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GARMENT OR IRONING PRESS

Original Filed Jan. 4, 1929 2 Sheets-Sheet 1

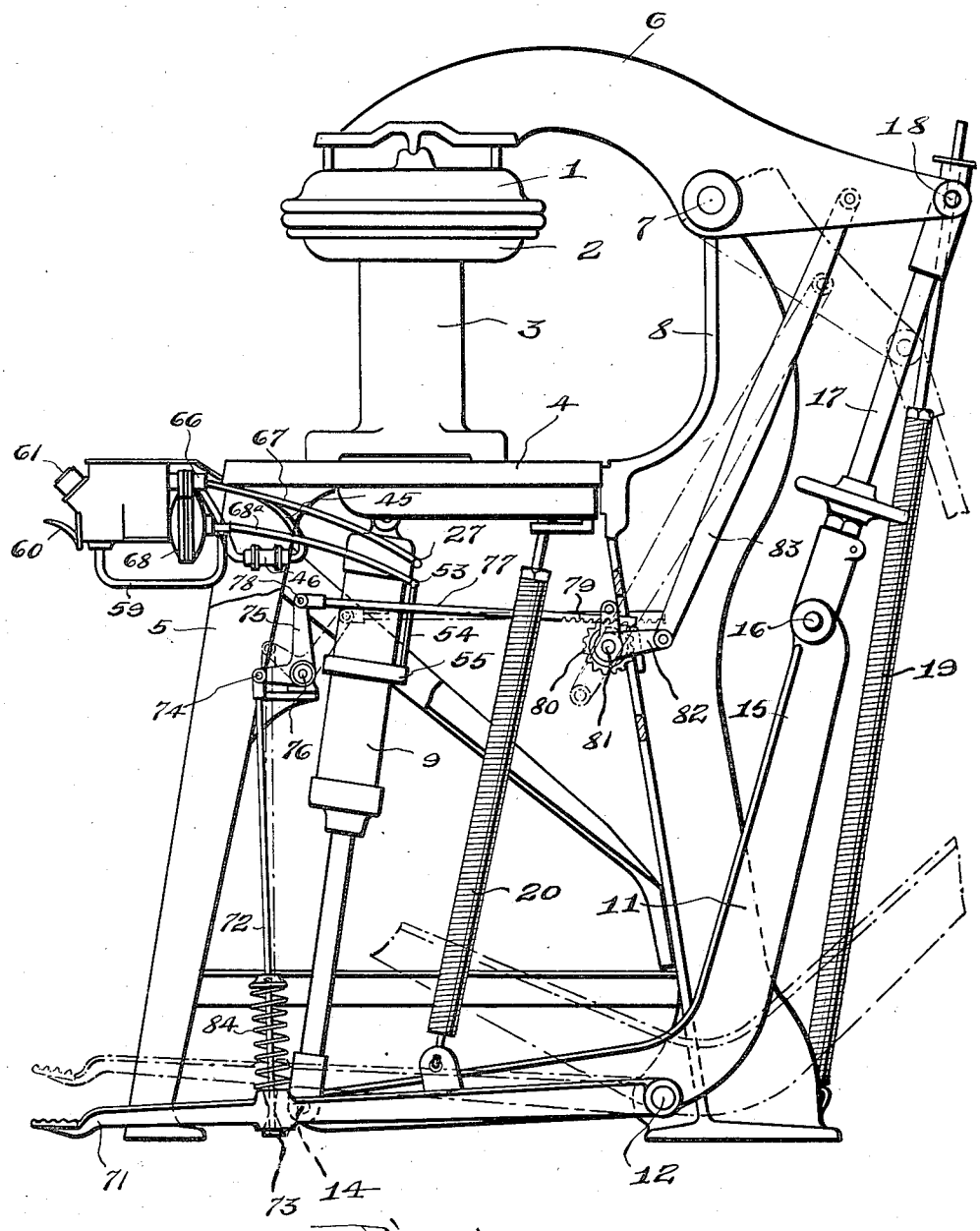


Fig. 1.

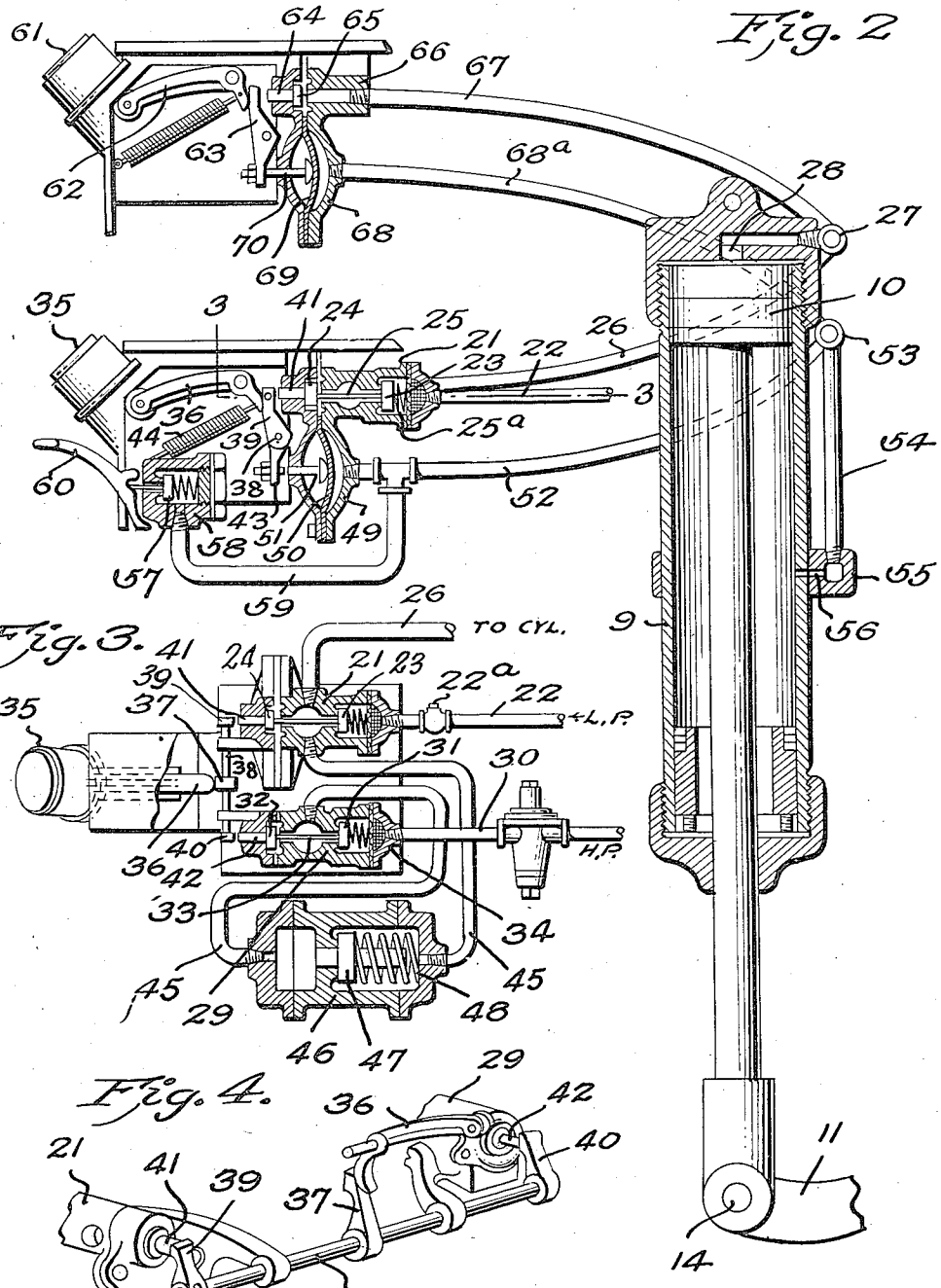
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Fig. 2



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GARMENT OR IRONING PRESS

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19 Claims. (Cl. 68—9)

This invention relates to pressing machines, and has for its object a particularly simple and efficient control mechanism by which the machine can be preliminarily closed under a light pressure or no pressure, and thereafter any degree of final pressure applied at the will of the operator.

Another object is to provide a control mechanism which is operated once to close the press under light pressure and thereafter heavy pressure is automatically applied to the press jaws. The heavy pressure may be graduated to apply any degree of final pressure desired by the operator. The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a side elevation of one form of pressing machine embodying my invention.

Figure 2 is a fragmentary, diagrammatic sectional view of the control mechanism.

Figure 3 is a sectional view taken on line 3—3, Figure 2.

Figure 4 is a detail view of a portion of the valve operating mechanism.

This invention is applicable to any machine having an opening and closing movement, and it is here shown as applied to a conventional type of garment and laundry pressing machine comprising cooperating pressing elements or jaws such as a head 1 movable toward and from a buck 2. The buck is mounted on a bracket or gooseneck 3, which in turn is mounted upon a bench or table 4, supported by a suitable frame 5. The head 1 is carried by a lever 6 pivoted between its ends at 7, to a standard 8 rising from the frame 5.

The actuating mechanism for the movable jaw or head may be of any suitable form and construction, and that here shown comprises a motor means and motion transmitting means between the motor means and the head 1.

The motor means here illustrated is fluid or pressure operated and comprises a cylinder 9, and a piston 10 movable in the cylinder. The motion transmitting means connecting the movable jaw 1 with the motor means in addition to the lever 6 comprises an angle lever 11, pivoted at 12 at its angle to the base of the frame 5 and having a forwardly extending arm to which the piston rod of the motor is pivoted at 14, and an upwardly extending arm 15 pivoted at 16 to a link 17. The link 17 is pivoted at 18 to the rear arm of the yoke lever 6. The link 17 and the arm 15 constitute a toggle. The piston 10 is single acting and the press is opened, when the pressure in the cylinder 9 is released, by countersprings 19 and 20.

This invention relates to novel means for controlling the closing of the press so that it can be preliminarily closed under little or no pressure and thereafter additional final pressure to different degrees can be applied at the will of the operator. In addition, the control means is designed so that upon a single actuation thereof the press closes under light pressure and subsequently heavy pressure is automatically applied to the press jaws by the motor means.

The means for controlling the actuation of the motor means, that is, in this embodiment of my invention, the flow of motive fluid to and from the cylinder 9 comprises two sets of control valves, one set having its casing connected in a low pressure supply line of motive fluid, as compressed air, and the other set having its casing connected in a high pressure supply line; and the two valve casings being connected in series in the high pressure line.

A valve casing 21 is connected in the low pressure line 22. 23 and 24 are respectively the intake and exhaust valves in the casing 21, these valves being connected by a stem 25 so that they act as a unit. These valves are arranged so that the intake valve 23 is normally closed and the exhaust valve 24 normally open, and they are normally held in such positions by a spring 25^a which constitutes means tending to return them to their initial position. The air pressure also might be relied on to return the valves to their initial positions. The valve casing 21 is connected by a pipe 26 to a coupling 27 communicating with a port 28 in the upper end of the cylinder 9, this pipe 26 being a combined intake and exhaust pipe.

A check valve 22^a (Figure 3) is inserted in the low pressure line to prevent the high pressure fluid from flowing back into the low pressure supply line 22 as will appear more fully hereinafter.

A valve casing 29 is provided in the high pressure supply line 30, and 31 and 32 designate intake and exhaust valves therein which are connected by a stem 33, these valves being pressed by a spring 34 to their initial or normal positions. The valves in the casing 29 are similar in construction and operation to those in the casing 21.

The control valves are operated by an operating member or manual common to the valves in both the high pressure and the low pressure line.

The manual is here shown as a push button 35 which acts upon a lever 36, the lever acting upon a rock arm 37 mounted upon a rock shaft 38. The rock shaft 38 has rock arms 39 and 40 at its opposite ends which act respectively on the stems 41 and 42 of the exhaust valves 24 and 32. The lever 39 has two arms, and one arm 43 coacts with the locking means to be presently described. Returning spring 44 acts on lever 36 to return it and the push button 35 to normal position when the push button is released.

Upon depression of the push button 35, the motion will be transmitted through lever 36, and rock shaft 38, to the rock arms 39 and 40 to close both exhaust valves 24 and 32 and open both intake valves 23 and 31 so that the low pressure air is free to flow from the low pressure line 22, through the valve casing 21 and pipe 26 to the cylinder 9 and actuate the piston 10 therein, and air from the high pressure line is free to flow through the valve casing 29. However, the flow of air from the high pressure line is delayed, as will be presently described, so that initially air under low pressure only flows to the cylinder to actuate the piston and close the press. The two valve casings 21 and 29 are connected in series in the high pressure line by a conduit 45 having a delayed action valve casing 46 therein.

A delayed action valve 47 is pressed against its seat by a spring 48. A certain amount of time is required for the fluid to build up sufficient pressure in the casing 46 to overcome the spring 48 and open the valve. This delayed action valve, therefore, momentarily retards the flow of high pressure fluid. Means are provided for locking the valves in the low pressure casing 21 in their operated position, but the valves in the high pressure casing 29 are free to return to their normal position whenever the push button 35 is released by virtue of the lost motion connection between the lever 39 and rock shaft 38, shown in Figure 4 as a pin and slot, but which may be any other well known lost motion expedient.

The locking means is here shown as controlled by the movement of the piston and comprises a diaphragm chamber 49 having a diaphragm 50 therein acting upon a sliding stem 51, which presses against the lower arm 43 of the lever 39 which lever acts on the stem 41 of the exhaust valve 24. The pressure side of the diaphragm chamber 49 is connected by a pipe 52 to a coupling 53 and pipe 54 which communicates with a casing 55 on the side of the cylinder. The casing is connected with the cylinder through a port 56 opening into the cylinder 9. This port 56 is located in position to be passed by the piston 10 about the time that the head 1 comes down on the buck 2. After the piston does pass the port 56, the pressure passes back from the cylinder 9 through the casing 55, and pipes 54 and 52, to the diaphragm chamber 49 to actuate the diaphragm therein and lock the valves 23 and 24 in their operated position and thus hold the press closed under either preliminary pressure or any degree of additional pressure.

By repeatedly depressing the button 35 after the valves 23 and 24 have been locked in operated position, additional pressure from the high pressure line 30 can be supplied to the cylinder 9, and if then the push button is released, the additional pressure will be held in the cylinder since the exhaust valve 24 is locked closed and the check valve 47 prevents the air from exhausting around the exhaust valve 32. If the button 35 is held depressed, then the press automatically closes under heavy pressure merely upon actuating the control means once. It should be noted that there is one set of manuals, represented by the buttons 35 and 61, which applies both initial light pressure and heavy pressure to the motor means and the transfer from low to high pressure is automatic or without the intervention of the operator or use of a high pressure control manual. Obviously, the button 35 can be released at any time to hold the press closed at an intermediate heavy pressure less than the full pressure available which is specifically dependent upon the pressure in the high pressure feed line 30.

The press is opened by exhausting the air from the diaphragm chamber 49 and this is accomplished by opening a normally closed spring pressed exhaust valve 57 in a casing 58 which is connected by a pipe 59 to the pressure side of the diaphragm chamber 49. The valve 57 is operated by a suitable manual or release lever 60 grouped with the push button 35.

Obviously, after operation of the release lever 60 the valves 23 and 24 will be free to return to their normal position thus opening the exhaust valve 24 so that the air is free to exhaust from the cylinder 9 through the pipe 26, valve casing 21, and out past the open exhaust valve 24.

Preferably, the machine is provided with a two hand control in order that both hands of the operator must be employed when the machine is being closed. The two-hand control includes a second push button 61 which through levers 62 and 63 acts on the stem 64 of a normally open exhaust valve 65 in a casing 66 which is connected by a pipe 67 to the coupling 27. This exhaust valve is locked in its operated position by a diaphragm chamber 68 and a diaphragm 69 acting on a stem 70 which in turn acts upon the lever 63. The pressure side of the diaphragm chamber 68 is connected by a pipe 68a to the coupling 53.

Obviously, if the push button 61 only is depressed, no air will pass to the cylinder and nothing will happen. If the push button 35 only is depressed, the air instead of passing from the pipe 26 and coupling 27 into the cylinder 9 will exhaust from the coupling 27 through the pipe 67 and around the exhaust valve 65. Hence both buttons must be depressed to close the press by power. As this second valve is controlled by the push button 61 and is also locked in position at the same time as the valves operated by the push button 35 are locked, additional and heavy pressure can be applied by merely depressing the button 35. Also, obviously, the operation of the release lever 60 will also exhaust the air from the diaphragm chamber 68.

The machine is preferably provided also with operator-operated means as a pedal for preliminarily closing the press. The pedal is carried on a treadle lever 71 pivoted on the pivot 12 of the angle lever 11. This treadle is connected to the yoke lever 6 by any suitable treadle motion transmitting mechanism. This mechanism comprises a link 72 connected at 73 to the treadle lever 71, and at 74 to one arm of an angle lever 75 pivoted at its angle at 76 to the frame. A link 77, pivoted at 78 to the other arm of the angle lever 75, has a toothed rack 79 meshing with a pinion 80 mounted on a rock shaft 81 which has a rock arm 82 thereon. A link 83 connects the rock arm 82 and the rear arm of the yoke lever 6.

Obviously, upon depression of the treadle lever

71, the press will be preliminarily closed. The link 72 is slidably connected to the treadle lever 71 in order to permit movement of the link, relative to the lever when the press goes under final pressure. This movement is against the action of a spring 84.

The operator can preliminarily close the press by depressing the treadle lever and thereafter apply any degree of final pressure by depressing buttons 35 and 61, or the operator may first depress both push buttons 35 and 61 to preliminarily close the press and thereafter apply any degree of final pressure in graduated steps by merely operating the push button 35, or the press may be closed under maximum pressure by holding both buttons 35 and 61 depressed until the heavy pressure has been automatically applied to the press jaws.

There is disclosed herein a garment or ironing press in which the motor means 9 provides a safety operating mechanism by operating with a two step power movement in which the first step is under low power until the movable press jaw 1 has reached preliminary closed position and thereafter the second step under high power automatically comes into operation to bring the movable jaw into heavy pressing contact with the other jaw or buck 2. This two step power movement of the motor means 9 is controlled by the control means which includes means, such as the delay valve means 46, which is automatically operable to control the actuation of the high power step of the motor means. The movable press jaw is in preliminary closed position or safety position when the movable jaw 1 is so close to the stationary jaw 2 that the operator cannot insert his hand between the jaws, or when the jaws just begin to contact, or when the jaws are in light contact with each other. Until one of these safety positions is reached by the movable jaw 1, the operator cannot remove his hands from the two-hand control manuals.

The press described above is new and novel irrespective of whether or not a two-hand control means is used. The safety feature, however, is not fully obtained unless a two-hand control is used, even though the low power step has only sufficient power to squeeze a hand or object between the jaws since one or both jaws of a garment or ironing press are heated. An operator can receive a painful burn from the press jaws even though he cannot be crushed by the high power closing step of the press. It is for this reason that a two-hand control means is used in conjunction with the automatic high power actuation of the motor means in order to provide a press which is fully safe.

What I claim is:

1. In a machine having an opening and closing movement, actuating mechanism therefor including a fluid operated motor, means for controlling the flow of motive fluid to and from the motor including a low pressure supply line and a high pressure supply line, a valve casing in each line, a controlling valve in each casing, manual means for initially operating the valves to open them, the valves having means for returning them to their initial position, means for locking the valve in the casing in the low pressure line in its operated position, a conduit connecting the casing in the high pressure line and the casing in the low pressure line in series in the high pressure line, and a delayed action valve in said conduit.

2. In a machine having an opening and closing movement an actuating mechanism including a cylinder and a piston movable in the cylinder, means for controlling the flow of motive fluid to and from the cylinder including two valve casings connected respectively to low pressure and high pressure supply conduits, a combined intake and exhaust valve in each casing normally arranged with the intake closed and the exhaust open, means tending to return the valves to their initial positions, manual means for operating the valves in the casings to open the intakes therein and close the exhausts, a conduit connecting the valve casing in the high pressure conduit to the valve casing in the low pressure conduit, and a delayed action valve in said conduit.

3. In a machine having an opening and closing movement, an actuating mechanism including a cylinder and piston movable in the cylinder, means for controlling the flow of motive fluid to and from the cylinder including two valve casings connected respectively to low pressure and high pressure supply lines, a combined intake and exhaust valve in each casing, normally arranged with the intake closed and the exhaust open, means tending to return the valves to their initial positions, manual means for operating the valves to open the intakes and close the exhausts, a conduit connecting in series the valve casing in the high pressure line and the valve casing in the low pressure line, a delayed action valve in said conduit and means for automatically locking the valves in the casing in the low pressure line in their operated positions, and a manual means operable at will to release the locking means.

4. In a machine having an opening and closing movement, an actuating mechanism including a fluid operated motor, means for controlling the flow of motive fluid to and from the motor including a low pressure line and a high pressure line, a valve casing in each line, a controlling valve in each casing, manual means for initially operating the valves to open them, the valves having means for returning them to their initial position, means for locking the valve in the casing in the low pressure line in its operated position, a conduit connecting the casing in the high pressure line and the casing in the low pressure line in series in the high pressure line, and a delayed action valve in said conduit, the manual means being common to the valves in both casings.

5. In a pressing machine in combination cooperating pressing elements which open and close on the work, mechanism for opening and closing the press including a fluid operated motor, two valves for controlling the operation of the motor, one valve having its casing connected in a low pressure supply line and the other in a high pressure supply line, manual means for operating the valves, the valves having means for returning them to their initial position, means automatically controlled by the closing of the press for locking the valve in the low pressure supply line in its operated position, a conduit connecting the valve casings in series in the high pressure line, a delayed action valve in said conduit, and release means operable at will to unlock the locking means.

6. In a garment or laundry pressing machine in combination cooperative pressing elements which open and close on the work; actuating mechanism for opening and closing the press including motor means; means to control the flow

of working fluid to the motor means to operate the press into a preliminary closed position; means to control the flow of working fluid to the motor means to apply heavy pressure to the pressing elements; a common operator-operated member for operating both control means simultaneously; and a delayed action mechanism for delaying the effect of the operation of the heavy pressure supply control means.

7. In a garment or laundry pressing machine in combination cooperative pressing elements which open and close on the work; actuating mechanism for opening and closing the press including a fluid operated motor; means to control the flow of working fluid to the motor including a low pressure working fluid supply line, and a high pressure working fluid supply line, and means in each supply line for controlling the flow of working fluid therethrough; operator-operated means for operating the control means; and means to delay the flow of working fluid from the high pressure working fluid supply line after operation of the high pressure control means.

8. In a garment or laundry pressing machine in combination cooperative pressing elements which open and close on the work; actuating mechanism for opening and closing the press including a fluid operated motor; means to control the flow of working fluid to the motor including a low pressure working fluid supply line, and a high pressure working fluid supply line, and a control valve in each supply line; operator-operated means for operating the control valves; and a delayed action valve in series with the high pressure control valve for delaying the supply of high pressure working fluid to the motor.

9. In a garment or laundry pressing machine in combination cooperative pressing elements which open and close on the work; operating mechanism for opening and closing the press including fluid operated motor means; a low pressure working fluid supply line; a high pressure working fluid supply line; means including a common operator-operated member for controlling the flow of working fluid from both of said supply lines to the motor means; and means to prevent the flow of high pressure working fluid to the motor means until after the low pressure working fluid has been supplied to the motor means.

10. In a garment or laundry pressing machine in combination cooperative pressing elements which open and close on the work; operating mechanism for opening and closing the press including fluid operated motor means; a low pressure working fluid supply line; a high pressure working fluid supply line; a valve in the low pressure supply line; a valve in the high pressure supply line; operator-operated means common to both valves for operating the valves substantially simultaneously; and a delayed action valve for delaying the flow of high pressure working fluid to the motor means.

11. In a garment or laundry pressing machine in combination cooperative pressing elements which open and close on the work; operating mechanism for opening and closing the press; a two-hand control mechanism for controlling the operating mechanism to close the press to preliminary closed position; and mechanism operable by one manual of the two-hand control means for controlling the application of graduated heavy pressure to the pressing elements.

12. In a garment or laundry pressing machine in combination cooperative pressing elements which open and close on the work; operating mechanism for opening and closing the press including a fluid operated motor means; valve means to control the flow of working fluid to the motor means to close the press to preliminary closed position; means controlled by the operating mechanism for automatically locking the pressing machine in preliminary closed position; and other valve means for supplying working fluid to the motor means to apply graduated heavy pressure to the pressing elements.

13. In a garment or laundry pressing machine in combination cooperative pressing elements which open and close on the work; operating mechanism for opening and closing the press including a fluid operated motor means; valve means to control the flow of working fluid to the motor means to close the press to preliminary closed position; means controlled by the operating mechanism for automatically locking the pressing machine in preliminary closed position; other valve means for supplying working fluid to the motor means to apply graduated heavy pressure to the pressing elements; and an operator-operated control member common to both of said valve means.

14. A garment or ironing press comprising cooperating press jaws which open and close on the work, actuating mechanism to operate the press including a fluid motor to close the press under light pressure and subsequently to apply heavy pressure to the press jaws, a source of low pressure air and a source of high pressure air, a valve means connecting the motor with the source of high pressure air, a valve means connecting the motor with the source of low pressure air, operator actuated means operating both valve means at the same time, means delaying the flow of high pressure air to the motor, and check valve means preventing the escape of high pressure air through the source of low pressure air.

15. A garment or ironing press comprising cooperating jaws which open and close on the work, actuating mechanism to operate the press including a fluid motor to close the press under light pressure and subsequently to apply heavy pressure to the press jaws, a source of low pressure air and a source of high pressure air, a valve means connecting the motor with the source of high pressure air, a valve means connecting the motor with the source of low pressure air, manual means operating both valve means at the same time, means holding the low pressure air valve means in operated position upon a predetermined movement of the press, means delaying the flow of high pressure air to the motor means, and check valve means preventing the escape of high pressure air through the source of low pressure air.

16. A garment or ironing press comprising cooperating press jaws which open and close on the work, actuating mechanism to operate the press including a fluid motor to close the press under light pressure and subsequently to apply heavy pressure to the press jaws, a source of low pressure air and a source of high pressure air, control valve means connected with the motor and operable once to apply low pressure air thereto so that the motor closes with a two step operation first into preliminary closed position under light pressure, said control valve means including valve means automatically operable when the press is in preliminary closed position to apply air under high pressure to the motor to

close the press under heavy pressure, and check valve means preventing the escape of high pressure air through the source of low pressure air.

17. A garment or ironing press comprising cooperating press jaws which open and close on the work, actuating mechanism to operate the press including a fluid motor to close the press under light pressure and subsequently to apply heavy pressure to the press jaws, a first valve means connected with the motor means and adapted to be connected with a source of low pressure air, a second valve means connected with the motor means and adapted to be connected with a source of high pressure air, said second valve means including means automatically operable when the press is in preliminary closed position to permit the flow of high pressure air to the motor, operator actuated means operating the first and the second valve means at the same time, and check valve means preventing the escape of high pressure air through the source of low pressure air.

18. A garment or laundry pressing machine including, in combination, cooperating pressing elements, one of which is movable toward and from the other; means for actuating the movable element including a fluid operated motor having a movable member, and operating connections between the movable member and the movable pressing element; conduits for the working fluid, operator-operated valve means for controlling the flow of low pressure motive fluid to the motor to apply light pressure, additional operator-operated valve means for controlling the flow of high pressure motive fluid to the motor to apply heavy pressure; and conduit connections including delayed action valve means by which the flow of motive fluid to effect heavy pressure is ineffective until the press has been closed under light pressure.

19. In a garment or laundry pressing machine comprising, in combination, cooperative pressing elements one of which is movable with respect to the other to open and close the press; operating mechanism for the movable pressing element including a fluid operated motor means; a first conduit for supplying working fluid to the motor means to close the press into preliminary closed position, operator-operated valve means for controlling the flow of working fluid through said first conduit, a second conduit for supplying working fluid to the motor means to apply heavy pressure to the pressing elements including delayed action valve means having a check valve in the second conduit to prevent the flow of working fluid from the motor through said second conduit, operator-operated valve means operable repeatedly to supply increments of working fluid to the motor through the second conduit to apply graduated heavy pressure to the pressing elements.

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