May 15, 1956 J. E. HOLT 2,745,197

MID-SOLE CONSTRUCTION

Filed Sept. 9, 1954 2 Sheets-Sheet 1

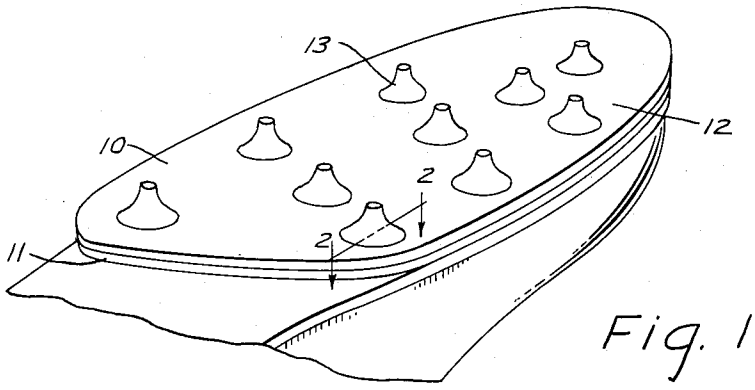


Fig. 1

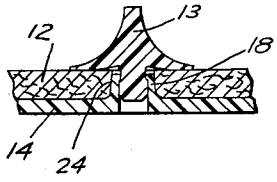


Fig. 2

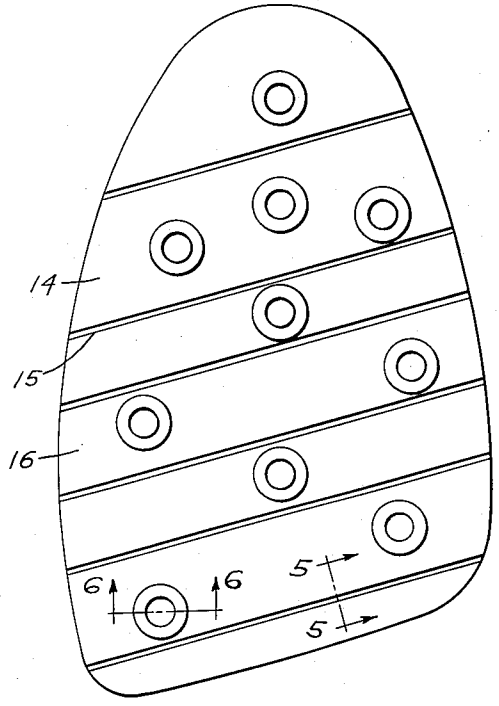


Fig. 3

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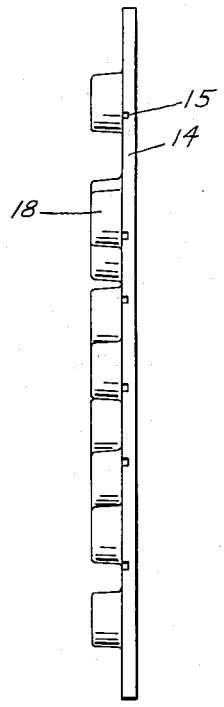


Fig. 4

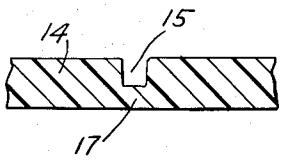


Fig. 5

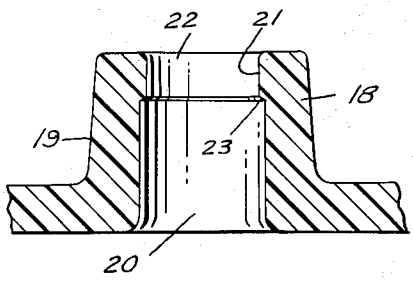


Fig. 6

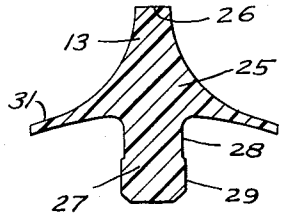


Fig. 7

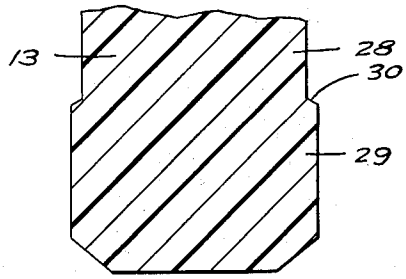


Fig. 8

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2,745,197

MID-SOLE CONSTRUCTION

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Application September 9, 1954, Serial No. 454,968

5 Claims. (Cl. 36—2.5)

The present invention relates to the manufacture of golf and suitable sport shoes, and has particular reference to a novel construction for a mid-sole.

Golf and similar shoes are constructed with a mid-sole and with one or two layers of tap soles, the tap soles having spaced spikes, preferably of metal, which are threadedly seated or otherwise locked thereto. Since the mid-soles should be flexible for ready bending, and rigid laterally, they have heretofore been made of laterally scored wood mounted on a flexible backing such as a textile base.

The principal object of the invention is to provide a novel mid-sole of molded plastic material, preferably nylon, which is flexible longitudinally but rigid laterally.

Another object of the invention is to utilize a plastic mid-sole as the support to which spikes may be threadedly or otherwise secured.

A further object of the invention is to provide a plastic mid-sole with spike receiving sockets adapted to snap lock spikes driven therein.

An additional object is to provide plastic spikes, preferably of nylon, which have retaining flanges adapted to yield under pressure, whereby the spike flanges securely grip the tap sole despite thickness variations therein.

With the above and other objects and advantageous features in view, the invention consists of a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more specifically defined in the claims appended thereto.

In the drawings,

Fig. 1 is a perspective view of an illustartive golf shoe sole embodying the invention;

Fig. 2 is a detail section on the line 2—2 of Fig. 1;

Fig. 3 is a plan view of the mid-sole thereof;

Fig. 4 is a side elevation of Fig. 3;

Fig. 5 is an enlarged sectional detail on the line 5—5 of Fig. 3, showing a preferred transverse slot arrangement;

Fig. 6 is an enlarged sectional detail on the line 6—6 of Fig. 5, showing a spike socket;

Fig. 7 is an enlarged section through a spike; and

Fig. 8 is an enlarged sectional detail of the spike base, showing the snap insert thereof.

It has been found desirable to make a plastic mid-sole or calk carrying plate for sport shoes, and particularly golf shoes, which can be used with a single or a double tap sole, which is light in weight, is flexible longtitudinally while being rigid laterally, and which is adapted to snap receive the bases of spikes, the spikes being of metal or plastic and being of conventional screw insert of of snap insert type. To this end, I mold the mid-sole of nylon or other suitable thermo-plastic, the mid-sole having longitudinally spaced grooves to provide longitudinally spaced bending portions between transversely extending sections of varying dimensions, and I provide integral spike receiving sockets in the larger sections which are adapted to receive standard metal screw-in spikes or

plastic snap-in spikes, as desired, the plastic spikes being provided with flanges for pressure seating over the tap soles and yielding to compensate for normal variations in tap sole thicknesses.

Referring to the drawings, the illustrative sole **10** of a golf shoe or similar sport shoe includes a conventional outsole **11**, a tap sole **12** which may be of single or of double thickness, and spikes **13** which extend outwardly from the tap sole and are locked or otherwise secured to the mid-sole.

The preferred construction for the mid-sole or calk carrying plates is shown in Fig. 3; mid-sole has a flat base **14** of substantially uniform thickness, shaped to the outline of the foot, and provided with slightly inclined parallel grooves **15** which divide the base into parallel sections **16**, the grooves **15** being generally rectangular in shape, see Fig. 4, and of a depth greater than one half the thickness of the base, whereby each groove has an associated portion **17** thin enough to permit longitudinal flexing of the sole; the sections **16** are rigid and resist lateral distortion, whereby edge curling is prevented and any bump resulting from a tilted spike and socket produces no uncomfortable feeling.

Each section **16** has at least one spike socket **18**, the distribution of the sockets being preferably as shown in Fig. 3. Each socket **18** has slightly conical sides **19** and a cylindrical recess **20**, entrance to which is provided by an inlet portion **21** which has an inlet opening **22** axially aligned with but slightly smaller in diameter than the diameter of the recess **20**, whereby an annular lock shoulder **23** is provided between the inlet portion and the recess. The tap sole or soles are preferably provided with circular passages **24**, see Fig. 2, to seat over the sockets and in contact with the mid-sole base.

Each spike **13** is preferably formed as illustrated in Fig. 7, with a body **25** terminating in a flat end **26** of small area, a lower plug **27** having an inner cylindrical part **28** adapted to fit into the socket inlet opening and a lower cylindrical terminal portion **29** of slightly greater diameter than the cylindrical part **28**, whereby an annular lock shoulder **30**, see Fig. 8, is provided, and an intermediate annular flange **31** which is cut away or dished as disclosed in Fig. 7; the outer surface of the upper portion of the spike flares outwardly concavely as illustrated, from the spike end to the periphery of the spike flange.

The mid-sole is preferably molded of plastic material, the preferred material being nylon, the spikes are also molded of plastic material, the preferred material being nylon, whereby the spike flanges and the mid-sole sockets are slightly resilient and yielding, for the purpose hereinafter disclosed.

Referring now to Fig. 2, a spike is readily snap locked into a recess by striking the spike end, whereupon the socket opening gives slightly and the plug end is forced through to snap seat within the socket recess, the socket shoulder and the plug shoulder engaging to prevent inadvertent separation or release of the spike from the socket; a worn spike may be removed, however, by a screw driver or the like.

The locking of the spike in the socket recess also forced the spike flange downwardly to press against the tap sole, as illustrated; the resilience of the flange compensates for any variation in thickness of the tap sole or soles, and serves as a resilient rivet binder for the tap sole.

If desired, standard type metal spikes having screw plugs may be used in place of the described plastic spikes; the screw threads dig into the self-tapping slightly resilient socket recess walls, which are made of the same diameter as the pitch diameter of the spike screw, and lock fast against inadvertent separation.

Although I have disclosed a specific mid-sole and spike construction, it is obvious that changes in the size,

shape, arrangement and material may be made to meet different mid-sole requirements, without departing from the spirit and the scope of the invention as defined in the appended claims.

I claim:

1. A calk carrying plate for a sport shoe or thermoplastic material, comprising a series of parallel transversely rigid sections each substantially at right angles to the inner edge of the sole, said sections being separated by grooves, whereby said plate is longitudinally flexible, each section having at least one spike socket intergral therewith and extending therefrom.

2. In combination with the article of claim 1, a spike mounted in each recess, said spike having a plug, a spike end, and an intermediate flange.

3. A sport shoe construction of the character described comprising an outsole, a thermoplastic mid-sole secured to the outer surface of said outsole, said mid-sole having a plurality of spike-receiving sockets integral therewith and extending therefrom, and a tap sole secured to said mid-sole and having a plurality of apertures therein for receiving said sockets.

4. A sport shoe construction of the character described comprising an outsole, a thermoplastic mid-sole secured to the outer surface of said outsole, said mid-sole comprising a series of parallel transversely rigid sections each substantially at right angles to the inner edge of the sole,

said sections being separated by grooves whereby said mid-sole is longitudinally flexible, each section having at least one spike-receiving socket integral therewith and extending therefrom, and a tap sole secured to said mid-sole and having a plurality of apertures therein for receiving said sockets.

5. A sport shoe construction as set forth in claim 3, the combination further comprising a spike mounted in each socket in snap-seat relation.

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