April 14, 1931. E. DAVIS 1,800,680

ACTUATING MECHANISM FOR PRESSING MACHINES

Filed Aug. 18, 1928

Fig. 1.

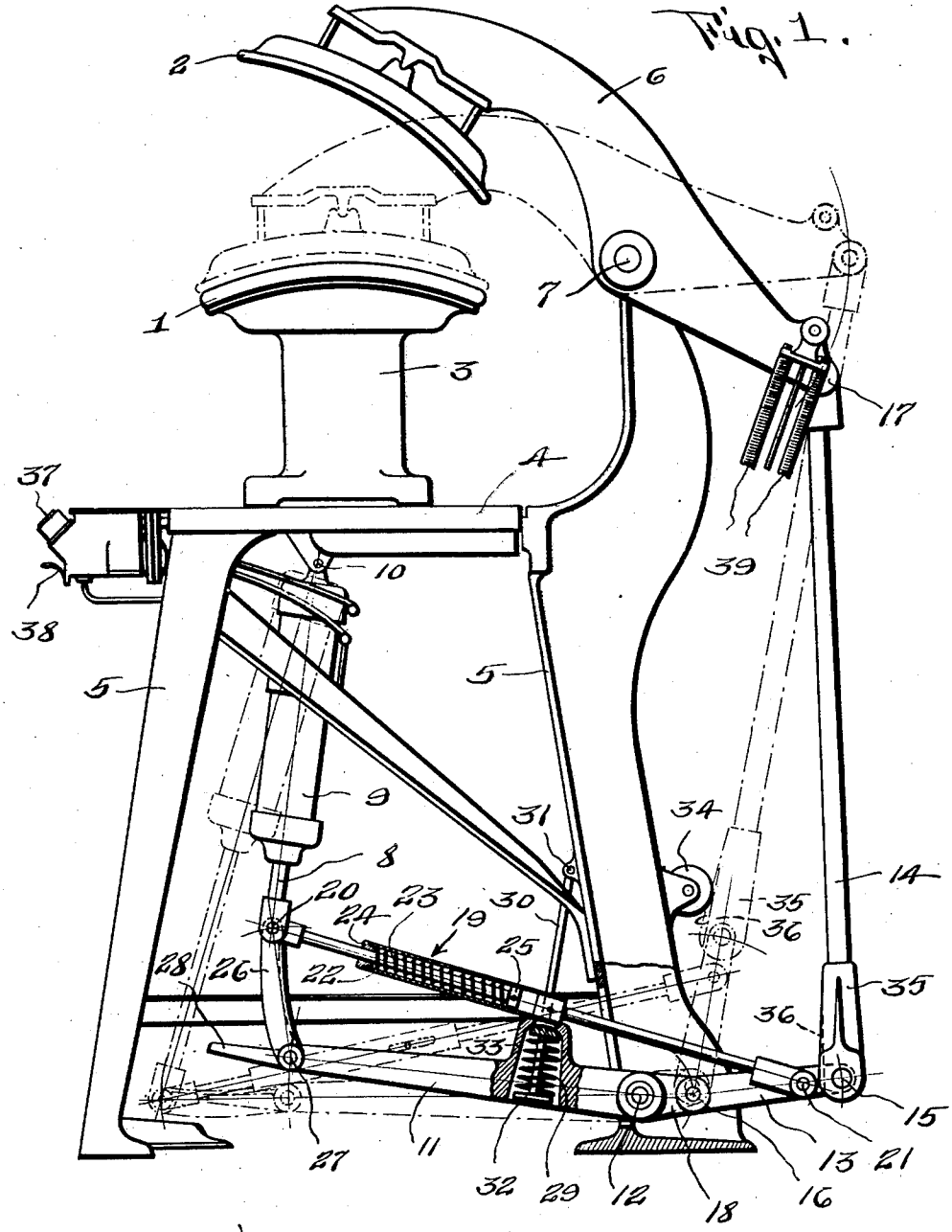
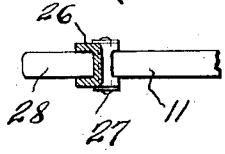


Fig. 2.



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UNITED STATES PATENT OFFICE

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ACTUATING MECHANISM FOR PRESSING MACHINES

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This invention relates to pressing machines or other machines having an opening and closing movement as garment and laundry pressing machines and has for its object, a particularly simple and economical actuating mechanism by which the press is closed with a comparatively quick movement and the expenditure of little power and heavy or final pressure applied with a long leverage movement and a short movement of the movable element or head.

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 drawing in which like characters designate corresponding parts in all the views.

Figure 1 is a side elevation, partly in section, partly broken away of a machine embodying this invention.

Figure 2 is a cross sectional view through the link connecting the piston rod and the intermediate lever, the contiguous part of the lever being shown.

This invention comprises generally, a pressing machine comprising cooperating pressing elements, one of which is movable toward and from the other and mechanism for actuating the movable element including a toggle which moves from folded into straightened position to close the press and which thrusts bodily endwise as a unit to apply final or heavy pressure, a lever to which one of the links of the toggle is pivoted, a reciprocating actuator and connections between the actuator and the toggle and between the actuator and the lever to successively straighten the toggle to close the press and actuate the lever to apply final pressure and to open the press in the reverse order.

The machine here illustrated is a conventional pressing machine including a buck 1, a head 2 movable toward and from the buck, the buck being carried by the usual bracket or goose neck 3 which in turn is mounted upon a table 4 supported by suitable framing 5. The head 2 is carried by a press lever or yoke 6 pivoted at 7 between its ends to the frame and carrying the head at its front end.

The actuating mechanism includes a reciprocating actuator as a piston rod 8, the piston of which is movable in a cylinder 9 pivoted at 10 to the frame to have an oscillating movement during the reciprocation of the piston rod 8.

The actuating mechanism in addition, comprises an intermediate motion transmitting lever 11 pivoted at 12 between its ends to the base of the frame, a toggle consisting of links 13 and 14 pivoted together at 15, the link 13 being pivoted at 16 to the lever 11 and the link 14 at 17 to the rear arm of the yoke lever 6 and connections between the actuator 8 and the toggle and the lever to operate the toggle and the lever 11 in succession.

The lever 11 is pivoted near its rear end so that its rear arm 18 is short compared with its front arm. The connections between the actuator 8 and the toggle comprises a link 19 pivoted at 20 to the piston rod and at 21 to the toggle or the link 13 thereof, this link 19 being extensible and having yielding means as a spring for resisting extension thereof. As here shown, it comprises two rods or sections arranged end to end, one rod having a barrel 22 in which the other rod telescopes and a spring 23 is located in the barrel between the head 24 at the outer end of the barrel and a collar 25 at the inner end of the rod telescoping into the barrel.

The connections between the actuator or the piston rod 8 and the lever 11 comprises a link 26 pivoted at 20 to the piston rod and at 27 to the front end of the lever. The parts are normally arranged so that the actuator 8 and link 26 are arranged at an angle when the press is open and the toggle unfolded. The link 26 is connected to the lever 11 to form a stop joint when the link moves into alinement with the lever 11 to form a forward extension thereof. The link is here shown as U shaped in cross section with its lower end arranged astride the lever 11 and when the link 26 comes in line with the lever 11, the bottom of the U shaped formation rests on an extension 28 of the lever and forms a stop joint to limit the movement of the link 26 relatively to the lever. The movement of the lever 11 is pre-

vented during the folding of the toggle toward a straight line by a spring 29, this spring being here shown as encircling a rod 30 pivoted at 31 to the frame 5 and extending through the lever 11, the spring being interposed between a collar 32 on the rod 30 and an abutment on the lever. As here shown, the lever is formed with a housing 33 which encloses the spring and the spring thrusts against the top of the housing.

The toggle when it reaches straightened position is limited by a stop as a roller 34 on the frame and the roller also forms a bearing during the up and down or thrust movement of the toggle when in straightened position. The roller 34 as here shown engages a part 35 at the lower end of the link 14 and the lower end of said part 35 and the roller coact to guide the link 14 during its up and down movement. As here shown, the part 35 is formed with a lengthwise groove 36 which forms a track for the roller 34.

The flow of motive fluid as air to and from the cylinder is controlled in any suitable manner as by a push button 37 and a release lever 38. The piston is single acting and the press is opened when the fluid, as air, is exhausted from the cylinder by countersprings 39.

In operation, during the downward movement of the piston rod 8 or the reciprocating actuator, the link 26 causes the rod 8 to swing forwardly about the pivot 10 and the forward swinging movement is transferred through the toggle to the link 19 causing the toggle to be moved from its folded position to its straightened position indicated in dotted lines. After the toggle is straightened or comes against the stop 34, the link 26 comes into horizontal alinement with the lever 11 so that during continued movement of the actuator or piston rod 8, the lever 11 is moved downwardly on its pivot 12 causing its short arm 18 to thrust the straightened toggle endwise and apply heavy pressure. The spring 23 permits endwise movement or endwise adjustment of the link 19 during the final movement of the link 26 into alinement with the lever 11 and during the power movement of the lever 11, and the spring 29 holds the lever 11 from movement until the link 26 is in line therewith. When the pressure in the cylinder 9 is released, the spring 29 reacts first as it is stronger than the spring 23 thus relieving heavy pressure and after the movement of the lever 11, the spring 23 reacts to give a starting opening impulse to the toggle and the opening is continued by the countersprings 39.

What I claim is:

1. In a pressing machine, coacting pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a lever, a toggle one of the links of which is pivoted to one end of the lever, motion transmitting means between the other toggle link and the movable pressing element, a reciprocating actuator arranged at an angle to the other end of the lever and mounted to have an oscillating movement during its reciprocating movement, a third link pivoted at its opposite ends to the actuator and to the toggle and extending in a direction lengthwise of the lever, and a fourth link pivoted to the actuator and to the adjacent end of the lever and connected to the lever to form a stop joint when said fourth link moves into a position to form an extension of the lever.

2. In a pressing machine, coacting pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a lever, a toggle one link of which is pivoted to one end of the lever, motion transmitting means between the other toggle link and the movable pressing element, a reciprocating actuator arranged at an angle to the other end of the lever and mounted to have an oscillating movement during its reciprocating movement, a link pivoted at its opposite ends to the actuator and to the toggle, lengthwise of the lever, a third link, a fourth link pivoted to the actuator and to the adjacent end of said lever and connected to the lever to form a stop joint when the fourth link moves into a position to form an extension of the lever, the third link being extensible and having means for resisting the extension thereof.

3. In a pressing machine, coacting pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a lever, a toggle one of the links of which is pivoted to one end of the lever, motion transmitting means between the other toggle link and the movable pressing element, a reciprocating actuator arranged at an angle to the other end of the lever and mounted to have an oscillating movement during its reciprocating movement, a third link pivoted at its opposite ends to the actuator and to the toggle and extending in a direction lengthwise of the lever, a fourth link pivoted to the actuator and to the adjacent end of the lever and connected to the lever to form a stop joint when said fourth link moves into a position to form an extension of the lever, and the lever having means for resisting the movement thereof during the straightening of the toggle.

4. In a pressing machine, coacting pressing elements, one of which is movable toward and from the other, mechanism for actuating the movable element including a lever, a toggle one of the links of which is pivoted to one end of the lever, motion transmitted means between the other toggle link and the movable pressing element, a reciprocating actuator arranged at an angle to the other end of the lever and mounted to have

an oscillating movement during its reciprocating movement, a third link pivoted at its opposite ends to the actuator and to the toggle and extending in a direction lengthwise of the lever, a fourth link pivoted to the actuator and to the adjacent end of the lever and connected to the lever to form a stop joint when said fourth link moves into a position to form an extension of the lever, the third being extensible, a spring resisting the extension thereof, and a spring for resisting the movement of the lever during straightening of the toggle.

5. A pressing machine including cooperating pressing elements, one of which is movable toward and from the other, means for actuating the movable element including an actuator, motion transmitting means between the actuator and the movable element including a toggle movable into straightened position to close the press, connections between the actuator and the toggle to straighten the same, a lever connected to the toggle to boost the same when straightened, connections between the lever and the actuator, and means for resisting the movement of the lever by the actuator until the toggle is straightened.

6. A pressing machine including cooperating pressing elements, one of which is movable toward and from the other, means for actuating the movable element including an actuator, motion transmitting mechanism between the actuator and the movable element including a toggle, connections between the actuator and the toggle to straighten the same, a lever connected to the toggle to boost the same when straightened, motion transmitting connections between the lever and the actuator, and means for resisting the movement of the lever by the actuator until the toggle is straightened, said means comprising a spring acting on the lever.

7. A pressing machine including coacting pressing elements, one of which is movable toward and from the other, a lever carrying the movable element, means for actuating the movable element carrying lever to close the press, including power means for successively closing the press and additionally actuating the element carrying lever after the press is closed, including a reciprocating actuator, a booster lever, connecting means between the actuator and the press element carrying lever to close the press, connections between said connecting means and the booster lever, and means for resisting movement of the booster lever until the press is closed.

8. A pressing machine including coacting pressing elements, one of which is movable toward and from the other, a lever carrying the movable element, means for actuating the movable element carrying lever to close the press, including power means for successively closing the press and additionally actuating the element carrying lever after the press is closed, including a reciprocating actuator, a booster lever, connecting means between the actuator and the press element carrying lever to close the press, connections between said connecting means and the booster lever, means for resisting the movement of the booster lever until the press is closed, and connections between the booster lever and said connecting means.

In testimony whereof, I have hereunto signed my name at Syracuse, in the county of Onondaga, and in the State of New York, this 16th day of August, 1928.

ERNEST DAVIS.