April 23, 1935. H. T. HUGHES 1,998,624

RUBBER HEEL

Filed Sept. 19, 1934

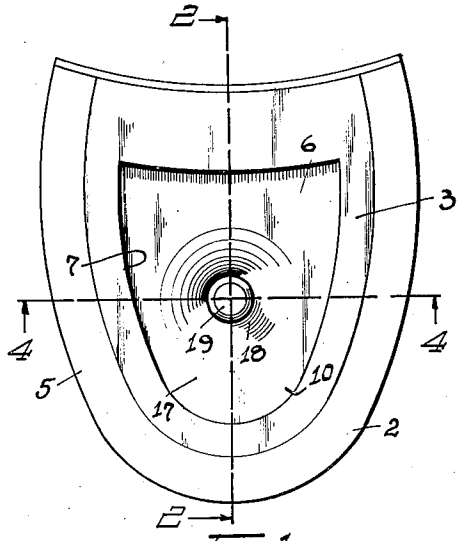


Fig-1

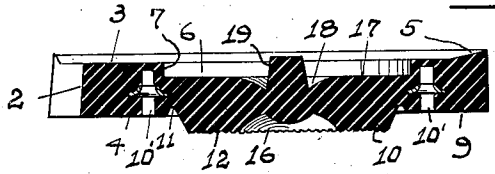


Fig-2

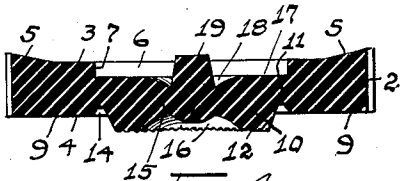


Fig 4

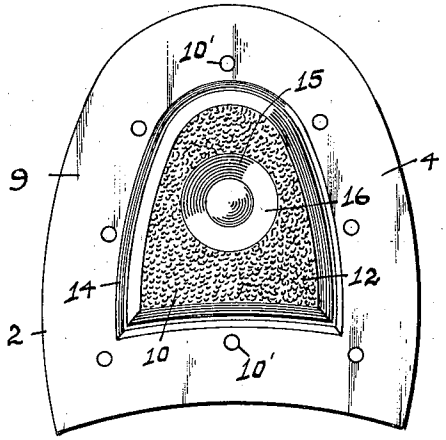


Fig-3

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RUBBER HEEL

Hugh Thomas Hughes, Cleveland, Ohio, assignor of fifty-one per cent to Herbert G. Goulder, Cleveland, Ohio

Application September 19, 1934, Serial No. 744,649

4 Claims. (Cl. 36—35)

My present invention relates to heels and more particularly to cushioned heels for boots, shoes and other wear.

It is the primary object of this invention to provide a lift or heel of rubber or rubber composition capable of yieldingly resisting the weight of the wearer with increasing force, when the heel first strikes the ground and eventually supports the whole weight of the wearer.

To this end the heel embodies an internal, yielding, central cushioning area or diaphragm enclosed by a marginal solid portion of yielding or compressible rubber, which diaphragm is offset with respect to said marginal portion, so as to protrude beyond the outer face of said portion, and which embodies means adapted to deform the diaphragm, when forced into said heel, thus increasingly resisting any movement of the diaphragm into the heel.

Another object of the invention is to provide a rubber heel with a shiftable central portion, embodying means for counteracting any shifting movement of said portion, said means including a central area within said portion adapted to be forcibly shifted in a direction opposite to the movement imparted to said portion, when the heel strikes the ground and which finally supports the whole weight of the wearer.

A further object of the invention is to provide a rubber heel with a shiftable central portion and a second, shiftable central portion in said first portion for movements in an opposite direction with respect to said first portion, when the heel strikes the ground and finally supports the whole weight of the wearer.

These objects and further novel features, that I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation with additional objects and advantages thereof will best be understood from the following description of a specific embodiment, when read in connection with the accompanying drawing, in which:

Figure 1 is a plan elevation of a heel embodying a shiftable central portion with a central portion shiftably arranged with respect to said first portion;

Figure 2 is a longitudinal sectional view on line 2—2 of Figure 1;

Figure 3 is a bottom view of the heel shown in Figure 1; and

Figure 4 is a cross sectional view on line 4—4 of Figure 3.

In the embodiment of my invention illustrated in the drawing, the heel-lift 2, as usual, is compounded from rubber stock. This heel-lift is provided with an upper attaching face 3 and a tread face 4. The attaching face 3 embodies the customary peripheral inclined edge 5 and is provided with a central cavity or recess 6 having its edge 7 equally spaced on all sides of the lift with respect to the peripheral edge 5. The tread face 4 of the heel-lift 2 includes a flat marginal portion 9 with the usual nail holes 10' for fastening the heel to a shoe, and a normally elevated diaphragm portion 10 forming a closure wall for the central cavity or recess 6. The diaphragm 10, having substantially the same thickness as the marginal portion 9 of the heel, is horizontally offset with respect to the tread face 4 and protrudes downwardly beyond said face. In walking, when the heel is brought to rest on the ground the diaphragm 10 which is the first part of the heel to engage the ground, is forcibly moved or shifted upwardly into the plane of the marginal portion 9 by the pressure exerted by the wearer. To facilitate this action of the diaphragm 10, same is connected to the marginal portion 9 by means of a thinned web 11. Preferably the side wall of the protruding portion 12 of the diaphragm 10 is inclined to readily dislodge any dirt or foreign matter, gathered in a groove 14, formed by thinning out the web between the marginal portion and the diaphragm 10.

It is desirable that the inherent elasticity of the diaphragm 10 be gradually decreased when forced into the recess 6 of the heel-lift, and that a gradual increasing resistance be offered to this movement. To that end the diaphragm includes a centrally arranged yielding section 15 and is provided with means adapted to effect a relative movement of this section with respect to the diaphragm when the latter is bodily shifted by the weight of the wearer. This section is formed by recessing the tread face of the central portion of the diaphragm to a substantial degree, as at 16, and slightly recessing the opposite or inner face 17 of the diaphragm, as at 18. A preferably cone-shaped lug or post 19 extending upwardly from the face 17 of the diaphragm for contact with the sole of the shoe, to which the heel is attached, opposes or cushions the relative movement of the section 15 with respect to the diaphragm 10, and while thus deforming the diaphragm sets up tensional stresses in the body of the latter tending to increase the resistance of the body as well as the web connection with the marginal portion 9. The deformation of the diaphragm is greatest at the central portion thereof

and radiates with decreasing intensity, so that the deformation of the diaphragm and its web connection with the marginal portion decreases substantially proportionate to the distance of movement of the diaphragm toward and into the heel lift. This is very essential to the attainment of a desirable shock absorbing and cushioning heel action. A highly resilient action is had at the beginning, when the heel strikes the ground and then a more pronounced and smoother dampening and cushioning resistance is offered until the weight of the wearer rests fully upon the heel.

The lug or post 15, which is of relatively small cross section, permits of the desired elastic action when the heel strikes the ground as this post will be slightly compressed before acting upon the yielding section 15 of the diaphragm.

It will be apparent that changes may be made in the details of construction of the heel and that the described and illustrated embodiment of the invention may readily be changed within the scope of the invention as defined by the claims.

Having thus described my invention,

What I claim is:

1. A cushioning heel lift comprising a heel body having a marginal portion, a diaphragm encircled by said marginal portion and vertically offset with respect thereto to provide a recess at the top of said body and a protruding portion at the bottom thereof, a substantially circular recess in the bottom face of said diaphragm, and means in alignment with said circular recess extending upwardly from the top face of said diaphragm into the recess in said body and adapted to effect deformation of said central area and the diaphragm, when the protruding portion of the diaphragm is forced into the body.

2. In a cushioning heel lift a diaphragm-like central portion protruding at the bottom of the heel, a diaphragm like portion within said first portion and means aligned with said second portion extending from the upper face thereof for shifting said second portion in a direction opposite to said first portion, when the weight of the wearer forces the protruding portion into the heel.

3. In a cushioning heel lift, a diaphragm-like central portion protruding at the bottom of the heel, a central section in said portion decreased in thickness to facilitate yielding of said section with respect to said central portion, and means to shift the central section in a direction opposite to the movement of said central portion, when the weight of the wearer forces the protruding portion of said central portion into the heel.

4. A cushioning heel lift as described in claim 3, wherein the means for shifting the said central section consists of a yielding post.

HUGH THOMAS HUGHES.