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G. H. JENNINGS

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WELTING AND METHOD OF PRODUCING IT

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*Fig. 1.*

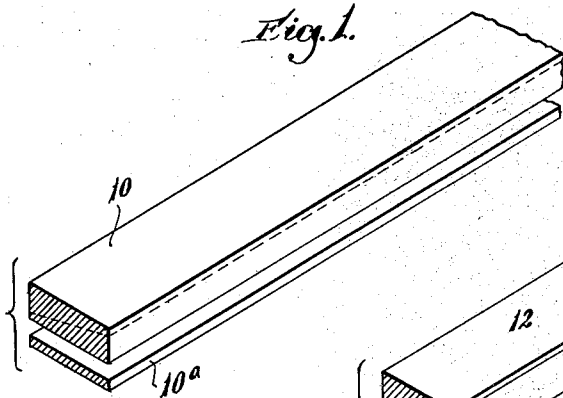


*Fig. 2.*

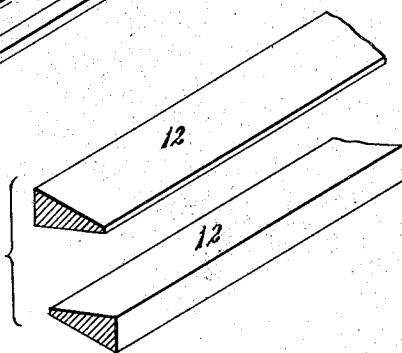


*Fig. 3.*

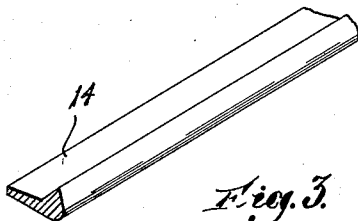


*Fig. 5.*

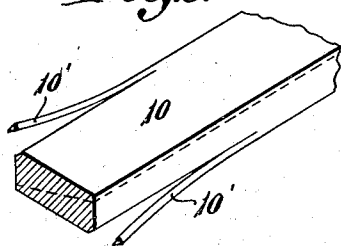
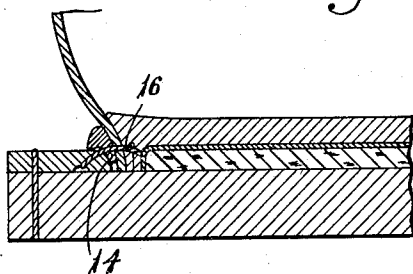


*Fig. 4.*



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## UNITED STATES PATENT OFFICE

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## WELTING AND METHOD OF PRODUCING IT

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5 Claims. (Cl. 12-146)

This invention relates to improvements in welting and methods of producing it.

More especially it relates to calk welting, which has particular utility for calking the angular crevice between the upper and the welt or sole of a shoe.

It is the function of calk welting, as used in shoe construction, to fill the crevice at the above stated location and thereby to exclude mud, snow, water and dust, also to improve the looks of the shoe. It is desirable that this welting should present a finished and attractive beaded surface which can take a good finish, and be polished by the ordinary agencies for that purpose. For this reason it is customary in the better grades to use only grain leather for that surface of the calk which is exposed to view. But as the calk is in some respects a non-essential part of the shoe, it is important, under competitive conditions of shoe manufacture and sale, to keep its cost low.

The invention is also adapted for other welting uses, such as for beading and thereby finishing a joint between adjacent surfaces in upholstery, and in other articles of manufacture.

As applied to Goodyear welt shoes, the calk welting has a fin portion reaching inward in the crease between the Goodyear welt and the upper so as to be pierced and held by the same stitches which secure together the Goodyear welt and the upper. It overlies the inner top part of the Goodyear welt, curves around the inner top corner thereof, and usually runs down across the inner edge thickness of the main welt to a place where the main welt, the bottom edge of the upper, and a portion of the inner sole all rest on the top of the outersole.

The considerable pains heretofore taken to provide that only the exposed bead portion would be surfaced with grain leather have been due first to a desire to conserve the relatively expensive grain leather; and second to the general belief that in order for a calk welting to serve its purposes in a shoe satisfactorily, the exposed bead portion should be wholly of the grain leather.

It is among the objects of the present invention to make the advantages of calk welting available for shoes of all grades, by producing such welting at a cost materially less than has been possible heretofore.

Another object is to provide for the making of calk welting without waste of any of the leather which makes up the preliminary strip.

A feature is to provide two intermediate strips by a mere oblique splitting of a stock strip, and

to mold each intermediate strip into calk welting form. And, preliminarily the grain face of this stock strip may have been removed for sale or utilization in any available way.

It is, therefore, an important feature that the improved welting may be made without regard to the grain surface of the preliminary strip, or even be made from leather having no grain surface, the portion to be exposed in a shoe being treated to give it a finished surface capable of being polished.

The two intermediate strips preferably will be produced by a single oblique splitting of a stock strip having rectangular cross-section, so that each intermediate strip will be trapezoidal in cross section. Each such strip may have a width dimension approximately that of the desired width of welting, a thickness at its larger edge a little less than the thickness of the stock strip, and thickness enough to be appreciable at its thinner edge, being that which constitutes the remainder of the thickness of the stock strip. The thickness of the thicker edge may approximate the desired thickness of bead and of the finished welting. The finished product is obtained from these strips by an absorption and tempering process, followed by a simple molding and condensing of the strip and its absorbed matter into the chosen calk welting form, followed or accompanied by drying.

The simplicity of the steps of cutting the leather stock, splitting off the grain face if desired, splitting the stock strip residue obliquely, and then molding the split portions, permits a substantial saving in the net costs as compared with prior practices. And, by suitably dressing or otherwise treating the leather during or subsequent to the molding thereof, the part to be exposed in a shoe is given an attractive and finished appearance. The completed welting has the necessary attributes of the more expensive varieties, and yet can be marketed at a price which will be acceptable for shoes in the medium and low price range.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawing:

Figure 1 is a perspective of a stock strip showing an appreciable thickness of grain leather cut away from the main body;

Figure 2 is a perspective of two intermediate strips obtained by an oblique splitting of the stock strip body of Figure 1;

Figure 3 is a perspective of a calk welting strip produced by molding either of the intermediate strips of Figure 2;

Figure 4 is an elevation, in cross-section, of a fragment of a shoe, with the improved calk welting embodied therein; and

Figure 5 is a perspective of a stock strip, whose angular corners, which are opposite the dotted line of splitting of the strip, are shown cut from the strip to facilitate molding of the rounded bead edge.

Referring to the drawing, a stock strip 10, having rectangular cross-section is preliminarily cut from a sheet or hide of leather. This strip, preferably will approximate in width the desired width of the finished welting, and if carrying its original grain surface may be a little thicker than the desired thickness of the thicker edge of the finished welting.

According to the invention the having of grain surfaced leather in the welting is quite unimportant. In fact the grain surface of the leather, if desired, may be preliminarily removed from the original sheet or hide of leather to obtain a sheet of sufficient thickness for sale or for use where a grain surface is essential. Or the grain surface may be split off in strips of any desired width; or may be removed from the stock strips 10 after these latter are cut. However, it is not necessary to remove the grain surface in practicing the present process.

Each preliminary strip 10 is split obliquely to produce two intermediate strips 12 of like size and configuration. The splitting ordinarily will be as indicated by the dotted line in Figure 1, so that the thinner edge of each strip 12 will have appreciable and definite thickness which constitutes one of the parallel sides of the trapezoidal strip cross-section. Of course the dimensions of the stock strip 10 will be such as to produce intermediate strips which, upon being molded, can provide the finished welting strips of the desired dimensions.

The trapezoidal intermediate strips 12, each having a shape approaching the shape of a completed calk welting, may be given the actual calk welting shape by a process of molding the leather, under heat and pressure, with a resinous adhesive substance. The strips first undergo a softening and tempering treatment, and then by the molding the leather is compacted and condensed; and each strip 12 is re-shaped, as may be chosen. For example, the line of the oblique cutting may, by the molding, be shaped into a concave bend or curve, making a fin and leading up to a crest of a sort of bead. This crest is thus offset from the plane of the fin; and the original edge face of the stock strip forms that face of the bead which will be exposed to view. The shaping may be varied so as to fit and to fill the welt crease of the shoe as may be desired or as the leather body will permit.

The treatment for softening and tempering the stock may be that well known in the art, comprising the soaking of the strips in a water solution of shellac made by adding an alkali, such as borax, or ammonia. The leather absorbs this solution, carrying the shellac into the body of the leather mass sufficiently in a half hour or so of soaking. Then a period of drying takes out some of the water. The strips may be thus partially dried preparatory to molding; or may be subjected to drying heat and pressure in the molding steps directly upon coming from the softening solution. The molded strip, thus made

into the completed welting, may be held in wire baskets for further drying and cooling for a few minutes and are then ready for marketing or for use.

As illustrated in the drawing the improved calk welting is narrower than has been usual for calk welting heretofore; although this is merely a matter of choice. It is shown with its fin 14 reaching in between the upper and the Goodyear welt and terminating a little beyond the stitches 16 which secure the upper, the calk welting and the regular Goodyear welting together. It need not extend all the way down with the regular welt, over the inner edge of the outer sole. As a practical matter the width of the welting, including bead and fin, need be no more than a quarter inch. This permits it to reach inward an adequate distance beyond the stitches which join it to the upper and the Goodyear welt. The part of the fin through which these stitches pass has all necessary strength and tenacity, because the calk welting has substantial thickness at that place and will have been additionally strengthened by the condensation pressure and adhesion of the molding process.

Unless modified by the molding, the edge portion of this improved calk welting which is exposed to view when installed in the finished shoe, departs somewhat from the usual construction of calk welting in that this surface approximates a plane set obliquely across the angular crevice constituting the welt crease. One angular edge of this oblique surface fits closely against the Goodyear welt whence the exposed surface extends toward the adjacent surface of the upper.

The surface of the calk welting which is to be exposed in a shoe may be further treated to improve its appearance by any suitable leather dressing process. However, the shellac pervading the body of the leather,—whose fibrous absorbent edge, being free from grain leather, was fully exposed to its absorption and then to its expression under the pressure of the molding,—comes out to the surface during the pressure of the molding and, upon solidification, stiffens the body of between-substance into a smooth firm surface, as of varnish, in which the pores in the leather are filled out to the surface thereof with the resinous shellac, and in which the fibres and shellac cooperate to make a strong smooth surface in which fibres and shellac each strengthen the other. If desired, a dye may be introduced before or simultaneously with the shellac. The welting surface thus made can be finished with usual polish. Although the shellac can be softened by heat, the temperature for that is higher than the shoes are likely to encounter while being worn. And if, in any case, it is desired to make the product more secure for holding its surface under attack by water, while being worn in a shoe, it is possible to use in place of the water solution above indicated, one of the well-known organic solvents for softening the leather and carrying the shellac or other resin into its body; and also some other resin less susceptible to water may be used in place of shellac. Casein may be used in place of the shellac. Also dry casein cut with ammonia and in varnish state may be a suitable substitute for the shellac and, while not truly waterproof, the varnish will contribute water-proofing qualities. It is feasible also to lacquer the molded welting strip, and thereby provide absolute water-proofness as well as an attractive calking surface. For ordinary purposes however, I have found the water solution of shel-

lac satisfactory for giving a good finish at low cost and of sufficiently durable quality. And it is to be observed that in so far as there is any relaxation of the compressed and molded shape of the leather under the attack of water, while a shoe is being worn, this causes a swelling of the compressed neck of the welting, and thus makes a tighter calking of the welt crease.

Although the intermediate strips 12 may be molded into calk welting form, it may be desirable in some cases to preliminarily reduce the abrupt right angular edge at the larger end of each intermediate strip. This may be done conveniently and effectively before the stock strip 10 is split, as represented in Figure 5, by cutting these angular edges away as at 10'. The stock then can more readily attain the rounded form shown in Figure 3, consequent upon the molding.

The invention, in result, simplifies the calk welting art. It provides a simple and economical method of producing the welting strips, and embodies in the completed calk welting important structural improvements whereby low cost material makes a product which can serve the functions required of calk welting in a shoe.

I claim as my invention:

1. The method of producing a leather welting strip having a calking edge and a fin, comprising the cutting of a stock strip; splitting the stock strip obliquely into two intermediate strips, each having one edge a little less in thickness than the stock strip, and each having appreciable thickness at its thinner edge; and applying molding pressure to the mid-portion of the tapering body of each said intermediate strip reducing it to a thickness approximating that of the thinner edge thereof.

2. The method of producing a leather welting strip having a calking edge and a fin, comprising the cutting of a stock strip; splitting the stock strip obliquely into two similar wedge-shaped intermediate strips each having appreciable thick-

ness at the smaller edge; soaking the intermediate strips in a tempering resinous solution; and molding a substantial mid-portion of the tapering body of each tempered intermediate strip into a welding fin which has thickness approximating uniformity throughout the body of the fin; followed by a solidifying of the molded welting strip by a hardening of its resinous material.

3. The method of producing a leather welting strip having a calking edge and a fin, comprising the cutting of a stock strip; splitting the stock strip obliquely into two similar wedge-shaped intermediate strips; tempering the intermediate strips in a resinous filler; and compressing a mid-portion of the fin thereby to make said mid-portion more dense than either edge portion.

4. The method of producing a leather welting strip, comprising the skinning of the grain surface portion from leather; cutting the leather from which the grain was removed into equal strips of trapezoidal cross-section, the longer of the parallel sides of the one trapezoid plus the shorter of the parallel sides of the other trapezoid being constituted by the thickness of the leather which remained after the grain was removed, from which said thickness the strips were cut; and molding each said trapezoidal strip into a chosen form of calk welting displacing material between the non-parallel sides of the trapezoid to make those two sides more nearly parallel with each other.

5. An intermediate product in the manufacture of calk welting comprising a leather strip of trapezoidal cross-section, one of the parallel sides of the trapezoid having length approximating the thickness of a welting bead, the other parallel side having length approximating the thickness of a welting fin, and the material between these two sides being in a condition adapted to be reshaped by compression.

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