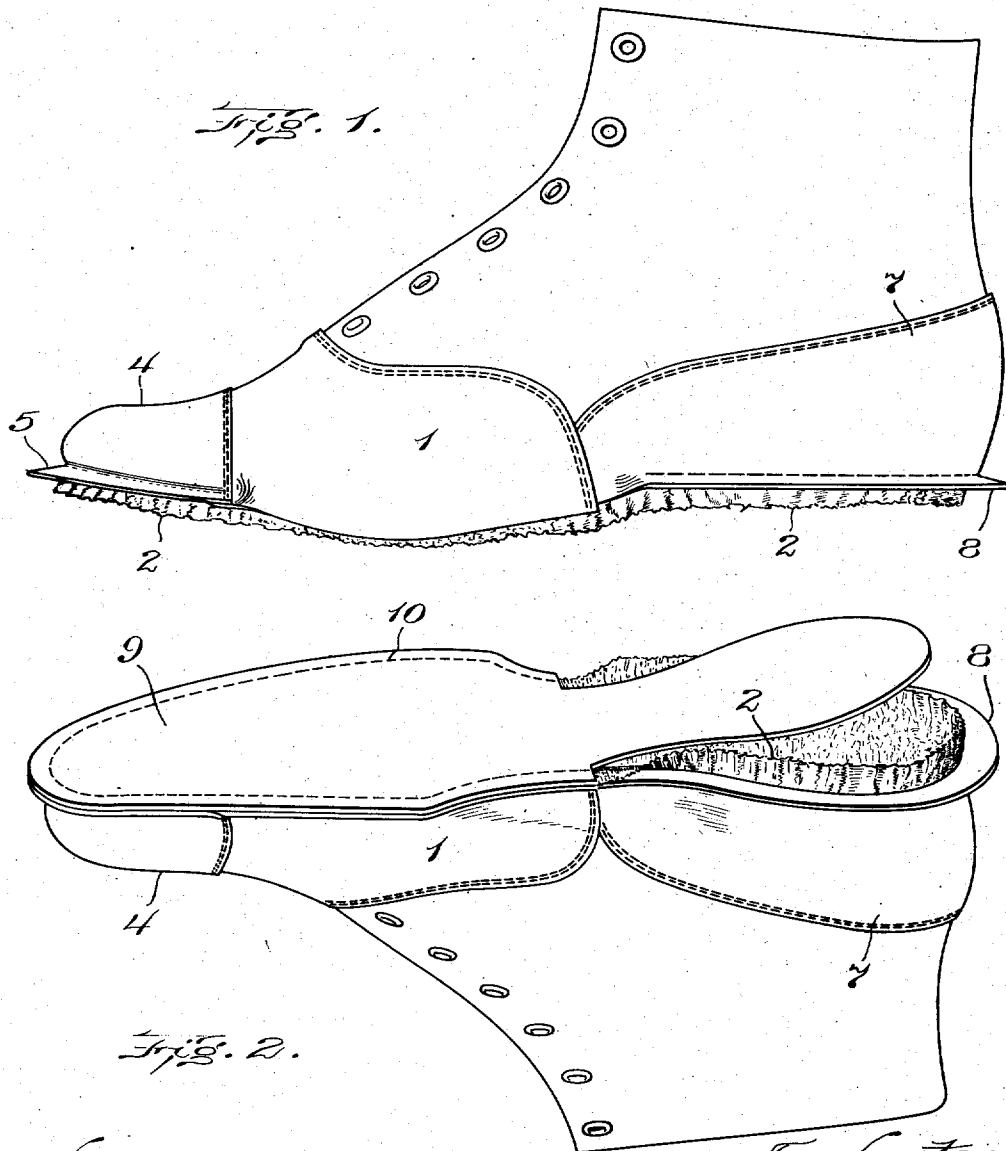


K. ENGEL.
METHOD OF MAKING SHOES.
APPLICATION FILED NOV. 20, 1905.

931,851.

Patented Aug. 24, 1909.

2 SHEETS—SHEET 1.



Witnesses:
Walter P. Abell
Lawrence E. Kennedy.

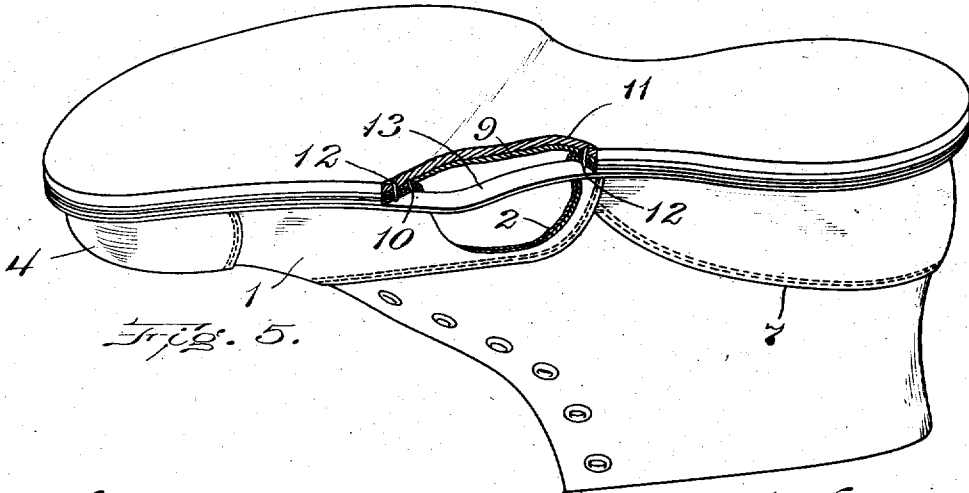
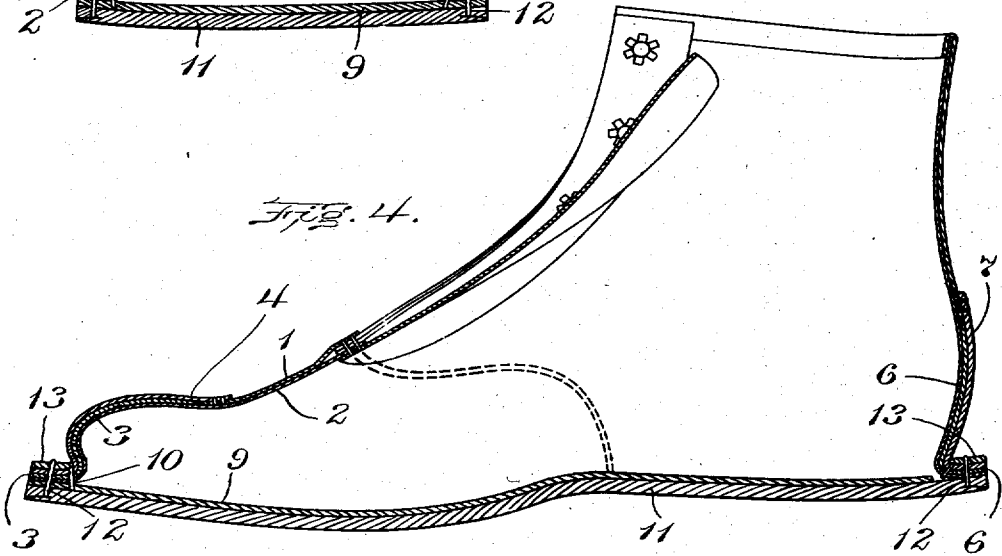
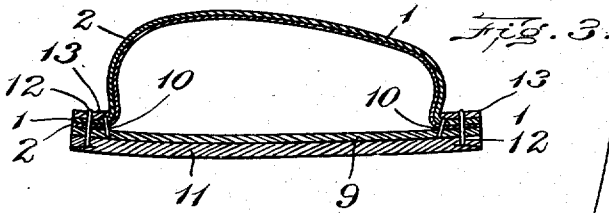
In Witness Whereof
Karl Engel,
by Knight Brown Lindley May
Attorneys.

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2 SHEETS—SHEET 2.



Witnesses:
Walter P. Abell
Laurence E. Kennedy.

Inventor,
Karl Engel.
by *Myrdal & Co.*
Attorneys.

UNITED STATES PATENT OFFICE.

KARL ENGEL, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATTERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

METHOD OF MAKING SHOES.

931,851.

Specification of Letters Patent. Patented Aug. 24, 1909.

Application filed November 20, 1906. Serial No. 288,182.

To all whom it may concern:

Be it known that I, KARL ENGEL, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Methods of Making Shoes, of which the following is a specification.

This invention relates particularly to that class of shoes known as "stitch-down" in which the upper is turned outwardly and stitched to the upper face of the sole. The principal objections which have existed heretofore to this form of shoe have been that after the stitches on the tread surface of the sole have become worn through, the seam is liable to spread open, and after it has become opened to a sufficient extent, it is impossible to mend the shoe without re-lasting and entirely re-making the shoe. Another objection is that after the outer sole of such a shoe has become worn through, it is impossible to mend the shoe and the same must be thrown away. This is due to the fact that in removing a worn out sole to substitute a new one, the stitches uniting the upper to the sole must be severed, which leaves the upper entirely unconfined so that a new sole cannot be applied by an ordinary shoemaker or mender of shoes, and the shoe must be sent back to the factory for re-lasting and making over. This renders the cost of mending a shoe almost as great as that of making an entirely new shoe.

It is the object of the present invention to provide an improved method of making a shoe of the general class above referred to, said method enabling a shoe to be produced which is free from the objections above named, so that not only will the shoe retain its shape and hold together after the stitches attaching the outer sole have become worn through, but will be of such construction that the outer sole may be removed and a new one applied by an extremely simple operation, which does not require lasting of the shoe.

The novel steps forming the subject-matter of this invention are described in the following specification and claims.

Of the accompanying drawings,—Figure 1 represents a perspective view of a shoe upper made in accordance with the present invention before attachment thereto of the inner sole and outer sole. Fig. 2 represents a perspective inverted view of the shoe after

attachment of the inner sole thereto. Fig. 3 represents a cross-section of a completed shoe, constructed according to the present invention. Fig. 4 represents a longitudinal section of the same. Fig. 5 represents a view similar to Fig. 2, of a part of the shoe with the outer sole applied.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, 1 indicates the upper leather of a shoe made in accordance with my invention, and 2 indicates the lining. The parts of the upper and the manner in which they are stitched together are the same as in shoes previously made. The essence of the present invention consists in molding either the toe portion alone or both the toe and counter portions of the upper or the entire upper, within the shank into the form which they will have when finally lasted but before the lasting operation or attachment of the inner sole is made. Fig. 1 shows the shoe upper after it has been molded ready for the application of the inner sole.

In making the shoe, the parts are all assembled and a flat blank for the formation of a box toe or toe-stiffener 3 is pasted to the under side of the toe cap 4. The same is then set into a press, being clamped about its edges and acted upon by a form having substantially the shape of the toe part of the last upon which the shoe is subsequently to be lasted. Pressure is then exerted so as to move the form out of the plane of the clamped edge, whereby the toe part of the upper is bulged out into the shape it is to have when finally lasted, and at the same time an outwardly-turned edge or flange 5 is formed upon the toe cap and box between which and the body of the toe is a constricted crease. The leather is tempered before the molding takes place and after it becomes dry, retains its shape exactly. The means for shaping the toe part of the upper and the method of shaping said toe part are not herein specifically described and claimed, being made the subject-matter of the respective co-pending applications of Karl Engel, Serial No. 387,168, filed August 5, 1907, and Serial No. 422,293, filed March 20, 1908. In a similar manner a blank for the formation of a counter stiffener 6 is applied to the counter 7 of the shoe and placed in a suitably shaped mold, and while held in

the mold, the projecting edges of the counter and stiffener are pressed over outwardly in all directions, forming the turned-out edge or flange 8. These portions being stiff, retain substantially the shape given them by the molds, while the intermediate parts of the upper being limp, may be turned out by hand when required. But these may be stiff and molded. The means for shaping the counter of the shoe and the method of shaping said counter are not herein specifically described and claimed, being made the subject-matter of the respective co-pending applications of Karl Engel, Serial No. 387,024, filed August 5, 1907, and Serial No. 387,023, filed August 5, 1907. After the molding operations have been performed, a tap sole or insole 9 of which the forward part has the shape and dimensions of the fore part of the upper when the edges thereof are turned outward, is applied to the upper and positioned properly with respect to the stiff forward flange 5, the lining 2 being also turned outwardly and laid upon the tap sole or insole. Then the limp edges of the sides of the upper are turned outward and the whole upper from one side of the shoe at the shank to the corresponding part upon the other side of the shoe is stitched close to the bend of the turned-out edge, to the insole, the line of stitches being shown at 10. The heel part of the insole is left free from the upper and is preferably of less width than the fore-part, although this is not essential.

The steps above described are all performed before the shoe has been placed upon a last, the attachment of the insole to the upper being rendered possible from the fact that the toe part is molded to its final shape. If this were not done, it would be impossible to unite the upper and insole so accurately as to permit of correct lasting. Thereafter a last is placed in the shoe and the outer sole 11 is cemented and laid in place. The usual steps of rough-rounding and grooving the outer sole now take place, and then the sole is stitched to the out-turned edges of the upper and the edges of the insole entirely around the shoe by a line of stitches 12, a welt strip 13 being laid at the same time upon the opposite side of the edge of the upper entirely surrounding the shoe, and the stitches being passed through the welt as well as through the other parts.

In a prior patent No. 788,354, granted April 25, 1905, I have shown and described a shoe in which the insole or sock lining is secured to the upper lining so as to prevent the upper pulling away from the sole when the stitches are worn through. With this form of shoe, it is necessary to shape the upper leather upon a last after securing the insole to the lining before the outer sole

can be attached, and after the outer sole has been removed, it is impossible to re-attach it or apply a new sole without re-lasting the shoe. With the present invention I have improved the shoe referred to by securing the insole or sock lining to the upper leather as well as to the upper lining so that it is impossible for the edges of the upper leather to become loosened even after the outer sole has been removed, and thus the upper is enabled to retain its shape so that a new outer sole may be easily applied. This attachment of the insole to the upper is rendered possible only by the previous formation of the molded toe and outward flange, and therefore the step of thus molding the toe prior to the lasting operation and a shoe upper having a toe so molded, constitute the gist of the present invention. By this step also the lasting operation is much simplified, for the upper has already been brought into its final lasted shape and it is only necessary therefore to insert a last to provide a support against which the outer sole is forced when being pressed in place. Accordingly the capacity of the lasters is more than doubled and that step which has previously been the most expensive one of shoe making, is by my invention reduced to one of the least expensive.

The material of which the insole or sock lining 9 is made is of much lighter weight and much less stiff than that ordinarily used, being preferably of the same quality of leather as that from which the upper is made, this being sufficiently strong to hold down the edges of the upper. Furthermore, as the upper is directly attached to the insole, it is not necessary to use a special grade of lining as is required in the shoe described in my patent above referred to, but the ordinary lining materials may be employed. Thus a shoe upper which is very light and flexible may be made and an extra heavy outer sole may be applied without increasing the weight or stiffness of the shoe to a greater degree than that previously necessary even with the lightest shoes. Thereby the greater part of the weight may be put where it is most needed, that is, in the outer sole, which receives the greatest wear. The welt gives the shoe the appearance of a Good-year shoe and also provides a backing for the stitches 12 passing through the upper.

The terms "last" and "lasting" as used throughout the specification and claims may include constructions and operations, respectively, which differ in many respects from the constructions and operations to which these terms ordinarily refer. As pointed out above, one of the main functions of the last in the employment of this method is to provide a support against which the outer sole may be forced in the sole laying operation. Although the last may also aid in

shaping the upper, it will be apparent to one skilled in the art that so far as this function is concerned it may be dispensed with in the successful employment of the present method of making shoes. As hereinbefore pointed out, a suitable shape is given to the shoe before the last is inserted. This initial shaping of the shoe is effected by the molding operation, an insole being attached which tends to hold the upper in its molded shape, and with a subsequent proper manipulation of the upper is the only shaping essential in this method of making shoes.

I claim:—

1. The method of making a shoe which consists in molding the toe part of the upper to the desired shape of the toe of the finished shoe and simultaneously forming an outwardly projecting flange thereon, bulging out the toe over said flange, stitching the edge of an insole or sock lining to said flange and outturned sides of the upper and securing an outsole to the edges of the upper and insole.

2. The method of making a shoe which consists in molding the toe part of the upper to the shape of the toe of the last and simultaneously forming an outwardly projecting flange thereon prior to lasting, stitching the edge of an insole or sock lining to said flange and out-turned sides of the upper, inserting a last and securing an outer sole to the edges of the upper and insole.

3. That improvement in the art of making shoes which consists in forming an outwardly-turned flange on the toe part of an upper, molding such part to the shape of a lasted shoe, turning out the sides of the upper and stitching thereto and to said flange the fore part of an innersole or sock lining, inserting a last, applying a welt to the upper side of the out-turned upper, and securing a sole thereto.

4. That improvement in the art of making shoes which consists in forming an outwardly-turned flange on the toe part of an upper, molding such part to the shape of a lasted shoe, molding the counter and stiffener therefor of the upper to the shape of a lasted shoe and forming thereon an outward flange leaving the sides of the upper unmolded, turning out the sides of the upper and attaching thereto and to said toe flange the fore part of an innersole or sock lining, inserting a last in the shoe, and securing an outer sole to the toe and counter flanges and to the intermediate out-turned sides of the upper edge of the innersole.

5. That improvement in the art of making shoes which consists in molding the toe and counter and the stiffeners therefor of a shoe upper to the final shape of a lasted shoe and forming thereon outwardly-turned flanges, stitching the fore-part of an insole to the toe flange and the sides of the upper, inserting a last, and securing an outer sole to said flanges and the out-turned sides of the upper.

6. That improvement in the art of making shoes which consists in molding the toe and counter and the stiffeners therefor of a shoe upper to the final shape of a lasted shoe and forming thereon outwardly-turned flanges, stitching the fore part of an insole to the toe flange and the sides of the upper, inserting a last, applying an outsole, laying a welt strip upon the turned-out edges of the upper, and stitching through the outer and inner soles, the turned-out upper edges, and the welt.

In testimony whereof I have affixed my signature, in presence of two witnesses.

KARL ENGEL.

Witnesses:

GEO. T. YOUNG,
STEPHEN B. LARRABEE.

Corrections in Letters Patent No. 931,851.

It is hereby certified that in Letters Patent No. 931,851, granted August 24, 1909, upon the application of Karl Engel, of Lynn, Massachusetts, for an improvement in "Methods of Making Shoes," errors appear in the printed specification requiring correction, as follows: Page 2, line 17 and lines 24-25, the words "tap sole" should read *sock lining*; page 3, after line 13, the following paragraph should be inserted:

The novel shoe herein disclosed is not herein claimed but is made the subject-matter of a copending application Serial No. 508,435, filed July 19, 1909.

Same page, line 53, the word "attaching" should read *stitching*, and line 58, after the word "upper" the word *and* should be inserted; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of October, A. D., 1909.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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4. That improvement in the art of making shoes which consists in forming an outwardly-turned flange on the toe part of an upper, molding such part to the shape of a lasted shoe, molding the counter and stiffener therefor of the upper to the shape of a lasted shoe and forming thereon an outward flange leaving the sides of the upper unmolded, turning out the sides of the upper and attaching thereto and to said toe flange the fore part of an innersole or sock lining, inserting a last in the shoe, and securing an outer sole to the toe and counter flanges and to the intermediate out-turned sides of the upper edge of the innersole.

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