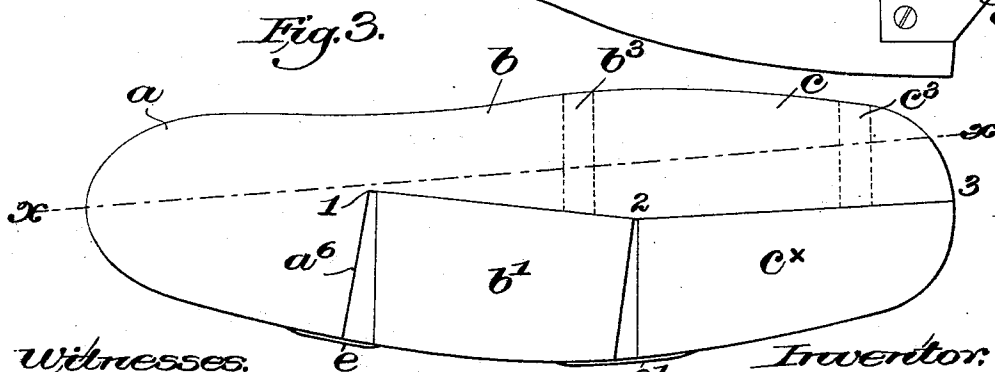
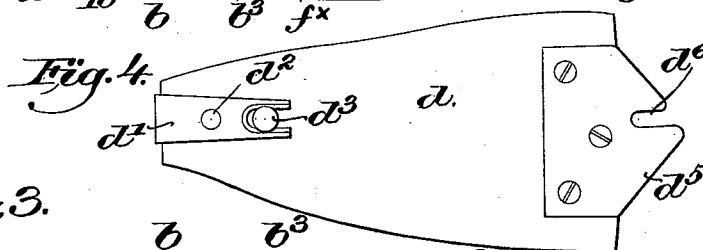
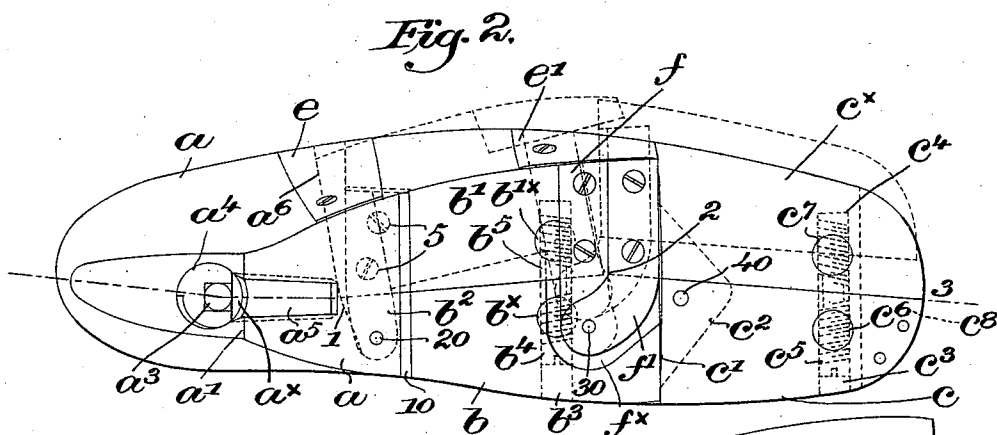
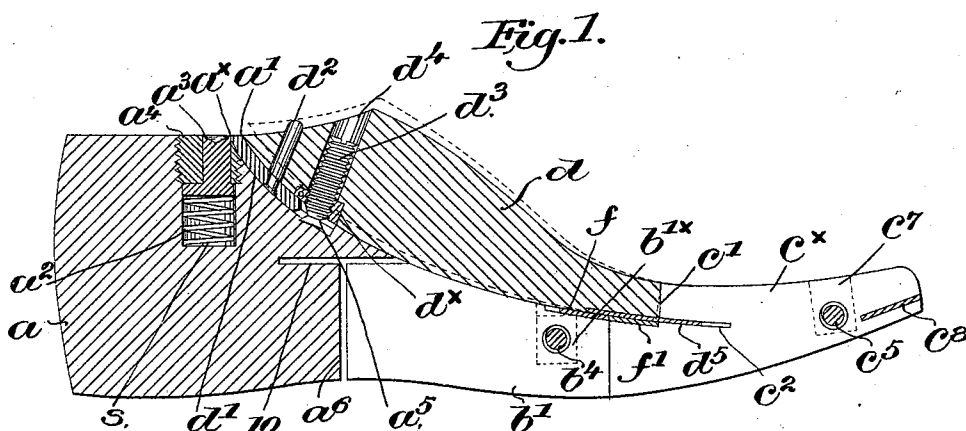


(No Model.)

S. APPLETON.
LAST.

No. 521,305.

Patented June 12, 1894.



Witnesses.
Louie N. Gowell
Edward H. Allen.

Inventor:
Samuel Appleton.
by Crosby & Gregory *attys.*

UNITED STATES PATENT OFFICE.

SAMUEL APPLETON, OF NEWTON, MASSACHUSETTS.

LAST.

SPECIFICATION forming part of Letters Patent No. 521,305, dated June 12, 1894.

Application filed July 31, 1893. Serial No. 481,920. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL APPLETON, of Newton, county of Middlesex, State of Massachusetts, have invented an Improvement in Lasts, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

It is now customary, so far as known to me, in making boots or shoes to measure, to make them conform in shape to the foot of the wearer, no matter how defective the latter may be. As a result, the defects of the foot are simply covered, and the completed boot or shoe retains the foot in its deformed or defective position. With ready-made shoes, the case is practically the same, for the shoes are made on a series of graduated sizes of standard lasts, and the shoe which can accommodate the particular foot is selected, and as a matter of course if the foot is deformed or defective the shoe only covers without at all correcting such defects.

In my studies and experiments to make foot coverings on a more intelligent basis, striving to restore the foot as nearly as may be to the perfect or natural foot, I have taken the perfect foot as the basis or standard, and so construct the shoe that the foot, if deformed, is allowed to re-assert itself by permitting the natural laws to act upon the defects, with the result of restoring the foot in greater or lesser degree to the form of the standard or perfect foot.

This invention has for its object the production of a last having certain features to be described, and capable of various adjustments whereby a shoe can be adapted to the needs of a particular foot, in accordance with the foregoing principles, the shoe permitting the foot to act as intended by nature, and allowing natural laws to aid it in returning to the standard form.

In accordance therewith my invention consists in a last having its toe, ball and instep portions continuous on the inner side of the last and rigidly fixed with relation to the heel portion and to each other, combined with an adjustable outer side, substantially as will be described.

Other features of my invention will be

hereinafter described and particularly pointed out in the claims.

Figure 1 is a side elevation, partially in section, of a last embodying my invention. Fig. 2 is a top view of the last shown in Fig. 1, with the removable instep block omitted. Fig. 3 is an under side or bottom view of the last, and Fig. 4 is an under side view of the removable instep block.

In carrying out my invention as herein shown, I form the heel portion *a* in usual manner, continuing the same forward along the line 1, 2, 3, see Figs. 2 and 3, to form the instep and ball portion *b*, and toe portion *c*, upon the inner side of the last, said latter portions being fixed thereby with relation to each other and to the heel portion. The theoretical axis or working line of the perfect or natural foot passes through the centers of the heel and great toe, see dotted line *x-x*, Fig. 3, and the continuous or fixed portion of the last, at the inner side, includes said axis, as will be seen, this side portion of the last being taken as the basis for the adjustable portions thereof. The said fixed portion is cut away on its upper side from the front edge *a'* of the heel portion to the shoulder *c'* in the fixed toe portion *c*, see Figs. 1 and 2, to receive the removable instep block *d*. The heel portion is recessed at *a²*, to receive a spring *s* adapted to bear upon the head of a locking pin *a³*, longitudinally movable in a bushing *a⁴*, herein shown as externally threaded to enter the heel above the recess *a²*, and beveled at *a^x*. A recess *a⁵*, preferably having undercut sides, is made in the top of the cut-away portion of the last adjacent to the beveled portion of the bushing, see Fig. 2, to receive therein a correspondingly shaped shoe *d'*, see Figs. 1 and 4, connected to the under side of the instep block by a pin *d²* extending loosely into a hole in said block and also by a screw *d³*, the lower end of the shoe being herein shown as slotted or forked to loosely embrace the end of the said screw *d³*, extended through a threaded bushing *d^x* in the block *d* at the bottom of an opening *d⁴*. The screw is thus securely held in the block *d*, and connects the forked end of the shoe *d'* to the block, while the other end of the shoe is connected to the

block by the pin d^2 extending loosely therein. It is evident that the shoe may therefore be moved toward or from the under side of the block by rotating the screw d^3 , the pin d^2 moving in or out of the block and correctly positioning the shoe whether it be drawn up against or removed from the block. The toe portion is slotted or grooved at c^2 to receive the end of a guide plate d^5 when the instep block is in place, the locking pin a^3 at such time extending beyond the end of the shoe d' as shown in Fig. 1, and preventing the withdrawal of the instep block from the last, because the undercut recess a^5 receives the shoe d' , and when it is desired to remove the block d , it, with its connected shoe d' , must be moved longitudinally upward in said recess, toward the heel portion of the last.

So long as the end of the locking pin a^3 stands in its normal position shown in Fig. 1, it is in the path of the shoe d' and prevents such longitudinal movement. Depression of the locking pin until its top is below the end of the shoe d' permits the removal of the latter from the recess a^5 , and consequently the removal of the instep block from the last.

Depression of the locking pin below the end of the shoe permits the withdrawal of the shoe d' and its connected block d .

In order to adjust the instep block for insteps of different heights the screw d^3 is rotated in one or the other direction, to thereby move the bottom of the block d toward or away from the shoe d' , thus lowering or raising the block, the shoe at such time being held in the recess a^5 and restrained from longitudinal movement therein by the locking pin a^3 , as hereinbefore described.

The heel portion is cut away vertically and rearwardly at a^6 , see Figs. 1, 2, and 3, and the movable block b' forming the instep and ball portion at the outer side of the last is retained in place adjacent thereto between the heel and the movable toe portion c^x , to be described, the ends of the movable portions being cut away to leave clearance spaces see Fig. 3 for the adjustments thereof.

A substantially horizontal slot or saw cut 10 is made in the heel a and rear portion of the inner instep portion b , to receive an ear b^2 , see dotted lines Fig. 2, suitably secured to the movable instep and ball portion b' , by screws 5, 5, and pivotally secured in said slot 10 by a pin 20, so that the front end of the portion b' can be swung outwardly on the pin 20 as a center.

The fixed instep and ball portion b has a transverse hole or opening b^3 therein, see dotted lines, Figs. 2 and 3, to receive loosely a right and left screw b^4 , the threaded portions engaging internally threaded bushings b^x and b'^x , in the portions b and b' , respectively; the portion b' having a recess b^5 to receive the bushing b'^x and end of the screw, the outer end of which is nicked, as shown in Fig. 2, whereby it may be rotated by means of a

screw driver inserted in the hole b^3 , rotation of said screw moving the front end of the portion b' toward or from the fixed portion b , about the pin 20 as a center, thus adjusting the width of the last laterally at the instep and ball portion.

A transverse hole c^3 is made in the fixed toe portion c , see dotted lines Figs. 2 and 3, and at c^4 in the movable portion c^x , to receive a right and left screw c^5 , the threaded portions engaging internally threaded bushings c^6 and c'^6 , in the toe portions c and c^x respectively, the screw being nicked similarly to screw b^4 , and for a like purpose.

The several bushings referred to are preferably cylindrical, as shown, fitting loosely in the material of the last, to thereby prevent binding of the screws when the movable portions are adjusted.

Cap pieces e and e' are secured to the ends of the instep and ball portion b' , the former covering the space between it and the heel a , and the latter the space between the adjacent ends of the portions b' and c^x , as shown in Figs. 2 and 3, thus preserving the continuity of the outer side of the last when the movable portions are in adjusted positions, as for instance, in the extreme outer position, shown in dotted lines Fig. 2.

The screw c^5 acts upon the front end of the toe portions c^x , if used alone, to broaden the last at the toe, so that if that adjustment only is desired it may be made. When, however, the last is to be widened from heel to toe it is necessary to throw the rear end of the toe portion c^x out or in, which I accomplish by securing two links f and f' to the adjacent ends of the portions b' and c^x , and pivotally connecting the inner ends of the links at 30. The links are herein shown as flat, and resting in a suitably recessed portion f^x made in the parts b and b' of the last. When the portion b' is adjusted by means of screw b^4 the rear end of the toe portion c^x will be moved with it, through the links f and f' , the front end of the toe portion remaining substantially stationary unless adjusted by the screw c^5 . A lateral fin or ear c^8 is let into the toe of the portion c , working in the slot in the portion c^x , guiding the latter when moved.

The guide plate d^5 on the removable instep block d is slotted at d^6 to receive a pin 40 in the recess c^2 , positively retaining the lower end of said block in position on the last.

By referring to Figs. 2 and 3 it will be noticed that the portion b' is curved outwardly, or convex, longitudinally as well as laterally at the outer side of the last, at the side of the ankle, rather than concaved, as is now the custom in shaping lasts. The usual inward curve or concavity on the outer side of the foot at the side of the ankle, in shoes made from such lasts has the effect of pressing in upon some of the most delicate muscular attachments controlling the action of the outer ankle, and as the ankle is deranged and

pressed out of its proper position it follows that the poise of the body is disturbed and distorted. By making the said portion of the shoe convex, the pressure is obviated, and the muscles and attachments have plenty of room to move in.

Shoes made on lasts in accordance with my invention permit the feet to spread at the outer side, the inner side being maintained as the standard.

The various adjustments hereinbefore described permit the last to be adapted to almost any distortion of the foot due to improper shoes, so that the shoe made thereon will present at the proper places room for the foot to expand and thus return to its natural shape, and in very difficult cases, or those of long standing, the wearer may have a succession of shoes made, each more nearly approaching the proper natural shape of the foot.

It is evident that the last herein described may be used as a pattern last, from which others can be made, or the shoe can be made up directly on such a last, so the use of the last is not restricted to one or the other method.

My invention is not restricted to the specific construction and arrangement of parts herein shown, as the same may be varied in details without departing from the spirit of my invention.

I claim—

1. A last having its toe, ball and instep portions continuous on the inner side of the last, and rigidly fixed with relation to the heel portion and to each other, combined with an adjustable outside, substantially as described.

2. A last having a fixed heel portion and an integral continuation thereof on the inner side to the toe, combined with adjustable instep, ball and toe portions at the outer side, substantially as described.

3. A last having its toe, ball and instep portions continuous on the inner side of the last

and rigidly fixed with relation to the heel portion and to each other, combined with a movable toe portion, and a separate movable ball and instep portion, at the outer side of the last, connections between the adjacent ends of said movable ball and instep portion and the movable toe portion, and adjusting devices for said movable portions, substantially as described.

4. A last having a removable instep block, and means for adjusting the height thereof, combined with a spring controlled locking device for said instep block, substantially as described.

5. A last having a fixed heel portion, a movable instep and ball portion hinged thereto at the outer side of the last, and an inner side instep and ball portion rigidly fixed with relation to the heel and to each other, combined with means to actuate said movable portion and laterally adjust it, substantially as described.

6. A last having a fixed toe portion at the inner side thereof integral with the heel and instep portion on said inner side, combined with a movable toe portion at the outer side, and independent means located at the front and rear of said movable toe portion to adjust either or both ends thereof, substantially as described.

7. A last having a fixed heel portion and an integral continuation thereof on the inner side to the toe, combined with an adjustable longitudinally and laterally convex or outwardly curved instep portion at the outer side of the last, substantially as described.

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

SAMUEL APPLETON.

Witnesses:

FREDERICK L. EMERY,
JOHN C. EDWARDS.