Mar. 13, 1923.

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H. L. BEAL.

RUBBER HEEL AND FASTENING DEVICE.

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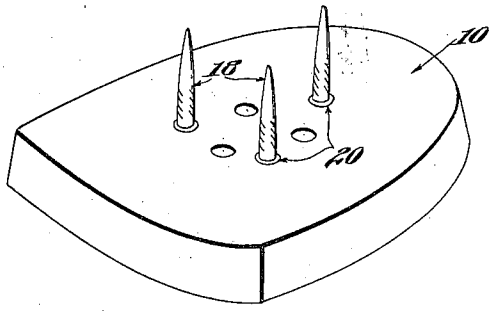


Fig. 1

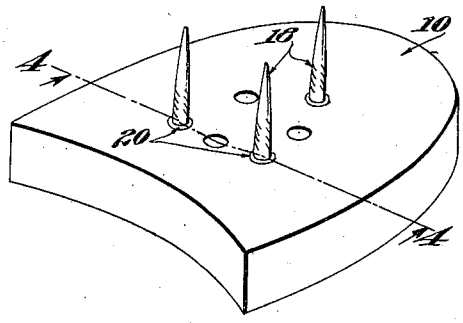


Fig. 2

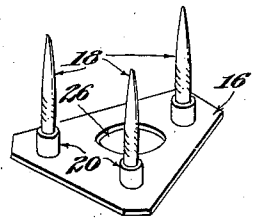


Fig. 3

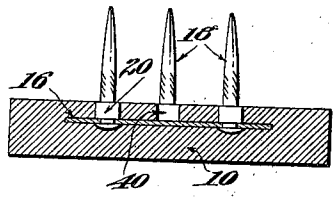


Fig. 4

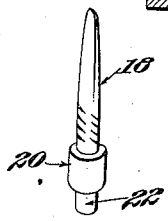


Fig. 5

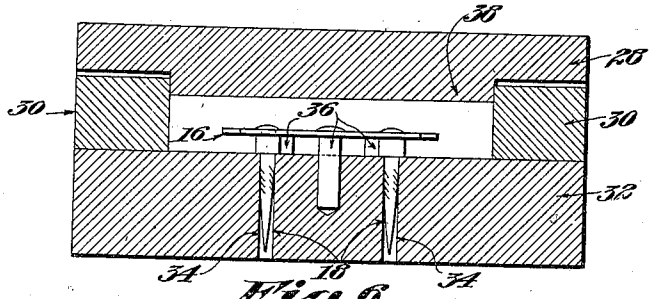


Fig. 6

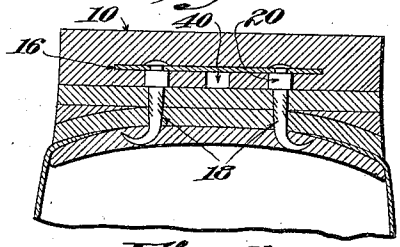


Fig. 7

Witness

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UNITED STATES PATENT OFFICE.

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RUBBER HEEL AND FASTENING DEVICE.

Application filed April 1, 1920. Serial No. 370,383.

To all whom it may concern:

Be it known that I, HERMAN L. BEAL, a citizen of the United States, residing at Brookline, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Rubber Heels and Fastening Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in rubber heels and fastening devices therefor.

In securing flat rubber heels to shoe heels the nails are often over-driven, that is to say, they are driven beyond the depth to which they should be driven, thereby compressing the rubber of the heel between the nail washer and the shoe heel. The compression of the rubber under the washer causes the rubber to be pushed out laterally and where the nails are located near the edge of the shoe heel this sometimes causes the opening of the joint between the rubber heel and the shoe heel which is sometimes called "bubbling." This is obviously objectionable because it detracts from the appearance of the heel after it has been attached to the shoe.

In the manufacture of prong heels, such, for example, as the heel shown in the patent to Hooper, Re. No. 14,596, wherein a prong plate is placed in the mould and the rubber compound is placed on top of the prong plate, provision has to be made for supporting the plate against the pressure of the moulds when the moulds are first closed. In the Hooper patent the plate is shown as supported in the mould by posts 7 upon which the plate rests, three such posts being indicated in the drawings. If only a small pressure is applied to the moulds before the rubber compound is heated sufficiently to become fluent no injury is done the plate, but if pressure is applied to the moulds too quickly the plates are distorted by the pressure and hence it has been necessary, in the manufacture of this type of heel, to take pains to see that the moulds are heated so as to render the compound more or less fluent before high pressure is applied to the moulds. This requires more attention and skill on the part of the pressman and therefore increases the cost of the product.

The present invention contemplates in its broader aspects a construction of rubber heel and a fastening device for fastening the heel to a shoe heel having provision for preventing bubbling on the one hand and at the same time, and by the same device, securing a more adequate support for the plate in the mould. In the specific embodiment illustrated in the drawings a prong heel is shown. The prongs are provided with an enlargement between the plate and the attaching surface of the heel. This prevents over-driving the nails and contributes to supporting the plate in the mould. Broadly considered it is immaterial whether the enlargement which constitutes a distance piece, or spacer, be an integral part of the prong or not, so long as a rigid contrivance is provided for preventing over-driving and for supporting the plate in the mould. In another aspect, and for securing only the advantage of preventing over-driving, it is apparent that the invention contemplates providing the heel with a spacer or distance piece which positively determines the distance of the nail head from the attaching face of the heel.

In the accompanying drawings illustrating the preferred form of the invention Fig. 1 shows a Nerger-shaped heel having a prong plate provided with prongs; Fig. 2 shows a flat heel provided with a similar prong plate; Fig. 3 shows a view of the prong plate alone; Fig. 4 is a section taken on the line 4—4, Fig. 2 (it may also be regarded as a section taken on a similar line, of the heel shown in Fig. 1, after such heel has been attached to the shoe heel); Fig. 5 is a view of the prong or nail; Fig. 6 is a sectional view of a mould with the prong plate in place and Fig. 7 is a transverse sectional view of a heel secured to a shoe heel, (in both Figs. 6 and 7 the section is taken on a line corresponding with the line 4—4, Fig. 2).

The illustrated embodiment of the invention is described as follows: The body portion 10 of the rubber heel may be of the

Nerger shape, as shown in Fig. 1, or the flat-heel shape, as shown in Fig 2. It is provided with a prong device for securing it to the shoe heel. This prong device consists of a metal plate 16 to which are rigidly attached three prongs 18. The plate is triangular in shape, has a hole 26 in its center and three holes to receive the prongs. The central hole 26 is provided for the purpose of permitting the rubber compound to flow through it when the moulds are closed. With the compounds used at the present time the hole 26 has a diameter of $\frac{9}{16}''$.

The prongs 18 are enlarged at 20 and provided with a head 22 adapted to be received in the prong holes in the plate. The enlargement 20 is a spacer or distance piece for locating the position of the plate in the mould and, therefore, in the rubber heel. The spacer 20 of the prong is made $\frac{3}{16}''$ long. When the prong heads 22 are riveted in the plate, the spacer is reduced in length $\frac{1}{16}$ of an inch by the riveting pressure so that after the prongs are riveted in place in the plate the spacer is $\frac{1}{8}''$ long. In Fig. 6 the three parts of the mould comprising the top plate 28, center plate 30, and bottom plate 32, are shown in the positions which they occupy when the mould is closed. The prong plate is shown in position in the mould. The holes 34 in the mould are provided to receive the prongs 18, and plate supporting pins or posts 36 are provided in the bottom plate to project upward between the prongs and to engage and contribute to the support of the prong plate. The posts 36 form holes 40 in the attaching face of the rubber heel but the presence of these holes in the attaching face is not objectionable. When the plate is put in place in the bottom plate, the spacers 20 of the prongs, together with the posts 36, support the plate in proper position in the mould. It will thus be seen that when the rubber compound is placed on top of the plate in the heel cavity with the inset 38 of the top plate 28 projecting into the top of the heel cavity of the mould, and is subjected to heat and pressure, the heat will soften the compound and the pressure will force it down around the plate and through the hole in the plate and cause it to conform to the shape of the cavity. The posts 36 and spacers 20 adequately serve to support the plate against the pressure of the compound. Heat and pressure are continued a sufficient length of time to vulcanize the heel, during which the prong plate is properly supported in the mould by the spacers 20 and posts 36. After vulcanization, the completed heel, as shown in Figs. 1 or 2, is removed from the mould.

The completed heel is attached to the shoe by hammering it onto the shoe heel, the shoe preferably being supported on a jack of some sort. The prongs, being large and rugged, penetrate the heel and the points are clinched on the inside. The spacers or distance pieces of the prongs act to prevent the prongs from being over-driven, because when the spacers come up against the heel they prevent further penetration of the nails in the shoe heel. This, therefore, prevents bubbling.

In rubber heels secured to the shoe heel by means of nails and washers or by means of prong plates, the rubber under the washer or prong plate is subjected to pressure during the attaching of the heel to the shoe heel, and thereafter when the heel is in use the pressure exerted on the heel in walking tends to relieve the nail head from the expansive force of the rubber under the washer or prong plate. This pressure upon the under side of the washer or prong plate is restored every time the foot is lifted from the ground, with the result that in use there is an intermittent, or variable, pressure on the under side of the nail head tending to withdraw it from the shoe heel. As is well known, this in time loosens the nail in the shoe heel and in the case of concavo-convex heels this tendency to pull the nails is greatly increased by reason of the tendency of the heel to resume its initial curved shape, with the result that concavo-convex heels operate to pull the nails out of the shoe heels. Examination of any concavo-convex heel after it has been worn for a while will frequently show that the nail heads have worked up toward the tread surface of the heel. This loosening of the nails or prongs is avoided by the present invention because the nail or prong is not subjected to an increase and decrease of pressure on the under side of the nail, tending to pull it out of the shoe heel. This constitutes an important feature of the present invention.

The invention is susceptible of embodiment in other forms.

It is to be observed that the rubber heel of the present invention contemplates a rubber heel body, a nail or prong to be driven into the shoe heel, a connection embedded in the body of the heel for connecting it to the nail or prong, and a spacer or distance piece for preventing over-driving of the nails. Viewed in its broader aspects it is immaterial whether the spacer or distance piece be integral with the nail or prong or not; likewise it is immaterial what the shape of the connection piece is by which the body of the heel is secured to the nail; and furthermore, it is immaterial what shape of heel is employed, whether curved or flat. The following claims are, therefore, to be read and understood as defining the invention as broadly as their language permits.

I claim:—

1. A rubber heel having a fastening de-

vice comprising a plate embedded in the body portion of the heel, nails secured to the plate for attaching the rubber heel to the shoe heel, the nails being provided with spacers for preventing the overdriving of the nails.

2. A rubber heel having a prong plate embedded in the heel provided with prongs having enlargements thereon for preventing over-driving of the prongs in the shoe heel, and for contributing to the support of the prong plate in the mould.

HERMAN L. BEAL.