April 21, 1964 H. FUNCK 3,129,520

ONE-PIECE MOLDED SOLE FOR WELT SHOES

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Fig. 1

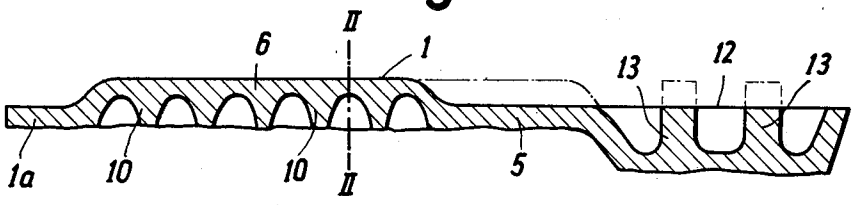


Fig. 2

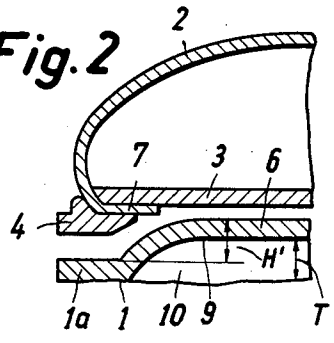
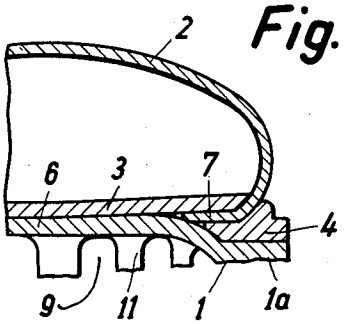


Fig. 2a



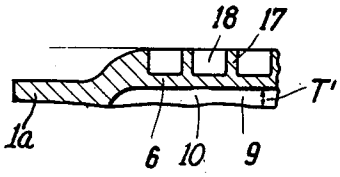


Fig. 3

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Fig. 4

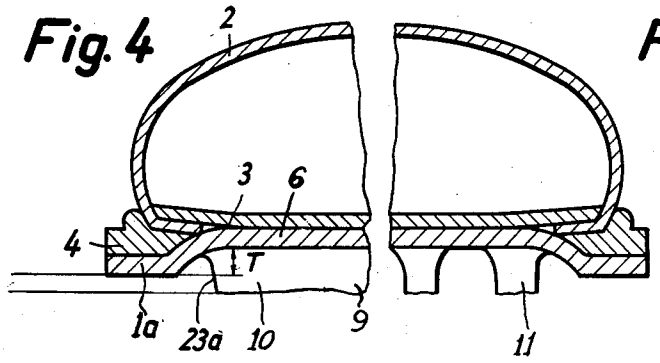


Fig. 5

Fig. 6

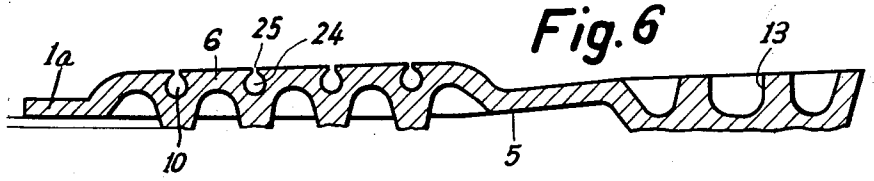
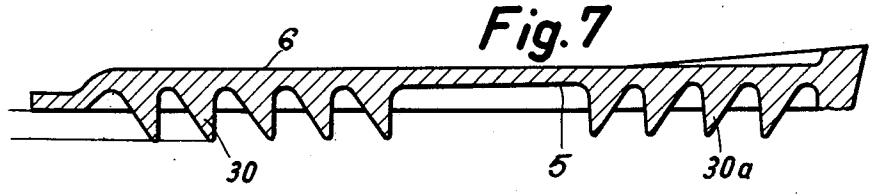


Fig. 7



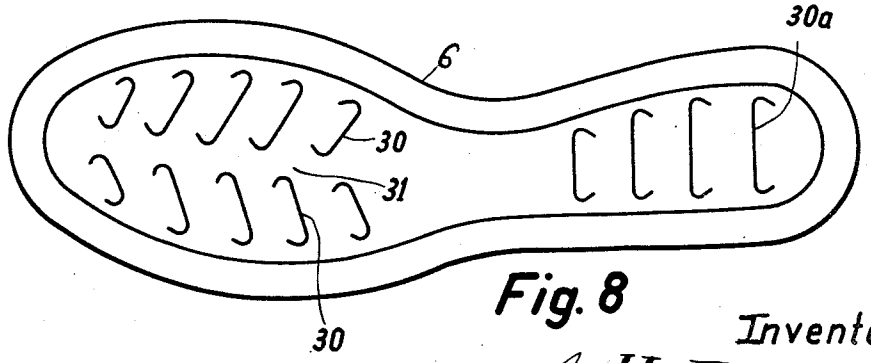


Fig. 8

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ONE-PIECE MOLDED SOLE FOR WELT SHOES

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Claims priority, application Germany Dec. 17, 1959
10 Claims. (Cl. 36—28)

This specification describes improved shoe outsoles made of molded resilient material. Each of the soles has a hollow prominence containing projections which are integral with the sole and are adapted for supporting the shoe on the ground, while the prominence is surrounded by a peripheral part of the sole for the attachment of a shoe upper.

My improved soles are illustrated in the attached drawings.

FIGURE 1 of the drawing shows the first sole in longitudinal section.

FIGURES 2 and 2*a* show in transverse section on the line II—II of FIGURE 1 two stages in the manufacture of a shoe using the sole. The figures show different forms of projections which can be used on the sole.

FIGURE 3 is a transverse section of part of a further improved sole.

FIGURES 4 and 5 are partial transverse sections of two further improved shoe soles.

FIGURE 6 is a longitudinal section of yet another improved sole.

FIGURES 7 and 8 are respectively a longitudinal section and a view from below of a still further improved sole designed for sports shoes.

Throughout the description of the invention, like reference numerals refer to parts or elements similar to the different embodiments.

As shown in FIGURES 1, 2 and 2*a*, the finished improved one-piece outsole **1** is of molded resilient material and, as shown in FIGURE 2*a*, is adapted for attachment by means of a welt **4** to the upper **2** of a shoe. For this attachment the sole is provided with a peripheral portion **1***a*. **3** denotes a leather insole of the shoe. The central part of the forepart of the sole is bent upwards to form a hollow prominence **6** defining a downwardly opening cavity **9**. This hollow prominence which extends backwards as far as the shank **5** of the sole, has an upper surface level with the top surface of the inturned or lasted margin **7** of the upper **2**, thus providing with the margin a level support for insole **3**, this being an important feature of the improved sole since therefore the insole can be applied directly on the sole **1** without any bottom filler. The height H′ of the hollow prominence **6** of the sole is therefore approximately equal to the combined thicknesses of the welt **4** and the inturned margin **7** of the upper **2**. The depth T of the cavity **9**, that is to say the vertical distance between the top face of the cavity (the lower surface of the prominence) and the lower surface of the peripheral portion **1***a*, is greater than the thickness of the peripheral portion. Moreover, the depth T is equal or substantially equal to the height of the upper surface of the prominence above the upper surface of the peripheral portion **1***a*, that is, $T—H'$.

The cavity **9** of the prominence **6** is provided with ground engaging projections, such as transverse ribs **10** (FIGURE 2)—i.e. ribs perpendicular to the axis of the sole or studs **11** (FIGURE 2*a*), which of course are hidden from view by the peripheral sole portion **1***a*.

The improved soles shown in FIGURES 1, 2 and 2*a* can be incorporated in shoes having shank stiffeners; but for use in shoes without shank stiffeners, the prominence **6** can be continued along the shank as shown in FIGURE 1, in dot-dash lines.

The heel portion **12** of the sole is hollow and contains transverse supporting ribs **13**.

The sole whose forepart is shown in FIGURE 3 has a hollow prominence **6** whose cavity **9** is of less depth than previously described and has transverse ribs **10**. The upper face of the prominence carries longitudinal ribs **17** and transverse ribs **18** for supporting the lower surface of the insole.

In the shoe sole shown in FIGURE 4, the transverse ribs **10** protrude below the level of the lower surface of the peripheral portion **1***a* of the forepart of the sole. The ends **23***a* of these ribs **10** are not joined to the sides of the cavity in the hollow prominence **6**. Alternatively, as shown in FIGURE 5, the projections can be in the form of studs **11**.

The improved sole shown in FIGURE 6 is provided with cavities **24** in the upper face of the prominence and these cavities are provided with slit openings **25**. During walking these cavities are intermittently compressed and serve to circulate air in the shoe. The hollow heel contains ribs **13**.

My improved shoe shown in FIGURES 7 and 8 has a prominence **6** which extends along the shank **5** of the sole to the rear end of the heel and contains rib-like projections **30** of saw-tooth cross section which in front of the shank extend downwards and towards the heel while the projections **30***a* behind the shank extend downwards and towards the toe. The projections on the forepart of the sole are placed in two rows on either side of a rib free area **31** to facilitate cleaning, and are at an angle to the longitudinal axis of the shoe, whereby to reduce both lateral and longitudinal slipping of the shoe.

The ribs **30** have a backward rake to facilitate the forward pushing by the ball of the foot during walking or running. On the other hand, the forward inclination or rake of the ribs **30***a* under the heel part of the sole are a help when the wearer draws up quickly from running.

If desired, the ribs can be made of V-shaped plan.

While I have described several improved shoe soles in detail so as to enable those skilled in the art to take full advantages of the novel teachings, it is to be understood that the monopoly claimed is not to be limited to the details of construction described above but is to be interpreted from the gist and spirit of the following claims.

What I claim is:

1. In a shoe having an outsole, an upper and a welt for securing the outsole to the upper, said welt having upper and lower surfaces, an inturned lower margin on said upper attached to the upper surface of the welt, said outsole comprising a one-piece body of flexible material having a fore part, a shank and a heel, at least the fore part of said outsole being provided with a peripheral portion and a central prominence lying within said peripheral portion and coextensive therewith and constituting a downwardly opening cavity, said peripheral portion and central prominence each having upper and lower surfaces, the lower surface of the welt being attached to the upper surface of the peripheral portion, the distance between the upper surface of said central prominence and the upper surface of said peripheral portion being substantially equal to the combined thickness of the welt and the inturned margin of the upper, and a plurality of downwardly extending projections located within said cavity and secured to the lower surface of the central prominence for supporting the shoe on the ground.

2. The shoe as claimed in claim 1, wherein the distance between the lower surface of said prominence and the lower surface of said peripheral portion is greater than the thickness of said peripheral portion.

3. The shoe as claimed in claim 1, wherein the distance between the upper surface of said prominence and the upper surface of said peripheral portion is substantially equal to the distance between the lower surface of said

prominence and the lower surface of said peripheral portion.

4. The shoe as claimed in claim 1, wherein the projections within said cavity are defined by ribs extending substantially transversely of the outsole.

5. The shoe as claimed in claim 1, wherein each projection has a lower end which extends below the lower surface of said peripheral portion.

6. A one-piece shoe sole comprising a body having a fore part, a shank and a heel part, at least the fore part being provided with an upwardly bulging hollow prominence constituting a downwardly opening cavity, a peripheral portion for said fore part surrounding said prominence and being coextensive therewith, said prominence and peripheral portion each having upper and lower surfaces, with the upper surface of the peripheral portion being adapted to be secured to a shoe welt, and projections within said cavity extending downwardly from the lower surface of the prominence for supporting the sole on the ground.

7. The shoe sole as claimed in claim 6, wherein the distance between the lower surface of said prominence and the lower surface of said peripheral portion is greater than the thickness of said peripheral portion.

8. The shoe sole as claimed in claim 6, wherein the distance between the upper surface of said prominence and the upper surface of said peripheral portion is substantially equal to the distance between the lower surface of said prominence and the lower surface of said peripheral portion.

9. The shoe sole as claimed in claim 6, wherein said projections are defined by ribs extending substantially transversely of the sole.

10. The shoe sole as claimed in claim 6, wherein each projection is provided with a lower end which extends below the lower surface of said peripheral portion.

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