

(No Model.)

3 Sheets—Sheet 1.

G. W. COPELAND, J. E. CRISP, E. F. GRANDY & W. AVERY.
LASTING MACHINE.

No. 558,043.

Patented Apr. 14, 1896.

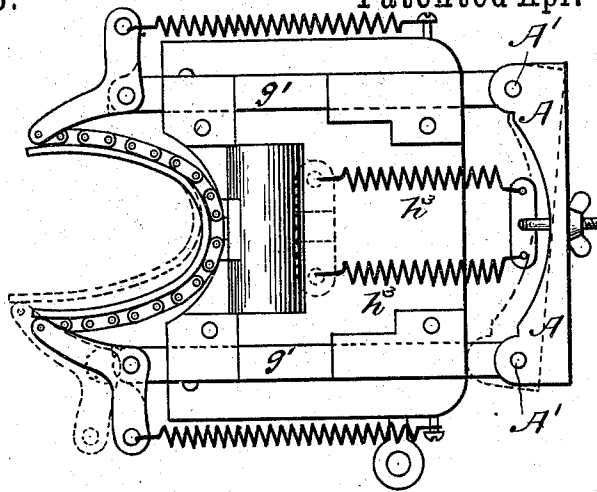


Fig. 2.

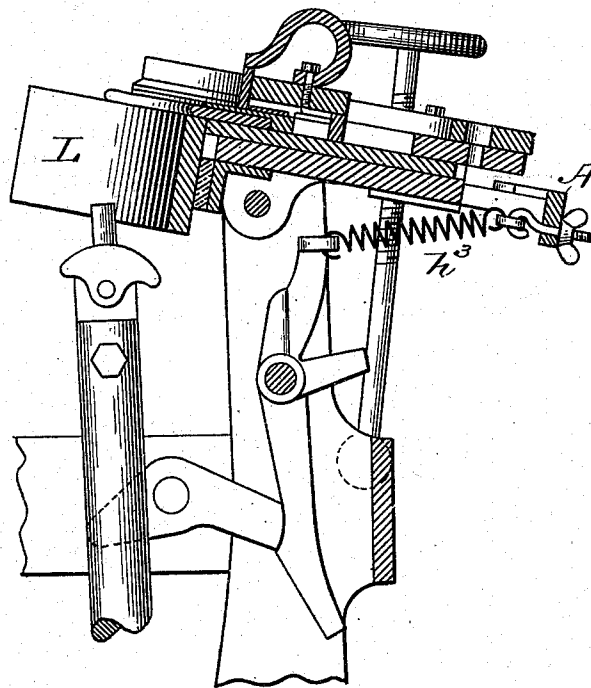


Fig. 1.

WITNESSES

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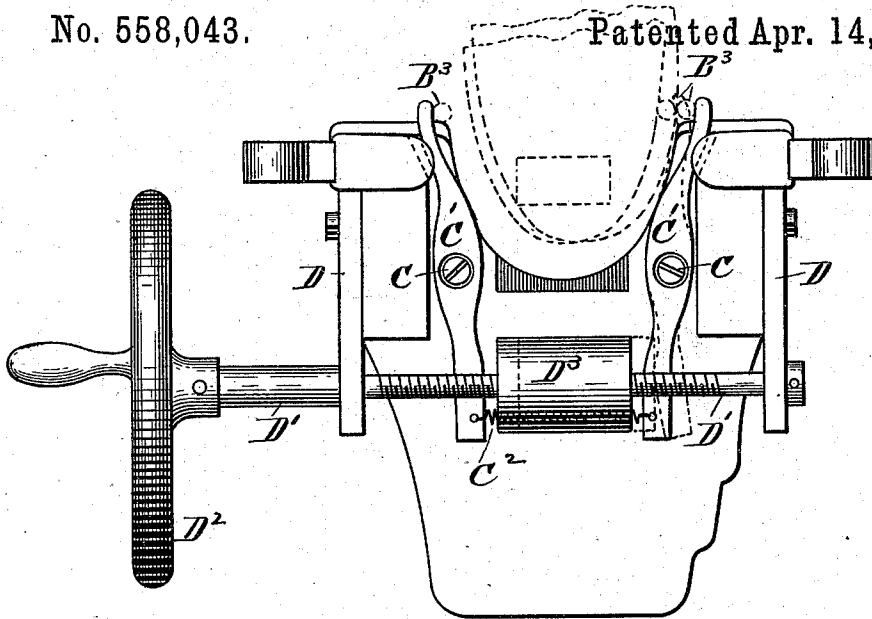


Fig. 4.

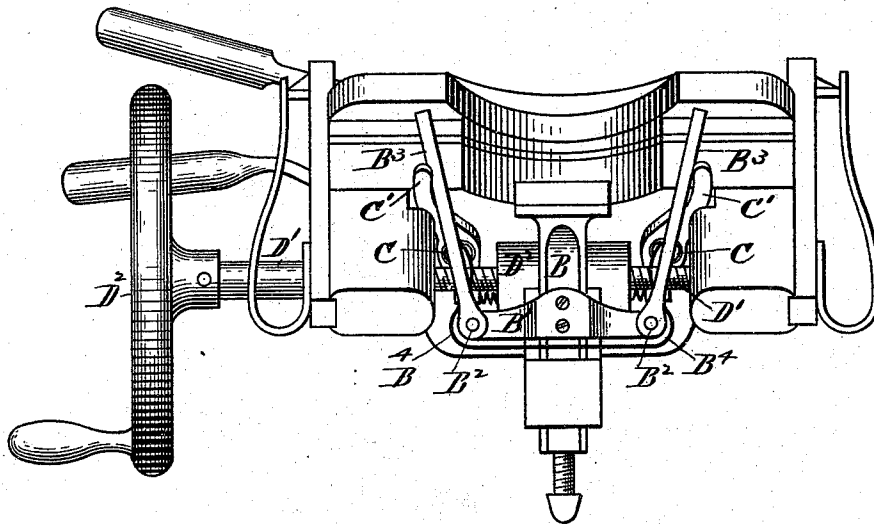


Fig. 5.

WITNESSES

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(No Model.)

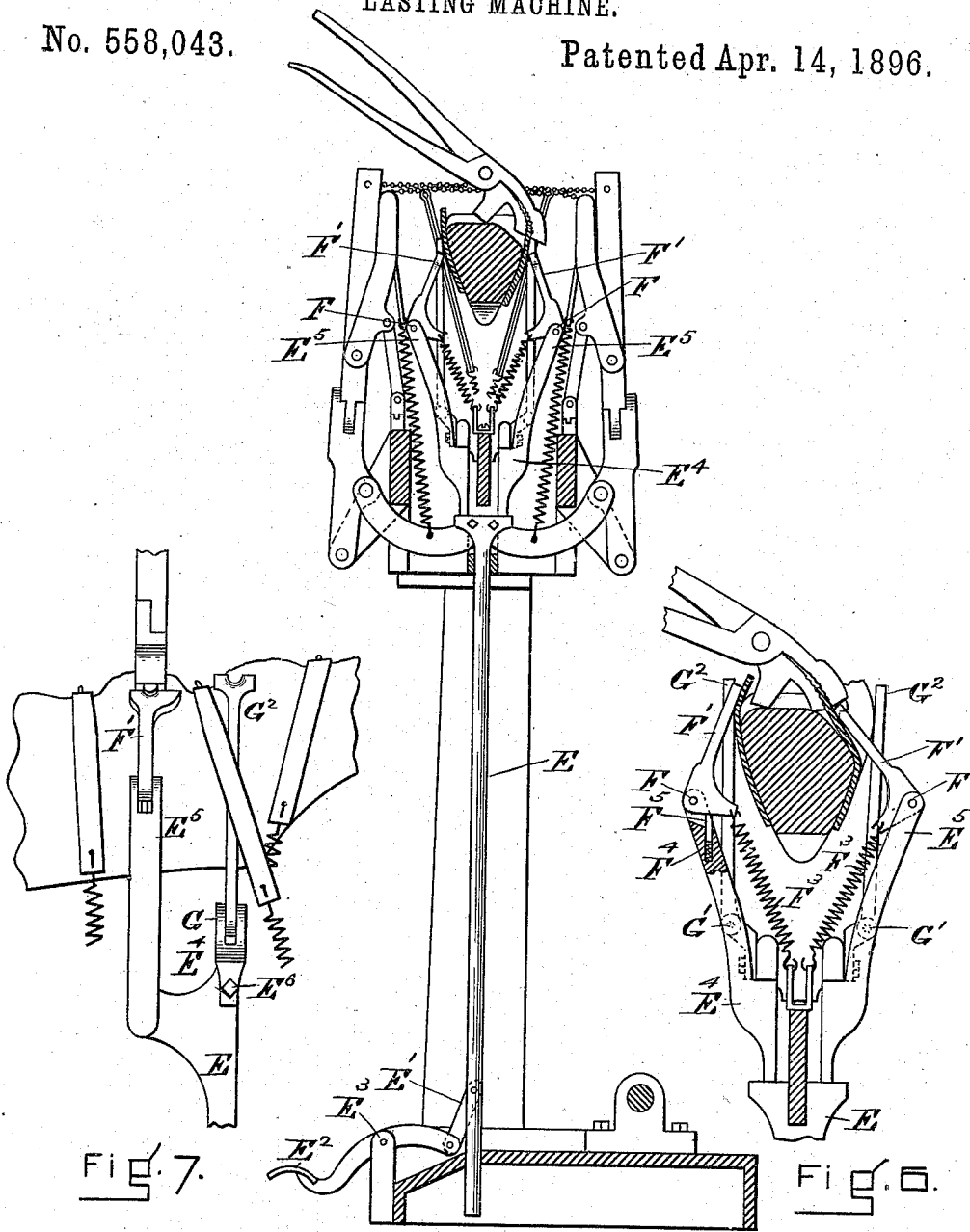
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WITNESSES

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FIG. 5.

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UNITED STATES PATENT OFFICE.

GEORGE W. COPELAND, OF MALDEN, JOSEPH E. CRISP, OF SOMERVILLE,
AND EDWARD F. GRANDY AND WILLIAM AVERY, OF EVERETT, MASSA-
CHUSETTS, ASSIGNORS TO THE COPELAND RAPID LASTER MANUFAC-
TURING COMPANY.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,043, dated April 14, 1896.

Application filed May 23, 1892. Serial No. 433,953. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. COPELAND, of Malden, JOSEPH E. CRISP, of Somerville, and EDWARD F. GRANDY and WILLIAM AVERY, of Everett, all in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Lasting-Machines; and we do hereby declare the following, with the annexed drawings, to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to enable the operator of a lasting-machine to bring the last into and hold it in a central or any other desired position while it is in the machine, and also to assist the operator in driving the upper around the last preparatory to securing the upper to the inner sole.

These improvements can be used on any lasting-machine; but in the present instance they are shown as connected and operating with toe and heel lasting heads such as are described in Letters Patent No. 465,073 of December 15, 1891, and having the addition of pincer-elevators to the same machine.

In the drawings forming part of this application, Figure 1 is a vertical sectional view of a heel-lasting head. Fig. 2 is a plan of the bottom of said head, showing the means for equalizing the operation of the heel-band as the toe is swung from right to left, or when said band is claspings very irregular-shaped lasts. Fig. 3 is an elevation of a toe-lasting head, looking from the heel end of the last. Fig. 4 is a plan of the under side of said head, showing the means for swinging the toe of the last to any desired position. Fig. 5 is a vertical cross-section of a strap lasting-machine, showing the pincer-elevators and their method of operation, with said elevators down. Fig. 6 is a portion of Fig. 5, showing the pincer-elevators when up and acting upon a very slanting shank. Fig. 7 is a side elevation of the pincer-elevators, showing their relations to the straps, upper, and pincers.

By reference to the specification of Patent No. 465,073 it will be seen that the heel-last-

ing band L is drawn around the last by the action of two independent spring connections h^3 of the same tension, another spring acting also on each end of the band. When used upon lasts whose curves from the heel to the shank were nearly equal on each side, this device was sufficient; but when one side of the last was nearly straight and the curve of the other side was extreme there would be an excess of pressure upon the straight side of the last that would swing the toe of the last to the right or left, according to the last used. To give uniformity of pressure to the ends of the heel-lasting band L, the slide bars g' , which operate the ends of said band, are connected by the equalizing cross-bar A and the pins A' , fixed in the ends of the slide-bars, the holes in the bar A through which the pins A' pass being slotted to allow said bar to swing as desired. This is shown by Figs. 1 and 2, the dotted lines of Fig. 2 showing the action of the device when operating upon a last of irregular form, where the pressure of each end of the band L would be substantially equal.

In the toe-lasting process upon fine shoes it is desirable at times to move the toe of the last slightly to the right or left after the last has been fixed in the machine to produce the best possible results, and in heavy work it is also desirable to hold one or the other of the sides of the last from moving under the strain of drawing the lasting-plates over.

The device shown by Figs. 3 and 4 as attached to the toe-rest and toe-lasting head is effective for either purpose, and it is constructed and operated as follows: Fixed to the stem B of the toe-rest is the cross-bar B' , and hung upon the ends of this cross-bar by pins B^2 are the vertical swinging arms B^3 , whose upper ends are thus governed for height by the height of the toe-rest and always swing just clear of the lower side of the toe-lasting plates and to and from the sides of the toe of the last. The spring B^4 keeps the arms B^3 spread apart when not moved by the levers C' . Pivoted to the under side of the toe-lasting head at C are the double-ended levers C' , whose inner ends are drawn together by the spring C^2 and whose outer ends

cross the back side of the arms B³, to which they may be connected, if desired.

To the side of the toe-lasting head are fixed the bearings D, in which revolves the quick-pitch screw D', provided with the hand-wheel D². Mounted upon the screw D', between the inner ends of the levers C', and so that its ends will contact with said levers when operated, is the sliding nut D³. It will be seen that the revolution of the screw D' in either direction will force one of the ends of the nut D³ against the inner ends of one of the levers C', and that this motion will be transmitted to one of the swinging arms B³, so that said arm will move and hold the toe of the last sidewise, as desired.

In the side-lasting process it is requisite that the operator should draw the upper tight around the last with the pincers before the holding devices are applied. In doing this many times a day, between the grasping of the pincers and using them as a lever to draw over the upper, a severe strain on the wrist and hand of the operator occurs. To relieve this strain and at the same time to facilitate the lasting process, pincer-elevators are used, which engage with the nose of the pincers and draw over or assist in drawing over the upper. These elevators may be operated by power or by foot of the operator, and they are constructed and operated in the following manner.

In the present instance a sliding bar E is mounted on the frame of the machine, so that it can be reciprocated vertically by the link-connection E', operated by the foot-treadle E², which is hung at E³ to a projection formed on the base of the machine for that purpose. At the top end of the bar E is the head E⁴, to which the elevators are secured, and each time the bar is reciprocated all of the elevators are correspondingly moved. The head E⁴ has branches E⁵, to which are pivoted at F the shank-pincer elevators F'. The spread of the branches allow these elevators to swing to the proper angle when operating upon the curved side of the last, as shown by Fig. 6. The upper ends of the branches E⁵ are slotted, and in these slots are pivoted upon the pins F² the shank-elevators F'. These elevators F' are bell-crank in form, and to their shorter ends are attached one end of the springs F³, the opposite ends of said springs being attached to a fixed part of the lasting-machine, so that when the bar E is down the springs F³ are inactive. In the bottom of the slots formed in the branches E⁵ there are placed the springs F⁴, which act upon pins F⁵ and swing the upper ends of the shank-elevators away from the last when the bar E is down. The tension of the springs F³ and F⁴ is regulated so that when the bar E is moved up the upper ends of the shank-elevators first move in toward the shank and then follow round it. When the bar E is lowered, the reverse motion takes place and the lasts can be

placed in or removed from the machine without difficulty.

Secured to the head E⁴ by the bolts E⁶, and so that they can swing lengthwise of the last, are the forked pieces G. To these pieces, at G', are pivoted the elevators G², which raise the pincers at the ball of the foot of the last. These elevators G² are held apart by a light spring, (not shown,) and from the nature of their connection with the head E⁴ they can be moved lengthwise and toward the last to the point where their services are required by the hand of the operator. The upper ends of these elevators and the outer jaw of the pincers are fitted together, so that when in contact they form a universal joint, which gives perfect freedom of motion and at the same time insures the union of these parts regardless of the power applied to the nose of the pincers to draw up the upper, or of the angle at which they may be acting. These elevators can be used in the following manner on the machine to which they are described as being attached.

After the last, with the upper properly adjusted upon it, is fixed in the machine, the upper on one side of the ball is grasped in the pincers and the bar E is raised until the elevator for that side is swung in and brought in contact with the nose of the pincers. The upper is then drawn to the required tension by the further raising of the elevators, when it is held by the holding-strap for that place. This draws the leather on one side of the last well up, and the strap so holds it that when the heavy strain is applied to the leather at the other side of the ball the margin of the side of the upper first operated upon remains firmly in place. After this the side of the shank corresponding to the side of the ball first drawn is drawn up in the same manner, the elevator for that side following the nose of the pincers around the curve, as shown by Fig. 6, and when the proper tension has been attained upon the upper the holding-strap for that side is drawn over. The same operation is then performed at the other side of the shank of the last, the elevators for that part being swung lengthwise of the last as the size varies. The upper is then fastened to the inner sole in the usual manner and the last removed from the machine.

During the process of lasting an upper the pincers are used by the operator at intermediate points between the ball and the shank to draw it to the last in the usual manner, and if the upper conforms readily to the last the pincers do not require to be given a final strain by the elevators at each side of the ball and shank, as above described.

Having thus described our invention, its construction and mode of operation, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a lasting-machine head of the class described, the combination of the band L, the

slide-bars g' , the equalizing-bar A, the spring connections h^3 , and suitable connecting and operating mechanism, substantially as shown and described.

5 2. In combination with a lasting-machine head having suitable toe-lasting mechanism mounted thereon, vertical swinging arms attached to the toe-rest, horizontal swinging levers pivoted to said head engaging with said
10 arms, and screw-nut mechanism for operating said levers and moving and holding said arms in operative position substantially as shown and described.

15 3. The combination in a lasting-machine of pincer-elevators located at the sides of the last, and adapted to fit within given spaces thereon, suitable connecting and treadle-operating mechanism for said elevators, individual hand-pincers, means substantially as
20 described to connect said pincers to either of

said elevators during the lasting process, substantially as shown and described, and for the purpose set forth.

4. The combination in a lasting-machine of pincer-elevators located at the sides of the 25 last, and adapted to fit within given spaces thereon, suitable connecting and treadle-operating mechanism for said elevators, individual hand-pincers, means substantially as described to connect said pincers to either of 30 said elevators during the lasting process, and a spring for depressing said elevators, substantially as shown and described.

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