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B. RUBEL

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PNEUMATIC HEEL

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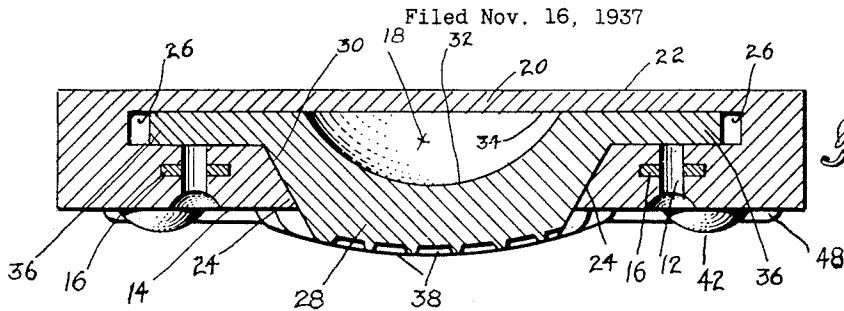


Fig. 3.

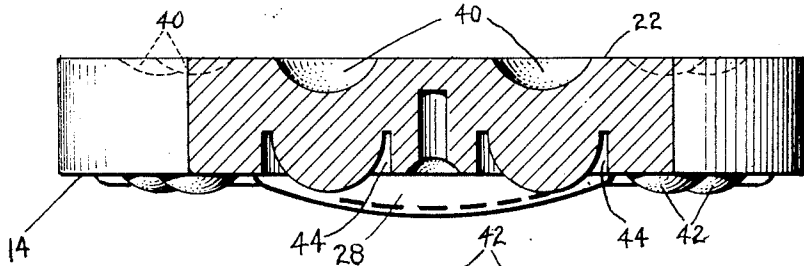


Fig. 2.

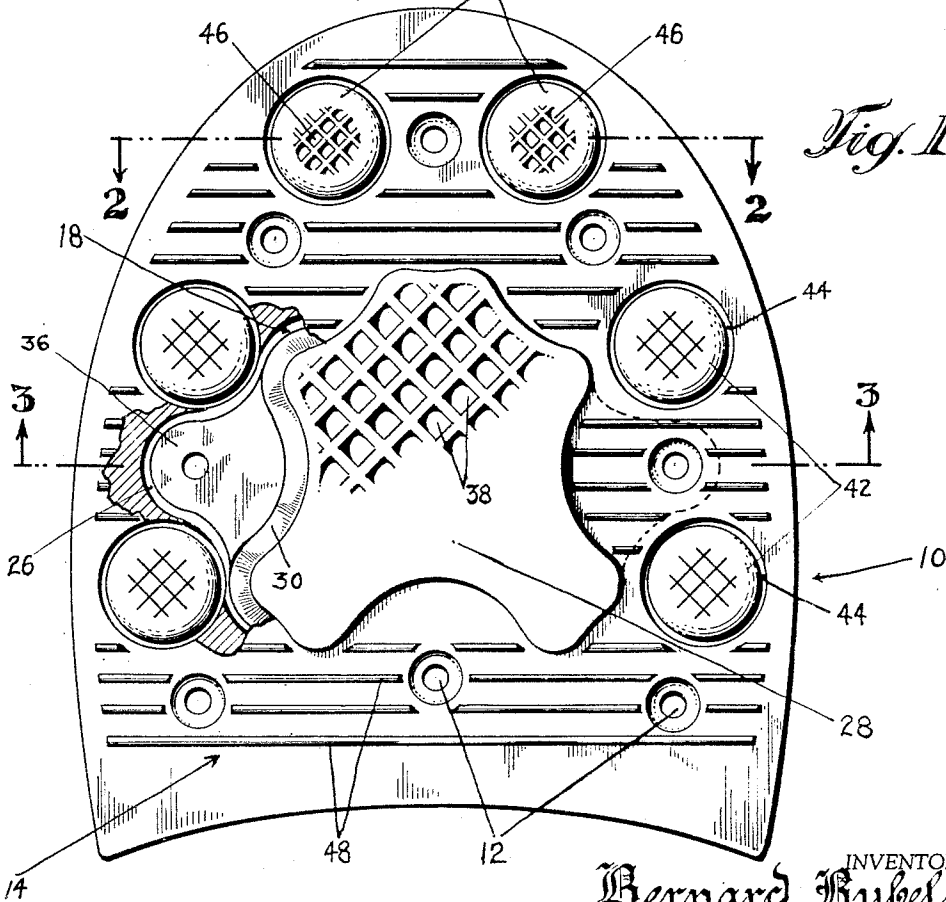


Fig. 1.

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PNEUMATIC HEEL

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7 Claims. (Cl. 36—35)

This invention relates to attachable heels for footwear and more particularly to air cushioned, resilient heels, and contemplates the provision of heels of the character described wherein resiliency is provided or whose resiliency is enhanced pneumatically by means of pockets for confining air, whereby such heels are made more comfortable and more restful for walking.

The present invention contemplates the provision of air cushioned rubber heels wherein air may be pneumatically trapped between the heel and the shoe to which it is attached, but more particularly contemplates the provision of heels wherein air is trapped within the body of the heel, thereby forming a pneumatic air pocket from which air is gradually and slowly expelled under the pressure of walking, thus relieving the foot and the body to a greater extent than possible with the resilient heels heretofore used from the shock of walking, particularly on hard pavement. The thereby improved shock absorbing characteristic of my improved heel is a distinct aid in preventing the many body ills resulting from the nervous shock occasioned from repeated and constant insufficiently cushioned footfalls experienced with prior heels. In addition, the air trapped in such pneumatic pockets is replaced when the pressure is relieved, thus providing a continuous change of the air within the heel, which thereby remains cool throughout its use.

This invention also contemplates the provision of air cushioned rubber heels of the character described, wherein the cushioning member is removable from and replaceable within the main body of the heel, with the air passing in and out around it, whereby economies in the use of such heels are made possible.

The present invention contemplates further the provision of rubber heels which, due to their greater resiliency and to the removability of the cushioning members, have greater frictional, ground-gripping characteristics than the rubber heels heretofore used, and, for that reason, safer for use on wet and slippery surfaces.

The present invention contemplates still further the provision of projections on the heel surrounded by grooves in the heel surface wherein the projections may be flattened upon pressure for still further enhanced resiliency and for increased traction and ground-gripping properties.

The above and other advantages are contemplated by the provision of the resilient heels of the present invention, as will be more apparent from the practical embodiment thereof, which is

illustrated in the accompanying drawing, and in which

Fig. 1 is a bottom plan view of such embodiment of the present invention, partly cut away to illustrate optional means for retaining the air cushioning member of the heel in position;

Fig. 2 is a cross sectional view of the same heel in reversed position, taken along line 2—2 of Fig. 1; and

Fig. 3 is a similar view of the heel taken along line 3—3 of Fig. 1.

The illustrated embodiment of the heel 10 of the present invention may be made of any desirable material, preferably of a resilient material, such as the rubber composition normally used for the purpose, and may be made of the same general shape and thickness as provided in resilient heels heretofore in use. It may also be provided on its underside or ground-contacting surface 14 with a plurality of recesses 12 for the reception and guidance of heel fastening means, such as nails or screws which are not thought necessary to be here shown, each of said recesses 12 being transversely by metallic washers 16 to prevent the fastening means from working through the heel material.

The heel may be provided with a substantially centrally located chamber or recess 18, extending, in thickness, from the underside 14 of the heel through the greater part of its thickness, leaving a relatively thin wall 20 separating the recess 18 from the upper shoe contacting surface of the heel 22. The recess 18 may occupy a substantial part of the central area of the heel, within the outline of the fastening recesses 12, and may preferably have an outline of irregular design. The upright wall of the recess may slope convergently to overhang the same, making the opening of the recess narrower than its base and providing a dovetail edge 24. The recess 18 may be provided with one or more horizontally disposed extension slots or wings 26, extending into the body of the heel, preferably in opposed directions, each such wing 26 passing under one or more fastening recesses 12, intermediate their washers 16 and the upper surface of the heel 22, to permit the fastening means, when inserted, to pass through such wing 26.

To fit within the recess 18, I provide a cushion member 28 which may be made of a material of the same or different resiliency than the main heel body 10, and may be of a thickness somewhat greater than the depth of the recess 18 so that the cushion may project beyond the surface 14 of the heel and bear the brunt of the ground-

contacting pressure. Preferably, the cushion may be made of material somewhat more resilient than the main heel body 10 so that it may be readily flexible for insertion and removal. The size and shape of the cushion 28 may be made to conform to the size and shape of the recess outline, and it may be provided with sloping edges 30 to cooperate with the edges 24 of the recess to make a dovetail fit between them, to prevent the involuntary removal of the cushion 28 from the recess 18.

The cushion 28 is provided on its upper surface with a cavity or pocket 32 which is adapted to trap air therewithin, between the edges of the pocket 32 and the base of the recess 18, which surface forms a seal to hinder the escape of trapped air, permitting it to escape between these surfaces but gradually and slowly, under pressure, to give the heel pneumatic characteristics. It is understood that, if desired, more than one pocket may be arranged on the under surface of the cushion 28.

The cushion 28 is provided with wings 36 which fit within the recess wings 26 and are engaged against removal when the heel is attached by the fastening means inserted through the respective recesses 12 directly above the wings 26. However, these wings and wing recesses are optional and need not be provided as the dovetail fit between the recess 18 and cushion 28 is ordinarily sufficient to retain the cushion within the recess.

It is apparent that because of the resiliency and flexibility of the heel 10 proper and of the cushion 28, it will be easy and simple to insert or remove the cushion from the recess 18 for replacement. It will, also, be further obvious that because the cushion 28 protrudes beyond the heel surface 14, it will receive the brunt of the wear and tear occasioned by walking, and will considerably conserve the remainder of the heel from the wearing effects, thus providing a heel which, by replacement of a comparatively small, readily removable and replaceable part thereof, may have its durability increased many times.

It will also be readily apparent that the gradually released air trapped within the pocket will provide an extremely effective cushioning and shock absorbing means, namely pneumatic cushioning which provides great resiliency, and that because of this high resiliency the frictional properties of the heel will be increased, giving it greater ground-gripping ability and making it safer for use on slippery surfaces.

The ground-gripping characteristics of the heel of the present invention may be further increased by providing the cushion with a frictional outer surface, as by means of the diamond shaped tread 38 illustrated, or by any other similar means which break up the surface of the cushion, and cause it to frictionally engage the ground.

The resiliency and cushioning characteristics of the heel of the present invention may be further enhanced in several ways, if desired. Thus, a plurality of small hollows 40 may be provided in the upper shoe contacting surface of the heel 22 disposed along its periphery, which, when attached to the shoe, by means of glue, as is usually the case, will form additional air cushioning pockets. The hollows nearer the rear portion of the heel may be made deeper than the others to provide greater resilience at that point which is the point of contact with the ground.

The heel of the present invention may be provided with further cushioning and ground-trip-

ping means in the form of a plurality of resilient studs 42, projecting from the underside of the heel 14, preferably arranged peripherally thereof, intermediate the fastening recesses 12, and preferably integral with the heel, each of the studs 42 being surrounded and bounded by a groove 44 in the surface of the heel, to give the stud greater resilience by providing room for it to flatten. The grooves 44 also provide greater traction and ground-gripping properties by permitting a resilient and gradual braking action by the stud against any sudden slipping movement.

The under surface 14 of the heel may be further provided with additional friction means by providing the studs 42 with the diamond-shaped or similar tread elements 46, which will frictionally engage the ground. Only a few of the studs in the drawing are shown with the tread, the others having only a diagrammatic representation thereof. The remainder of the surface of the heel may be provided with the transverse ribs 48.

I claim:

1. A heel for a shoe comprising a resilient member having a centrally located recess and a hollowed cushion member of greater resilience and having upstanding walls forming a hollow, loosely held within said recess and projecting therefrom the surface of the said walls surrounding the hollow adapted to contact the roof of the said recess to form an air pocket there-within.

2. A heel for footwear comprising a resilient member having an under surface, said under surface having a plurality of fastening means guiding recesses peripherally arranged thereon and a centrally located recess, said central recess having horizontally disposed wing slots extending into the resilient member under one or more of said guiding recesses, and a hollowed resilient insert removably held within the said central recess and projecting therefrom and having wings adapted to fit within the said recess wings, said hollowed insert being adapted to form an air pocket within the said central recess.

3. A heel for a shoe comprising a resilient member having an under surface and a centrally located recess on the said under surface, said recess having downwardly converging walls to form a narrowed opening and a member of greater resilience having a cavity in its upper surface dovetailed in air admitting relation within the said recess and projecting therefrom, the surface margins surrounding the said cavity contacting the roof of the said recess to form an air pocket within the said recess.

4. In combination, a shoe heel having a centrally located recess arranged on the under surface thereof and a hollow, resilient member provided with a cavity on its upper surface, said resilient member being fitted into the said recess and loosely retained therein, the roof of the said recess contacting the edges of the said cavity to form an air pocket in the heel, said insert projecting from the under surface of the said heel whereby, in walking, air in the pocket may be forced therefrom when the heel is trod upon and air is trapped in the pocket when the heel is lifted from the ground.

5. In combination, a shoe heel unit having a recess arranged on the under surface thereof and a resilient cushion provided on its upper surface with a cavity, said cushion arranged within the recess and retained therein whereby the said recess and cavity forming pocket adapted to en-

trap air therewithin, said cushion and recess arranged to permit the entrapped air to escape from the air pocket gradually and slowly under pressure of walking and to permit reentering of air into the pocket when the heel is raised off the ground.

5 6. A heel for an article of footwear comprising a unitary resilient member having a centrally located recess on its underside, said recess having
10 downwardly converging walls to form a narrow

opening and a flexible resilient member having a cavity on its upper surface, dovetailed in air admitting relation within the said recess and projecting outwardly therefrom, the roof of the said recess and the edges of the said cavity contacting 5 to form an air pocket within the said cavity.

7. The combination defined in claim 4, wherein said resilient member is of comparatively greater resilience than the heel.

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