J. C. Plumer,

Shoe Upper.

No. 32,487. Patented June 4, 1861.

Fig. 1.

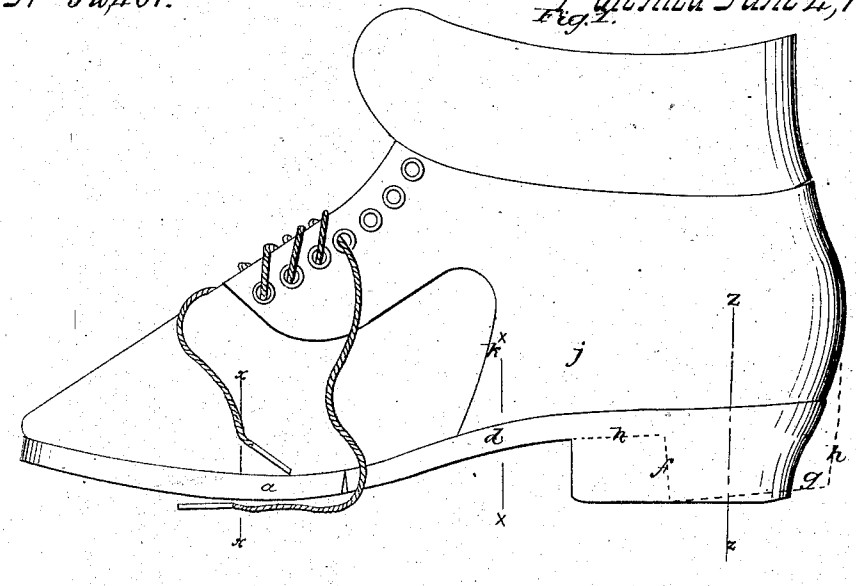


Fig. 5.

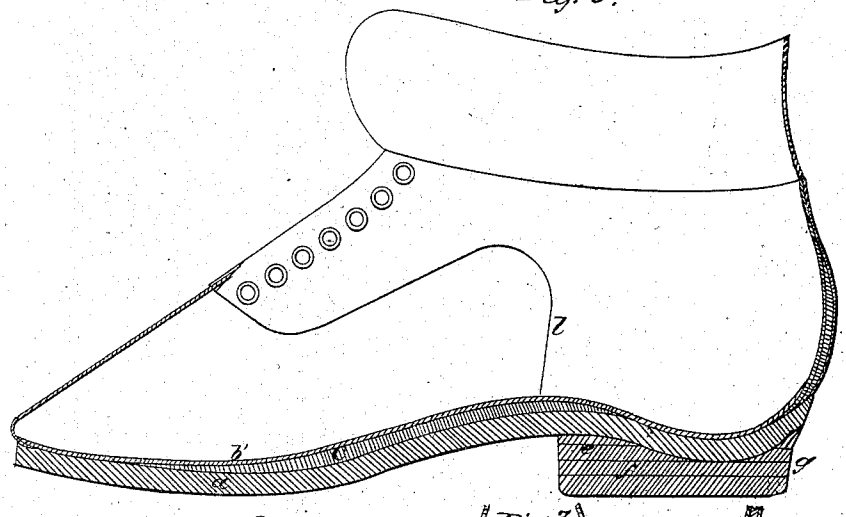


Fig. 2.

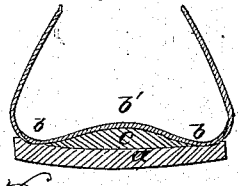


Fig. 3

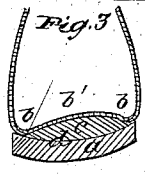
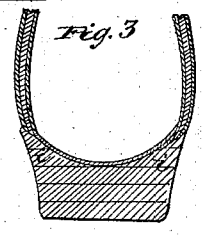


Fig. 3



Witness.

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UNITED STATES PATENT OFFICE.

JOHN C. PLUMER, OF PORTLAND, MAINE.

BOOT AND SHOE.

Specification of Letters Patent No. 32,487, dated June 4, 1861.

To all whom it may concern:

Be it known that I, JOHN C. PLUMER, of Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Boots and Shoes; and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, in which—

Figure 1 represents a side view of a shoe constructed according to the principles of my invention, Fig. 2 represents a transverse section of the same at the line *x x* of Fig. 1, Fig. 3 represents a transverse section of the same at the line *y y* of Fig. 1, Fig. 4 represents a transverse section of the same at the line *z z* of Fig. 1, and Fig. 5 represents a longitudinal section of the same following the middle line of the sole.

The objects of my invention are to make shoes and boots conform to the bony and ligamentous structure of the natural foot, and to obviate the disadvantages which result from the use of boots and shoes constructed in the methods heretofore practiced.

My invention is divided into parts which may be used separately or in combination, but I believe that a boot or shoe of the best construction will be obtained by using all the parts of my invention in combination in the same boot or shoe.

The first part of my invention has reference to that portion of the sole which is beneath the ball of the foot. Previous to my invention it has been customary to construct the sole at this portion of equal or nearly equal thickness transversely; and as the sole of the shoe is convex on its exterior, the interior is correspondingly concave. A sole of this construction is directly the reverse in form of the bony and ligamentous structure of the natural foot, which has the form of a transverse arch and is concave on its under side; hence as the foot is constricted by the upper leather of the shoe the tendency is to depress the transverse arch into the concavity of the sole of the shoe and to deform the foot, bunion, or the dislocation of the bones of the great toe, being frequently produced.

The object of the first part of my invention is to obviate this tendency and it consists in combining an outer sole that is convex or flat exteriorly, with an insole that is convex at its upper surface, the convexity of the insole corresponding in position with the rise of the transverse arch of the foot, so that the depression thereof is effectually prevented.

The second part of my invention has reference to that portion of the sole which connects the heel with the portion beneath the ball of the foot and which is commonly called the shank. Its object is to support this portion of the foot both longitudinally and transversely, and it consists in a shank which is transversely convex at its upper surface, in contradistinction to being transversely concave at its upper surface as has been the case with boot and shoe shanks heretofore in use.

The third part of my invention has reference to the shank and heel of a boot or shoe. The human foot is composed of a series of bones and liagaments, or fleshy muscles, and is arched longitudinally, the highest portion of the underside of the longitudinal arch being beneath the instep. When the heel rests upon a support which is higher than the level of the ball of the foot, the members of which it is composed tend to assume a more arched form, and if this tendency be prevented by the boot or shoe, there is a constant strain upon the foot, which sometimes results in the breaking down of the longitudinal arch of the foot, thereby producing flat or splay foot, and is always accompanied by the sensation of weariness. The shanks of ordinary heeled shoes have hitherto been made of about the same convexity longitudinally that they would have been if the shoes had been made without heels, moreover the heels of the shoes have been set so far back and have been so short that they do not support the anterior portion of the heel of the human foot to which a considerable amount of the pressure in walking is applied; hence there has been a constant tendency in the foot to move forward in the shoe, and as this tendency has been counteracted only by the pressure of the upper leather upon the instep, the tendency has been to depress the instep and break down the longitudinal arch of the foot. The object of this part of my invention is to prevent this tendency and afford an efficient support for the anterior portion of the heel of the foot; and it consists in combining the heel of a boot or shoe with the sole thereof in such manner that the

heel extends forward beneath the anterior portion of the heel of the foot, and is there made thicker, so as to support the insole in a proper convex form longitudinally beneath the foot, the shank of the boot or shoe being shortened in proportion to the advance of the heel.

The fourth part of my invention has reference to the upper leather of a shoe. In order that the upper leather of a shoe may fit closely in the hollow at the inner side of the foot, it is advantageous to carry the front edge of the inner quarter as far forward as the most hollow portion of that hollow, and it has been customary hitherto to make the quarters at the opposite sides of the foot to extend equal distances forward from a central seam at the back of the shoe. By this mode of construction the seam at the front of the outside quarter is located opposite the corresponding seam at the front of the inside quarter, and is immediately over or in close proximity with the bony projection at the outer side of the foot, which is frequently galled by the pressure of the seam. The object of this part of my invention is to relieve the bony projection of the foot from the pressure of the seam without interfering with the fit of the shoe; and it consists in combining the front piece with quarters at the opposite sides of the foot of unequal length, so that while the inner quarter extends sufficiently far forward to insure a close fit of the leather to the inner side of the foot, the seam at the front side of the outside quarter is between the bony projection of the foot and the heel.

All the parts of my invention are embodied in the shoe represented in the accompanying drawings. In this shoe the outsole (*a*) and the insole (*b b'*,) are separated by a filling (*c*) of such form that the upper surface of the central part (*b'*) of the insole protrudes into the shoe above the lateral portions (*b b*) of the insole, while the outer surface of the outsole (*a*) is slightly convex as usual. The protrusion of the insole thus produced corresponds with the rise of the central portion of the transverse arch of the foot, so that this arch is prevented from being broken down by the constriction of the upper leather. The filling (*c*) gradually decreases in thickness as it approaches the toe of the shoe, so that the inner surface of the insole is there parallel or thereabout with the outer surface of the outsole (*a*). The filling (*c*) also extends toward the heel of the shoe through the shank (*d*), so that the upper surface of the insole of the shank is convex while the external surface of the shank is of the usual form, which is generally convex; the insole at the shank is thus protruded upward to support the hollow of the foot.

The heel (*f*) of the shoe represented is extended forward and its anterior part is raised to support the insole. The front edge of the heel may be extended with advantage to a distance from the heel of the shoe equal to one third the whole length of the shoe, and as a firm support is thereby furnished for the foot beneath the point at which the bones of the leg are jointed to the bones of the foot, the heel may be cut away behind (as shown at *g*) so as to diminish the total length of the sole and heel of the shoe. As the front portion of the sole (*a*) beneath the ball of the foot is not shifted forward by this extension of the heel, the shank of my improved shoe is shorter than the shanks of shoes hitherto made; and as the pressure of the anterior part of the heel of the foot is sustained by the heel, instead of by the shank, the employment of steel shank-plates, or other means to prevent the shank from being broken down, and to sustain the foot, are unnecessary, and the shank may be made more flexible than in shoes or boots hitherto made.

The difference between my combination of the heel with the sole, and the old mode may be seen by a comparison of the representation of the heel and sole of my shoe in Fig. 1 with the dotted line *h h*, which represents the outline of the corresponding portions of a shoe of the old construction. In order to afford a firm lateral support for the heel of the foot, the heel of the shoe at the periphery is raised above its central portion, thus forming lateral rims (*i i*) that sustain the sides of the heel of the foot and relieve the most protuberant portion thereof of a portion of the pressure to which it is subjected in a shoe of the common construction.

The quarters at the opposite sides of the shoe are of unequal length; that on the inner side (*j*) extends forward from the heel about three-sevenths of the total length of the shoe, terminating at the middle seam (*k*). The outer quarter is much shorter, the position of its front edge being indicated by the dotted line *l* Fig. 5; as a general rule the distance of its front edge, where it meets the sole, from the heel of the shoe, should be about one-third of the total length of the shoe.

In order to construct boots and shoes embodying the first three parts of my invention, a last should be provided which is the counter part of the interior of the shoe intended to be made, having concave depressions in the bottom to correspond with the transverse rise of the central portions of the insole. But a shoe may be constructed according to my invention by putting its parts together upon an ordinary last and by fitting a false insole of the proper form into it after the last has been withdrawn. The false insole introduced may be kept in place by an

adhesive cement, such as glue or india rubber composition, or by means of pegs or tacks.

The first three parts of my invention are applicable to boots as well as shoes; the fourth part is applicable especially to shoes, but may be applied to those boots which have a back seam.

Having thus described a shoe embodying all my improvements, what I claim as my invention in boots and shoes is.

1. The combination of a sole that is flat or convex exteriorly with an insole that is convex at its upper surface, substantially as described.

2. A shank that is convex at its upper surface substantially as described.

3. The combination of an elongated heel with the sole, substantially as described.

4. The combination of the front piece of the upper leather with quarters of unequal length, substantially as described.

In testimony whereof I have hereunto subscribed my name.

JOHN C. PLUMER.

Witnesses:
E. S. RENWICK,
W. L. BENNEM.