Nov. 26, 1935. G. S. BALDWIN 2,022,176

PRESSING MACHINE AND ELEMENT

Filed Jan. 4, 1934 2 Sheets-Sheet 1

FIG.-1

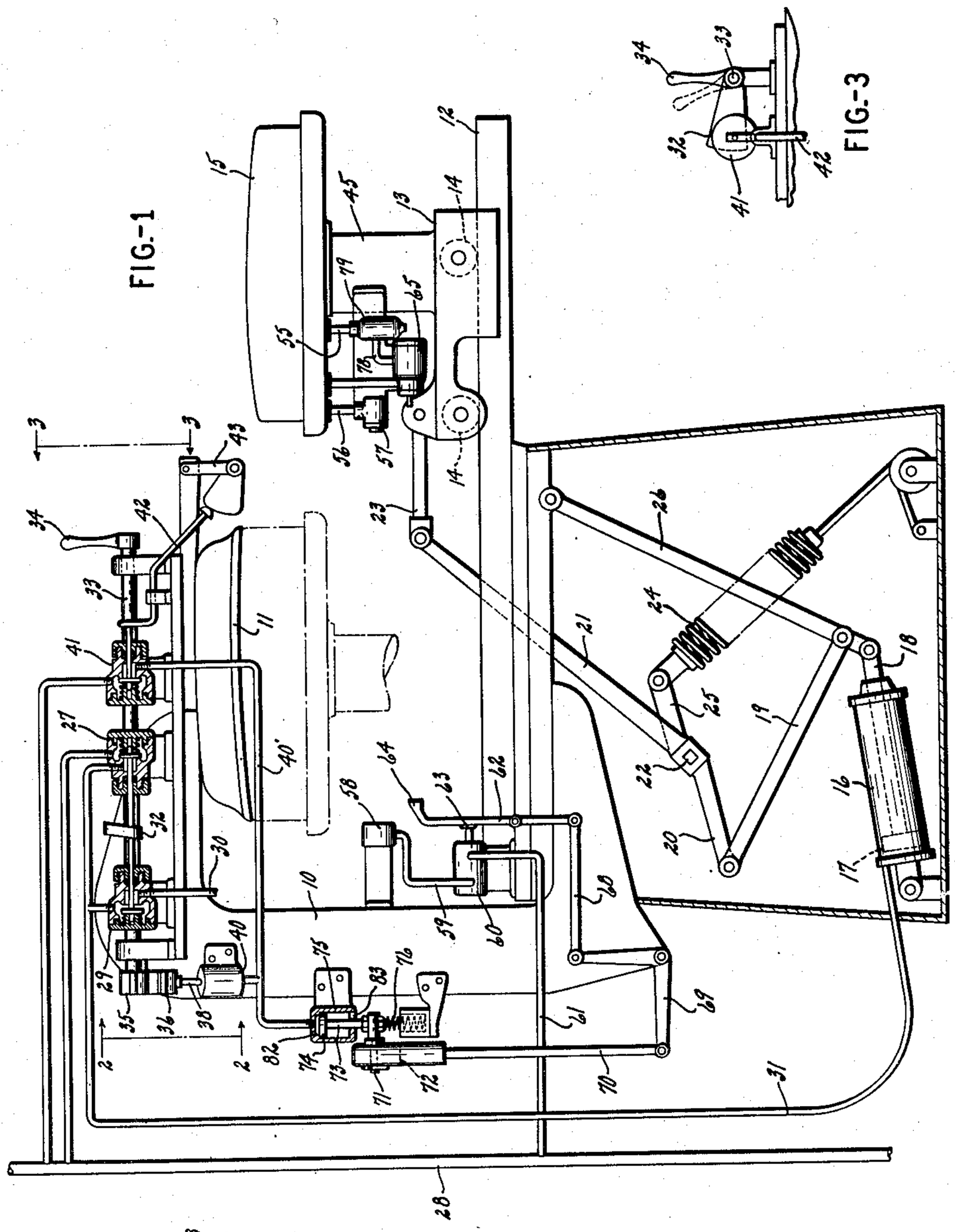
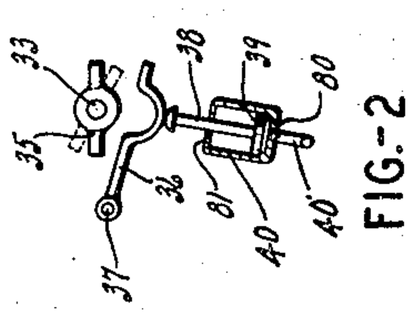


FIG.-3

FIG.-2



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Filed Jan. 4, 1934 2 Sheets-Sheet 2

FIG.-4

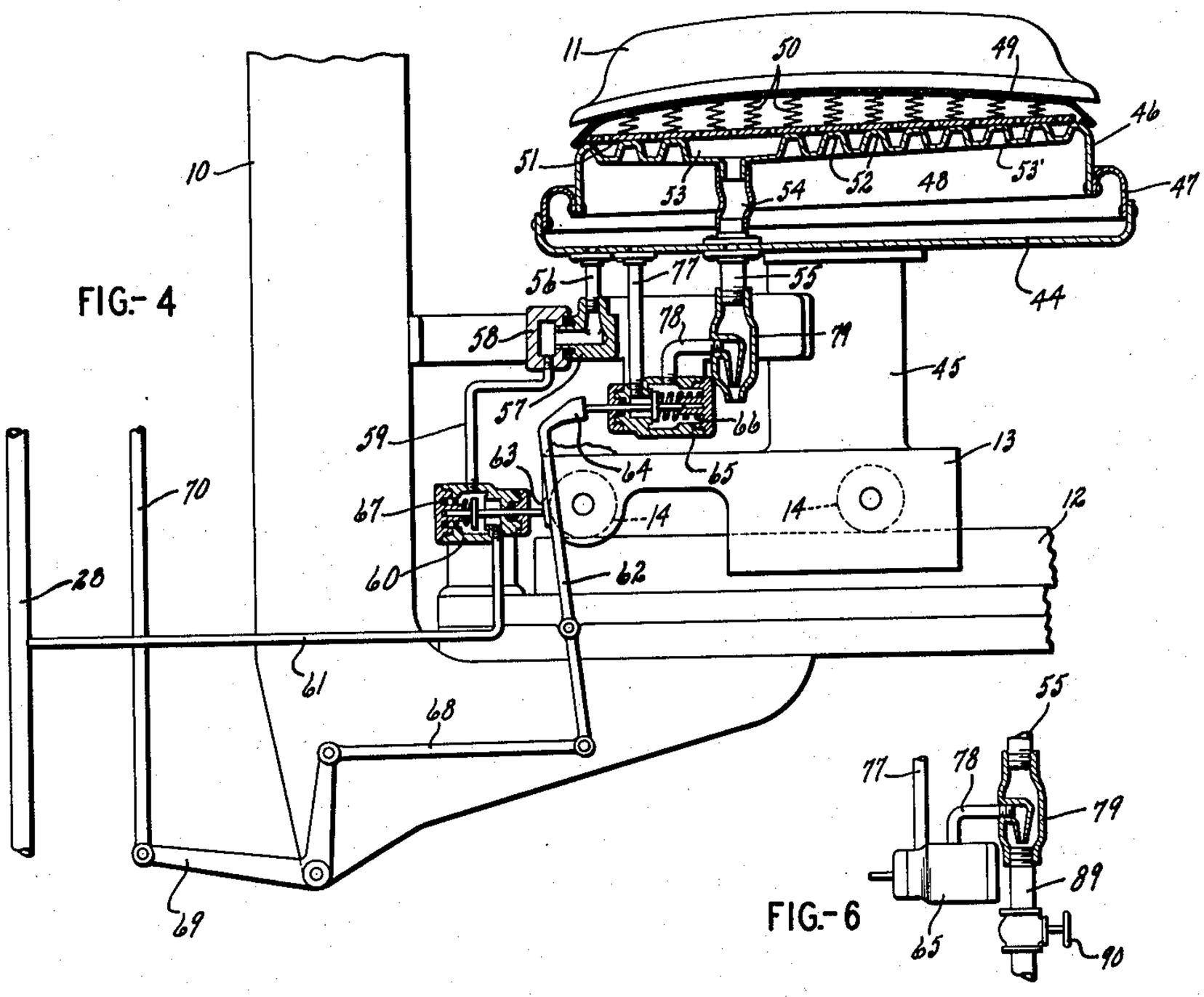
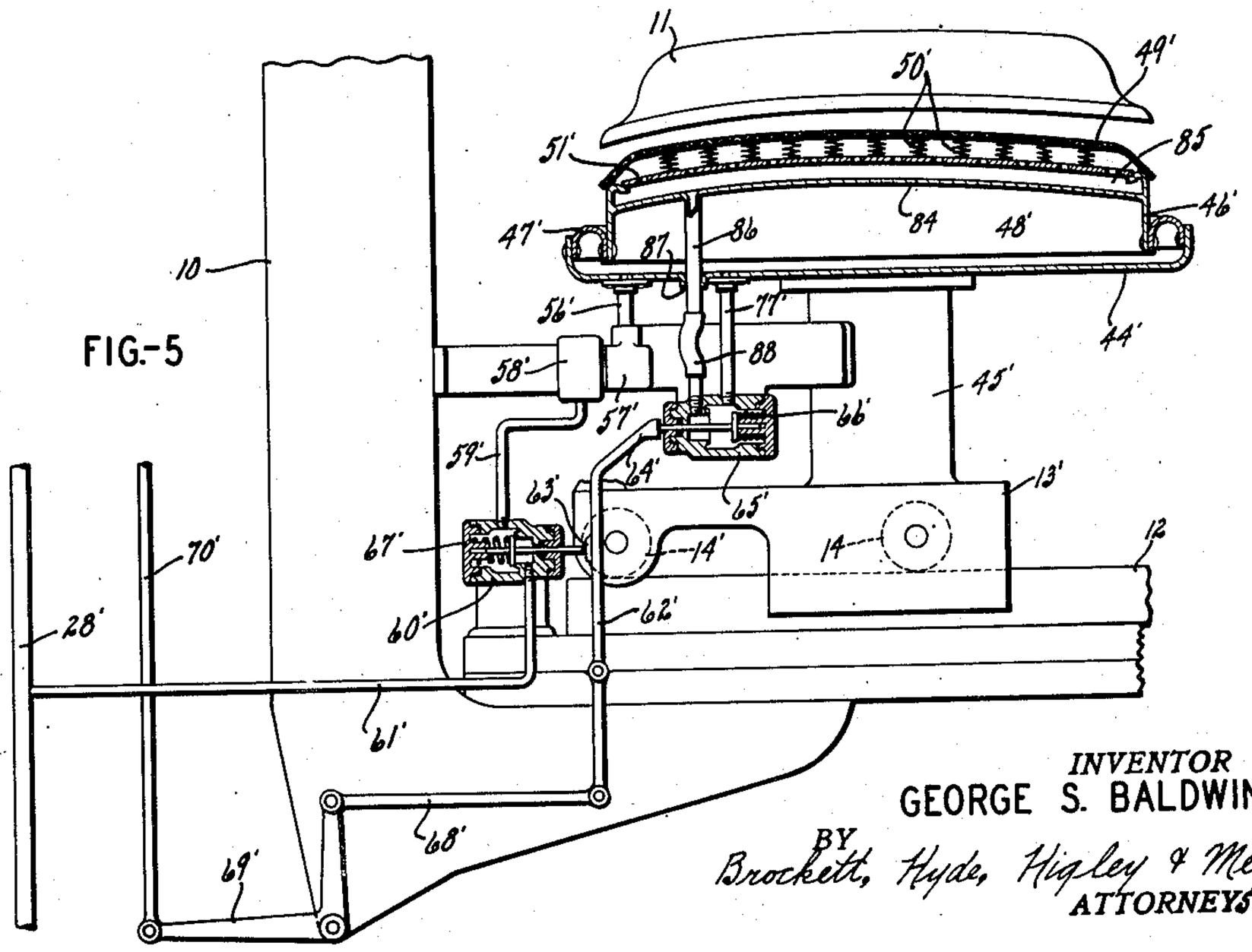


FIG.-6

FIG.-5



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2,022,176

PRESSING MACHINE AND ELEMENT

George S. Baldwin, Cleveland Heights, Ohio, assignor to The American Laundry Machinery Company, Cincinnati, Ohio, a corporation of Ohio

Application January 4, 1934, Serial No. 705,275

10 Claims. (Cl. 68—9)

This invention relates to a pressing machine and particularly one involving a pressing element which is expansible by fluid pressure.

An object of the invention is to provide means for creating a flow of air through the cover of an expansible element by the use of the fluid exhausted from the element.

Another object of the invention is to provide means for creating such a current flow through a pressing element either outwardly or inwardly through the cover.

Another object of the invention is to provide appropriate control means in a pressing machine embodying my improved expansible element whereby the element may be suitably operated when incorporated in a pressing machine.

Further objects and advantages of my improved pressing element will be understood by those skilled in the art from the accompanying specification together with the drawings, in which Fig. 1 is a side elevation of a pressing machine embodying the novel pressing element with certain portions of the control mechanism in section to more clearly indicate the structure involved; Figs. 2 and 3 are partial views along similarly numbered lines of Fig. 1; Fig. 4 is an enlarged view partly in section of the pressing element of Fig. 1 with the element in its pressing position; Fig. 5 is a view similar to Fig. 4 of a modified form of the pressing element; while Fig. 6 is a detail view partly in section of a modification of the pressing element shown in Fig. 4.

My invention comprises in general a fixed pressing head and a pressing bed expansible by fluid pressure and movable into and out of registration with the head. These pressing elements are embodied in a machine provided with a fluid piston motor for moving the bed into and out of registration and with automatic control means for the supply and exhaust of fluid pressure to and from the expansible element whereby the said element is moved into and out of pressure engagement with the head. Various devices are illustrated for utilizing the exhaust fluid when the expansible element is deflated in order to cause a flow of current through the cover of the pressing bed. In Fig. 4 the parts are arranged to create a suction through said cover. In Fig. 5 the fluid exhausted from the expansible member is passed outwardly through the cover of the pressing bed, while Fig. 6 represents a modification wherein at the will of the operator the flow through the bed cover may be easily changed from suction to pressure as desired. The control mechanism for carrying out these various operations is so arranged that the control for deflating the bed, so as to disengage the pressing surfaces, and the control mechanism for moving the bed out of registration may be actuated simultaneously, but the mechanism for moving the bed out of registration is arranged so that its effect is delayed until after the pressing bed has moved out of engagement with the head.

My improved pressing element is herewith illustrated as embodied in a pressing machine of the general type illustrated, described and claimed in the copending application of George W. Johnson, Serial No. 693,957, filed October 17, 1933, but it will be understood that many of the improved features here disclosed may be utilized in other forms of pressing machines without departing from the spirit of my invention.

The pressing machine illustrated comprises frame members 10 supporting a fixed pressing head 11 and substantially horizontally disposed rails 12 upon which a carriage 13 is adapted to move along rollers 14. The carriage supports an expansible pressing bed 15 and power means is supplied for moving the bed into and out of registration with the head. The power means illustrated comprises a piston motor 16 having a piston 17 and piston rod 18 which is connected by link 19, cranks 20 and 21 pivoting about shaft 22, and link 23, which is pivotally connected to the carriage. It will be evident from an inspection of Fig. 1 that the introduction of fluid pressure behind piston 17 will move the piston forwardly or to the right as seen in Fig. 1, which in turn will cause the pressing bed to move rearwardly or to the left into registration with the pressing head. The piston motor 16 is mounted in trunnions to permit of this motion. When fluid pressure is exhausted from the piston motor the bed is returned to its forward position by spring 24 acting through crank 25 connected to shaft 22. The link 26 serves to support a large proportion of the weight of the piston motor and link 19.

The supply of fluid pressure to the piston motor 16 is controlled by a normally closed inlet valve 27 communicating with a source of fluid pressure 28 and an outlet valve 29 communicating with an exhaust conduit 30. Both inlet and outlet valves communicate with the piston motor by a common flow and exhaust conduit 31. Valves 27 and 29 are actuated by a cam 32 lying between the two valve stems, the cam being rotatable by means of shaft 33 upon actuation of the manual control member 34. The relationship of the control member and the cam is clearly shown in Fig. 3. When

the control member 34 is actuated to its broken line position of Fig. 3 the exhaust valve 29 is closed and the inlet valve 27 is opened, thus admitting fluid pressure to the piston motor for moving the bed toward registering position. On the rear end of shaft 33 is a flanged collar 35 which lies in the broken line position of Fig. 2 when the control member 34 has been actuated. For returning the control valves to their initial position to exhaust the piston motor the flanged collar 35, and thereby shaft 33, is returned to its full line position of Fig. 2 by means of an arm 36 pivotally mounted at 37 and moved by a plunger 38 connected with piston 39 in a release cylinder 40. The piston 39 is actuated by a flow of fluid pressure from the supply line 28 or other suitable source of fluid pressure by way of release valve 41 which is shown mounted in line with valves 29 and 27 and arranged to be actuated by a push rod 42 which in turn is actuated by a finger guard 43 which depends in a freely swingable manner before the pressing head. This finger guard 43 is in a position to be moved toward the rear by the operator's hands if they should accidentally be lying upon the bed as it moves toward its pressing position. The guard is also used to release the pressing members at the close of the pressing operation at the will of the operator.

The pressing bed shown in Fig. 1 is shown in greater detail in Fig. 4. The bed is shown as comprising a base portion 44 mounted on the carriage 13 by a pedestal 45 or in any other suitable manner. A movable portion 46 is connected with the base portion by a continuous flexible strip 47 which permits relative movement in a substantially vertical direction between the portions 44 and 46 when fluid under pressure is introduced into the space or chamber 48 formed by the cooperation of these portions. The pressing element illustrated in Fig. 4 comprises a pervious cover 49 mounted upon a spring padding 50 which rests upon a perforated plate 51 which in turn is supported on projections 52 which extend upwardly from the bottom 53' of a drainage chamber 53. Vapor and condensate which is often formed as the result of a pressing operation is thus permitted to drain through the perforated plate into the drainage chamber and a drainage connection 54 leads through the expansible chamber 48 and through the base member 44 to an outlet 55. The parts are so arranged as to permit the expansion of the pressing bed without breaking the conduit connection 54. The inlet of fluid pressure to chamber 48 is by way of conduit 56 which communicates with a coupling member 57 associated with the bed carriage. A coacting coupling member 58 is mounted on the frame in position to receive the coupling member 57 when the bed moves into registering position. Pressure is then supplied through conduit 59, valve 60 and conduit 61, which is illustrated as communicating with the source of fluid pressure 28, although other suitable source might be used. Valve 60 is arranged to be opened automatically when the bed moves into registering position. The arrangement illustrated comprises a lever 62 pivoted to the frame and engaging the stem of valve 60 at 63 and engaging a portion of the carriage at the upper end 64 of the lever. In this particular instance the lever engages the stem of a valve 65 whose purpose will be later described and the spring 66 of this latter valve is stronger than the spring 67 associated with valve 60 so that the parts may be moved into the position shown in Fig. 4 when the bed reaches registering position. The lower end of lever 62 is connected by link 68, bell crank 69 and link 70 with a pin 71 which engages a slot 72 in the upper end of link 70. Pin 71 in turn is rigidly secured to the piston rod 73 of a piston 74 which reciprocates in a cylinder 75 secured to the frame. A spring 76 normally biases the piston toward its upward position. The cylinder 75 may conveniently be supplied with actuating pressure from the same conduit 40' which furnishes the actuating pressure for cylinder 40.

The exhaust of fluid pressure from the expansible pressing bed is accomplished in the following manner:—

When the parts were moved into the position of Fig. 4 which admits fluid pressure to the expansible pressing bed the link 70 was moved upward, which raised the lower portion of slot 72 substantially into engagement with pin 71. At the close of the pressing operation the operator swings finger guard 43 to the rear, which actuates release valve 41 and admits fluid pressure into conduit 40' thence into cylinder 75, causing piston 74 to move downward, whereupon pin 71 engages link 70 and through the connecting parts rotates lever 62 in a clockwise direction, thus closing valve 60 and opening valve 65. The exhaust of fluid pressure from chamber 48 then follows through conduit 77, valve 65, conduit 78, and ejector 79. The escape of fluid under high pressure through the ejector creates a suction through conduit 54, chamber 53 and cover 49, thus creating a current of air inwardly through the work which has been pressed and through the cover. Also, any vapor or condensate in the drainage chamber 53 will thus be evacuated through conduit 54 and thrown out by the ejector where it may be disposed of in any manner desired.

Upon inspection of Figs. 1 and 2, it will be noted that cylinder 40 has a small opening 80 at its lower end and another small opening 81 at its upper end, while cylinder 75 has a small opening 82 at its upper end and a large opening 83 at its lower end. The purpose of this construction is to permit the operator to actuate both control cylinders simultaneously by movement of the finger guard which admits fluid pressure through valve 41 into conduit 40', but to delay the return of the pressing bed to its forward position until the bed has deflated out of pressure engagement with the head. Some such arrangement is necessary to avoid disturbing the lay of the work after the pressing operation. It will be apparent that the movement of piston 39 upwardly will take place slowly as the pressure in the upper portion of the cylinder is evacuated through opening 81. At the same time, the action of piston 74 will take place rapidly as the opening 83 is insufficient to impede the movement of this piston in any appreciable degree.

The modification shown in Fig. 5 is similar to that shown in Fig. 4, and so far as the construction is similar the parts are similarly numbered with a prime suffix. It will be noted that partition 84 and chamber 85 are arranged in a slightly different manner, but the other parts are substantially similar except that a conduit 86 communicating with chamber 85 is mounted in a manner to permit sliding movement at a joint 87 where the conduit passes through the wall of the base member 44. The necessary flexibility to permit the expansion of the pressing bed upon introduc-

tion of fluid pressure to chamber 48' is supplied by flexible member 88 which connects the conduit 86 to the exhaust valve 65'.

The operation of the modification shown in Fig. 5 will be easily understood when taken in connection with the explanation of the operation of the form shown in Fig. 4. When the bed moves into pressing position, lever 62' is rotated counterclockwise by the engagement of the stem of valve 65' with the upper end 64' of the lever which opens valve 60' and admits fluid pressure from supply conduit 28' through conduit 61', 59' and coupling members 58', 57' and conduit 56' to the expansible chamber 48'. Upon completion of the pressing operation the link 70' is moved downwardly in the manner described in connection with Fig. 4 and through the connecting linkage rotates lever 62' in a clockwise direction, thus closing valve 60' and opening valve 65'. The fluid in chamber 48' is then exhausted through conduit 77', valve 65', conduit 86 and chamber 85 through perforated plate 51' and cover 49'.

The fluid used with the modification of Fig. 5 will normally be untreated air but it will be understood that treated air embodying substances which it is desired to blow through the garment after the pressing operation might be used in the expansible chamber and thereafter be exhausted through the cover of the pressing element in the manner just described.

The modification of Fig. 6 adds to the ejector 79 of Fig. 4 a means of closing the ejector outlet at the will of the operator which in the form shown comprises a conduit 89 and a valve 90. It will be apparent that with the valve 90 open, the functioning of the device will be the same as that described in connection with Fig. 4, but upon closing the valve 90 the exhaust fluid will move in the opposite direction through ejector 79 and pass through conduit 55, conduit 54, chamber 53 and cover 49 in a manner similar to the operation of the modification shown in Fig. 5.

What I claim is:

1. In a press of the class described, the combination of an expansible bed movable into and out of registration with a fixed head, power means for moving said bed, means for the supply and exhaust of fluid under pressure to and from said expansible bed when in registering position to move the pressing surface of said bed toward and away from said head, control mechanism for each of said means, means for simultaneously actuating the control mechanism for said power means in out-of-registration direction and the control mechanism for said fluid supply and exhaust means in exhaust direction, and said mechanisms being so constructed that the control effect on said power means is delayed until after the effect upon said fluid exhaust means.

2. A pressing element comprising a chamber expansible by fluid pressure, a separate pressing face including a pervious cover carried by one wall of said chamber for movement toward a cooperating single element, means for the supply and exhaust of fluid under pressure to and from said chamber, and means for creating a flow of air through said cover by fluid exhausting from said chamber.

3. A pressing element comprising a chamber expansible by fluid pressure, a separate pressing face including a previous cover carried by one wall of said chamber for movement toward a cooperating pressing element, means for the supply and exhaust of fluid under pressure to and from said chamber, and means for creating a suction through said cover by fluid exhausting from said chamber.

4. A pressing element comprising a chamber expansible by fluid pressure, a separate pressing face including a pervious cover carried by one wall of said chamber for movement toward a cooperating pressing element, means for the supply and exhaust of fluid under pressure to and from said chamber, and means for causing fluid exhausted from said chamber to flow through said cover.

5. A pressing element comprising a chamber expansible by fluid pressure, a separate pressing face including a pervious cover carried by one wall of said chamber for movement toward a cooperating pressing element, and means for the supply and exhaust of air under pressure to and from said chamber and for exhausting air from said chamber through said cover.

6. A pressing element comprising a chamber expansible by fluid pressure, a separate pressing face including a pervious cover carried by one wall of said chamber for movement toward a cooperating pressing element, means for the supply and exhaust of air to and from said chamber, and means for alternatively blowing said exhaust air through said cover or for causing a suction through said cover by said exhaust air at the will of the operator.

7. A pressing element comprising a pressing face having a pervious cover, a drainage chamber communicating therewith for receiving vapor and/or condensate formed during a pressing operation, a second chamber supporting said drainage chamber and pressing face, said second chamber being expansible by fluid pressure to move said pressing face toward a cooperating pressing element, means for the supply and exhaust of fluid to and from said expansible chamber, and means for evacuating vapor and/or condensate from said drainage chamber by exhaust fluid from said expansible chamber.

8. In a press of the class described, the combination of an expansible bed movable into and out of registration with a fixed head, said bed having an expansion chamber and a pressing face spaced from a wall of said chamber and movable with said wall, said face comprising a pervious cover, power means for moving said bed, means for the supply of fluid under pressure to said expansion chamber when said bed is in registering position to move the pressing surface of said bed toward said head, a device for causing a flow of air through said cover by the exhaust of said fluid, means for exhausting fluid from said bed, control mechanism for each means, and means for simultaneously actuating all of said mechanism.

9. In a pressing machine, a pair of coacting relatively movable pressing members, one of said members comprising a chamber expansible by fluid pressure and a pressing surface carried on the outer face of a wall of said chamber, said surface including a pervious cover, means for relatively moving said pressing members into and out of coacting position, means for supplying fluid under pressure to said chamber when said members are in coacting position whereby to carry said pressing surface into engagement with the coacting member, and means for causing a flow of air through said cover by fluid exhausting from said chamber.

10. In a pressing machine, a pair of coacting relatively movable pressing members, one of said members comprising a chamber expansible by fluid pressure and a pressing surface carried on

the outer face of a wall of said chamber, said surface including a pervious cover, means for relatively moving said pressing members into and out of coacting position, means for supplying fluid under pressure to said chamber when said members are in coacting position whereby to carry said pressing surface into engagement with the coacting member, exhaust means for said fluid including conduit means for causing a flow of air through said cover by fluid exhausting from said chamber, a normally closed valve in said conduit means, and means for opening said valve upon initiation of movement of said members out of coacting position.

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