Sept. 25, 1928. 1,685,538

A. A. GLIDDEN ET AL

SOLE FOR BOOTS AND SHOES

Filed July 22, 1927

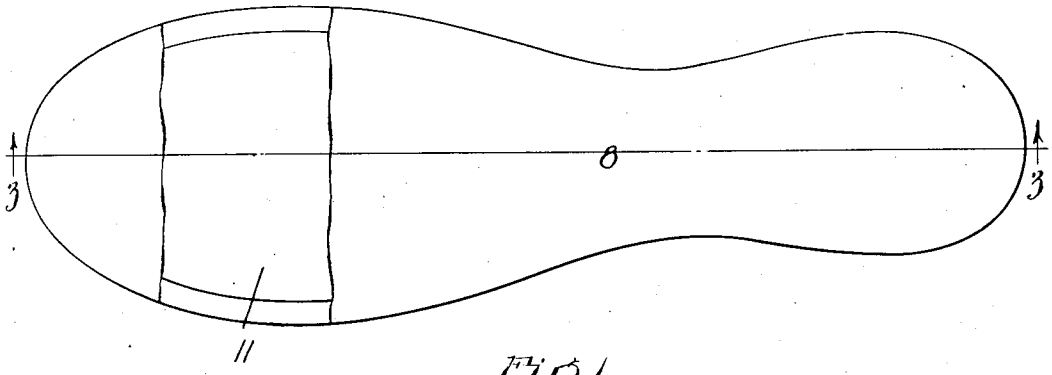


Fig. 1.

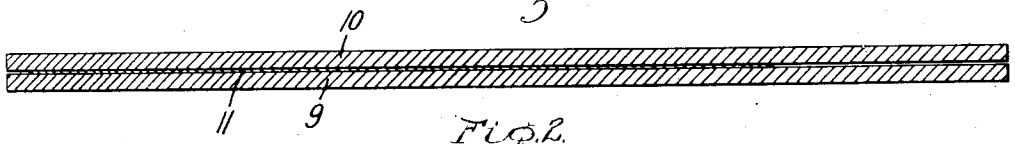


Fig. 2.

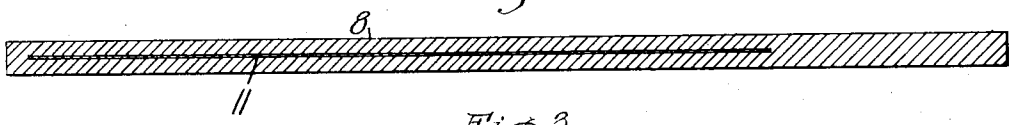


Fig. 3.

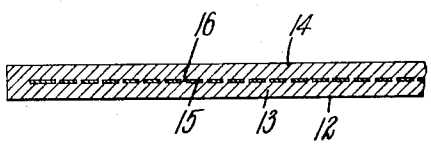


Fig. 5.

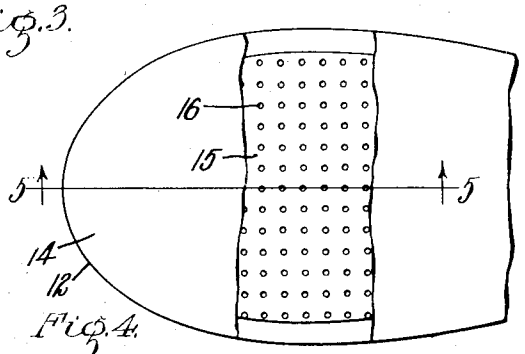


Fig. 4.

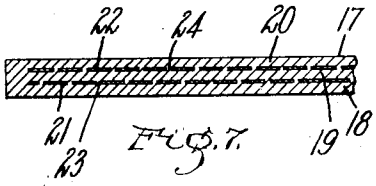


Fig. 7.

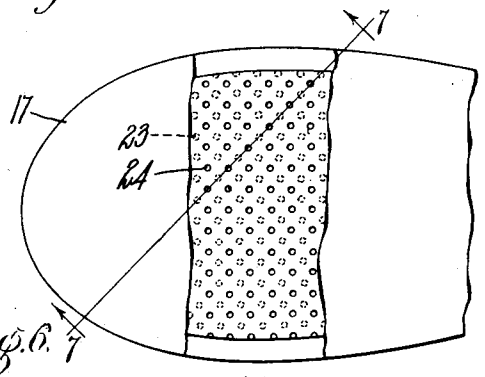


Fig. 6.

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UNITED STATES PATENT OFFICE.

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SOLE FOR BOOTS AND SHOES.

Application filed July 22, 1927. Serial No. 207,790.

This invention relates to an improvement in soles for boots and shoes.

The object of the invention is to provide a rubber sole for boots and shoes, and particularly a sole for a molded rubber boot, which will be impervious to nails or other sharp articles which might penetrate the sole and cause injury to the foot of the wearer. This object is attained by embodying in a rubber sole a flexible metallic layer or layers so constructed and arranged within said sole that they will be firmly bonded therein and the flexibility of the sole retained.

The invention consists in a sole for boots and shoes as set forth in the following specification and particularly as pointed out in the claim thereof.

Referring to the drawings:—

Figure 1 represents a plan view of a sole embodying our invention, a portion thereof being broken away and exposing a metallic layer which is located within said sole.

Fig. 2 is a vertical section through the layers of material comprising the sole before said layers have been compressed together.

Fig. 3 is a vertical section through the finished sole as taken on the line 3—3 of Fig. 1.

Fig. 4 is a plan view of the front portion of a sole illustrating a modified embodiment of the invention, a portion of said sole being broken away and exposing a perforated plate which is located therein.

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 4.

Fig. 6 is a plan view of a portion of a sole illustrating another modified embodiment of our invention, a portion of said sole being broken away to expose a perforated metal plate located therein.

Fig. 7 is a vertical section taken on the line 7—7 of Fig. 6.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, referring to Figs. 1, 2 and 3 inclusive, 8 represents a sole embodying therein a lower layer of rubber 9 and an upper layer of rubber 10, between which is a metallic layer consisting of a flexible metal plate 11. The layers of rubber 9 and 10 extend for the full length of the sole 8, while the metallic layer 11 extends from the front of the sole to a point adjacent to the front of the heel portion thereof only, allowance being made for a narrow marginal portion of solid rubber in the finished sole between the edge of the metallic layer and the edge of said sole.

In the process of forming the sole the metallic plate 11, which may be of any thin metal, and which, furthermore, may be plated with any suitable substance to increase the adhesion of the rubber therewith, is inserted between the lower and upper layers of rubber 9 and 10 respectively. The superimposed layers are then compressed in any suitable manner to expel air that may be trapped therebetween and to force the layers of rubber tightly against the metal plate. The superimposed layers are then molded and vulcanized to form a completed sole as illustrated in Fig. 3.

It is evident that the sole of this invention may be utilized as an outer sole for all types of boots and shoes, said sole being attached to the upper of a shoe by any well-known method, or the sole may be employed as an inner sole, in which case it may be inserted within a boot or shoe in the usual well-known manner, and when so employed, it is evident that it will protect the foot against nails or other pointed articles, which, if stepped upon, might penetrate the outer sole of the shoe and injure the foot of the wearer.

In Figs. 4 and 5 we have illustrated a modified embodiment of our invention in which a sole 12, formed by the process hereinbefore mentioned, embodies therein a lower layer of rubber 13 and an upper layer of rubber 14, between which is a metal plate 15 provided with a plurality of perforations 16 regularly spaced apart over its entire surface. In all respects, except for the perforations 16, the plate is similar to the plate 11 previously mentioned. The perforations 16 contribute to make the plate 15 more flexible, and during the molding and vulcanizing operation the rubber upon the opposite surfaces of said plate penetrate said perforations, and the upper and lower layers are thereby bonded together through said perforations. The perforations 16 are preferably so small that only the very smallest of nails can project therethrough.

In Figs. 6 and 7 still another modified embodiment of the invention is illustrated in which a sole 17 embodies therein a lower

layer of rubber 18, an intermediate layer of rubber 19, and an upper layer of rubber 20. Between the layers of rubber 18 and 19 a thin metal plate 21 is positioned and between the layers of rubber 19 and 20 another thin metal plate 22 is positioned. The plates 21 and 22 are provided with perforations 23 and 24 respectively, and said perforations are so spaced within said plates that they will not align with each other in the completed sole. By so positioning the perforations the chance of a nail penetrating the sole is reduced to a minimum. In this form of our invention, during the process of vulcanizing the sole, the rubber upon the opposite sides of the plates 21 and 22 will be forced through the perforations of said plates, thereby bonding the layers of rubber together.

While we have employed the term "rubber" throughout the specification and claim, we wish it distinctly understood that this term applies to all gum or rubber compounds, or to all compositions of materials having the qualities of rubber, and that are employed as substitutes therefor, and are the equivalents thereof.

We claim:

A sole for boots and shoes having, in combination, a body portion comprising a plurality of layers of rubber, and a plurality of perforated metal plates, with one plate between each of said rubber layers, the rubber of said layers being bonded together through said perforations, and the perforations of adjacent plates being out of alignment with each other.

In testimony whereof we have hereunto set our hands.

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