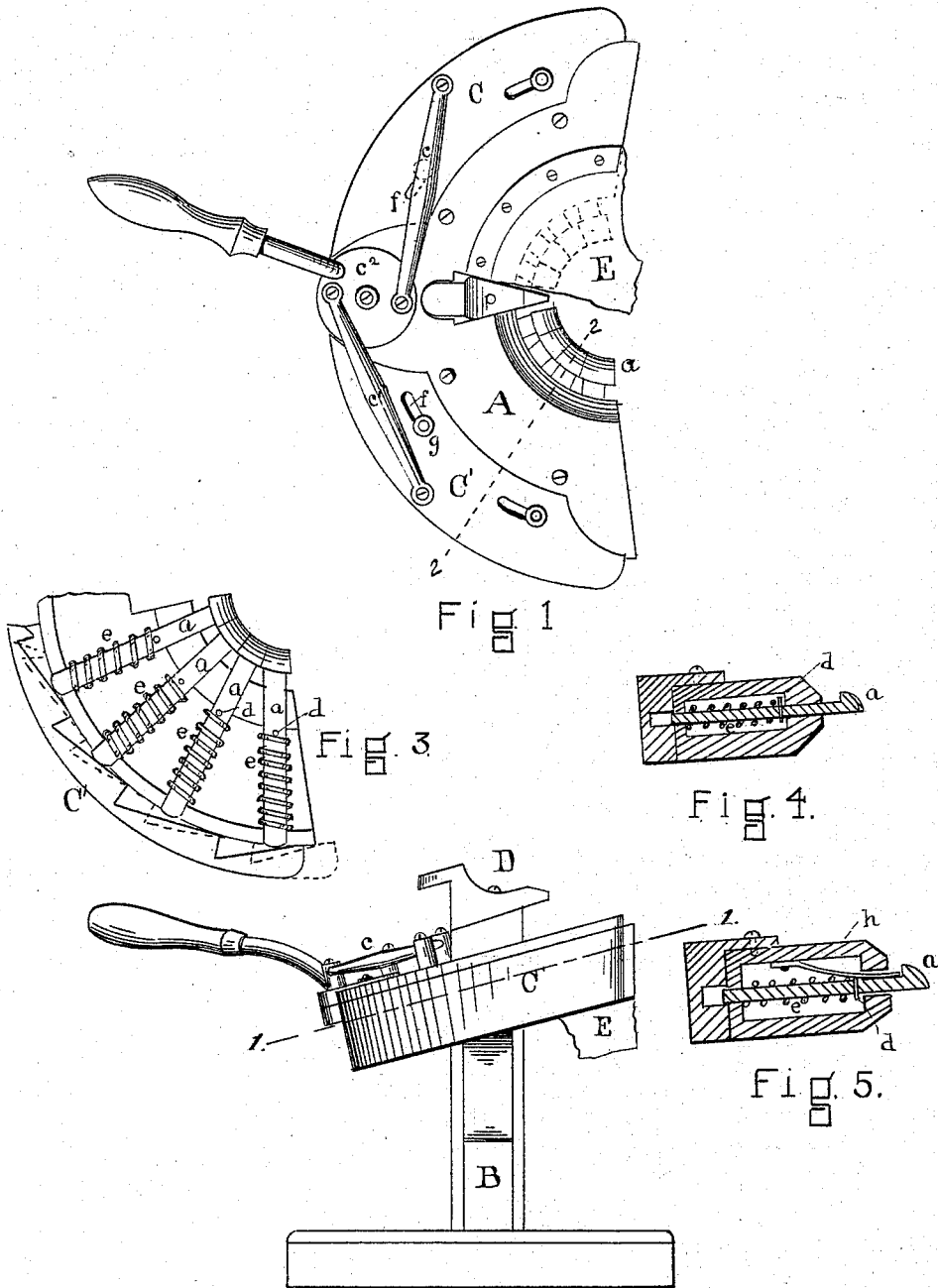


G. W. COPELAND & E. L. CONKEY.

LASTING-MACHINES FOR BOOTS AND SHOES.

No. 182,304.

Patented Sept. 19, 1876.



WITNESSES

Frank G. Parker
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Fig. 2

INVENTORS

Geo. W. Copeland
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UNITED STATES PATENT OFFICE.

GEORGE W. COPELAND, OF MALDEN, AND EDWARD L. CONKEY, OF BOSTON,
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IMPROVEMENT IN LASTING-MACHINES FOR BOOTS AND SHOES

Specification forming part of Letters Patent No. **182,304**, dated September 19, 1876; application filed
July 15, 1876.

To all whom it may concern:

Be it known that we, GEORGE W. COPELAND, of Malden, in the State of Massachusetts, and EDWARD L. CONKEY, of Boston, Massachusetts, have invented Improvement in Lasting Mechanism, of which the following is a specification:

This invention has for its object the lasting of boots and shoes by a mechanism provided with an automatic adjustment, and adapted to constantly act upon the varying conformation of the surface of a last while the lasting progresses, finishing the lasting by laying and folding the surplus upper in plaits upon the insole in position for tacking.

Reference is had to the accompanying drawing in explaining the construction of our device, in which—

Figure 1 is a plan of the top. Fig. 2 is a side elevation. Fig. 3 is a cross-section on the line 1 1, Fig. 2; and Fig. 4 is a section on the line 2 2, Fig. 1. Fig. 5 is a view representing the vertical adjustment of the fingers, herein-after explained.

In this application the principle which constitutes our invention is employed in lasting the toe of a boot or shoe, and is embodied in the following described mechanism.

A jaw, A, arranged to rise and fall parallel with the end of the last, on the standard B, carries the converging yielding fingers *a*, which project therefrom, and when at rest their ends describe a semicircle, as shown in Fig. 1. They may also be arranged so that the line represented by the ends may be irregularly curved to conform to any variation in the shape of the last at the toe. The peculiarly bulging or convex conformation of a last requires that any force exerted below the edge of the last-bottom, and designed to rise along the sides of the last, shall have the property of automatic adjustment to the constantly-changing shape, and at the same time to bear against the sides thereof without relinquishing the strain upon the upper. To accomplish this, we cause the fingers *a* to yield when in contact with the surface of the last, by allowing them to act against the springs *e*, which abut against the frame of the jaw A, and bear on the pins *d*, which

also serve in preventing the action of the fingers beyond a given line, by contact with the front portion of the frame of the jaw. After the fingers have compressed the upper to the last, and carried the surplus to the edge of the insole, it is necessary to complete the lasting by laying the folds or plaits upon the surface of the insole. This may be partially accomplished by the action of the springs upon the fingers; but as the upper is often thick, and as a constant pressure upon the springs tends to weaken them, we employ the locking sliding plates C and C', arranged to operate against the ends of the fingers, when actuated by the connecting-rods *c c'*, and cam-lever *c''*, to assist the action of the springs and relieve the strain therefrom. This is effected by making the locking-plates wedge-shaped opposite the inner end of each finger, leaving sufficient space for the play of the finger when the plates are unlocked, but made to bear against the ends, as shown in Fig. 3, in the operation of locking, or in laying the folds upon the surface of the insole. These sliding plates as fastened to the jaw by the screws or bolts *g g*, which also serve as guides in connection with the slots *f f*. The converging ends of the fingers are enlarged, convex on their upper surface, and sharp at the outermost edge, at the juncture of the straight under surface and the convex upper surface. This construction is necessary to insure a smoothing action on the upper as the fingers rise over the convex surface of the last, while, in developing the folds on the insole, a determined edge is necessary, that the plaits may commence to form at a slight distance from the edge of the insole.

To prevent injury, and to assist in the lasting of delicate uppers, and also to equalize the strain on the upper, produced by the operation of the fingers on lasts of irregular shape, a girt, E, of any suitable material, (in some work, one of an elastic nature is preferred,) is secured to the jaw by suitable clamps, to hang over and cover the points of the fingers, and may be fastened to the under surface of the jaw, or some suitable projection, if desired.

Although we represent this principle in the drawing as applied to the lasting of toes, yet

it is equally applicable in lasting the entire upper, by simply conforming the line of the converging fingers to the shape of the last at the point below the edge of the insole at which they commence to operate upon the upper.

The operation of the mechanism is as follows: The last with the insole fitted thereto, and the upper temporarily secured thereon at the toe and heel, is adjusted in the machine, with the toe under the downhold D, on standard B. The jaw A is then raised by any suitable mechanism, and the fingers made to operate along a given line somewhat remote from the edge of the last, and from that line, by a constantly upward movement of the jaw, to strain the upper to the last and carry the surplus to the edge of the insole, in position to be laid by the converging of the fingers over and upon the insole, when driven thereon by the action of the locking sliding plates. The upper is then in position to be tacked.

The advantages of our invention consist in the employment of the principle of constant pressure brought to bear on a line equally remote from the edge of the last throughout its length, and to compress and fit the upper to the last in gradually-increasing areas, until the surplus is brought to the edge of the insole and plaited thereon by the converging of the fingers. It may be necessary, in some instances, to provide the projecting ends of the fingers with a further adjustment, by causing them to act against the spring *h*, as shown in Fig. 5, in which case the jaw is slotted to allow a slight vertical movement to the fingers.

Having thus fully described our invention,

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

1. In lasting mechanism for lasting boots and shoes, the combination of a rising jaw with a series of yielding fingers, arranged to constantly bear against the surface of the last from a given line, somewhat remote from the edge of the last to the edge and over upon the insole, substantially as described.

2. In lasting mechanism, the combination of the fingers *a*, stops *d*, and springs *e*, arranged to operate as described, with the locking sliding plates C C', substantially as set forth.

3. The combination of the locking sliding plates C C', provided with the slots *f*, with the screws or bolts *g*, connecting-rods *cc'*, and cam-lever *c''*, substantially as described.

4. The combination of the lasting mechanism, substantially as claimed, with a strap or girth fastened to the jaw to fall over the projecting ends of the fingers, substantially as and for the purpose described.

5. In a lasting-machine in which a series of fingers are caused to act from a point somewhat remote from the edge of the insole in straining and smoothing the upper upon the last, the fingers described, formed upon their contacting ends with a rounded upwardly-presenting surface, substantially as and for the purpose described.

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Witnesses:

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FREE. F. RAYMOND.