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FABRIC BACKING FOR COMPOSITION SOLES.
APPLICATION FILED OCT. 7, 1918.

1,400,428. Patented Dec. 13, 1921.

FIG. 1.

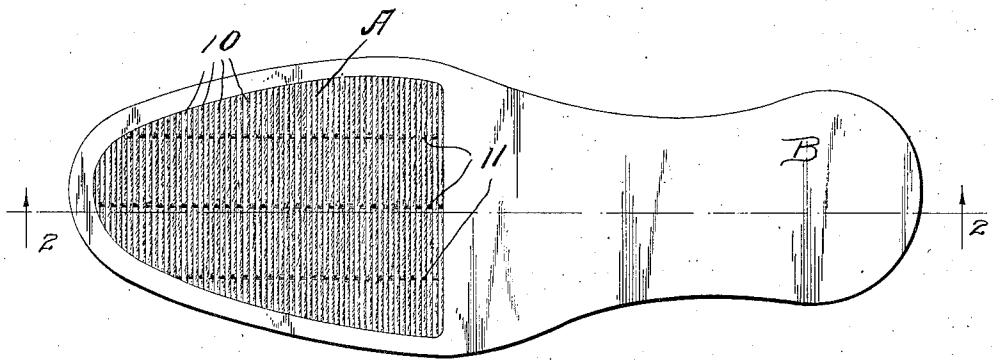
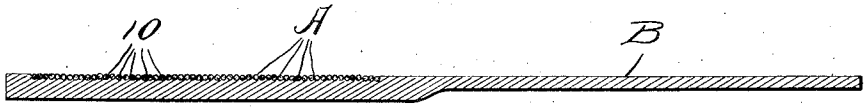



FIG. 2.



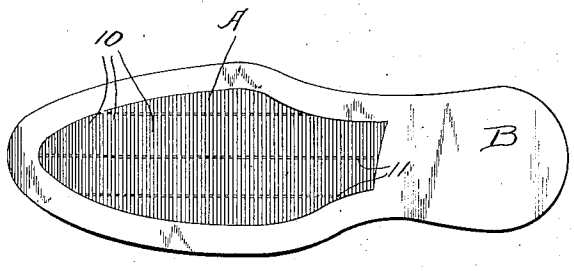




FIG. 3.

Inventor
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# UNITED STATES PATENT OFFICE.

GORDON B. GREENOUGH, DECEASED, BY NELLIE B. GREENOUGH, ADMINISTRATRIX, OF MALDEN, MASSACHUSETTS, ASSIGNOR TO THE GOODYEAR TIRE & RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

## FABRIC BACKING FOR COMPOSITION SOLES.

1,400,428. Specification of Letters Patent. Patented Dec. 13, 1921.

Application filed October 7, 1918. Serial No. 257,259.

*To all whom it may concern:*

Be it known that I, NELLIE B. GREENOUGH, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, administratrix of estate of GORDON B. GREENOUGH, deceased, do hereby make application for Letters Patent of the United States covering the invention of said GORDON B. GREENOUGH of Improvements in Fabric Backing for Composition Soles, of which the following is a specification.

The present invention relates to new and useful improvements in the construction of composition soles.

One of the principal objects of the present invention is to incorporate in a composition sole, whether it be a rubber composition or a synthetic product such as "Neolin," a fabric backing which will act to stiffen the sole, without adding to the weight thereof and without affecting the structural unity of the sole.

Another important object of the invention is to provide a fabric backing which is of such nature that while the sole will be stiffened in so far as detection through the wearer's senses is concerned, it will not be stiffened in the sense that the ease in walking, secured by composition soles, will be diminished.

A more specific object of the invention is to provide for a composition sole a fabric backing which may be vulcanized with the sole to form a unitary part thereof and which will stiffen the sole against transverse flexing, secure it against transverse stretching, but will not diminish the longitudinal flexibility of the sole.

The above and additional objects of a similar nature, which will be hereinafter more specifically treated, may be accomplished by such means as are illustrated in the accompanying drawings, described in the following specification, and then more particularly pointed out in the claims which are appended hereto and form a part of this application.

With reference to the drawing, wherein there has been illustrated a preferred embodiment of the invention as it is reduced to practice, and throughout the several views of which, similar reference numbers designate corresponding parts:

Figure 1 is a plan view of a composition sole illustrating the improved backing applied thereto;

Fig. 2 is a longitudinal section on the line 2—2 of Fig. 1; and

Fig. 3 is a modified form of the invention in which the reinforcement is carried back into the instep portion of the sole.

The fabric backing proposed by this invention and illustrated in the drawings is made from what is known in the textile art as cord fabric.

Fabric of this character consists of a plurality of independent cords extended in only one direction and in parallelism to each other, there being no interweave except for light threads of cotton which connect the parallel cords very insecurely and only for the purpose of maintaining the cords in proper assembled relation while the fabric is being handled prior to its incorporation in a finished product.

In the accompanying drawing, the backing generally denoted by the letter A, comprises a number of twisted cords 10 laid in parallelism and connected by a plurality of widely spaced interwoven light cotton threads 11 which serve as above described to hold the cords in the proper assembled relation during the manufacture of the sole (designated B as a whole) but do not in any appreciable sense, tie the cords to one another. As a result, each cord comprising the fabric backing is free from each adjacent cord.

The fabric is preferably cut to leave a margin 12 of rubber or composition as the case may be, at the edge portion of the sole so that the stitching of the sole to the upper or welt of the shoe will not require that the stitching threads be passed through the fabric backing and whereby also the sole is not stiffened transversely to such an extent as to render the shoe uncomfortable in use.

The fabric backing is placed in the mold with the plastic rubber when the sole is to be cured, and after the cure, forms a unitary part of the sole, being united to the body of the sole through vulcanization process.

In Fig. 3 a modified backing is illustrated, wherein the backing is projected back of the ball portion of the foot and into the instep region to take care of the strains experienced there, as will be understood.

Attention is now directed to the fact that, inasmuch as the cords which comprise the fabric backing extend transversely across the sole, their presence will not result in a decrease of longitudinal flexibility, for they will, in fact, offer no resistance to longitudinal flexing of the sole.

It is to be noted, however, that the capacity of the sole for transverse flexing is diminished and, as a result, the sole feels stiffer to the wearer's foot since it will not so readily yield to and transmit to the wearer's foot, shocks resulting from contact with stones, bumps, or other foreign elements on the floor or road.

Furthermore, the presence of the transverse cords, (whose coefficient of elongation is very small), prevents the sole from stretching transversely and therefore prevents impairment of the appearance of the shoe after it has been in service. Thus, the present construction overcomes what has been a very principal objection to rubber and composition soles as heretofore made.

What is claimed is:

1. A shoe sole comprising a body formed of vulcanized material and a cord fabric backing countersunk in the surface of the sole and incorporated therein by vulcanization, said backing having an exposed surface flush with the surface of the sole.

2. A shoe sole comprising a body formed of vulcanized material and a cord fabric backing countersunk in the surface of the sole and incorporated therein by vulcanization, the backing being of such dimensions that a free margin of sole extends around the backing.

3. A shoe sole comprising a body formed of vulcanized material and a cord fabric backing countersunk in the surface of the sole and incorporated therein by vulcanization, the backing being of such dimensions that a free margin of sole is provided around the edge thereof said backing having an exposed surface flush with the surface of the sole.

4. A shoe sole comprising a body portion formed of flexible material, and a reinforcing backing incorporated therein with its upper surface exposed, the backing including flexible unwoven cord elements arranged at an angle normal to the major axis of the sole to restrict the flexing action of the body portion in a transverse direction only.

5. A shoe sole comprising a body portion formed of flexible material, and a reinforcing backing incorporated therein with its upper surface exposed, the backing including flexible unwoven cord elements arranged substantially at an angle normal to the major axis of the sole to restrict the flexing action of the body portion in a transverse direction only and being of such dimensions that a free margin of sole extends around the backing.

6. A shoe sole comprising a body portion formed of flexible material, a reinforcing backing incorporated therein with its outer surface flush with the surface of the sole, the backing including flexible unwoven cord elements lying in parallelism and arranged substantially at an angle normal to the major axis of the sole to restrict the flexing action of the body portion in a transverse direction only.

7. A shoe sole comprising a body portion formed of vulcanized material, and a reinforcing backing having an exposed surface flush with the surface of the sole and incorporated within said sole by the process of vulcanization, said backing comprising a plurality of substantially independent cord lengths disposed in parallelism transversely of the sole, whereby transverse stretching of the sole is precluded without diminishing its longitudinal elasticity.

8. A shoe sole comprising a body portion formed of vulcanized material, a reinforcing backing having an exposed surface flush with the surface of the sole, and incorporated within said sole by the process of vulcanization, said backing comprising a plurality of substantially independent cord lengths disposed in parallelism transversely of the sole, whereby transverse stretching of the sole is precluded, and a margin upon the sole inclosing the edges of said backing.

9. A shoe sole comprising a body portion formed of a vulcanized material, and a reinforcing backing incorporated therein by the process of vulcanization, the backing including flexible unwoven cord elements arranged to restrict stretching action of the body portion in a transverse direction and having an exposed surface flush with the surface of the sole.

10. A shoe sole comprising a body portion formed of vulcanized material, and a reinforcing backing incorporated therein by the process of vulcanization, the backing including flexible unwoven cord elements arranged to restrict stretching action of the body portion in a transverse direction and having an exposed surface flush with the upper surface of the body portion.

In testimony whereof, I have signed my name in the presence of two subscribing witnesses.

NELLIE B. GREENOUGH,
*Administratrix of Gordon B. Greenough, deceased.*

Witnesses:
CHARLES FRANK DAY,
ANDREW A. PORTER.