May 30, 1944. T. C. MORRIS 2,349,877

REINFORCING SHOE PARTS

Filed June 17, 1942

Fig 1.

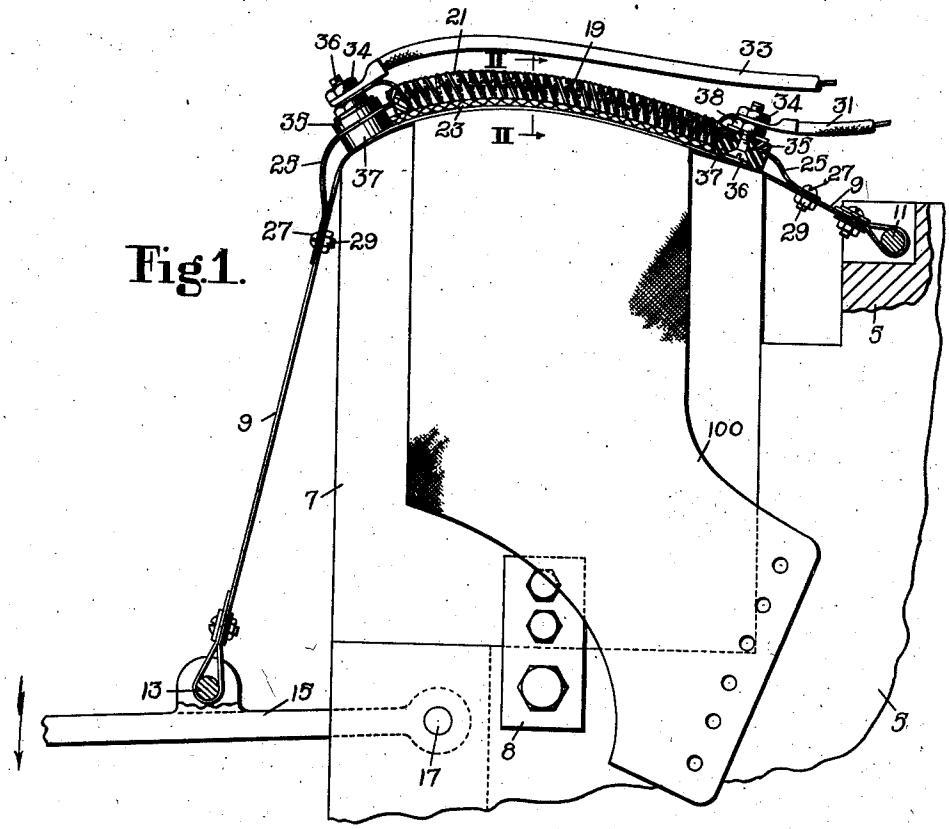


Fig 2.

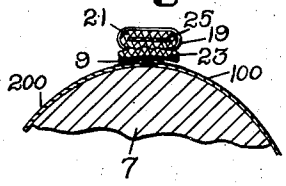
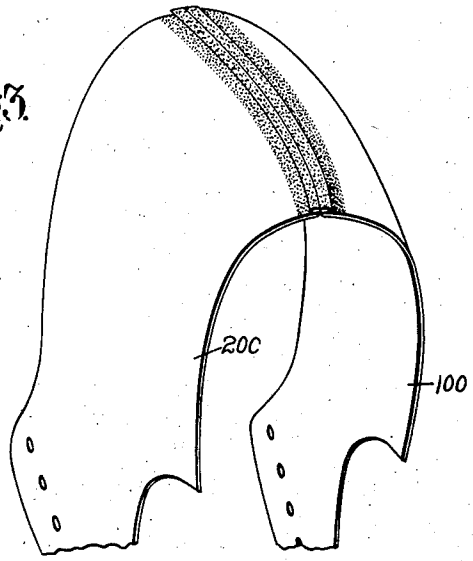


Fig 3.



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UNITED STATES PATENT OFFICE

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REINFORCING SHOE PARTS

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6 Claims. (Cl. 36—57)

This invention relates to reinforcing the uppers of shoes and is herein illustrated in connection with the reinforcing of the back seams of uppers.

In the manufacture of shoes it is common to reinforce certain portions by applying to them strips of adhesive tape. For example, it is customary to superpose one quarter of an upper upon another with their display sides in contact and to sew the two quarters together by a seam which lies close to their rear edges, this seam being known as the back seam of the upper. When the quarters are opened away from each other and turned right side out into the position which they will occupy in the finished shoe, the ends of the quarters beyond the line of the seam form a ridge which projects from the inner sides of the quarters toward what will be the interior of the finished shoe. In order to reduce this ridge and to reinforce the upper at the back seam, it is customary, while the quarters are wrong side out, to apply pressure to the seam ridge in such manner as to flatten it and then to apply over the flattened seam ridge a strip of adhesive tape.

According to the present invention, a selected portion of an upper, for example the seam ridge, is coated with rubber latex, and pressure, preferably together with heat, is applied to the coating, the rubber latex being preferably one which will vulcanize upon standing. The work may thus be rapidly operated upon and laid aside, the present invention doing away with the necessity of providing a preformed, reinforced tape as well as with the machine which is necessary for the application of such a tape to a shoe upper, and at the same time providing a more desirable reinforcement.

Referring to the accompanying drawing,

Fig. 1 is a side elevation of an apparatus showing the application of heat and pressure to a coated seam ridge;

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

Fig. 3 is a perspective of the finished product wrong side out.

The illustrated apparatus comprises a bench or stand, a portion of which is indicated at 5, to a suitably shaped part or extension of which is firmly fastened a work-supporting block 7, the operative surface of which has the general form of the heel end of a last. The block 7 is fastened to the bench by two metal straps, one of which is indicated at 8. In order to apply heat and pressure to the work, a thin, flexible metal band 9 has at one end a loop to receive a pin 11 carried by the bench and at the other end a second loop to receive a pin 13 carried by a lever 15 which is pivoted at 17 to a part of the bench. When a piece of work is in place and force is being applied to the hand lever to swing it down, the band 9 presses a portion of the work against the block 7, as shown in Fig. 1.

The flexible band 9 is heated by a resistance unit which comprises a spiral of wire 19 wound about a core 21 of insulating material, there being on the lower face of the unit a piece of insulating material 23 to insulate the wire 19 from the band 9. Extending longitudinally through the core 21 is a thin steel band 25, the ends of which are fastened by screw bolts 27 and nuts 29 to the band 9. The ends of line wires 31, 33 are clamped in place by nuts 34 and are insulated from the band 25 by members 35, 37 of insulating material which are held in place by screws 36 and nuts 38.

The rear portion of the upper of a shoe, comprising quarters 100 and 200 joined by a back seam having a seam ridge, is first turned wrong side out to expose said seam ridge. The seam ridge and the adjacent localities of the quarters are coated with a stripe of rubber latex, and the work thus prepared is placed upon the block or work support 7, the hand lever 15 at that time being raised to permit the insertion of the work beneath the band 9. The hand lever is then swung down into the position shown to cause the heated band to exert pressure upon the coated seam ridge. The band may be heated, for example, to from 150° to 175° F., in which case a dwell of a few seconds suffices to coagulate the rubber latex and to press the seam. The uppers of shoes are commonly made of absorptive materials such as leather or fabric; and consequently a large part of the water in the latex is absorbed almost immediately after the coating has been applied and acts to soften the material. In order, then, to obtain good results, both as to coagulating the latex and as to flattening the seam ridge, the heat and pressure should be applied immediately.

A representative formula of a compounded rubber latex which will vulcanize upon standing at room temperature is as follows:

I

	Parts by weight
Zinc oxide	200
Precipitated sulfur	100
Zenite	50
Zimate	100
Darvan	22
Casein	25
Sodium hydroxide	10
Water	493
	1000

The above is a typical sulfur and accelerator dispersion in which the zinc oxide is an activator for the accelerators. Zenite and Zimate are ac-

celerators, Darvan is a dispersing agent and casein is a protective colloid. No antioxidant is used since antioxidants are liable to cause staining of the work. The Zenite, besides its action as an accelerator, acts somewhat as an antioxidant but without the liability to produce stains.

II

Lotol (a concentrated rubber latex containing 60% solids).

The ingredients of I are charged into a ball mill, the casein being cut with the caustic soda previous to its addition to the mill. Good dispersion is obtained by about 72 hours of grinding. Of the product thus obtained, 7 parts by weight are mixed with 93 parts of II (the Lotol). The product of I should not be mixed with II until just before the mixture is to be used, since the mixture is not stable indefinitely.

As has been stated above, the heating and pressing should take place immediately after the coat of rubber latex has been applied. It is desirable to make use of a rubber latex of low stability so that the coagulation may take place rapidly, and to make use of a concentrated latex of comparatively low liquid content since if a large amount of water is present, there is a tendency to produce water stains. The use of a latex which will vulcanize upon standing is desirable because it permits the coating, heating and pressing to be carried out rapidly at a moderate temperature, and because coagulated, unvulcanized latex tends to oxidize, and thereby to become semi-liquid and to pass through the upper and produce stains.

The formula given above is for a vulcanizable rubber latex of low stability and high solid content for the reasons which have just been given. Such a rubber latex is suitable for use with uppers made of all sorts of materials and is particularly indicated with uppers made of fabrics which are readily stained. It should be understood, however, that uncompounded rubber latex may be used on uppers made of certain materials, but that in any case the solid content should be fairly high. For example, uncompounded rubber latex having a solid content of 60% could be used.

Although the method has been set forth, for purposes of illustration, as a method of reinforcing a back seam and as one in which the coat of rubber latex is applied by hand, and pressure is applied simultaneously to all parts of the seam, it should be understood that the invention is limited in the scope of its application neither to the reinforcing of a seam nor to any particular manner of coating the work or of applying the pressure.

The terms "rubber latex" and "latex" as used in the specification and claims denote not only natural rubber latex but any similar product which comprises an emulsion or dispersion of rubber in water.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. The method of reinforcing a selected portion of the upper of a shoe, said method comprising applying to the selected portion a coat of liquid vulcanizable rubber latex, and thereafter applying heat and pressure directly to the coating.

2. The method of finishing the back seam of the upper of a shoe, said method comprising applying to the seam ridge and the adjacent localities of the inner side of the upper a stripe of liquid rubber latex, and thereafter applying pressure to coagulate the latex and to press the seam ridge.

3. The method of finishing the back seam of the upper of a shoe, said method comprising applying to the seam ridge a coating of liquid rubber latex which will vulcanize upon standing, and thereafter applying heat and pressure for a short interval to coagulate the rubber latex and to press the seam ridge.

4. The method of finishing the back seam of the upper of a shoe, said method comprising supporting the rear portion of an upper with the inner side exposed, applying a stripe of liquid vulcanizable rubber latex to the seam ridge and the adjacent localities of the upper, and immediately thereafter applying heat and pressure to the coated seam ridge.

5. The method of finishing the back seam of the upper of a shoe, said method comprising supporting the rear portion of an upper with the inner side exposed, applying a stripe of liquid vulcanizable rubber latex to the seam ridge and the adjacent localities of the upper, and thereafter applying heat and pressure to the coated seam ridge for an interval not greater than a few seconds to coagulate the rubber latex and to press the seam ridge.

6. The rear portion of the upper of a shoe, said portion comprising two quarters joined by a seam having a ridge projecting from the inner faces of the quarters, the seam ridge being flattened and covered only with a coat of vulcanized rubber latex.

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