

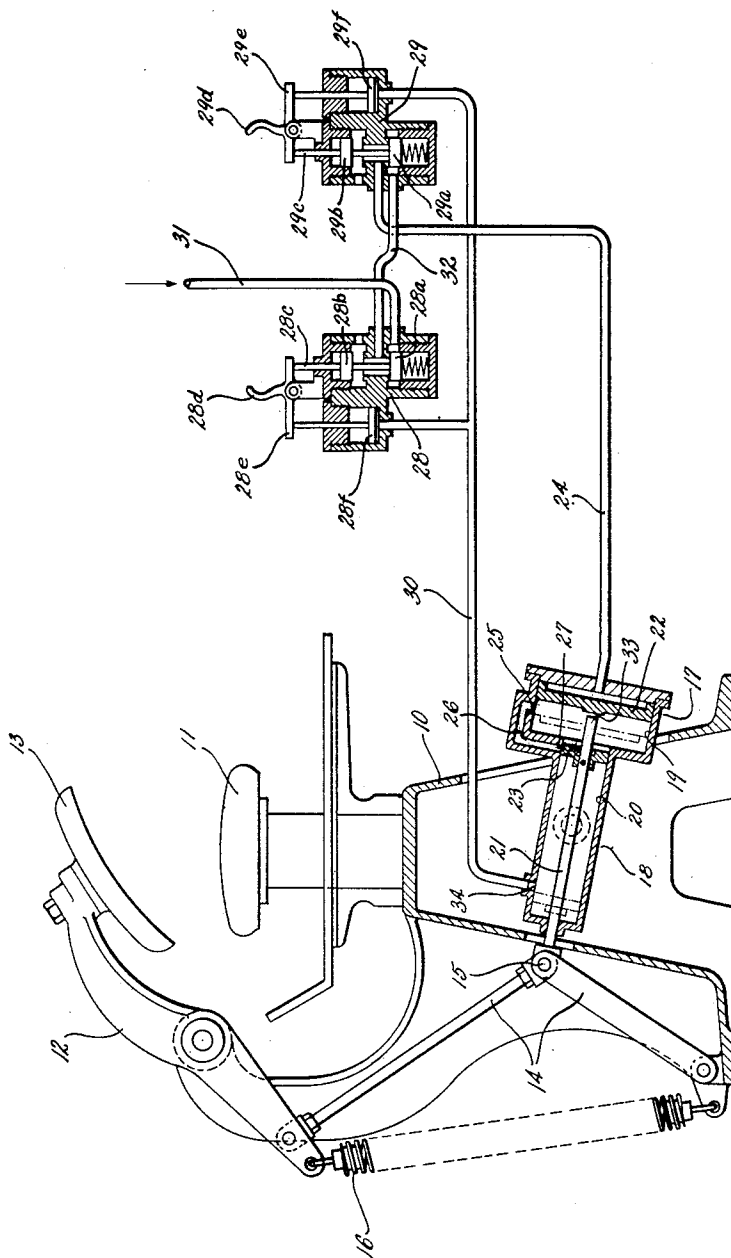
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J. M. DEWEY

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MOTOR FOR PRESSING MACHINES AND THE LIKE

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INVENTOR
JAMES M. DEWEY
BY
Brockett, Hyde, Higley & Meyer
ATTORNEYS

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MOTOR FOR PRESSING MACHINES
AND THE LIKE

James M. Dewey, Cincinnati, Ohio, assignor to
The American Laundry Machinery Company,
Norwood, Ohio, a corporation of Ohio

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This invention relates to power means for moving a body from a position of rest and more particularly to a specific arrangement of the power means to quickly overcome the inertia of a stationary body to set the same in motion.

My invention provides motors of greater and lesser power, each having operative connections with the body to be moved, means for first actuating the motor of greater power to set the body in motion, and means actuable thereafter for energizing the motor of lesser power to continue the body in motion.

Another feature of my invention is the provision of motors of greater and lesser power respectively for actuating a moving body, and means for energizing the motors sequentially, said means operating and energizing the motor of greater power first.

Another feature of my invention is the provision of motors of greater and lesser power for actuating a moving body, together with control mechanism by which the motor of greater power is actuated first to overcome the inertia of the stationary body, and means actuated by a predetermined movement of the motor of greater power for energizing the motor of lesser power.

My invention also contemplates a specific application of a two-motor arrangement as above described in the operation of a pressing machine.

Other objects and advantages of my invention include a specific arrangement of two axially aligned fluid motors with the special arrangement of their parts so that one of said fluid motors which is of greater power than the other, actuates a moving body from a position of rest and thereafter the fluid motor of lesser power is actuated to continue the body in motion.

The drawing illustrates a pressing machine shown in end elevation, certain portions being shown in section and the control mechanism being illustrated diagrammatically.

I have illustrated my invention as applied to a pressing machine of a well known type embodying a frame 10 upon which is mounted a stationary pressing bed 11. A bracket of the frame carries a pivoted head lever 12 which carries a pressing head 13 adapted to coact with the bed 11 for the pressing operation when the pressing members are engaged. For actuating the head lever I connect a pair of toggles 14 between the rear end of the head lever and a part of the frame and connect power mechanism to the knuckle 15 of the toggles for moving them from the broken position of the drawing to a straightened position to cause pressing or ironing engage-

ment between the head and bed pressing members. A spring 16 connected between the rear end of the head lever and the frame serves to bias the pressing head in the open position of the drawing.

The power means for actuating the pressing head comprises two motors, one having greater power than the other, each of the motors being operatively connected to the body to be moved, and control mechanism whereby the motor of greater power is actuated first and after a predetermined movement of this motor the motor of lesser power is energized. In the embodiment illustrated the head pressing member 13 is the body to be moved from a position of rest as shown in the drawing, the motor of greater power is indicated generally at 17 and is actuated first to overcome the inertia of the head 13 and the connected parts, and thereafter the motor of lesser power indicated generally at 18 is actuated to maintain the movement of the head until it finally engages the bed 11.

It will be obvious to any skilled mechanic that the motors 17 and 18 need not necessarily be arranged in a unitary structure as shown but might be separately constructed motors having separate connections with the body to be moved. However, in the form shown I have a very compact structure comprising a cylinder of greater diameter 19 and a cylinder of lesser diameter 20 axially aligned and rigidly connected with the two cylinders concentric. A piston rod 21 extends through both cylinders and is pivotally connected to the toggle knuckle 15 at the end near the cylinder of lesser diameter. A large piston 22 reciprocable in cylinder 19 abuts the free end of rod 21. A small piston 23 reciprocable in cylinder 20 is rigidly connected to the rod 21. It is obvious therefore that piston rod 21 performs the double duty of an operative connection between both pistons 22 and 23 and the toggles 14.

The control mechanism is arranged to operate pistons 22 and 23 successively and in order to accomplish this I have caused the energization of piston 23 to be dependent upon a predetermined travel of piston 22. This arrangement comprises the supply of motive fluid first through conduit 24 to the working face of piston 22 and an open port 25 in the wall of cylinder 19 adapted to be uncovered after a predetermined travel of piston 22 whereupon motive fluid will travel through a passageway 26 which communicates between port 25 and the working face of piston 23. In the position of the parts shown in full lines in the drawing, piston 23 covers port 27 where pas-

sageway 26 enters cylinder 20 but it will be obvious that upon movement of piston 22 to its broken line position piston 23 will have moved sufficiently to uncover port 21. Passageway 26 is shown as a cored opening in the casting which provides cylinders 19 and 20 but it will be obvious that other constructions might be used.

For safety of operation I provide a two-hand control mechanism for the supply of motive fluid to motor 17 and a means for maintaining the two-hand control mechanism in its operated position upon the completion of the power stroke of motor 18. This construction comprises a pair of valve casings 28 and 29 each housing a normally closed inlet valve 28a, 29a and a normally open outlet valve 28b, 29b mounted on common valve stems 28c, 29c and operable by manuals 28d, 29d. Each manual is also provided with a laterally extending arm 28e, 29e which engages a rod connected to a maintaining piston 28f, 29f which is supplied with pressure fluid upon completion of the stroke of motor 18 through conduit 30 which communicates with a port 34 which is uncovered by a piston 23 near the end of its power stroke. The supply of motive fluid to motor 17 is by way of conduit 31, valve casing 28, conduit 32, valve casing 29 and conduit 24.

The operation of the mechanism described with the parts in the position shown in the drawing, is as follows: The operator arranges work to be pressed upon the bed 11 and actuates manuals 28d and 29d. Both manuals must be actuated and held actuated as the release of either one will permit the exhaust of motive fluid through one of the normally open valves 28b and 29b. If both manuals are held depressed, motive fluid flows through conduits 31, 32 and 24 to the working face of piston 22 which, being of large diameter, supplies sufficient power to toggles 14 to move the weight of head member 13 and the connected mechanism rapidly from a position of rest to set the parts in motion. When piston 22 has moved to the broken line position shown, it uncovers port 25 and motive fluid is admitted to passage 26 and to the working face of piston 23. The free connection at 33 between piston 22 and rod 21 then becomes separated as piston 23 continues to travel rearwardly in cylinder 20 to continue the motion of head 13 toward the bed 11. When piston 23 reaches the broken line position indicated in the drawing, toggles 14 have been nearly straightened and the pressing members are in engagement. At this time, piston 23 has uncovered port 34 which admits motive fluid through conduit 30 beneath pistons 28f and 29f which serves to hold manuals 28d and 29d in their actuated positions, whereupon the operator may release the manuals and the supply of motive fluid to both motors 17 and 18 will be maintained. To open the press, either of the manuals is actuated against the

holding piston to open valve 28b or 29b and close valve 28a or 29a which cuts off the supply of motive fluid and exhausts both motors, whereupon spring 16 returns the parts to the position shown in full lines in the drawing.

What I claim is:

1. In a pressing machine, a pair of coaxing relatively movable pressing members, a cylinder of larger diameter, a cylinder of smaller diameter, said cylinders being axially aligned, a piston rod in said cylinders and operatively connected at its end nearer the smaller diameter cylinder with one of said pressing members, large and small pistons in said cylinders of larger and smaller diameters respectively, said small piston being rigidly connected with said rod, said large piston abutting the free end of said rod, a port in the wall of said larger diameter cylinder adapted to be uncovered upon a predetermined travel of said large piston, a passageway leading from said port to the working face of said small piston, and means for supplying motive fluid to the working face of said large piston.

2. In a pressing machine, a pair of coaxing relatively movable pressing members, a cylinder casing providing adjoining cylinders of larger and smaller diameters concentric and in open communication, a piston rod in said cylinders and operatively connected at its end nearer the smaller diameter cylinder with one of said pressing members, large and small pistons in said cylinders of larger and smaller diameters respectively, said small piston being rigidly connected with said rod, said large piston abutting the free end of said rod, a port in the wall of said larger diameter cylinder adapted to be uncovered upon a predetermined travel of said large piston, a passageway leading from said port to the working face of said small piston, and means for supplying motive fluid to the working face of said large piston.

3. In a pressing machine, a pair of coaxing relatively movable pressing members, a toggle for causing relative movement of said pressing members, said toggle being arranged to break inwardly and movable toward straightened position to close the press, a cylinder of larger diameter, a cylinder of smaller diameter, said cylinders being axially aligned, a piston rod in said cylinders and connected at its end nearer the smaller diameter cylinder with said toggle, large and small pistons in said cylinders of larger and smaller diameters respectively, said small piston being rigidly connected with said rod, said large piston abutting the free end of said rod, and means for controlling actuation of both of said pistons in the same direction for causing relative movement of said pressing members to close the press.

JAMES M. DEWEY.