Sept. 20, 1927. 1,642,878

B. F. HARTWELL

COMPOSITE RUBBER SOLE

Filed Sept. 14, 1925

Fig. 1.

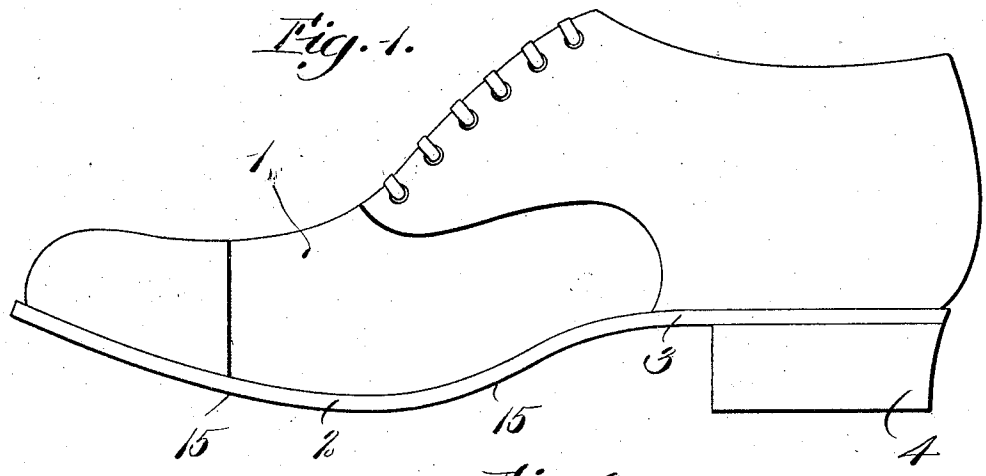


Fig. 2.

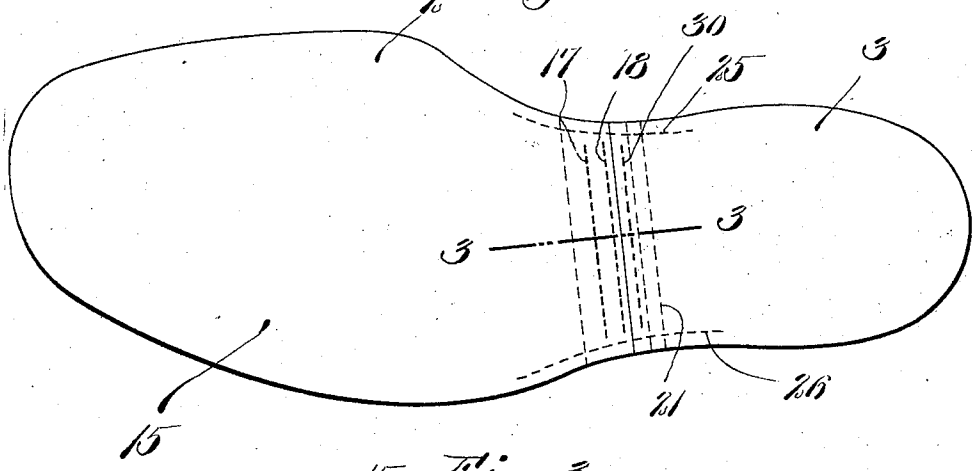


Fig. 3.

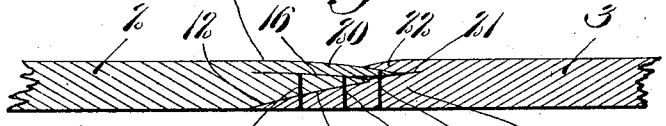
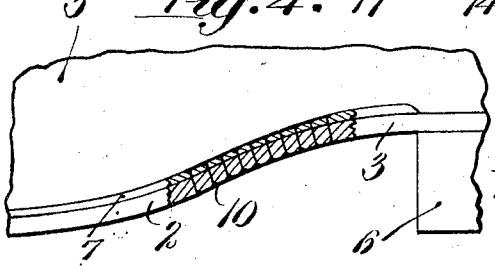


Fig. 4.



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COMPOSITE RUBBER SOLE.

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My present invention relates to boots and shoes, and is directed to improve the comfort and flexibility, and more particularly involves a novel construction of a combined leather and rubber sole, and method of joining same.

In the manufacture of boots and shoes, it has long been desirable to secure a shoe structure which would have great flexibility in the sole, combined with rigidity, wearing qualities, and the strength of a rigid heel seat construction. To this end it has been heretofore attempted to devise a combined composite sole with a rubber forepart and leather shank and heel part, but all such prior efforts have been unsuccessful and uncommercial. Great difficulty has been experienced in the attempt to combine a leather and rubber sole, particularly outsoles, because of the difficulty in making a proper joint between the two materials, the impracticability of permanently cementing rubber and leather, the expense of effecting intricate joints and the weakening of the sole at such joints, and the positioning and location of the joint in the sole relatively with the sole.

My present invention obviates former difficulties and enables me to produce a combined sole, as an outsole for boots and shoes, whether welts, McKays or other types, wherein the full flexibility of the forepart is secured by a rubber or rubberlike composition, combined with the advantages of a leather shank and heel seat portion for the sole, and a novel type of interengaging joint structure at a peculiarly advantageous location in the shoe.

In carrying out my invention I may utilize any of the well known types of rubber or rubberlike compounds or compositions, preferably wear resisting and flexible layer of suitable thickness to constitute the outsole of the shoe and with toughness to give wear resisting and stitch-holding capabilities. The forepart section is preferably of sufficient length and extent, relatively with the size and style of shoe and hence of sole blank, so that this rubber-like section will be joined to the leather shank and heel portion at a point substantially remote from that portion of the sole which withstands the greatest amount of flexing in movement. This particular feature, i. e., the location of the joint between the leather portion and the rubber portion, as well as the method of making this joint, constitute important features in the present invention. By positioning the joining portion in the shank or arch part of the shoe, where no or substantially no flexing, bending and working of the sole is required, I avoid the difficulties heretofore experienced in making such a jointure between rubber and leather. Furthermore I can, by my peculiarly interengaging joint arrangement, and at the position which I have discovered is most important in the rigid shank of the part of the shoe, I can partially cement and partially stitch the leather and rubber together, effecting a permanent jointure. By having this joining position in a protected portion under the non-flexing part of the shank or arch, the stitching will not be broken during flexing, the interengaging dovetailed joint arrangement which I prefer to employ, is not endangered or disturbed, and the entire sole is maintained in a desirable and satisfactory manner.

A further feature of my present invention consists in the fact that by the peculiar and novel type of interengaging joint, I am enabled to both interengage the leather and the rubber parts so that cement can be used, holding leather to leather and rubber to rubber. One of the great difficulties heretofore deemed insurmountable was the attempt to cement rubber and leather together, which has not been found feasible. By my method of cementing rubber to rubber and leather to leather, I secure an interengaging overlapping and smooth joint, and simultaneously provide a protecting covering for the stitching so that an extremely desirable and attractive, as well as strong and durable, joint is obtained between the rubber and leather sole sections.

Referring to the drawings illustrating a preferred embodiment of the invention,

Fig. 1 is a side view of a McKay type of shoe embodying my invention;

Fig. 2 is a bottom view of the shoe illustrating in dotted lines the stitching;

Fig. 3 is an enlarged cross-sectional view on the line 3—3 of Fig. 2; and

Fig. 4 is an enlarged fragmentary view of the stitching in a welt type of shoe.

While my invention is primarily in the sole, and the methods of joining same, I consider that I have also effected a substantial and novel improvement in the boot or shoe structure, whether of McKay or welt type,

and therefore I wish to claim these features herein.

Referring to the drawings, Fig. 1 is a characteristic side view of an oxford shoe, wherein the upper 1 is joined to the sole, here shown as the forepart 2 of rubber or rubberlike composition and the shank and heel portion 3 of leather, the latter carrying the heel seat and the heel 4.

Figs. 1 and 2 illustrate a typical McKay structure, while in Fig. 4 the upper 5 and heel 6 are shown in a welt type of shoe, wherein the welt 7 is illustrated attached to a similar composite sole with the forepart 2 of rubber and the heel and shank portion 3 of leather, a fragmentary portion of the outsole stitching 10 being shown, uniting welt and sole.

In forming my composite sole, I first prepare a blank wherein the forepart 2 is of suitable size and area for the particular shoe to be made, utilizing rubber or rubber compound, preferably the well known type of soling sold under the name "Gleasonite" for this purpose. For the shank and heel seat I utilize ordinary sole leather. In the forepart I form a beveled portion, either straight across the sole or at a slight angle transversely, this beveled portion having its bottom face 12, to fit a correspondingly beveled surface 14 in the leather portion 3. The bevel face 14 of leather, has a slight projecting interengaging lip throughout, as clearly shown in the sectional detail in Fig. 3. Adjacent the tread or outside face 15 of the sole portion 2, I form a transverse cut 16 of a considerable depth, to provide a surface to receive stitching 17 and 18 transversely of the sole and which unites the two sections of the sole, rubber and leather, firmly and permanently together. These faces may be coated with cement if desired, but it is not necessary as the stitching will hold them rigidly and permanently. The flap 20 between the cut 16 and the bottom face 15 (shown in inverted position Fig. 3, corresponding with the cross-section of Fig. 2), is employed to subsequently cover the stitching 17 and 18 on the bottom or tread surface of the shoe, these surfaces being cemented as they constitute a rubber to rubber contact throughout substantially the greater area and length. In the leather portion 3, I continue the line of the bevel 14 (except for the slight projecting lip) rearwardly a considerable distance as shown at 21, to thus form an overlapping layer 22 of leather, the rubber flap 20 and the leather flap 22 being of sufficient extent to overlap and interengage and thus allow the leather portions 22 and 23 to be cemented leather to leather, as well as the rubber portions being cemented rubber to rubber. The slight overlapping edge of the leather flap 22 thus conceals and protects the rubber which is also stitched to the leather shank portion by stitching 30, while the stitching which in McKay shoes is illustrated at 25 and 26 and in welt shoes at 10, Fig. 4, catching and engaging the edges of both sides of the flaps, hold them permanently and securely in position. Thus I obtain the advantages of a protected joint between rubber and leather, both stitching and cementing, while in the cemented portions I obtain the advantages of leather to leather and rubber to rubber, and interengaging the edges of the entire flap portions by the McKay stitching 25 and 26 or the Goodyear outsole stitching 10.

By discovering the proper position in which this jointed portion can be located, i. e., in that part of the shank or arch where the shoe does not flex, but just above the same, I thus obtain the advantage of a non-working sole portion, allowing the rubber section 2 to take up the flexing in walking and thus secure the desirable combination of a flexible forepart with a rigid shank and heel part. This location of the joint is most vital and important and I claim the same broadly herein.

In the completing of the shoe by edge finishing the soles, whether in McKays or welts, the edge finishing completely solidifies the beveled and cut edges, covering the same, and the appearance of the completed shoe does not disclose the interengaging joint edges of the combining of the two soles. The rubber or rubber-like sole can be of any desired composition; such as "Gleasonite" as above noted; crepe rubber; intermingled rubber and canvas for better stitch receiving and holding, or other composition.

My invention is further described and defined in the form of claims as follows:

1. A composite sole, comprising a rubber forepart and a leather shank portion, interengaging parts of the leather and rubber extending transversely of the sole in a non-flexing portion thereof, stitching uniting the same, interengaging leather layers being cemented to each other and the interengaging rubber layers being cemented to each other.

2. A composite sole, comprising a rubber forepart and a leather shank portion, interchanging parts of the leather and rubber extending transversely of the sole in a non-flexing portion thereof, stitching uniting the same, the interengaging leather layers being cemented to each other and the interengaging rubber layers being cemented to each other, overlapping portions of the cemented layers covering and protecting the uniting stitching.

3. A composite sole, comprising a rubber forepart and a leather shank portion, a beveled face on said leather portion having a projecting lip extending across said face,

a correspondingly beveled face on said rubber portion adapted to engage said beveled face and interengage with said lip, stitching uniting the same in a non-flexing portion of the sole, a flap cut on the outer face of the rubber portion cemented to the rubber portion and protecting said stitching, said flap extending onto the beveled face of the leather portion and stitched thereto, and a flap cut from the leather portion and overlapping and cemented to the leather portion from which it is cut and to the outside of the rubber flap, covering and protecting the edge of the rubber flap and the last said stitching.

In testimony whereof, I have signed my name to this specification.

BENJAMIN F. HARTWELL.