Dec. 12, 1933. E. DAVIS 1,939,043

LAUNDRY PRESSING AND DRYING MACHINE

Original Filed June 8, 1929 2 Sheets-Sheet 1

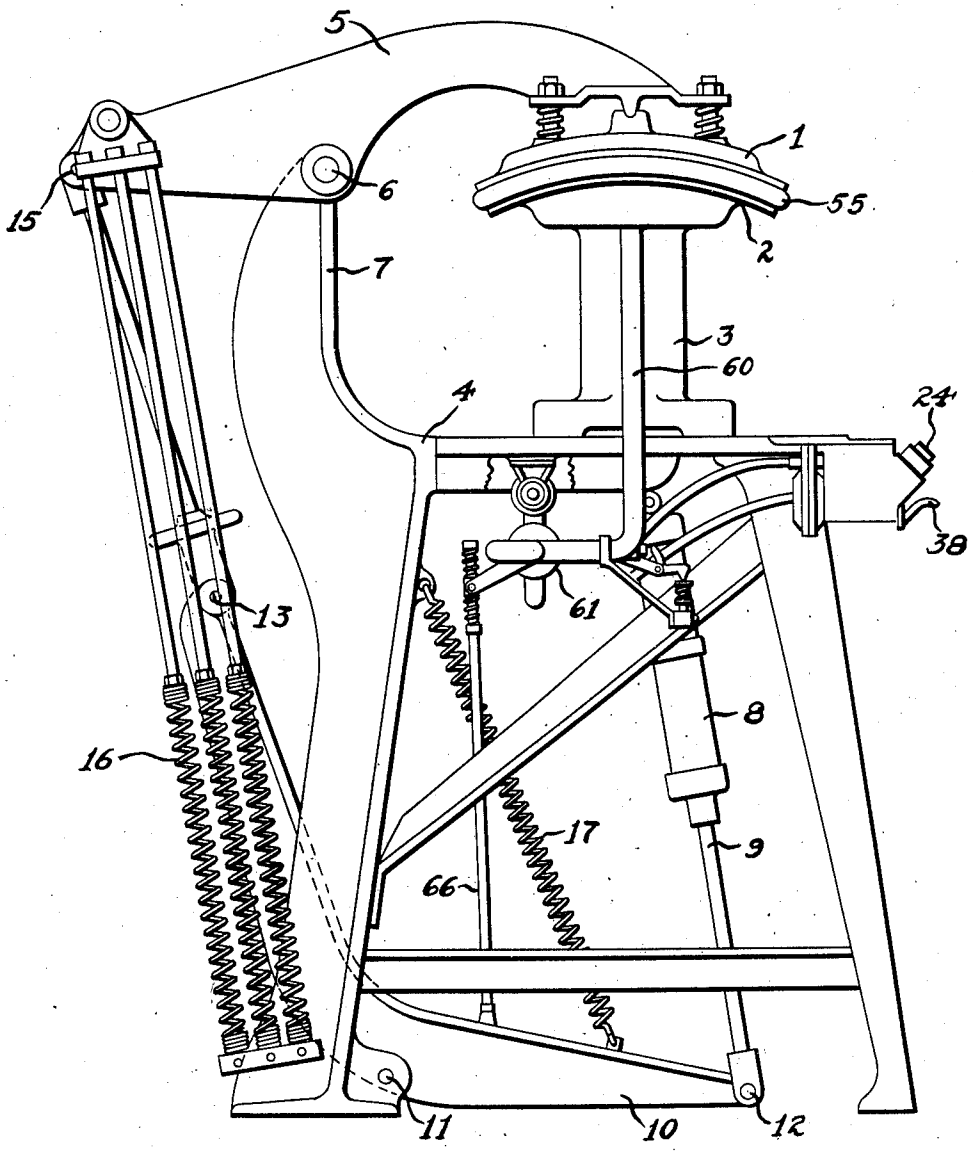


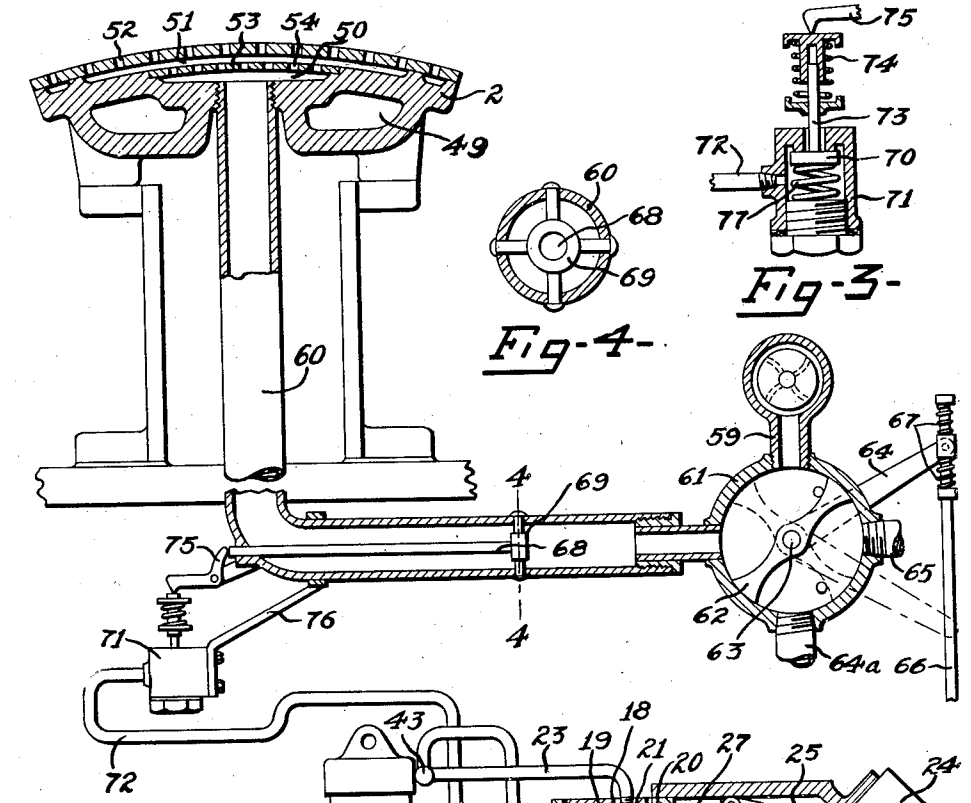
Fig-1-

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LAUNDRY PRESSING AND DRYING MACHINE

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This invention relates to garment and laundry or ironing presses and particularly to presses where the work is subjected to treatment by air currents to dry and cure or set the work. The invention has for its object a particularly simple and efficient means for controlling the timing and direction of the air currents, in a certain sequence or synchronization with the opening and closing of the press. Another object is to provide means controlled by the temperature to which the work is subjected for automatically opening the press to avoid scorching of the work. A still further object is to provide a temperature controlled press timer for a garment or ironing press.

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 a garment or ironing press embodying my invention.

Figure 2 is a partly diagrammatic and partly mechanical sectional view of the lower pressing element or jaw, the air current creating means and the control therefor and of the means for controlling the opening and closing of the press.

Figure 3 is an enlarged detail view of the thermostatically operated valve for automatically controlling the opening of the press.

Figure 4 is an enlarged sectional view on line 4—4, Figure 2.

Figure 5 is a front elevation showing the blower driving motor and reversing valve used on the pressing machine shown in Figure 1.

In general, the invention comprises means for passing blowing and sucking air currents through the work being pressed and means for automatically controlling the direction of the air currents in step with the opening and closing of the press. The invention also comprises a novel automatic press timer feature which opens the press after a predetermined lapse of time.

The construction of the press, the actuating mechanism and controls therefor, per se, form no part of this invention and are old insofar as this invention is concerned. Neither does the construction of the air current creating means, per se, constitute this invention.

The fundamentals of my invention lie in the novel means for timing the suction and blowing currents in synchronism with the operating movements of the press, and also the automatic opening of the press by thermostatic means to prevent scorching of the work.

The invention is here illustrated as applied to a modern laundry or ironing press comprising upper and lower pressing elements or jaws, one of which is movable toward and from the other to close and open the press, as a head 1 movable toward and from a buck 2 The buck 2 is mounted on a bracket or bolster 3 which in turn is mounted on a suitable frame 4. The head 1 is illustrated as carried at the front end of a yoke or frame lever 5 pivoted between its ends at 6 to a standard 7 rising from the frame.

The press is here shown as power actuated, and the motor in the illustrated embodiment of my invention comprises a cylinder 8 having a piston movable therein, the rod 9 of which is connected by suitable motion transmitting means to the rear arm of the yoke lever 5. The motion transmitting means is here shown as an angle lever 10 pivoted at 11 to the base of the frame and having a forwardly extending arm to which the piston rod 9 is pivoted at 12 and an upwardly extending arm which is pivoted at 13 to the lower end of the link 13 which is pivoted at 15 to the rear end of the yoke lever. The piston is single acting, and the press is opened when the pressure in the cylinder 8 is released by countersprings 16, 17.

The flow of motive fluid, as compressed air, to and from the cylinder is controlled by manually operated valve mechanism.

The mechanism, here illustrated, comprises a valve casing 18 having a normally closed, spring pressed intake valve head 19 and a normally open exhaust valve head 20 connected together by the stem 21 so that they act as a unit. The intake end of the valve casing 18 is connected to a suitable supply pipe 22 and the casing is connected between the valve heads 19 and 20 by a pipe 23 leading to the intake end of the cylinder 8. The valve is actuated by a suitable operator-operated means such as a push button 24, the push button acting upon a lever 25 which in turn acts upon an intermediate lever 26 which acts on the stem 27 of the exhaust valve. A spring 28 which acts on the lever 25, returns the push button to its starting position.

Means is provided for locking the press closed by locking the valve heads 19, 20 in their operated position. This means is controlled in its operation by any moving part of the press and operates to lock the valve heads 19 and 20 in operated position when the press head 1 is closed or nearly closed.

The locking means, here illustrated, comprises a diaphragm chamber 29 having a diaphragm 30 therein which acts on a sliding stem 31 which thrusts against the intermediate lever 26. The pressure side of the diaphragm chamber 29 is connected by a pipe 32 to a pipe 33 which communicates with a casing 34 having a port opening into the cylinder 8 and located to be passed by the piston, when the piston approaches the end of its power stroke, thereby permitting air to pass through the pipes 33, 32 to the diaphragm chamber 29 and actuate the diaphragm 30 therein to hold the lever 26 and hence the valves 19, 20 in their operated position.

The press may be opened manually by opening a normally closed, spring pressed exhaust valve 35 located in a casing 36 which is connected by a pipe 37 to the pipe 32. The valve 35 is operated by means of a finger lever 38.

The press is preferably provided with a two hand control or an additional push button, which may be dispensed with if desired. The additional push button 39 when depressed, acts to close a normally open exhaust valve 40, which is located in a valve casing 41 which is connected by a pipe 42 to the coupling 43 in the intake end of the cylinder 8 to which the pipe 23 is connected.

The motion of the push button 39 is transmitted to the stem 44 of the exhaust valve 40 by two levers 44*a*, 44*b* similar to the levers 25 and 26, and the push button is returned to its normal position by a spring 44*c* similar to the spring 28.

The exhaust valve 40 is held or locked in its operated position by a holding means which includes the diaphragm chamber 45 having a diaphragm 46 therein, which acts on a sliding stem 47 which thrusts against the lever 44*b*. The pressure side of the diaphragm chamber 45 is connected by a pipe 48 to the pipe 33 so that the diaphragm 46 operates to hold the exhaust valve 40 closed at the same time that the diaphragm 30 operates to hold the valves 19 and 20 in their operated position.

To close the press, both push buttons 24, 39 must be depressed which permits air to enter the cylinder 8 and actuate the piston therein, and when the piston uncovers the port located in the casing 34, the valves operated by the push buttons 24, 39 will be locked in their operated position to hold the press closed.

As before stated, the motor mechanism, and the controls per se form no part of this invention.

One or both pressing elements 1, 2 are heated and formed with the usual heating chamber to receive a heating medium as steam.

In this embodiment of my invention, the air blowing and suction means is applied to the lower pressing element or buck 2. The buck 2, is illustrated in detail, though the air blowing or suction may be applied to the head, by using similar construction.

The buck 2 is formed with an internal heating chamber 49 for the heating medium as steam and is also provided with a conduit 50 extending lengthwise thereof, and a distributing chamber 51, the top wall of which is formed with perforations or air passages 52. The conduit 50 is separated from the chamber 51 by a plate 53 formed with air passages 54 therethrough opening into the chamber 51. The buck is usually overlaid with a padding 55.

The means for creating suction and blowing currents of air to pass through the garment and the padding may be of any suitable construction and one means or unit may be used to create suction and another means or unit to create blowing. However, I have shown one means for creating both blowing and suction currents and means for controlling the passing or flow of blowing and suction currents through the garment on the buck effected by the single means.

The blowing and suction creating means is preferably a blower including a casing 56 having a rotor therein, which is actuated by an electric motor 57. The motor constantly runs while the press is in operation.

The casing 56 of the blower has a central intake 58 and a peripheral outlet 59. The air currens through the buck 2 are reversed from blowing to suction by valve or reversing means and as shown, means is provided for interchangeably connecting either the inlet or the outlet to the conduit means 60 which communicates with the channel 50 of the buck 2. In order to produce suction or blowing air currents, both the blowing and suction currents are preferably passed through the same conduit to the channel 50 and the direction of flow of the current is reversed in conduit 60 by a reversing valve which connects the conduit 60 with the peripheral outlet 59 for a blowing flow of air or with the central intake for a sucking flow of air.

The conduit 60 opens through the bottom of the channel 50, and the means for controlling the suction and the blowing air currents comprises a reversing valve including a casing 61 and a rotary valve 62 therein, this being mounted on a shaft 63 journalled in the casing and having a rock arm 64 thereon. The outlet 59 of the blower opens into the casing 61 and the pipe 64*a* leads from the casing from a point diametrically opposite the blower outlet 59 to the central intake 58 of the blower 56. The casing 61 has also a passage 65 opening into the outer air which is diametrically opposite from the connection of the conduit 60 with the casing.

Normally the reversing valve 62 is arranged in the position indicated by full lines, Figure 2, so that the air passes through the passage 65 of the reversing valve into the casing 61 thereof on the lower side of the rotary valve 62, out through the pipe 64*a* to the central intake 58 of the blower 56, through the blower and the outlet pipe 59 and casing 61 above the rotary valve 62, and thence through the pipe 60, channel 50, chamber 51 and out through the perforations 52, the padding on the buck and the work thereon. If there is no work on the buck, the air blows through the padding to dry it.

When the reversing valve 62 is shifted into the dotted line position in Figure 2, the air is drawn down through the work on the buck and the padding, through the perforations 52, chamber 51, channel 50, pipe 60 into the casing 61 below the rotary valve, it being borne in mind that the rotary valve is now in dotted line position, out through the pipe 64*a* to the intake side of the blower through the blower, out through the pipe 59 above the rotary valve 62, thence out through the passage 65.

The reversing valve 62 is controlled in a certain sequence or in synchronism with the opening and closing of the press, and is timed so as to blow air when the press is opened and also when the press is opening and to suck air when the press is closing or nearly closed and when the press is closed. The time when blowing ceases and sucking begins is determined by the initial position of the reversing valve 62 and this may be adjusted within a range of approxi-

mately 45° or even 90°. As before stated, in the illustrated embodiment of my invention, the blowing and suction is accomplished through the buck 2.

As here illustrated, the valve 62 or the arm 64 on its shaft 63 is connected to any part which has a back and forth movement and is here illustrated as connected by a link 66 to the forwardly extending arm of the angle lever 10, although it may be connected to any other moving part. In order to avoid straining of the link and the arm 64, the motion of the link 66 is transferred to the arm 64 through buffer springs 67.

As the damp garment, which is being pressed, dries, either the garment or the air current becomes heated in proportion to the drying and means is provided for automatically opening the press when the garment is dry. This automatic means is controlled indirectly by the temperature of the garment since the temperature of the air passing therethrough will depend on the temperature of the garment, and as here shown, the automatic opening is controlled directly by the heat of the suction current through the pipe 60, which current of air has been heated in its passage through the garment. So long as the garment is moist the latent heat of vaporization will prevent the air from becoming very hot. The means also prevents possible scorching of the work or garment, if the pressing element is hot enough to scorch, after the garment is dried.

A thermostat 68 is located in the pipe 60 and anchored at one end to a spider 69 therein and having its other end extending out of the pipe to mechanically open a normally closed, spring pressed exhaust valve 70 located in a casing 71. The casing 71 is connected by a pipe 72 to the pipe 32 or any other pipe communicating with the diaphragm chambers 29, 45. The motion of the thermostat 68 is transferred to the stem 73 of the exhaust valve 70 through a spring 74, which serves to give a quick opening action to the valve 70, and a motion transmitting member or angle lever 75. The valve casing 71 is supported on the pipe 60 by a bracket 76.

In operation, the suction air current passes through the garment and pad on the buck and becomes heated. The heated air passes through the pipe 60 and heats the thermostatic bar 68 which gradually expands or lengthens thus actuating the angle lever 75 which transmits the motion of the bar to the valve stem. This gradual lengthening of the bar 68 gradually compresses the spring 74 until it overcomes the spring 77 acting on the exhaust valve 70 and opens the valve.

When the exhaust valve 70 opens, the pressure in the diaphragm chambers 29, 45 is released permitting the intake valve head 19 and exhaust valve head 20 to return to their normal position and also permitting the exhaust valve 40 to open so that the air is free to exhaust from the cylinder 8 and the press to open under the influence of the springs 16, 17.

The press may be opened at any time by operating the release lever 38.

In operation, the work, which is usually moist when it comes to the press, is laid on the buck 2 or the padding thereon, and as the rotary valve 62 is in its normal position, air is blown through the pad or through both the pad and work in order to dry them. Upon the depression of the push buttons 24, 39, the press closes and the air continues to blow while the press closes and air bulges the padding forming an air cushion against which the work is first lightly pressed while the head is going to final pressure.

When the head 1 comes under heavy pressure, the rotary valve 62 of the reversing valve means 56 clears the passage opening to the pipe 60 so that now a suction current is created through the pipe 60 and down through the garment, withdrawing any moisture left in the garment. When the heat of the suction current through the pipe 60 reaches a predetermined point or a point where the garment would be scorched if pressing continues, the exhaust valve 70 is automatically opened by the action of the thermostat 68. When the press opens, the reversing valve moves to its starting position causing a current of air to blow through the garment and cool it and break it away from the padding if it tends to adhere to the padding.

The thermostatic bar or means 68 is located in the conduit 60 so that when the press is opened a cool current of air is blowing through the conduit to cool the bar 68 and contract it so that the exhaust valve 70 may close. When the press closes, the air flow through the conduit 60 becomes a suction through the pad so that this suction air flow becomes heated and flows around the bar 68. This heated air heats the bar 68 and it expands as it heats. In a relatively long bar 68, such as shown herein, the expansion is relatively large and any extent of expansion of the bar may be used to actuate the exhaust valve 70. Since the reversed air current blows a cooling flow of air over the heated bar 68 or subjects the bar to a cooling medium when the press opens, there is a direct combination between the currents of air and the thermostatic bar, irrespective of the fact that those air currents also have a definite purpose with respect to conditioning the work and pad. The flow of heated air from the heated jaws is one way of subjecting the thermostatic bar 68 to the heat of the jaws as soon as the press is closed so that it may expand under the influence of the heat and actuate the opening or releasing means or exhaust valve 70.

What I claim is:

1. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, means for actuating and controlling the actuation of the movable element to open and close the press, air blowing and suction creating means, conduit means connecting the creating means with one of the pressing elements to blow air to, and such air from, between said elements, an air flow reversing means located in the conduit means and including a shiftable member for operating the reversing means, the actuating means including a reversely movable member, and a link connecting said shiftable member and the reversely movable member of the actuating means to effect the flow of air in one direction through the conduit means during the closing and opening of the press and in the other direction when the press is substantially closed.

2. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other and one being heated and serving as a support for the work, means for withdrawing the moisture by suction from the work when the press is closed, means for actuating the movable element, releasable means for holding the press closed and means controlled by the temperature of the suction current after passing through the work to release the holding means.

3. In a pressing machine, cooperating pressing

elements, one of which is movable toward and from the other, one serving as a support for the work and one being heated whereby the work is subjected to heat when the press is closed, means for actuating the movable element to close and open the press, releasable means for holding the press closed, means for passing a current of air through the work when the press is closed, and thermostatically operated means operated by the temperature of the air current, after passing through the work, to release the holding means.

4. In a garment pressing machine 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; means for heating one of the pressing elements; a conduit; means for passing a current of air through the work and through the conduit; thermostat means within the conduit; and means connected with and operated by the thermostat means for controlling the operating mechanism for the movable pressing element to open the press.

5. A garment pressing machine including in combination a buck having a foraminous pressing face; a pressing head movable into and out of pressing contact with the buck to close and open the press; operating mechanism for moving the pressing head; means for heating the head; conduit means connecting with the buck; means for drawing a current of air through the work on the buck and through the pressing face of the buck and the conduit; a thermostat in the conduit in the path of the air current which passes through the conduit; and means connected with and operated by the thermostat to control the operating mechanism to open the press if the temperature of the air exceeds a predetermined degree.

6. A garment or laundry press comprising cooperating pressing jaws one of which is movable towards and from the other, one of the jaws being heated, means for actuating the movable element, holding means for retaining the press in operated position, means to release the holding means, and a thermostatic means subjected to the heat of a pressing jaw upon the press closing and operatively connected with the releasing means to actuate the latter and open the press.

7. A garment or laundry press comprising cooperating pressing jaws one of which is movable towards and from the other, one of the jaws being heated, means for actuating the movable element, holding means for retaining the press in operated position, means to release the holding means, a thermostatic means operatively connected with the releasing means, and means to subject the thermostatic means to the heat of the pressing jaw upon the press closing to actuate the releasing means and open the press.

8. A garment or laundry press comprising cooperating pressing jaws one of which is movable towards and from the other, one of the jaws being heated, means for actuating the movable element, holding means for retaining the press in operated position, means to release the holding means, a thermostatic means operatively connected with the releasing means, and means creating a flow of air from the heated jaw over the thermostatic means when the press closes to actuate the releasing means and open the press.

9. A garment or laundry press comprising cooperating pressing jaws one of which is movable towards and from the other, one of the jaws being heated, means for actuating the movable element, holding means for retaining the press in operated position, means to release the holding means, a thermostatic means operatively connected with the releasing means, means to subject the thermostatic means to the heat of the pressing jaw upon the press closing to actuate the releasing means and open the press, and means subjecting the thermostatic means to a cooling medium upon the press opening.

10. A garment or laundry press comprising cooperating pressing jaws one of which is movable towards and from the other, one of the jaws being heated, means for actuating the movable element, holding means for retaining the press in operated position, means to release the holding means, a thermostatic means operatively connected with the releasing means, means to subject the thermostatic means to the heat of the pressing jaw upon the press closing to actuate the releasing means and open the press, and means for blowing a cooling current of air over the thermostatic means upon the press opening.

11. A garment or laundry press comprising cooperating pressing jaws one of which is movable towards and from the other, one of the jaws being heated, means for actuating the movable element, holding means for retaining the press in operated position, means to release the holding means, a thermostatic means subjected to the heat of a pressing jaw upon the press closing and operatively connected with the releasing means to actuate the latter and open the press, and air flow creating means connected with one of the jaws to blow cooling air through the jaw and to cool the thermostatic means upon the press opening.

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