

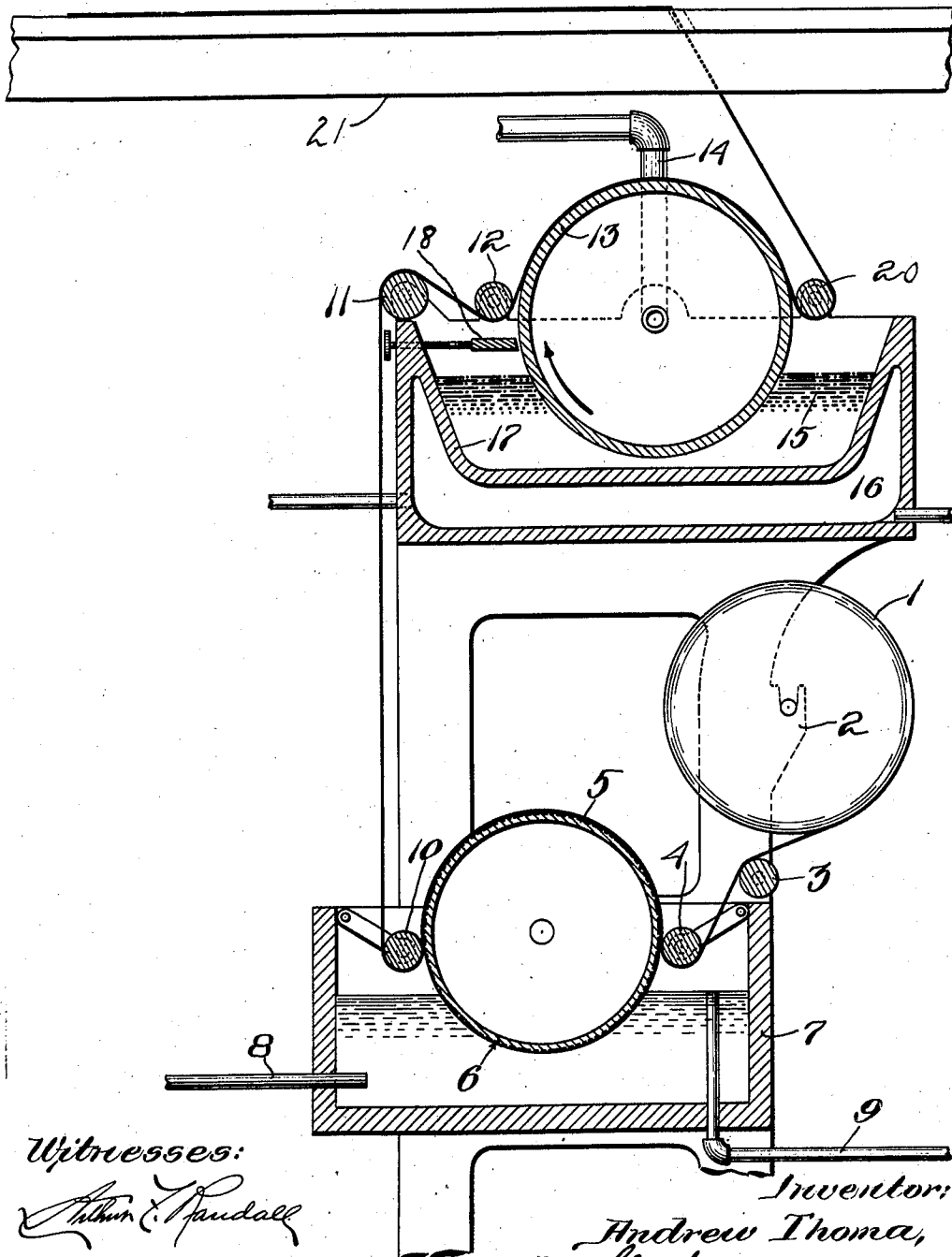
No. 853,326.

PATENTED MAY 14, 1907.

A. THOMA.

ART OF APPLYING REINFORCING FABRIC TO INNERSOLES AND THE LIKE.

APPLICATION FILED OCT. 2, 1905.



Witnesses:

Arthur E. Randall
Chas. A. Jones.

Inventor:

Andrew Thoma,
by Geo. H. Maxwell,
Attorney.

UNITED STATES PATENT OFFICE.

ANDREW THOMA, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO CLIFTON MANUFACTURING COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ART OF APPLYING REINFORCING FABRIC TO INNERSOLES AND THE LIKE.

No. 853,326.

Specification of Letters Patent.

Patented May 14, 1907.

Application filed October 2, 1905. Serial No. 280,930.

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 Suffolk and State of Massachusetts, have invented an Improvement in the Art of Applying Reinforcing Fabric to Innersoles and the Like, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

One of the most difficult parts of shoe manufacture is the reinforcing of the innersoles with canvas, due to the difficulty of making the canvas stick to leather. The innersole body contains a feather edge for supporting the upper and a stitch-receiving rib or projection to which the edge of the upper and of the welt are sewed, and in order to make the comparatively stiff canvas conform neatly and accurately to these depressions and projections and become adherent to the entire surface, pounding machines are used for pressing the canvas to the leather by rapid pressing movements or blows applied simultaneously to the canvas at the opposite sides of the rib and progressing around the rib from one end thereof to the other. The result is that as the stiff canvas is being pounded down at one side, it is pulled up at the other side of the innersole. The usual means of securing the canvas is by naphtha-rubber cement, which is not only expensive, but, because of the evaporation of the naphtha and its quick oxidation, will not hold properly. Moreover, it is repelled by the wet leather, and, being exceedingly stringy in character, is wasteful and tends to smear surrounding objects. Other means have been devised for cementing the fabric, but the absorbent character of the fabric and the repellent character of the wet or oily leather have stood in the way of success.

My invention consists in providing the fabric with a thin coating impervious to the cementing agency, but which is influenced by heat so as to become capable of amalgamating or uniting with the cementing agency without losing its character as a coating, and then applying a special cementing agency capable of uniting tenaciously with the external surface of the coating on one side and with the fiber of the leather on the other side. In other words, I interpose between the ce-

ment and the fabric a barrier which remains on its cloth side solely as a coating but on its external side it unites integrally with the cement and keeps all the adhesive properties of the cement externally available and active for adhering to the leather.

I have found that, in cements which are capable of penetrating and enveloping the surface fibers of leather with the requisite grip to maintain adhesion in spite of the presence in the leather of dampness, oil, whiting or other repellent matter, a great amount of the sticky property is commonly absorbed by the canvas, so that the strength and adhesiveness of the cement is lost for the leather. I provide a special means of applying the cement, and the latter is so compounded that, taken with the above-described method, a copiousness and adhesiveness are obtained which will produce a tenacious close union with the leather under all circumstances and will not be repelled by the damp leather, whether fatty in character or otherwise filled with repellent or undermining materials such as soap, whiting, etc.

Further details of my invention will be more particularly pointed out in the course of the following description, reference being had to the accompanying drawings in which I have illustrated in vertical transverse section one form of mechanism for carrying out my invention. I do not, however, herein claim the machine nor the fabric-article, but reserve them for separate patents, the present case being restricted to the process or art of treating, applying and securing the fabric.

I first coat the canvas, full width, with a layer of suitable resinous or sticky material capable of becoming firm and non-sticky or dry when cold, so that the coated sheet or strip can be rolled and practically handled. I will mention later on a wide variety of materials which may be used for this purpose, but I prefer to use a gutta percha or vegetable gum coating, as it can be readily applied in an exceedingly thin coating if desired, affords a great strength of resistance or toughness on cooling, and is readily responsive to heat. The sheet when thus coated is then cut into strips of the required width for the reinforcing purpose in hand. For the purpose of rendering my invention plainly understood, I will confine my description to the reinforcing of innersoles (although it will be

understood that it is capable of various other applications). I then mount a roll 1 of this coated strip, wound with the coated side inward, on a suitable support 2 and pass the same down over guide rolls 3, 4, into contact with the upper side of a moistening drum 5 provided with an external surface 6 of felt or other suitable moisture-carrying material, and turning freely in a moistening tank 7 preferably filled with water, shown as steam heated by pipes 8, 9. The uncoated side of the fabric is pressed tightly on the upper side of the drum 5 over a sufficient extent of surface thereof to insure proper moistening of the fabric in order to render it readily pliable, being thence conducted over guide rolls 10, 11, 12 to a hot drum 13 of iron or other suitable heat-radiating material, said guide rolls 10—12 and drum being so located as to bring the coated side of the fabric in contact with the drum, heated by any suitable means as steam from a steam pipe 14. The heat of the drum 13 instantly transforms the previously dry coating of the fabric to a sticky condition, and simultaneously moistens it with an application of hot, strongly adherent, non-oxidizing cement 15 maintained highly liquid by a steam-jacket 16 or other heating means for the cement tank 17. The result is that a strong union of the gutta-percha coating and the cementitious liquid is effected and a more perfect and copious external stickiness is secured without losing any of its penetrating qualities than can be obtained otherwise. The saturated covering of the dampening roll 5 properly and uniformly dampens, without soaking, the uncoated side of the fabric which not only facilitates the subsequent application of the canvas to the innersoles, but makes certain that the canvas side or inner surface of the gutta-percha coating will not be influenced by the heat but will remain as an impervious barrier between the cement and the canvas, while the external surface of said coating is instantly rendered tacky and sticky by the steam heated drum, so that it will unite with and support any desired amount of the non-oxidizing outer layer of hot cement 15. I provide a cement-regulator or coating-controller 18 capable of being carefully adjusted by a screw 19 for limiting the amount of fluid cement conveyed by the hot roll, thereby insuring the exact and uniform coating required. The heat of the drum directly on the gutta-percha-coated side of the fabric softens said coating and the hot cement prolongs the heating of the undercoating and unites with it in producing an adhesive quality (as well as quantity) which it is impossible to get with the methods at present employed.

The penetrating outer coating of sticky non-oxidizing cement consists of soft, sticky residuum of petroleum reinforced with stearin

pitch or other strongly adhering resinous mass capable of being used for this purpose. My special coating is set forth in my application Ser. No. 249,688, filed Mch 13 1905. This treatment of the gum or gutta percha coating develops an exceedingly pliable and adhesive quality which is not repelled or undermined by a little moisture or fatty or oily matter, for, by union with this special top dressing, a different organic element is introduced, and the still more pliable and sticky cementitious element of the top dressing is introduced at the time of the subjection of the gutta percha coating to the action of heat, thereby not only rendering the entire coating non-oxidizable, but retaining on the surface all the penetrating, viscid qualities. If the gutta percha coating were placed on the outside and the non-oxidizing coating on the inside of the fabric, only a small amount of the sticky properties would be available, whereas by my present method I can get any amount of stickiness, and instead of being required to use a large amount of gutta percha, thereby tending to stiffen and harden the cloth, my present method enables me to secure extreme pliability, because only a very thin basic coating is necessary, amounting, in fact, to not much more than a mere sizing, as it depends almost wholly on the external cement layer for the sticking quality and does not necessarily depend at all therefor upon the foundation coating. Although preferably I use a more or less heavy foundation coating such as already described, which materially aids in developing and retaining the adhesive qualities, I prefer to use gutta percha as a foundation coating, for reasons already mentioned, and also as it is non-sticky when dry, although a normally sticky coating can be used and dusted over with starch, whitening, or the like, to enable it to be rolled and handled, which will disappear when heated, being taken up or lost between the heated coating and the heated cement. For instance, I may employ solutions of vegetable oils and resins. Nor do I limit myself to the particular composition mentioned for the cementitious external layer, as it may be modified to a limited extent, as, for instance, during the winter season, I introduce means such as boiled vegetable oils, for insuring greater pliability and elasticity to the coating. I intend to change and modify the cement, moreover, according to the particular surface to which the fabric or reinforcing material is to be applied. The remaining step in using the cemented fabric consists simply of pulling or delivering said cemented fabric from a guide roll 20 to a table 21 where it is applied by hand to the innersoles, and then cut off from the strip and delivered to the pounding and pressing machine already mentioned.

It will be understood that while I have ex-

plained my invention in connection with reinforcing innersoles, I do not intend to limit it in all cases thereto.

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

1. The herein described process, consisting of providing the fabric with a permanent coating impervious to cement but capable of uniting with it, providing a strongly adherent, sticky cement in liquid form, uniting a thin layer of said liquid cement as a top dressing to said coating, and then applying the cemented fabric under pressure to the leather or surface to be covered.

2. The herein described process, consisting of providing the fabric with a normally non-sticky coating, capable of being rendered sticky by heat, heating said coating, applying thereto a dressing of strongly adherent sticky cement, and then applying the cemented fabric under pressure to the surface to be covered.

3. The herein described process, consisting of providing the fabric with a normally non-sticky coating, capable of being rendered sticky by heat, applying on said coating a hot dressing of strongly adherent, sticky cement.

4. The herein described process, consisting of providing the fabric with a normally dry, oxidizable coating, capable of becoming superficially sticky under heat, heating the same, applying thereto a layer of sticky non-oxidizing cement, and pressing the fabric, then cemented upon the leather or other surface.

5. The herein described process, consisting of providing the fabric with a normally dry, oxidizable coating, capable of becoming superficially sticky under heat, applying thereto a layer of hot non-oxidizable sticky cement, and then pressing the cemented fabric upon the leather or other surface.

6. The herein described process, consisting of providing the fabric with a gutta percha coating, heating the outer surface of said coating, applying thereto a hot cement containing sticky residuum of petroleum, and then pressing the cemented fabric upon the surface to be covered.

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

ANDREW THOMA.

Witnesses:

GEO. H. MAXWELL,
M. A. JONES.