No. 812,384. PATENTED FEB. 13, 1906.

A. THOMA.

REINFORCING FABRIC FOR INNERSOLES.

APPLICATION FILED MAY 15, 1905.

Fig. 1.

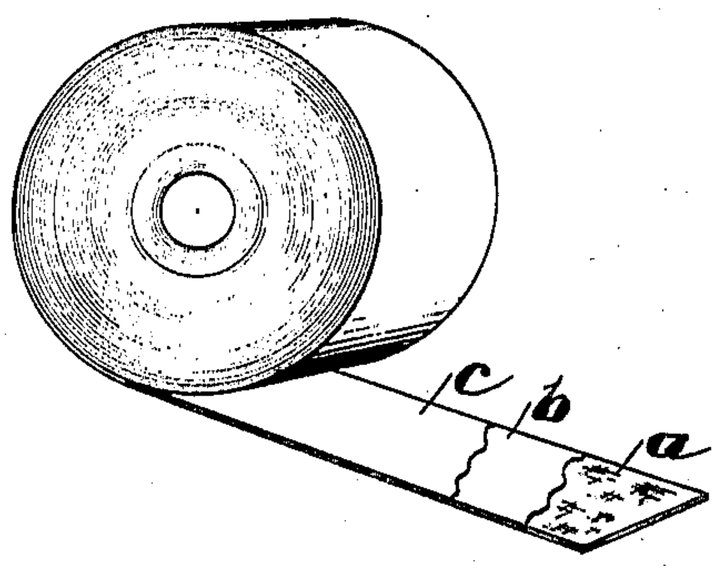
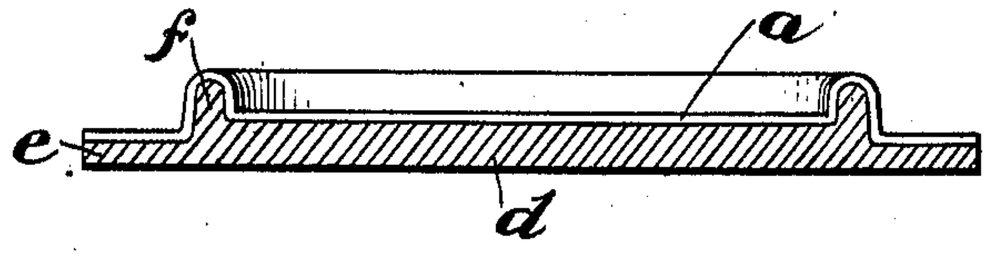


Fig. 2.



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UNITED STATES PATENT OFFICE.

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REINFORCING FABRIC FOR INNERSOLES.

No. 812,384. Specification of Letters Patent. Patented Feb. 13, 1906.

Application filed May 15, 1905. Serial No. 260,558.

To all whom it may concern:

Be it known that I, ANDREW THOMA, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Reinforcing Fabric for Innersoles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The object of my invention is to provide a reinforcing-strip of canvas or the like which which can be applied directly to an innersole (of the kind in which a raised stitch-receiving lip or rib is turned up substantially parallel to and slightly in from the edge or feather of the sole) without the use of the usual rubber cement, and yet with certainty of proper tenacious application thereof to the entire surface to be covered and also with certainty that the said fabric covering will remain permanently secured during the life of the innersole. In my copending application Serial No. 249,688, filed March 13, 1905, I have set forth at length the advantages which I aim to secure. In applying reinforcing-canvas in the ordinary manner by separately brushing with naphtha rubber-cement both the canvas and the leather and then hammering the two coated surfaces together after they have dried and set there is not only a great waste of time, expensive cement, and labor, but the already stiff canvas is rendered still stiffer by the hardened cement thereon before the canvas is applied to the innersole-body. Accordingly I have aimed to secure three principal ends: first, to provide a reinforcing material which instead of being stiff and hard to manipulate can be rendered soft and exceedingly pliable by steaming or otherwise soaking in a proper moistening-bath, so that it can be applied easily and neatly to the innersole; second, to eliminate the use of liquid cement, which is not only slow-drying and expensive, but invariably daubs and soils those surfaces of the shoe which should be kept clean and is unhealthy, volatile, readily catches fire, and is wasteful, and, third, to save time by providing a reinforce capable of quick application and quick drying.

My invention also has other advantages, such as being permanently flexible and permanently adherent—*i. e.*, not liable to dry loose or crack off from the innersole-body, as is frequently the case with the use of rubber-cement.

For the purpose of illustration I have shown in the accompanying drawings, in Figure 1, a perspective view of a roll of my reinforcing-strip material ready for use, and, in Fig. 2, a cross-sectional view of an innersole having my fabric applied thereto.

My invention, although applicable to various other uses, is particularly intended for the manufacture of innersoles, and therefore I will describe it in connection therewith. Having stripped the fabric, usually canvas, into widths of, say, four and one-half inches and in convenient lengths for handling—say fifty to one hundred or more yards in length—I apply to one side of the strip *a* a thin layer *b* of very sticky compound having the property of adhering strongly to cotton, and on this as a base I apply one or more coatings *c* of a somewhat different nature, so that the final result is that the coating is not sticky except under heat, but when heated will become sticky and capable of adhering strongly to the usual innersole-foundations, such as leather, leather-board composition, and the like. Various well-known compounds may be employed; but I prefer to employ for the first or basic coating, a compound consisting of twenty per cent. of resinous residuum of petroleum and eighty per cent. of gum chicle, or pontianac, or tuna, or almeidina, or any vegetable gum of a similar nature and for the second and subsequent coatings a compound consisting of five per cent. of said residuum of petroleum, twenty per cent. of said gum chicle or other enumerated gums, and seventy-five per cent. of resinous gutta-percha. The point to be observed in respect to the compounds is that the base shall be tacky or sticky and capable of adhering strongly to the cotton or other material upon which it is placed and capable also of adhering strongly to the next layer or coating, while said next layer or coating is not normally sticky, but yet is capable of becoming exceedingly sticky upon proper treatment, as the application of dry heat. I prefer the use of resinous residuum of petroleum, because not being readily oxidizable it prevents

the finished coated fabric from deteriorating when exposed to the air, and yet it is very tacky. For the latter reason I employ a larger proportion of this ingredient in the base or first coating and only barely enough of it in the second coating to properly join the two coatings. I rely mainly upon the gutta-percha for the normally non-sticky character of the finished surface of the coated fabric. These strips of prepared canvas may then be rolled up in quantity and kept (because of their non-oxidizable character) for a long time, if desired.

A reinforcing material prepared as above stated can be applied directly to the innersole-body without the use of any liquid cement and without treating the innersole in any way, said material being capable of adhering directly to the dry leather or other body. Also this reinforcing material thus prepared can be moistened to any extent desired and even saturated in hot water, if required, in order to soften its fibers, so that it can be molded to fit the special curves and shapes of the innersole. In Fig. 2 I have shown a section through a body *d* of the innersole which shows the curves and special requirements of the innersole-reinforcing fabric *a*, the feather of the innersole being indicated at *e* and the stitch-receiving rib at *f*. When applied, it dries quickly and adheres at once.

In use the fabric is first thoroughly moistened in a steam-bath or hot-water bath and is then passed over an intense dry heat, whereby the normally non-sticky coating is rendered exceedingly sticky. The fabric is thereupon applied directly to the innersole and cut off in proper lengths. The hot-water application is advantageous in a number of particulars, as it not only softens the fibers, so that the fabric is pliable, and prevents any liability of burning or scorching the fabric under the subsequent intense heat, but it softens to some extent the coating prior to the heating thereof and also maintains said heated coating properly moist for a considerable time, thereby retaining said coating in a sticky condition long enough to permit its application with proper deliberation to the innersoles. The coating is not only waterproof, but its nature is such that it withstands the action of the enveloping steam or of the hot or boiling water, so that the strip of canvas may be subjected to the latter sufficiently to eliminate all stiffness therefrom and become soft and limp. The relatively thick coating is rendered workable by the joint action of the wet heat and dry heat, so that, in connection with the pliable canvas, it can be shifted and molded even after it has been stuck to the innersole to conform to the exact requirements of the latter without losing its adhesion thereto.

My reinforcing fabric above described has a normally non-sticky surface on its coated side, whose stickiness can be instantly developed by heat, but which need not be applied hot, as it retains its stickiness for a considerable time and remains workable and adhesive, so as to be capable of being applied to the body *d* in a cold condition and thereafter pressed and molded to the innersole. The thick coating also produces under normal conditions of temperature in connection with the subsequent drying of the canvas on the innersole a firm and stiff reinforcing of the latter, affording a material additional body of strength and stiffness to the innersole, so that thin weak foundations of innersole material may be employed with good results. The wet condition of the fabric also greatly facilitates the cutting or trimming of the reinforcing-canvas on the inner sole.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. As an article of manufacture, a strip of reinforcing fabric, coated on one side with a base of sticky compound adhesive to the fabric, and an external coating on said base of non-sticky, non-oxidizing compound unaffected by water, and capable of becoming sticky under dry heat.

2. As an article of manufacture, a strip of reinforcing fabric, having a coating on one side, normally tacky next to the fabric and decreasingly tacky toward the exterior surface of the coating, which can be rolled without sticking the roll together, said coating being rendered exceedingly sticky by the application of dry heat.

3. As an article of manufacture, a strip of reinforcing fabric, coated on one side with a base of normally sticky compound and with an external coating thereon of normally non-sticky compound unaffected by water and capable of being rendered sticky by heat.

4. As an article of manufacture, a strip of reinforcing fabric, having a coating on one side whose external surface is normally non-sticky, said coating being capable of being rendered sticky by heat and being thereafter capable of adhesion when cold.

5. As an article of manufacture, a strip of reinforcing fabric, having an external coating normally non-sticky, but capable of being rendered sticky by heat, and containing a large percentage of gutta-percha, combined with ingredients maintaining said stickiness when cold.

6. As an article of manufacture, a strip of reinforcing fabric, having a base containing a large percentage of resinous residuum of petroleum, and an external coating containing a large percentage of resinous gutta-percha.

7. As an article of manufacture, a strip of

reinforcing fabric, having a base containing resinous residuum of petroleum and a sticky vegetable gum, and an external coating thereon containing a small percentage of said residuum of petroleum, and a large percentage of said vegetable gum and resinous gutta-percha, the latter predominating.

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

ANDREW THOMA.

Witnesses:

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M. A. JONES.