed end. The twin piston unit 190, control valve 197, pressure reservoir 59 and graduated feed valve or governor 62 and their associated parts may be readily applied to various types of pressing machines in which a movable member is desired to be brought into pressing engagement with a coacting member by a variable or controlled pressure.

Thus, it will be seen that the attachment is such as to be conveniently applied to any type of ironing or pressing machine at a minimum expenditure of time and labor or may be installed as a complete new unit. While for the purpose of illustration, the rollers have been shown associated with a drum, it will be manifest that these rollers are equally applicable for use with a flat ironing surface such as a table or the like and may be efficiently employed for ironing all types of fabric material. Likewise, the twin piston unit may be operatively associated with any kind of garment press or instrumentalities in which it is necessary or desirable to control the application of equal and graduated pressure to a movable or fixed surface.

Moreover, it will be obvious that the pressure feed valve, reservoir and control valve may be connected to anyone of the various twin piston units for controlling the pressure applied to an ironing roller, a movable press head or similar pressing element.

It is understood that the several forms of the invention shown and described, are merely illustrative of preferred embodiments and that such changes may be made as fall within the purview of one skilled in the art, without departing from the spirit of the invention and the scope of the appended claims.

What is claimed is:

1. In combination with an operable member, a twin piston unit having a pressure cylinder and a lifting cylinder, a reciprocating piston in each of said cylinders, a common piston rod connected to the piston, means for conducting the pressure supply to one side of each of the cylinders so that when the piston in one cylinder is compressed the piston in the other cylinder is moved to its exhaust position, means connecting the piston rod to the operable member, a control slide valve for regulating the supply to each of said cylinders to actuate the pistons and the operable member, said slide valve having spaced exhaust ports controlled thereby, a reservoir communicating with the control valve, a graduated feed valve communicating with the reservoir, means for controlling the supply to the graduated feed valve, valve means between the reservoir and the graduated feed valve for maintaining a constant supply of air in the reservoir and for preventing back flow of air from the reservoir into the graduated feed valve, means for operating the slide valve for conducting a predetermined supply to the twin piston unit and a predetermined pressure to the operable member, and valve means spaced from said exhaust ports and operable by movement of the slide valve for lowering the air supply pressure to the operable member.

2. In combination with an ironing machine having a revoluble drum, a series of spaced circumferentially disposed rollers arranged to be moved in and out of engagement with said drum, a twin piston unit having a pressure cylinder and a lifting cylinder, a reciprocating piston in each of said cylinders, a common piston rod connected to the pistons, means for conducting the pressure supply to one side of each of the cylinders so that when the piston in one cylinder is compressed, the piston in the other cylinder is moved to its exhaust position, means connecting the piston rod to the rollers whereby to move the rollers in engagement with the drum upon the introduction of the supply into the pressure cylinder to apply a uniform pressure of the rollers against the drums and to withdraw the rollers from the drum when the pressure supply is cut off from the pressure cylinder and delivered to the lifting cylinder.

3. In combination with an ironing machine having a revoluble drum, a series of spaced circumferentially disposed rollers arranged to be moved in and out of engagement with said drum, a twin piston unit having a pressure cylinder and a lifting cylinder, a reciprocating piston in each of said cylinders, a common piston rod connected to the pistons, means for conducting the pressure supply to one side of each of the cylinders so that when the piston in one cylinder is compressed, the piston in the other cylinder is moved to its exhaust position, means connecting the piston rod to the rollers whereby to move the rollers in engagement with the drum upon the introduction of the supply into the pressure cylinder to apply a uniform pressure of the rollers against the drums and to withdraw the rollers from the drum when the pressure supply is cut off from the pressure cylinder and delivered to the lifting cylinder, a reservoir communicating with the control valve for maintaining the supply in the control valve under a predetermined pressure, a graduated feed valve communicating with the reservoir, means for controlling the supply to the graduated feed valve, means when the pressure of the supply in the reservoir reaches a predetermined pressure for cutting off the supply to the graduated feed valve, and means for preventing the return of the supply in the air reservoir to the graduated feed valve.

4. In combination with an ironing machine having a pressing surface, a series of spaced circumferentially disposed rollers arranged to be moved in and out of engagement with said surface, one of the end rollers constituting a leading roller, each of said twin piston units having a pressure cylinder and a lifting cylinder, a reciprocating piston in each of said cylinders, a common piston rod connecting the pistons of each unit, means for selectively conducting the pressure supply to the cylinders of each unit so that when the piston in one cylinder is compressed the piston in the other cylinder is moved to its exhaust position, a pivoted member for connecting the piston rod of each twin piston unit to its complementary roller to move the roller in engagement with said surface upon the introduction of the supply into the pressure cylinder and to withdraw the roller from said surface when the pressure supply is cut off from the pressure cylinder and delivered to the lifting cylinder of each unit, and means for adjusting the pivotal member connected to the leading roller to provide a greater pressure thereon than the other rollers of the series so as to effect the

stretching of the fabric during the ironing operation.

5. In combination with an ironing machine having a revoluble drum, a series of spaced circumferentially disposed rollers arranged to be moved in and out of engagement with said drum, one of the end rollers constituting a leading roller, each of said piston units having a pressure cylinder and a lifting cylinder, a reciprocating piston in each of said cylinders, a common piston rod connecting the pistons of each unit, means for conducting the pressure supply to the cylinders of each unit so that when the piston in one cylinder is compressed the piston in the other cylinder is moved to its exhaust position, a pivoted member for connecting the piston rod of each twin piston unit to its complementary roller to move the roller in engagement with the drum upon the introduction of the supply into the pressure cylinder and to withdraw the roller from the drum when the pressure supply is cut off from the pressure cylinder and delivered to the lifting cylinder, and means for adjusting the pivotal member connected to the leading roller to provide a greater pressure thereon than applied to the other rollers of the series so as to effect the stretching of the fabric during the ironing operation.

6. In combination with a machine having a pressing surface, a pair of pressure rollers arranged to be moved in and out of engagement with said surface, a twin piston unit having a pressure cylinder and a lifting cylinder, a reciprocating piston in each of said cylinders, a common piston rod connected to the pistons, means for conducting the pressure supply to one side of each of the cylinders so that when the piston in one cylinder is compressed the piston in the other cylinder is moved to its exhaust position, and means operatively connecting the pair of rollers to the piston rod whereby to move the rollers simultaneously in engagement with the pressing surface upon the introduction of the supply into the pressure cylinder and to withdraw the rollers from said surface when the pressure supply is cut off from the pressure cylinder and delivered to the lifting cylinder.

7. In combination with a machine having a pressing surface, a pair of pressure rollers arranged to be moved in and out of engagement with said surface, a twin piston unit having a pressure cylinder and a lifting cylinder, a reciprocating piston in each of said cylinders, a common piston rod connected to the pistons, means for conducting the pressure supply to one side of each of the cylinders so that when the piston in one cylinder is compressed the piston in the other cylinder is moved to its exhaust position, said piston rod being positioned between the rollers, a pivotal member connected to each roller, and means operatively connecting the pivotal members to the piston rod whereby to move simultaneously the rollers in engagement with the pressing surface upon the introduction of the supply into the pressure cylinder and to withdraw the rollers from said surface when the pressure supply is cut off from the pressure cylinder and delivered to the lifting cylinder.

8. In combination with a press of the class described having a stationary buck, a movable press head arranged to be moved in and out of engagement with said buck, a twin piston unit having a pressure cylinder and a lifting cylinder, a reciprocating piston in each of said cylinders, a common piston rod connected to the pistons.

means for conducting the pressure supply to one side of each of the cylinders so that when the piston in one cylinder is compressed, the piston in the other cylinder is moved to its exhaust position, means operatively connecting the pistons to the press head, a slide valve operatively connected to each of said cylinders, foot operated means for actuating said valve to control the movement of the press head relative to the buck, and means for varying the pressure applied by the press head to the buck during the pressing operation.

9. In combination with a press of the class described having a stationary buck, a movable press head arranged to be moved in and out of engagement with said buck, a twin piston unit having a pressure cylinder and a lifting cylin-

der, a reciprocating piston in each of said cylinders, a common piston rod connected to the pistons, means for conducting the pressure supply to one side of each of the cylinders so that when the piston in one cylinder is compressed, the piston in the other cylinder is moved to its exhaust position, means operatively connecting the pistons to the press head, a slide valve operatively connected to each of said cylinders, foot operated means for actuating said valve to control the movement of the press head relative to the buck, and means for normally maintaining the press head in its raised position relative to the buck.

ROBERT L. HOLBROOK.

Administrator of James A. Hicks, Deceased.