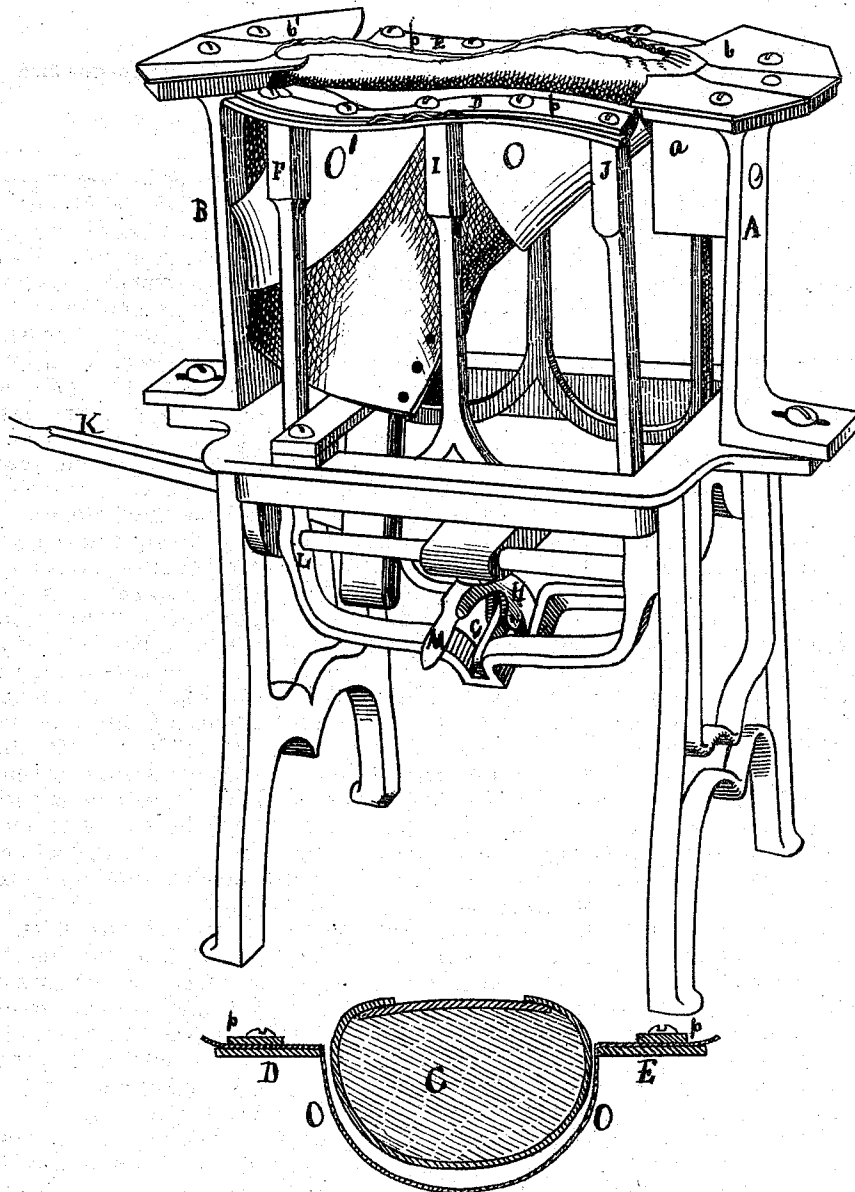


F. D. BALLOU & G. W. COPELAND.
Machinery for Lasting Boots and Shoes.

No. 156,405.

Patented Nov. 3, 1874.



L. J. Berner.
H. F. Raymond.
Witnesses.

Francis D. Ballou
Geo. W. Copeland,
Inventors.

UNITED STATES PATENT OFFICE.

FRANCIS D. BALLOU, OF ABINGTON, AND GEORGE W. COPELAND, OF
MALDEN, MASSACHUSETTS.

IMPROVEMENT IN MACHINERY FOR LASTING BOOTS AND SHOES.

Specification forming part of Letters Patent No. **156,405**, dated November 3, 1874; application filed
September 23, 1874.

To all whom it may concern:

Be it known that we, FRANCIS D. BALLOU, of Abington, and GEO. W. COPELAND, of Malden, Massachusetts, have invented an Improvement in Machinery for Lasting Boots and Shoes, of which the following is a specification:

The object of our invention is to last boots and shoes with rapidity and precision by machinery, which we will describe with the aid of the accompanying drawing.

Figure 1 is a perspective of the machine, and Fig. 2 is a section of the parts showing our invention.

Two jaws, D E, formed at the edges in plan to lap upon the last a moderate distance when closed, along a line parallel to the outer conformation of the last, and in elevation to correspond with the curved under surface of the last, are arranged upon levers of the first order, F, I, and J, which are pivoted in slots in the frame of the machine, allowing the jaws D E to be raised and lowered parallel to the sides of the last. Another lever of the first order, K, having arms L which lay hold of the jaw-frame F I J, serves to lift the jaws; and the toggles G H, with its handle M, serves to close the jaws. Standards A and B, at either end of the machine, carry lasting-plates *b* and *b'*, which project inward toward the shoe to fold the upper over at the toe and heel, and are adjusted by set-screws and slots. The last C is hung upon a spindle or bracket secured to standard B, or to the frame of the machine, with the toe resting on toe-block *a*.

Thus far this machine has a great resemblance to the machine already patented to said BALLOU; but, as this is intended for lasting shoes without welts, we are obliged to strain the leather upon the last by other forces; and as we intend, instead of drawing the leather upon the last by pulling it at its edges, to compress it upon the last by an automatically-fitting bandage, we have made use of this part of the old patent to wrap the bandage properly and tightly upon the upper.

A girth, O, of a more or less elastic material, shaped in such a way as to be drawn tightly

around the upper from instep to toe on top, and, on closing the plates D E, to fit with a firm pressure every part it touches of the upper, is attached to the lasting-plates D E on top by clamping-plates *p*. In most instances the lasting can be perfectly accomplished by this device only; but if the leather on the heel is thick, heavy, and unmanageable, I apply another girth, O', from the plates D E, around the heel part of the shoe. These girths pass over the edge of the plates D E, which are slightly rounded. Good "pure packing" can be employed for these girths, and even materials of much less elasticity than rubber.

We are aware that many attempts have been made to last by the employment of the principle of constantly-succeeding pressure from the median line of the upper leather toward the bottom of the last, by means of bags of water and packages containing "contents susceptible of molecular slip;" but this is not our invention. A notable instance of this is in the patent of Glidden, No. 136,317, in which the water-bags of Julian Bernard's English patent of 1852 are used in combination with independent slides that operate after the leather is compressed on the upper by the independent action of the water-bags, and clamp the upper to the last till tacked down.

The girths coming in contact with the upper along a line most remote from the line of union between upper and insole compresses it upon the last along that line, and the girths then compress the upper on the last from this most remote line over regularly-succeeding areas till the surplus margin is folded on the last-bottom ready for tacking.

A strap wrapped around the hollow of the foot, and drawn together by clamps crossing the hollow, was used for shank-lasting in Hanna's patent No. 144,903, November 25, 1873; but the distinction between this contrivance for the local strapping or belting of a shoe and the girth shaped to conform to the shoe, attached to lasting-plates that also conform to the shoe, and which do not lap enough upon it to interfere with tacking, which nowhere covers the edge of the upper, is very clear.

Of course the shoe may be moved relative to the jaws, as well as the jaws relative to the shoe.

We claim and desire to secure by Letters Patent of the United States—

1. The girth O, in combination with jaws having a horizontal motion toward and from the last, and a relative vertical motion along the sides of the same, substantially as described.

2. The girth O', in combination with jaws having a horizontal motion toward and from the last, and a vertical motion along the sides of the same, substantially as described.

3. The girth O, in combination with jaws having a vertical motion relative to the sides of the last, and parallel thereto, substantially as described.

4. The girth O', in combination with jaws having a vertical motion relative to the sides of the last, and parallel thereto, substantially as described.

5. In combination with horizontally-closing jaws carrying lasting-plates D E, shaped to conform to the under surface of the last, the girth O, shaped as described and shown, attached to said lasting-plates, near the edges thereof, and drawn by the closing of the plates over the edge of the sole, substantially as and for the purpose described.

FRANCIS D. BALLOU.

GEO. W. COPELAND.

Witnesses:

L. D. BENNER,
F. F. RAYMOND.