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HEEL MEMBER FOR BOOTS AND SHOES

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Fig. 1

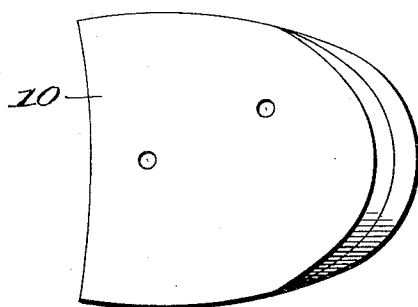
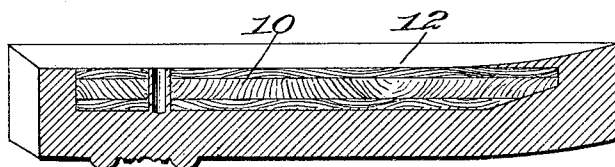


Fig. 2



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HEEL MEMBER FOR BOOTS AND SHOES

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The present invention relates to heels and top lifts for boots and shoes, together with a method for producing such heels and top lifts, and more particularly to articles of this character having a body portion of rubber compound surrounding an embedded core of filler material.

The incorporation of a wooden core as a nail-anchoring element in a rubber heel or top lift achieves certain desirable and important results. Among other advantages, the use of such a core permits the attaching nails to be inserted as desired at any point within the area circumscribed by the core. Further, the employment of this type of core materially improves the joint between the rubber heel or top lift and the base to which it is attached, and serves to maintain a tight joint during the entire period of attachment. A nail holding core consisting of a plurality of thin plies of wood secured in assembled relation is particularly adapted for embodiment in a heel body of rubber compound, owing to its rigidity, its freedom from distortion or warping, and its capacity for bonding firmly with the rubber compound during the vulcanizing operation and for anchoring the attaching nails without splitting. The employment of a wooden core, however, makes it desirable, if not essential, to prevent penetration of moisture into the interior of the core, either along the plane of the attaching face or through the openings formed by the introduction of the securing nails. If penetration of moisture to the interior of the core is permitted at any time after the attachment of the heel, it may result in a warping, swelling or distortion of the core sufficient to loosen or displace the heel with respect to the base of the shoe. The complete embedding of the core within the heel body may serve to lessen the penetration of moisture to the interior of the core but does not prevent seepage of moisture through the nail holes. The complete surrounding of the nail-holding core with the rubber heel body is furthermore objectionable from several standpoints. In order to secure a tight joint between the heel and the attaching base, the core should be embedded

in the heel body in such a manner that the major portion of the upper face of the core constitutes the attaching face of the heel in contact with the base of the shoe to which the heel is secured. This results in a substantially rigid and unyielding nail-anchoring element for holding the attached heel firmly in place. Many attempts have been made to treat the wooden cores with vegetable oils, mineral hydrocarbons, resins, waxes, bitumens, latex, and rubber cement in order to waterproof the core and prevent the entrance of moisture. In all cases, however, the treatment of the core with these compounds for the purpose of making the core waterproof or water resistant has either prevented satisfactory bonding of the core to the rubber heel body or has interfered with the handling of the cores and their use in the vulcanizing process to such an extent as to make it impractical to so treat them. It has also been suggested that the wooden cores be waterproofed by superimposing over the core a layer of frictioned canvas or similar material which is bonded to the rubber heel body about the margin of the core. The employment of a layer of waterproof material at the attaching face prevents seepage of moisture into the core throughout this area and does not interfere materially with the bonding. The use of the waterproofing layer, however, does not prevent seepage of moisture through the nail holes and furthermore materially increases the expense of forming and handling the core during the manufacture of the heel or top lift.

I have discovered that by treating a wooden core with a sulphur terpene compound, the core is made water-resistant and the vulcanizing action throughout the area of contact between the core and the heel body is improved to such an extent as to materially enhance the resulting bond between the core and the heel body surrounding it.

The core is preferably treated by a short immersion in a solution of the sulphur terpene compound in a solvent, thereafter removing the surplus liquid from the core through a centrifuge or equivalent operation. In actual practice the cores are heated to

drive off moisture prior to immersion in the solution and facilitate the penetration by the sulphur compound. As the period of immersion determines to some extent at least the penetration of the sulphur terpene compound into the core, it is obvious that the length of immersion may be gauged in accordance with the result desired. After treatment the cores are generally allowed to stand several hours or days before insertion in the heel mold in order to permit all traces of solvent to pass off. Prior to insertion in the heel mold, it is desirable to heat the cores for the purpose of removing surface moisture which may have collected and improving the resultant vulcanizing operation. As the wooden cores are relatively poor conductors of heat, the insertion of an unheated core in the heel mold may result in too low a temperature for good vulcanization at the area of contact between the core and the heel body. This is avoided by heating the cores before insertion in the heel mold. Thereafter the heat of the vulcanizing operation causes the core to assume the temperature within the mold, resulting in an accelerated and uniform vulcanizing action not only throughout the area of contact between the core and the heel body but within the core itself, due to the presence of the sulphur terpene compound therein.

The result is to secure a highly satisfactory bond between the core and the rubber compound which resists the entrance of moisture both throughout the plane of attachment and at the points of insertion of the attaching nails. This is due in part to the water-resistant qualities imparted by the treatment and in part to the improved bond resulting from the treatment throughout the area of contact between the core and the body of the heel.

In the accompanying drawings illustrating the preferred form of the invention,

Fig. 1 represents a plan view of a treated plywood core before insertion in the heel mold; and

Fig. 2 is a longitudinal section of a heel having an embedded core.

In producing the heel shown in the illustrated embodiment of the invention, the plywood core 10, as shown in Fig. 1, is first heated to a temperature slightly above 100° C. for a period of an hour or longer to thoroughly dry it out and expel the contained moisture. Thereafter the warmed, dried core is momentarily immersed in a solution of a sulphur terpene compound. In the actual production of the core shown the best results are obtained with a solution consisting of twenty-five per cent. or more of sulphur terpene compound in a solvent, such as benzol, toluol, or gasoline. After removal from the solution, the core is centrifuged or otherwise treated to remove any excess of solution, and thereafter stored ready for use. Ordinarily

the cores after treatment may be allowed to stand for several days or weeks before use, thus removing any vestige of solvent that may remain. Prior to the use of the treated cores in the heel molds they are preferably heated to temperatures of 100° F. or above, in order to facilitate elevation in temperature of the core during the vulcanizing operation. Although drying of the core subsequent to treatment with the sulphur terpene compound is desirable before placing in the mold, nevertheless a satisfactory heel can be produced by utilizing the cores directly following the treatment. In ordinary practice a large number of cores are treated at one time and then held until needed for use in the production of heels. According to the present method of treatment this is not disadvantageous, but if it is attempted to treat the cores with certain other compounds, such as phenolic resin, the exposure of the treated cores for any considerable period to atmospheric conditions, more particularly in warm weather, results in a partial curing of the resin and serious interference with the bond resulting from the vulcanizing operation.

A compound of sulphur which will give the desired results may be prepared by digesting oil of turpentine and sulphur at a temperature of 140° C. or higher. The proportions may consist of two parts by weight of oil of turpentine and one and one-half to two parts of sulphur. This compound at ordinary temperatures is semi-solid or solid and may be melted to a liquid consistency.

The treated core is embedded in the upper portion of the heel body, as indicated at 12, and constitutes substantially the attaching face in contact with the supporting base. The treatment of the core causes it to resist the entrance of moisture through the attaching face and through the openings formed by the introduction of attaching nails. The bond between the treated core and the surrounding heel body is much superior to that obtainable with an untreated core. Although the exact action of the sulphur terpene compound is not thoroughly understood, it is believed that the compound functions both as a rubber softener and as a vulcanizing agent. By virtue of the impregnation of the core with this compound, therefore, the plastic rubber in contact with the core is caused to flow into the surface portion of the core during the vulcanizing operation and after penetration is vulcanized uniformly by the presence of the compound within the core. The result is a strong, unbreakable bond between the rubber compound and core which cannot be destroyed without actual rupture of the core body itself. In addition to the enhanced bond resulting from this treatment, the vulcanizing of the rubber compound within the pores of the core body serves to seal the openings about the

nails when the latter are seated with the heads in engagement with the under face of the core in such a manner as to effectually preclude the entrance of sufficient moisture to harm the core. The result is to produce a heel or top lift which may be readily attached to a supporting base with a close joint and which may be worn down to the embedded core without warping or distortion of the core or without losing any part of the bond existing between the core and the heel body. The desirability of an effective and permanent bond between the rigid core body and the relatively yielding heel body surrounding it will be self-evident when it is considered that the pounding and friction to which the rubber heel is subjected in actual use will sooner or later separate the heel body from the core. This may cause a complete separation of the two or result in a blistering of the heel. The strain on the bond is materially increased when the core is employed as the medium for attaching and securing the heel to the shoe base.

25 What is claimed is:

1. A method of producing heels of vulcanizable rubber compound having an embedded core of fibrous material vulcanized therein, which consists in treating the core with a vulcanizing and waterproofing agent, inserting the thus treated core in a rubber heel mold with a rubber blank, and subjecting the assembly to vulcanizing heat and pressure to bond the core firmly to the heel body.

35 2. A method of producing heels of rubber compound having an embedded core of fibrous material vulcanized therein, which consists in impregnating the surface portion of the core with a solution of a vulcanizing and water proofing agent and thereafter assembling the thus treated core with a rubber blank in a heel mold, and subjecting the assembly to vulcanizing heat and pressure to vulcanize the core firmly to the surrounding body of rubber compound.

3. A method of producing heels of rubber compound having an embedded wooden core, which consists in treating the core with a solution of vulcanizing and waterproofing agent, removing the surplus liquid from the core and assembling the pre-treated core with a rubber blank in a heel mold, and subjecting the assembly to vulcanizing heat and pressure to bond the core to the rubber heel body during the vulcanizing operation.

4. A method of producing heels of rubber compound having an embedded core of fibrous material vulcanized therein, which consists in pre-treating the core with a solution of sulphur terpene in a hydrocarbon solvent in a manner to impregnate the surface of the core, removing the surplus liquid therefrom, assembling the core with a blank of rubber in a heel mold, and subjecting the assembly to vulcanizing heat and pressure.

5. A heel member for boots and shoes comprising a body portion of vulcanizable rubber compound, a core of fibrous material embedded in the upper portion of the body and impregnated with a rubber vulcanizing water-resisting agent to promote the bond between the core and the surrounding heel body during the vulcanizing operation and resist the entrance of moisture into the core.

6. A heel member for boots and shoes comprising a body portion of vulcanizable rubber compound, and a nail anchoring core of plywood embedded in the upper portion of the body and treated with a solution of a sulphur compound to make the core water resistant and accelerate the vulcanizing action throughout the area of contact between the core and the heel body.

7. A heel member for boots and shoes comprising a body portion of vulcanizable rubber compound, a plywood core embedded in the upper portion of the body and impregnated with a solution of a sulphur terpene compound to make the core water resistant and to promote the bond between the core and the heel body.

8. A wooden core for rubber heels having its surface portion impregnated with a solution of a rubber vulcanizing agent to cause the rubber in contact with the core to become softened and flow readily into the surface portion of the core in contact with the vulcanizing agent during the vulcanizing operation.

9. A wooden core for rubber heels having its surface portion impregnated with a sulphur terpene compound to make the core water resistant and accelerate the vulcanizing operation.

10. That step in the method of producing rubber heels having embedded wooden cores which consists in treating the core with a solution of a sulphur terpene compound in a solvent to waterproof the core and promote the subsequent vulcanizing operation within the core.

11. That step in the method of producing rubber heels having embedded wooden cores which consists in drying the wooden core, immersing the core for a predetermined length of time in a solution of a vulcanizing agent, and thereafter removing the surplus liquid from the core.

12. A rubber heel comprising an embedded wooden nail anchoring core impregnated at its surface with a waterproofing and vulcanizing agent, a body of vulcanized rubber surrounding the core and bonded to the surface fibers thereof, whereby the core is sealed against entrance of moisture through the nail holes when the heel is attached.

13. A method of making rubber heels which consists in impregnating the surface of a wooden nail anchoring core with a solution of a vulcanizing and waterproofing agent, assembling the treated core with a rubber

blank in a heel mold, and subjecting the assembly to heat and pressure to vulcanize the core firmly to the surrounding body of rubber compound, whereby the rubber flows into the surface portion of the core to waterproof
5 the core against entrance of moisture through the nail holes when the heel is attached.

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