F. BOYLE.

RUBBER SOLE.

APPLICATION FILED DEC. 24, 1914.

1,137,724. Patented Apr. 27, 1915.

Fig. 1

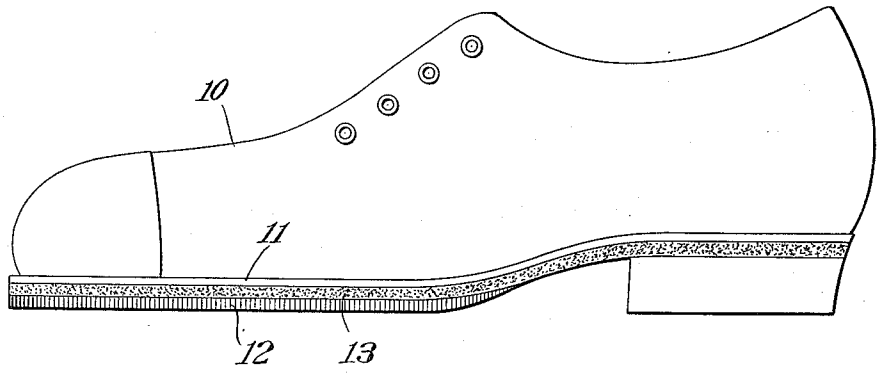
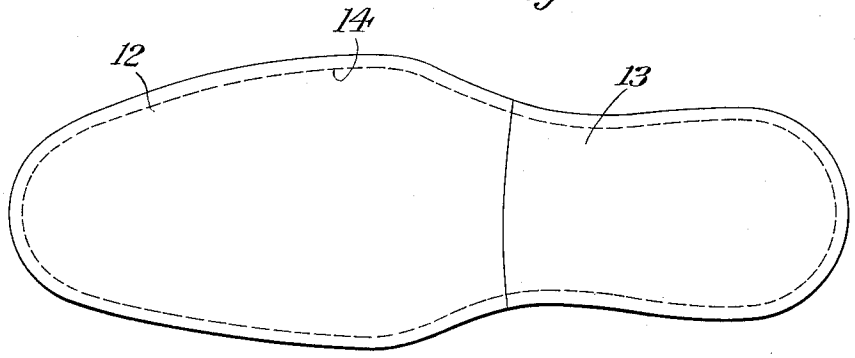


Fig. 2



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UNITED STATES PATENT OFFICE.

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RUBBER SOLE.

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To all whom it may concern:

Be it known that I, FRANCIS BOYLE, a citizen of the United States, and a resident of New York, county of New York, State of New York, have invented certain new and useful Improvements in the Manufacture of Rubber Soles, of which the following is a full, clear, and exact description.

My invention relates to soles for boots and shoes, and more particularly to rubber soles.

In the manufacture of shoes provided with rubber soles it has been customary to attach the rubber sole directly to the leather sole or welt of the shoe by fastenings, such as stitches, metallic nails, etc. This construction has proved very unsatisfactory because the rubber sole quickly snubs off in chunks at the edge back to the line of the fasteners due to forcible impact with hard obstacles, thereby loosening the fastenings, breaking away from the leather sole or welt, and quickly becoming unfit for use.

It is the object of my invention to provide a rubber sole which can be stitched, nailed, or otherwise secured to the leather sole or welt, and will be capable of superior wearing qualities and superior retaining qualities for the fastening devices, and which shall be also neat and attractive in appearance, and retain its edge line intact much longer than has hitherto been possible in rubber soled boots and shoes.

To attain these results I provide a rubber sole embodying a tread and a backing therefor, especially adapted to withstand the wear and usage to which they are individually subjected, while at the same time forming a unitary structure.

By my invention I provide a rubber sole in which the tread portion throughout is stiffer and stronger than the backing, whereby it is less liable to break or chip from impact with hard substances, and form a firm anchorage for the fastening means, such as stitches, nails, etc., and is more durable than ordinarily, thus, through the prolonging of the life and appearance of the tread, prolonging the life of the entire sole.

The invention consists in a sole for a boot or shoe embodying therein an integral mass of vulcanized rubber, comprising a tread of relatively firm, tough, strong and comparatively unyielding rubber and a backing therefor of more or less yielding and elastic rubber, and in such other novel features as are hereinafter set forth and described and more particularly pointed out in the appended claims.

In the accompanying drawing: Figure 1 is a side elevation of a shoe equipped with a rubber sole embodying my invention; Fig. 2 is a fragmentary bottom view of the shoe shown in Fig. 1.

Referring to the drawing 10 designates a shoe having secured to the leather welt sole 11 a sole embodying a tread 12 of relatively firm, tough, strong and comparatively unyielding rubber, and a backing 13 integral therewith, of more or less soft and elastic rubber, whereby the tread will have superior wearing qualities, and superior retaining qualities for the fastening means, which in this instance is illustrated as a line of stitching 14, while the backing will have the usual cushion function so desirable in rubber soles.

The tread is preferably of such consistency as to approximate leather in stiffness whereby stitch-retaining and marginal edge-retaining qualities approximating that of leather will be produced in the sole, while at the same time the product will be characterized by an absence of the separable strata existent in the combination of a leather tread with a rubber backing.

In one embodiment of my invention I make the tread and backing of the same grade of rubber stock but incorporate more sulfur or other vulcanizing agent in the tread than in the backing, so that during vulcanization the tread will partake of a firmer, tougher, and less yielding body than the backing. I also accomplish the same result by making the tread and backing of the same or even different rubber compounds and initially partially curing the tread so that during vulcanization in contact with the backing the additional heat will effect the desired degree of firmness and strength in the tread. I also effect the same result by making the tread and backing respectively of different grades of rubber stock which inherently have the relative physical characteristics desired in the product.

In constructing the sole I prefer to form the tread and backing from calendered sheets of rubber; to assemble the same either before or after cutting from the

sheet; and finally to cure the cut soles in a vulcanizer. The tread and backing initially adhere intimately with each other at their contacting surfaces and subsequently flow together during vulcanization and form a unitary integral mass, in different portions of which exist different qualities adapted to withstand the wear and usage to which they are individually subjected, as above described.

In carrying out my invention there are a great number of variations possible in the treatment and manipulation of the rubber stock, and my invention is not limited to any particular method above described, but is intended to include all methods which produce the results and conditions involved in the principle of my invention, which resides in the embodiment in a rubber sole of inseparable strata or layers having different qualities which adapt them to withstand the wear and usage to which they are individually subjected.

What is claimed is:

A vulcanized rubber sole of unitary integral structure embodying a bottom layer of stiff, tough and comparatively non-compressible consistency, adapted to form a firm anchorage for securing means, and an upper layer of yielding elastic consistency adapted to form a cushion.

Signed at New York, county and State of New York, this 23rd day of December, 1914.

FRANCIS BOYLE.

Witnesses:

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