Feb. 8, 1949. G. SUPPLE 2,461,355

TRANSVERSELY RIGID, LONGITUDINALLY FLEXIBLE, INTERNAL SOLE ELEMENT FOR FOOTWEAR

Filed May 27, 1946 2 Sheets-Sheet 1

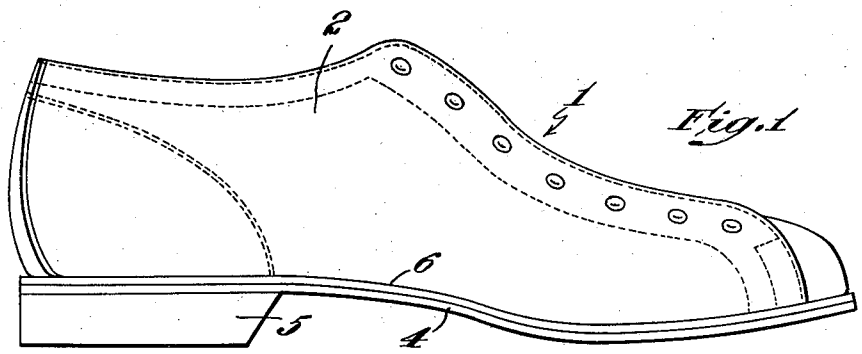


Fig. 1

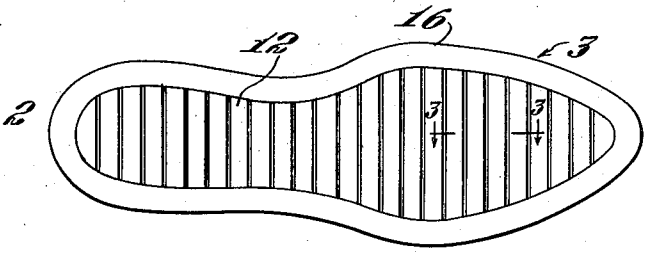


Fig. 2

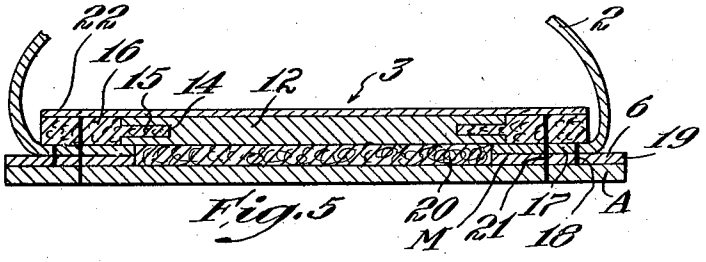


Fig. 5



Fig. 4



Fig. 3

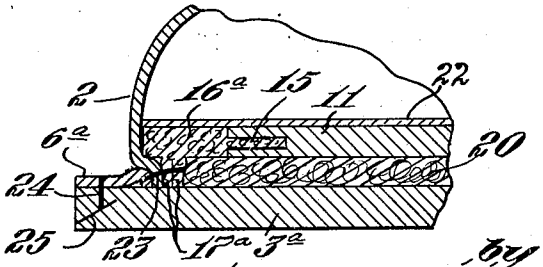


Fig. 6

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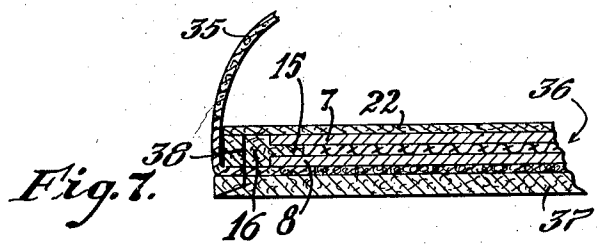


Fig. 7.

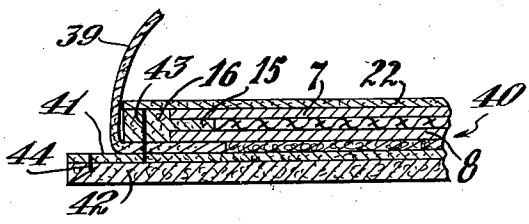


Fig. 8.

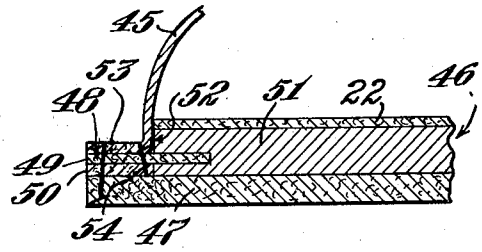


Fig. 9.

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UNITED STATES PATENT OFFICE

2,461,355

TRANSVERSELY RIGID, LONGITUDINALLY FLEXIBLE, INTERNAL SOLE ELEMENT FOR FOOTWEAR

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Application May 27, 1946, Serial No. 672,346

8 Claims. (Cl. 36—22)

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This invention pertains to footwear and more particularly to a novel inner sole element for use in footwear and designed to provide a transversely rigid, but longitudinally flexible, foot-supporting surface.

In my Patent No. 2,381,937, dated August 14, 1945, I have described a transversely rigid, longitudinally flexible sole element comprising one or more plies of wood and a marginal attaching strip of flexible material such as leather. In the patented construction the sole element with its attaching strip is shown as terminating substantially at the heel breast line, and the shoe chosen for specific illustration in said patent is a Goodyear welt shoe wherein the sole element constitutes the outer sole.

Such a sole element, transversely rigid but longitudinally flexible, modified for particular uses, is desirable as an inner member of the shoe bottom structure in association with a conventional outer sole of leather, rubber or the like and operative to provide a foot-supporting surface having a degree of transverse rigidity not inherent in the material of conventional outer soles. Such an inner member may, for example, constitute the insole in shoes of some types, especially in athletic shoes, for example, golf and bowling shoes, wherein longitudinal flexibility coupled with adequate foot support are highly desirable.

An object of the present invention is to provide a novel shoe construction wherein such a sole element constitutes the inner sole. A further object is to provide an inner sole having the characteristics of the sole element above referred to but which is of full length, that is to say, it extends from heel to toe tip of the shoe, thus making it available for use in shoes of certain special types. A further object is to provide an insole wherein the forepart, or forepart and shank portions, are of the transversely rigid construction of the aforesaid patent, while the remainder of the insole is of conventional character, for example of leather or fabric. A further object is to provide a transversely rigid longitudinally flexible inner sole having an attaching element extending all of the way around it, including its toe and heel portions. Other and further objects and advantages of the invention will be pointed out in the following more detailed description and by reference to the accompanying drawings wherein

Fig. 1 is a side elevation of an athletic shoe embodying the present invention;

Fig. 2 is a top view of the inner sole used in

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the shoe of Fig. 1 before it is incorporated in the shoe;

Fig. 3 is a fragmentary longitudinal section on the line 3—3 of Fig. 2, and to larger scale, showing one desirable way of forming the inner sole;

Fig. 4 is a view similar to Fig. 3 but illustrating an alternative way of making the inner sole;

Fig. 5 is a fragmentary transverse section in a plane of the inner sole such as indicated by the line 5—5 of Fig. 4, to larger scale than Fig. 1, and illustrating the construction of a shoe of the sewed Littleway type embodying an insole of the kind shown in Fig. 4;

Fig. 6 is a view similar to Fig. 5 but showing the present invention embodied in a shoe of Goodyear welt type, the inner sole being of the specific construction shown in Fig. 4;

Fig. 7 is a fragmentary transverse section showing the insole of the present invention embodied in a shoe of the Littleway type, the inner sole being of the specific form shown in Fig. 3;

Fig. 8 is a fragmentary transverse section showing the improved inner sole of the present invention embodied in a shoe of Goodyear Littleway type, the inner sole being of the specific construction shown in Fig. 3; and

Fig. 9 is a fragmentary transverse section showing the improved inner sole of the present invention embodied in one type of stitch-down shoe, the inner sole being of the kind shown in Fig. 4.

Referring to the drawings, the numeral 1 designates a shoe, for example a golf or bowling shoe, comprising the upper 2, the outer sole 4, the heel 5, and a welt strip 6. This shoe also has an inner sole 3, illustrated in Fig. 2. This inner sole may be of the general construction of the sole element illustrated in my aforesaid patent. For example, as shown in Fig. 3, it may comprise a longitudinally extending series of parallel transversely extending and transversely rigid ribs 12, each rib consisting of superposed splints or slats 7 and 8, respectively, of wood or material having equivalent characteristics. This inner sole, as illustrated for example in Fig. 3, also comprises a flexible, thin connecting element 10, for instance textile material, sheeted synthetic resin, vulcanized rubber or the like, which extends throughout the area of the inner sole, and which is interposed between the upper and lower slats 7 and 8 constituting the respective ribs. The edges of the adjacent slats are spaced apart slightly, as shown at 9, and the slats are securely united to the flexible sheet 10, for instance by the employment of a suitable cement. Alternatively, as illustrated in Fig. 4, the inner sole may comprise a

single thin piece of wood, with the grain extending transversely of the inner sole and having transversely extending grooves or incisions 11, which define the transversely extending ribs 12. The incisions or grooves 11 do not extend all of the way through the thickness of the sheet of wood, thus leaving thin hinge areas 13 permitting the ribs 12 to flex relatively to each other, thus providing a sole which is transversely rigid but very flexible longitudinally.

Whether the arangement of Fig. 3 or Fig. 4, or other equivalent be employed, the ends of the several ribs are provided with slots or grooves 14 (Fig. 5) which receive a portion of a flexible attaching strip 16. This portion of the attaching strip 16 which is disposed in the slots in the ribs, may be an integral tongue, as shown in Fig. 5, or if the ribs be constructed as shown in Fig. 3, for example, this portion may consist of the margin of the flexible uniting ply. This attaching strip, whether of one or more plies, is of some flexible but strong material, for instance leather which is readily penetrable by an awl, sewing needle, staple, tack or other usual instrumentality employed in the union of shoe parts, and as illustrated in Fig. 2 it extends all of the way around the inner sole. The part 15 or its equivalent fits snugly in the grooves 14 in the ends of the several ribs and is firmly and permanently secured to the ribs by adhesive or the like. The strip 16 thus unites the several ribs which form the inner sole, although permitting the ribs to flex freely relatively to each other longitudinally of the sole. It is within the scope of the invention to connect the slats or ribs solely by means of the attaching strip 16.

This longitudinally flexible transversely rigid inner sole with its penetrable attaching strip 16 extending all of the way around it, forms a very desirable inner sole for shoes of certain types, for instance the modified sewed Littleway shoe of Fig. 5. As illustrated in this view, a welt strip 6 is first secured to the marginal portion of the upper 2, by means of the sewed seam 18 or by means or staples or other fastener elements, if preferred. This welt strip 6 is of such width that its outer edge 19 registers with the outer edge of the outer sole 4. The inner sole 3, in accordance with the present invention, is assembled with the upper on a last, and the margin 17 of the upper is lasted-in against the under face of the attaching strip 16 of the inner sole, and with the inner marginal portion M of the welt strip 6 underlying this marginal portion 17 of the upper. These parts 17 and M may be united by adhesive, if desired, as well as by the seam 18, the marginal portion 17 of the upper being united to the attaching strip 16 of the insole by adhesive or by staples during the lasting operation. The space defined by the inner edges of the upper margin 17 and the welt M is filled with a suitable filling material shown at 20, and the outer sole 4 is secured in place, for example by means of adhesive. The last is removed from the upper and the parts 16, 17, M and 4 are now united by the Littleway sewing stitches shown at 21. The seam constituted by the stitches 21 extends all of the way around the shoe, including the toe and heel portions. After the outer sole has thus been sewed in place, the heel 5 may be attached and a slip sole 22 inserted, if desired, and adhesively secured in place to form a smooth surface on which the foot of the wearer may rest. It is not necessary to employ this slip sole 22 although it provides a better finish when used. If desired,

the welt strip 6 may constitute the outer marginal portion of a complete middle sole member.

In Fig. 6, the inner sole above described is shown as employed in the construction of a Goodyear welt shoe. In this instance the attaching strip of the inner sole, designated 16a, is furnished at its under side with parts 17a which collectively form a sewing rib such as is customarily provided at the under side of a Goodyear welt inner sole. These elements 17a may be integral with the body portion of the strip 16a, for example, they may be skived up from the under side of the latter. On the other hand, these members 17a may be separate from the body portion 16a of the attaching strip, and suitably secured to the latter, following practices which are customary in the making of Goodyear welt inner soles. Having prepared the inner sole with its attaching strip 16a and its sewing rib 17a, the inner sole is assembled with the upper 2 on a last, and the lower edge of the upper and the inner edge of a Goodyear welt 6a are secured to the sewing rib 17a by the inseam stitches 23, or if preferred, by staples or other fasteners. The space defined by the sewing rib 17a is then filled with suitable filler material 20. The inseam is trimmed in customary fashion, and the outer sole 3a applied and secured, if desired, by adhesive to the shoe bottom structure. The outer margin of the outer sole 3a is sewed to the welt 6a by the stitches 24, which as here illustrated are concealed at the shoe bottom by the channel flap 25.

For certain types of Goodyear shoe, for instance those employed for sport use, it may be desirable to have the attaching strip 16a extend all of the way around the inner sole, as above described, and to extend the Goodyear welt 6a all of the way around the shoe rather than to have it terminate at the heel breast line, as is more often the practice.

In Fig. 7 the shoe upper is shown at 35, the insole (similar to the insole shown in Fig. 3) is indicated at 36, and the outer sole at 37, the upper, insole and outer sole being united by sewing stitches 38.

In Fig. 8 the shoe upper is shown at 39, the insole (similar to that shown in Fig. 3) is shown at 40, the mid-sole at 41, and the outer sole at 42. The upper, insole and middle sole are united by the sewing stitches 43. The mid-sole extends outwardly beyond the upper to provide a welt to which the outer sole is attached by the sewing stitches 44.

In Fig. 9 the upper is shown at 45, the insole at 46, and the outer sole at 47. In this instance the insole is generally like that shown in Fig. 5, but the upper surface 48 of the attaching strip (comprising the parts 49 and 50) is substantially below the plane of the upper surfaces of the wooden ribs 51 thus providing an inset vertical marginal face or shoulder 52 defined by the ends of the wooden ribs, and a substantially horizontal face defined by the upper surface 48 of the attaching strip. The upper lies against the vertical face 52 and then turns outwardly so that its margin 53 contacts the surface 48. Sewing stitches 54 unite the attaching strip and upper, these sewing stitches extending through the upper at the apex of the angle formed respectively by those portions of the upper which engage the surface 52 and the surface 48, these stitches being formed in the operation of thread-lasting. By reason of the shoulder at the margin of the insole these stitches draw the upper very snugly down against the upper surface of the attaching strip.

While certain desirable embodiments of the invention have been illustrated by way of example, it is to be understood that the invention is broadly inclusive of all modifications and equivalents which fall within the terms of the appended claims.

I claim:

1. A full length insole for use in footwear, said insole comprising a series of transversely rigid ribs and a marginal attaching strip of flexible material, said attaching strip comprising a portion which fits into and is secured in grooves in the ends of the several ribs, the attaching strip thereby connecting the ribs and extending uninterruptedly all of the way around the insole, including its heel and toe ends.

2. An insole for use in footwear, said insole comprising a series of transversely rigid ribs and a marginal attaching strip, said attaching strip comprising a part which fits into and is secured in grooves in the ends of the several ribs, the attaching strip thereby connecting the ribs, the attaching strip having a rib of needle-penetrable material projecting from its under surface for the reception of fastener elements for uniting the marginal portion of a shoe upper to said strip.

3. An insole for use in footwear, said insole comprising a series of transversely rigid ribs and means flexibly uniting them and a flexible marginal attaching strip of needle-penetrable material comprising a part which fits into and is secured in grooves in the ends of the several ribs, the attaching strip having a sewing rib projecting from its under surface for the reception of fastener elements for uniting the margin of a shoe upper and Goodyear welt to said strip.

4. A full length insole for use in footwear, said insole comprising a series of transversely rigid ribs and a marginal attaching strip of flexible material, said attaching strip connecting the ribs, the attaching strip extending uninterruptedly all of the way around the insole, including its heel and toe ends, and comprising a needle-penetrable sewing rib designed to receive the inseam stitches in the manufacture of a Goodyear welt type shoe.

5. An insole for use in footwear, said insole comprising a series of transversely rigid ribs and a marginal attaching strip of flexible material, said attaching strip connecting the ribs, the upper surface of the exposed portion of the attaching strip being substantially flush with the upper surfaces of the ribs, and a needle-penetrable sewing rib projecting from the lower side of the attaching strip, said rib being integral with the body portion of the strip.

6. An insole for use in footwear, said insole being longitudinally flexible and comprising a series of parallel, transversely rigid ribs and a flexible attaching strip having its inner marginal portion permanently united to the ends of the several ribs, the attaching strip extending all of the way around the insole including its heel and toe ends.

7. A longitudinally flexible inner sole element comprising a series of parallel, transversely rigid ribs and a flexible attaching strip, said attaching strip having an integral tongue which fits into slots in the ends of the several ribs and which is permanently united to the ribs, the lower surface of the attaching strip being substantially flat and flush with the lower surfaces of the series of ribs.

8. A transversely rigid, longitudinally flexible, internal sole element designed to constitute one of the constituent layers of a shoe bottom structure and to be interposed between a conventional outer sole and a foot-contacting sole member, said sole element having an edge contour generally similar to that of the forepart portion, at least, of the outersole with which it is to be associated and comprising superposed plies, and means permanently uniting said plies, one of said plies being of tough, strong material which is flexible both longitudinally and transversely of the sole element and another of said plies being flexible longitudinally but substantially rigid transversely of the sole element, said latter ply comprising a series of longitudinally spaced, parallel, transversely extending slats, each slat being of wood or a material having similar stiffness and rigidity.

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