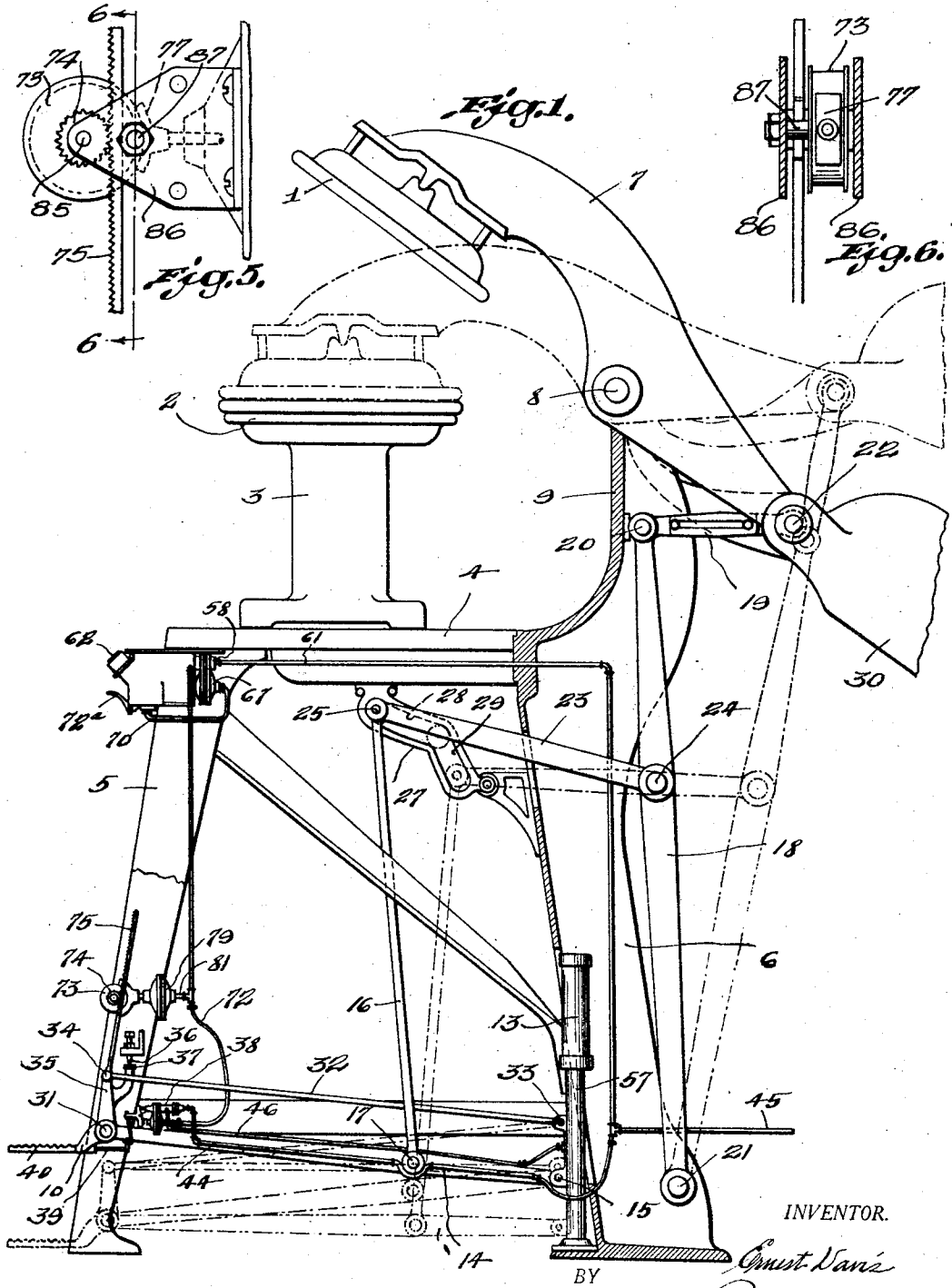
Nov. 15, 1932. E. DAVIS 1,887,953

COMBINED FOOT AND POWER OPERATED PRESSING MACHINE

Original Filed March 24, 1928 2 Sheets-Sheet 1



Nov. 15, 1932. E. DAVIS 1,887,953

COMBINED FOOT AND POWER OPERATED PRESSING MACHINE

Original Filed March 24, 1928 2 Sheets-Sheet 2

Fig. 3.

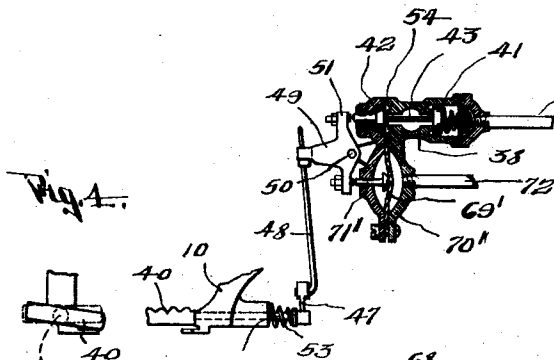


Fig. 4.

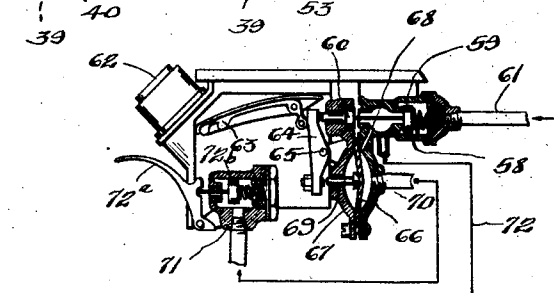
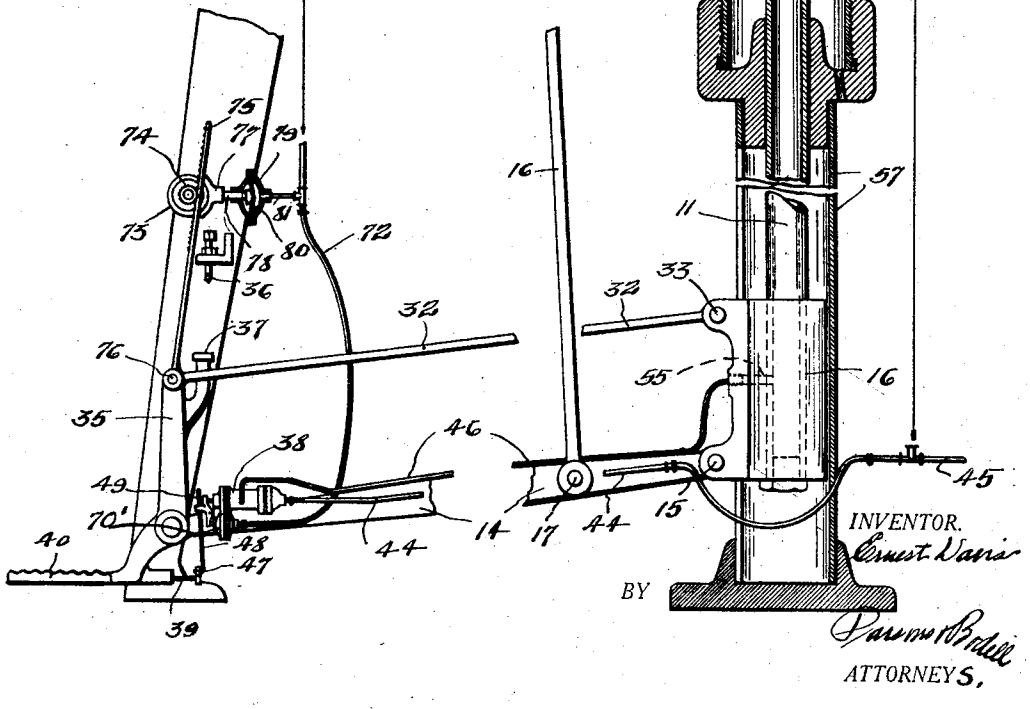


Fig. 2.



INVENTOR.
Ernest Davis
BY
Parmelee Bolles
ATTORNEYS.

Patented Nov. 15, 1932 1,887,953

UNITED STATES PATENT OFFICE

ERNEST DAVIS, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE PROSPERITY COMPANY, INC., OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK

COMBINED FOOT AND POWER OPERATED PRESSING MACHINE

Application filed March 24, 1928, Serial No. 264,389. Renewed May 21, 1931.

This invention relates to pressing machines as garment and laundry pressing machines and more particularly, for the reasons hereinafter set forth, to garment pressing machines and has for its object, a particularly simple and efficient mechanism by which the heavy pressure is applied by power and the amount of pressure applied, controlled and sensed by the operator by the feel of the machine.

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, partly in section, of a machine embodying my invention.

Figure 2 is an enlarged fragmentary detail sectional view of the foot and power actuators and the motion transmitting element common to both of them and the means for locking the press closed.

Figure 3 is an enlarged detail sectional view of the valve means for controlling the actuation of the actuator.

Figure 4 is a front edge view of the pedal plate and contiguous parts.

Figure 5 is an enlarged side elevation of the support for the brake drum and associated parts.

Figure 6 is a sectional view on line 6—6, Figure 5.

In garment pressing machines which have been operated by a pedal, the operator gages by the feel of the machine, the amount of force or pressure he is applying to the pedal. A skilled operator applies different degrees of pressure for different operations. Some operations require heavy pressure and numerous other operations less degrees of pressure.

The skilled operator intuitively applies the right amount of pressure to the pedal for the particular operation. The principal object of this invention is to apply the pressure for the most part by power, but permit the operator to intuitively control the application of the desired degree of pressure.

This invention comprises a differential motion transmitting member between the power actuator and the pedal of a pressing machine whereby the combined operation of both the power actuator and the pedal is required to fully close the press and the force of the power actuator is applied against the operator's foot on the pedal. It further has for its object, means for controlling the actuation of the power actuator and for locking the press closed.

I have here shown my invention as embodied in a conventional type of pressing machine in which an upper pressing element or head 1 is movable toward and from a buck 2 mounted on a bracket or a goose neck 3 which in turn is mounted upon a table or bench 4, the latter being supported on suitable framing including legs 5, 6. The head 1 is carried by the usual yoke lever 7 which is here illustrated as pivoted between its ends at 8 to an upright 9 rising from the frame, the head being carried at the front end of the lever.

10 designates the pedal member which is vertically movable, and 11 is a vertically movable power actuator, this actuator being the rod of a piston 12 movable in the cylinder 13 suitably carried by the frame. The piston is single acting.

A motion transmitting element common to the pedal member and the actuator member is, in the illustrated embodiment of my invention, a lever 14 pivoted at 15 to the power actuator or a collar 16 thereon, the pedal 10 being mounted at the other end of said lever. Thus owing to the arrangement of the lever, the pedal moves the front end thereof downwardly and the actuator moves the rear end of the lever downwardly. The motion of the lever 14 is transmitted to the head 7 in any suitable manner, it being here shown as transmitted through a link 16 pivoted at its lower end at 17 to the lever. The motion of the link 16 is transmitted to the head 1 or the lever 7 through toggle links 18 and 19 pivoted together at 20 and pivoted respectively at 21 and 22 to the frame at the base thereof and to the rear arm of the yoke lever 7. The toggle is connected to the link 16 by another

link 23 pivoted at 24 to the link 18 and at 25 to the link 16. The link 23 is guided in its movement to straighten the toggle by a cam 27 carried by the frame, this cam having an angular slot, one portion 28 of the slot inclining rearwardly and downwardly out of the horizontal and the other portion 29 inclining rearwardly and downwardly out of the vertical.

The link 23 has a follower at its end movable in the slot. The pivot 17 between the link 16 and the lever 14 common to the pedal and the power actuator, is located nearer the power actuator than the pedal in order to lessen the reaction of the power actuator on the pedal, it being intended that the reaction be sufficient only to convey to the operator enough force for him to sense or gage the amount of pressure being applied by the power actuator. Neither the movement of the pedal nor the power actuator is sufficient to entirely close the press and apply pressure, but both the pedal and the power actuator must be used successively.

In the operation of the machine as thus far described, the operator depresses the pedal 10 moving the follower on the link 16 along the portion 28 of the slot, this movement bringing the head 1 close to the work on the buck 2. The operator then controls the flow of motive fluid to the cylinder 13, as will be presently described, so that the piston is actuated to further move the lever 14 downwardly moving the follower down the rear portion 29 of the cam slot thus applying heavy pressure.

During the movement of the lever 14 by the actuator, the foot of the operator acts as a fulcrum and the amount of the reaction depends on the location of the pivot 17 along the arm 14. When the force of the pedal and the actuator is discontinued on the lever 14, the press opens up under the influence of a counterweight 30 or in any other well known manner. In order that the pedal 10 may always remain level or at any other initial angle during the movement of the lever 14, it is pivoted at 31 to the lever arm 14 and its angular or horizontal position maintained by a link 32 pivoted at 33 to the collar 16 on the actuator 11 and at 34 to an upwardly extending rock arm 35 on the pedal 10. The upward or initial position of the pedal is determined by an adjustable stop 36 on the frame coacting with the stop arm 37 on the pedal or the arm 35.

The operator may if he desires, first close the press by power and then apply heavy pressure by the pedal and such operation may be used in some instances. In the normal use however, the head 1 is first closed by the pedal and the final pressure applied by the power actuator.

The means for controlling the operation of the power actuator, that is, the means for controlling the flow of a motive fluid to the cylinder 13 includes a member carried by the pedal and operable by the foot of the operator on the pedal.

This controlling means, as here shown, comprises a valve casing 38 carried by the lever 14 and having a combined intake and exhaust valve therein, an operating member 39 carried by the pedal and operable by a lateral movement of the pedal plate 40 relatively to the vertical movement of the pedal and pedal plate and connections between the operating member and the valves in the casing 38. The controlling means is held in operated position by pressure means to be described.

The combined intake and exhaust valves are here shown as of the reciprocating type and as including a normally closed spring pressed intake valve head 41 and a normally open exhaust valve head 42 which are connected by a stem 43 so that they act as a unit, the intake end of the casing 38 being connected by a pipe 44 to a supply pipe 45. The pipe 44 is usually a flexible hose. The valve casing 38 is connected by a pipe 46 to the cylinder as will be presently described.

The operating member 39 is here illustrated as a rock shaft journalled in the pedal 10 and carrying the pedal plate 40, the rock shaft having an arm 47 thereon which is connected by a link 48 to a lever 49 pivoted at 50, the lever having an arm 51 coacting with the stem 43 of the exhaust valve 42. The rocking or angular movement of the shaft 39 by the pedal plate 40 out of horizontal position is against the action of a returning spring 53. Upon the rocking of the pedal plate 40 to the right, the shaft 39 is rocked moving the rock arm 47 upwardly and actuating the lever 49 to close the exhaust valve 42 and open the intake valve 41, permitting the motive fluid as air to flow from the pipe 45, through the pipe 44, valve casing 38 out through pipe 46 to the cylinder 13 to actuate the piston therein on its power stroke.

When the rock shaft 39 is returned to its normal position by the spring 53, the exhaust valve 42 opens and the intake closes under the influence of its spring and the air pressure, permitting the air to exhaust out from the cylinder through the pipe 46, valve casing 38 and exhaust passage 54. When the air exhausts from the cylinder the head is free to open under the influence of the counterweight 30.

The construction of the valve mechanism per se, forms no part of this invention and any suitable valve mechanism may be substituted therefor.

In the illustrated embodiment of my invention, the air is conducted from the pipe 46 to the upper end of the cylinder through a passage 55 formed in the collar 16 and opening into the piston rod 11 which is tubular. The upper end of the piston rod opens through a part 56 into the cylinder above the piston.

The cylinder is supported on a hollow pedestal 57 in which the collar 16 is located.

The means for locking the press closed and for releasing it after being locked, comprises means for locking the pedal or the front end of the lever 14 in its depressed position and means for holding the intake valve 41 and exhaust valve 42 in their operated position. These holding means are also pressure operated and include a valve casing 58 similar to the valve casing 38 and having combined intake and exhaust valves 59 and 60 therein similar to the valves 41, 42, the pressure side of the casing 58 being connected by a pipe 61 to the supply pipe 45.

The valves 59 and 60 are operated by manual means as a push button 62 coacting with the lever 63 which acts on a lever 64 pivoted at 65, this lever 65 coacting with the stem of the exhaust valve 60 and the valves after being operated are automatically held in their operated position by pressure operated means as a diaphragm 66 located in a diaphragm chamber 67 associated with the casing 58 and connected to the interior of the same by a duct 68. The diaphragm acts on the sliding stem 69 which presses against the lever 64. The pressure side of the diaphragm chamber is connected by a pipe 70 to a casing 71 having a normally closed exhaust valve 72^b therein which is operated by a manual or lever 72^a.

In the operation of this valve mechanism, the operator depresses the button 62 after the press is closed so that the intake valve 59 is open and the exhaust valve 60 closed and air free to pass from the supply pipe 45 through pipe 61 into the valve casing 58 and thence into the diaphragm chamber 67 to actuate the diaphragm and the lever 64 to hold the valves 59 and 60 in their operated positions. The result of being held in their operated positions will now be described.

The intake and exhaust valves 41 and 42 which control the flow of air to the cylinder are held in their operated positions by pressure operated means as a diaphragm 69′ in a diaphragm chamber 70′ associated with the valve casing 38, the diaphragm acting upon a sliding stem 71′ which acts upon the lever 49, which lever operates the valves 41, 42. The pressure side of the diaphragm chamber 70′ is connected by a pipe 72 to the valve casing 58 between the intake and exhaust valves 59 and 60. Hence, when the push button 62 is depressed to open the intake valve 59 and close the exhaust valve 60, the air passing into the valve casing 58 through the pipe 61 will in addition to actuating the diaphragm 66 also pass out through the pipe 72 to the diaphragm chamber 70′ to actuate the diaphragm 69′ therein and thus hold the intake valve 41 open and the exhaust valve 42 closed so that the pressure is held in the cylinder 13.

The means for holding the front end of the lever 14 in its operated position is here shown as a rotary brake drum 73 mounted on the frame and connected to the pedal by suitable means, as a pinion 74 rotatable with the drum and meshing with a rack 75 which is pivoted at 76 to the arm 35 of the pedal.

This locking mechanism further includes a brake shoe 77 coacting with the brake drum and carried by a sliding stem 78 mounted in a diaphragm chamber 79 having a diaphragm 80 therein acting on the stem. The pressure side of the diaphragm chamber 79 is connected by a pipe 81 to the pipe 72. Therefore, when the push button 62 is depressed, air will also enter the diaphragm chamber 80 to press the shoe 77 against the brake drum at the same time that the diaphragm 69′ and the diaphragm 66 are operated to hold the valves 41, 42 and 59, 60 in their operated positions. The drum 73 and pinion 74 are mounted upon a suitable spindle 85 carried between two bracket arms 86 suitably supported on the frame of the machine and the brake shoe 77 is also suitably supported by said bracket arms 86. The rack 75 is held from displacement by a pin or roller 87 carried by one of the bracket arms and spaced apart from the periphery of the pinion, this pin or roller bearing on the rear side of the rack opposite the point where the rack meshes with the pinion. Thus, the rack is free to swing during the movement of the rock arm 35.

Upon the opening of the exhaust valve 72^b by the lever 72^a, the air from all the diaphragm chambers will be exhausted permitting the press to open.

In operation, the operator after arranging the work on the buck, may hold onto the garment to prevent it from becoming disarranged while he is closing the head down on the buck by depressing the pedal 10, this being the usual operation in pedal operated garment pressing machines. After the head has been thus brought down onto the work, the operator then turns his foot sidewise rocking the shaft 39 to open the intake valve 41 and close the exhaust valve 42 permitting air to enter the cylinder 13 and actuate the piston on its power stroke. During the movement of the piston on its out stroke, the operator, due to the reaction of the piston on the pedal through the lever 14, can determine the amount of pressure and when the desired amount of pressure is obtained, can turn his foot and the pedal plate in the opposite direction discontinuing the flow of fluid to the cylinder, or he may hold the pedal plate in the position to which he has operated it and thus hold the pressure. If however, he desires to maintain the pressure for a relatively long time, he depresses the push button 62 and thus locks the press closed. To open the press after it is locked closed,

he operates the lever 72ª to exhaust the air from all the diaphragm chambers.

By my invention, a machine is provided in which the work is performed by power but the personal element of the foot operated machine determining the amount of pressure delivered, is maintained in the power machine.

What I claim is:

1. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator and a differential motion transmitting member common to the pedal and the power actuator whereby the force of the actuator is transmitted to the pedal against the foot of the operator, and operator-operated means for controlling the operation of the power actuator.

2. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator, a lever pivoted at one end to the actuator, the pedal being mounted on the other end of the lever, and a motion transmitting member connected to the lever between the pedal and the actuator, connections between said member and the movable element, to transmit the movement of the lever to the movable element and operator-operated means for controlling the movement of the power actuator.

3. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a downwardly movable pedal and a downwardly movable power actuator, a lever pivoted at one end to the actuator, the pedal being mounted on the other end of the lever, and a motion transmitting link pivoted to the lever between the pedal and the actuator, connections between the link and the movable element, and means for controlling the actuation of the power actuator.

4. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a downwardly movable pedal, a downwardly movable actuator, a lever pivoted at one end to the actuator, the pedal being mounted on the other end of the lever, and a motion transmitting member connected to the lever between the ends thereof, connections between said member and the movable element to transmit the movement of said member to said element, power means for the actuator comprising a cylinder and a piston movable in the cylinder and connected to the actuator, and means for controlling the flow of motive fluid to and from the cylinder.

5. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator and a differential motion transmitting member between the pedal and the power actuator, whereby the force of the actuator is transmitted to the pedal against the foot of the operator, and means for controlling the actuation of the power actuator including a control member fixed from movement with the pedal, an operating member carried by the pedal, and connections between the operating member and the control member.

6. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator, and a differential motion transmitting member connected to the pedal and the power actuator, whereby the force of the actuator is transmitted to the pedal against the foot of the operator, the pedal including a movable pedal member having a lateral movement relatively to its normal downward movement, means controlling the actuation of the power actuator including a control member fixed from movement with the pedal, and a part connected to the control member and to the movable pedal member to be actuated by the lateral movement of said pedal member.

7. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal member, a power actuated member, motion transmitting means between the pedal member and the power actuated member and the movable pressing element including a differential element common to both members, either one of said members being operable to partly close the press and the other being operable to completely close the press thereafter, and means for controlling the actuation of the power actuated member.

8. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator and a differential motion transmitting member connected to the pedal and the power actuator whereby the force of the actuator is transmitted to the pedal against the foot of the operator, connections between the differential member and the movable pressing element, and means for holding the pedal depressed against the force of the actuator acting against it and locking the press closed.

9. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator, and motion trans-

mitting means between the pedal and the power actuator and the movable element, including a differential motion transmitting member to transmit the motion of the power actuator to the pedal against the foot of the operator, connections between the differential member and the movable element and means for controlling the operation of the power actuator.

10. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator and a differential motion transmitting member connected to the pedal and to the power actuator whereby the force of the actuator is transmitted through the pedal against the foot of the operator, connections between the differential member and the movable pressing element, means for locking the press closed, and means for controlling the operation of the power actuator and the locking means.

11. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator, and a differential motion transmitting member between the pedal and the power actuator whereby the force of the actuator is transmitted through the pedal against the foot of the operator, connections between the differential member and the movable pressing element, means for controlling the operation of the actuator, and operator controlled means for holding the actuator in its operated position assumed when the press is closed and locking the pedal in its depressed position.

12. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator, and a differential motion transmitting member between the pedal and the power actuator whereby the force of the actuator is transmitted through the pedal against the foot of the operator, connections between the differential member and the movable element, operator controlled means for holding the actuator in its operated position assumed when the press is closed, means for locking the pedal in its depressed position, and a single manual for controlling the operation of the actuator holding means and the pedal locking means.

13. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator, and a differential motion transmitting member between the pedal and the power actuator whereby the force of the power actuator is transmitted through the pedal against the foot of the operator, means for controlling the actuation of the actuator, said controlling means including a part movable with the pedal and the pedal including a member movable by the foot of the operator to operate said controlling means, and a manual control means for locking the former control means in its operated position.

14. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, a power actuator, and a differential motion transmitting member between the pedal and the power actuator whereby the force of the power actuator is transmitted through the pedal against the foot of the operator, means for controlling the actuation of the actuator, said controlling means including a part movable with the pedal and the pedal including a member movable by the foot of the operator to operate said controlling means, manually controlled means for locking the former control means in its operated position, means for locking the pedal in its depressed position, and connections between the pedal locking means and the manually controlled means for operating the pedal locking means when the manual means is operated to control the locking of the control means for the actuator.

15. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, an actuator, and a differential motion transmitting member between the pedal and the actuator whereby the force of the actuator is transmitted through the pedal against the foot of the operator, a fluid operated motor for driving the actuator, valve means movable with the pedal for controlling the flow of motive fluid to and from the motor, an operating member associated with the pedal for operating the valve means, fluid operated means for locking the valve means in its operated position, manually operated valve means for controlling the flow of motive fluid to said locking means, pressure operated means associated with the second valve means for locking the valves thereof in their operated position, and a manually operable normally closed exhaust valve connected to the pressure operated locking means.

16. In a pressing machine, cooperating pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a pedal, an actuator, and a differential motion transmitting member between the pedal and the actuator whereby the force of the actuator is transmitted through the pedal against the foot of the operator, a fluid operated motor for driving the actuator, valve means movable with the pedal for controlling the flow of

motive fluid to and from the motor, an operating member associated with the pedal for operating the valve means, fluid operated means for locking the valve means in its operated position, manually operated valve means for controlling the flow of motive fluid to said locking means, pressure operated means associated with the second valve means for locking the valves thereof in their operated position, a pressure operated lock for holding the pedal in its depressed position, said pedal locking means being connected to the second valve means, and a normally closed manually operable exhaust valve connected to said pressure operated locking means and common to all of them.

17. In a garment or laundry 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; a rack bar connected with said operating mechanism; a gear operated by the rack bar; a brake drum operated by the gear; a friction brake for engaging said drum to hold the press closed under pressure; and means for operating the brake to engage the drum.

18. In a garment or laundry 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 including a pedal and motion transmitting means between the pedal and the movable pressing element for transmitting force from the pedal to the movable pressing element to close the press; a brake drum connected to and rotated by the pedal during movement thereof; and a brake coacting with the brake drum and operable to lock the pedal and to hold the press closed.

19. In a garment or laundry pressing machine in combination cooperative pressing elements, one of which is movable with respect to the other to open and close the press; actuating mechanism for the movable pressing element; a pedal; a motor; means comprising a differential lever connecting both the pedal and the motor to the actuating mechanism; said pedal normally moving, as a unit, with the differential lever and operable to have relative movement to said lever; and means operated by movement of the pedal relative to said differential lever for controlling the supply of power to the motor.

In testimony whereof, I have hereunto signed my name, at Syracuse, in the county of Onondaga, and in the State of New York, this 27th day of February, 1928.

ERNEST DAVIS.