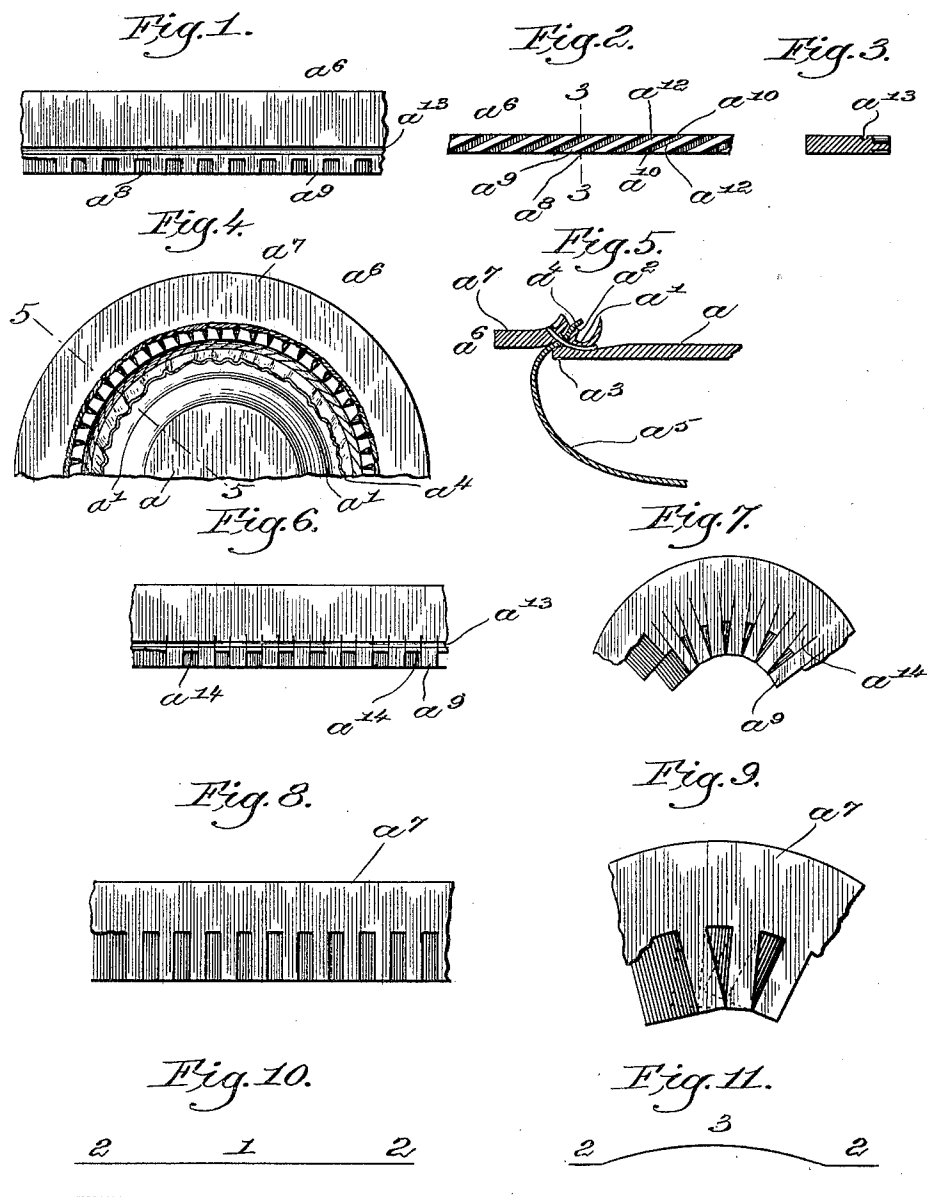


W. B. ARNOLD.
WELT FOR BOOTS OR SHOES.

(Application filed Mar. 5, 1901.)

(No Model.)



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM B. ARNOLD, OF NORTH ABINGTON, MASSACHUSETTS.

WELT FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 674,831, dated May 21, 1901.

Application filed March 5, 1901. Serial No. 49,932. (No model.)

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, county of Plymouth, and State of Massachusetts, have invented an Improvement in Welts for Boots or Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

In modern shoe manufacture there is a demand for extreme flexibility, and one main requirement to this end is that the welt shall be capable when laid out flat of being bent readily in its own plane—as, for instance, for rounding the toe end of a shoe—and shall also be capable of easy flexure transversely thereto. One form of welt for accomplishing this purpose is shown in my Patent No. 646,592, granted April 3, 1900; and the present invention is another form of welt having various advantages peculiar to itself and aiming at accomplishing the flexibility explained above and also referred to in my said patent. The welt shown in my said patent is very successful for McKay work, but is not adapted to making Goodyear-welt shoes, and so far as I am aware there is no specially-flexible welt for Goodyear work, notwithstanding that this style of manufacture requires extreme flexibility, especially at the toe, where the inner edge of the welt is not only curved around in conformity to the shape of the toe, but it is simultaneously bent laterally at an angle to the body portion of the welt in order to receive the stitches which pass through the vamp, lining, and adjacent part of the inner sole. The usual welt employed for this purpose is simply a straight piece of leather, and in order to give it the said required curvature and flexure skill in manipulating it is required, and also it has to be beaten and handled with special tools and force in order to get it into the proper shape, and even then its use is extremely awkward and difficult.

The welt which forms the subject-matter of this case has a specially-formed inner edge which permits the body portion to be curved around the toe flatwise without the tendency to bulge up into a conical shape, as has heretofore been the case, and also permits the said inner edge to bend out laterally at the

desired angle to the body part without any difficulty or special manipulation. This desirable result is obtained in the present preferred form of my welt by providing along the inner edge of the welt a series of projections of special shape spaced apart by intervening exposed spaces or gaps, which thereby render said edge thin and flexible at the portion thereof just beyond the stitch-receiving groove. This welt has various advantages also for use in McKay work and is particularly well adapted for various other parts in boot and shoe manufacture, as will be more apparent in the course of the following description.

In the drawings, Figure 1 is a top plan view of a portion of a welt-strip embodying one form of my invention. Fig. 2 is an edge elevation thereof, showing the overlapping teeth or projections and the intervening cut-away portions. Fig. 3 is a transverse section taken on the line 3 3, Fig. 2. Fig. 4 is a plan view of an unfinished portion of a shoe, showing the manner of using my improved welt in the Goodyear process of manufacturing a shoe. Fig. 5 is a vertical sectional view thereof on the line 5 5, Fig. 4. Fig. 6 is a view similar to Fig. 1, showing a further feature of my invention, whereby it is particularly adapted for heavy and hard stock. Figs. 7 to 9 are fragmentary plan views of portions of welt more particularly adapted for McKay work and other parts, the first and last of said figures illustrating the advantages thereof in bending in its own plane. Figs. 10 and 11 are diagrammatical views to be referred to.

In this art the practical difficulties encountered in using welts in the manufacture of boots and shoes are severe, being partly due to the difficulty of properly cutting and handling leather, especially the grade of leather which is employed in the manufacture of welt-strips, and being partly due to the difficulty in manipulating the leather with the rapidity and economy required by modern competition in shoe manufacture.

In my before-mentioned patent the general requirements as experienced in making shoes according to the McKay method are set forth; but in addition to the difficulties of this work other more difficult problems are presented when it comes to making a shoe according to

the Goodyear method. In the latter construction, which is shown in Figs. 4 and 5, an inner sole a is provided, having a stitch receiving and retaining flange or shoulder a^1 , terminating in a lip a^2 , which forms, with the feather-edge a^3 of the inner sole, an approximately rectangular recess in which the edge a^4 of the vamp a^5 is laid, and against the latter a welt-strip a^6 is placed, the vamp and inner edge of the welt-strip, and usually also one or more thicknesses of lining material, being bent in as sharply as possible to conform to said rectangular recess. This bending is exceedingly difficult taken in connection with the curvature about the toe, (which is illustrated in Fig. 4,) and yet it must be properly accomplished or the stitches will not retain the parts as they should. The bending of the inner edge around the toe for stitching purposes requires that the leather assume a somewhat conical or flared shape, inasmuch as the body part a^7 of the welt should extend out flat in a single plane, as shown in Figs. 4 and 5. In carrying out my invention and providing an inner edge which will accommodate itself to this lateral flaring or conical shape with extreme facility, I reduce the vertical or transverse thickness of the edge by cutting away the leather on diagonal lines, as indicated at a^8 , thereby leaving intervening teeth or projections a^9 , which overlap without touching each other, and yet are capable of being brought against each other when bent up, as shown in Figs. 4 and 5, so as to form a practically continuous thin edge, said edge being shown substantially in plan in Fig. 4 and section in Fig. 5. The teeth or projections a^9 , it will be observed, have upper and lower sides a^{10} lying in the planes of the sides of the welt, and the inclined or oblique sides a^{12} of the teeth or projections a^9 are inclined relatively to said top and bottom sides, the teeth being so formed as to expose at the top and bottom a portion of each of the inclined sides when looking down upon the welt. A stitch-receiving groove a^{13} is formed adjacent the teeth on one side of the welt when the latter is used for Goodyear work.

When my invention is applied to heavy and hard stock, such as is required for certain special forms of manufacture, a series of short teeth or projections a^{14} are formed intermediate the longer teeth a^9 , said short teeth overlapping or lying against the inclined sides of the longer teeth for a portion only of the length of the latter, as is clearly shown in Figs. 6 and 7, these figures showing the general character of welt, excepting that in Fig. 6 the welt is specially intended for Goodyear work, the teeth being short and the welt being provided with a stitch-receiving groove, whereas in the latter figure the respective teeth are considerably longer, and therefore better adapted for McKay work and other general welt purposes, as is also the case in the forms shown in Figs. 8 and 9, where a welt substantially the same as that shown in Figs.

1 and 2 is represented, excepting that the teeth are longer and the body portion narrower than is required for Goodyear work.

One leading feature of my invention resides in the distinct and separate teeth or projections formed in such a manner that they respectively overlap each other while yet providing the desired thinness of stock at said edge, which is desirable for the purposes already explained.

For many purposes it is desirable to use a welt-strip of considerable width, and also in some cases, especially when it is used as a rand, it is desirable that it should have considerable thickness, and yet in all these cases it should be flexible in the direction of its own plane for the purpose of bending into a flat curved piece conforming to the shape of the portion of the shoe where its use is required, and under such circumstances the construction shown in Fig. 7 is of particular advantage. In practice this form of welt gets nearly all of its bending flexibility in its own plane by reason of the projecting teeth a^9 , the short teeth a^{14} serving to aid to some extent in said flexibility, while at the same time giving extreme flexibility in a transverse direction—as, for example, when in a McKay-sewed shoe it is desired to have a very thick sole at the edge and yet have it extremely flexible for walking purposes. Moreover, this form of construction gives an extremely easy and more or less cushion-like support for the foot, and, in fact, the latter feature particularly distinguishes my present form of welt when used with relatively long teeth.

The construction shown in Fig. 7 provides a large practically solid supporting part in the body portion of the welt greater than could be accomplished with an ordinary welt.

By having the teeth slanting and preferably thin, as best shown in Fig. 2, the inner or toothed edge of the welt is rendered relatively thin, so that when the welt is bent around, as shown in Figs. 7 and 9, so as to gather in all the free ends of the teeth in a bunch, as it were, the resulting thickness is still less or at least not greater than the thickness of the main body portion or solid part a^7 of the welt. It will be observed that when thus bent around, as shown in said Figs. 7 and 9, the free ends of the teeth or projections rest on each other, giving the inner edge when the welt is in this position a thickness uniform with the body of the welt, as indicated at 1, Fig. 10, where 2 2 indicate the adjacent portions of the body part of the welt, thereby avoiding the bulge in the leather which inevitably occurs when a solid welt-strip or a welt-strip in which the leather is not thinned out or cut away is used, as is illustrated, diagrammatically, at 3, Fig. 11.

My invention accomplishes in an exceedingly neat and practical manner the flexibility which is necessary and may, moreover, be manufactured with great rapidity and economy.

The welt is manufactured in long straight strips of indeterminate length coated with cement and otherwise finished, as explained in my said patent.

5 It will be understood that while I have shown rectangular teeth and a special embodiment of my invention in two specific forms the invention is not confined thereto, as it is capable of being embodied in a large
10 variety of specific forms, and while I prefer for many purposes that the teeth should be thin and quadrangular in cross-section and practically the same width and size at their outer or free ends than they are at their inner
15 ends they may with advantage be of other shapes—as, for instance, they may taper to a point or relatively thin edge and be otherwise varied within the spirit and scope of my invention as set forth in the following claims:

20 Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A welt having a solid outer edge or body part and an inner edge rendered thin in stock
25 transversely and flexible by being cut away so as to leave projections or teeth, separated by intervening spaces, the adjacent edges of contiguous teeth lapping over each other but out of mutual contact.

30 2. A welt having a series of projections of substantially uniform length extending from one edge and presenting sides in the plane of

the welt-surface and other sides inclined thereto, part of each inclined side being exposed between the plane portions of adjacent
35 projections, and a series of intermediate shorter projections overlapping a portion only of the inclined sides of the longer projections.

3. A welt comprising a solid body portion adapted to support the edge of a sole and constitute a portion of the edge part of a shoe,
40 and an inner portion composed of a series of independent teeth separated from each other by intervening spaces, said teeth being relatively thin and extending approximately in the direction of planes parallel to each other
45 obliquely to the general direction of the welt.

4. A welt comprising a solid body portion adapted to constitute a portion of the edge of the boot or shoe sole, or other part in which
50 the welt is used, and an inner part composed of long and short teeth separated from each other, the long teeth extending beyond the short teeth with intervening spaces, and respectively lying in the direction of parallel
55 planes extending obliquely to the general direction or plane 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:

GEO. H. MAXWELL,
JOHN J. MCGAREGILL.