Aug. 19, 1952 A. A. LANGER 2,607,135

DETACHABLE CALK

Filed Feb. 8, 1950

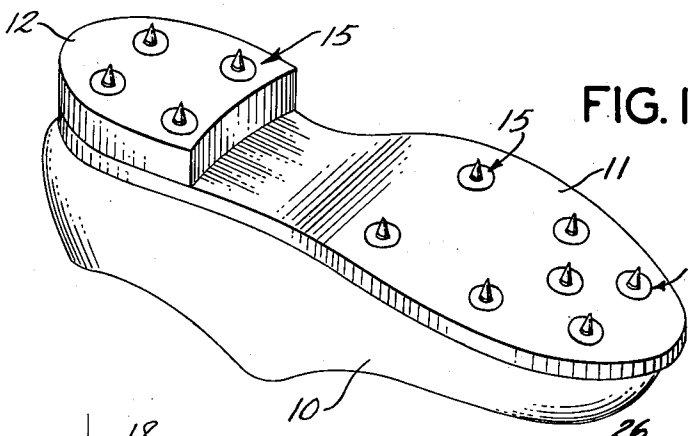


FIG. 1.

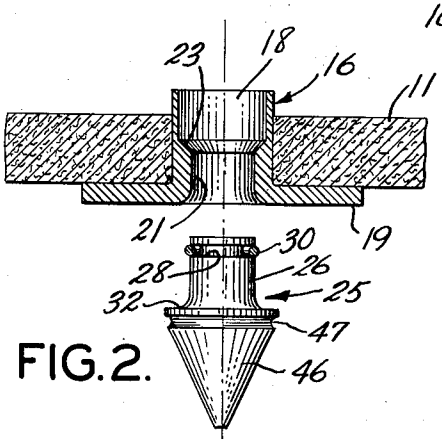


FIG. 2.

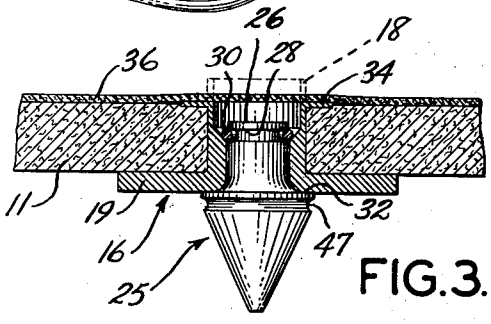


FIG. 3.

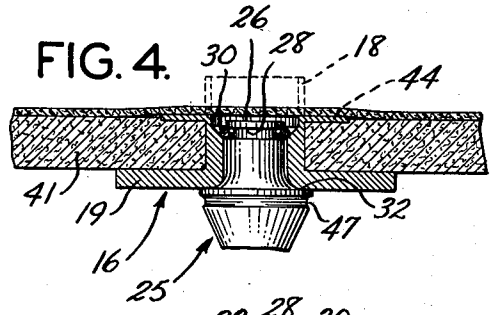


FIG. 4.

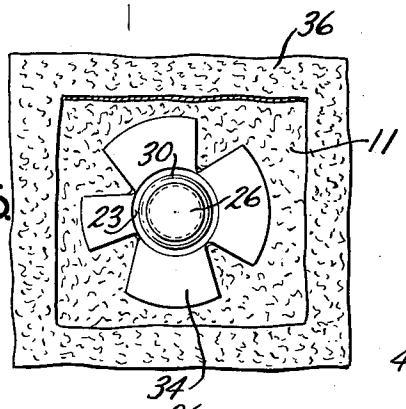


FIG. 5.

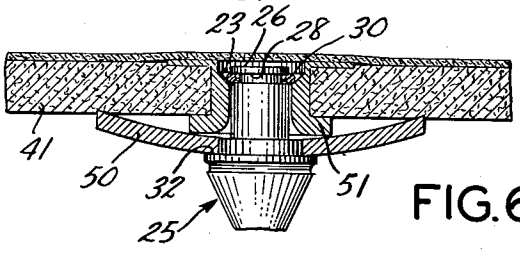


FIG. 6.

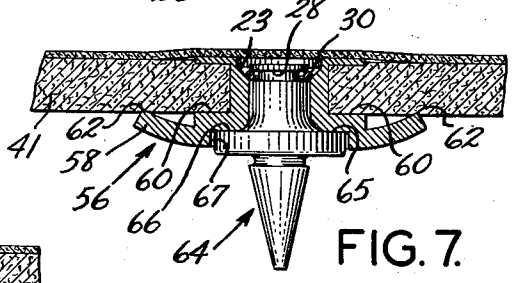


FIG. 7.

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DETACHABLE CALK

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9 Claims. (Cl. 36—59)

1

This invention relates to calks for foot wear, commonly referred to as spikes, and used in climbing, sports, and other various activities, and the invention is more particularly concerned with calks for golf shoes.

A common form of calk for golf shoes comprises an internally threaded holder secured to the shoe and a calk formed with an internally threaded head which screws into the holder. These calks are unsatisfactory when it becomes necessary to replace worn elements because the threads often become stripped, and at other times the threads become stuck so securely that the holder is broken loose in the sole when trying to unscrew the calk. In either case it is necessary to replace the holder and this requires removal of the heel or sole from the shoe.

It is an object of this invention to provide an improved calk having a construction which includes a calk element that is connected with a holder by a resilient fastening that makes it possible to extract a worn calk and snap a new calk into the holder quickly and conveniently; and without danger of breaking the holder loose from the shoe or otherwise damaging the shoe. In accordance with one feature of the invention the calk is pushed into the holder with a direct translatory or non-rotary movement and it is pulled from the holder by a similar movement in reverse. This avoids any tendency to impart rotary movement to the holder through the installing and removing of calks, and thus avoids danger of breaking the holder loose in the shoe. The calk of this invention has a shank that fits closely in the holder so as to prevent any relative lateral movement between the calk and holder when the shoe is being worn.

Another object of the invention is to provide a calk holder assembly that can be connected with shoe soles of different thicknesses. At the present time, a manufacturer of shoes employing conventional calks is required to carry three sizes of holders in inventory in order to accommodate the different thicknesses of soles used for sport shoes. With this invention a single length of calk holder is suitable for all thicknesses of soles currently employed in the manufacture of sport shoes having calks.

These and other objects, features and advantages of the invention will in part be obvious and in part be more fully set forth in the following description, when read in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of a sport shoe turned upside down to show the calk assemblies

2

of this invention connected to the heel and sole of the shoe.

Fig. 2 is a greatly enlarged sectional view showing the parts of the calk assembly of this invention before the holder is secured to the shoe and before the calk element is inserted in the holder.

Fig. 3 is a sectional view, similar to Fig. 2, but showing the upper end of the calk holder bent over to rivet the holder to the shoe sole, and showing the calk assembled with the holder.

Fig. 4 is a view similar to Fig. 3, but showing the calk assembly connected with a sole of less thickness than that shown in Fig. 3.

Fig. 5 is a top view of the structure shown in Fig. 3, with the inner sole broken away to show the way in which the calk holder is bent outwardly across the inside face of the outer sole.

Fig. 6 is a view similar to Fig. 3 but showing a modified form of the invention.

Fig. 7 is a view similar to Fig. 3 showing a second modified form of the invention.

The calk assemblies of this invention are of the type in which single calks are connected at various selected locations of a pattern on the heel and sole of a shoe.

Fig. 1 shows a shoe 10 with a sole 11 and heel 12. Calk assemblies 15 are connected with a shoe as shown, there being seven calks in the sole 11 and four calks in the heel 12.

The preferred embodiment of the invention comprises a longitudinal hollow calk holder 16 (Fig. 2) made of suitably hard wearing material such as steel and of suitable dimensions to fit with other holders through the outer sole 11, or through the lift of the heel 12. Preferably the holder is circular in cross section, but it may be of any desired practical contour.

Each of the calk holders comprises a center tubular portion 18 and a flange 19 extending radially from the lower end of the tubular portion 18. The inner face of the flange 19 contacts with the outside surface of the outer sole 11. With the holder in this position, the upper end of the tubular portion 18 extends through and beyond the inside surface of the sole 11. The sole shown in Figs. 2 and 3 has a thickness which is substantially equal to the greatest thickness with which the holder 16 is intended to be used, though the holder can be used with thinner soles, as will be explained and illustrated in connection with Fig. 4.

In order to secure the calk holder to the sole 11, that portion of the holder which extends beyond the inner face of the sole 11 is peened

over and bent outwardly and downwardly over the adjacent face of the sole, as shown in Fig. 3, to rivet the holder to the sole. This serves to secure the holder in place and prevent any significant movement.

The opening through the calk holder 16 is of two diameters. The lower portion, which is of reduced diameter, comprises a cylindrical bearing 21 for holding a calk; and the upper portion, having the larger diameter, is of reduced wall thickness and is the part of the calk holder that is bent outwardly and downwardly to rivet the holder to the sole. The difference in the wall thicknesses of the holder created by the differences in inside diameters provides a recess or seat 23 at which the inside wall of the holder converges downwardly and inwardly. The seat 23 can have its surface at right angles to the side walls but is preferably a frustro-conical surface so as to facilitate removal of the calks when they become worn and require replacement.

A spike 25 made in accordance with this invention comprises a head or shank 26 that fits the cylindrical bearing 21 of the calk holder. A circumferential groove 28 in the shank 26, preferably located near the upper end of the shank, holds an open circular spring comprising a snap ring 30. The entrance at the lower end of the opening through the holder 16 is flared to facilitate entrance of the calk 25 and for the purpose of providing a cam action that will compress the snap ring 30 into the circumferential groove 28. The snap ring 30 is of such a size when fully expanded, that a portion of it remains in the groove 28.

When the calk is inserted into the holder 16, a shoulder 32 on the calk contacts with the outer face of the flange 19 and limits the calk to a predetermined penetration into the holder 16. When thus inserted as far as possible into the holder 16, the circumferential groove 28 is at the level of the seat 23, and the snap ring 30 contacts with the tapered face of the seat 23 to retain the calk in the holder.

The advantage of the moderate taper of the seat 23 is that the construction accommodates itself to substantial manufacturing tolerances for the distances from the shoulder 32 to the circumferential groove 28, and from the face of the flange 19 to the seat 23.

Fig. 3 shows the upper portion 18 of the calk holder peened over to form a riveted upper end 34 which overlies the inside face of the sole 11 and which is preferably pressed down hard enough to partially embed or countersink the bent over end 34 into the inside face of the sole 11. The advantage of this construction is that an inner sole 36 overlying the upper end of the calk holder remains relatively flat, and if the insole is of sufficient thickness, no consequent protrusions are caused by the calk holders.

Fig. 4 shows the same construction as Fig. 3 when applied to a thinner sole 41. It will be evident that the upper end portion 18 of the calk holder extends above the inner face of the sole 41 for a greater distance than it did with the thicker sole 11 of Fig. 3. When the upper portion 18 is bent outwardly and downwardly to rivet the calk holder to the sole 41, the bent over ends 44 extend further out radially from the axes of the calk holder and thus accommodate the additional length of metal that extended above the inside face of the sole.

This comparison of Figs. 3 and 4 illustrates one of the features of the invention. It will be evident that there exists a constant relationship between the position of the seat 23 of the calk holder, the snap ring 30 and the shoulder 32, regardless of the thickness of the sole to which the calk assembly is attached. This is made possible by inserting the calk holder from the outside of the sole so that differences in thickness of the sole material are made up at the inner end of the calk holder.

The calk element 25 has a pointed portion 46 below the shoulder 32, and has a recess, preferably an annular groove 47, immediately below the shoulder 32 to permit the insertion of the jaws of a plier-like tool that is used for withdrawing the calk from the holder, such withdrawal being effected by pulling with a direct axial translatory or nonrotary movement; and the insertion of the calk being effected with a similar movement in reverse.

When the calk assembly of this invention is used with leather soles, the leather of the outer sole may expand when wet. Such a force as is exerted by expansion of the leather is not sufficient to bend the riveted upper ends of the calk holder and will merely result in having the bent over portions 34 or 44 embedded slightly further in the inside face of the sole 11 or 41. It is an advantage of the invention, however, that the force exerted by the expansion of the leather is not exerted against the calk and has no tendency whatever to pull the calk out of the holder.

Fig. 5 shows a top view of the calk assembly with the riveted upper end portion 34 of the holder extending outward over the top surface of the sole 11. The upper end of the holder is preferably made of malleable metal so that it can be bent sharply without danger of breaking at the bend, and the metal may stretch substantially or may divide into tabs, as shown in Fig. 5 when peened over, the strength of the riveted end being substantially unaffected either way.

Figure 6 shows a modified form of the invention in which a large ornamental washer 50 is secured to the calk 25 as a flange just above the shoulder 32. The shank of the calk is made somewhat longer in this modification to compensate for the added distance, between the washer or flange 50 and the circumferential groove 28, made necessary by the locating of the flange 50 above the shoulder 32. This flange 50 is dished upwardly and is preferably so shaped that it contacts with the bottom of a flange 51 of the calk holder and also touches the outside face of the sole 41. In the preferred construction the flange 50 touches the outside face of the sole just before it comes into contact with the flange 19 of the calk holder so that the upper circumferential edge of the flange 50 displaces the leather under it slightly and provides a tight fit against the leather for preventing entrance of dirt into the space between the flange 50 and the face of the sole above it.

The flange 51 of the calk holder is somewhat smaller in the construction shown in Fig. 6 than in the construction illustrated in Figs. 2–4, but the calk holder is otherwise the same. The pressure exerted against the pointed portion of the calk is transmitted through the flange 50 to the flange 51 of the calk holder and also to the face of the sole around the circumference of the flange 50 where it contacts the bottom of the sole.

In the constructions shown in Figs. 3 and 4,

upward pressure against the calk is transmitted by the shoulder 32 directly to the flange 19 and through this flange to substantial areas on the sole 11 on which the wearer's foot rests. It is a feature of the invention that the load carried by the calk is never transmitted to the resilient fastening means that retain the calk in the holder. As a result of this feature, calks may become damaged and badly worn over long periods of time without ever doing any damage to the resilient fastening means comprising the snap ring 30 and the surfaces of the parts with which it contacts.

Figure 7 shows another modified form of the invention. A calk holder 56 is held in the sole 41 by a riveted construction at the upper end of the calk holder similar to that shown in Figures 3–6. Parts of the structure shown in Fig. 7 which are the same as the constructions illustrated in the other figures are indicated by the same reference characters.

The calk holder 56 has a novel flange 58 extending outward across the bottom of the sole 41. This flange has an annular upper face 60 which is preferably plane and bears against the bottom surface of the sole around the lower end of the tubular portion of the calk holder. The flange 58 is shaped so that its upper surface, immediately beyond the circumferential edge of the annular face 60, is spaced from the bottom of the sole; and there is an upper outside edge 62 of the flange 58 located at a slightly higher level than the face 60 so that the edge 62 is embedded slightly in the leather, or other material of the sole 41, when the face 60 is in contact with the bottom of the sole.

The advantages of the construction shown in Fig. 7 is that the upper edge 62 of the flange 56 fits snugly against the surface of the sole 41 even though the sole has a substantial curve across its surface.

A calk 64 fits into the holder 56 and has a shoulder 65 that bears against a countersunk face 66 of the holder 56. Side walls 67 between the countersunk face 66 and the bottom of the flange 56 have some clearance around the calk 64, but this clearance is preferably only a few thousandths of an inch to allow for manufacturing tolerances. The clearance is exaggerated in the drawing for better illustration. One feature of this modified construction, shown in Figure 7, is that the side walls 67 provides protection against lateral movement in addition to that provided by the walls of the holder that contact with the shank of the calk.

As in the case of the other forms of the invention, upward pressure on the calk shown in Figure 7 is transmitted directly to the holder 56 and none of the load on the calk is carried by the resilient fastening means, comprising the snap ring 30 with the groove 28 and seat 23, that retain the calk in the holder.

The invention in its principal aspects is not limited to the constructions shown and described, and many changes can be made in the details thereof without departing from the main principles of the invention or sacrificing its chief advantages.

What is claimed is:

1. A calk assembly for a shoe that has an inner and an outer sole, said assembly including a calk holder that is connected to the outer sole and that has a tubular portion that extends through an opening in the outer sole, and an integral flange located at the lower end of the tubular portion for contact with the outside face of the outer sole, the upper end of the tubular portion of the calk holder being thin and peened over to produce a low fastening element that overlies the inner face of the outer sole leaving a relatively flat construction over which the inner sole is placed, a calk element that fits, with a longitudinally sliding fit, into the hollow tubular portion of the holder, a flange intermediate the ends of the calk element, said flange being larger than the opening in the tubular portion of the holder and contacting with the flange at the lower end of the holder and serving as an abutment for limiting the movement of the spike element into the holder so that the weight carried by the sole is transmitted from the holder to the spike through the flanges, and resilient fastening means at an intermediate level between the upper and lower ends of the assembled calk element and tubular portion of the holder, said fastening means including a ring and a shoulder under the ring, one of which is on the calk element and the other of which is on the tubular portion of the holder.

2. A calk assembly for use with a sport shoe having one or more openings through its sole for receiving calk assemblies, said assembly including a holder comprising a tubular portion that extends through the opening in the sole and a radially extending flange that contacts with the outside face of the sole, the upper end of the tubular portion of the holder being spread outwardly across the inner face of the sole through which the holder extends so as to rivet the holder in the sole, a calk element having an upper portion that fits snugly, with a longitudinally sliding fit, within the lower portion of the tubular portion of the holder, a shoulder intermediate the ends of the calk element for limiting the extent to which the calk element can be inserted into the holder, a seat within the holder, a recess in the side wall of the calk element at substantially the same level as the seat when the calk element is inserted as far as possible into the holder, and a snap ring in the groove that springs out part way over the seat in the holder when the calk is inserted into the holder as far as said shoulder will permit.

3. A calk assembly for use with a sport shoe having one or more openings through its sole for receiving calk assemblies, said assembly including a holder comprising a flange portion that bears against the outside face of the sole, and a tubular portion that extends upwardly through the sole with an internal diameter that provides a bearing surface in said tubular portion immediately above the flange, said holder having an internal seat, at the upper end of the bearing portion, and having an upper wall thickness above the seat substantially less than the wall thickness below the seat so as to provide for riveting or peening of the upper wall section across the inside surface of the sole to rivet the holder securely to the sole, a calk element having a shank portion that fits, with a longitudinally sliding fit, into the bearing provided in the holder below the seat, a circumferential groove in the wall of the shank portion at a level substantially equal to that of the seat when the calk is inserted into working position in the holder, a shoulder on the calk element that serves as an abutment for determining when the calk element is in working position in the holder, and a snap ring that extends part way into the circumferen-

tial groove and part way across the seat to retain the calk element in the holder.

4. A calk assembly for use with a sport shoe having one or more openings through its sole for receiving calk assemblies, said assembly including a holder which is tubular and which has a flange at its lower end and a riveted upper end that overlies the inside face of the sole for securing the calk holder to the sole, a calk having a shank that fits, with a longitudinally sliding fit, into the hollow interior of the holder, resilient and yieldable fastening means yieldably retaining the calk in the holder, an upwardly dished water comprising a different piece from the holder and calk but held by the calk against the bottom of the holder and extending radially from the calk immediately below the holder and having a circumferential edge that contacts with the sole, and a pointed portion of the calk below the washer.

5. A calk assembly for connection with a sole of a sport shoe, said assembly comprising a tubular holder having a radially extending flange at its lower end and having an upwardly extending portion longer than the thickness of the thickest sole with which the holder is intended to be used, a seat within the holder formed by a portion of the inside wall of the holder converging inwardly and downwardly, the wall of the holder above the seat being thinner than the wall below the seat for the purpose of riveting the holder to the sole, the distance from the seat to the upper face of the flange being less than the thickness of the thinnest sole with which the spike holder is intended to be used, the opening through the holder being of substantially uniform cross section for a substantial distance downward below the seat, a calk element having a shank portion that fits, with a longitudinally sliding fit, the opening through the holder below the seat, a shoulder on the calk element limiting the extent to which the calk element can be inserted into the holder, and an element carried by the calk element and cooperating with the seat in the holder for retaining the calk element in the holder.

6. A calk for sport shoes, said calk comprising an upper shank portion having an outside bearing surface for insertion in a calk holder of a shoe, said bearing surface being of uniform diameter and having a longitudinally smooth outside surface except for a recess intermediate the upper and lower ends of the bearing surface for cooperation with resilient fastening means for retaining the calk in the holder, a lower portion pointed at one end and integrally connected with the shank portion at the other end, the lower portion of the calk being of larger cross section than the shank portion at the region where the lower portion and shank portion of the calk merge and forming a shoulder at said region for limiting the extent to which the calk can be inserted into the holder.

7. A calk for sport shoes, said calk comprising a substantially cylindrical upper shank portion for holding the spike in a tubular spike holder on a shoe, the cylindrical surface having a circumferential groove therein near the upper end of the shank portion, a snap ring in the groove and projecting part way beyond the cylindrical surface when normally expanded, a lower part of the calk of one-piece construction with the shank portion and shaped with a point at one end and a cross section larger than the shank portion of the calk at the other end where the shank portion and lower part of the calk merge together, a shoulder formed by the change in cross section of the calk for determining the extent to which the calk can be inserted into the holder, and a circumferential groove below the shoulder for receiving a tool for extracting the calk from a holder when worn or broken.

8. A replaceable shoe calk comprising an upper shank portion having a cross section and smooth surface shaped to fit slidably into a calk holder in which it is intended to be used, and having a recess near its upper end for cooperation with resilient fastening means for retaining the calk in the holder, a washer connected with the calk at the lower end of the shank portion, said washer extending outwardly from the calk and being dished upwardly toward the end of the calk having the shank portion, and a pointed lower end of the calk extending downward from the washer.

9. A calk holder assembly comprising a tubular portion for extending through an opening in a shoe sole, an outwardly extending flange at the lower end of the tubular portion, said flange having a substantially flat annular face that contacts with the bottom surface of the shoe sole, and having a dished portion beyond the annular face with a top surface that is located at some distance below the annular face in the region immediately adjacent to the circumferential edge of the annular face, and having an upper and outer edge located at a level slightly higher than the annular face so that said outer edge will be embedded in the surface of the shoe sole when the annular face is pressed firmly against the bottom surface of the sole.

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