

J. F. PLUMMER.
LAST.

APPLICATION FILED FEB. 18, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

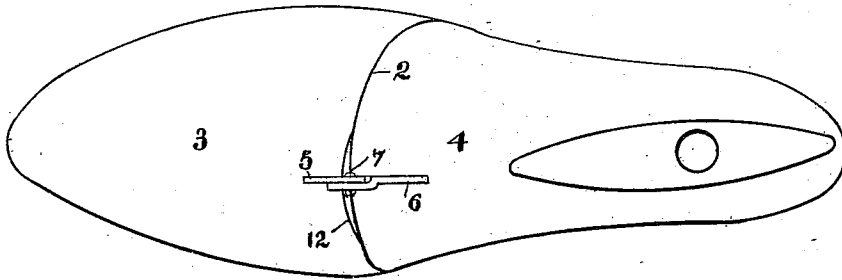


Fig. 1.

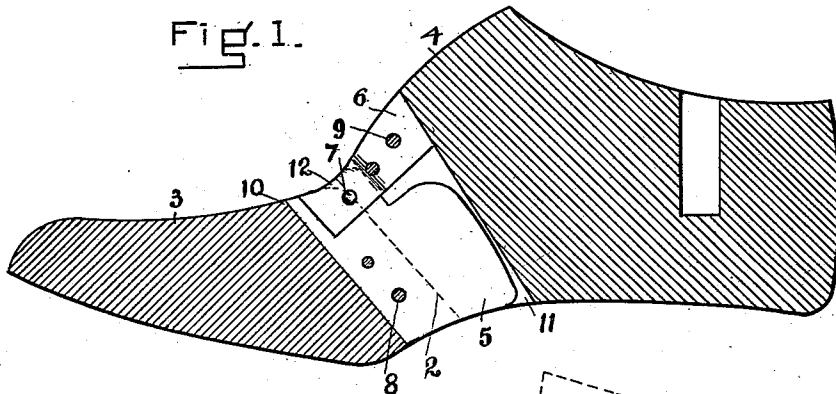


Fig. 2.

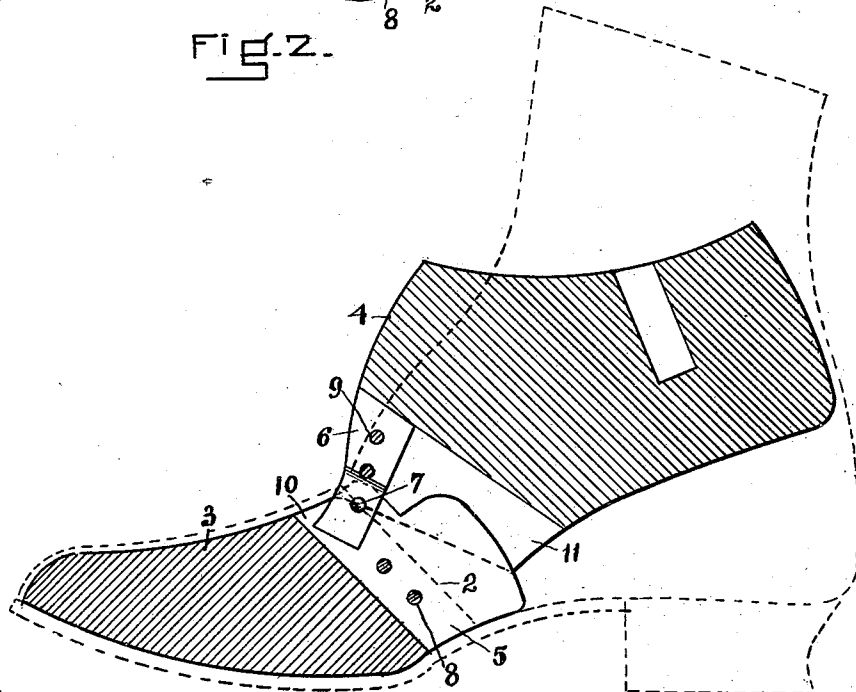


Fig. 3.

WITNESSES

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2 SHEETS—SHEET 2.

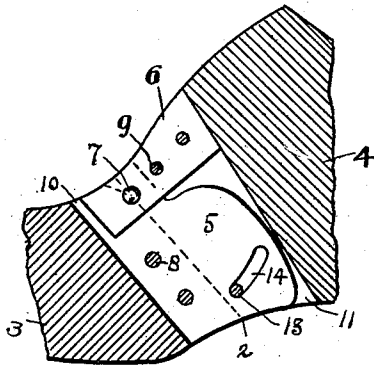


Fig. 4.

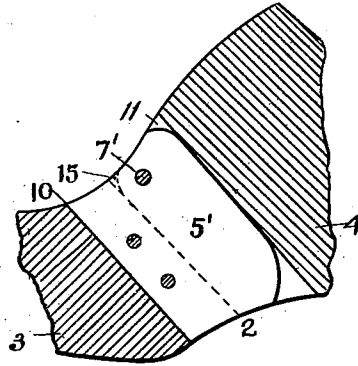


Fig. 5.

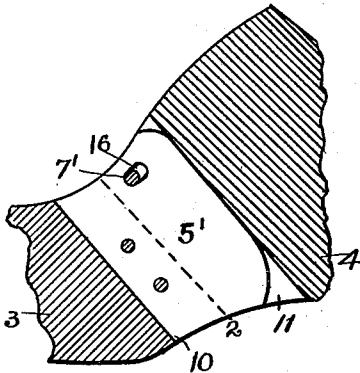


Fig. 6.

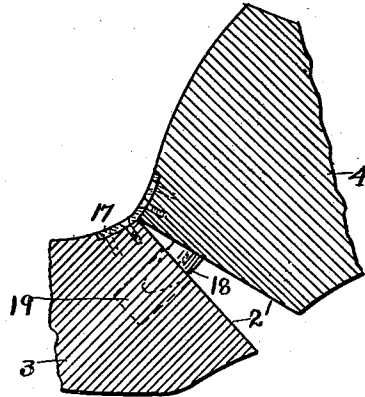


Fig. 7.

WITNESSES.
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UNITED STATES PATENT OFFICE.

JOSEPH F. PLUMMER, OF SWAMPSCOTT, MASSACHUSETTS.

LAST.

SPECIFICATION forming part of Letters Patent No. 742,902, dated November 3, 1903.

Application filed February 18, 1901. Serial No. 47,735. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH F. PLUMMER, a citizen of the United States, residing at Swampscott, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Lasts, of which the following is a specification.

My invention relates to lasts for boots and shoes, and is intended principally to provide a last which can be inserted into or withdrawn from a shoe with greater ease and with less strain on the leather of the shoe than those heretofore used. My invention is thus particularly adapted to be applied to follower-lasts; but it may advantageously be embodied in leading or lasting lasts, and it may also be applied to "fillers" and similar devices, such as are used in connection with shoes when finished.

The follower-lasts hitherto commonly used, including both the block-last and the hinged-last types, have been made in two or more parts adapted to be forced into a shoe and withdrawn therefrom consecutively and by separate and independent operations, their construction being based on the principle of making the main portion of a block-last and the toe portion of a hinged last just enough smaller than the complete last to make its insertion and withdrawal practically possible. In these prior block and hinged lasts that portion thereof which enters the toe of the shoe extends in one piece so far back from its front end that it has to be inserted a considerable distance before its rear end can be forced down upon the sole of the shoe, and hence the toe and ball portion of the last has to enter the shoe at an angle to the sole, the result being that the top of said portion binds against the vamp of the shoe during insertion and withdrawal, and thereby not only makes these operations difficult, but also stretches the leather of the upper and injures the form and fit of the shoe.

My improved last has a mode of operation which, so far as I am aware, is entirely new in lasts—namely, a mode of operation substantially like that of the human foot when inserted into and withdrawn from a shoe; and my invention consists, broadly speaking, in a last provided with a pivotal joint located in its waist portion and preferably near the

top of the last, the "waist" portion of a last, as the term is herein used, being the portion at and near the line 2 in the accompanying drawings within the limits hereinafter stated. By virtue of this construction my last is, in effect, rendered flexible at a point so far forward that its front or toe portion is made small enough to be capable of insertion and withdrawal by sliding it along the sole of the shoe into and out of the toe without holding it at an angle to the sole, and hence without lifting it against the vamp-seam at the top of the shoe or putting an excessive strain upon the leather of the upper at any point, while the heel portion of the last, although extending forward to the joint above referred to, nevertheless has sufficient space provided between the front edges of the top portion of the upper for its necessary pivotal movements with respect to the toe portion. When the last is inserted or withdrawn, the heel portion turning through a small angle at the aforesaid joint slides into and out of the heel of the shoe easily and smoothly, the whole operation of insertion or withdrawal requiring practically but one continuous movement.

In the accompanying drawings, Figure 1 is a top plan view of a last made in accordance with my invention. Fig. 2 is a vertical longitudinal section of the same; and Fig. 3 is a view similar to Fig. 2, illustrating the operations of inserting and withdrawing the last. Figs. 4, 5, 6, and 7 are detail views in section, showing different forms of joints which may be employed in constructing my last.

Referring to the drawings, Figs. 1, 2, and 3 show a last which is divided at its waist, as at 2, into two parts 3 and 4, said parts being pivotally secured together by a suitable joint. My preferred form of joint is that shown in Figs. 1, 2, and 3, comprising two flat metal plates 5 and 6, pivoted together, as at 7, and secured, respectively, as by pins 8 and 9, within aligned slots 10 and 11, which are cut in the opposed ends of the parts 3 and 4, respectively, and lie in a vertical plane in or near the longitudinal axis of the last. The plate 5 is preferably made large enough to extend across the dividing-surface 2 into the slot 11, thereby forming a guide which serves to keep the parts 3 and 4 in proper alinement

in all their relative positions. The pivot 7 is preferably located at the dividing-surface 2 and near the top of the last, and one of the parts of the last, as 3, may be slightly cut away above said pivot, if necessary, as at 12, to prevent the desired pivotal movement of said parts from being interfered with by the meeting of their opposed top edges.

In Fig. 4 I have shown a joint like that shown in Figs. 1, 2, and 3, except that it is provided with a stop for limiting the pivotal movement of the parts 3 and 4, said stop consisting of a pin 13, secured to the part 4 and passing through an arc-shaped slot 14, cut in the plate 5 with the pivot 7 as a center, the length of said slot determining the possible angular movement about said pivot in an obvious manner.

In Fig. 5 I have shown a joint consisting of a single plate 5', firmly secured to the part 3 of the last within the slot 10 and extending across the dividing-line 2 into the aligned slot 11 formed in the part 4 and pivoted to said part 4 by a pin 7'. In this form of joint also the plate 5' serves as a guide to keep the parts 3 and 4 in proper alinement. Inasmuch as the pin 7' is offset somewhat from the line of division 2, the part 4 should be cut away slightly, as at 15, on a curve having said pivot as a center in order to permit said part 4 to turn on said pivot without being stopped by the opposing end of the part 3. This same result may also be accomplished in the manner shown in Fig. 6, in which the joint is like that shown in Fig. 5, except that the plate 5' is provided with a short slot 16 for the reception of the pivot-pin 7'. In this case it will not be necessary to cut away any part of the last at the dividing-surface 2, and the parts 3 and 4 may thus be made to fit together accurately at all points when the last is inserted.

In Fig. 7 I have shown a different type of joint, consisting of a strip of leather or other flexible material 17, extending across the dividing-line 2 at the top of the last and secured at its ends to the parts 3 and 4, thus providing a flexible joint therefor. For the purpose of guiding said parts 3 and 4 with respect to each other and keeping them in alinement I prefer to provide one or more dowel-pins 18, set into one part of the last, as 4, and playing freely in holes 19, drilled into the other part of the last.

As above stated, I prefer to locate the pivot which connects the parts 3 and 4 at or near the top edge of the last, the result of this arrangement being that said parts 3 and 4 are brought together at the dividing-line 2 when the last is in a shoe and are separated only during the insertion or removal of said last, so that when the last is in place in a shoe its entire surface in contact with the shoe is smooth and continuous and free from gaps, such as are found near the heel of the hinged lasts hitherto employed.

The dividing-line 2 may be either plane or curved, and although I prefer that it shall

coincide substantially with the waist-line of the last, yet its position, contour, and general direction may be varied to a considerable extent without departing from my invention, so long as the part 3 is kept so small that it will enter the shoe in the manner above described, but is not made so small as to bring the top of said dividing-line under the vamp of the shoe when the last is inserted. The position of the pivot may also be varied considerably, and it is difficult to define with exactness the limits within which said pivot may be located; but in a general way it may be said that the forward limit will be the line of the ball of the last and the rearward limit will be the line of the instep, the portion between these lines being herein referred to as the "waist" portion of the last. So, too, any desired form of joint may be employed for connecting the parts of my last, all these constructional features being details to which I do not consider my broad invention to be limited, since, so far as I am aware, I am the first to construct a last having a pivotal joint between its ball and its instep and operating according to the principles above set forth. I consider the waist-line of the last to be the most suitable place between the ball and the instep for dividing the last into two parts, because the circumference of a last at the waist-line is less than at any other point between the ball and the instep, and therefore when the heel portion of my last turns on the pivot those portions thereof which are next to the line of separation between it and the toe portion move into a part of the shoe which is of greater circumference than at the waist, and hence ample room is provided for such pivotal movements without straining the leather of the shoe. Furthermore, the top of the waist is so low that the pivot may be located at this point without causing any material elongation of the last during insertion and withdrawal, or, in other words, without causing the heel of the last to bind against the inner surface of the heel of the shoe. It will be observed that the heel portion and crown of my last are entirely free from any joint or break, and this feature of my last is important, for this reason, that it renders it practicable to keep my last in a shoe during the treeing and ironing operations, thereby doing away with the necessity of changing the shoe to a special last or form when these operations are to be performed.

I claim as my invention—

1. A last divided into two parts on a line coinciding substantially with the waist-line of the last, said parts being pivotally connected together and provided with means for guiding them with respect to each other during their pivotal movements.

2. A last divided into two parts on a line extending from the top of the waist portion of the last to the bottom thereof, said parts being pivotally connected together.

3. A last divided into two parts on a line

extending from the top to the bottom of the last, said parts being pivotally connected together near the top of the waist portion of the last.

5 4. A last comprising two parts divided by a line extending from the top of the waist portion of the last to the bottom thereof, said parts being pivotally connected together near the top of the last and provided with means
10 for guiding them with respect to each other during their pivotal movement.

15 5. A last comprising two parts divided by a line extending from the top to the bottom of the last at its waist portion, said parts being provided with alined vertical slots, in combination with a rigid plate secured in the slot formed in one of said parts and extending

into the opposed slot to form a guide, and a pivot connecting the other part of said last with said plate. 20

6. A last comprising two parts divided by a line extending from the top to the bottom of the last at its waist portion, said parts being provided with alined vertical slots, in combination with plates secured in said slots respectively and pivoted together at the dividing-surface between said parts. 25

In testimony whereof I have hereunto subscribed my name this 14th day of February, 1901.

JOSEPH F. PLUMMER.

Witnesses:

FREDERICK W. MILLOY,
E. D. CHADWICK.