Feb. 9, 1937. J. V. POOLE 2,070,314

INNERSOLE

Filed Aug. 10, 1934

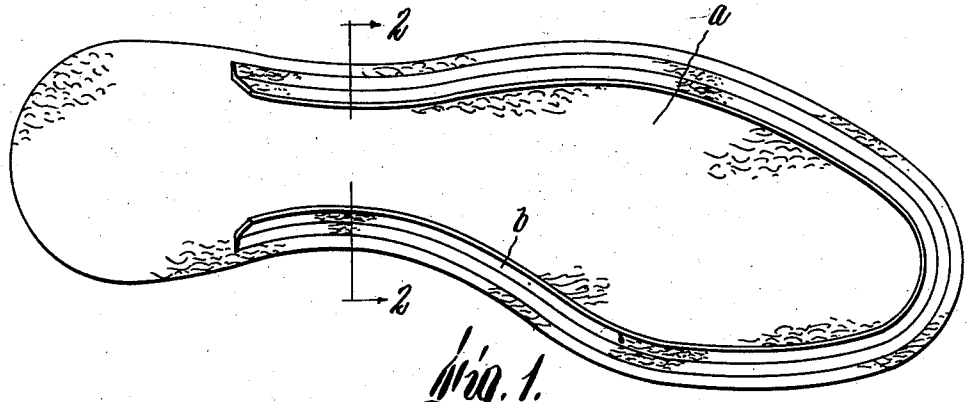


Fig. 1.

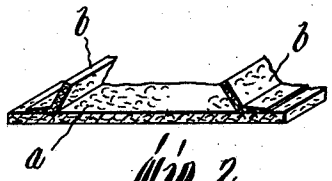


Fig. 2.

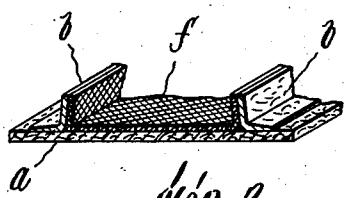


Fig. 3.

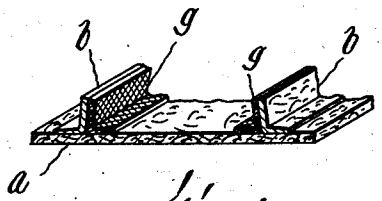


Fig. 4.

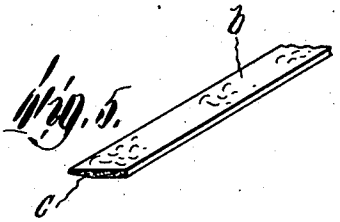


Fig. 5.

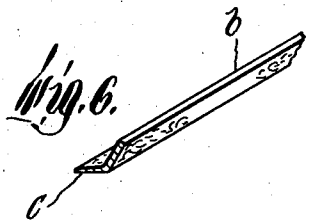


Fig. 6.

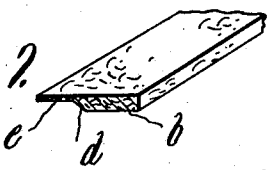


Fig. 7.

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UNITED STATES PATENT OFFICE

2,070,314

INNERSOLE

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Application August 10, 1934, Serial No. 739,246

7 Claims. (Cl. 36—22)

The present invention relates to innersoles for boots and shoes, particularly those which are used in Goodyear shoe making and are provided with a lip or rib for receiving the stitches which unite the upper, the welt and the innersole together. The main object is to provide for the use of the industry an innersole of this character which is amply strong for the purpose, flexible, and may be made from inexpensive materials at a minimum of cost. A further object is to provide strip material in a form and condition such that it can be applied to innersole blanks by the makers of innersoles, in such manner as to produce a ribbed innersole suitable for shoes of the Goodyear type.

In carrying the invention into effect I unite with the innersole body or blank, an originally separate rib, so formed as to include in its structure a base flange portion; effecting the union between such body and rib by means of an adhesive substance. I may reinforce the rib and supplement the strength of its attachment to the body by a layer of duck or equivalent fabric applied in any of the ways familiar in the well known Gem type of innersole, or by a strip of such fabric which is tucked into the inner angle between the body and rib and is adhesively united to the adjacent surfaces of both.

Referring to the drawing which illustrates the invention,—

Fig. 1 is a plan view of the innersole as seen looking toward the ribbed side thereof;

Fig. 2 is a cross section on line 2—2 of Fig. 1, and a perspective view of the parts adjacent to the line of section;

Fig. 3 is a similar view showing the same combination reinforced by a layer of so called Gem duck tucked into the inner angle of the rib;

Fig. 4 is a similar view showing a modified form of reinforcement consisting of a strip of duck or the like which is united to the inner face of the rib and to a zone of relatively narrow width on the face of the body contiguous to the rib;

Fig. 5 is a perspective view of a fragment of the strip from which the stitch receiving rib is made;

Fig. 6 is a perspective view of the strip bent up as applied to the body;

Fig. 7 is a view similar to Fig. 4 showing a modified design of skived strip.

Like reference characters designate the same parts wherever they occur in all the figures.

The body *a* of the innersole and its stitch-receiving rib are made of originally separate pieces. The preferred material for making these parts is artificial leather manufactured under the patent of George A. Richter, 1,891,027, December 13, 1932, for Artificial leather and process of manufacturing the same, marketed under the trade name of Onco. This material is a water-laid web or felt of cellulose fibers containing rubber. In its preferred commercial form the fibers are refined wood pulp containing a high proportion of alpha-cellulose; and the rubber is the coagulated residue of compounded rubber latex substantially enveloping the fibers. As prepared for innersole use, the material is formed with residual porosity sufficient to permit passage of air through it for ventilation of the shoes into which such innersoles are built. It is highly resilient, tough and strong. The body or blank of the innersole is died out from a sheet of this material of any desired thickness, for instance $\frac{1}{16}$'' or thereabout; and the rib strip is cut of desired width from a similar sheet of the same or any other desired thickness.

The rib strip is skived longitudinally at and adjacent to one edge so as to form a scarf or bevel *c* of suitable width to form a base flange when bent up at an angle to the balance of the strip. The skiving cut may be made so as to bevel the skived zone uniformly to a more or less thin edge, as shown in Figs. 5 and 6; or to make the skived part of nearly uniform thickness but substantially thinner than the rest of the strip, forming a distinct shoulder *d* and flange part *e*, as shown in Fig. 7. Before attachment to the body, the skived or flange part is bent up at a distinct angle to the body of the strip, as shown in Fig. 6. The bending action may be performed, or the strip prepared for easy subsequent bending on a definite line, by running the strip between rolls suitably shaped and located to crease or indent the strip in the surface opposite to the skived side. When the strip is skived with a uniform bevel, the bend thus made is located near the thickest part of the bevel, so that the junction between the bevel and the uncut surface forms a salient angle. When skived with a distinct shoulder, the apex of the reentrant angle is located opposite to the shoulder, so that the flange when thus bent up is approximately in the same plane with the shoulder.

Such a strip, of uniform width and skived, may be cut of any desired length from sheets of the herein described material, the length of which is practically unlimited. Such strip material is thus marketable as a manufacture suitable to be used by makers of shoes and inner soles in fabricating their products. Preferably such strips are of about $\frac{5}{16}$'' in width and $\frac{1}{16}$'' in thickness, so skived as to make the upstanding part or rib proper about $\frac{3}{16}$'' high. This leaves about $\frac{1}{8}$'' or slightly more as the width of the surface which comes in contact with the face of the sole. But equivalent strips may be made of other dimensions suitable to obtain any desired height of rib proper and any desired width of surface for application

and connection to the body of the sole. In attaching the rib to the blank, the bottom edge of the rib proper and adjacent surface of the base flange are coated with adhesive, and laid under pressure against the surface of the body in the location prescribed for the rib, with the flange directed outwardly. The zone of the body against which the rib is thus placed may be also coated with adhesive. The adhesive used is preferably a freely fluid rubber latex or equivalent dispersion of rubber; but may be rubber cement of other character. In any event, whether the adhesive substance is latex or cement of other character, it is preferably of such fluidity as to penetrate to some extent into the residual pores of the material, both of the body and the rib, additionally enveloping the fibers in those portions to which it is applied. Drying of the latex or other cement effects a firm bond between the body and the entire contacting area of the rib and its contiguous flange.

The innersole constructed as thus described is a substantially integral entity, for the rubber of the bonding fluid, coalescing with that already contained in the fibrous material, makes a substantially continuous phase of rubber throughout the body and rib. The bond between these originally separate parts may be likened to an autogenous weld; and it is indeed substantially as strong as the material itself.

While I claim the foregoing combination as a most important factor of the present invention, I do not limit my claim for protection exclusively thereto, but include also the combination of body and rib made of any other materials suitable for innersoles wherein the rib is provided with an integral base flange and is bonded to the body by intervening cement. Even though the body and rib, or either of them, be made from materials (leather, leather-board, textile fabric, etc.), which do not coalesce homogeneously with cement, the cemented union is stronger and more efficient than that afforded by a sewed seam, since it is distributed uniformly over the entire area of contact between the rib and its base flange on the one hand and the innersole body on the other. Such extended union enables the base flange to be made of slight thickness, or beveled to a thin edge without sacrifice of essential strength.

Such thinning of the base flange has the advantage in shoemaking that liability of the sewing needle tearing or cutting the rib away from the body is substantially eliminated. In stitching the inseam of a welt shoe the operator holds the shoe so that the needle passes through the rib from the inside close to the adjacent surface of the innersole, and frequently at such an inclination that the needle would also pass into an external base flange of much thickness. But the thin flange of the present construction is located safely out of the path of the needle. This feature is useful independently of the utility of the artificial leather construction.

Innersoles made according to this invention can be made of thin stock; much thinner than that required for innersoles of which the rib is made by channeling. If strength additional to that of the body itself is needed when such thin material is used, the innersole can be reinforced by a sheet of fabric, such as that shown at *f* in Fig. 3, covering the whole area of the body within the rib and turned up at its edges, being tucked into the inner rib angle and cemented to the contiguous areas of the body and rib. Or the rib and its union with the body may be reinforced by a strip of fabric, such as that shown at *g* in Fig. 4, tucked into the inner rib angle and cemented to the adjacent surface of the rib and to the zone of the body contiguous thereto, but not covering the whole included area of the body. Such reinforced innersoles are claimed as factors of the invention, but without limitation thereto of my broadest protection.

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

1. An innersole consisting of a body and a rib formed from an originally separate strip, the body and rib being of fibrous material containing rubber in its composition, and being bonded together by rubber in substantially integral union with the rubber content of the fibrous material.

2. An innersole consisting of a body and a rib of fibrous material, both containing a bonding material substantially encasing their fibers, said rib having a base flange extending at an angle to the rib proper, lying against a surface of the body and being in substantially integral welded union therewith by means of such bonding material.

3. An innersole comprising a body of felted cellulose fiber containing rubber substantially encasing the fibers throughout the mass thereof, a rib strip in contact with one face of such body, and a bond of rubber between the body and rib strip in substantially integral coalesced union with the rubber content thereof.

4. An innersole as set forth in claim 1, combined with a reinforcing sheet of fabric adhesively connected to one side of the rib and the adjacent surface of the body.

5. The manufacture consisting of a strip of fibrous material containing rubber among and around its fibers, adapted to provide the stitch-receiving rib of an innersole and having a skived zone extending lengthwise of the strip and from one edge thereof through a part only of the width of the strip, and being creased longitudinally in the surface opposite to the skived side and in a location substantially registering with the inner limit of the skived zone.

6. An innersole consisting of a body, combined with a rib made from an originally separate strip having an integral outturned base flange in surface contact with a surface of the body adjacent to the edge thereof, and in bonded connection with the body at the contacting surfaces; said flange extending outward toward the adjacent edge of the body and being of reduced thickness with respect to the rib proper whereby to diminish liability of the flange being penetrated or dislodged by a sewing needle in the course of connecting the innersole to the upper and welt of a shoe.

7. An innersole consisting of a body, combined with a rib made from an originally separate strip having an integral outturned base flange in surface contact with a surface of the body adjacent to the edge thereof, and in bonded connection with the body at the contacting surfaces; said flange extending outward toward the adjacent edge of the body and being of gradually diminishing thickness from the base of the rib proper to its outer edge.

JESSE V. POOLE.