

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

1,059,700.

Patented Apr. 22, 1913.

Fig. 1.

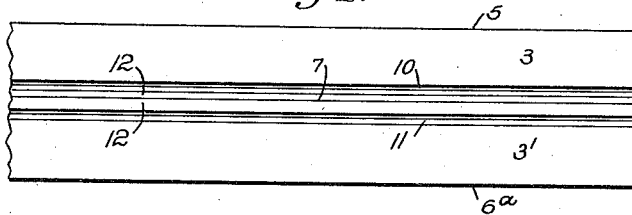


Fig. 2.

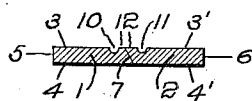


Fig. 3.

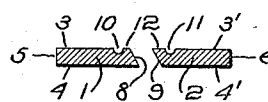


Fig. 4.

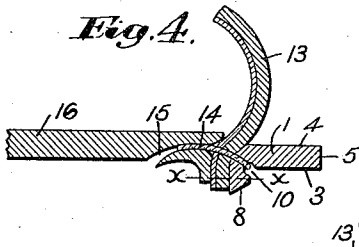


Fig. 5.

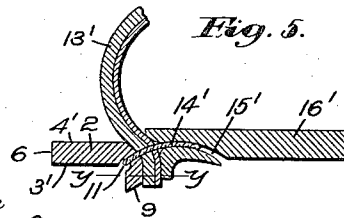


Fig. 1a

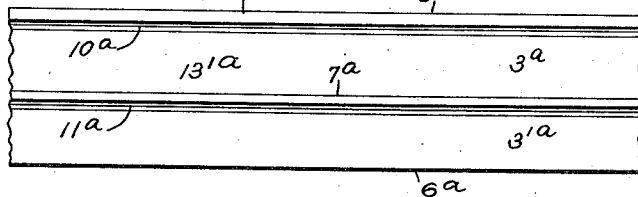


Fig. 2a

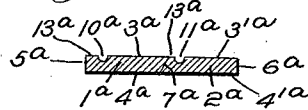


Fig. 3a

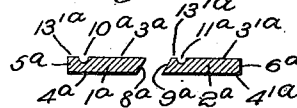


Fig. 4a

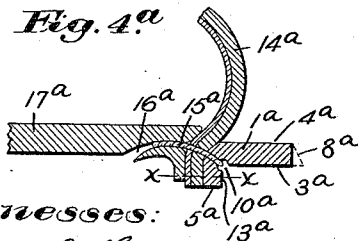
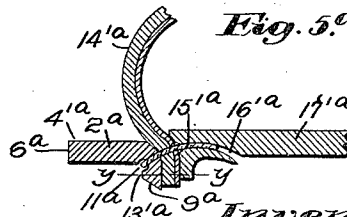


Fig. 5a



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UNITED STATES PATENT OFFICE.

WILLIAM B. ARNOLD, OF NORTH ABINGTON, MASSACHUSETTS.

WELTING FOR BOOTS AND SHOES.

1,059,700.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed January 25, 1913. Serial No. 744,080.

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 Welting for Boots and Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to welting for boots and shoes.

In order that the principle of the invention may be readily understood, I shall set forth certain forms of welting embodying my invention and all possessing the described characteristics thereof.

Referring more particularly to the drawings:—Figure 1 is a plan view of a portion of a duplex welting strip constructed in accordance with my invention; Fig. 1^a is a similar view of another form of duplex welting strip constructed in accordance with my invention; Figs. 2 and 2^a are respectively transverse sections taken through said duplex welting strips; Figs. 3 and 3^a are views similar to Figs. 2 and 2^a but representing the two welting strips segregated; and Figs. 4 and 5 and 4^a and 5^a are partial transverse sections taken through a shoe and representing the manner of applying thereto the several types of 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 of 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. Where this taper has been imparted to the inner edge of the welt, it has usually been given thereto after the welting 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 sinuous or irregular

cut extending from face to face 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 is to be 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,—instead of cutting the leather blank into strips, 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 to form the outer edge of one of the members of said duplex strip and the inner edge of the other member of the duplex strip, and the other of which cuts is an intermediate, longitudinal cut extending entirely through the blank at an inclination to the surface thereof, thereby to form the opposite or remaining edges of said two strips. 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. These grooves are comparatively shallow, and inasmuch as in every case the welting strip is of full, un-reduced and unimpaired thickness throughout from edge to edge of the narrower face, it follows that each groove is spaced from the adjacent edge of the strip wherein it is formed by a continuous or unbroken ridge, of which the surface adjoining said groove is the actual flesh surface of the welting strip and of which the opposite surface is the grain surface of such strip. Such ridge, having the two surfaces as described, is of the full unimpaired thickness of the welting strip, and hence there is provided a most efficient stitch anchoring shoulder. In certain cases, as hereinafter pointed out, the groove is formed adjacent to the inclined edge, and in the remaining case the groove is formed adjacent to the non-inclined or square edge. Furthermore, I save

a step in the manufacture of those welting strips having a beveled, inner edge, because heretofore it has been customary to cut the welt into a rectangular form in cross section, and thereafter, as a separate step, to bevel the inner edge. 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, by one operation, all the material required to be severed at any time from the inner edge of such welting strip subsequent to the removal of such welting strip from the stock.

I shall first refer to and describe the welting strips shown in Figs. 1 to 5 inclusive, and then describe those shown in the remaining figures.

In Figs. 1, 2 and 3, I have 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 edges of said two welting strips or duplex welting strip, said two cuts being indicated at 5, 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 inner edge 8, 9 of each strip is inclined. It will be noted that in the case of the welting strip 1, the grain face 4 extends beyond the flesh face, while the converse is true of the welting strip 2. Each of the welting strips possesses advantages flowing from such characteristic, 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 the groove is at the same distance from the extreme inner edge of the welting strip, measuring along a surface of said strips. Moreover each groove is shown as within a line normal to the welting faces and extending from the intersection of the narrower face and the inclined edge. This is in accordance with the preferred embodiment of my invention. Moreover, it will be observed that in each case the portion of the welting strip that is between its groove 10 or 11 and its inclined inner edge 8 or 9 is of the full thickness of the welt, measured from face to face along a line normal to said faces. In other words, it will be observed that each groove is spaced from the inner edge of the welt by an unbroken, longitudinal ridge 12, 12 formed at its face

adjoining said groove by the very or actual flesh face of the welting strip, inasmuch as each welting strip is of unreduced or full thickness throughout from edge to edge of each face. Thus between the inclined edge and the stitch anchoring shoulder of each welting strip, there is preserved a longitudinal portion thereof which is of the full, unimpaired thickness of the welting strip. This is of extreme importance, inasmuch as the stitching by which the welt is secured to the shoe passes through the base of the grooves, and were the ridge or shoulder between such groove and the inner edge of the welt of less than the full thickness of the welt, then said stitching would be exceedingly apt to and does in practice tear through the inner edge 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, sinuous or similar cut, as shown in the said patent to Hadaway, thereby to furnish an inner inclined edge of each welt and at the same time to furnish a stitch receiving 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 very apt to and will in practice tear through the inner edge of the welt.

Referring now particularly to Fig. 4, it will be observed that the welting strip 1 is secured to the upper 13 by a line of through and through stitching 14 extending into the channel 15 of the insole 16 and passing through the base of the groove 10 of the welt. It will also be observed that the grain face of the welt 1 extends to the extreme inner edge of said welt, so that the grain faces of the upper and of the welt contact to the extreme inner edge of the welt, and thus co-act to exclude moisture. 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, as heretofore described, and thus prevents the tearing out of the through and through stitching.

Referring now particularly to Fig. 5, it will be observed that the welting strip 2 is secured to the upper 13' by a line of through and through stitching 14' extending into the channel 15' of the insole 16'.

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 an edge of each of the said strips. The groove of at least one of said strips is adjacent to the inner or inclined edges thereof. These grooves are

comparatively shallow, and therefore each groove is spaced from an edge of the strip wherein it is formed by a continuous or unbroken ridge formed by the flesh surface of the welting strip adjoining said groove, such ridge being of the full, unimpaired thickness of the welting strip, and hence providing a most efficient strip anchoring shoulder. In that specified form of the invention herein shown, each groove is adjacent the inner or inclined edge of the strip, but is spaced therefrom by a ridge of the full, unimpaired thickness of the welt as defined. It will be observed that none of the material has been removed from the inner edge.

Again referring to Fig. 5, it will be observed that none of the material has been removed from the inner edge of the welt 2 at any time prior to the securing of said welt to the upper 13'. Heretofore so far as I am aware, it has been customary to remove by an inclined cut the inner edge of the welt strip prior to the securing of the welt to the shoe, and it has necessitated a distinct or separate operation. I avoid the necessity of such operation, because of the fact that the duplex welting 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 is separated from the extreme, inner edge of the welt by a ridge or shoulder of the full thickness of the welting strip, as heretofore described, thus overcoming all liability of the through and through stitching tearing through the inner edge of the welt. The beveling of the inner edge of the welt so prepares the welt that when applied to the shoe, it is not only more elastic, but it is necessary to cut off far less material beyond the line of stitching $x-x$ and $y-y$ than in those weltings which are rectangular in cross section. In fact, it is unnecessary to remove a substantial amount of such inner edge. After the welts have been secured as described and the extreme inner edges thereof have been removed as stated, all outer edges of the welt may be treated in any suitable manner.

Now referring to those forms of my invention shown in Figs. 1^a to 5^a inclusive, it will be observed that they differ from those shown in Figs. 1 to 5 inclusive only in that the stitch anchoring groove of the welt shown at the left in Figs. 2^a and 3^a and shown applied to Fig. 4^a, is located adjacent the square edge of the welt instead of adjacent the inclined edge thereof. Therefore, I have applied the same reference characters to the various features of the welts shown in Figs. 1^a to 5^a, that I have em-

ployed in connection with Figs. 1 to 5, but in each case have added the designating letter "a."

Referring to Figs. 1^a to 5^a, I have in Figs. 1^a, 2^a and 3^a represented at 1^a, 2^a, a duplex welt, the flesh face whereof is indicated at 3^a, 3'^a and the grain face whereof is indicated at 4^a, 4'^a. 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^a and the inner edge of the welting strip 2^a, said two cuts being indicated at 5^a and 6^a. The duplex strip is severed into two welting strips by an intermediate, longitudinal cut 7^a extending entirely through the blank at an unvarying angle, as heretofore described. In this manner, the outer edge 8^a of the welting strip 1^a and the inner edge 9^a of the welting strip 2^a are inclined. It will be noted that in the case of the welting strip 1^a, the flesh face 3^a thereof extends beyond the grain face 4^a, while the converse is true of the welting strip 2^a. Each of the welting strips possesses advantages flowing from such characteristic, as will be set forth more fully with respect to Figs. 4^a and 5^a. Each welting strip is grooved as indicated at 10^a, 11^a to provide a stitch anchoring shoulder. Furthermore and in accordance with the essential feature of the invention as heretofore pointed out, it will be observed that in each case the portion of the welting strip that is between its groove 10^a or 11^a and the adjacent edges, namely, the edges 5^a and 9^a 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^a, 13'^a formed by the very or actual flesh face of the said welting strips. That is to say, each welting strip from edge to edge 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^a or 11^a thereof there is preserved a longitudinal portion which is of the full, unimpaired thickness of the welting strip. The welting strip 1^a is secured to the upper 14^a by a line of through and through stitching 15^a extending into the channel 16^a of the insole 17^a and passing through the base of the groove 10^a of the welt. It will be observed that in this case, as in the case of the welts shown in Figs. 4 and 5, the grain face of the welt 1^a extends to the extreme inner edge of the welt, so that the grain faces of the upper and of the welt contact to the extreme inner edge of the welt and co-act to exclude moisture. After the welt 1^a has been se-

cured 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^a 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^a. It will be observed, viewing Fig. 4^a, that the outer edge of the welt 1^a 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. 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 least 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 shoulder at the upper edge is 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^a and 3^a and as applied in Fig. 4^a, 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^a. 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^a 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 it 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^a, 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 at the outer ball portion thereof.

Referring to the welt 2^a, shown at the right in Figs. 2^a and 3^a and shown as applied to the shoe in Fig. 5^a, 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^a. After the welt 2^a 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^a, it will be observed that the groove 11^a thereof is separated from the ex-

treme 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^a 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. Because of the beveled inner edge of the welt 2^a it can be more readily flexed in its own plane, and therefore can be more readily applied to the boot and shoe, and particularly to the toe portion thereof. I have heretofore pointed out, with reference to Fig. 4^a, 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^a, 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^a and 5^a possess individual characteristics, certain of which are possessed by both of them, and all of which peculiarly adapt the welts to their 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.

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.

Claims:

1. As a new article of manufacture, welting of indeterminate length consisting of a leather strip having a flesh face and a grain face, said strip being of unreduced thickness throughout substantially the extent of its narrower face and having one edge normal to the said faces and the other edge inclined thereto, the flesh face having a lon-

gitudinal, stitch anchoring groove adjacent to one of said edges and spaced therefrom by a substantially unbroken longitudinal ridge whose surface adjoining said groove is a portion of the actual flesh surface of the strip, of such width that a stitch anchoring shoulder is provided which is of substantially the full unimpaired thickness of the welting strip.

2. As a new article of manufacture, welting of indeterminate length consisting of a leather strip having a flesh face and a grain face, said strip being of unreduced thickness throughout substantially the extent of its narrower face and having its one edge normal to the said faces, and its other edge inclined thereto in a direction providing an obtuse angle at the grain face, the flesh face having a longitudinal, stitch anchoring groove adjacent said edge normal to the two faces and spaced therefrom by a substantially unbroken, longitudinal ridge whose surface adjoining said groove is a portion of the actual flesh surface of the strip, whereby a stitch anchoring shoulder is provided which is of substantially the full, unimpaired thickness of the welting strip.

3. As a new article of manufacture, welting of indeterminate length consisting of a leather strip having a flesh face and a grain face, said strip being of unreduced thickness throughout substantially the extent of its narrower face and having one edge normal to the said faces and the other edge inclined thereto, the flesh face having a longitudinal, stitch-anchoring groove adjacent to one of said edges and spaced therefrom by a substantially unbroken longitudinal ridge whose surface adjoining said groove is a portion of the actual flesh surface of the strip and whose opposite surface is a portion of the grain surface of the strip and is of at least substantially the maximum width of the said ridge.

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.