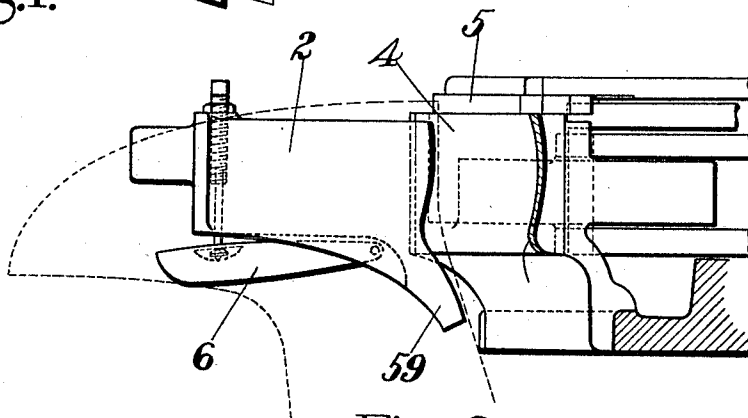
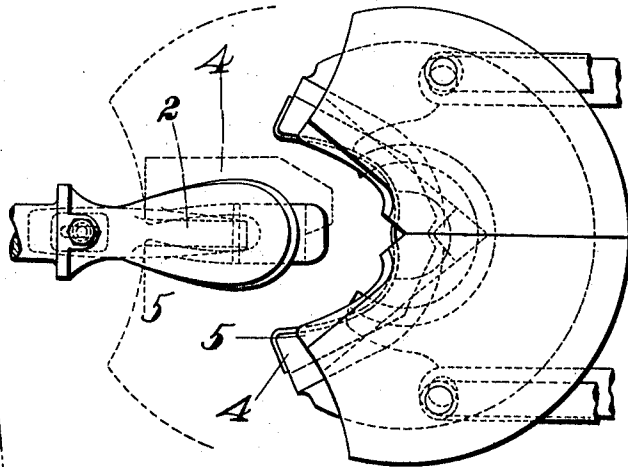
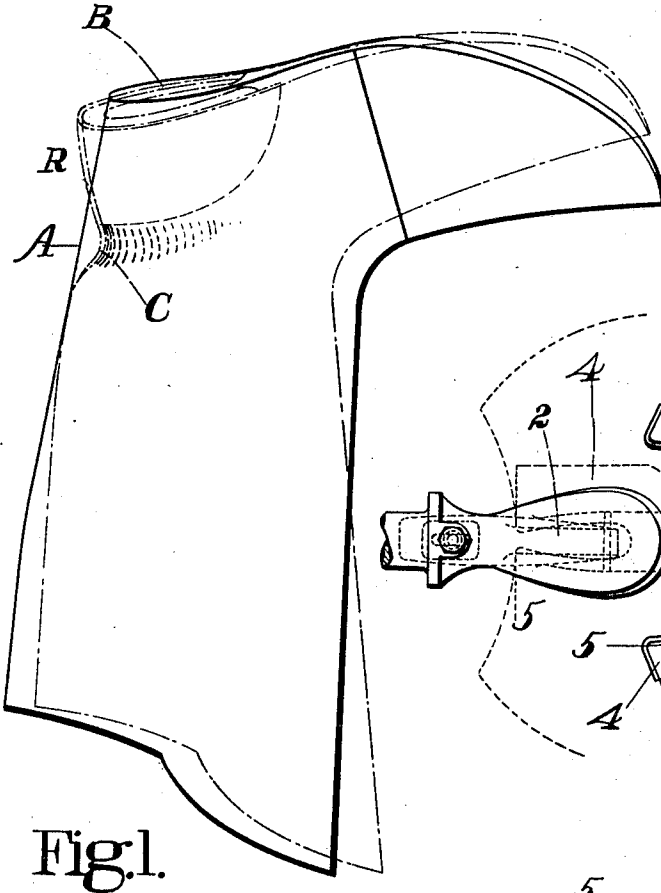


P. BEIER.
METHOD OF SHAPING BOOT UPPERS.
APPLICATION FILED NOV. 7, 1912.

1,055,122.

Patented Mar. 4, 1913.

2 SHEETS—SHEET 1.



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2 SHEETS-SHEET 2.

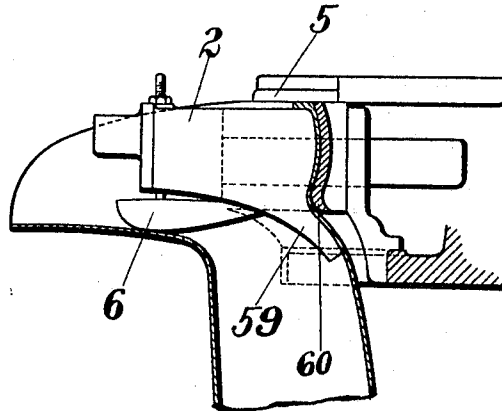


Fig. 4.

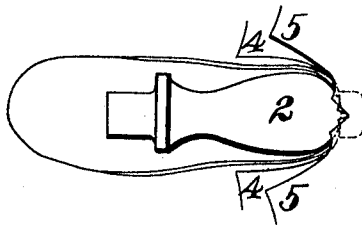


Fig. 6.

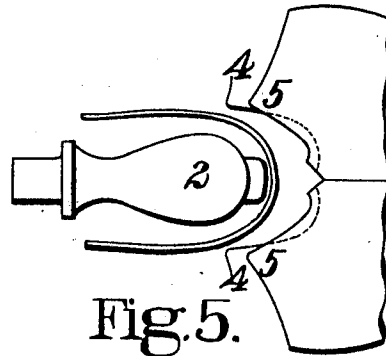


Fig. 5.

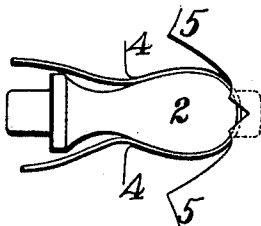


Fig. 7.

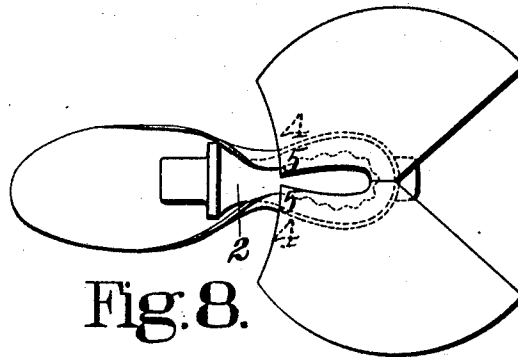


Fig. 8.

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UNITED STATES PATENT OFFICE.

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METHOD OF SHAPING BOOT-UPPERS.

1,055,122.

Specification of Letters Patent.

Patented Mar. 4, 1913.

Original application filed April 16, 1912, Serial No. 691,123. Divided and this application filed November 7, 1912. Serial No. 730,000.

To all whom it may concern:

Be it known that I, PAUL BEIER, a subject of the Emperor of Germany, residing at Rödelheim-Frankfort, Germany, have invented certain Improvements in Methods of Shaping Boot-Uppers, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to methods of making boots and shoes and particularly to methods of shaping the upper materials for the purpose of causing them more fully to fit a wearer's foot.

The invention was made particularly to overcome difficulties experienced in the manufacture of heavy boots made of stiff and stubborn leather for the German army but the principles of the invention are applicable, as experiments have demonstrated, to improving the fit and permanency of shape of other boots and shoes and also can be made to effect economies in labor and stock costs in the manufacture of various kinds of shoes.

It may be explained that much difficulty has been experienced in the present methods of boot manufacture, in making the upper fit the foot around the heel, and particularly just above the ball of the heel, or as it may be called at the "neck" of the foot. The objectionable feature noticeable in many faultily made boots and shoes is that they do not hug the rear part of the foot sufficiently to cause the boot to flex when the weight comes on the ball of the foot in stepping, and consequently the heel slips up and down in the boot and chafes in a way that is often painful, especially in "breaking-in" new boots. In heavy goods which are usually made without a back-seam that allows "cutting in" to fit the neck of the foot it has been particularly difficult to obtain shapes and fitting qualities satisfactory to the government, and it is a prime object of this invention to provide a method for obtaining a properly shaped boot or shoe without necessarily backseaming and cutting in, although, as above indicated, this method may be used with advantage to improve the fit and permanence of shape of all or nearly all boots and shoes. This result is accomplished by manipulating the upper

leather to displace it from places where there is too much fullness or where snugness is desired and, what is of equal or greater importance, by working the displaced stock toward and into places where it is needed and preferably where it can be secured permanently to establish the upper in its reshaped condition and maintain it during the life of the boot. As an incident to this manipulation other portions of the upper than the heel part are reshaped, particularly over the instep and in the shank, and their adaptation to the foot of the wearer is improved.

As is well known, it is customary to provide boots and shoes with heel stiffeners. It is contemplated that a straight or unmolded heel stiffener shall be applied to the boot upper prior to the shaping of the upper and that the upper and the heel stiffener shall be shaped or molded together, thereby providing an identity of shape for both the upper and the stiffener which will enable each to assist in maintaining the form of the other during wear of the boot. Prior to being treated, the upper and the heel stiffener extend in a substantially straight line at the back. In the shaping process the entire heel part is made to assume the same curvature as the heel part of the forms, which corresponds with, or preferably is an exaggeration of, that of the last upon which the boot is subsequently assembled. This shaping operation includes, as one of its most essential features, the formation at the upper portion of the stiffener at the back and extending partly along the sides of the heel of a short ridge projected inwardly to fit into and around the neck of the foot and cause the boot to hug the heel of the wearer firmly so that the heel does not lift away from the boot sole while walking. In addition to the formation of this ridge it is preferred that, while the stock is displaced as a result of such formation, the entire heel portion of the upper and stiffener shall be subjected to compression, as, for example by being molded between inside and outside formers, and moreover that the flange of the upper and stiffener shall be molded over upon the heel seat on a line determined by the displacement of the stock which has taken place in the formation of the ridge, this seat molding being conveniently done between

the inside former and devices which are similar to the heel lasting plates of a bed lasting machine.

The result of forming the ridge appears to be to displace the upper of the heel portion of the boot downwardly and backwardly as indicated by the contrasting views in the drawings, so that while the upper is displaced inwardly around the neck it is bulged outwardly around the ball of the heel where by a pocket or seat is formed for the large part of the heel of the wearer's foot. Also this operation of forming the ridge appears to effect a backward displacement of the entire flange or edge portion of the boot upper, including also the whole forepart of the upper from the instep to the toe, with relation to the leg portion of the boot. Preferably the ridge is first formed at the extreme back end of the heel and it is during this initial ridge forming that the described displacement appears mainly to take place. Then the formation of the ridge is completed along the sides of the heel and the upper is thereby wrapped around the heel in its described displaced condition. While it is so held the upper is drawn over the rear end of the heel seat and then over the sides of the heel seat with an inward sweep to complete the formation of the pocket for the heel of the wearer's foot, after which all the heel portion of the upper is "set" in its reshaped condition and position by being subjected to heavy compression. The described displacement of the upper by these manipulations appears also to be important, particularly in its effect upon the shank and instep portion of the upper, in shaping the foot portion of the boot upper so that it will fit closely to and around the wearer's foot. It will be noted from the drawings that the ridge is located low down where it will engage the top incline of the heel, being at or slightly below the narrowest part of the instep so that the foot may slide obliquely into the boot and then the heel settle backward into its pocket. No attempt is made to exhaust the stretch from the leather which forms the ridge, as by pulling or tensioning it toward the toe, but it is left elastic to stretch and then react resiliently as the heel is forced past it in putting the boot on the foot or taking it off. The boot shaping operation is essentially a pressing operation in which the upper leather, with the heel stiffener, is displaced in directions and into positions desired to produce the required shape in the contemplated shoe and then is clamped and finally gathered inwardly and compressed over the heel seat in its new position and held under pressure for a period long enough to permit the acquired shape to become permanent. Thereafter the boot upper is withdrawn ready to be assembled with an insole upon a last over which it will

be pulled over and the forepart will be lasted and tacked to the insole, the heel part being already completely lasted and ready to be tacked.

The invention will now be explained in connection with the accompanying drawings and then pointed out definitely in the claims.

Figure 1 shows in full and dotted lines contrasting views of a boot upper before and after treatment in accordance with this invention; Figs. 2 and 3 are plan and sectional views of shaping devices which may be employed in practising this invention. No novelty is claimed herein for said devices as they are substantially the same as those shown and claimed in my prior application Ser. No. 691,123, filed April 16, 1912, from which application this present case is a division. Fig. 4 shows the step in the operation immediately following that illustrated in Fig. 3 wherein the stretched upper is shown as extending at the back in a substantially straight line from which it is to be reshaped as indicated by full lines in Fig. 4 and dotted lines in Fig. 1 into the shape which it is desired that it have in the completed shoe. Figs. 5, 6, 7 and 8 are diagrammatic views illustrating the steps of receiving the upper; initially forming the ridge at the back of the heel by pressing the upper materials inwardly at a point located about at the elevation of the upper edge of the heel stiffener; forming it around the sides of the heel by wrapping the upper about the sides of the heel while maintaining the pressure at the rear end of the heel; then forming the edge line of the shoe bottom while the upper is so held, and with reference to the displacement which has been effected, by laying the flange of the upper over the heel seat and finally subjecting the shaped upper to compression on the back end, sides and seat of the heel, although as indicated in the drawings the operation may extend well into the shank of the shoe.

From Fig. 1 may be seen the reshaping of the vamp effected by this invention which contemplates the use of a stitched upper which is or may be straight at the back as at A and is pressed into an inwardly extending ridge C at and just above the top edge of the heel stiffener, where it will come just above the ball of the wearer's heel, and is shaped to the heel. The ridge forming pressure against the back of the upper tends to and does displace upwardly the stock in the instep and forward portion of the upper and this displacement is shared by the forward ends of the heel stiffener which, with the overlying and adjacent upper materials, are thereby raised into the shank. It is with these materials in this condition that the stock is shaped around the heel, and it is also with these materials in this condition that the edge line of the heel seat is formed,

as by wiping the flange inwardly as at B and subjecting the stock to compression to set it. This formation of the edge line of the heel seat, and it may be extended into the shank more or less as shown, does much to maintain the stock in the position to which it has been displaced and the subsequent fastening of the flange to the innersole renders permanent in the completed shoe the shape given to it in this preliminary shaping operation. The ridge forming pressure applied as indicated also appears to have another effect that is important in that it not only displaces the stock of the instep and forepart of the shoe upwardly, but also backwardly as indicated in Fig. 1, whereby there is produced at R in the forming operation a pocket for the ball of the heel.

From the foregoing it may be seen that the upper is reshaped to fit the heel and avoid slipping up and down on the wearer's foot by producing the inwardly directed ridge C and the outwardly directed pocket R which cooperate for the purpose stated.

In practising the invention an upper which may be like the boot upper shown by full lines in Fig. 1 or may be any usual form of boot or shoe upper, is applied as in Figs. 2 and 3 over an inside former and pulled snugly forward with its margin projecting above the former enough to provide the desired width of heel seat flange. The ridge is then formed first at the back end of the heel by pressing the upper materials inwardly at and above the top edge of the heel stiffener. This is done, as shown in Fig. 4, by engaging the upper on the inside and pressing or holding it backward, as by means of the part 59 of the inside former, while engaging it higher up and pressing it inwardly as by the lower edge portion 60 of the outside formers. The displacement of the stock thus produced tips upwardly and draws backwardly the instep portion and the forepart of the upper and this produces the rearward movement indicated by dotted lines at R in Fig. 1 to provide the heel ball pocket. This latter movement largely accompanies the extension of the ridge along the sides of the heel, such extension following directly after the formation of the ridge at the back of the heel and being produced by the closing of the outside formers 4 from the position shown in Fig. 6 to that shown in Fig. 7. The stock thus molded around the heel to produce the inwardly directed ridge C and the pocket R is now preferably subjected to compression to set it, by powerful operation of the inside and outside formers 2 and 4 as by mechanism not necessary here to describe (but an operative mechanism for that purpose may be found in my said prior application) and is held in this shape for the formation of the heel seat edge line with relation to the acquired shape

of the upper at the rear and sides of the heel seat and its position in the shank and forepart indicated by the dotted lines in Fig. 1. The edge line may be formed by seat

wipers, such as 5, being advanced from the position Fig. 7 to the position Fig. 8. Vertical compression sets the flange upon the heel seat ready for tacking to the innersole when later the reshaped upper is assembled with the innersole upon the last. There is a tendency for the forepart of the upper to tip up too sharply when the ridge is formed at the back end of the heel and in doing so to throw too much stock into the shank of the shoe, and I preferably restrain this tipping more or less, as by the use of a weight or spring actuated device 6 engaging the inner side of the instep portion of the upper, and allowing the forepart to tip up gradually as the ridge is formed.

When the upper has remained in process long enough to have set or acquired permanently its new shape it will be found to have been transformed more or less completely from the sort of shape indicated by full lines in Fig. 1 to the sort of shape shown by dotted lines in that figure, after which it is ready to be assembled with an innersole upon a last and pulled over and lasted. This process not only saves arduous labor in lasting the heel portion of uppers, particularly of stiff leathers, and displaces the leather in accordance with requirements of the shape of the heel portion of the foot so that economy of stock may be effected in cutting the upper patterns as small as may be, but better fitting uppers of more uniform and permanent shape than heretofore possible are obtained which are calculated to satisfy the most exacting demands.

Having explained the nature of this invention and how it may be practised, I claim as new and desire to secure by Letters Patent of the United States:—

1. That improvement in methods of shaping boot uppers which consists in molding an inwardly extending ridge into the upper immediately above the ball of the heel, and then shaping the upper to the heel.

2. That improvement in methods of shaping boot uppers which consists in molding an inwardly extending ridge in the upper immediately above the ball of the heel, and then forming the inturned heel seat flange on the upper with reference to said ridge.

3. That improvement in methods of shaping boot uppers which comprises pressing the upper materials inwardly at the back end of the heel locally at a point located approximately at the elevation of that longitudinal edge of the heel stiffener which is remote from the shoe bottom, whereby the stiffener ends are tilted upwardly with reference to the bottom of the shoe, and thereafter wiping the flange in over the heel seat

to form the shoe bottom edge line while the stiffener is so positioned.

4. That improvement in methods of shaping boot uppers which consists in pressing the upper materials inwardly at the back end of the heel first at a point located approximately at the elevation of that longitudinal edge of the heel stiffener which is remote from the shoe bottom, then wrapping the upper about the sides of the heel while maintaining said pressure and subsequently laying the flange of the upper over the heel seat to form the edge line of the shoe bottom while the upper is so held.

5. That improvement in methods of making boots and shoes the stitched upper of which extends at the back in a line which is more nearly straight than is desired in the completed shoe which consists in producing, by tension and pressure, in the heel portion of the upper in proximity to that longitudinal edge of the heel stiffener which is remote from the shoe bottom, prior to the pulling-over and lasting operations, the shape which the heel portion is to have in the finished shoe, and restraining movement of the forward portion of the upper tending to misshape the shoe during the heel shaping operation.

6. That improvement in methods of making boots and shoes the stitched upper of which extends at the back in a line which is more nearly straight than is desired in the completed shoe which consists in producing, by tension and pressure, in the heel portion of the upper in proximity to that longitudinal edge of the heel stiffener which is remote from the shoe bottom, prior to the pulling-over and lasting operations, the shape which the heel portion is to have in the finished shoe, and laying the marginal flange of the upper at the heel seat inwardly after the shaping of the upper portion of the heel part and prior to the pulling-over and lasting operations.

7. That improvement in methods of shaping uppers which consists in displacing forwardly and obliquely toward the edge that is to be fastened to the sole the upper stock which is to extend about the foot just above the ball of the heel and, while holding the stock so displaced, forming the heel seat edge line substantially as described to render the displacement permanent.

8. That improvement in methods of shaping uppers which consists in displacing forwardly and obliquely toward the edge that is to be fastened to the sole the upper stock which is to extend about the foot just above the ball of the heel, yieldingly resisting the upward displacement by force applied to the inside of the upper at the instep; and finally, while holding the stock in reshaped condition around the heel, folding the flange of the upper inwardly to form the heel seat edge line whereby the acquired shape is made permanent.

9. That improvement in methods of shaping uppers which consists in displacing forwardly and obliquely toward the edge that is to be fastened to the sole the upper stock which is to extend about the foot just above the ball of the heel and displacing rearwardly and away from the edge that is to be fastened to the sole the stock which is to extend around the ball of the heel whereby a heel ball pocket is formed with a contracted neck opening.

10. That improvement in methods of shaping uppers which consists in displacing forwardly and obliquely toward the edge that is to be fastened to the sole the upper stock which is to extend about the foot just above the ball of the heel and, while holding the stock so displaced, forming the heel seat edge line substantially as described to render the displacement permanent and subjecting the displaced stock to compression to set it in its displaced condition.

11. That improvement in methods of making boots and shoes which comprises engaging first the back end face of the heel locally at that longitudinal edge of the heel stiffener which is remote from the shoe bottom and pressing said edge forwardly, while the front ends of the stiffener are free to move toward the plane of the heel seat, and thereafter pressing the said ends of the stiffener inwardly and rendering the acquired position thereof permanent, all prior to the lasting of the shoe.

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

PAUL BEIER.

Witnesses:

HUGO HOFFMANN,
WALLACE ELLISON.