V. ŠLAMPA ET AL

SHOE HEEL WITH ELASTIC CHAMBER

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FIG. 1.

FIG. 2.

INVENTORS:

VÁVRA ŠLAMPA, KAREL CEPELAK, & FRANTIŠEK VRAGA

BY

[Signature]
The present invention relates to rubber heels, more particularly heels of the type having cavities for the purpose of increasing the resiliency of the tread. The known rubber heels of the type indicated above, in which the cavities are enclosed by a frame serving for the fastening of the heel to the shoe, are worn out in a comparatively short time. Due to the elastic deformation of the cavities caused by compression and transmitted to the frame, the latter has a tendency to become larger, and a sliding on the support is effected thereby.

As a consequence of the lateral sliding, the heel will, after a short time of wear, no longer lie tightly against its support and, upon walking, air will be sucked through the gap formed between heel and shoe into the cavities, carrying also dust and moisture. This is a serious disadvantage.

Furthermore, the friction of the heel on the ground tends to loosen the fastening means and to shorten the useful life of the heel. It is an object of the present invention to provide a heel which allows to avoid the above mentioned disadvantages and is not only durable in use but easy to manufacture.

It is another object of the invention to provide a heel which will keep the neat appearance of a new heel during prolonged wear by a change of transmission of forces which prevents the frame from becoming worn down.

It is yet another object of the present invention to provide a mold for simplifying the manufacture of the improved heel.

With the above objects in view, a preferred heel according to our invention comprises in combination a centrally disposed portion, an outer portion circumferentially enclosing the central portion and means for attaching the same to a shoe, a plurality of inner cavities arranged in the above mentioned central portion, a plurality of outward bulges arranged in the central portion, one opposite each of the inner cavities, these outward bulges being of greater height than the outer portion circumferentially enclosing the central portion and projecting beyond the outer portion, whereby only the bulges are adapted to form the treading surface of the heel.

As mentioned above, the bulges are of greater height than the frame; they project considerably beyond the frame and, as a consequence thereof, the frame is not worn down at all. This provides a neat appearance for the heel during its whole life. When a larger number of bulges is arranged, for example in the form of a circle, the stress is distributed on ample tread surface. Wear is also diminished by the resiliency of the bulges.

According to the invention, we further provide elements of reduced cross section, by making channels and thus forming ribbons or straps, for connecting the bulges with the outer frame. In this way it is brought about that the inner portion of the heel formed by the bulges will pivot around the ribbons or straps, while the frame remains immovably fastened to the heel part of the shoe, without any transmission of lateral forces occurring as a consequence of the resilient deformation of the cavities. The drawbacks of the customary rubber heels are thereby eliminated.

The invention furthermore comprises a form for making rubber heels as above described in a single-step operation. The form is made of two separable sections, the section for forming the tread surface of the heel comprising a depression near the circumference substantially in the shape of a horse-shoe and adapted to shape a frame on the heel, a plurality of depressions arranged within the horse-shoe depression and of greater depth than the same, adapted to form bulges on the heel of greater height than the frame, and a plurality of elevated cutting members between the outer depression and the enclosed depressions adapted for shaping channels between the bulges and the frame.

The novel features which we consider as characteristic for our invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 shows the tread surface of the heel in plan view; and

Fig. 2 is a section along line A-B of Fig. 1, illustrating at the same time the form or mold for making the heel according to the invention.

The rubber heel is surrounded by a frame fastened in a customary manner by pins or screws to the heel of the shoe at 2. If desired, the rubber heel may be fastened centrally as well as circumferentially, as shown in Figure 1.

The inner portion of the heel is formed by a number of bulges, each underlying and surrounding a chamber. In order to save material, the central portion of the heel, which is not provided with a bulge, may contain a cavity, too.

The bulges project over the frame and the central portion of the frame so that they will extend beyond the frame, and the tread surface will be formed entirely by the bulges. Between the
frame 1 and the outer edge of bulges 3, channels 6 are arranged so as to extend into the frame 1 to a certain depth and the frame will, therefore, be connected to the bulges at these points by thin ribbons or straps 7. Channels 6 become wider towards the tread surface of the heel.

When the wearer of the shoe treads on the heel, bulges 3 are depressed and, as a consequence, the inner part of the heel will become slightly larger due to resilient deformation of the bulges at the tread surface; the dimensions shown at D and C will be slightly increased. At the same time, ribbons or straps 7 pivot outwardly at their bottom points E whereby channels 6 are narrowed. The forces are, however, not transmitted to frame 1 so that this will not be displaced on its supporting face. The pins or screws used for fastening the frame to the heel of the shoe are therefore not stressed or loosened, nor do any frictions occur between the frame and the faces it contacts. No dust or moisture has access to the interior of the cavities 4 when by lifting the shoe from its support, that is when the foot is removed from the ground, the bulges resiliently return to their former shape causing at the same time an intake of air by suction into the cavities and a simultaneous widening of the channels.

It is possible to make the channels 6, which are so important for the action of ribbons or straps 7, by making cuts into the heels after they have been shaped in the molds. This way of production, however, is cumbersome and expensive, and it was not possible to give the channels the desirable direction at a slant with respect to the tread surface of the heel, which proved to be of advantage in making the ribbons or straps merge into the bulges.

According to the invention, molds have now been made which allow the forming of the heel to be combined with the formation of channels 6 in a single operation. The mold according to the invention, which may for instance be made of iron, comprises two portions 8a and 8b; the latter portion, in which the tread surface of the heel is made, contains cutting members 11 which form the channels 6 at the border between the frame 1 and the bulges 3.

The cutting members are of such shape and direction that they will form the ribbons or straps with the cross section necessary to allow the above mentioned pivoting of these elements and the free play of the inner portion of the heel formed by bulges 3.

After the heels have been formed in a single operation, they can easily be removed from the opened mold due to resiliency of the rubber.

It should be noted that the channels 6 do not extend along the entire circumference of the inner portion of the heel containing the bulges, but there are interruptions by lands of rubber such as shown at 9; the cutting members of the molds are formed with corresponding interruptions. In this way, greater strength is imparted to the heel. The lands are preferably arranged in line with radially extending ribs 10, each rib 10 being arranged at the level of the central portion 5 between two bulges 3. It is obvious that there may be a greater number of lands 9 or ribs 10 if it is so desired.

It will be readily understood by anybody skilled in the art that instead of using rubber, we may use synthetic rubber or similar materials employed in the art of making heels of the type described.

While we have illustrated and described the in-