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M. HACK ET AL
RESILIENT SHOE SOLES
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3,079,707

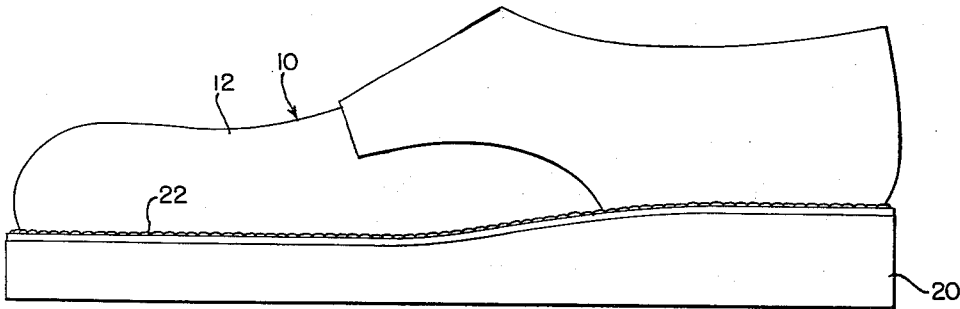


FIG. 1

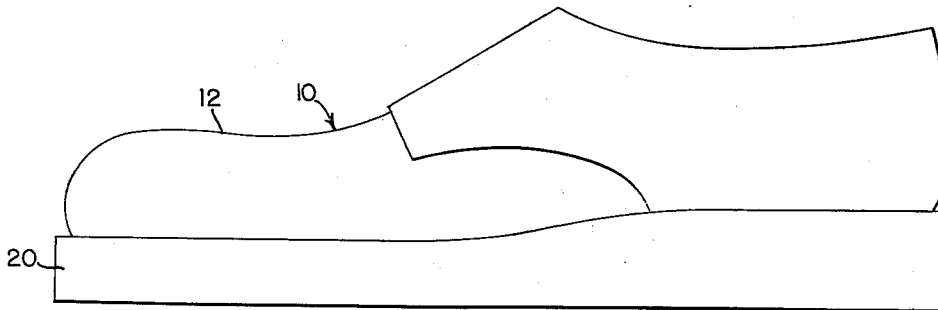


FIG. 2

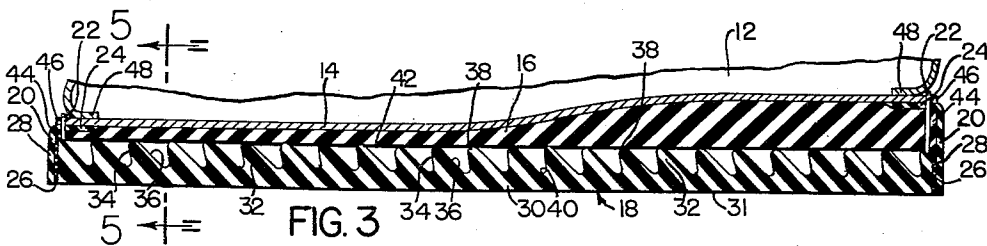


FIG. 3

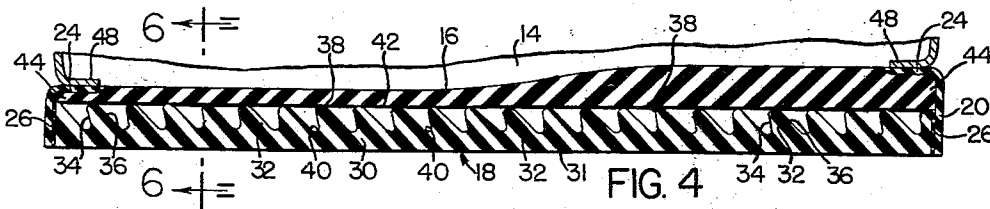


FIG. 4

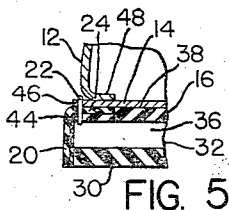


FIG. 5

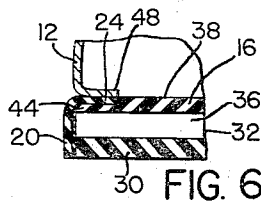


FIG. 6

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RESILIENT SHOE SOLES

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4 Claims. (Cl. 36-28)

This invention relates to shoe soles made of a resilient material, and more particularly to a closed shoe sole having a flexing, cushioning action as the wearer walks, runs or jumps upon the sole.

This application is a continuation-in-part of the subject matter disclosed in Hack et al. application Serial No. 789,571 filed January 28, 1959 which issued in United States Letters Patent No. 2,930,149 on March 29, 1960.

The invention involves a shoe sole of resilient material which may be of full shoe length, i.e. from toe to heel, or which may be made in the form of a tap, or in the form of a heel. The sole is provided with a ground plane contacting body, having a smooth under side, from which project a series of integrally formed angularly upwardly directed transverse rib members that are in contact with the bottom of the shoe base, or a shoe wedge layer, as the case may be. Circumscribing and enclosing the side edges of the shoe sole of this invention is a thin peripheral band of resilient material secured to the sole edge and to the shoe base or wedge. The top edge of each of the transverse rib members should preferably be secured to the shoe base or wedge, as the case may be, in order to provide adequate securement to the shoe structure. The resilient shoe sole of this invention may be modified as will be shown and described below.

The shoe embodying the novel sole arrangement here disclosed has a soft, cushioning feel when walked on, accompanied by a forward gliding motion as the rib members flex forwardly under load. In addition, the encircling band of resilient material closes off the open spaces between the rib members from an accumulation of water, mud, snow or other such elements. The ground plane contacting body of the sole functions as a closed wear surface.

It is an object of the invention to provide a resilient sole for a shoe in which a series of angularly upwardly directed inclined transverse rib members are integrally formed with a sole body which is in ground plane contacting arrangement on the shoe. Another object is to provide such a shoe sole with rib members that flex in the direction of their inclination. A further object is to provide such a sole with a peripheral encircling, enclosing band of resilient material secured to the sole edge and to the shoe structure, to provide a closed sole for a shoe.

These and additional objects of the invention and features of construction will be more fully presented in the description of the invention which follows, and in which the terms employed are used for purposes of description and not of limitation.

Reference is here made to the drawings annexed hereto and in which:

FIG. 1 is a side elevational view of one form of the shoe arrangement embodying the invention.

FIG. 2 is a side elevational view, similar to FIG. 1, showing a slightly different form of shoe arrangement.

FIG. 3 is a longitudinal vertical sectional view of the shoe shown in FIG. 1, taken substantially on a medial line through the shoe.

FIG. 4 is a view similar to FIG. 3 for the shoe shown in FIG. 2.

FIGS. 5 and 6 are fragmentary transverse vertical sec-

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tional views taken substantially on the lines 5-5 and 6-6 of FIGS. 3 and 4, respectively.

As shown in the drawings, particularly in FIGS. 1, 3 and 5, the shoe 10 comprises generally an upper portion 12, a shoe base 14, a wedge layer 16, a sole 18, and a peripheral foxing strip 20.

The upper portion 12 is secured to the shoe base 14 in any suitable manner and the shoe base is shown secured to the wedge layer 16 by stitching 22. It will be understood by persons skilled in the art to which the invention pertains that this arrangement of elements may be slightly modified to accord with such structural relationships as may be preferred by them. The peripheral foxing strip 20 has one of its edges, 24, stitched to the shoe base 14 and the wedge layer 16 therebetween as shown in FIGS. 3 and 5.

The principal portion of the foxing strip 20 is secured by an adhesive 26 to the peripheral edge 28 of the sole 18. The sole 18, made of resilient material, comprises a ground plane contacting body 30 having a smooth underside 31 and integrally formed transverse rib members 32 projecting upwardly and angularly therefrom in a longitudinally extending series from toe to heel. Rib members 32 have their front faces 34 and rear faces 36 inclined forwardly of the sole to a conjunction at the top edges 38, the front and rear faces 34 and 36 respectively of adjacent rib members being conjoined by a blended radius or fillet 40 at the body 30.

It will be understood by persons skilled in the art to which the invention pertains that the top edges 38 and the blended conjunctions 40 of the rib members 32 may be modified slightly by sharpening the radii and edges, if desired or required.

The top edges 38 of the rib members are secured by an adhesive 42, as shown in FIGS. 3 and 4, to the bottom side of the wedge layer 16. However, depending upon the transverse stiffness of the sole 18, it is possible that the sole may be adequately secured to the shoe structure solely by the peripheral foxing strip 20. Yet another alternative may be securement of the sole 18 to the wedge layer and shoe structure by such fasteners passed through the sole and the wedge layer which permit flexing of the rib members 32 under load in the direction of rib inclination.

Although the rib members 32 are shown to be straight transverse, it will be understood that these members may be curved or arced transversely of the sole, may be arranged in a chevron pattern, or in any other pattern arrangement permitting forward flexing of the rib members to occur when a load is applied downwardly to the sole.

As shown in the transverse vertical sectional view of FIG. 5, the foxing strip edge 24 is secured by sewn stitches 22 between the outer peripheral edge 44 of the wedge layer 16 and the outer peripheral edge 46 of the shoe base 14. In FIGS. 2, 4 and 6, an alternative arrangement is shown, wherein the foxing strip edge 24 is secured between the peripheral wedge layer edge 44 and the intumed edge 48 of the upper portion 12. This securement is effected by the use of an adhesive or by fusion of the layers under heat and pressure should the materials employed have properties and characteristics suitable to such processing.

The shoe upper portion 12 is preferably made of leather, although it may also be fabricated of material that can be combined with the peripheral foxing strip 20 and the wedge layer 16 by the application of heat and pressure. The wedge layer 16 is made of a resilient cushioning layer of rubber, plastic or suitable composition material. The shoe base 14 is made of leather or suitable substitute material. The resilient shoe soles 18 are made of rubber, plastics, or suitable composition materials pro-

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viding a flexing characteristic to the rib members, when under load, in the direction of the rib inclination. The peripheral foxing strip 20 is also made of resilient, preferably rubber, materials suitable for securement to the resilient shoe soles heredescribed.

It will be understood that the peripheral resilient foxing strips 20 are designed to be conjoined and secured to the body portions of each of the resilient shoe bases heredescribed. Optionally, the foxing strips may also be secured and conjoined to the side edges of the rib members, in those areas where the rib members are provided, to increase and improve the holding and gripping power of the foxing strip on the sole. The foxing strip being relatively thin, it does not appear that any appreciable resistance to flexing of the rib members will result by such conjunction at the side edges thereof.

Having described the invention in its simplest terms it is to be understood that the features of construction may be changed and varied in greater or lesser degree without departing from the essence of the invention defined in the appended claims.

We claim:

1. In combination with a shoe having a shoe base, a resilient sole secured to said shoe under said shoe base, said sole having
 - a ground plane surface contacting body, and a longitudinally extending series of transverse parallel rib members inclined forwardly at its upper surface,
 - said rib members having their front and rear faces converging upwardly from said body to conjunctive edges,
 - said edges being arranged in load supporting relationship at and under said shoe base,
 - and a peripheral resilient foxing strip about said sole and secured to said shoe sole and shoe base.
 whereby when said body is engaged upon said ground plane surface said rib members will flex in the direction of their inclination under weight.
2. In combination with a shoe having a shoe base, a resilient sole secured to said shoe under said shoe base, said sole having
 - a ground plane surface contacting body, and a longitudinally extending series of transverse parallel rib members inclined forwardly at its upper surface,
 - said rib members having their front and rear faces converging upwardly from said body to conjunctive edges,
 - said edges being arranged in load supporting relationship at and under said shoe base,
 whereby when said body is engaged upon said ground plane surface said rib members will flex in the direction of their inclination under weight.
3. In combination with a shoe having a shoe base provided with a rear wedge portion

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a resilient sole secured to said shoe under said shoe base, said sole having

a ground plane surface contacting body, and a longitudinally extending series of transverse parallel rib members inclined forwardly at its upper surface

said rib members having their front and rear faces converging upwardly from said body to conjunctive edges,

said edges being arranged in load supporting relationship at and under said shoe base,

and a peripheral resilient foxing strip about said sole and secured to said shoe sole and shoe base, whereby when said body is engaged upon said ground plane surface said rib members will flex in the direction of their inclination under weight.

4. In combination with a shoe having a shoe base provided with a rear wedge portion,

a resilient sole secured to said shoe under said shoe base, said sole having

a ground plane surface contacting body, and a longitudinally extending series of transverse parallel rib members inclined forwardly at its upper surface,

said rib members having their front and rear faces converging upwardly from said body to conjunctive edges,

said edges being arranged in load supporting relationship at and under said shoe base,

whereby when said body is engaged upon said ground plane surface said rib members will flex in the direction of their inclination under weight.

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