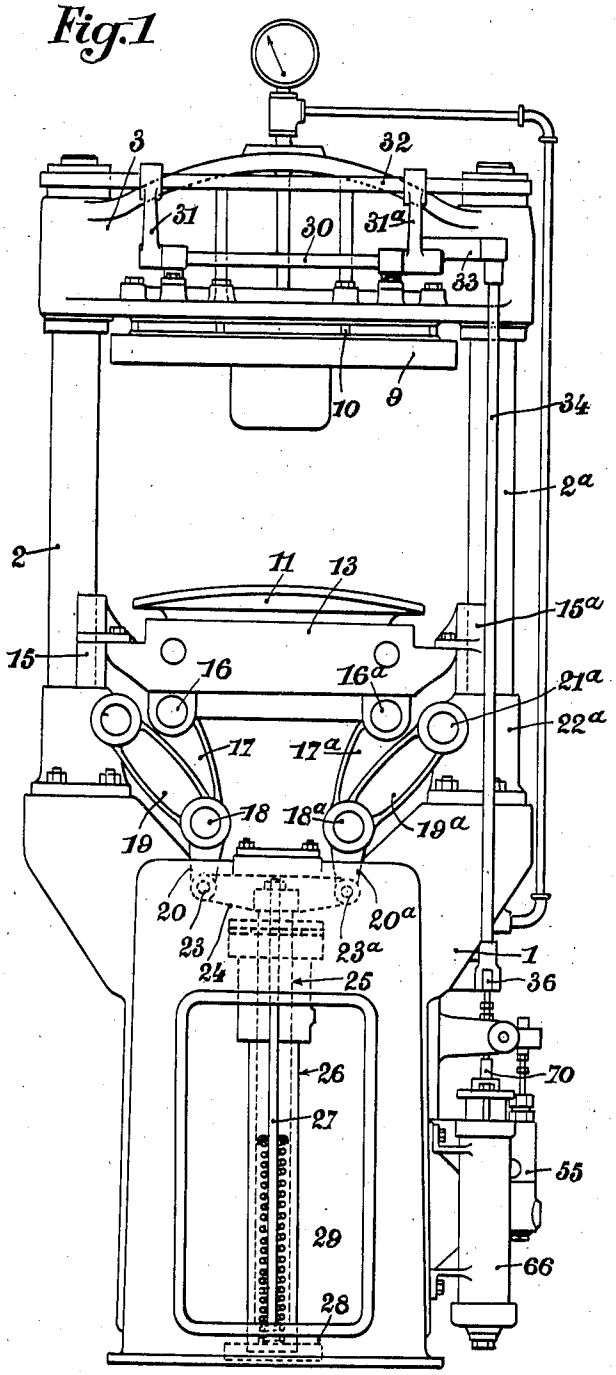
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HAT PRESS

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Fig.1



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Fig. 2

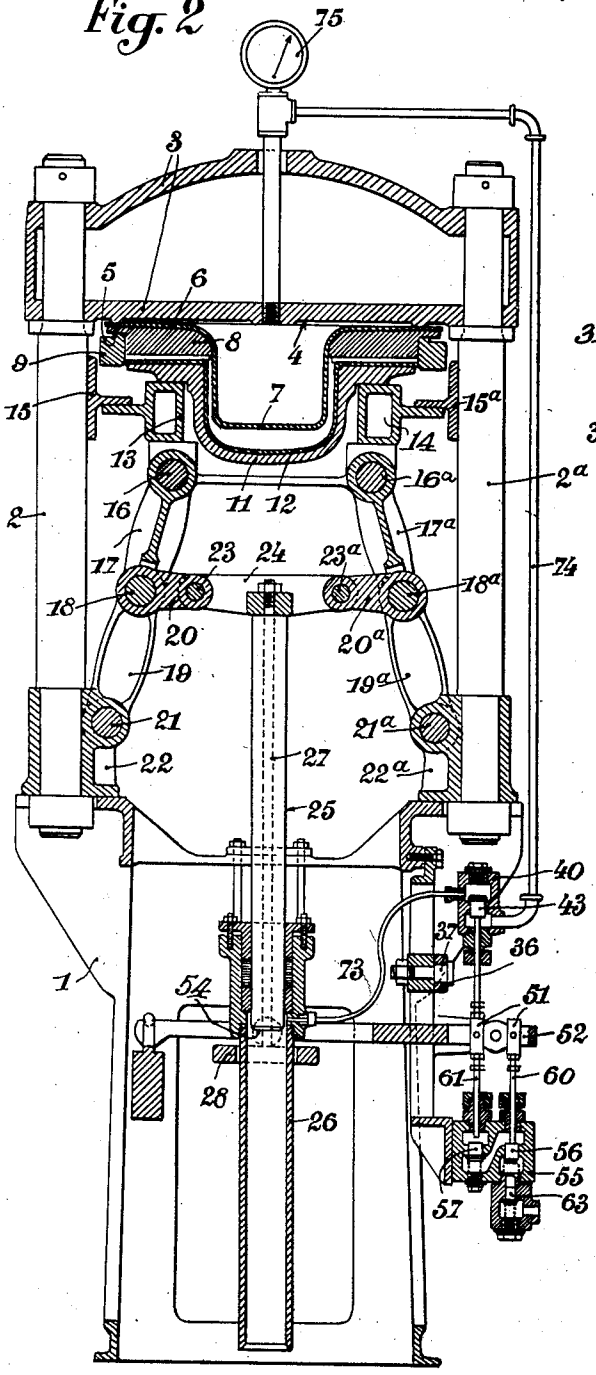
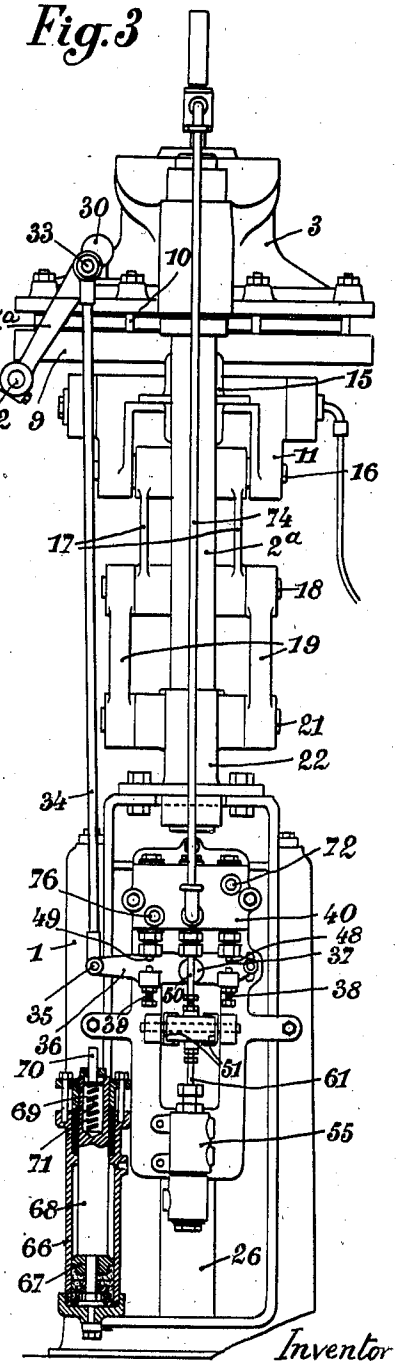


Fig. 3



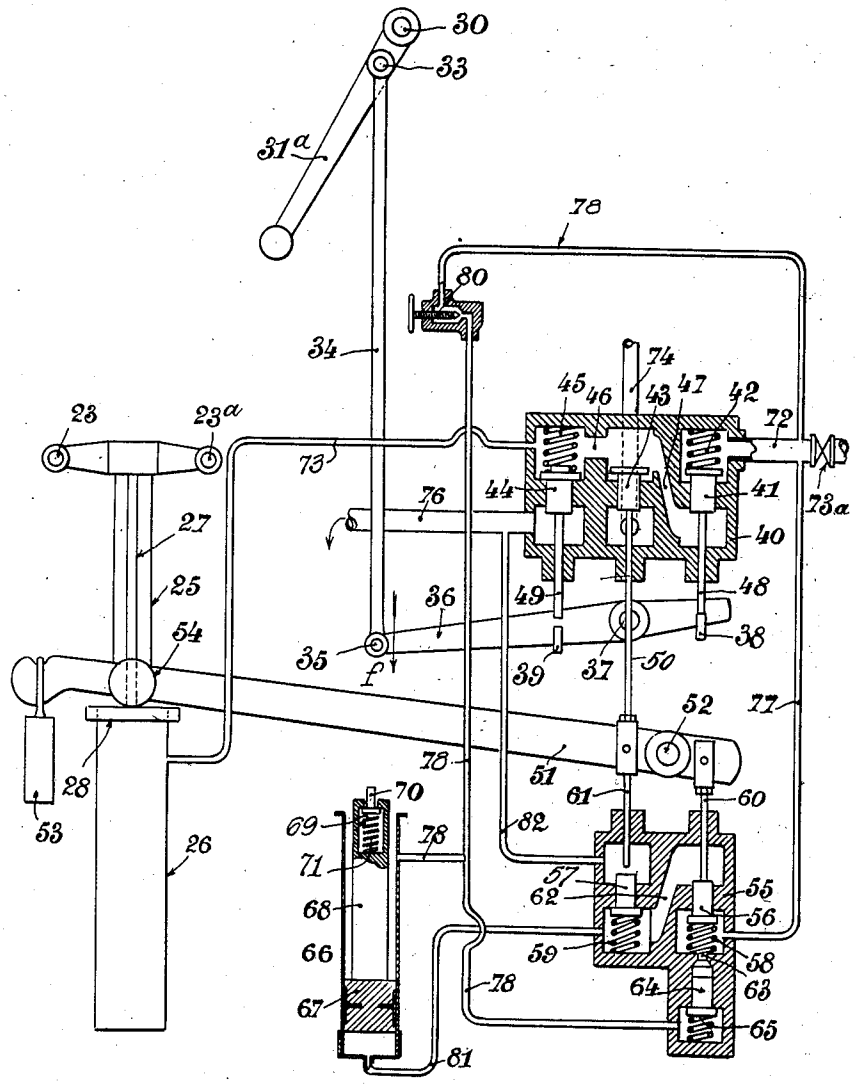
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Fig. 4



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UNITED STATES PATENT OFFICE

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HAT PRESS

Application filed February 5, 1931, Serial No. 513,570, and in France February 10, 1930.

As is well known, operating the presses now in use for hatmaking comprises the following operations:

As soon as the hat is placed in the mould, the press is shut, which comprises introducing the rubber bag into the mould. When this operation is effected the press is locked so as to prevent separation of the mould and the bag. Finally the press is put under pressure. This last operation is effected by operating taps which ensure the filling of the bag with water under pressure. After a certain time, left to the judgment of the operator, the aforedescribed operations are effected in the reverse order to remove the hat.

The present invention has for its object an improved press, adapted to be used chiefly in the hatmaking industry, and the characteristic feature of which consists in that a single operating lever starts the operation of the press, whose working is then automatic.

Preferably the lever is so arranged that when the operation of the press is started, said lever is located in front of the press, so as to constitute a safety device which prevents the operator from getting his hands between the mould and the rubber bag.

According to another characteristic of the invention, said single operating lever insures the admission of fluid under pressure under a piston whose displacement causes, successively, the shutting, the locking of the press, the putting under pressure of said press and the operation of a suitable device adapted to bring back, after a fixed time, the operating lever to its original position.

Other characteristics will appear from the following description, with reference to the appended drawings, given merely by way of example, and in which:

Fig. 1 is an elevational view of the improved press, according to my invention, shown at rest;

Fig. 2 is a longitudinal section of said press after locking;

Fig. 3 is a side view thereof;

Fig. 4 is a diagram of the various pipes which ensure the distribution of the fluid under pressure to the different parts of the press.

According to the embodiment shown, the press comprises a framework 1 on which are fixed two parallel columns 2 and 2^a. At their upper end, said columns have a metallic transverse piece 3. The under side 4 of this piece 3 comprises a circular ridge 5 (Fig. 2) against which the edge 6 of the rubber bag 7 is pressed through a piece 8 and the annular element 9, fixed to the piece 3, by means of a series of bolts 10. A mould 11, on which is placed the hat 12 to be moulded, is applied against piece 8 when the press is locked. This mould is supported by an annular box 13 adapted to be heated by circulating in 14 any fluid, water, hot air, etc. which is introduced into said piece, through a pipe not shown in the drawings.

This annular box 13 is guided in its vertical displacements along columns 2 and 2^a through two slide rods 15 and 15^a. On this annular box are articulated about 16 and 16^a, two rods 17 and 17^a respectively. Each of these rods is articulated at its other end, in 18 and 18^a, to two rods 19—20, 19^a—20^a respectively.

Rods 19—19^a are themselves pivoted about axes 21—21^a, carried by sleeves 22—22^a, fixed to columns 2—2^a and resting upon framework 1. As for rods 20—20^a, they are articulated in 23—23^a to a piece 24. This piece 24 is fixed to the upper end of a piston consisting of a cylindrical rod 25. This piston is adapted to move vertically in a stationary cylinder 26. Piece 24, fixed to the upper end of the piston is provided with two rods 27 located respectively before and behind the plane of Fig. 2. The lower ends of said rods 27 carry an annular part 28, concentric with cylinder 26, along which it can slide. Springs 29 are disposed around rods 27.

The press that has just been described includes an operating organ and organs for distributing the power fluid, such as water under pressure, or other, to the different parts of the press.

The operating organ consists of a lever articulated to an axle 30 carried by the cross-member 3. This lever comprises two parallel branches 31 and 31^a connected by a horizontal brace rod 32 located in front of the press. An operating rod 34, whose lower

end is articulated at 35 to a lever 36, is articulated to lever 31^a about axis 33.

Lever 36 is pivoted to axis 37 carried by framework 1. This lever 36 carries (Figs. 3 and 4) two pushbuttons 38—39 placed on either side of its axis of articulation 37.

Above this lever 36 is placed a valve box 40. This box comprises 3 valves: an inlet valve 41, submitted to the action of a spring 42; a valve 43 for placing the parts under pressure, which is free, without a spring, and lastly, an exhaust valve 44, submitted to the action of a spring 45. The space above valve 44 communicates through conduit 46 with the space above valve 43, which in turn communicates through conduit 47 with the space below inlet valve 41. The two lateral valves 41 and 44 may be alternately lifted, through rods 48 and 49 by two above mentioned pushbuttons 38 and 39, carried by oscillating lever 36. Central valve 43 can be lifted by means of a rod 50, articulated to a forked lever 51, oscillating about axis 52 carried by framework 1. This forked lever 51, provided at its end with a counterweight 53 (Fig. 4) can be lifted, through bosses 54, by thrust-collar 28, which is adapted to slide along cylinder 26. Under this oscillating lever 51 is fixed to the framework, a second valve box 55 comprising two upper valves 56 and 57 which can be lifted from their seats against the action of springs 58 and 59, by means of two push rods 60 and 61 articulated to lever 51, on either side of axis 52. The space under valve 56 communicates through conduits 62 with the space above valve 57. The space above valve 56 communicates through aperture 63 with the space under a valve 64, pressed on its seat by a spring 65.

Lastly, on the side of the framework 1 is fixed a cylinder 66, whose longitudinal axis coincides substantially with that of rod 34. In this cylinder 66 moves a piston 67 provided with a piston rod 68.

At the upper end of said rod 68 is a cylindrical hole 69, in which can move a push rod 70, which is pressed in the upward position by a spring 71. Cylinder 66 is so placed that push rod 70 is in contact with the end of lever 35 when piston 68 reaches the top of its stroke.

On the diagrammatic view of Fig. 4, the different pipes connecting the different elements have been shown. The arrival of water under pressure is effected, through pipe 72 provided with a cock $73a$, above inlet valve 41. The space below valve 41 communicates through conduits 47 and 46, or through pipe 73, with the upper end of cylinder 26. The space under central valve 43 communicates, through a pipe 74 passing through transverse member 3, with rubber bag 7. A manometer 75 located at the end of the pipe makes it possible to control the pressure in said bag. Lastly, the space under valve 44 communicates with the exhaust through pipe 76.

Water under pressure also arrives through conduit 77 to the space above valve 56 and under valve 64. The space above this valve 64 communicates, on the one hand, through pipe 78, with the upper end of cylinder 66 in the part which contains piston rod 68, and on the other hand, with the inlet pipe 72. An adjustable orifice 80 is provided in said pipe 78. The space under cylinder 66 is connected, through conduit 81, to the space above valve 57 and to the space under valve 56. The space under valve 57 communicates, through a pipe 82, with the exhaust.

The working of the press is as follows:

The press being at rest (Fig. 1), piston 67 is in its lower position, since water under pression acts upon its upper side. Said water arrives under valve 64, which it lifts, and flows freely through conduit 78. When the operating lever 31 is lowered, lever 36 swings in the direction of arrow *f*, and press button 38 lifts inlet valve 41. Water under pressure is admitted through conduits 46—47 and pipe 73 into cylinder 26. The main piston 25 is lifted, which causes the annular box 11 to be lifted and consequently closes the press. When the axes of articulation 21, 18, 16 and $21a$, $18a$, $16a$ of the rods 17—19 and $17a$—$19a$ respectively are in line (Fig. 2), the locking of the press is ensured.

On its upward stroke, piston 25 drives collar 28 through rod 27. During the last millimeters of its stroke, collar 28 comes into contact with lever 51 which it causes to rotate. Said lever 51 lifts valve 43 through rod 50, and thus causes water under pressure to be admitted into rubber bag 7, and consequently places the press under pressure. At the same time lever 51 has lifted valve 56 from its seat and water under pressure has been let in to the lower part of cylinder 66, under piston 67. The two sides of cylinder 67 are thus submitted to the same pressure, but they have unequal surfaces, since the surface of the upper side of piston 67 has the whole cross section of rod 68 to be deducted from it. Piston 67 thus tends to rise and the water contained in the upper part of cylinder 66 can escape only by passing through needle valve 80. As the aperture corresponding to this needle valve is adapted to be regulated, it will be obvious that the time that is necessary for the piston to move up to the upper end of cylinder 66 depends on the regulating of said aperture. When push rod 70 comes into contact with lever 36 it causes the rotation of this lever and consequently the closing of the inlet valve 41. Piston rod 68, further moving upward, compresses spring 71 up to the moment when the compression of said spring is such that push rod 70 lifts, through lever 36, valve 44, thus causing exhaust to begin. The weight of piston 25, the

action of springs 29, and the weight of lever 51 added to that of counterweight 53 causes the downward motion of the main piston 25 to start. The speed of this downward motion is accelerated by the weight of the annular box 11 and of the rods as soon as the angle between rods 17 and 19 on the one hand and 17*a* and 19*a* on the other hand has taken a notable value. Rubber bag 7 can then be emptied for the water contained therein can raise valve 43 which rests freely on its seat. The lowering of lever 51 has caused the opening of valve 57 and the connecting to the exhaust of the space below piston 67 through said valve, and conduit 82. Water under pressure arriving under valve 64 causes the quick downward motion of piston 67. As soon as this piston reaches the lower part of its stroke, the press is back to its starting position and is ready for a new operation.

It is thus evident that the whole working of the press is absolutely automatic and only depends on the initial operation of lever 31—31*a*. The disposition of this lever is so chosen that when it is in the lowered position corresponding to the working position of the press transverse tube 32, carried by this lever, prevents access to the part of the press that is located between rubber bag 7 and annular box 11, which removes all possibility of accidents, it being not possible for the operator to get his hands caught between the pieces.

While I have disclosed what I deem to be the preferred embodiment of my device, it should be understood that I do not wish to be limited thereto as there might be changes made in the arrangement disposition and shape of the pieces without departing from the principle of my invention as comprehended within the scope of the appended claims.

What I claim is:

1. A hydraulic press of the type described especially adapted to the hat making industry which comprises in combination a stationary frame, a stationary member carried by said frame, a rubber bag secured to said stationary member, a pipe opening into said rubber bag, a movable member adapted to slide with respect to said frame, a hat mould secured to said movable member opposite the rubber bag, a main hydraulic piston adapted to actuate said movable member, a valve element connected to a source of liquid under pressure, for controlling said main piston, manually operable means for operating said valve element, whereby the main piston is caused to apply the movable member against the stationary member, means, operated by said main piston, for sending liquid under pressure through said pipe into said rubber bag about the end of the stroke of said piston, a release hydraulic piston, a second valve element for controlling said release hydraulic piston, means, actuated by said release piston, for operating said first mentioned valve element, whereby the main piston is caused to cease to apply the movable member against the stationary member, means, actuated by said release piston for causing liquid under pressure to escape from said rubber bag, and means, actuated by said main piston, for operating said second mentioned valve element, whereby said release piston is brought into play.

2. A hydraulic press of the type described especially adapted to the hat making industry, which comprises in combination a stationary frame, a stationary member carried by said frame, a rubber bag secured to said member, a pipe opening into said bag, a movable member disposed under said stationary member and adapted to slide vertically in said frame, a hat mould secured to said movable member opposite said rubber bag, a cylinder, a main hydraulic piston in said cylinder, a chamber connected to the lower end of said cylinder, an inlet valve for connecting said chamber to a source of fluid under pressure, an exhaust valve in said chamber, a freely moving valve for connecting said chamber to the pipe leading into said rubber bag, manually operable means for opening said inlet valve, whereby the main piston is moved in the upward direction and caused to apply the movable member against the stationary member, a release hydraulic piston, a valve element for controlling said release hydraulic piston, means, actuated by said release piston for closing said inlet valve and opening said exhaust valve, whereby the main piston is allowed to move in a downward direction and the water under pressure in the rubber bag can flow out through said freely moving valve, and a lever, actuated by said main piston, for operating said valve element, whereby said release piston can be brought into play.

3. A hydraulic press of the type described especially adapted to the hat making industry, which comprises in combination, a stationary frame, a stationary member carried by said frame, a rubber bag secured to said member, a pipe opening into said bag, a movable member disposed under said stationary member and adapted to slide vertically in said frame, a hat mould secured to said movable member opposite said rubber bag, a main hydraulic piston in said cylinder adapted to actuate said movable member, a chamber connected to the lower end of said cylinder, an inlet valve for connecting said chamber to a source of liquid under pressure, an exhaust valve in said chamber, a freely moving valve for connecting said chamber to the pipe leading into said rubber bag, an operating lever, a transversal bar secured to said lever and adapted to prevent access to the lower part of the movable member when the operating lever is in the operative position, a vertically

sliding rod actuated by said lever, a control oscillating lever articulated to the lower end of said rod, operatively connected to the inlet and to the exhaust valve and adapted to open the inlet valve when the operating lever is brought into the operative position, whereby the main piston is caused to move in the upward direction, a pivoting lever actuated by said main piston and a rod actuated by said pivoting lever for opening said freely moving valve whereby liquid under pressure is sent into said bag, a release differential hydraulic piston, a valve element for controlling said release piston, a push rod elastically connected to said release piston adapted to bear against the lower end of said vertically sliding rod and to push it in the upward direction, whereby the aforesaid control oscillating lever is caused to close the inlet valve and to open the exhaust valve, whereby the main piston is allowed to move in the downward direction, a rod, actuated by said pivoting lever for operating said valve element of the release piston, whereby said release piston is brought into play, and means for regulating the speed of the motion of said release piston.

4. In a hat press comprising a stationary frame, a stationary member carried by said frame, a movable member adapted to slide vertically, means for reciprocating said movable member, a rubber bag secured to one of said members, a hat mould secured to the other member opposite said rubber bag, a pipe opening into said rubber bag and means for supplying fluid under pressure through said pipe into said rubber bag, automatic connecting means between said reciprocating means and said supplying means, whereby fluid under pressure will be conducted into the rubber bag about the end of the stroke applying said movable member against said stationary member.

5. In a hat press comprising a stationary frame, a stationary member carried by said frame, a movable member adapted to slide vertically, means for reciprocating said movable member, a rubber bag secured to one of said members, a hat mould secured to the other member opposite said rubber bag, a pipe opening into said rubber bag and means for supplying fluid under pressure through said pipe into said rubber bag, automatic connecting means between said reciprocating means and said supplying means, whereby fluid under pressure will be admitted into the rubber bag about the end of the stroke applying said movable member against said stationary member, escaping means whereby said fluid can escape from said bag, said escaping means being controlled by said movable member in such a manner that the fluid will automatically escape from said rubber bag about the beginning of the return stroke of said movable member.

6. In a hat press comprising a stationary frame, a stationary member carried by said frame, a movable member adapted to slide vertically, means for reciprocating said movable member, a rubber bag secured to one of said members, a hat mould secured to the other member opposite said rubber bag, a pipe opening into said rubber bag and means for supplying fluid under pressure into said rubber bag, a chamber, an inlet valve for connecting said chamber to a source of fluid under pressure, an exhaust valve in said chamber, a freely movable valve for connecting said chamber to the pipe leading into said rubber bag, manually operable means for actuating said inlet valve, and means actuated from said reciprocating means whereby said freely movable valve will be opened about the end of the stroke applying said movable member against said stationary members, said inlet valve will be closed and said exhaust valve will be opened about the beginning of the return stroke of said movable member, whereby the fluid under pressure in the rubber bag can flow out through said freely movable valve.

7. In a hat press comprising a stationary frame, a stationary member carried by said frame, a movable member adapted to slide vertically, means for reciprocating said movable member, a rubber bag secured to one of said members, a hat mould secured to the other member opposite said rubber bag, a pipe opening into said rubber bag and means for supplying fluid under pressure into said rubber bag, connecting means between said reciprocating means and said supplying means whereby fluid under pressure will be conducted into the rubber bag about the end of the stroke applying said movable member against said stationary member, a release differential hydraulic piston, a valve element for controlling said release piston, escaping means actuated by said release piston, whereby the fluid under pressure can escape from said rubber bag, said valve element being operated by said movable member whereby said release piston is brought into play.

In testimony whereof I have signed my name to this specification.

MARCEL CASSÉ.