

G. McKAY & H. P. FAIRFIELD.
LASTING MACHINE.

No. 458,001.

Patented Aug. 18, 1891.

Fig. 2.

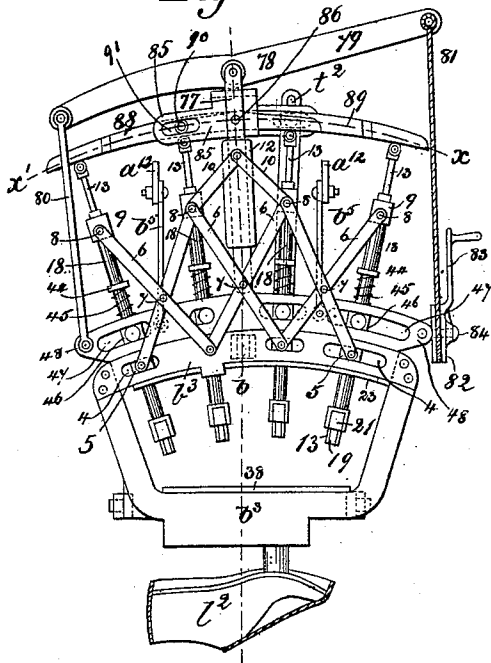


Fig. 4.

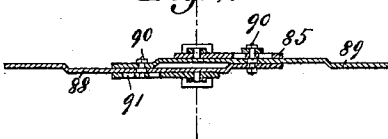
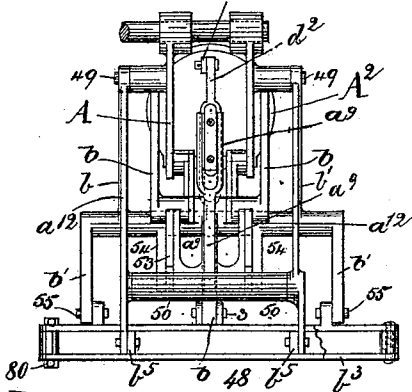


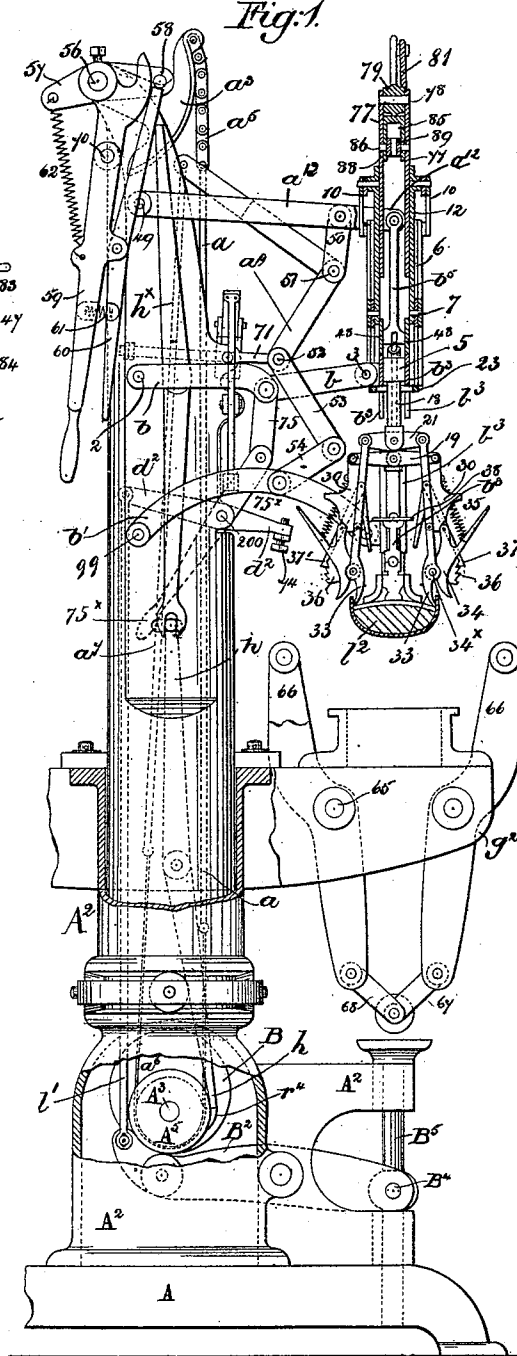
Fig. 3.



Witnesses:

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Fig. 1.



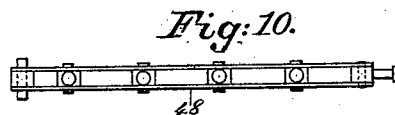
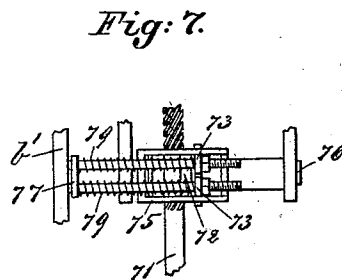
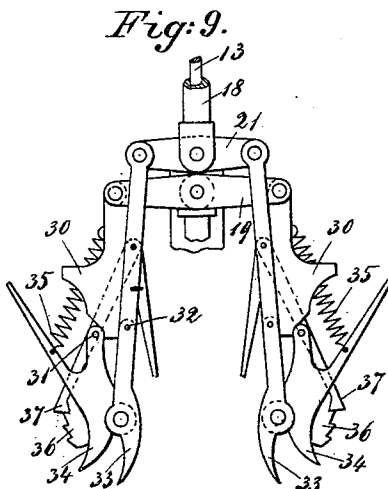
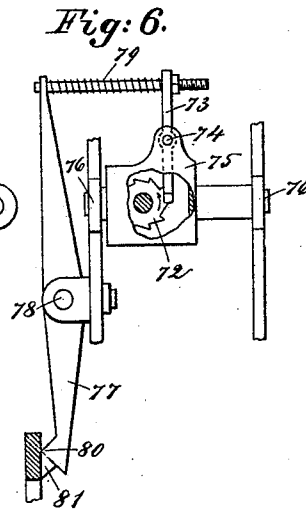
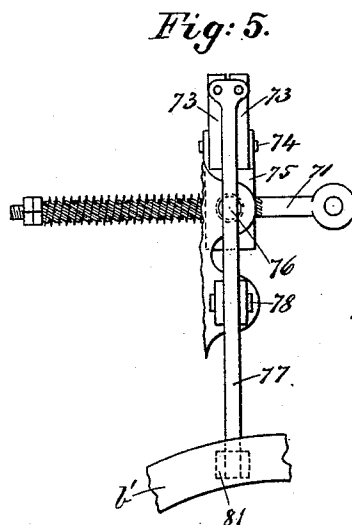
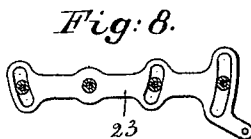
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G. McKAY & H. P. FAIRFIELD.
LASTING MACHINE.

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UNITED STATES PATENT OFFICE.

GORDON MCKAY, OF NEWPORT, RHODE ISLAND, AND HADLEY P. FAIRFIELD, OF MEDFORD, MASSACHUSETTS, ASSIGNORS TO THE MCKAY & COPELAND LASTING MACHINE COMPANY, OF PORTLAND, MAINE.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 458,001, dated August 18, 1891.

Application filed February 6, 1891. Serial No. 380,493. (No model.)

To all whom it may concern:

Be it known that we, GORDON MCKAY, of Newport, county of Newport, State of Rhode Island, and HADLEY P. FAIRFIELD, of Medford, county of Middlesex, 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 is intended as an improvement on that described in United States application, Serial No. 339,803, filed February 10, 1890, the machine described in the said application being an improvement on that described in United States Patent No. 250,450. In the machine described in the said application the toggle-lever for drawing up or lifting the devices carrying the pinchers or pullers has always to be straightened before the pinchers are opened to release the upper and before the side jaws are closed, and in practice with some classes of uppers such straightening is unobjectionable; but in other classes of uppers the straightening of the toggle is apt to put too much and an injurious strain on the upper. One part of this present invention is to provide a lasting-machine with means whereby when the upper of the particular shoe being lasted has been sufficiently stretched the further movement of the toggle, and consequently further strain of the pinchers or pullers on the upper, will be arrested, while the usual side-closing devices act to lay the edges of the upper over upon the inner sole laid upon the last, supported in usual manner. In the machine described in the application referred to the pinchers were closed upon the upper by hand, one at a time; but herein the machine has been provided with pincher-closing devices which are automatic in their action, the said devices being, however, so constructed that in their closing movement they adapt themselves to the particular thickness of the upper where the particular pincher grasps it, and the devices to close the pinchers are so shaped that the hold of the pinchers is stronger in proportion to the thickness of the upper. We have also

provided the machine with means whereby the devices which carry the pinchers or pullers may not only be adjusted horizontally to lasts of different length, but also in case it is desired to draw the pinchers in a line inclined to a horizontal plane that that may be done, so as to enable the strain upon the upper to be adapted to the spring of the last. We have also provided the machine with a pincher-releasing cam which is so constructed or shaped that the pinchers, when carried inwardly by the side-lasting devices, will be automatically released from the upper at the proper time, notwithstanding any change in their longitudinal position owing to different length of last, for it will be understood that the particular time at which the pinchers should be released will depend upon the particular width of the last, which width varies for lasts of different length. We have combined with the toggle for drawing the pinchers locking devices to lock the said toggle in its more or less straightened position, the said locking devices being automatically disengaged as the head carrying the pincher-lifting devices is raised after the pinchers have been released and preparatory to the removal of the lasted shoe.

Figure 1 in side elevation, partially broken out and in partial section in the line x^{12} of Fig. 2, looking to the right, shows a sufficient portion of a lasting-machine with our present improvements added to enable our invention to be understood, the heel and toe rests for the last and the closing-in devices to lay the upper over upon the last being omitted, the rod 18, to be described, carrying the evenér or being broken off to show the rod 13 within it and the link b^5 beyond in elevation. Fig. 2 is a partial right-hand elevation of the parts shown in Fig. 1 above the side levers, the jack for supporting the last, the columns, and the pinchers being omitted, the upper being in section; Fig. 3, a partial top or plan view of some of the parts shown in Fig. 1, chiefly to show the devices instrumental in lifting the head-plate b^3 and lifting-bar 48, the shaft, hand-lever, and chain-segment, chain, and rod shown in Fig. 1 being omitted; Fig. 4, a section in the curved line x' , Fig. 2, of the de-

vices employed to adapt the closing of the pinchers to the material between them, whatever may be its thickness. Figs. 5, 6, and 7 are details of the devices for locking the toggle and for releasing the said locking devices. Fig. 8 shows the cam device for adjusting the pincher-carrying slide-bars in the direction of the length of the last; Fig. 9, an enlarged detail of one of the pinchers and closing devices; Fig. 10, a top or plan view of bar 48 detached; Fig. 11, a detail of the lever 85, shown in Fig. 2.

The frame-work A, having the upright or column A², the jack g², surrounding it and carrying the side levers 66, the cam-shaft A³, having the pulley A⁵ fast thereon, the sector a³, its attached chain a⁵, rod a, strap a⁶, rod a⁷, the toggle a⁹, to which the latter rod is attached, the lever a¹², link b⁵, connected to it, the slide-rods 18, the evener-levers 21, connected to their lower ends, the plate b³, having in practice at its lower edge suitable hold-downs, the cam B, loose on the shaft A³ alongside of the pulley A⁵ and provided with the projection r⁴, the lever h, the cam-plate 23, and the lever B³, connected at B⁴ to the rod B⁵, the links 67 68, and the last I² are and may be all substantially as in the said application, where the said devices are designated by like letters and figures. It will be understood that the pulley A⁵ and cam B will have a clutch mechanism between them, which will become effective to lock the cam B to the said pulley whenever the lever h is moved out of engagement from the projection r⁴, and that the said levers 66 in practice will carry side-lasting appliances to act upon the edges of the stretched upper between the pinchers and the last to lay the upper over upon the bottom of the last or upon the inner sole thereon and at the same time move the pinchers inwardly, as in the said application.

The lever b, pivoted at 2 and shaped as best shown in Figs. 1 and 3, is jointed at its front end at 3 to the head-plate b³, shaped as best shown in Figs. 2 and 3, said head-plate being double-walled at its upper end and provided with horizontal curved slots 4 for the reception and support of the blocks 5, through which slide the bars 18, to the lower ends of which are pivoted the evener-levers 21. These blocks have journals at their opposite sides, which extend through the slots 4, beyond which the said journals at the front and rear sides of the plates b³ receive upon them the lower ends of the lazy-tongs links 6, jointed together at 7 between their ends and jointed at their upper ends at 8 to sleeves 9, loose, one on each rod 18. The two middle sleeves (see Fig. 2) are connected by links 10 with a hollow guide 12, the pivot for the central pair of lazy-tongs links being carried by the lower end of the said guide. The slide-rods 18 in this present invention are hollow instead of solid, as in the said application, and each of said slide-rods receives through it a pincher-closing rod 13, provided, preferably, at its upper

end with a roller-stud and having at its lower end an equalizer-lever 19, to the opposite end of which is pivoted the pincher-closing devices 30, shown as cams adapted to be lowered and raised, as desired, between studs 31 and 32 (see Fig. 9) of the pincher-jaws 33 34, which are adapted to grasp the edges of the upper along the sides of the last, the jaws 33 of the said pinchers being pivoted directly upon the ends of the evener-levers 21. The jaws 34, pivoted at 34^x on the jaws 33, have connected to them and to the latter jaws springs 35, which normally act to open the said jaws. Each jaw 34 has a ratchet-plate 36, which is engaged by one end of a Λ -shaped pawl 37, pivoted upon a part of the jaw 33, each of the said pawls engaging by its outer end one of the said ratchet-plates 36 to keep the said jaws in their closed condition, as when the jaw-closing devices 30 are lowered between the studs 31 and 32. The inner arms of these pawls, as the pinchers are moved toward the longitudinal center of the last by the side-lasting devices, as described in the said application, act against the edge of a suitable releasing-plate 38, connected to the plate b³, (see Fig. 1,) which causes the said pawls to be turned to release the said ratchet-plates and let the jaws be opened by the springs 35. In practice the edge of the releasing-plate will be of cam shape, so that the said pawls will contact sooner or later with the edges of the said plate, according to the adjustment of the rods 18 with relation to the length of the last, by turning the plate 23, common to the said patent, the said plate having at its center of motion, as shown in Fig. 2, the second rod 18 from the left, the said rod in any case being that one carrying the pinchers, which are to grasp the upper about midway of the length of the last. The cams 30 are of such shape that their lower ends act quickly to close the jaws approximately upon the upper, the remainder of the cams being so varied in their inclination as to enable the jaws to grasp a thick part of the upper with increased force. The rods 18 are provided with collars 44, which rest on springs 45, the lower ends of which in turn rest on blocks 46, having at two sides journals which enter curved slots 47 in two parallel lifting-bars 48, supported by the links b⁵, connected to one end of a double lever a¹², pivoted at 49 on the column. The lever a¹² has two rigid depending ears 50, which receive the pivot-pin 51, on which turns the toggle-lever member a⁹, jointed at 52 to a link 53, constituting the second member of the said toggle, and jointed at its lower end between arms 54 of the double lever b⁷, pivoted to the column at 99 and to the plate b³ at 55, (see Fig. 3,) the link 53 constituting one member of the toggle to act through lever a¹² and links b⁵ upon the bars 48 and lift the rods 18 and their connected pinchers or pullers. The toggle-lever a⁹ is straightened through the rod a⁷, connected to it, and to the belt a⁶, rod a, chain a⁵, and sector a³, as in the

application referred to, the pulley A^5 engaging the belt a^6 frictionally. In this present invention the sector a^3 is fast on the rock-shaft 56 at the upper end of the column, and
 5 fast on the said rock-shaft is a lever 57, having at one end a pin 58. A hand-lever 59, mounted loosely on the said rock-shaft, has a latch 60 pivoted thereon and acted upon by a spring 61 to normally keep the upper end
 10 of the said latch under the said pin 58, so that when the hand-lever 59 is turned toward the column in opposition to the spring 62 the upper end of the said latch acting against the said pin 58 will turn the said rock-shaft and with
 15 it the sector, drawing the rod a and causing the pulley to act on the strap a^6 and straighten the said toggle a^9 53 more or less. When the operator considers that the upper has been sufficiently stretched, he turns the latch 60
 20 away from under the said pin 58, which stops the upward-pulling action of the pinchers on the upper. The movement of the toggle referred to takes place to lift the lever a^{12} , while the usual hold-down rests on the inner
 25 sole on the last. The latch having been removed from the pin 58, the hand-lever may be turned on the rock-shaft 56 until the pin 70, carried by the said lever, comes in contact with the upper end of the lever h^x , which
 30 moves the lever h to effect the release of the cam B, so that it is clutched to the rotating pulley A^5 to operate as described in the said application and cause the side-lasting devices employed to lay the upper over
 35 upon the inner sole. When the toggle has been more or less straightened, according to the upper being lasted, the rod 71, jointed to the toggle at 52 and having very steep screw-threads, (see Fig. 5,) is drawn to the
 40 right in Fig. 1, the said screw-threads acting within a ratchet-nut 72, rotating the said nut in the direction of the arrow thereon, Fig. 6, and the said nut is held in the position in which it is turned by two pawls 73, one being
 45 a little shorter than the other, the said pawls being pivoted at 74 in a cage 75, pivoted to the frame at 76. The pawls referred to may be released whenever it is desired to break the toggle by means of a trip-lever 77, pivoted
 50 at 78 on an ear of column A^2 and acted upon by springs 79, the lower end of the said lever having a cam-toe 80, which when the lever b' is lifted, as will be described, is acted upon by a toe or incline 81 on the said lever,
 55 (see Fig. 6,) the releasing of the ratchet-nut being therefore automatic.

To effect the lifting of the entire apparatus carrying the pinchers and the plate b^8 after the release of the pinchers from the upper,
 60 the rod d' , common to the said application, is connected to a lever d^2 , having at its inner end an adjusting screw or device 74, which as the lever d^2 is moved through the lever B² causes the said screw to act upon the lever
 65 b' and lift the same and its connected parts far enough above the lasted shoe to enable the same to be removed from the machine

and a new shoe supplied in its place. While the parts are being lifted as described, the small toggle, consisting of the link 75, pivoted to the lever b and connected at its lower
 7c end to a hand-lever 75^x, having its fulcrum upon a stud 200 of the frame-work, is straightened, thus locking up or in elevated position the said parts ready to be lowered upon the
 75 work, when desired, by breaking the said toggle by hand. The guide 12 referred to receives within it a double bar 77, having at its upper end a pivot 78, upon which is mounted to turn a lever 79, the said lever being con-
 80 nected at one end by a double link 80 to one end of the double lifting-bar 48, the opposite end of the said lever being represented as being connected by a cord 81 to a pulley 82, having a handle 83, the pulley being pivoted
 85 upon a stud 84 at the opposite end of the lifting-bar 48. This double bar 77, below the pin 78, receives between it the U-shaped center of a lever 85, (shown in section in Fig. 1 and separately in Fig. 11,) the said lever hav-
 90 ing its fulcrum on a stud 86 of the double bar 77, the said lever having its two ends extended in opposite directions from the said pivot 86, one end being, however, in front of and the other behind a pair of equalizing-le-
 95 vers 88 and 89, the said equalizing-levers having each a suitable roller or other stud 90, which enters a slot, as 91, in one end of the said U-shaped lever. The under sides
 100 of the levers 88 89 are curved in shape and act as tracks against which bear or run the roller-studs at the upper ends of the slide-rods 13, carrying the pincher-closing clamps
 105 30, so that when the plate 23 is turned to move the rods 18 in the direction of the length of the last to adapt the pinchers to lasts of different lengths the said rods 13, in whatever position they may occupy, owing to the ad-
 110 justment of the slide-bars 18, being subjected to equal pressure, or that the force applied on the pincher-closing device will be equal throughout.

To cause the cams 30 to act to close the pinchers, the operator will engage the lever 83, turn the same, and through the cord 81
 115 draw down one end of the lever 79, depressing the double bar 77, and with it the U-shaped lever pivoted between its sides and receiving in its slots the center pin or roll of the equalizing-levers 88 and 89. One of the
 120 bars 18—viz., the second one from the right in Fig. 2—has an upward extension which is slotted, as at t^2 , to receive the prolonged end of that roller-stud or center pin connected with the lever 89; but inasmuch as the sec-
 125 ond bar from the left in Fig. 2 does not change its position the said bar does not need the said extension to receive the center pin of the lever 89. As the levers 88 and 89 descend they tip about the pins 90 as centers, and the
 130 U-shaped lever also tips about its center pin 86, which enables the downward pressure to be the same on the rods 13 whatever may be the position of the said rods with relation to

each other owing to adjustment for lasts of different lengths.

It is not intended to limit the invention herein contained to the exact shape of the levers employed to actuate the plate b^3 or to
 5 actuate the double lifting-bars; nor is it intended to limit the invention to the exact shape of the equalizing-levers or devices which act upon the upper ends of the rods 13.
 10 We have shown the screw and ratchet nut and pawls as a means for locking the toggle-lever in any desired position; yet it is not intended to limit this invention to the exact locking device, for any equivalent well-
 15 known mechanical device may be used instead.

We claim—

1. In a lasting-machine, a vertically-movable bar adapted in its vertical movements
 20 to cause a series of pinchers to strain the upper about the last, a series of pinchers, and a toggle to actuate the said bar vertically, combined with a locking device to hold the said toggle in any desired position, according to
 25 the strain wished to be put upon the upper, substantially as described.

2. In a lasting-machine, a vertically-movable bar adapted in its vertical movements to cause a series of pinchers to strain the upper
 30 about the last, a series of pinchers, and a toggle to actuate the said bar vertically, combined with a locking device to hold the said toggle in any desired position, according to the strain wished to be put upon the upper,
 35 and with a releasing device to automatically release the said locking device to permit the toggle to be broken when desired, substantially as described.

3. In a lasting-machine, a friction pulley or
 40 device, as A^5 , a sector, a toggle-lever, connections between the same adapted to be actuated or started by the said pulley to straighten the said toggle, a hand-lever having a tripping
 45 device by which to actuate the said sector for a greater or less distance, and a clutch-pulley and cam actuated by it, combined with a tripping device for the said cam, which tripping
 50 device is adapted to be actuated by the said lever after the sector referred to has come to rest, substantially as described.

4. In a lasting-machine, a series of bars having pivoted eveners and nippers attached thereto at opposite sides of the fulcrum of the
 55 eveners, combined with a series of rods having pivoted equalizers, and nipper-closing devices carried by each equalizer at opposite sides of its fulcrum, to operate substantially as described.

5. In a lasting-machine, a series of longitudinally-movable rods and connected pinchers,
 60 combined with blocks constituting bearings for the said rods, and means to adjust the said blocks to enable the said rods to be put into positions more or less inclined with
 65 relation to a horizontal plane, to thus accommodate the pinchers to the spring of the last, substantially as described.

6. In a lasting-machine, a series of longitudinally-movable rods and connected pinchers,
 70 combined with blocks constituting bearings for the said rods, means to adjust the said blocks to enable the said rods to be put into positions more or less inclined with relation to a horizontal plane, to thus accommodate
 75 the pinchers to the spring of the last, and with means to adjust the said bars horizontally with relation to each other for lasts of different lengths, substantially as described.

7. In a lasting-machine, a series of longitudinally-movable spring-supported rods having
 80 attached pinchers, a series of blocks through which the said rods pass, and lifting-bars provided with curved slots and means to actuate the said lifting-bars to cause the pinchers to stretch the upper, substantially
 85 as described.

8. In a lasting-machine, a lifting-bar, as
 48, a series of longitudinally-movable bars, pinchers carried thereby, collars through
 90 which the said bars pass, a slotted plate, as b^3 , to support the said collars, a series of collars connected to the upper ends of the said rods, and a series of lazy-tongs to connect the collars referred to, to operate substantially as
 95 described.

9. In a lasting-machine, a series of longitudinally-movable slide-bars having attached
 pinchers, and a series of rods having pincher-closing cams, combined with equalizing-levers
 10 to act upon the upper ends of the said rods 13 to equalize the movement of the pincher-closing devices, according to the different adjusted positions of the said rods, substantially
 as set forth.

10. In a lasting-machine, a series of pinchers
 105 to grasp the upper about the last, combined with a series of cam-shaped pincher-closing devices having cam-grades, as shown, to operate in succession, the said pincher-closing devices being adapted to close the
 110 said pinchers and adapt them to the thickness of the upper between them, for the purposes set forth.

11. In a lasting-machine, a series of pinchers to grasp the upper, a series of cam-shaped
 115 pincher closing devices, and means to operate them, combined with a cam plate or device 38, and with means intermediate the pinchers and the said cam-plate to release the pinchers from the upper, substantially as described.
 120

12. A guide-plate b^3 , a series of guide-blocks supported thereby, a series of slide-bars therein having connected pinchers, a lifting-bar,
 125 a series of guide-blocks carried thereby, and means to lift the said lifting-bar and adjust the said slide-bars in the direction of the length of the last, substantially as described.

13. The jaws or pinchers, eveners 21, and
 130 slide-rods, combined with the series of pincher-closing cams differentially graded, and actuating devices therefor, whereby the pinchers are closed automatically, substantially as described.

14. In a lasting-machine, the following in-

strumentalities, viz: a plate or head having curved guideways, a series of guide-blocks, means to connect said blocks, a lifting-bar, as 48, and a series of slide-rods having connected 5 pinchers or pullers, the said slide-rods occupying an inclined or radial position with relation to the last, and means to move the said rods longitudinally in the said lifting-bar to actuate the said radial lines, substantially as 10 described.

15. In a lasting-machine, the following instrumentalities, viz: a plate or head, a series of slide-rods therein having connected pinchers or pullers, a lifting-bar to actuate the said

slide-rods, a lever and link to which the said 15 lifting-bar is joined, a toggle-lever to move the lever having the attached link, and means to lock the said toggle-lever in any desired position more or less straightened, for the 20 purposes set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GORDON MCKAY.

HADLEY P. FAIRFIELD.

Witnesses:

GEO. W. HAMMATT,

A. L. PICKETT.