Jan. 15, 1929.

1,698,791

J. B. HADAWAY

HEEL

Filed May 12, 1925

Fig. 1.

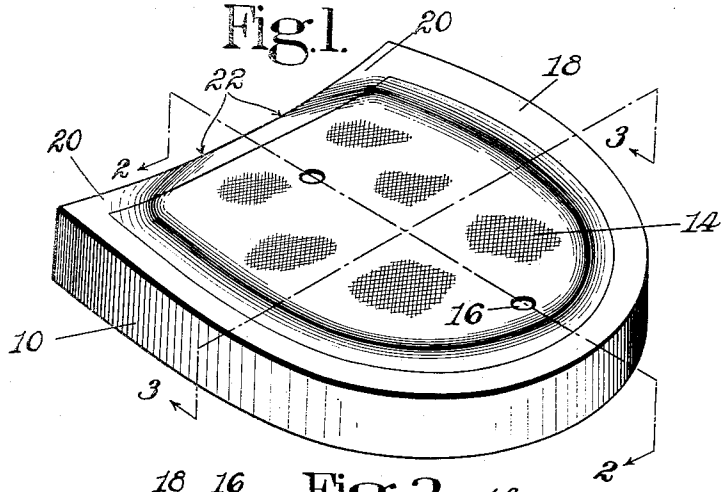


Fig. 2.

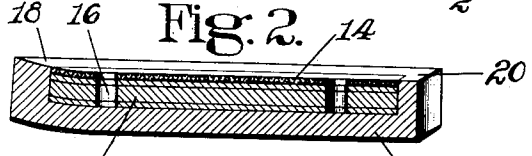
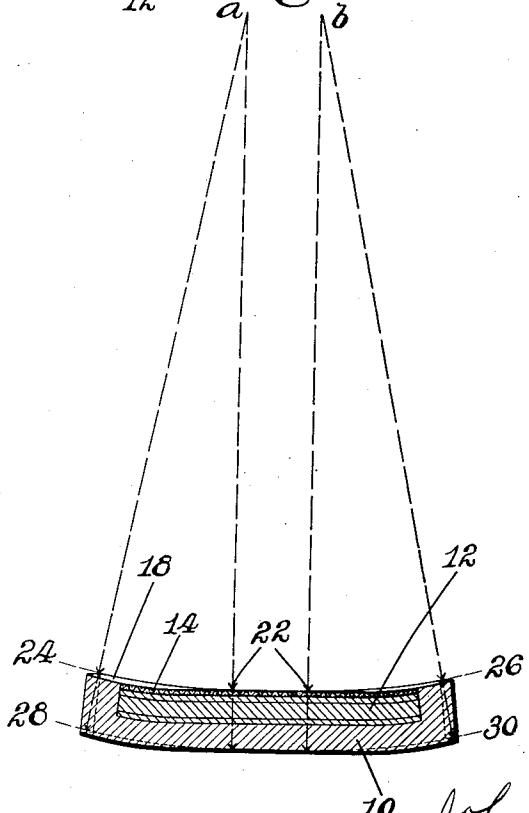


Fig. 3.



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UNITED STATES PATENT OFFICE.

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HEEL.

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This invention relates to heels and is illustratively set forth as embodied in a cushion heel of the type in which a wooden nail anchoring element is embedded in the material from which the heel is made. In various respects, however, the invention is not limited in its application to heels having such nail anchoring elements.

Cushion heels are commonly made of some composition containing rubber, which is molded and set or vulcanized in the desired form by the application of pressure and heat. Such heels are generally called rubber heels, and that term will, for convenience, be used hereinafter, not in a limiting sense as defining a heel made exclusively of pure rubber, but in the ordinary sense as denoting any heel made of rubber or of a rubber composition or other composition having similar characteristics.

In respect to rubber heels having nail anchoring elements of the type above referred to which may deteriorate during the normal life of the heels if exposed to moisture, it is important that the nail anchoring elements be properly protected against access of moisture. To this end, it has been proposed to cover the exposed surface of a wooden insert with a more or less thick layer of the relatively soft rubber of which the heel is made, but this has not proved to be commercially successful, partly because of difficulties which it introduced in the manufacture of the heel, and partly because the covering layer of soft rubber was compressible and, therefore, would not permit the heel to be nailed down firmly and rigidly upon a heel base or upon the heel seat of a shoe.

In view of the foregoing, it is an object of the present invention to provide an improved heel of the type having a nail anchoring element of wood or other nail penetrable material having similar characteristics, in which the nail anchoring element will be so sealed against access of moisture as to insure against any deterioration from that cause, while retaining all the advantages characteristic of heels of this type, and without introducing any disadvantages as to the quality of the heel, its ease of attachment, or its satisfactory performance in use upon a shoe.

According to the present invention, an improved rubber heel having a nail anchoring element adjacent to its attaching face is provided, wherein a layer of substantially incompressible, moisture resisting material covers the attaching face of the nail anchoring element which, therefore, may otherwise be made of wood or other material which would deteriorate if moisture were admitted to it, and may be exposed at the attaching face of the heel so that it may be pressed into direct engagement with the heel base or heel seat of a shoe to which it may be tightly nailed, thus affording the benefits of secure and rigid attachment and maximum wear for a given amount of rubber, since the entire thickness of the rubber is upon the tread side of the heel where it is available for wear. In the illustrated embodiment of the invention the nail anchoring element is built up from a plurality of plies of wood and a covering layer having the above described characteristics, which plies and layer are suitably secured together. The invention, however, is not limited in its utility to the use of ply wood or, indeed, to the use of wood, inasmuch as it is within the scope of the invention to use other suitable materials for this element.

A satisfactory material for the covering layer of the nail anchoring element is fabric which has been frictioned or otherwise impregnated with a rubber compound, which vulcanizes when the heel is vulcanized. Such a covering is readily penetrable by nails, solid, waterproof and substantially unyielding. It adheres well to the remainder of the nail anchoring element and the rubber of the heel body vulcanizes to the edges of the fabric so that the nail anchoring element is completely moisture proofed and held in the heel. There are also materials other than woven fabric which have, to a greater or less degress, the required characteristics, and it is within the scope of the invention to use any such other materials as come within the terms of the appended claims.

It is a further object of the present invention to effect an improvement in the shape of rubber heels with a view to securing the maximum tightness of the edge joint between the rubber heel and the base to which it is attached and a flat tread face, with a minimum deformation of the heel in the attaching operation. To this end the central portion of the heel is made substantially flat and a marginal portion of substantially uniform width, along the sides of the heel and

around its curved, rear end, is curved upward, the upward curve of the margin being continued around the breast corners and part way across the breast at each side. The curved area of both the tread and attaching faces of the heel merges smoothly into the flat central area, and the line at the junction of the breast and attaching faces of the heel curves upward, smoothly and gradually, from a straight, central portion to the side edges of the heel. The heel is thus of substantially concavo-convex form but of an improved shape which produces a maximum hugging effect at the heel edge with a minimum deformation of the heel. In actual use it has been demonstrated that a heel of this improved shape can be attached easily and accurately and will produce permanently tight edge joints, even without the use of cement. Moreover, especially when a nail anchoring element of the general type herein disclosed, which constitutes a practically rigid core exposed at the attaching face of the heel, is employed in a heel of concavo-convex form, it is not necessary that the concavity of the attaching face of the heel be very deep, the heel, therefore, being easy to handle in the heel attaching machine and not requiring a great amount of deformation to flatten it upon the base to which it is attached. I believe that a substantially concavo-convex cushion heel having a rigid core, exposed at its attaching face, is broadly new and it is my intention to claim such a heel structure broadly. In the specific embodiment of the invention herein illustrated the exposed face of the nail anchoring element or core is substantially flat throughout the central portion of the heel and said element is surrounded by an attached, relatively narrow, concavo-convex deformable margin of rubber, which is capabale of being flattened by the heel attaching pressure without substantial deformation of the central portion of the heel.

The above and other features and advantages of the invention will be fully understood and appreciated from reading the following detailed description of one embodiment thereof in connection with the accompanying drawings, in which

Fig. 1 is a perspective view of a heel embodying the invention, showing its upper, or attaching, face;

Fig. 2 is a longitudinal, sectional view of the heel taken upon the line 2—2 of Fig. 1; and

Fig. 3 is a transverse sectional view of the heel, taken upon the line 3—3 of Fig. 1.

In the drawings, 10 indicates a heel which may be made of rubber or any suitable composition having the desired qualities of elasticity and resiliency. Embedded in the heel, adjacent to its attaching face, is a nail anchoring element 12 which, as herein shown, is made of ply wood, although it might, within the scope of the invention, be made of a single layer of wood or of a suitable material other than wood which would not be detrimentally affected by the temperature of vulcanization.

The attaching face of the nail anchoring element 12, which would otherwise be exposed at the attaching face of the heel, is provided with a substantially incompressible, penetrable, waterproof covering 14 which, in the present instance, is shown as consisting of a layer of fabric conforming in size and shape to the element 12. The fabric covering 14 is frictioned or otherwise impregnated with rubber which becomes vulcanized when the heel is vulcanized. It is thus completely impervious to moisture and prevents access of any moisture to the nail anchoring element 12. The rubber of the heel body 10, as is well known, will vulcanize readily to the edges of the rubberized fabric, and both the rubber of the heel body and the rubberized fabric, after the vulcanization of the heel, adhere to the wood of the nail anchorinz element, which is thus enclosed upon all sides with waterproof material.

Holes 16 are shown in the nail anchoring element 12 and its covering to provide an easy means for locating these parts accurately upon pins in the vulcanizing mold in which the heel is made. In the ordinary wear of the heel upon a shoe the effect of any small amount of moisture which might enter these holes is negligible but they may be dispensed with entirely if, under any conditions, it is believed that their presence is detrimental.

As shown in the drawings, the heel is of approximately uniform thickness throughout but may be modified more or less in this respect, if necessary, to produce a flat tread face upon the attached heel. The central portion of the illustrative heel is substantially flat and the marginal portion, as shown at 18, is turned upward in a smooth, gradual curve which merges into the flat central area without any decided break or line of demarcation. The curvature of the margin is continued around the breast corners, as shown at 20, being gradually reduced until it becomes zero at points 22 at either side of the center of the breast, leaving a substantially flat surface between the said points 22.

In the cross sectional view, Fig. 3, the approximate shape of the line defining the upper edge of the heel breast is shown by the line 24—26 and that of the line defined by the intersection of the breast and tread faces of the heel by the line 28—30. The lines 24—26 and 28—30 are approximately, or quite, parallel, and their curved portions may be struck about centers *a* and *b*, the broken lines converging to said points *a* and *b* in Fig. 3 representing the radii of the curves. It is not essential,

however, that these curves be mathematically exact arcs of circles, it being important only that the curves be smooth and gradual and that they merge smoothly into the straight line joining the points 22.

Thus this conformation of the heel produces a uniformly tight joint around the sides and rear of the heel and a still tighter joint at the breast corners, where the greatest danger of a crack between the heel and the base exists, since the heel is curved or arched in two directions at said breast corners. The smooth, continuous line 24—26 across the breast avoids the occurrence of any open places in the breast joint between the heel and the base, such as are liable to occur when the line at the junction of the breast and attaching faces has any abrupt changes in direction, and the flat, central surface permits the heel to engage and be firmly supported by the base over a comparatively large area. It will be observed that this flat surface extends all the way to the breast of the heel, the central portion, between the points 22, of which is the lowest part of the breast edge of the attaching face. This contributes to the tightness with which the corners of the heel press upon the base and accommodates the slight bulge upon the base in this region which is often present as the result of the bulging of the shank portion of the sole by the shank stiffener.

It will be understood that the improved heel of the present invention may be readily attached either by hand or by machine, the attaching nails being driven through the rubber of the heel and the nail anchoring element 12, which is readily penetrable, at any desired points and preferably being driven deeply enough to cause their heads to engage the said nail anchoring element and draw it firmly into engagement with the surface to which the heel is attached. In the attaching operation the deformable margin of rubber 18 will be flattened and placed in such a state of tension as to cause the edge of the rubber to press tightly against the surface to which the heel is attached.

Having described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A rubber heel having a nail anchoring element embedded therein adjacent to its attaching face, the face of said element having a substantially incompressible moisture resisting covering.

2. A rubber heel having embedded therein adjacent to its attaching face a nail anchoring element of material subject to deterioration by moisture, the attaching face of said element having a substantially incompressible, nail penetrable, moisture proof covering, and the remaining faces of said element being covered by the rubber of the heel, said rubber being vulcanized to the edges of said moisture proof covering.

3. A rubber heel having embedded therein adjacent to its attaching face a nail anchoring element, said element having a fabric covering which is exposed at the attaching face of the heel.

4. A rubber heel having embedded therein, adjacent to its attaching face, a nail anchoring element, one face of said element being completely covered by an adherent layer of fabric which is exposed at the attaching face of the heel and the remaining faces of said element being completely enclosed by the rubber of the heel.

5. A cushion heel having all its faces which will be exposed in the finished shoe made of rubber and having a wooden nail anchoring element embedded therein adjacent to the attaching face of the heel, the exposed face of said wooden element being permanently covered with a substantially incompressible layer of rubberized, moisture proof fabric.

6. A rubber heel having embedded therein, adjacent to its attaching face, a nail anchoring element of plywood, the outer face of said element being covered with a substantially incompressible layer of rubberized fabric to which the rubber of the heel is vulcanized.

7. A substantially concavo-convex deformable cushion heel having a rigid core, exposed at its attaching face.

8. A cushion heel having embedded therein a substantially rigid core the face of which is exposed at the attaching face of the heel, the exposed face of the core being flat throughout the central portion of the heel and the core being surrounded by a concavo-convex, vertically deformable margin of rubber.

9. A rubber heel having the central portion of its tread face flat, and having at its attaching face a rigid nail anchoring element presenting an exposed, flat surface opposite the flat portion of said tread face, said rigid element being surrounded by an upwardly curved vertically yielding margin of rubber at the sides and rear of the heel and part way across the breast from each corner toward the center.

10. A rubber heel having the central portions of its tread and attaching faces flat, a rigid nail anchoring element embedded in the attaching face of the heel and extending throughout the flat portion thereof, and a narrow, upwardly curved vertically deformable, marginal portion extending around the sides and rear of the heel and part way across the breast from each corner toward the center, said marginal portion being capable of being flattened by heel attaching pressure without substantial deformation of said central portion.

11. A rubber heel having a substantially

flat, unyielding, nail anchoring element embedded in its attaching face, and a relatively narrow, concavo-convex, vertically deformable margin of rubber secured to the edge of the nail anchoring element and movable about said edge to permit said margin to be flattened by heel attaching pressure.

12. A rubber heel having embedded therein, adjacent to its attaching face, a plywood nail anchoring element which is smaller than said attaching face and is surrounded, except at the center of the heel breast, by a concavo-convex, vertically yielding margin of rubber.

In testimony whereof I have signed my name to this specification.

JOHN B. HADAWAY.