Oct. 3, 1933. K. TUKI ET AL 1,929,126

RESILIENT SOLE ELEMENT FOR FOOTWEAR

Filed March 9, 1932

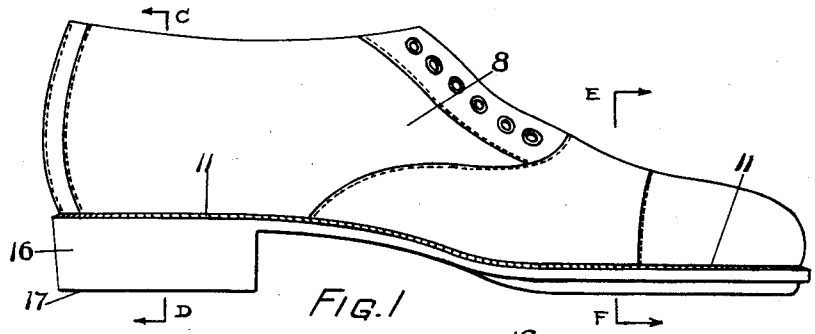


FIG. 1

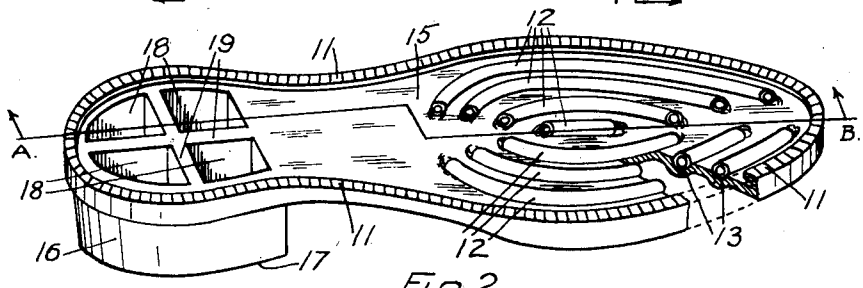


FIG. 2

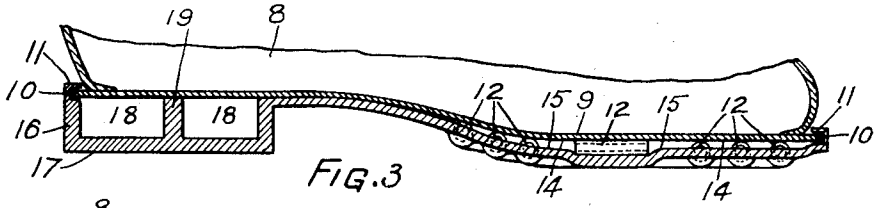


FIG. 3

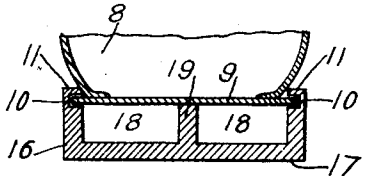


FIG. 4

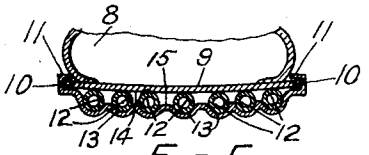


FIG. 5

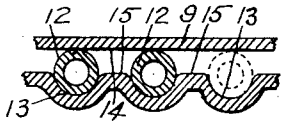


FIG. 6

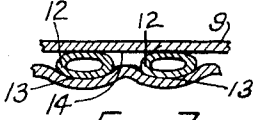


FIG. 7

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Patented Oct. 3, 1933 1,929,126

UNITED STATES PATENT OFFICE

1,929,126

RESILIENT SOLE ELEMENT FOR FOOTWEAR

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Application March 9, 1932, Serial No. 597,834, and in Australia May 7, 1931

3 Claims. (Cl. 36—28)

This invention relates to improvements in resilient combination sole and heel elements for footwear, as boots and shoes, and has for an essential objective the provision of such improvements as at once ensure a maximum degree of comfort to the wearer, complete security to the wearer against the ingress of moisture, and an insulation or protection to the wearer against electric shock.

Resilient combination sole and heel elements for footwear as hitherto known have not been of such form and character as to ensure to the wearer the before-mentioned desiderata to that extent made possible by a sole and heel element according to the present invention which incorporates improved cushioning means, a cavity heel formation in combination with such improved cushioning means, and an integrally formed continuous inwardly projecting upper securing edge in combination with such improved cushioning means and cavity heel formation.

An article according to the invention is of rubber or like waterproof material. Its main body portion is formed as in a single moulding operation and its wearing faces are of such configuration as to effectually prevent liability of slip upon wet or greasy pavements.

A combination sole and heel element according to the invention may be permanently or detachably fitted. It may be fitted to and around the welt of a boot or shoe to which the usual outer sole has not been attached, but is preferably fitted to and around the projecting welt portion or edge of the usual outer sole and will be herein so described.

A particular feature of the invention resides in the provision within suitable recesses or channels formed from the inner surface of the sole portion of the said combination sole and heel element, of a series of inset open-ended tubes as of stout rubber or like resilient material. The said tubes are so arranged as to be adapted to function to maintain separated one from the other the adjacent surfaces as of the usual outer sole of the boot or shoe and the sole portion of the said combination sole and heel element.

A further feature of the invention resides in the provision, in a combination sole and heel element having a sole portion as already set forth, of a heel portion which has above its tread cavities divided by one or more integral cross members or walls.

A further feature of the invention resides in the provision in an improved resilient combination sole and heel element of the character described, of an integrally formed continuous inwardly projecting upper securing edge designed to slip over and engage with the projecting welt edge of the boot or shoe sole, a suitable cement being first applied if desired.

But in order the more clearly to define the invention according to one form thereof reference will now be had to the accompanying drawing.

Like reference numerals denote like parts in the several views of the drawing which are as follows:—

Figure 1 is a side elevation of a shoe to which the invention has been applied.

Figure 2 is a perspective view of a combination sole and heel element according to the invention, a part being shown broken away to more clearly illustrate the arrangement of tubes and recesses therefor.

Figure 3 is a longitudinal sectional view on the line A—B of Figure 2.

Figure 4 is a broken cross sectional view on the line C—D of Figure 1.

Figure 5 is a broken cross sectional view on the line E—F of Figure 1.

Figures 6 and 7 are enlarged fragmentary sectional views respectively illustrating inset tubes (*a*) when not under compression and (*b*) when under compression.

In the drawing, the shoe 8 has the usual outer sole 9 to and over the projecting welt edge 10 of which latter is secured the integrally formed continuous inwardly projecting upper securing edge 11 of the combination sole and heel element, a suitable water-proof cement being first applied if desired.

The said securing edge 11 is moulded with an upper surface resembling that of a sewn leather welt.

The said securing edge so applied to and around the said boot or shoe sole serves to at once effectually seal from the exterior atmosphere the cavities of the said fitted improved resilient combination sole and heel element.

Series of inset open-ended tubes 12 as of stout rubber or like resilient material are snugly accommodated within recesses or channels 13 where they are lightly cemented in position and where they function to maintain separated one from the other the surface 14 of the sole 9 and the surface 15 of the sole portion of the combination sole and heel element.

The said open-ended tubes 12 have walls of sufficient thickness to offer a requisite degree of resistance to compression when the wearer is walking whilst yet being elastic to a desired degree and such degree of resistance to compression

is to an extent obviously aided by reason of the fact that the interior of the combination sole and heel element is effectually sealed from exterior atmosphere by its securing edge applied to and around the boot or shoe sole.

The said tubes are partially flattened out or laterally extended only when under compression to so afford a great elasticity of tread and comfort in walking.

The said tubes are of readily replaceable character although lightly cemented in the recesses or channels provided for their accommodation. They the said inset tubes and their associated recesses or channels preferably have a curvature substantially conforming to and with the shape or contour of side and toe portions of the sole and are arranged in series equidistantly and parallelly across the breadth of the sole so that a desired cushioning effect and springy tread may be secured no matter which portion of the sole may be in contiguity with the ground surface when pressure is applied during the act of walking.

The heel portion 16 of the said combination sole and heel element has above its tread 17 cavities 18 divided by integral cross members or walls 19. It will be obvious that when the continuously formed securing edge 11 has been applied to and over the projecting welt edge 10 of the shoe sole 9 the said cavities 18 are formed into sealed air-filled compartments which bring about a desired cushioning effect.

The wearing face of the sole portion of the combination sole and heel element is, according to that form of the latter which has been illustrated by the drawing herein, formed with longitudinally disposed curved ribs (see sectional portion of broken-away part of Figure 2 and see Figures 5, 6 and 7 of the drawing), the said curved ribs being the outer surfaces of the recesses or channels 13 and the material of which the said sole portion is composed being of the same thickness throughout. The recesses or channels 13 may alternatively however be formed in the thickness of the material which may be heavy or light according to requirements.

The invention is found in practice to entirely fulfill in very satisfactory manner its before-mentioned objective, securing the desired degree of comfort in wear and cushioning effect as well as security against dump and against liability of slipping upon wet or greasy pavements and against electric shock.

What we do claim is:—

1. A sole structure including an inner portion, an outer portion, one of said portions being provided with recesses on its face adjacent the other portion, and a series of tubes of resilient material arranged in said recesses and positioned between and in contact with said portions.

2. A sole structure including an inner portion forming a welt, an outer portion provided on its inner face with a series of recesses, a plurality of open ended tubes cemented within the recesses and projecting above said surface and adapted to contact with the inner portion to hold said portions in slightly spaced relation, and means for securing the said portions together.

3. A sole structure as claimed in claim 2, wherein the outer portion is depressed to provide the recesses, said depressions forming ribs on the outer surface of the sole.

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