May 9, 1967 H. LUDWIG 3,317,940

TWO-PART LAST FOR THE MANUFACTURE OF FOOTWEAR

Filed Dec. 8, 1965

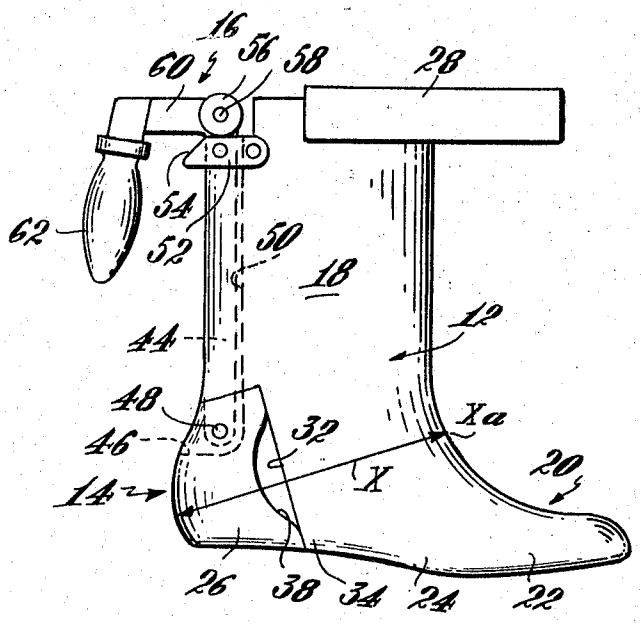


Fig. 1

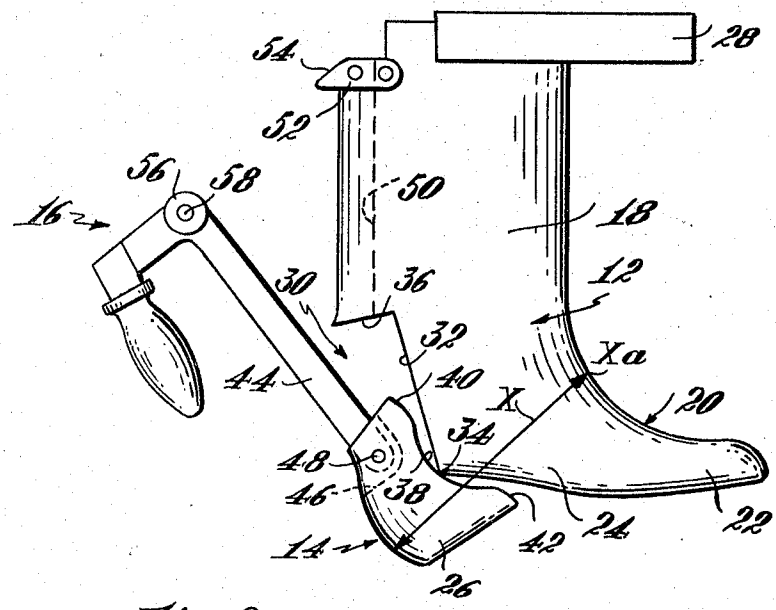


Fig. 2

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United States Patent Office 3,317,940 Patented May 9, 1967

3,317,940

TWO-PART LAST FOR THE MANUFACTURE OF FOOTWEAR

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Filed Dec. 8, 1965, Ser. No. 512,358
3 Claims. (Cl. 12—135)

This invention relates to two-part lasts designed especially for use in the manufacture of footwear by the process of injection molding to enable easily drawing the upper onto the last preparatory to applying the bottom and removing the last following completion. However, such lasts may be used for other purposes to effect a foreshortening of the bottom for lasting and delasting shoes regardless of how they are made.

A great many mechanical expedients have been employed to enable foreshortening lasts but for the most part if the component parts of the last have been articulated with sufficient strength to withstand the lasting operation without collapse, they are extremely difficult to manipulate, or if the articulation is designed to afford stiffness in use and ease in manipulation, the means for effecting such foreshortening is too intricate and expensive. Additionally, articulation has not been carried out with proper regard to the change in dimensions of the last during relative movement of the parts, so that stresses will not be imposed on the interior of the article of footwear either during the lasting or delasting operation.

The objects of this invention are principally to provide for articulation in such fashion that substantially no effort is required in effecting relative movement of the parts either during lasting or delasting, and that when the parts are drawn into registration, there is no danger of their being dislocated by the stresses encountered during lasting; to provide for articulation at a place which will enable relative movement without expansian of the shoe whether it is being placed on or removed from the last; and to provide means which will enable articulation of the parts easily and inexpensively.

As herein illustrated, the two-part last which forms the subject matter of this invention embodies a forepart and heel part divided from each other in such fashion that the parts may be moved relative to each other to foreshorten the bottom on a radius centered at the forepart and terminating in the most rearwardly convex portion of the heel part. The heel part is situated in a rearwardly facing recess at the heel end of the forepart and has a flat, downwardly and forwardly extending surface which intersects the bottom substantially at the base of an arch forming a shoulder at the intersection, and the heel part contains a recess confronting the corner of such depth as to enable the heel part to pass around the corner without increasing the distance between the instep and the most rearwardly convex portion of the last. The recess in the confronting face of the heel part is substantially concave and at opposite ends of the concavity there are bearing surfaces which engage the inclined surface of the recess. Preferably these bearing surfaces are relatively narrow. At the back line of the last there is a groove, the lower end of which commences above the recess and the upper end of which terminates at the top of the last. A lever is pivotally connected at one end to the heel part and there is means at the other end of the lever and on the last at the upper end of the groove cooperable to draw the heel part into the recess. In the operative position, the lever is situated entirely within the groove at the back line thereby maintaining an uninterrupted cross section through the entire shaft which corresponds to the cross section of the article of footwear.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

FIG. 1 is an elevation of the two-part last with the forepart and heel mutually engaged; and

FIG. 2 is an elevation of the two-part last with the heel part moved downwardly relative to the bottom of the forepart to effect foreshortening of the bottom either to enable applying the upper to the last or removing it therefrom.

Referring to the drawings, the two-part last comprises a fixed part **12** and a movable part **14** held in mutual engagement by locking means **16** which is operable, as will appear hereinafter to release the parts to permit relative movement for effecting foreshortening of the bottom.

The fixed part **12** embodies a leg portion or shaft **18** at the lower extremity of which is a foot portion **20** which includes the forepart and shank **22** and **24** respectively. The movable part **14** comprises essentially the heel end of the last comprising that part of the foot rearwardly of the base of the arch to the back line of the heel and extending from the bottom upwardly to approximately the Achilles tendon.

A bracket member **28** is bolted to the upper end of the part **12** for securing the last to a suitable holder.

The heel part **26** is supported in a rearwardly facing recess **30** formed in the rear part of the fixed part **12** and has a downwardly and forwardly inclined flat surface **32** which intersects the bottom of the last at about the base of the arch forming a shoulder **34**, and an upwardly and forwardly extending surface **36** intersecting the surface **32** substantially at right angles. The heel part **26** contains in the fact confronting the surface **32** a concave recess **38**, the depth of which is such that the heel part may be moved downwardly from the position shown in FIG. 1 around the corner or shoulder **34** at the lower end of the part **12** without increasing the distance between the instep and the most rearwardly convex portion of the heel, this distance being indicated by the line X. In other words, the heel part is centered for movement about a point X*a* at the instep such that by providing the concave recess **38** movement of the heel part may be achieved on a radius of constant length. Optionally the part X*a* may be chosen so that the radius decreases as the heel part moves around the corner. The heel part **26** is supported when in the recess by bearing surfaces **40** and **42** at its upper and lower ends at opposite sides of the recess **38** which preferably are flat and relatively narrow so as to minimize frictional engagement, thus allowing the part **26** to be easily displaced along the surface **32**. The heel part **26** is moved into and out of the recess and locked in position by locking means **16** comprising a lever **44**, the lower end of which is situated in a slot **46** in the upper end of the heel part and pivotally connected therein by a pin **48**. A groove **50** is provided at the back line of the leg portion **18** which commences at the top of the recess **32** and extends upwardly to the upper end of the leg portion. At the upper end of the leg, adjacent the top of the groove **50** and at opposite sides thereof, there are cam blocks **52** having downwardly and rearwardly inclined shoulders **54**. The lever **44** has mounted at its upper end a pair of rollers **56** which are supported at opposite ends of a pin **58** fixed in the upper end of the lever. An arm **60** extends rearwardly from the upper end of the lever, and has at its distal end a downwardly extending handle or grip **62**. The lever is adapted when swung forwardly and upwardly to bring the rollers **56** into engagement with the inclined shoulders **54** and to enable drawing the upper end of the heel part **26** into locking engagement with the recess in the part **12** by elevation of the rollers upwardly on the cam shoulders **54** into engagement with the flat upper edges of the cam blocks at the top of the groove. The handle or grip **62** enables

manipulation of the lever and securing a strong hold for moving the lever into and out of position.

The two-part last as constructed above, affords the advantages of a relatively large, flat, sloping contact surface for the heel which guarantees correct guidance of the heel part during relative movement of the parts either for lasting or delasting; provides an increased cross-section, that is, dimension between the upper end of the recess and the sole surface which is of sufficient strength to withstand the high stress which occurs at the protruding portion of the heel without breaking; provides a structure in which the distance between the instep and the most rearwardly convex portion of the heel does not increase and may optionally be somewhat smaller as the parts are moved relative to each other, thereby eliminating stress or distortion of the upper; and provides a structure which is comparatively inexpensive to manufacture, is durable and dependable.

While one desirable embodiment of the invention has herein been disclosed by way of example, it is to be understood that the invention is broadly inclusive of any and all modifications falling within the terms of the appended claims.

I claim:

1. A two-part last comprising a forward part having top, bottom and rear sides, said rear side containing a rearwardly facing recess and said recess having a transversely flat, downwardly and forwardly extending inclined surface which intersects the bottom side substantially at the arch, and a back part which has a rear side which is rearwardly convex and a front side containing a transverse recess confronting said inclined surface at the rear-side of the forward part, said recess being of such depth as to enable the back part to pass around the corner where said inclined surface intersects the bottom side to effect foreshortening of the bottom without rearward displacement of the back part relative to the forward part.

2. A two-part last according to claim 1, comprising a lever pivotally connected at one end to the heel part, said last containing at the back line above the recess a rearwardly facing open groove for receiving the lever, inclined cams fixed to the last adjacent the upper end of the groove, and rollers at the upper end of the lever cooperable by swinging movement of the lever about its lower end toward the grooves to pull the heel part into locking engagement with the forepart.

3. A two-part last according to claim 1, wherein the front side has above and below the recess therein transversely extending, relatively narrow bearing surfaces.

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