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INNERSOLE.

APPLICATION FILED MAY 8, 1915.

1,227,483.

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Fig. 1.

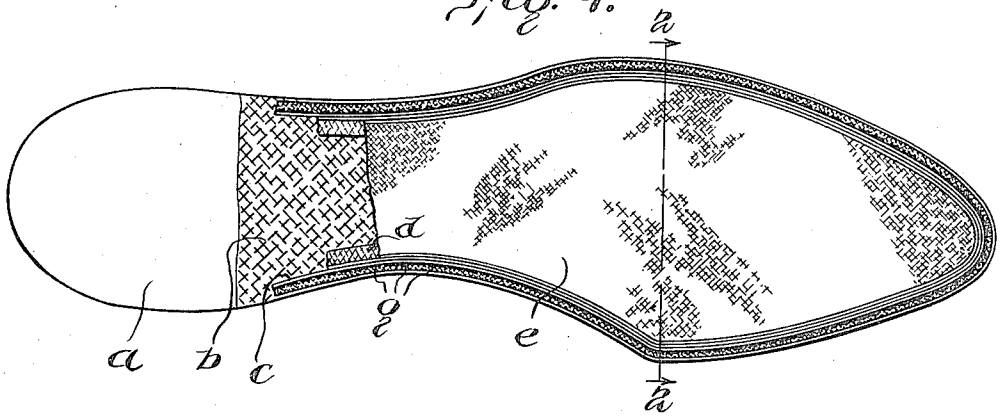


Fig. 2.

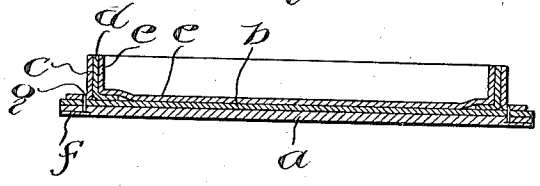
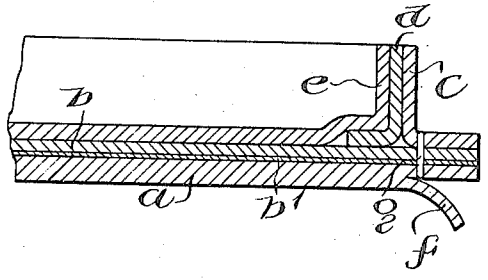


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANCIS P. MURPHY, OF NEWPORT, AND JAMES P. McKEEVER AND HERBERT E. PETERS, OF CLAREMONT, NEW HAMPSHIRE, ASSIGNORS TO W. H. McELWAIN COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

INNERSOLE.

1,227,483. Specification of Letters Patent. Patented May 22, 1917.

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To all whom it may concern:

Be it known that we, FRANCIS P. MURPHY and JAMES P. McKEEVER and HERBERT E. PETERS, the first of Newport and the others of Claremont, both towns being in the county of Sullivan and State of New Hampshire, have invented certain new and useful Improvements in Innersoles, of which the following is a specification.

The present invention relates to innersoles for welted shoes and the general objects of the invention are to produce an inner sole having the desirable quality of cheapness, both as to material and labor entering into its construction, and at the same time possessing not only the desirable qualities of an all leather inner sole, but having in addition greater strength as for holding the upper of the shoe in lasted condition. Other objects of the invention appear from the following description of an inner sole embodying the invention and from the statement of advantages appended to such description.

In the drawing forming a part of this specification,

Figure 1 is a plan view of an inner sole embodying our invention, showing the surface which is turned toward the bottom of the shoe, and which may be called for the purpose of this description, the bottom surface of the inner sole.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a sectional detail view on an enlarged scale showing the construction of the inner sole.

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

It has long been the aim of shoemakers to reduce the cost of the inner sole used in the manufacture of welted shoes by making the soles in part of other materials than leather, so as to make unnecessary so thick a piece of leather as is required for an all leather inner sole, and to enable the cheaper grades of leather to be employed which cannot be used in an all leather inner sole; and at the same time to preserve the strength of the sole in undiminished degree or even to increase its strength. For various reasons it is essential in practice that part of the inner sole, that is the side or surface which is exposed on the inside of the shoe, should be of leather. Numerous attempts have been made to secure the objects above mentioned, and many forms of composite inner sole have been invented, some of which have met with practical success, in which the desired end has been more or less closely approached.

The inner sole forming the subject of the present invention approaches the desired object more nearly than those which have been heretofore produced and combines the qualities of decreased cost of manufacture with increased strength, and other advantageous features which we will presently describe.

The complete inner sole consists, in its preferred form, of five parts, which are a body portion *a* of leather; a stiffening and strengthening layer *b*; an outer tape or strip *c*, an inner tape or strip *d*, and a reinforcing layer *e*. The members *b*, *c*, *d* and *e* are preferably all of some other material or materials than leather, being preferably of textile fabric. Without intending thereby to limit our invention to the use of any particular material or fabric, we will say that we prefer to make the layer *b* of some such heavy and stiff fabric as burlap, and to make the strips *c* and *d* and the reinforcing layer *e* of cotton duck or its equivalent.

The steps by which the complete inner sole may be most efficiently and conveniently built up are the following:

First, we unite the leather body *a* and the stiffening layer *b* together firmly by an adhesive, which may be any of the cements ordinarily used in shoemaking, or may be any other suitable adhesive material. Preferably also the layer *b* is given increased stiffness by a sizing solution. Then the leather body is channeled inwardly from its edge all around the sides and forepart, producing a flap *f*, which is turned back. Then the tape or strip *c* is applied on the outer face of the stiffening layer *b* and stitched to the body,

the stitches being shown at *g* and passing through the strip *c* and the layer *b* and the body *a*, being contained in the channel formed as above described. Either before application or while being applied, the strip *c* is bent longitudinally on a right angle and so as to form a base flange which lies against the face of the layer, and an upstanding rib, the stitches being passed through the base flange close to the rib.

Then the longitudinally folded stay strip *d* is applied against the stiffening layer *b* and the inner sole of the rib portion of the strip *c*. Then the reinforcing layer *e*, which is cut to approximately the outline of the sole with dimensions sufficient to cover the surface of the sole within the rib and to have its edges extend up on the inner side of the rib to the edge thereof, is laid upon the sole and pressed flat upon the same and its edges turned up along the entire extent of the rib. The stay strip *d* and reinforcing layer *e* are coated with adhesive before being applied so that they adhere to the parts with which they come in contact. So also the strip *c* may be adhesively coated on that side which comes next to the layer *b*, if desired to increase the strength of the bond between them, although this is not essential because the strip *c* is securely attached by stitches.

At some stage during the process of manufacture the channel flap *f* is laid down so that it covers the stitches *g*, thereby presenting an uninterrupted leather surface on the inner side of the sole, that is the side which is exposed on the interior of the completed shoe. The flap *f* may be cemented down against the body of the inner sole if desired, although this is not obligatory.

We do not limit the layer *b* or any other of the fabric members to a layer composed of a single ply only, but may make this layer and the other members of two or more plies. In inner soles which we have already produced we have made the stiffening layer of two plies one being of coarse textile fabric, such as burlap, shown at *b* in Fig. 3 and the other being of a much finer woven fabric, shown at *b'* in Fig. 3.

It must not be supposed from the foregoing description in which the strengthening layer *b* is described as part of the sole that we intend to limit the invention to an article embodying such layer in its construction. We have found in practice that in some cases the fabric layer *b* may be omitted without objectionable loss of strength. Therefore although the "five piece" insole as hereinbefore described and including the stiffening fabric layer *b* is the best form of the invention for most purposes and possesses the greatest number of desirable features, yet it is part of our invention to embody the rib construction and reinforcing layer *e* in a sole which is not equipped with the stiffening layer *b* underneath the rib and the reinforcing layer. Thus in the broader aspects of the invention, and in certain of the claims hereunto appended, we do not limit the invention to a five part construction including the layer *b*, although such layer is an element of one form of the invention and is covered in other claims.

Among the advantageous features possessed by the inner sole made as above described are the following:

First, the strength necessary to be possessed by the sole in holding the lasted upper in proper shape is furnished by the fabric members of the sole.

Second, the stitch-receiving rib is formed of three layers of strong textile fabric, namely the upstanding rib of the strip *c*, the upstanding rib of the strip *d* and the upstanding edges of the reinforcing layer *e*, all of these layers being firmly secured adhesively together, the outer layer being secured firmly by stitches to the body of the sole, the inner layer being firmly held in place by its integral union with the part of the reinforcing layer *e* which lies against the face of the body, and the intermediate layer *d* furnishing additional strength to secure the inseam and being secured in place by the overlapping portions of the reinforcing layer *e*.

Third, the part of the inner sole which is required for practical purposes to be of leather is of leather, but this part may be made of a very thin sheet of leather and also of leather having very little strength, which is therefore comparatively cheap.

Fourth, the leather and fabric elements of the inner sole are securely united together by the stitches *g*, but such stitches are not exposed on the inside of the shoe in which the inner sole is incorporated and therefore do not cause the discomfort to the wearer and the unsightly appearance which are so objectionable and which, when present, seriously diminish the salability of the shoe.

Fifth, the part of the stitch-receiving rib which is stitched to the sole body, namely the strip *c*, is so arranged that the upstanding part lies inside of the line of stitches or in other words the seam is on the outer side of the upstanding part. This arrangement enables the seam to be exactly located and forms a true and rigid extension line.

Sixth, the inner layers which form part of the stitch-receiving rib reinforce the outer layer and strip *c* and take some of the pull of the upper from the seam *g*, so that there is no danger of this seam being broken or pulled out. In other words we do not depend entirely upon a sewed seam for securing the rib to the body of the inner sole.

Seventh, the inner-layers of the reinforc-

ing rib which are folded or bent oppositely to the outer layer assist in holding the outer layer upright, and are thus held upright by the outer layer, thereby making a rib of exceptional stiffness.

Eighth, the reinforcing layer *e*, or cover, provides a smooth inner surface close to the rib, without folds or puckers, for the welt guide of the inseaming machine, so that there is no obstruction to this guide; and it guides the welt guide at such a height above the base of the outside layer *c* that there is no danger of the awl or needle of the inseaming machine cutting the stitches *g*.

Ninth, the stiff backing layer *b* reinforces the layer *a* in the channeling operation, so that although such layer may be very thin and flexible, it is firmly held during this operation so that a channel may be cut accurately between the two surfaces without penetrating either surface of the leather layer.

Tenth, the stitch-receiving rib is entirely of fabric, containing no leather, and has greater strength and tenacity than a rib formed wholly of leather or one of the same thickness formed partly of leather. Such a rib is not damaged by stitching, and in case the inseam is improperly made in any instance, can be stitched over again.

Eleventh, it has been found in practice that inner soles made as above described are easily manufactured and cheaper to produce than any other heretofore made, so far as we are aware.

While we have specified leather as being the material of which the body or layer *a* of the inner sole is made, and although leather is the material preferably used in most cases for such layer, still we do not limit our invention to that material at that place, since it is within our contemplation to produce an inner sole constructed essentially as described but having some other material than leather for the layer *a*.

What we claim and desire to secure by Letters Patent is:

1. An inner sole comprising a body layer, a stiffening layer adhesively secured thereto, the said body layer being channeled inwardly from its edge, a strip forming a component part of a stitch-receiving rib united to the sole by stitches passing through the base portion of said strip and through said stiffening and body layers into the said channel, and being covered by the flap of said channel, an upright reinforcing strip lying against the inner side of said first-named strip, and having a flange lying against the said stiffening layer, and a reinforcing layer overlying said stiffening layer and the flange of the second-named strip and having its edges turned up and bearing against the inner side of the said second-named strip.

2. An inner sole comprising a flat body portion and a stitch-receiving rib formed in part of an outer strip stitched to the body portion, an inner strip lying against the inner side of the outer strip, and a reinforcing layer overlying the surface of the sole within the rib and having its edges turned up against the inner face of the second strip.

3. An inner sole comprising a body layer of leather, a stiffening fabric layer adhesively secured to the body layer and overlying one entire side thereof, said leather layer having a channel at its edge, and a stitch-receiving rib formed of a longitudinally folded strip sewed to the body of the sole by means of stitches passing through the strip close to the fold thereof, and also through the stiffening layer and the body layer, lying in the channel of said body layer and being covered by the flap of such channel.

4. An inner sole comprising a channeled body portion and a composite rib composed in part of an upstanding strip stitched to the body portion with the stitches lying in the channel thereof, and in part of a reinforcing layer lying against the body within the space inclosed by said strip and having its edges turned up adjacent to the inner side of the strip.

5. An innersole body comprising a plurality of layers, of which the layer forming one face of said body has a channel and a covering flap, a rib having a base flange lying against the layer forming the opposite face of the body, and stitches passing through said base flange and the layers into the channel of the first layer, connecting the rib and layers together and being covered by the flap of said channel.

6. An innersole body comprising a plurality of layers, of which the layer which forms one face of said body has a channel near its edges and a flap covering the channel, stitches uniting said layers lying in said channel and being covered by said flap, and a rib placed against the opposite face of the body.

7. An inner sole comprising in combination, a body layer, a longitudinally folded strip having an upstanding rib and a base flange, laid on one face of said body layer conforming to the outline thereof and with its flange turned toward the edges of the body, a second strip having an upstanding rib and a base flange applied to the body with its rib against the inner side of the first-named rib and its base flange against the face of the body and a reinforcing layer overlying the surface of the sole inside of said strips with its edges turned up along the inner side of the second-named strip.

8. An inner sole comprising a body having a channel at its edge, a rib formed of a

fabric strip longitudinally bent on a line between its edges to form an upstanding rib and an outstanding base flange, being applied to one side of the body along a line within and approximately parallel to the edge of the body with said base flange extending toward such edge, stitches passing through said flange close to the said rib and through the body into the channel thereof and being covered by the flap of such channel, and means for reinforcing the said rib.

In testimony whereof we have affixed our signatures, in presence of two witnesses.

FRANCIS P. MURPHY.
JAMES P. McKEEVER.
HERBERT E. PETERS.

Witnesses:
C. V. HARRIHAN,
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