

W. B. ARNOLD.
 PROCESS OF FORMING WELTING FOR BOOTS AND SHOES.
 APPLICATION FILED JAN. 25, 1913.

1,059,699.

Patented Apr. 22, 1913

Fig. 1.

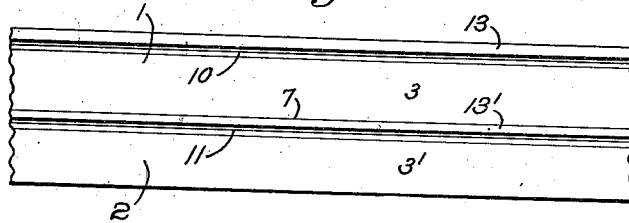


Fig. 2.

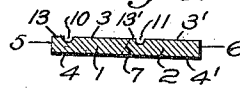


Fig. 3.

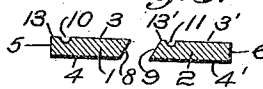


Fig. 4.

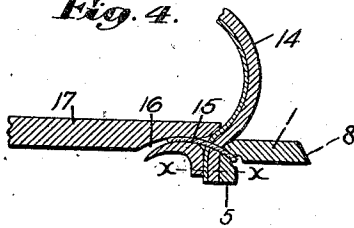
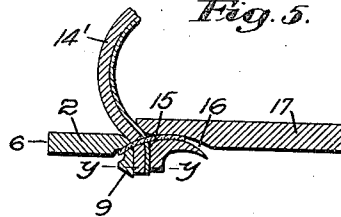


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM B. ARNOLD, OF NORTH ABINGTON, MASSACHUSETTS.

PROCESS OF FORMING WELTING FOR BOOTS AND SHOES.

1,059,699.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed January 25, 1913. Serial No. 744,079.

To all whom it may concern:

Be it known that I, WILLIAM B. ARNOLD, a citizen of the United States, and a resident of North Abington, in the county of Plymouth and State of Massachusetts, have invented an Improvement in Processes of Forming Welting for Boots and Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawing representing like parts.

This invention relates to the process of forming welting for boots and shoes.

In order that the principle of the invention may be readily understood, I shall set forth the steps constituting the process and the best mode known to me for carrying the process into effect.

In the accompanying drawing, I have shown welts formed by my process and have therein indicated the steps involved in applying the same to boots and shoes.

Referring more particularly to the drawing:—Figure 1 is a plan view of a portion of a duplex welting strip made in accordance with my invention; Fig. 2 is a transverse section taken through said strip, the line of severance being indicated; Fig. 3 is a view similar to Fig. 2, but representing the two welting strips segregated; and Figs. 4 and 5 are partial transverse sections taken through a shoe, and representing the manner of applying thereto the two welting strips produced in accordance with my invention.

The high cost of leather renders necessary the saving of all possible material. It is therefore extremely desirable that the welts for boots and shoes be cut with the least possible waste. Welts are usually cut as strips of indeterminate length from a blank by cuts which are normal to the faces of the blank, so that the welt is rectangular in cross section when cut from the blank. In order that the welt may be properly applied to the boot or shoe, it is desirable that at least one edge thereof be of reduced thickness or taper. Heretofore when a welt has been provided with a tapered edge, such taper has usually been imparted thereto after the welt has been cut from the blank, though in some cases a strip wide enough for two welts has been cut from a blank, as shown, for example, in Figs. 3 and 6 of the patent to Hadaway, No. 744,752, the said strip being cut into two welts by a cut in-

clined to the faces of the strip, as there indicated. Welts vary in width, but are customarily from one half to three quarters of an inch in width. Assuming the normal welt to be about one half inch in width, I am enabled, in the practice of my invention, to save a portion of the leather depending upon and substantially equaling the inclination of the beveled edge of the welt. Assuming that the extreme width of a welt is to be one half inch, and assuming that each welt should have a tapered edge to permit it to be secured in more effective manner to the shoe, then instead of cutting the leather blank into strips each rectangular in cross section and one half inch in width along each face, I cut the blank, in order to form a duplex welt, into two strips, by three continuous, longitudinal cuts, two of which are normal to the surfaces of the blank and are spaced apart a distance equaling the width of two welting strips,—that is, the width of the duplex strip,—thereby—in the embodiment of the invention herein shown, but to which I am not limited,—to form the outer edge of one of the members of such duplex strip and the inner edge of the other member thereof, and by an intermediate, longitudinal cut extending entirely through the welt at an inclination to the surfaces thereof to form the other edge of each of said strips.

Referring now to that specific embodiment of the invention herein shown, either previous to, simultaneously with or subsequent to the cutting of the duplex welting strips, I groove the flesh face of the material along lines adjacent to the inner edge of each of said strips. As set forth more fully hereinafter, the square edge of one welt constitutes its inner edge and the tapered edge of the other welt constitutes the inner edge of that welt. The groove to each of said strips is adjacent to the inner edge thereof. These grooves are comparatively shallow, and therefore each groove is spaced from the inner edge by a continuous or unbroken ridge, the adjoining surface of which is formed by the actual flesh surface of the welting strip, and the other or opposite surface of which is formed by the grain surface of the welting strip. Such ridge or shoulder is therefore of the full, unimpaired thickness of the welting strip, and hence provides a most efficient stitch anchoring shoulder. In both cases, the width of the grain face portion of the ridge or shoulder

is that of the full or maximum width of such ridge or shoulder. Inasmuch as the grain face is of stronger texture and resists the tearing stress upon the applied stitching, it follows that such ridge or shoulder is of maximum strength and efficiency. Moreover, I save a step in the manufacture of one of the welting strips, because heretofore it has been customary when beveling an edge of the welting strip to cut the welt into a rectangular form in cross section and thereafter to bevel the inner edge thereof. I am enabled to dispense with said beveling as a separate operation, and after the welting strip has been applied to the boot or shoe, I then remove from the inner edge of the welting strip having a tapered inner edge, by one operation, the material required to be severed therefrom subsequent to the separation of such welting strip from the stock.

Referring more particularly to the drawing, I have in Figs. 1, 2 and 3 represented at 1, 2 a duplex welt, the flesh face whereof is indicated at 3, 3' and the grain face whereof is indicated at 4, 4'. This duplex welting strip has been severed from the stock by two continuous, longitudinal cuts normal to the surfaces of the blank and spaced apart a distance equaling the width of the two welting strips, thereby to form the outer edge of the welting strip 1 and the inner edge of the welting strip 2, said two cuts being indicated at 5 and 6. The duplex strip is severed into two welting strips by an intermediate, longitudinal cut 7 extending entirely through the blank at an unvarying angle,—that is, by a single cutting operation effected by a single severing blade inclined to the surface of the strip. In this manner, the outer edge 8 of the welting strip 1 and the inner edge 9 of the welting strip 2 are inclined. It will be noted that in the case of the welting strip 1, the flesh face 3 thereof extends beyond the grain face 4, while the converse is true of the welting strip 2. Each of the welting strips possesses advantages flowing from such characteristics, as will be set forth more fully with respect to Figs. 4 and 5. Each welting strip is grooved as indicated at 10, 11 to provide a stitch anchoring shoulder, and it will be observed that in each case I have represented the groove as at the same distance from the adjacent edge of that face of the welt in which it is formed, this being the preferred construction. Furthermore and in accordance with the essential feature of the invention, it will be observed that in each case the portion of the welting strip that is between its groove 10 or 11 and the adjacent edge, namely, the edges 5 and 9 respectively, is of the full thickness of the welt measuring from face to face, or, in other words, each

groove is spaced from the inner edge of the welt wherein it is formed, by an unbroken, longitudinal ridge 13, 13' formed by the very or actual flesh face of the said welting strips. In other words, each welting strip from edge to edge of the narrower face is of the full, unreduced thickness of the welting strip, and therefore between the inner edge of each welting strip and the stitch anchoring groove 10 or 11 thereof, there is preserved a longitudinal portion which is of the full, unimpaired thickness of the welting strip. This is of the utmost importance, as it prevents the tearing out of the inner edge of the welting strip by the stitches, which heretofore has so frequently occurred, owing to the stress to which they are subjected. In other words, inasmuch as the stitch by which the welt is secured to the shoe passes through the base of the said grooves 10, 11, the stitching has been exceedingly apt to and has in practice torn through the inner edge of the welting, because the ridge between such grooves and the inner edges of the welts has been of less than the full thickness of the welt. If, for example, a duplex welting strip be severed into two welting strips, each of the desired width for use, by an irregular groove or similar cut, such for example as that shown in the said patent to Hadaway, and at the same time to furnish a stitch anchoring groove, into which the inclined edge merges or from which it is not separated by a ridge of the full, unimpaired thickness of the welt, then the stitching is exceedingly apt to and will in practice tear through the inner edge of the welt.

The welting strip 1 is secured to the upper 14 by a line of through and through stitching 15 extending into the channel 16 of the insole 17 and passing through the base of the groove 10 of the welt. It will be observed that the grain face of the welt 1 extends to the extreme inner edge of the welt, so that the grain face of the upper and the grain face of the welt contact to the extreme inner edge of the welt and co-act to exclude moisture. This is a feature of much importance, because were the flesh face of the welt to contact with the upper, then the resistance to the penetration of moisture would be very substantially diminished. After the welt 1 has been secured as described, the inner edge of the welt is severed along substantially the line $x-x$, thus removing superfluous material. It will, however, be observed that this removal of superfluous material still leaves the ridge separating the groove 10 from the inner edge of the welt of the actual or full thickness of the welt, and thus prevents the tearing out of the through and through stitching 15.

It will be observed, viewing Fig. 4, that the outer edge of the welt 1 is beveled, and that such outer edge is at an obtuse angle to the upper or grain face. In other words, the upper or grain face of the welt terminates short of the lower or flesh face thereof. In so beveling the welt, I secure certain important advantages. In the first place, I effect an important saving in the material at the outer edge of the welt, since the material removed in the final trimming operations from the outer edge of the welt is not or need not be more than the amount of the bevel itself, and at certain parts at least of the shoe, as, for example, at the outer ball portion thereof, a portion or all of the outer bevel may be left in the final trimming operation. Frequently such bevel is left, in part, about substantially the entire sole. After any welt has been sewed to the shoe, the rough rounder cuts off the edge of the sole and of the welt. The amount of welt taken off at the different points about the shoe varies, the last width being usually taken off at the outside ball portion of the foot. At substantially any point, however, excepting the outside ball portion, the width of welt cut off by the rough rounder is one sixteenth of an inch or more. This amount is invariably cut off. The welt is never left uncut, but is always trimmed by the rough rounder, not only to give the approximate desired shape, but in order to secure clean stock about the entire shoe; that is to say, it is the invariable practice to trim the welt at all points, not only to give the required shape, but also to produce a fresh cut edge. In addition to the width of welt cut off by the rough rounder, the trimming machine cuts off an additional amount, usually varying from one sixty-fourth to one thirty-second of an inch. Therefore, no welt in the finished shoe is of that full width possessed by the welt when first sewed in place and before it is trimmed by the rough rounder.

The trimming machine usually employed for the purpose of trimming the welt and sole is provided with a rotating cutter composed of a hub having a series of inclined blades extending in a general radial direction therefrom. Each of said blades is provided at its outer end with a cutting edge, the central or main portion of which is vertical and the upper and sometimes the lower portion of which are inclined so as to provide projecting cutting shoulders triangular in vertical section at the upper and lower faces of each blade. Said cutting shoulders at the upper edge are customarily provided for the purpose of beveling off the outer edge of the welt to give a finished appearance thereto.

The welt shown at the left in Figs. 2 and 3 and as applied in Fig. 4, provided as it

is with a beveled outer edge, is trimmed with the sole by the rough rounder into approximate shape, the amount of material varying to suit the style or type of shoe. Depending upon the style or type of shoe, more or less of the beveled outer edge is left untouched or intact by the rough rounder, and this is particularly the case at the outer ball portion of the shoe, which is customarily left of the full width of the welt. Therefore, when the shoe is removed from the rough rounder, a considerable portion of the welt, depending in extent upon the character of the shoe, has its outer edge beveled in the direction shown in Fig. 4. This bevel constitutes a support and guide for the upper, shouldered portion of the trimming machine cutter previously described, and not only facilitates the proper application of the welt and sole to the said cutter, but it constitutes a separating point for the cutting operation, assuming such bevel to have been left only at the outer ball portion of the shoe. An equally important advantage of that form of welt shown applied in Fig. 4 is that because of the beveled, outer edge, it is less rigid than one having an outer edge at right angles to its face. By reason of the described beveling of the outer edge of the welt, the latter is rendered more pliable; that is, it can be more readily flexed in its own plane, and therefore can be applied far more readily to the boot or shoe, and particularly can it be more readily bent about the toe thereof. Obviously, when the welt has been applied to the shoe, as represented in Fig. 4, its outer, beveled edge has completely subserved its function of rendering the welt more pliable, and its subsequent removal is immaterial, though, as above indicated, I may and preferably do retain a portion thereof in the complete shoe and particularly to the outer ball portion thereof.

Referring to the welt 2, shown at the right in Figs. 2 and 3 and shown as applied to the shoe in Fig. 5, it will be observed that none of the material has been removed from the inner edge of the said welt at any time prior to the securing of the said welt to the upper 14'. Heretofore, so far as I am aware, it has been customary to remove by an inclined cut the inner edge or shoulder of the welt prior to the securing of the welt to the shoe, and this has necessitated a distinct operation. I avoid the necessity of such operation because of the fact that the duplex welt strip is severed by an inclined cut. After the welt 2 has been secured to the shoe, then by a single cut along substantially the line $y-y$, I remove all superfluous material from the inner edge of the welt and insole. Even after the removal of the superfluous inner edge of the welt 2, it will be observed that the groove 11 thereof is separated from the extreme inner edge of

the welt by a ridge or shoulder, which is of the full thickness of the welting strip, thus overcoming all liability of the through and through stitching to tear through the inner edge of the welt. Furthermore, it will be observed that the grain face of the welting strip 2 extends to the extreme inner edge of the welt, and that therefore there is no contact between any part of the flesh face or structure of the welt with the upper of the shoe. For this reason, the liability of moisture penetration is reduced to the minimum.

Because of the beveled inner edge of the welt 2 it can be more readily flexed in its own plane, and therefore can be more readily applied to the boot or shoe, and particularly to the toe portion thereof. I have heretofore pointed out, with reference to Fig. 4, that the beveling of the outer edge of the welt facilitates the application of the welt to the boot or shoe and its bending about the toe thereof. This is true because of the increased elasticity of the outer edge, thus permitting it to stretch more readily. When the inner edge of the welt is beveled as indicated in Fig. 5, then there is secured a greater degree of compressibility which permits the more ready application of the welt. In other words, the welts shown in Figs. 4 and 5 possess individual characteristics; certain of which are possessed by both of them, and all of which peculiarly adapt the welt to its intended purpose. After the welts have been secured as described and the extreme inner edges thereof have been removed as stated, the outer edges may be treated in any suitable manner.

It will be understood that within the scope of my invention, one of the welts may be grooved as herein disclosed adjacent its inclined edge, and that the other welt may be grooved adjacent its opposite or square edge, in which case said square edge would constitute the inner edge of such welt. In both cases however, each groove is separated from the adjacent edge by an unbroken ridge formed by the flesh surface, so that there is provided for each welt a stitch anchoring shoulder of the full, unimpaired thickness thereof. The longitudinal groove of at least one of said strips is formed near the inclined edge thereof.

Having thus described one illustrative embodiment of my invention, I desire it to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

1. That process of forming welt in indeterminate lengths which consists in cutting a leather blank into two welting strips by

two continuous, longitudinal cuts normal to the surfaces of the blank and spaced apart a distance equaling the width of two welting strips, thereby to form one edge of each of two welting strips, each of which strips is of the desired width, and by an intermediate, longitudinal cut extending entirely through the blank at an inclination to the surfaces thereof, thereby to form the other edge of each of said strips and thereby securing two strips, each of the full, unreduced and uniform thickness throughout substantially the extent of the narrower face, and each having one inclined edge; and in longitudinally grooving the flesh face of each strip adjacent one of its edges but spaced therefrom by a substantially unbroken ridge formed by the flesh surface thereof, and of such width as to provide a stitch anchoring shoulder for each welt of substantially the full, unimpaired thickness of each of said welting strips, the longitudinal groove of at least one of said strips being formed near the said inclined edge thereof.

2. That process of forming welting in indeterminate lengths which consists in cutting a leather blank into two welting strips by two continuous longitudinal cuts normal to the surfaces of the blank and spaced apart a distance equaling the width of two welting strips, thereby to form the inner edge of one of said welting strips and the outer edge of the other strip, and by an intermediate, longitudinal cut extending entirely through the blank at an inclination to the surfaces thereof, thereby to form the opposite or remaining edges of said strips and thereby forming two strips each of equal, unreduced and full thickness throughout substantially the extent of the narrower face; in longitudinally grooving adjacent its inclined edge the flesh face of that strip having an inclined, inner edge, and in longitudinally grooving the flesh face of the other strip adjacent its edge that is normal to its faces, each of said grooves being spaced from the adjacent inner edge of its welt by a ridge which is of substantially the unreduced or full thickness of the welt and having as its entire face adjoining the groove a portion of the actual flesh face of the welt, thereby to provide a stitch anchoring shoulder of substantially the full, unreduced, unimpaired thickness of the welt.

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

WILLIAM B. ARNOLD.

Witnesses:

EVERETT S. EMERY,
MAY H. LOWRY.