April 4, 1944. W. P. FIELD 2,345,738

SHOE

Filed Feb. 15, 1941

Fig. 1.

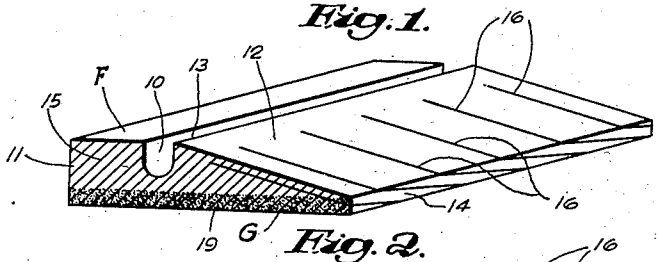


Fig. 2.

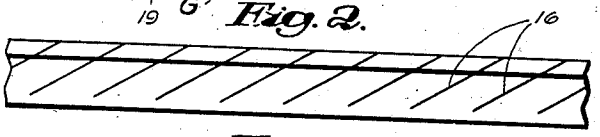


Fig. 3.

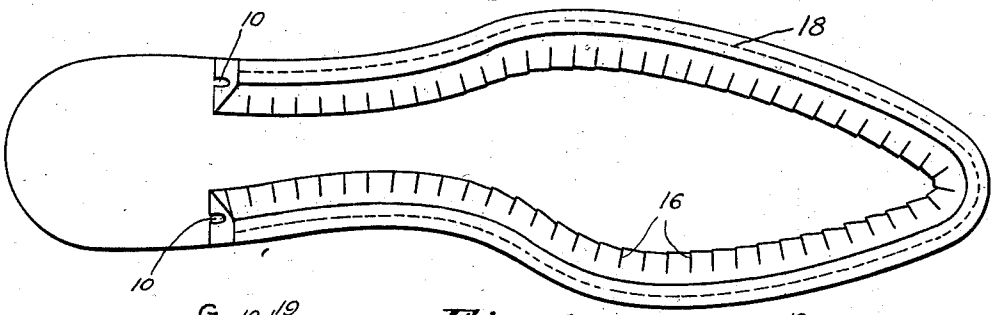
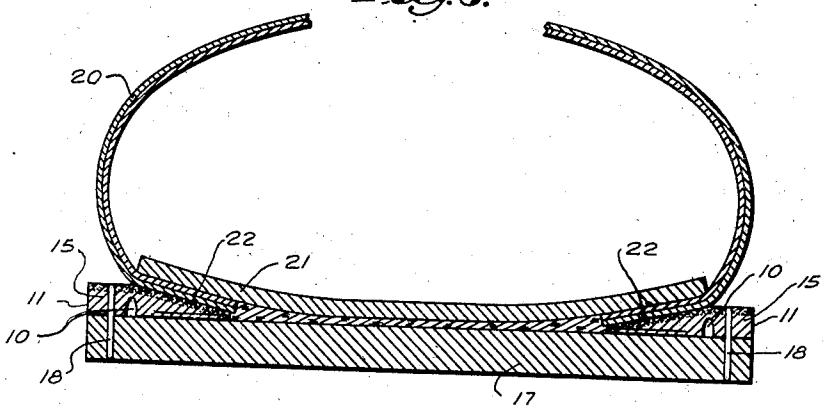


Fig. 4.



Fig. 5.



Inventor:
Walter P. Field
by Ernest E. Kent
Attorney

Patented Apr. 4, 1944 2,345,738

UNITED STATES PATENT OFFICE

2,345,738

SHOE

Walter P. Field, Brockton, Mass.

Application February 15, 1941, Serial No. 379,008

7 Claims. (Cl. 36—17)

This invention relates to improvements in shoes and more especially to improvements in that type of shoe having the appearance and many of the advantages of a Goodyear welt shoe but in which the upper is secured to the welt by cement in place of the usual stitching.

Heretofore the manufacture of "cemented" shoes, wherein an upper lasted over an inner sole is cement attached to an outer sole, has been more or less limited to women's shoes wherein the outer sole does not extend beyond the upper. Attempts have been made to manufacture welted shoes wherein the upper is cement attached to the welt but these have not met with any amount of success due to the difficulty of securing a proper bond between the welt and upper. In order to form a suitable seat for the lasted upper, that portion of the welt to which the overlasted portion of the upper is to be attached is usually skived, sometimes to form an inwardly beveled seat and sometimes to form a flat attaching face joining the welt extension at a shoulder. Ordinarily the upper face of a leather welt has a grain surface and the necessary removal of the material of the welt to form the seat for the upper removes this grain surface and leaves a flesh surface at the point where the upper is attached thereto.

I have observed that, when an outer sole with the attached welt has torn away from an upper to which it is cement-attached, the cement impregnated fibers of the welt remain adhering to the upper, indicating that the failure of the bond was not due to the cement nor lack of penetration thereof but almost entirely to the relatively weak condition of the fleshy fibers of the welt. The fibers of a leather welt at the grain surface thereof are relatively fine in texture and strong and may not be readily separated from one another nor from the fleshy part of the welt lying thereunder. In order to carry out one of the principal objects of the invention, namely the production of a stronger bond between the overlasted upper and the welt, I propose a form of shoe construction and especially a welt for use therein, wherein that portion of the welt forming the seat for the upper is provided with a grain surface which surface is disturbed no more than is necessary to secure adequate penetration of the cement, be the latter pyroxylin or latex.

In order to provide for a proper finish and appearance of the welt extension, the exposed upper surface of the latter must likewise be provided with a grain surface thus requiring, in the welt which I propose to use, the use of two angularly disposed adjoining grain surfaces. This is brought about in the preferred form of the invention, more fully described hereinafter, through the shaping of the under side of the welt, that is to say, the side towards the outer sole, the under side of the welt being so shaped, especially at its inner margin, that the inner margin may be folded or pressed downwardly into contact with the outer sole to form a seat for the lasted upper, the seat having a grain leather surface. A feature of the invention resides in a form of welt wherein the above ends may be obtained.

Another object of the invention is to bring about a form of cemented welt shoe construction wherein the shoe bottom may be more flexible than has heretofore been possible in this type of shoe.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the drawing,

Figure 1 is a perspective view of a short strip of welting in accordance with the preferred form of the invention;

Figure 2 is an elevational view showing the inner edge of the welting of Figure 1;

Figure 3 is a plan view of an outer sole having the new welting applied thereto, the scale of the welting being somewhat smaller than in Figures 1 and 2, with inner margin bent as in Figure 5;

Figure 4 is a cross sectional view of my welted sole unit showing the welt prior to being bent to its position of Figure 5; and

Figure 5 is a cross sectional view of a shoe according to the invention and showing the new welting embodied therein.

In the embodiment of the invention shown in the drawing, the process of manufacture of the welt may start, as usual, with a fillet or blank strip of welting leather having a plane grain surface and a plane flesh surface parallel to the grain surface, the thickness and width of the strip being varied to meet the individual needs of the shoe manufacture.

In carrying out the invention the strip described above is first run past a channeling knife or knives so shaped and guided as to cut a channel 10 in the flesh surface F, the channel 10 being spaced inwardly from the outside edge 11, of the strip, a distance substantially equal to the extension the welt will have in a shoe in which it may be embodied. After being channeled the strip is skived on its flesh face F to form a face 12 which, in this instance, tapers from the inside edge 13 of the channel 10 towards the in-

side edge 14 of the strip at the grain surface G. The welting thus formed will have a grain face extending from edge to edge and an under or flesh side which is divided by the channel into an outer portion wherein the flesh face is parallel to the grain face as at 15 and an inner portion having a face 12 which tapers upwardly with respect to the grain face. The welting is now preferably slashed along its inner marginal portion, that is to say, at the edge 13, the slashes being oblique to the grain face G and extending into the welting to a depth not quite reaching the channel 10 or the inside edge of the welt extension, thus leaving an unslashed portion of the attaching face of the welting adjacent the welt extension. The slashes are indicated by the reference numeral 16. The welting is now ready for use in the manufacture of shoes. The making of the slashes without removal of stock, and the making of the taper by skiving the under face to a thin edge, as shown in the drawing, leaves the welting having the whole area of the upper face a grain stock surface, approximately as smooth and tough as the leather naturally is, and provides that when the welting is laid around a sole the inner margin does not build up too much in thickness.

The process of manufacture of shoes embodying welting of the above type may be varied but preferably is as follows: I first attach the outer marginal portion 15 of the welting to the marginal portion of the forepart of a rounded sole 17, from the heel breast line on one side around the toe to the heel breast line on the other side. Preferably the marginal portion of the welting is attached to the sole 17 by means of a line of stitches 18 sewed through the welt and sole in the usual manner of welted shoes. Figures 3 and 4 are illustrative of the outer sole with the welting attached thereto. The attaching face 19 of the welt is roughened either before or after application to the sole to permit the penetration of the cement, it being understood that in accordance with one aspect of the invention this roughening of the welt is not carried to the point of destroying the grain surface of the attaching face.

An upper 20 consisting of the usual vamp, quarters, top, box toe, counter and lining, (not shown in detail herein), may be lasted over an unchanneled inner sole 21, the overlasted portions 22 of the upper, together with the lining, etc., being stapled, cemented or otherwise attached to the inner sole. The overlasted portion 22 of the upper is then coated with cement as is the attaching face of the welt, sufficient cement being applied to the latter so that it may penetrate into the cuts formed by the slashing.

The channel 10 leaves the inner marginal edge portion of the welt attached to the outer marginal portion by a part of reduced thickness, in other words the welt is somewhat weakened or made more flexible at the channel which facilitates the bending of the welt along this line as a hinge and permits the inner marginal portion to be readily pressed downwardly into contact with the outer sole as the lasted upper is applied thereto. In completing the construction of the shoe the cement on the upper and welt is softened by use of a cement solvent whereupon the upper may be applied to the welt, the latter being pressed down into the position shown in Figure 5 of the drawing whereupon on drying of the cement the shoe is complete ready for the usual finishing operations.

The channel 10 should be of such width as to provide clearance for the edge 13 which is swung into the channel when the inner marginal portions of the welt are pressed downwardly into contact with the outer sole during the attachment of the upper. It will be obvious that the width of the inner and outer marginal portions of the welting may be varied in accordance with the amount of extension required in the shoe and the width of the attaching face required, these being somewhat narrower in women's shoes than in men's.

It would be within the invention to cement the inner margin of the welt to the outer sole but I have found that by leaving this portion of the welt unattached to the outer sole the flexibility of the shoe bottom is greatly increased. I do not commit myself to an exact theory as to how this takes place but I attribute it to the fact that as the bottom of the shoe is bent or flexed during the act of walking, the upper may adjust itself to a certain extent towards and away from the outer sole by flexing the inner margin of the welt about the grain stock overlying the channel, which acts as a hinge. As the axis of this hinge is longitudinal at each side of the ball of the foot, where the bending of the foot at each step is about a transverse axis, this combination of bendings, about axes which are perpendicular to each other, increases the flexibility of the shoe bottom. The space open in the channel 10 and the space that will be under the shoe upper, left by the skiving of the under face 12, as seen in Figure 4 and the non-adhesion of the latter face to that part of the outer sole which is under it, provide space and welt-flexibility for a slight easy come-and-go, lifting and depressing, of the inner part of the welt as the wearer's effort to bend his foot is transmitted from the shoe upper to the outsole. Such flexing action could not, of course, be effected if the inner margin of the welt was cemented to the outer sole.

Whether the inner margin of the welt is cemented to the outer sole or not the fact that the grain surface of the attaching face of the welt is intact enables me to obtain a much stronger bond between the welt and shoe upper than has heretofore been possible, the slashing not only enabling me to lay the welt around the curved marginal edges of the rounded outer sole but causing the penetration of the cement into the welt in the form of fingers which serve to anchor the cement firmly therein. By extending the slashing only part way through the attaching or inner marginal portion of the welting and thus leaving an unslashed portion of the attaching face I eliminate any tendency of the welt to tear at the inner edges of the slashing, adding considerable strength to the welt while providing for the easy laying of the welt. It has been found in actual practice that the inwardly beveled seat for the lasted upper guides the latter into proper relation to the outer sole and welt so that the careful "spotting" of the upper on the welt and sole, which characterizes the usual process of manufacture, is largely avoided.

Thus there is a grain leather surface of welt at the whole area of the cement bond of welt to upper; the part of the welt thus cemented to the upper has its under fact skived, and is loose from the part of the sole on which it lies; and there is space in which, and a hinge of grain stock on which, it can rise and fall relative to that part of the welt which is firm on the sole. The tension of the upper on the sole is indirect

but is through grain stock, for cement securement and for strength of the hinge that operates when the wearer walks. These features combine to produce durability as well as easy flexibility in a shoe of the class described.

While I have shown and described a preferred form of the invention, it will be readily understood that the same is capable of variation and modification and is only to be limited by the scope of the appended claims.

This application is a continuation in part of my copending application Serial No. 293,532, filed September 6, 1939.

What I claim is:

1. A shoe welting strip of leather having a plane top side whose whole area has grain surface; and an angular bottom side, composite of two flesh surfaces disposed at an obtuse angle to each other, one of said flesh surfaces being oblique to the grain surface and defining, with the grain surface, a portion of strip having gradually diminishing thickness from the apex of the obtuse angle to an edge of the strip, there being a deep channel in the bottom side of the strip, extending longitudinally at a mid-location therein, providing a hinge of grain leather between opposite sides of the channel, about which the portions of the strip on opposite sides of the channel may be swung relative to each other, to bring their said angularly disposed flesh surfaces resiliently into approximately a common plane.

2. Shoe welting, being a strip of leather having an upper face whose whole area has grain surface; and whose under face has in its midst a longitudinal channel of open space, that portion of the strip which is between the channel and one edge of the strip being relatively thick, and that portion which is between the channel and the other edge of the strip having diminishing thickness, its under surface being at an angle to the under surface of the thicker portion of the strip so that the said thinner portion tapers from the border of the channel to the edge of the strip, and, at that edge, is thinner than said relatively thick portion is; said channel being an excavation of flesh stock deep enough to constitute a longitudinal hinge in the strip, between the two said portions of the strip, said hinge comprising the grain stock of the strip between that channel and the upper face of the welting, and said tapering being from the flesh surface of the leather to the grain stock which underlies the said grain surface of the strip, there being slits extending through the tapering portion of the strip in direction which is oblique to the grain face.

3. Shoe welting, being a strip of leather having an upper face whose whole area has grain surface; and whose under face has in its midst a longitudinal channel of open space, that portion of the strip which is between the channel and one edge of the strip being relatively thick, and that portion which is between the channel and the other edge of the strip having diminishing thickness, its under surface being at an angle to the under surface of the thicker portion of the strip so that the said thinner portion tapers from the border of the channel to the edge of the strip, and, at that edge, is thinner than said relatively thick portion is; said channel being an excavation of flesh stock deep enough to constitute a longitudinal hinge in the strip, between the two said portions of the strip, said hinge comprising the grain stock of the strip between that channel and the upper face of the welting, and said tapering being from the flesh surface of the leather to the grain stock which underlies the said grain surface of the strip, there being slits extending through the tapering portion of the strip in direction which is oblique to the grain face; the said slits terminating short of the channel, leaving a non-slitted portion of the grain stock beside that said grain stock which is between the channel and the grain face.

4. In a shoe, having a sole; an upper; and a welt attached to the marginal part of the sole and to the lasted-under part of the upper; that combination in which said welt, has its under surface obtusely angular with vertex at a mid-location between its inner and outer edges, and has there a longitudinally-extending hinge of relatively thin leather stock, that portion of the welt that is attached to the upper diminishing in thickness from the vertex to its edge, and being free to rise from the sole, being free of direct connection to that part of the sole which this part of the welt directly overlies.

5. In a shoe, having a sole; an upper; and a welt attached to the marginal part of the sole and to the lasted-under part of the upper; that combination in which said welt, at the longitudinal region of its attachment to the upper, has taper toward the inner edge of the welt, has slits which are oblique to both faces of the taper, and, at this tapered portion, is free from direct attachment to the sole; there being an excavated channel of open space in the midst of the under face of the welting, between that part of the welt which is secured to the margin of sole and the said tapering part which is free from direct attachment to the sole; the residue of the thickness of the welt stock, which is between the said channel and the upper face of the welt, constituting a hinge on which the said tapering and sole-free part of the welt can swing up from the sole, when drawn by the upper.

6. In a shoe, the combination as in claim 5 wherein the said welt is of leather and the surface thereof which is directly attached to the upper is a grain leather surface.

7. In a shoe, having a sole; an upper; and a welt attached to the marginal part of the sole and to the lasted-under part of the upper; that combination in which, in that region of the lengthwise extent of the shoe where the act of walking bends the sole, the inner marginal part of the welt is directly attached to only the upper; the outer marginal part of the welt is directly attached to only the sole; and the mid-portion of the welt, between the two said marginal attachments, has a longitudinally extending region which is not directly attached to either sole or upper, and has in its said region a longitudinally extending channel, whereby at each side of the shoe a hinge between upper and sole is constituted about an axis extending fore and aft in the welt; said inner marginal part of the welt being free of direct connection to that part of the sole which it overlies directly, so that it tends to rise from the sole, about the hinge, as the upper pulls upward from the sole in the act of walking.

WALTER P. FIELD.