

(No Model.)

M. BROCK.  
LASTING MACHINE.

No. 444,792.

Patented Jan. 13, 1891.

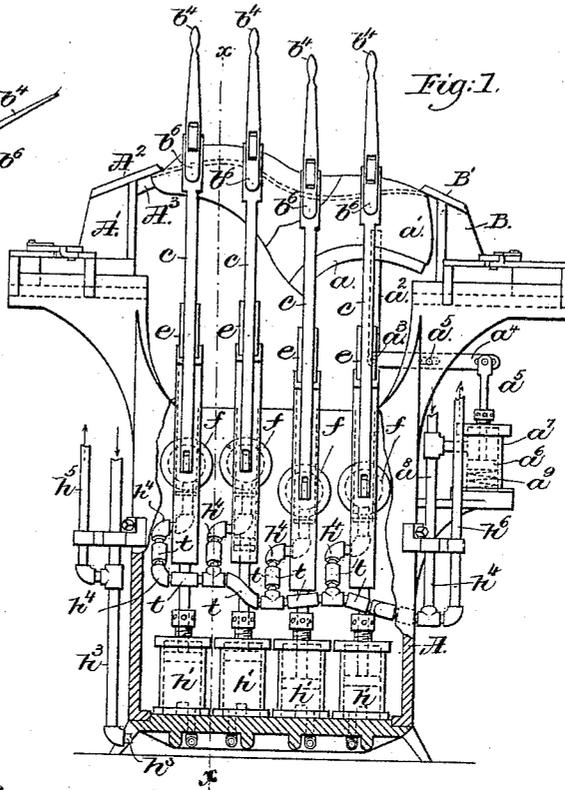
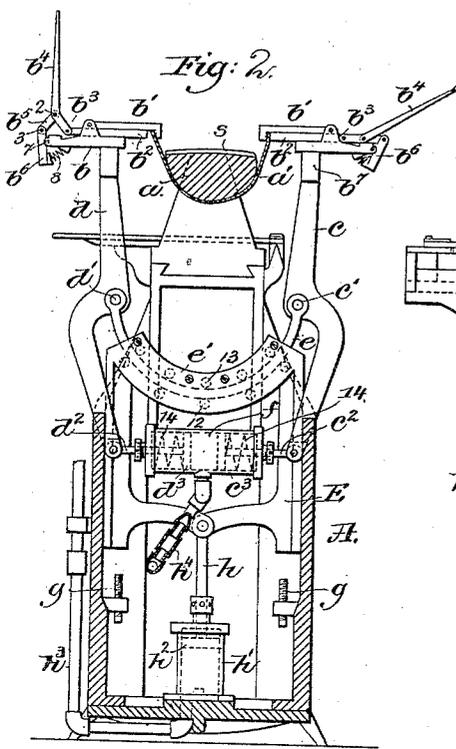
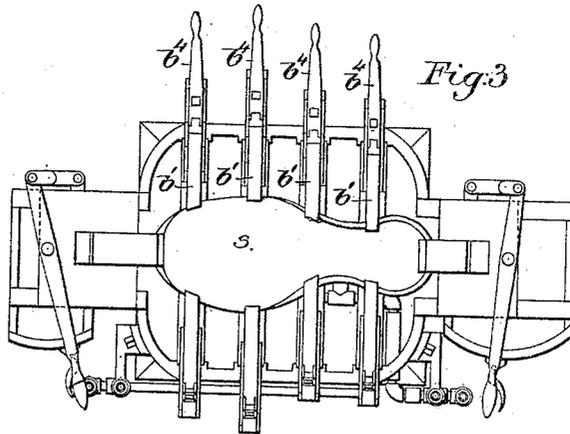
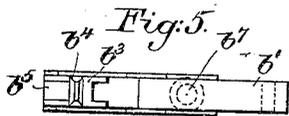
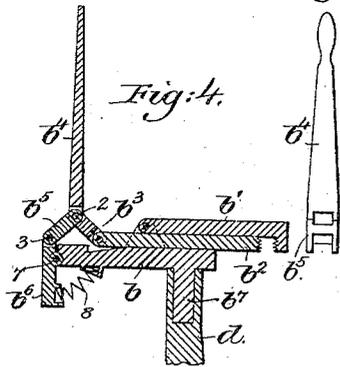


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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## LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 444,792, dated January 13, 1891.

Application filed April 26, 1890. Serial No. 349,588. (No model.)

*To all whom it may concern:*

Be it known that I, MATTHIAS BROCK, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Lasting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to that class of lasting-machines wherein jaws are employed to grasp the upper and stretch the same about the last, the object of my invention being to move the said jaws by or through pistons actuated by a fluid, either water, steam or air, such pistons, contained in cylinders in usual manner, being acted upon uniformly, so as to regulate the extent of stretching of the upper and make it uniform at all parts. The jaws arranged in pairs at opposite sides of the last are mounted on side levers, which are adapted to turn on their pivots to equalize the pull on the upper at opposite sides of the last during the lifting of the jaws, the said side levers being, however, moved longitudinally to lay the edge of the upper over upon the inner sole on the last by an independent mechanism, herein shown as a cylinder containing two pistons, one at each end, the steam, water, or air being shown as admitted into the cylinder between the said pistons, springs serving to move the pistons in opposition to the action of the fluid-pressure, as when the jaws are to be moved away from the last. The opening and closing movement of the jaws to grasp and then release the upper is shown as effected by hand. I have also combined with the last-pin rod a piston and cylinder to receive steam, water, or air.

Figure 1 in side elevation represents a sufficient portion of a last with my improvements added to enable my invention to be understood; Fig. 2, a section of Fig. 1 in the line  $x$ , looking toward the left; Fig. 3, a top plan view of the machine shown in Fig. 1; Fig. 4, a longitudinal sectional detail of the jaws for grasping the upper, the same being open; Fig. 5, a top view of Fig. 4, and Fig. 6 a detail of the lever for operating the movable member of the jaws.

The frame-work (marked A) is and may be of any usual or suitable shape to support the

working parts. This frame-work supports in suitable guideway a toe-carriage A', upon which in practice are and may be mounted any usual toe-closing devices, (not herein shown,) the said toe-carriage having, however, attached to it a hold-down A<sup>2</sup> and a toe-abutment A<sup>3</sup>, which devices may be of any usual or suitable construction. This frame-work is also provided with a heel-carriage B, herein shown as having a hold-down B', to act upon the inner sole or last at the heel. In practice this heel-carriage will and may be supplied with any usual heel-lasting jaws or appliances.

The last  $a$ , containing the upper  $a'$  to be lasted, is supported upon a last-pin rod  $a^2$ , the upper end of which enters a hole in the comb of the last in usual manner; but the lower end of this last-pin rod is jointed at  $a^3$  upon a lever  $a^4$ , pivoted at  $a^5$  upon the frame of the machine. This lever  $a^4$  at its outer end is attached to a piston-rod  $a^6$ , connected to a piston  $a^6$ , (shown by dotted lines in Fig. 1,) placed in a cylinder  $a^7$ , the said cylinder having connected to it, as herein shown, near its upper end, a suitable pipe  $a^8$ , connected with some suitable supply for steam, water, air, or other fluid. A spiral spring  $a^9$ , placed in the said cylinder, acts normally to elevate the piston therein to retract the last-pin rod. The jaws to grasp the edges of the upper are arranged in pairs at opposite sides of the last containing an inner sole  $s$ . These jaws, as herein represented, are alike, and each jaw is shown as composed of a base  $b$ , having pivoted upon it between suitable ears a jaw member  $b'$ , having a downturned lip serrated at its inner side, as best shown in Fig. 4, the other member  $b^2$  of the jaw being jointed at  $b^3$  to the lower end of a bent lever  $b^4$ , the latter having jointed to it at 2 a link  $b^5$ , in turn jointed at 3 upon a compensating lever  $b^6$ , pivoted at 7 upon one end of the base  $b$ , a spring 8 acting upon the said lever  $b^6$ , so that it may yield to adapt the acting faces of the jaws to the thickness of the upper held between the same. Each base  $b$  has a foot  $b^7$  (shown by dotted lines and in full lines, Fig. 4) to enter a socket in the upper end of the side levers  $c$   $d$ , so that the said jaws may rock or turn horizontally, as required, to enable them to conform to the side curvature

or width of the last at the ball and shank. The side levers  $c d$  are pivoted, respectively, at  $c' d'$  upon opposite ends of a segmental bar  $e$ , adapted to slide in a suitable guide or way  $e'$ , attached to the frame-work, the said guide or way having, as herein shown, two series of anti-friction rolls 12 13, (shown by dotted lines,) so that the said segmental bar may be moved readily and easily in the said guide during the equalizing movement of the jaws, to be described, as when the said side levers are being lifted vertically to stretch the upper about the last, both jaws having been closed to grasp the upper, as at the right in Fig. 2.

In practice, while the side levers are being lifted to stretch the upper, in case the upper is weaker or stronger at one side or the other, the said jaws, instead of being moved vertically for the same distance, are moved for different distances—that is, the jaw grasping the upper which has least stretch in it is stopped in its vertical movement—and the rod or bar  $e$  then slides through the guide referred to, permitting the opposite side lever carrying the jaws grasping the weaker part of the upper to move farther, so as to stretch both sides of the upper uniformly. The lower ends of the side levers  $c d$  are connected, respectively, with piston-rods  $c^2 d^2$ , each having attached to it a suitable piston, as  $c^3 d^3$ , the said two pistons entering one and the same cylinder  $f$ , the piston-rods passing out from the opposite ends thereof. Between the ends of the cylinder  $f$  and the pistons I have interposed like spiral springs 14, the normal tendency of which springs is to move the pistons into the cylinders and the upper ends of the side levers  $c d$  outwardly away from the last after the jaws have been open preparatory to removing a lasted upper or applying a last and upper into the machine. Each guide  $e'$  referred to forms part of a vertically-movable carriage E, the side edges of which are fitted to slide in suitable ways in the frame-work A.

The descent of the carriages may be controlled by suitable stops  $g$ . The lower end of each carriage has jointed to it a like piston-rod  $h$ , extended into a suitable cylinder  $h'$  and provided with a piston  $h^2$ . Steam, water, air, or other fluid may be entered into the series of cylinders  $h'$  under their pistons through a suitable pipe or pipes  $h^3$  in communication with any usual or suitable supply for said fluid, and each of the several cylinders  $f$ , one for each pair of side levers, is also in communication with said source of steam, water, or air supply by means of pipes  $h^4$ , the special form of connections being best shown in Figs. 1 and 2. The pipe  $h^3$  takes care of the exhaust from the cylinders  $h'$  and the pipe  $h^4$  the exhaust from the cylinders  $f$ . These cylinders may be supplied with fluid all from one reservoir, or they may be supplied each from an independent reservoir through suitable pipes, and the pressure

of the fluid entering the said cylinders may be more or less, according to the requirements of the upper being lasted, as it is usually desirable to stretch the upper at the ball more than at the shank.

In operation a last having an upper thereon is placed upon the last-pin rod and a fluid is introduced into the cylinder  $a^7$  to act upon the piston to lift the said last-pin rod so as to force the inner sole of the last below or up against the hold-down. Then the upper is grasped between the jaw members by turning the lever  $b^1$ , as at the right of Fig. 2, and fluid is admitted into the cylinders  $h'$ , lifting the carriages and with them the side levers and the jaws, the latter stretching the upper and equalizing the stretch, as stated, by movement of the rod or bar  $e$  in the guide  $e'$  during the lifting movement of the carriages E. The upper having been sufficiently stretched, the next step is to carry the jaws forward or toward each other from the position Fig. 2 to lay the edges of the stretched upper over upon the inner sole, to be there secured in usual manner. To effect this closing-in movement the fluid referred to is admitted into the cylinders  $f$  to act upon the pistons  $c^3 d^3$ , and turn the side levers  $c d$  upon their pivots  $c' d'$ , and it will be noticed, inasmuch as the two pistons referred to are located in one cylinder, that should the inward movement of one jaw of the pair of jaws be arrested sooner or later than the other, owing to the strength of the upper or the curvature of the last, the other jaw may continue to move, the piston connected with the jaw which has come to rest remaining still in the cylinder. During this operation of closing in the sides of the upper by the movement of the jaws some of the fluid will be let out from the cylinders  $h'$ , so as to permit the jaws to descend slightly as they carry the edges of the upper over upon the inner sole.

Prior to my invention I am not aware that a lasting-machine has ever been constructed wherein the stretching of the upper has been effected by jaws adapted to grasp the upper, the said jaws deriving their motion from the pressure of a fluid, such as steam, water, or air in a cylinder, so I do not desire to limit my invention to the exact form of piston and cylinder or connections between the steam and the usual side levers and the carriages for effecting the vertical movement of the side levers and their attached jaws. By pivoting the jaw members  $b' b^2$ , as described, it is possible as the carriage E descends to enable the said jaws to yield, thus leaving the jaws at the level of the last or the inner sole thereon, whatever may be the curvature of the last from heel to toe, and also to adapt them to any rocking motion of the last.

The pipe supplying the series of cylinders  $f$  has a series of flexible sections  $t$ .

I claim—

1. A lasting-machine containing the following instrumentalities, viz: jaws or devices to

grasp the upper, carriers for the said jaws, and a series of pistons and cylinders and connections between said pistons and carriers, whereby the said carriers are moved directly  
5 thereby to cause the jaws to stretch the upper about the last, substantially as described.

2. In a lasting-machine, a series of carriers and jaws mounted thereon, combined with a rod, as *e*, connecting the said carriers, a carriage *e'*, in which the said rod may slide to  
10 equalize the strain upon the upper during the vertical movement of the jaws in straining the upper about the last, and devices carried by and connecting the carriers to move them  
15 about their fulcra on the said rods, substantially as described.

3. A series of jaws and carriers therefor, combined with a series of cylinders and two pistons for each of the said cylinders, the rods  
20 of the said pistons being connected to the carriers supporting pairs of jaws at opposite sides of the last, whereby the strain upon the upper during the inward or closing movement of the jaws is equalized, substantially as de-  
25 scribed.

4. In a lasting-machine, hold-downs and a last-pin rod to support the last, combined

with a cylinder and piston and piston-rod and connections between the latter and the said last-pin rod, to operate substantially as  
30 described.

5. In a lasting-machine, a pair of jaws to grasp the upper and a lever for moving one of the said jaws, combined with a compensating device consisting of the lever *b<sup>6</sup>* and link  
35 *b<sup>5</sup>* and a spring acting thereon to enable the jaws to adapt themselves to the thickness of the upper between them, substantially as described.

6. In a lasting-machine, pivoted jaws, each  
40 consisting of a plate, a pivoted member *b'*, a sliding member *b<sup>2</sup>*, and an actuating-lever for the sliding member, the pivots of the jaws enabling them to be turned simultaneously  
45 thereon when desired, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MATTHIAS BROCK.

Witnesses:

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EMMA J. BENNETT.