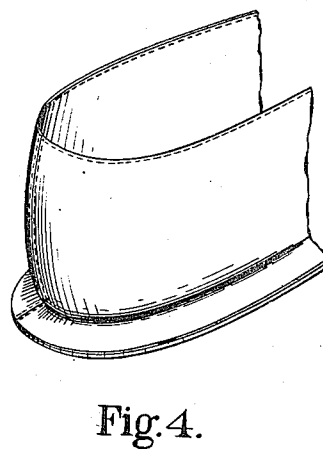
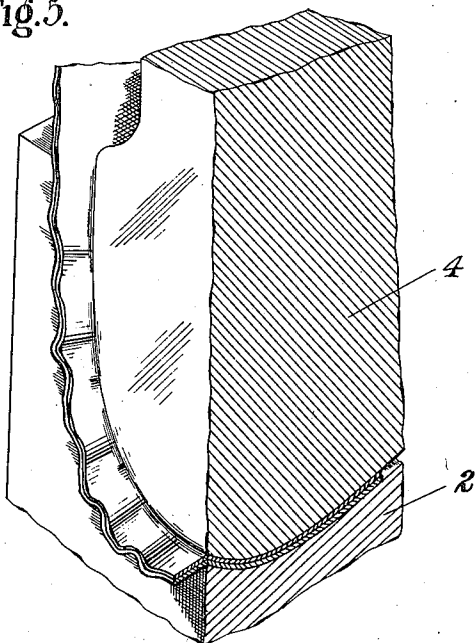
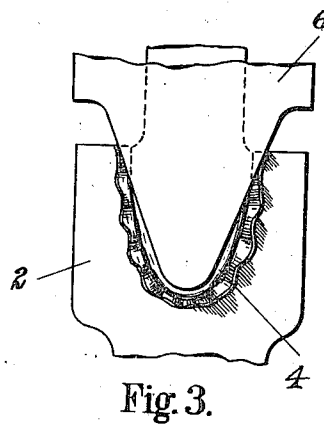
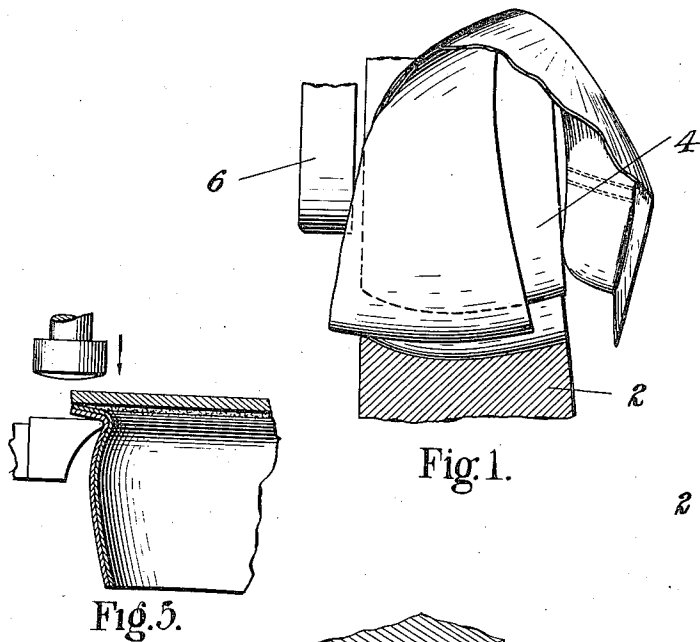


K. ENGEL.
METHOD OF FORMING UPPERS OF BOOTS AND SHOES.
APPLICATION FILED AUG. 5, 1907.

1,001,745.

Patented Aug. 29, 1911.



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UNITED STATES PATENT OFFICE.

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METHOD OF FORMING UPPERS OF BOOTS AND SHOES.

1,001,745.

Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed August 5, 1907. Serial No. 387,023.

To all whom it may concern:

Be it known that I, KARL ENGEL, a subject of the Emperor of Germany, residing at Revere, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain Improvements in Methods of Forming Uppers of Boots and Shoes, 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 used in the manufacture of stitch-down shoes, the term "stitch-down" being commonly used to designate shoes having uppers with outturned portions or flanges to which the soles are attached. Shoes of this type have long been known in the art, but their manufacture has hitherto been seldom undertaken upon a large scale owing to the fact that the advantages to be gained from the simplicity of the method of attaching the sole to the upper have been more than counterbalanced by the difficulties experienced in shaping the upper to fit the foot and at the same time forming upon the upper the outturned flange for the attachment of the sole. The formation of such flanges is attended with comparatively little difficulty along the straight edges of the upper, and also along the shank portions. Along the curved portions of the upper, however, considerable difficulty is experienced in producing these flanges, especially along the counter portion of the upper, where the leather is apt to be torn when it is turned out. Owing to the difficulties attending the formation of outturned flanges around the counter portion of the upper, many manufacturers of stitch-down shoes have formed flanges extending only along the sides and about the toe portion of the upper and have turned in the leather about the heel or counter portions. The tearing of the leather about the counter portion in the turning operation, when it is attempted simply to turn the leather back at an angle to itself to form the flange, is due to the fact that the outturned portion must have a greater periphery than the part upon which it forms the flange.

The object of the present invention is a method of forming a flange upon a counter or counter portion of an upper, or other

similarly curved portion of flexible material, which will obviate the difficulties above referred to.

Another object of the present invention is a method of forming an outturned flange upon a counter or other similarly curved portion of flexible material by which such flange can be formed with very little stretching of the material which is turned out to form the flange.

In the method hereinafter to be described, together with suitable means for carrying it out, the curved portion of flexible material upon which the flange is to be turned is first gathered in along the turning line of the part which is to form the flange until this line lies within the original line of the material a distance approximately the width of the flange to be formed. Upon the side of this line away from the flange, the gathering in of the material extends preferably back from the line a greater distance than upon the side upon which the flange is to be formed. This causes a gradual sloping of the counter down to the flange. The amount of gathering in necessary will depend obviously upon the nature of the material. After the material has been gathered in along the flange line, the portion which is to form the flange is turned out and the fullness of material lying within its peripheral edge tends naturally to form into small folds, which may be pressed down until the whole flange lies within one plane, or the material itself may sometimes be compressed into a more compact form. On the side of the turning line away from the flange, the gathering in having extended back farther from the line than on the flange side, the folds are smaller and less distinct and may be easily pressed out so that they are scarcely noticeable. The sloping back of the material from the side of the flange line away from the flange also permits the flange to be easily accessible for sole attaching purposes. The periphery of the flange, after it has been turned out, may be extended somewhat by beating it out. The beating-out step may also, if desired, be made a step in the flange-turning process, the first step consisting in turning the flange back until its periphery is substantially the same as the original periphery of the material upon which it is formed, in which case the fullness of ma-

terial within the periphery will tend to make the flange incline either above or below the flange line, and the second step consisting in beating the flange out until the periphery is stretched sufficiently to permit the flange to lie in a plane substantially perpendicular to the part upon which the flange is formed. This method of forming a flange upon a counter or other similarly curved portion of flexible material can be used with comparatively stiff material, such as counters are usually made of, as well as with very flexible material such as the cloth which is used in lining shoes. It can also be used with several different kinds of material at the same time. The method can, therefore, be used to advantage in forming an outturned flange upon a shoe upper having a counter and lining in place, flanges being formed upon all of these parts at the same time.

A further object of the invention is to provide a method of forming an outturned flange upon a stitch-down shoe upper which will use the excess of leather appearing in some parts of the upper to aid in forming a flange in other parts where there would naturally be a deficiency. The shank of the shoe being incurved somewhat, so that the outturned flange upon the shank portion of the upper is likewise incurved, there will be in this outturned flange an excess of material which, if it can be moved toward the counter portion of the upper, will aid in forming the flange upon said latter portion. In this aspect the invention, therefore, comprehends moving toward the counter portion of the upper, at the time the outturned flange is being formed upon said portion, some of the material in the shank portion of the upper.

In the accompanying drawings, which illustrate a convenient way in which the method of this application may be carried out, Figure 1 illustrates portions of a mechanism adapted to form an outturned flange upon a shoe upper in accordance with the method of this application; Fig. 2 is a view, partly in section, showing a piece of work clamped between the molds and ready for the flange-turning operation; Fig. 3 is a view illustrating the flange-turning operation, Fig. 4 shows the completed flange. Fig. 5 is a view illustrating the step of beating out or leveling the outturned flange.

A U-shaped female mold 2, transversely concaved (as shown in Figs. 1 and 2) in such manner that adjacent to the edge over which the flange is to be turned lies a more abruptly descending portion of the concavity, cooperates with a male mold 4 shaped to fit said female mold. Over the side of the molds on which the flange is to be formed is adapted to be moved the flange turner 6, preferably in the direction from the male

mold toward the female mold. These parts may be connected to any suitable mechanism for automatically operating them, such, for example, as that illustrated in the co-pending application of Karl Engel, Ser. No. 387,024, of even date herewith.

With the mechanism just described, the method of this application may be carried out as follows: A counter or upper, or counter and upper, together with the shoe lining, if the shoe is to be lined, is placed between the molds in the manner shown in Fig. 1, a portion being left projecting upon the side of the molds upon which the flange is to be turned. The width of this portion may be gaged in any suitable way. In practice, the operator usually gages this with the thumb and finger, at the same time pressing the leather back slightly over the female mold. With heavy or stiff leather, a preliminary tempering is usually preferable. The material to be molded, having been placed in position, the molds are then brought together (as shown in Fig. 2). As will be seen from an inspection of this figure, the abruptly descending portion of the concavity in the female mold, adjacent to the side upon which the flange is to be turned, and the portion of the male mold shaped to fit this concavity cause the leather to be gathered in along the edge of the mold, the peripheral measurement of this edge being less than that of the bottom of the concavity, so that the leather is wrinkled as shown in the figure. The molds, upon being pressed together, press out the wrinkles in the leather between them. It will be further seen from an inspection of Fig. 2 that, following the gathering-in operation, there is more material in the U-shaped part that projects beyond the molds than is necessary to form the U in which it lies, and that this part may be turned back upon the female mold until its edge forms a U of the length of that which it originally formed without stretching this edge at all. When this part has been turned back until its edge has a peripheral length substantially the same as the original peripheral length of all the outturned material, it will be obvious that the material lying within the edge of the part turned out will still lie within a curve smaller than that which it might form if curved cylindrically instead of being curved nearly or quite in its own plane, and that, therefore, it will be folded more or less upon itself, the excess material being naturally greatest where the length of the curve is least. As hereinbefore pointed out the edge of the portion turned out may be made to lie outside its original position by stretching the material somewhat in turning it out. Furthermore, the material may be stretched still more and the edge

caused to lie still farther outside its original position by beating out the outturned portion.

Fig. 3 illustrates the flange turning operation. From this figure it will be seen that the flange turner is so shaped and its direction of movement is such that it facilitates the flange forming operation by moving toward the parts where it is needed the excess of upper material which appears in some parts of the upper, particularly in the region of the shank. It will be seen, further, that the movement of the flange turner is toward the rear end of the upper, being over the male mold and toward that part of the female mold where the curvature is most abrupt and where, therefore, there is the greatest strain in the flange turning operation. It will be apparent, therefore, that any movement of the upper material which serves to increase the length of material which may go into the flange during the flange turning operation, will facilitate this operation.

Fig. 4 shows the counter portion of an upper with a completed flange formed by the method of this application.

The particular mechanism illustrated is obviously not essential to the successful employment of this method of forming outturned flanges.

The principle of this invention is capable of quite general application in the art to which it has above been applied, as well as in related arts.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. The method of forming a counter having an outturned flange which consists in molding the counter blank to fit the back of the heel, gathering in and confining the blank material along the flange line, and then turning out the part of the blank which is to form the flange.

2. The method of forming an upper for a stitch-down shoe which consists in placing a counter blank in position in the upper, curving the upper and counter blank to fit the back of the heel, gathering in the material of the upper and blank along the turning line and then turning out the material below the turning line to form an outturned flange.

3. The method of forming a counter having an outturned flange which consists in molding the counter blank to fit the back of the heel, gathering-in and confining the blank material along the flange line and then turning out the part of the blank which is to form the flange, and during the turning-out operation moving toward the rear end of the counter some of the material which is to form the flange.

4. The method of forming an outturned flange upon a counter or other similarly shaped portion of flexible material which consists in gathering in the material of the counter along the turning line, turning out the portion which is to form the flange until it forms an oblique angle with the counter and then beating out said portion until it stands out approximately at a right angle to said counter.

5. That improvement in the art of making stitch-down shoes which consists in assembling a lining, upper and counter in proper relative positions, molding these parts to fit the back of the heel, gathering in the material of said parts along a line near their lower edge and turning out the material below this line to form an outturned flange.

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

KARL ENGEL.

Witnesses:

H. DORSEY SPENCER,
ARTHUR L. RUSSELL.