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CALK DEVICE

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This invention relates to calk devices, and particularly to an improved means for associating a calk with a shoe sole.

Two types of calk devices involving removable cleats, now widely used with athletic shoes, include, respectively, an assembly in which a threaded stud or post is carried by and projects from the cleat to be screwed into a complementary holding member in or otherwise associated with the shoe sole, and an assembly in which the threaded stud or post is carried by and projects from the shoe sole to threadedly receive the cleat. The present invention relates particularly to assemblies of the latter type, which may be referred to as post type assemblies.

It is an object of the present invention to provide an assembly of the foregoing type which may be very effectively and simply associated with a shoe sole and in which the cleat may be removed without adversely loosening the cleat-holding stud or post relative to the sole.

Another object of the invention is to provide a post type assembly involving a washer and holding nut on the outside of the shoe sole in which both the washer and the holding nut are effectively held against adverse turning when the cleat is screwed off of the post and away from the sole.

Another object of the invention is to provide a cleat assembly which is particularly rugged and in which the ground-engaging or cleat element proper may be worn appreciably without rendering the same unsafe and unsuitable for use.

A feature of the invention, therefore, resides in the provision of a cleat assembly including special interengaging means on the washer and holding nut elements for locking the same against relative rotation, and also a means on the washer element for gripping the sole against relative rotation.

Another feature of the invention resides in the provision of a cleat assembly including means whereby the extent by which the holding nut projects outwardly beyond the outside of the sole and the main cleat-seating surface of the washer may be reduced.

Another feature of the invention resides in the provision of a cleat assembly in which the washer element has an inner portion offset in the direction of the shoe sole, and with which a recess is formed in the sole for receiving this offset portion concurrently with the tightening of the holding nut relative to the sole.

Other objects, features and advantages will hereinafter appear.

In the drawing:

Figure 1 is an exploded view illustrating the several elements of the calk device prior to association with a shoe sole.

Fig. 2 is a sectional view showing elements of the calk device in association with a shoe sole.

Fig. 3 is a view similar to Fig. 2, but showing the elements after being further tightened with respect to the shoe sole.

Fig. 4 is a sectional view showing the calk device in final and fully assembled operative association with the shoe sole.

Fig. 5 is a view of the side of the washer which faces the sole, the washer being in the condition shown in Figs. 1, 2 and 3.

Fig. 6 is a view similar to Fig. 5, but showing a modified form of washer.

Fig. 7 is a view similar to Fig. 6, but illustrating another modified form of washer.

Fig. 8 is an edgewise view of the washer shown in Fig. 7.

Fig. 9 is a view showing the base of a cleat having teeth formed thereon.

Before describing the present improvements and mode of operation thereof in detail it should be understood that the invention is not limited to the details of construction and arrangement of parts shown in the accompanying drawing, which are merely illustrative of the present preferred embodiments, since the invention is capable of other embodiments, and the phraseology employed is for the purpose of description and not of limitation.

Referring more particularly to the drawing and first to Figs. 1 through 5 there is shown for the purpose of illustrating the present invention a portion of a shoe sole 11 of conventional construction including an inner layer 12 and an outer layer 13, and in which there is formed a usual aperture 14 for receiving a cleat-holding stud 15. Advantageously this stud is formed with a threaded shank portion 16 adapted to project outwardly from the sole and with a head portion 17 adapted to engage the inner side of the sole and thus limit axial movement of the stud in an outward direction. Projecting teeth 18 formed on the head and engageable in the sole as shown in Fig. 4, serve to maintain the stud against adverse turning movement relative to the latter.

Cooperable with the head portion 17 in maintaining the threaded stud 15 in position relative to the sole is a holding nut 19. As is usual a

washer 20 is interposed between the holding nut and the outer side of the sole.

Of importance, however, the washer 20 and holding nut 19 are so designed and so associated with each other, with the stud 15 and with the shoe sole that when the cleat-holding assembly, including the stud, washer and holding nut, is finally and operatively associated with the sole as shown in Fig. 4, the holding nut is effectively locked against turning movement on the stud relative to the washer and the washer is effectively locked against turning movement relative to the sole and between the latter and the holding nut.

In achieving these results the washer 20 is provided in the central portion 21 thereof with slots 22 and 23 which extend radially from and communicate with a usual stud-receiving aperture 24. Also, advantageously this central portion 21 is bulged or offset inwardly in the direction of the sole, and, as shown in Figs. 1 and 5, the washer is formed with the main body thereof, bent into a substantially spread U-shape to provide marginal portions 25 and 26 which when the washer is initially associated with the sole, as shown in Fig. 2, are spaced outwardly from the sole. This initial shape of the washer serves to likewise initially space from the sole, teeth 27 and 28 which are formed to project from these marginal portions.

Ribs 29 and 30 formed on the holding nut 19 and projecting therefrom in the direction of the washer are adapted to fit in the slots 22 and 23 formed in the latter. Advantageously these ribs extend radially outwardly from the terminus of the threaded bore 31 in the holding nut and are formed with threaded inner ends 32 and 33 which form continuations of the wall defining the threaded bore of the holding nut.

In associating the cleat-holding assembly with the shoe sole, the stud 15 is inserted in the sole aperture 14 and the washer 20 and holding nut 19 located in position as shown in Fig. 2 with the ribs projecting into the slots.

Then, by means of a wrench or other suitable tool holding nut is screwed up on the stud, turning and moving axially of the stud therewith, the washer 20. This action, as will be readily appreciated, forces the washer against the outer side of the sole and draws the head 17 of the stud against the inner side of the sole. If prior to the screwing up of the nut the gripping teeth 18 on the stud head have not been firmly embedded in the sole, this will be effected by the drawing action explained above.

The relative position of the several elements of the cleat-holding assembly to each other and to the sole after the holding nut has been tightened is shown in Fig. 3. Of importance, it is to be noted that a recess 34 has been formed in the sole to receive the offset portion 21 of the washer. This recess is formed by the ribs 29 and 30, which preferably and as shown are proportioned to project through the slots beyond the offset portion and serve, in effect, as reamers when the holding nut is being turned to tighten the same relative to the sole.

After the cleat-holding assembly is associated with the sole as shown in Fig. 3, the washer, which advantageously is formed of deformable material such as metal, may be pressed with some suitable tool to flatten out the bent marginal portions 25 and 26 so that the projecting teeth 27 and 28 are embedded in the outer side of the sole as shown in Fig. 4. A ground-engaging cleat 35 is then screwed on the projecting shank of the

stud to complete the assembling operations of calk device on the sole. Alternatively, the flattening out of the portions 25 and 26 to engage the projections 27 and 28 in the sole may be effected concurrently with the screwing up of the cleat through the pressure of the latter on the washer.

As shown, the main body of the cleat may be of distortable material, such as rubber or the like, having molded therein an insert member 36 with a threaded bore 37 axially aligned with continuing bore 38 in the cleat body for receiving the stud 15. As is conventional the bore 38 terminates in a recess 19 formed in base 40 of the cleat for receiving the holding nut 19.

With the cleat and cleat-holding assembly in association with the sole as shown in Fig. 4, the base of the cleat is firmly seated on the seating surface 41 of the washer. Advantageously special means may be provided on the washer for gripping the base of the cleat and most effectively holding the latter against adverse unscrewing relative to the stud. As shown in Fig. 6, this gripping means may be provided by holes 42 formed in the seating surface of the washer and into which the rubber of the base may be forced when the cleat is screwed in place. Alternatively and preferably, this gripping means may be provided, as shown in Figs. 7 and 8, by projecting means such as teeth 43 punched out from the washer. If desired, and as shown in Fig. 9, teeth 44 may be formed on the base of the cleat for cooperating with the gripping teeth 43 on the washer. However, especially if the cleat be formed of distortable material, the gripping action provided by the edges defining the holes 42 in or by the projecting teeth 43 on the washer, alone will provide effective anti-rotation means even though the base of the cleat has no teeth formed thereon.

Frequently in actual use, the rubber of the base of a cleat will, in effect, become welded to the washer on the sole. Also, in use, the rubber defining the recess 39 is pressed against and sometimes becomes, in effect, welded to the holding nut. With a usual assembly, therefore, involving a usual and conventional holding nut and washer, when the cleat is unscrewed, as for the purpose of replacement the holding nut is often unscrewed or at least partially unscrewed therewith. This permits an adverse backing off of the stud in the sole.

With a calk device constructed according to the present invention, the nut is effectively locked against unscrewing on the stud and the washer likewise effectively maintained in place even though there be a drag on the nut and/or washer as the cleat is being unscrewed. Moreover, it is to be noted that if for any reason it be desired to remove the nut and/or washer from the stud, this may be easily done by bending the portions 25 and 26 of the washer to free the projections 27 and 28 from the sole and then applying a simple unscrewing action to the nut. Of importance, despite the most effective locking of the nut and washer relative to the sole and stud there is no adverse marring of the threads either in the nut or on the stud.

Also of importance, the locating of the holding nut in the offset portion 21 in the washer and the embedding of this portion in the sole, serves to diminish the extent by which the holding nut projects outwardly relative to the seating surface of the washer and at the same time insures a snug engagement of the washer with the sole. Thus it

is possible to diminish the depth of the usual holding nut-receiving recess in the cleat base. This is advantageous in strengthening the cleat base. Also, by diminishing the depth of this recess the stud-receiving insert 36 may be located in the cleat closer to the base thereof, thus providing more rubber between the insert and the ground-engaging end of the cleat with attendant greater allowance for cleat wear before exposing the insert.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

Having thus described the invention, what is claimed as new is:

1. In combination with a shoe sole having a threaded cleat-holding stud extending from the outer side thereof, a washerlike member on said stud and overlying the outer side of said sole, formed with at least one slot disposed laterally relative to said stud, said member also having means for gripping said sole and maintaining said member against rotative movement relative thereto; a holding nut on said stud and outwardly of said washerlike member; and projecting means on said nut, extending into said slot, for maintaining said nut against rotation relative to said washerlike member.

2. In combination with a shoe sole having a threaded cleat-holding stud extending therefrom, a washerlike member, having an inner portion with a stud-receiving aperture therein and offset toward said sole, said inner offset portion having at least one slot therein disposed radially outwardly from said aperture; a holding nut on said stud; complementary riblike means projecting from one face of said nut through said slot and beyond said offset portion to engage said sole, to lock the nut against rotation relative to said washerlike member, and to form a recess in said sole for receiving said offset portion when the nut is screwed into a holding position on the stud; and means on said washerlike member for gripping the sole against relative rotation.

3. In combination with a shoe sole having an aperture, a threaded stud in said aperture and extending from the outer side of said sole; means on said stud for limiting movement of the latter through said aperture in the direction of the outer side of said sole; a holding member threaded on said stud; a washer on said stud, intermediate said holding member and said sole and extending laterally beyond said member, having means for gripping the sole against relative rotation; interengaging means on said member and said washer for maintaining the same against rotation relative to each other; a cleat threaded on said stud, having a recess in the base thereof for receiving said member; and means on said washer for maintaining said cleat against inadvertent unscrewing on said stud.

4. In combination with a shoe sole having a threaded cleat-holding stud extending from the outer side thereof, a washerlike member having sole-gripping means initially spaced from said sole, on said stud and deformable to cause said means to grip the sole against relative rotation; a holding member in threaded relation with said stud; interengaging means on said members for maintaining the same against rotation relative to each other on said stud; and gripping means on said washer for holding a cleat against unforced unscrewing on said stud and relative to said washerlike member.

5. In combination with a shoe sole having an aperture, a threaded stud in said aperture and extending from the outer side of said sole; means on said stud for maintaining the same against rotation in said aperture and against outward movement relative to said sole; a holding member threaded on said stud; a washer on said stud intermediate said sole and holding member, having an inner portion and a cleat-seating surface, said inner portion having at least one slot therein; means on said holding member extending through said slot for locking said holding member against rotation relative to said washer; and means on said washer for gripping said sole against relative rotation.

6. In a calk device for association with a sole of a shoe, the combination of a threaded cleat-holding stud; a holding member threaded on said stud; a washerlike member on said stud, having a recessed inner portion for receiving said holding member, and having a surface for seating a cleat; interengaging means on said members for locking the same against rotation relative to each other on said stud; and means on said washerlike member for gripping said sole against relative rotation.

7. In a calk device for association with a shoe sole having an outer side, the combination of a threaded stud adapted to threadedly receive a cleat; means for arresting movement of the stud in a direction outwardly relative to the sole; a holding member threaded on said stud, opposed to said arresting means; a washerlike member intermediate said holding member and the outer side of the sole, having an inner portion with a stud-receiving aperture therein and offset toward the sole, said inner offset portion being adapted to receive said holding member and having at least one slot communicating with and extending laterally from said aperture; sole-gripping means on said washerlike member, initially spaced from the shoe sole, said washerlike member being deformable to cause said means to engage said sole against relative rotation; riblike means on said holding member, extending into said slot and beyond said washerlike member, to lock said members against rotation relative to each other and to engage and form a recess in the sole for said offset portion.

8. In combination with a shoe sole having a threaded cleat-holding stud extending from the outer side thereof, a washerlike member having an inner portion offset toward said sole and with the stud extending therethrough, said inner offset portion having at least one slot therein extending away from said stud; a holding nut on said stud, received in said offset portion and adapted to press said washerlike member toward said sole; means on said holding nut, extending through said slot and beyond said offset portion to engage said sole, to lock the nut against rotation relative to said washerlike member, and to form a recess in said sole for receiving said offset portion when the nut is screwed into a holding position on the stud.

9. In combination with a shoe sole having a threaded cleat-holding stud extending from the outer side thereof, a washerlike member having an inner portion offset toward said sole and with the stud extending therethrough, said inner offset portion having at least one slot therein extending away from said stud; sole-gripping means on said washerlike member; a holding member with a threaded stud-receiving bore therein, received in

said offset portion and adapted to press said washerlike member toward said sole; riblike means on said holding member, extending through said slot and beyond said offset portion, having a threaded inner portion forming a continuation of the wall defining the threaded stud-receiving bore, and adapted to lock the holding member against rotation relative to said washerlike member, and to form a recess in said sole for receiving said offset portion when the holding member is screwed into a holding position on the stud.

10. In a calk device for association with a shoe sole, the combination of a threaded cleat-holding stud; a holding nut on said stud; a washerlike member on said stud, adapted to be positioned between said holding nut and the outer side of said sole, said member having an inner portion with at least one slot therein laterally offset relative to said stud; means on said holding nut extending into said slot for locking said holding nut against rotation relative to said member; and

sole-gripping means on said member, adapted to be initially spaced from said sole, said member being deformable to cause said sole-gripping means to grip the sole against relative rotation.

11. In a calk device for association with a shoe sole, the combination of a threaded cleat-holding stud; a holding nut on said stud; a washerlike member on said stud, adapted to be positioned between said holding nut and said sole, said member being formed with at least one slot positioned laterally relative to said stud, said member being formed with a deformable portion with sole gripping means extending therefrom and adapted to be initially spaced from said sole, and said deformable portion being deformable to cause said sole-gripping means to grip said sole against relative rotation; and means on said holding nut, extending into said slot for locking said holding nut against rotation relative to said member.

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