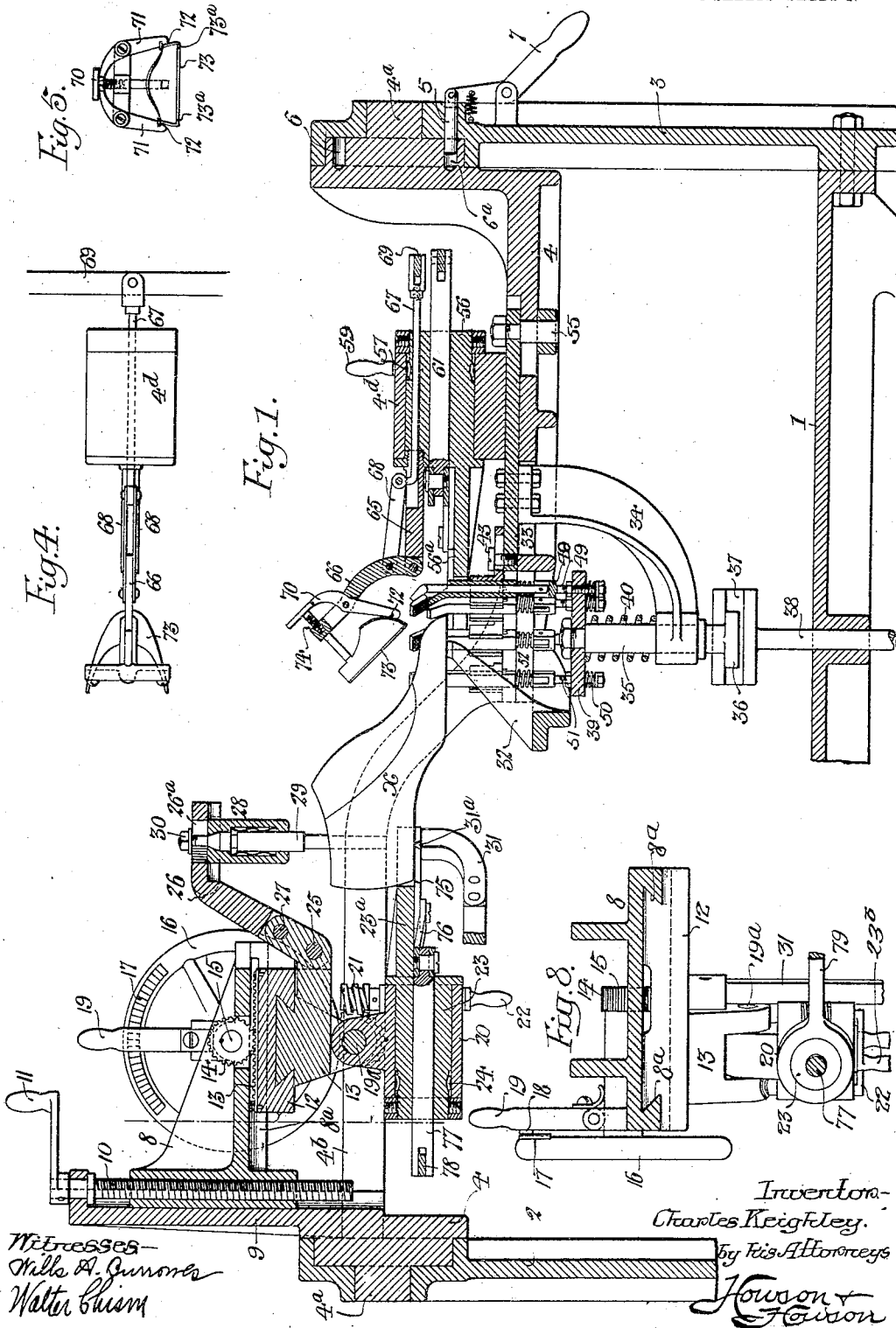


Patented Aug. 27, 1912.

3 SHEETS—SHEET 1.

1,037,018.

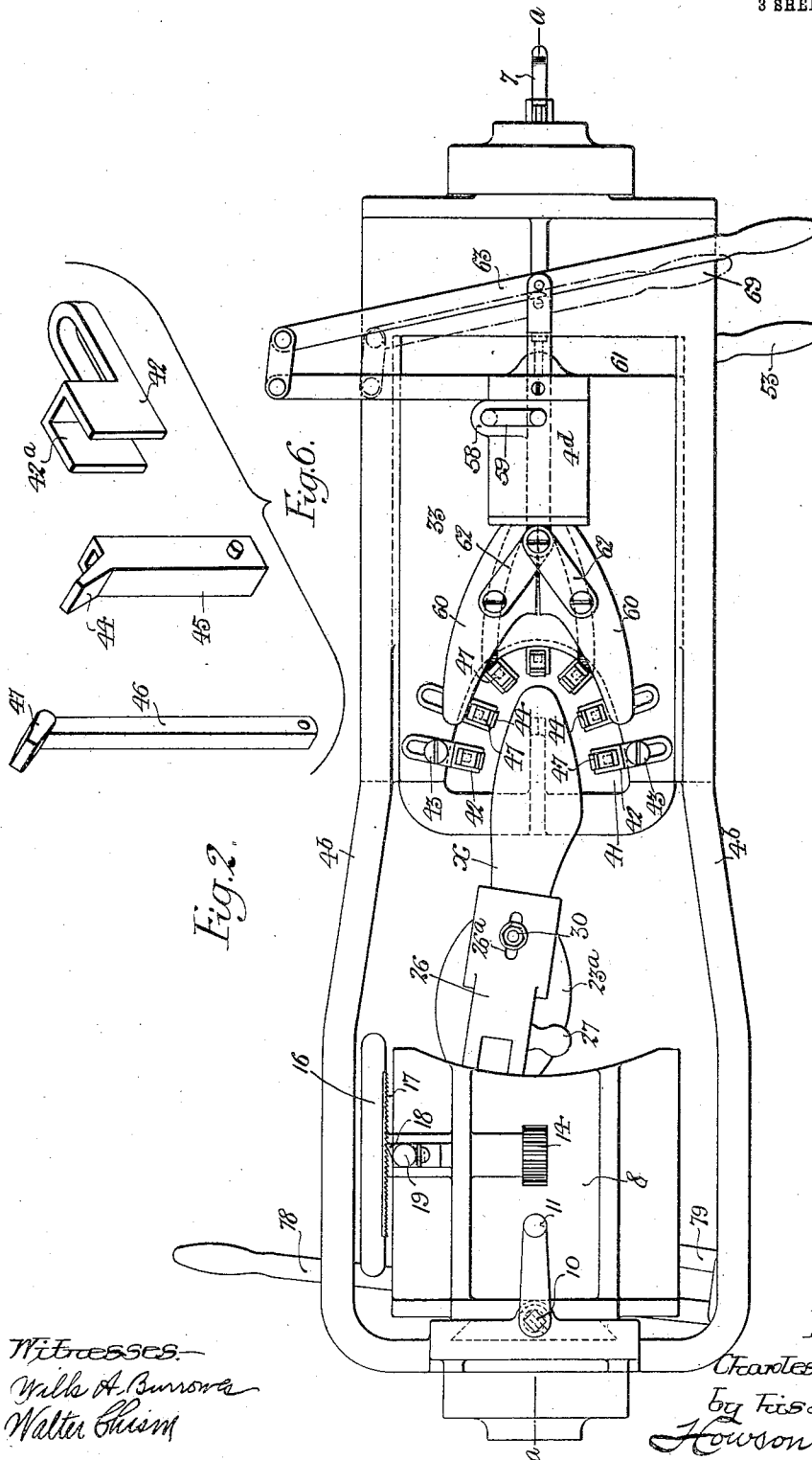


C. KEIGHLEY.
LASTING MACHINE.
APPLICATION FILED AUG. 31, 1910.

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3 SHEETS—SHEET 2.

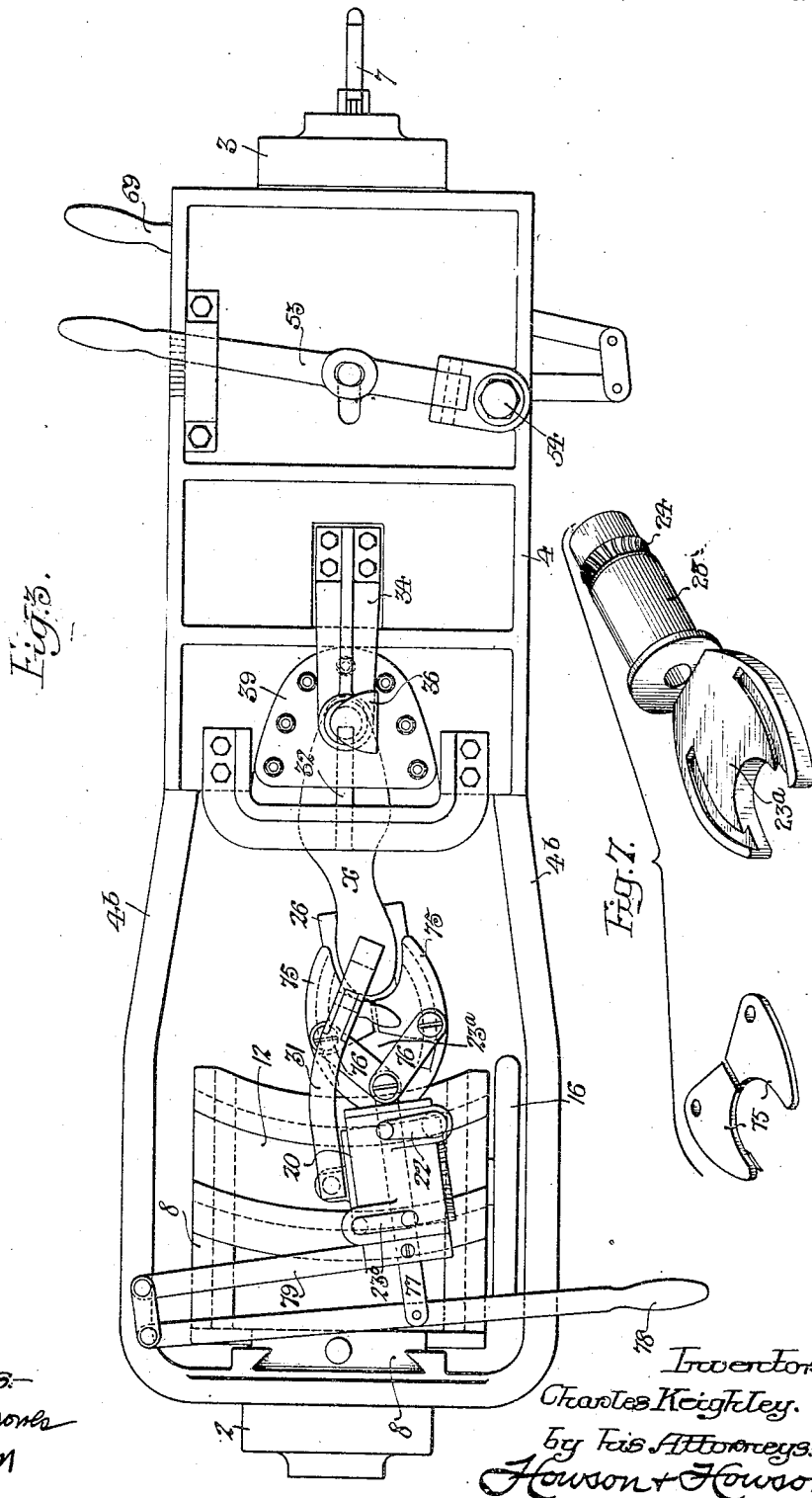


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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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LASTING-MACHINE.

1,037,018.

Specification of Letters Patent.

Patented Aug. 27, 1912.

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To all whom it may concern:

Be it known that I, CHARLES KEIGHLEY, a citizen of the United States, and a resident of Vineland, Cumberland county, New Jersey, have invented certain Improvements in Lasting-Machines, of which the following is a specification.

One object of my invention is to provide a machine particularly designed to facilitate the lasting of shoes; it being desired that the various parts shall be so arranged as to permit of the machine being operated with the utmost rapidity as well as in a satisfactory and efficient manner.

I further desire to provide a lasting machine which shall be capable of adjustment for operation with either right or left lasts of practically any size or shape; it being especially desired that the arrangement of parts shall be such as to so apply the leather to a last as to produce the highest grade of shoes.

I also desire that the machine constructed according to my invention shall, after properly applying and stretching the leather on the last, also be capable of placing in position a leather-retaining cap for use instead of the tacks or wires customarily used to hold the leather to the front portions of a shoe, and in addition be adjustable to give free access to the heel of the last.

Another object of my invention is to provide a lasting machine, which in addition to stretching an upper over certain portions of a last, shall be capable of manipulation to smooth or wipe such upper so that it takes the desired shape.

Another object of the invention is to provide a machine capable of lasting shoes practically without tacks, strings, wires or other temporary fastenings, so that the shoes may be advertised and sold as tackless lasted.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which;—

Figure 1, is a vertical section illustrating the detail construction of my improved machine; Fig. 2, is a plan of the machine with its parts in the positions shown in Fig. 1; Fig. 3, is a plan of the machine after its revoluble frame has been turned 180°; Figs. 4 and 5 are respectively a plan and a front elevation of the cap applying device forming part of my invention, Fig. 6, is a de-

tached perspective view of certain of the leather stretching jaws; Fig. 7, is a perspective view of certain of the wiping or smoothing jaws, and Fig. 8, is a section of the back slide with certain of its associated parts.

In the above drawings, 1 is the base portion of the main frame of the machine, to the opposite ends of which are rigidly connected uprights 2 and 3. Between the top portions of these uprights extends a frame 4 revoluble on a horizontal axis and having at its ends trunnions 4^a fitted to bearings in the uprights 2 and 3 whereby such movement is rendered possible. This frame may be held in either one of two positions 180° from each other by means of a pin 5 mounted in the upright 3 and capable of entering either of two holes 6 and 6^a in the adjacent ends of said frame; there being provided a lever 7 (preferably foot operated) pivoted on the upright 3 for shifting the position of this pin at will.

As shown in the two plan views, the frame 4 is of an open construction and includes two widely separated side members 4^b between which is mounted a vertically movable slide 8 co-acting with suitable guideways on an upward extension 9 projecting from what is, under operating conditions, the rear end of the frame 4. In this part 9 is mounted a screw 10 having an operating handle 11 and engaging the slide 8 in such manner as to raise or lower it when said handle is turned. Said slide is provided with horizontal guideways 8^a in which is mounted a horizontally movable slide 12 having a rack 13 formed in its upper portion and designed to co-act with a pinion 14. This latter is mounted on a shaft 15 carried in bearings on the vertically movable slide 8 and also having fixed to it a wheel 16 which has on one face a series of teeth, indicated at 17, capable of engagement by a pawl 18 carried on a lever or handle 19 which may be swung away from said wheel in order that it and hence the pinion 14 may be moved at will to shift the slide 12 in a horizontal line.

The under side of the horizontally movable slide 12 is provided with curved undercut guideways for the reception of a carriage 13 which, by means of a shaft 19^a, supports a sleeve 20; there being mounted on said shaft a segment of a worm gear, as indicated in dotted lines in Fig. 1, designed to

mesh with a worm 21 carried on a spindle having bearings in the sleeve 20 and capable of operation by means of a handle 22 to swing said sleeve upon its pivot.

5 Within the sleeve is rotatably mounted a cylindrical piece 23 having worm teeth indicated at 24 designed to be engaged by a worm indicated in dotted lines in Fig. 1, to which is fixed a handle 23^b whereby the piece
10 piece 23 may be rotated within the sleeve. Said piece 23 has a forwardly projecting portion 23^a in which are formed curved guideways for the reception of projecting lugs belonging to two heel wiping jaws 75 pivotally
15 connected to a pair of links 76 movably held to the end of a bar 77 guided within the piece 23 and capable of reciprocation by means of a hand lever 78. This latter is pivoted to an arm 79 rigidly fixed to said
20 piece 23.

Adjustably pivoted to the carriage 13 by an adjustable clamping bolt 25, is an arm 26 normally held in a raised position by a removable pin 27 and carrying a depending post 28, as shown in Fig. 1. This post is provided with an elongated rod 2 whose upper end is threaded and extends through a slot 26^a in the arm 26 in which it is held in any adjusted position by means of a nut
30 30; the lower end of this rod projecting downwardly so as to be capable of engaging the last X. For supporting the rear part of such last, I provide an adjustable arm 31 connected to the carriage 8, from which
35 it extends downwardly and under the parts heretofore described; the construction and arrangement being such as to permit this arm being locked or clamped in any given position.

40 The front portion of the last is carried by an arm 32, shown in Figs. 1 and 3, and forming part of the frame 4. Said frame also supports a horizontally reciprocable carriage 33 in which is mounted a series of
45 pairs of jaws of the detail construction shown in Fig. 6 and designed to grasp the leather of an upper so as to stretch it over the toe and front portions of a last. In order to support and operate said jaws, the
50 carriage 33 has a downwardly and rearwardly projecting arm 34 having a bearing serving as a guide for a vertically extending rod 35 which is provided with a lateral extension 36 at its lower end so as to be
55 capable of removably engaging the suitably formed upper end 37 of a foot operated bar 38 guided in the main frame 1.

The construction of the end 37 is such that the part 36 is free to disengage it when the frame 4 is swung on its trunnions 4^a and is also free to move longitudinally of the machine while still remaining operatively connected to said bar 38. The upper end of the rod 35 carries a plate 39 which has a
60 spring 40 confined between it and the arm

34; the arrangement being such that when the parts 36 and 37 are in engagement, it is possible, by drawing down on the bar 38, to likewise draw down the plate 39 against the action of said spring.

As shown in Fig. 2, the rear end of the carriage 33 has a semi-elliptical recess 41 around whose curved edges are mounted guide boxes 42 for the jaws. These, as best shown in Figs. 1 and 6, have longitudinally
70 slotted lugs through which extend screws or bolts 43 whereby it is possible to bodily slide said jaws toward or from the last and thereafter retain them in their adjusted positions. As shown, one side of each of the
80 guide boxes 42 is open and has mounted within it a stem 45 which carries a forwardly projecting jaw 44; said stem being hollow and of substantially rectangular section so as to snugly fit within the space 42^a
85 of the guide box 42. The passage within the stem 45 of each jaw is preferably rectangular in section and has movably mounted in it the rectangular stem section 46 of the second or upper jaw 47, which preferably is inclined forward so that one of its faces may co-act with the jaw 44 to grip a piece of leather. The lower end of the stem 46 of each jaw 47 is pivoted to the suitably
95 formed head 48 of a bolt 49 movably carried by the plate 39; the arrangement being such that said bolts extend below this plate and have springs 50 confined between their lower ends and said plate. A nut or other suitable form of abutment 51 is mounted
100 on each of the bolts 49 above the plate 39 so as to adjustably limit the amount of its possible downward movement. In addition to the above, I preferably mount a spring 52 on each of the stems 46 between the upper
105 end 48 of the bolt 49 and the lower end of the stem 45 of the jaw 44; it being possible by this means for the latter jaws to be moved independently of the jaws 47 and likewise for both of said jaws to be moved
110 together after they have gripped a piece of leather.

In order to reciprocate the carriage 33, I provide a lever 53 pivoted to the frame 4 at 54 and suitably connected to a stud 55 projecting downwardly from the body of the carriage 33; it being seen from Fig. 3 that the handle of said lever projects from one side of the frame of the machine so as to be readily grasped and operated.

120 The frame 4 extends upwardly from the front portion of the carriage 33 and is provided with a cylindrical bearing 4^a for a sleeve 56 having formed in its surface a series of worm teeth 57 designed to be engaged by a worm 58 mounted in the bearing structure and capable of being turned by a handle 59 to rotate said sleeve. This latter has a rearwardly projecting portion 56^a serving as a support and provided with
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guideways for two wiper jaws 60 so placed as to be capable of being brought into engagement with and wiping or smoothing the leather of an upper after this has been stretched over the last X, as hereafter described. For operating these jaws, I provide a bar 61 preferably of rectangular section and operative within the sleeve 56; connecting this to the jaws by links 62 and actuating it by means of a hand lever 63 suitably supported on said sleeve. This latter also has projecting rearwardly from it a structure 65 to which is pivoted an arm 66; it being possible to swing this arm up or down as desired by means of a reciprocable rod 67 connected to it by a link 68. This rod is capable of operation by means of a hand lever 69 shown in dotted lines in Fig. 2 and also illustrated in Fig. 4. As shown best in Figs. 1, 4, and 5, this arm has depending from its end three levers, of which one is indicated at 70 and the others are shown at 71; each of these having near its lower end a recess for the reception of the flange 72 on a toe cap 73. All the levers are normally maintained in engagement with this flange by a spring 74, though they are capable of being turned on their pivots against the action or said spring to release the cap. This latter is preferably made of steel or other springy light material and is designed to fit over the toe of a shoe so as to confine or hold the leather of the upper in position thereon after it has been properly stretched, as hereafter described. For this purpose the cap has around its lower edge an inwardly projecting flange 73^a of such dimensions as to be capable of springing over and tightly fitting the toe of the last after the leather has been applied thereto, to maintain this latter in any given position.

With the above described arrangement of parts, a last suitable for the work is mounted on the supporting arms 31 and 32, being held in place on the former by engagement with a sharp point 31^a thereon. The bolt or pin 29 is then placed in its hole in the last and the carriage 18 is swung in its guide to suitably position the last for the operation to be performed on it; the part 8 being raised or lowered as may be necessary, by suitable operation of the handle 11, to bring the last to the proper level. Likewise the handle 19 is manipulated to free the wheel 16 which may be operated to move the last backward or forward until it is in the proper position.

With the various parts of the machine in the positions shown in Fig. 1, the previously assembled upper is then applied to the last and is laid by hand between the jaws 44 and 47 of each pair, these being normally in their separated positions. By means of a suitable treadle or other device (not shown) the bar 38 is then drawn downwardly, thus likewise

drawing down the rod 35 and all of the jaws 47. These are thus caused to co-act with the jaws 44 to grip the leather of the upper and thereafter the continued downward movement of the bar 38 causes all of the pairs of jaws to be bodily drawn down so that said leather is properly stretched over the front of the last. The handle 53 is now moved toward the rear of the machine, thus moving the carriage 33 and with it all of the jaws in the same direction thereby more tightly stretching the leather and drawing its front lower edge under the toe. The handle 63 is now oscillated, thereby causing the wiper jaws 60 to engage the upper around the lower portions of the toe and sides of the last so as to wipe or press the overlapping toe portions over the insole and force the same squarely into the shoulder or channel of the insole, at the same time properly smoothing the leather in the desired manner. Said handle 63 is then drawn toward the front of the machine and a cap 73 placed in position on the levers 70 and 71, though if desired these latter, with their associated parts, may be omitted and the cap placed by hand. By moving the lever 69 to the rear, the arm 66 is swung downwardly and said cap is placed over the toe of the last; its flanges 73^a extending under the bottom of said last and tightly confining the stretched leather thereto in its smoothed position. By pressing down on the upper end of the lever 70 against the action of the spring 74, this lever with the two levers 71 are turned on their pivots and made to disengage the cap 73, which is thus left in position on the last.

By operating the lever 7, the pin 5 is withdrawn from the hole 6^a so that the frame 4 may be turned 180° on its trunnions, thereby disengaging the members of the coupling formed by the parts 36 and 37 and bringing uppermost the bottom of the last, with the various parts occupying the positions shown in Fig. 3. By suitably manipulating the handles 22 and 23^b the wiper jaws 75 may be adjusted so as to be capable of properly operating on the heel portion of the upper, when by oscillating the lever 78, said jaws are brought into engagement with and caused to wipe or smooth the upper around the lower edges of the heel portion thereof. Thereafter those edges of the upper which project below the heel are drawn inwardly over the bottom of the last and either tacked or wired thereto or held in position by a portable clamp, after which the pin 5 is withdrawn from the hole 6 of the frame 4 and this latter is swung back into the position shown in Fig. 1, whereupon the last may be removed and another substituted therefor.

From the above description it will be noted that my machine may be quickly ad-

justed to operate either on right or left lasts, for which purpose I provide the structure 12 with its adjustable carriage 13. Likewise the support for the rear end of the last 5 may be raised or lowered to accommodate it for the reception of lasts of various styles.

I claim:—

1. The combination in a lasting machine of a supporting framework including a structure for supporting a last; a series of jaws capable of engaging an upper; means for actuating the jaws to cause them to draw the upper over the last; with mechanism for applying a retaining cap to the upper 10 after the jaws have drawn it into position.
2. The combination in a lasting machine of a supporting framework including a horizontally revoluble auxiliary frame; means for supporting a last on said auxiliary frame; a series of leather gripping jaws and wiper jaws all mounted on the auxiliary frame; means for actuating the gripping jaws at will including a structure mounted on the supporting frame; and a detachable 20 coupling connecting said structure to the gripping jaws.
3. The combination in a lasting machine, of a supporting framework including a structure for supporting a last; a series of pairs of vertically acting gripping jaws; means for actuating said jaws to cause them to grip an upper and apply it to the last; means for moving said jaws bodily toward the last; wiper jaws having lugs and placed 30 to act on the upper after the same has been applied to the last by the gripping jaws; a plate having guideways for said lugs; and means for actuating said plate to apply the wiper jaws.
4. The combination in a lasting machine of a supporting framework including a structure for carrying the last; mechanism for applying an upper to the last; with means for adjusting the height of the last-carrying structure; and other means carried by said first means for adjusting the lateral position of said structure.
5. The combination in a lasting machine of a main supporting frame including a last-carrying structure; mechanism for applying an upper to the last; means for adjusting the position of the last-carrying structure toward or from said mechanism; means for adjusting the position of the last-carrying structure in a horizontal plane; and means 55 carrying said two other adjusting means for adjusting said structure up and down.
6. The combination in a lasting machine of a main supporting frame including means for carrying a last; mechanism for applying an upper to the last; and a device for applying a retaining cap to the last after the upper has been applied thereto.
7. The combination in a lasting machine 65 of a main supporting frame, including

means for carrying a last; mechanism for applying an upper to the last; a holder for detachably engaging a toe cap; and means for actuating said holder to apply the cap to the last so as to retain the upper thereon in a given position. 70

8. The combination in a lasting machine of a main supporting frame including means for carrying a last; mechanism for applying an upper to the last; a holder including a plurality of jaws for detachably engaging a toe cap; and means for actuating said holder to apply the cap to the last so as to retain the upper thereon in a given position. 75

9. The combination in a lasting machine, of a frame; means thereon for supporting a last; an operating member; a plate carried thereby; a spring acting to return said plate to a predetermined position when it is moved therefrom; a series of jaws capable of engaging an upper and mounted on said plate; with a second series of jaws slidable in straight lines toward and from said first jaws. 80 85

10. The combination in a lasting machine, of a frame; means thereon for supporting a last; an operating member; a plate carried thereby; a spring acting to return said plate to a predetermined position when it is moved therefrom; a series of jaws capable of engaging an upper and mounted on said plate; with a second series of jaws guided by the jaws of the first series so as to be slidable in straight lines toward and from the same. 90 95

11. The combination in a lasting machine, of a frame; means thereon for supporting a last; a carriage movably mounted on the frame; a series of guide boxes on the carriage; a pair of jaws for each guide box mounted to slide relatively to each other; with means for actuating said jaws. 100 105

12. The combination in a lasting machine, of a frame; means thereon for supporting a last; a carriage movably mounted on the frame; a series of guide boxes on the carriage; a pair of jaws for each guide box; a plate connected to one jaw of each pair; and means for actuating the plate to operate the jaws. 110 115

13. The combination in a lasting machine, of a frame; means for supporting a last; a series of pairs of jaws mounted on the frame; both jaws of each pair being vertically movable independently of each other; a supporting structure common to all of the jaws; with means for actuating said supporting structure to operate the jaws. 120

14. The combination in a lasting machine, of a supporting frame; means for stretching an upper over a last and means for supporting a last; the same consisting of a structure adjustably guided on the frame to move up and down; a second structure movably mounted on said first structure and adjust- 125 130

able in a line at right angles to the line of adjustment of the same; and a third structure having last supporting means mounted on the second structure so as to be adjustable in a line lying in a plane at right angles to the line of adjustment of the first structure.

15. The combination in a lasting machine, of a supporting frame; means for stretching an upper over a last and means for supporting a last; the same consisting of a structure adjustably guided on the frame to move up and down; a second structure movably mounted on said first structure and adjustable in a line at right angles to the line of adjustment of the same; and a third structure having last supporting means mounted on the second structure so as to be adjustable in a line lying in a plane at right angles to the line of adjustment of the first structure; a fourth structure pivoted to the third structure; and jaws carried thereby for acting on an upper.

16. The combination in a lasting machine, of a supporting frame; means for stretching an upper over a last and means for supporting a last; the same consisting of a structure adjustably guided on the frame to move up and down; a second structure movably mounted on said first structure and adjustable in a line at right angles to the line of adjustment of the same; and a third structure

having last supporting means mounted on the second structure so as to be adjustable in a line lying in a plane at right angles to the line of adjustment of the first structure; a fourth structure pivoted to the third structure; and jaws rotatably carried thereby for acting on an upper.

17. The combination in a lasting machine, of a frame, last mechanism mounted thereon; a structure mounted on the frame and adjustable in a straight line; a second structure mounted on the first structure and adjustable at right angles to the line of movement of said first structure; a third structure adjustably mounted on the second structure and adjustably movable in a line lying in a plane at right angles to the line of movement of the first structure; a fourth structure pivoted to the third structure; a rotatable member mounted in the fourth structure; a longitudinally movable bar mounted in said member; means for actuating said bar; and jaws for operating on an upper connected to be operated by said bar.

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

CHAS. KEIGHLEY.

Witnesses:

WILLIAM BAIRD,
MARY EILENBERG.