J. D. PRINCE.

TREAD SURFACE FOR BOOTS AND SHOES.

APPLICATION FILED DEC. 20, 1913.

1,226,247. Patented May 15, 1917.

Fig. 1.

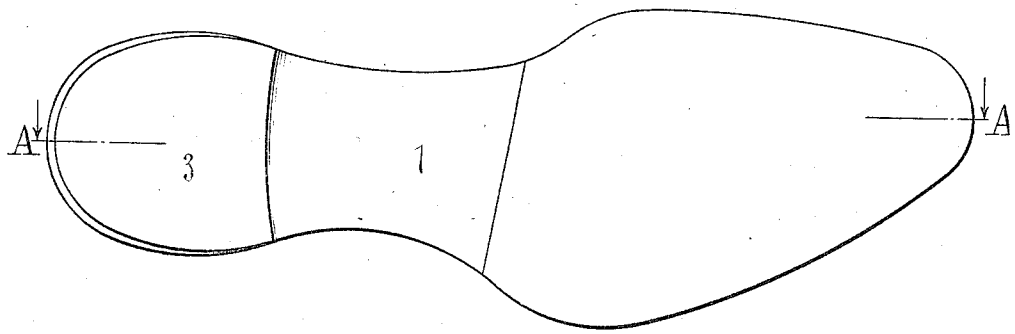


Fig. 2.

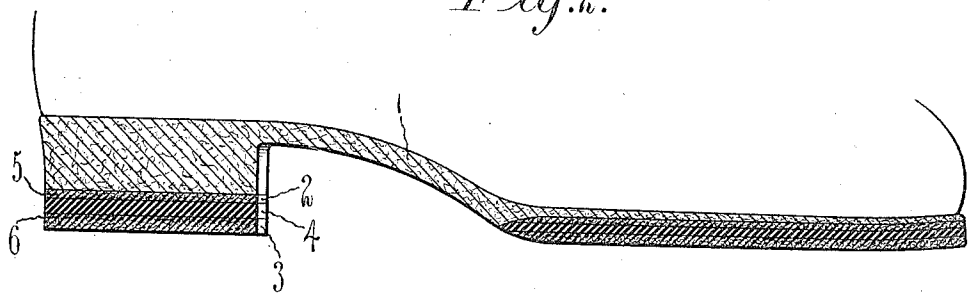


Fig. 3.

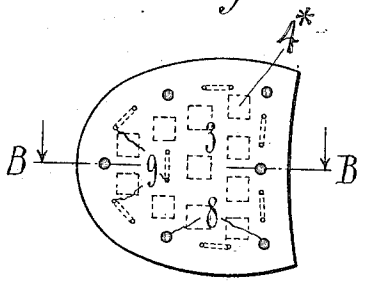
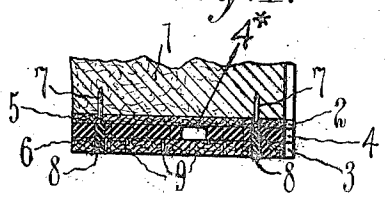


Fig. 4.



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UNITED STATES PATENT OFFICE.

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TREAD-SURFACE FOR BOOTS AND SHOES.

1,226,247. Specification of Letters Patent. Patented May 15, 1917.

Application filed December 20, 1913. Serial No. 807,943.

To all whom it may concern:

Be it known that I, JOHN D. PRINCE, a citizen of the United States, and resident of the borough of Manhattan, in the city and State of New York, have invented a new and useful Improvement in Tread-Surfaces for Boots and Shoes, of which the following is a specification.

This invention relates to tread surfaces for boots, shoes and the like, with the object in view of providing such a surface in which there is combined the resilience of rubber with the wearing and non-slipping qualities of leather.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents a bottom plan view of the sole and heel of a shoe,

Fig. 2 represents a longitudinal section taken in the plane of the line A—A of Fig. 1, looking in the direction of the arrows,

Fig. 3 represents a bottom plan view of a modified form of heel, and

Fig. 4 represents a detail vertical section taken in the plane of the line B—B of Fig. 3, looking in the direction of the arrows.

It is well known that rubber has been utilized for the tread surfaces of boots, shoes and the like in the place of leather, but such use has presented appreciable drawbacks, for the reason that the rubber is rapidly worn and rotted under certain conditions; that it presents rather an unsightly appearance; that it is not stiff enough for ordinary service, and, particularly in the case of heels; that it has been very difficult to so fasten the rubber onto the shoe that it would not become loose; and further, owing to the fact that such rubber heels are exceedingly prone to slip under certain weather conditions.

By my invention I have so combined leather and rubber in such a structure that all these difficulties are obviated while a greater wear and ease of walking is obtained than in the case of either leather or rubber.

In carrying out the invention, I associate layers of leather and rubber and preferably interpose one layer of rubber between two layers of leather, the whole being vulcanized into a firmly bonded structure.

Referring to the drawings, the main sole and heel combined of the shoe is denoted by 1. The half sole and lower portions of the heel are formed according to this invention, and as they are both constructed in the same manner, a full description will be given of only one, to wit; the heel portion.

This heel tread comprises an upper layer of leather 2, a lower layer of leather 3 and an interposed layer of rubber 4.

It will be noted that the layer 3 of leather is somewhat thicker than the layer 2 and that the layer 4 of rubber is about the same thickness as the layer 3 of leather. This is the relationship which I prefer, but it is not an essential part of the invention. I also prefer to perforate the layer of rubber, as denoted at 4*, as this economizes rubber, and tends to make the structure more resilient.

In forming this heel surface, I preferably proceed as follows: The surfaces of the layers 2 and 3 of leather which are to be placed adjacent the rubber layer 4 are either roughened or peeled so as to present a somewhat porous surface. The leather is then placed in a chamber containing a solution of vulcanizable rubber compound. After the leather has been placed in this vessel, the same is closed in any desired manner and a vacuum created therein by means of an ordinary suction pump or other means conveniently at the disposal of the operator.

This vacuum will cause the vulcanizable rubber compound to penetrate the layers of leather, particularly on the sides or surfaces which have been roughened or peeled. This penetration of the rubber into the leather is denoted in Figs. 2 and 4 of the drawings by the extension of the heavy black lines into the leather layers 2 and 3 as at 5 and 6.

The length of time during which the leather is subjected to this treatment roughly determines the extent of the penetration of the rubber, and when the desired point has been reached the leather may be removed from the vessel.

The layer of rubber 4 is preferably formed in the desired thickness and then semi-cured in any manner well known to the art.

The two surfaces of the layer of rubber 4 are then preferably coated with a rubber cement which is adapted for a quick vulcanization at a relatively low temperature, and the two surfaces of the leather layers 2, 3, which are to be adjacent the rubber layer 4 are also coated with a similar cement.

After the layers have been thus treated, they are assembled in the proper position, put under pressure and vulcanized, but I

prefer not to use a temperature above 260° F. during the vulcanization so as to be sure and avoid any deleterious action upon the leather.

The composition of the liquid rubber and rubber cement used, with regard to their vulcanizability, and the extent to which the rubber layer has been semi-cured, should be regulated so that the whole will be uniformly completely vulcanized at a given time.

The fact that the leather has been partially impregnated with rubber will cause an exceedingly firm union of the rubber and leather elements while preserving great flexibility, involving contractibility and extensibility in structure.

After the article has been thus completed, it may be secured to the heel of the shoe in any desired manner, and I suggest the use of nails 7, which are countersunk through the outer layer of leather 3 and the layer of rubber 4 so that their heads are flush with the inner layer of rubber 2. The holes through which the nails are countersunk may then be plugged with rubber plugs 8 in order to present an unbroken surface.

The nails 7 being thus far countersunk will not come to the surface until the heel tread has been almost entirely worn out, while, at the same time, they will firmly hold the tread onto the shoe by reason of their engagement with the layer of leather 2.

If desired, some anti-slipping devices may be embedded in the outer layer of leather 3, before it is united to the other layers, such, for instance, as U-shaped staples 9. These staples will provide an anti-slipping surface for the heel tread.

It will be understood, as stated above, that the half-sole tread is formed in the same manner, and it may be secured to the shoe in any desired way, such, for instance, as by nailing or sewing.

I have found, in practice, that tread surfaces thus constructed are exceedingly resilient and comfortable, that the leather surface prevents slipping in wet weather and that the rubber cushion enables the leather surface to yield so that after weeks of usage the wear is hardly appreciable.

It will be understood that various changes may be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to specific details except as they are set forth in the claims.

What I claim is:—

1. A tread for boots and shoes comprising a layer of rubber, and a compound layer consisting of leather having certain of its surfaces impregnated with rubber, said surface and layer of rubber being vulcanized into a firmly bonded structure.

2. A tread for boots and shoes comprising layers of leather, each of said layers having certain of its surfaces roughened and impregnated with rubber, and a layer of rubber interposed between said rubber impregnated surfaces, the whole being vulcanized into a firmly bonded structure.

3. A tread for boots and shoes comprising layers of leather, each of said layers having certain of its surfaces roughened and impregnated with rubber, and a layer of perforated rubber interposed between said rubber impregnated surfaces, the whole being vulcanized into a firmly bonded structure.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this third day of December, 1913.

JOHN D. PRINCE.

Witnesses:
F. GEORGE BARRY,
C. S. SUNDGREN.