

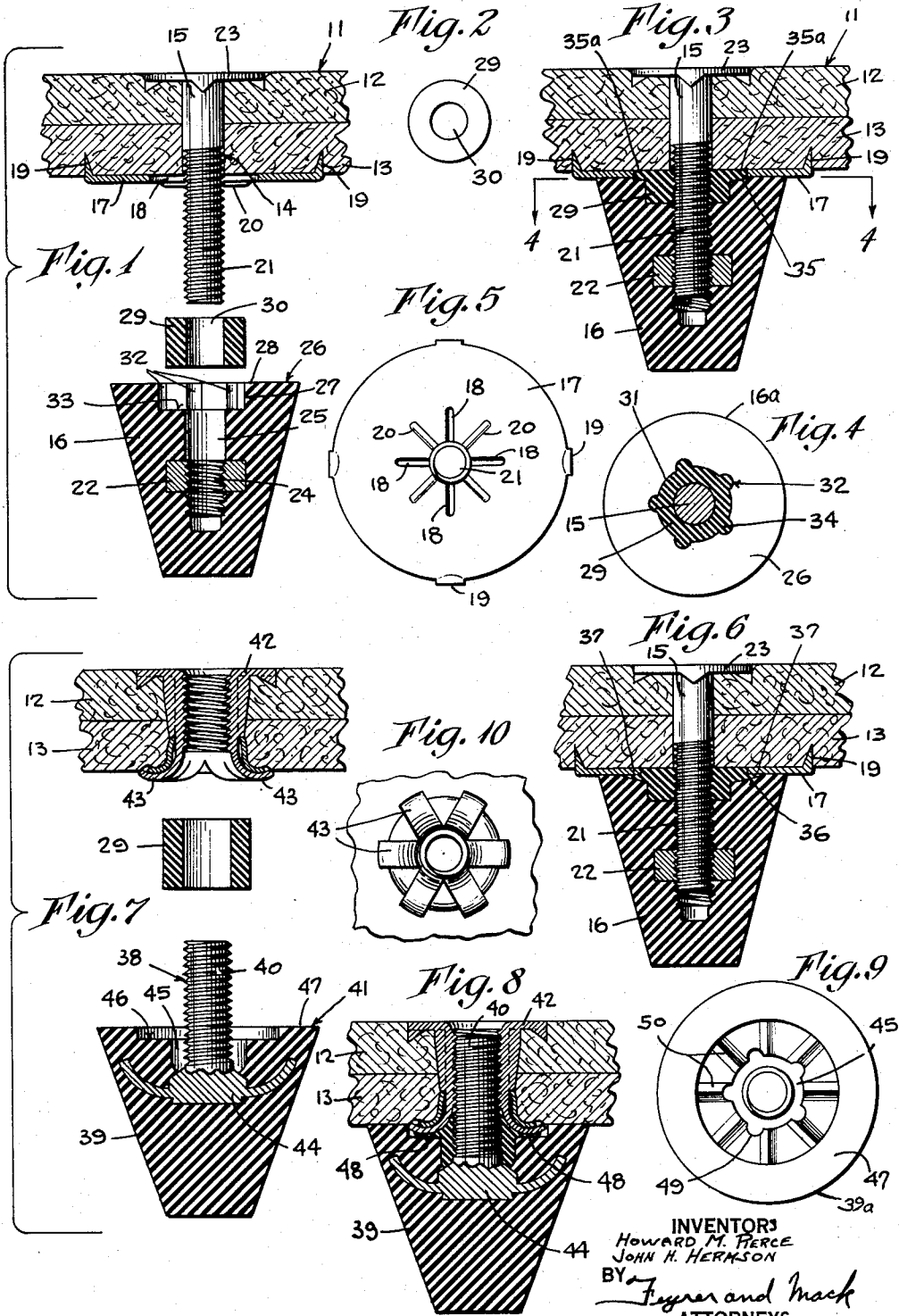
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CALK DEVICE

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CALK DEVICE

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The invention relates to calk devices for association with the soles of shoes, such for example as the soles of football, soccer, softball and other athletic shoes.

It is an object of the present invention to provide a calk device of the type having complementary fastening means for removably securing a ground engaging element or cleat relative to the shoe sole, in which the cleat when once tightened relative to the sole is very effectively maintained against adverse unforced loosening with respect thereto, and which may be easily manufactured.

Another and related object of the invention is to provide a calk device of the screw-on removable cleat type, which may be quickly assembled with a shoe sole and which includes an especially simple but particularly effective means for maintaining the cleat element against unforced unscrewing relative to the shoe sole.

A feature of the invention, therefore, resides in the provision in a cleat assembly including screw type complementary securing means for attaching a cleat to a shoe sole, of a cleat-anti-unscrewing means of such a nature that a simple bushinglike locking member of distortable material may be utilized in very effectively resisting any unforced unscrewing of the cleat once the cleat is screwed into position on the shoe sole.

Another feature of the invention resides in the provision of a cleat assembly of the immediately foregoing nature in which the cleat has formed in the base thereof a recess for receiving the bushinglike locking member and in which the locking member and the recess are so proportioned and shaped relative to each other that the locking member initially has a portion projecting outwardly from the recess and that the locking member initially may expand laterally therein in at least one restricted section while being held against lateral expansion in a contiguous section.

Another feature of the invention resides in the provision of a cleat assembly of the foregoing nature in which the locking member receiving recess in the cleat base is formed with laterally offset pockets and in which when the cleat is screwed up towards the sole the bushinglike locking member is pressed axially to distort certain portions thereof laterally into the pockets and another portion thereof laterally into a flangelike projection which is axially pressed and gripped intermediate the base of the cleat and the shoe sole.

Other features of the invention include the provision in a cleat assembly of the general character referred to above, of special gripping means on the sole and on the base of the cleat facing the sole for engaging with the distortable bushinglike locking member when the cleat is screwed on the shoe sole.

Other objects and features will hereinafter appear.

In the drawing:

Figure 1 is a sectional view illustrating one form of the present invention and showing the cleat and bushinglike locking member in a separated or exploded position relative to each other and to the sole.

Fig. 2 is an end view of the bushinglike locking member.

Fig. 3 is a view similar to Fig. 1, but showing the cleat assembly with the cleat fully screwed up into position and with the bushinglike locking member distorted into effective locking condition.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a view looking toward the sole with the cleat and bushinglike locking member removed.

Fig. 6 is a view similar to Fig. 3, but illustrating a modified form of the present invention.

Fig. 7 is a view similar to Fig. 1, but showing another modified form of the invention.

Fig. 8 is a view similar to Fig. 3, but illustrating the form of the invention shown in Fig. 7.

Fig. 9 is a view looking toward the base of a modified cleat adapted for utilization in place of the cleat shown with the form illustrated in Figs. 7 and 8.

Fig. 10 is a view similar to Fig. 5, but illustrating portions of the assembly initially secured to the shoe sole with those forms of the invention shown in Figs. 7, 8 and 9.

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 now more particularly to the drawing, and first to Figs. 1-5, there is shown for the purpose of illustrating one form of the present invention a portion of a shoe sole 11, including, as is conventional, an inner layer 12 and an

outer layer 13, and having formed therein an aperture 14 for receiving a threaded stud 15 by which a cleat 16 may be removably secured to the sole.

As shown, in associating the stud 15 with the sole there may be utilized a particularly effective combined stud holding and cleat seating washer 17 preferably of metal, having radial slots 18 formed therein, and having prongs 19 for engaging the shoe sole. Such a washer is embodied in the cleat assembly illustrated in United States Patent 2,178,106 and reference is made to that patent for a detailed description thereof and of the manner of its association with the cleat holding stud and the sole. It is to be particularly noted, however, that while the washer illustrated in the patent of reference does not include special gripping means projecting towards the base of the cleat, the washer 17 preferably used with the cleat assembly of the present invention includes such means in the form of the radially extending ribs 20.

As is conventional, the stud 15 includes, in addition to a threaded shank portion 21 extending downwardly from the shoe sole to threadedly receive an internally threaded insert 22 in the cleat, a head portion 23 adapted to engage the upper or inner side of the shoe sole.

As illustrated, the cleat 16 may, as is usual, include a main body of moldable material such as rubber, "Bakelite," or the like having the threaded insert molded therein with the threaded bore 24 thereof aligned with a stud receiving bore 25 communicating with the cleat base 26.

Of importance, however, with the cleat 16 of the present invention there is provided a recess 27 forming an enlarged continuation of the bore 25 and defined at its outer terminus by a pressing portion 28 of the base. Located in the recess 27 is a bushinglike locking member 29 of distortable material, such as rubber, having a bore 30 adapted to be aligned with the bore 25 in the cleat for receiving the projecting shank portion 21 of the stud.

It is to be particularly noted that the recess 27 and the bushinglike locking member 29 are so shaped and so proportioned relative to each other that the locking member when initially located axially fully in the recess has a portion projecting axially outwardly from the recess, and that the locking member initially may expand laterally in the recess in certain restricted sections while being held against lateral expansion in sections contiguous thereto.

As shown best in Figs. 1 and 4, this result is achieved by forming the recess 27 with a main portion 31 having a transverse cross sectional shape conforming or substantially conforming to the initial transverse cross sectional shape of the locking member 29 which, as illustrated in Figs. 1 and 2, is that of a cylinder, and with a plurality of pocket portions 32 laterally offset from and communicating with the main portion 31.

With this construction, and as shown clearly in Figs. 3 and 4, when the cleat is screwed up on the stud 15 toward the sole, the locking member is axially pressed between the washer 17 and the shoulder 33 defining the inner terminus of the recess to laterally distort circumferentially spaced sections of the locking member into the pockets 32 while sections of the locking member circumferentially adjacent thereto are confined against lateral expansion by the side walls of the main portion 31 of the recess and the walls of

the locking member bore are pressed laterally inward against the threaded stud.

In this manner laterally projecting circumferentially spaced portions 34 on the locking member are provided which cooperate with the shoulders defining the side walls of the pockets to effectively maintain the locking member against turning relative to the cleat. At the same time the end of the locking member initially projecting axially from the recess also is distorted laterally as shown in Fig. 3 to form an annular flangelike portion 35 that is pressed axially between the washer on the sole and the pressing portion of the cleat base. If the cleat body itself be of somewhat distortable material, and as clearly shown in Fig. 3, the pressing portion thereof will be depressed to make room for the flangelike portion 35 of the locking member and thus permit a firm seating of the outer marginal portion of the base on the washer. Additionally, it is to be noted, and as also shown in Fig. 3, portions 35a of the locking member are pressed into the radial slots 18 in the washer. These latter portions 35a, together with the ribs 20 which engage the projecting end of the locking member, serve to most effectively maintain the locking member against unforced turning relative to the washer and stud.

If desired and as shown in Fig. 6, the pressing portion of the cleat base may be dished adjacent the outer terminus of the recess 27 to provide a preformed annular expansion chamber 36 into which a flangelike portion 37 may be distorted and pressed axially between the washer on the sole and the cleat base. This feature is particularly advantageous when the distortability of the cleat body is very limited, insuring as it does firm support and seating of the outer marginal portion of the base on the washer and at the same time facilitating the formation of the flangelike portion. In all other respects the assembly shown in Fig. 6, including the modified cleat 16a, is exactly the same as the one shown in Fig. 3.

It is thus seen that with the present invention a cleat assembly is provided which when operatively associated with a shoe sole as shown in Figs. 3 or 6, will be most effectively maintained in a tightened condition. In this connection it is to be noted that a firm and forced frictional grip is provided between the side walls of the locking member and the side walls defining the main portion 31 of the receiving recess 27, between the walls defining the bore of the locking member and the threaded stud, between the distorted flangelike portion 35 of the locking member and the cleat base and washer, between the lower end of the locking member and the shoulder 33 in the recess, and between the upper end of the locking member and the central portion of the washer. Moreover, and of particular importance these several gripping actions are supplemented by the more positive engagement of the laterally distorted portions 34 with the shoulders provided by the pocket portions 32 of the receiving recess, by the distorted portions 35a engaging in the slots 18 in the washer, and by the ribs 20 on the washer engaging the upper end of the locking member.

It will be readily appreciated that while with a cleat assembly constructed according to the teachings of the present invention the ground engaging element or cleat is very firmly and securely held against adverse turning and unscrewing relative to the holding stud 15 and sole

it may be removed by forced unscrewing due to the distortable nature of the locking member which initially and as shown most clearly in Figs. 1 and 2 is of a simple cylindrical form and hence may be very easily and cheaply produced, as for example, by cutting to requisite length sections of rubber tubing scrap.

In Figs. 7 through 10 there is shown the application of the present invention to a cleat assembly of the type in which a threaded stud 38 is fixed in a cleat 39 and has a threaded shank portion 40 which projects from the base 41 of the cleat to be received in a suitable complementary securing member 42 fixed in the shoe sole. A cleat assembly of this type is shown in United States Patent 2,161,883 and reference is made to that patent for a more detailed description of the complementary securing member and the manner in which radially extending gripping fingers 43 are provided thereon and overlie the outer side of the sole.

As shown in Figs. 7 and 8, the cleat 39, which like the cleat in the forms first described may be of moldable material such as rubber, "Bakelite," or the like, has molded therein the head portion 44 of the stud 38 so that the outwardly projecting threaded shank portion 40 is held securely in position relative to the body of the cleat and to a bushing receiving recess 45 formed in the latter and defined at its outer terminus by an annular pressing portion 46 of the cleat base. Advantageously, and as shown, this pressing portion is countersunk relative to the marginal seating surface 47 of the base.

Located in the recess 45 and receiving the shank portion of the stud therein is a bushing-like locking member 29 exactly the same as the locking member first described and being so proportioned relative to the recess that when initially fully located therein, a portion of the locking member projects outwardly therebeyond to engage with the securing member 42 and the radially extending gripping fingers 43 thereon when the cleat is screwed up toward the sole.

As in the case with the assemblies illustrated in Figs. 3 and 6, when the cleat 39 of Figs. 7 and 8 is screwed up toward the sole the outwardly projecting portion of the locking member is distorted laterally to form an annular flangelike portion 48 which is axially pressed intermediate the pressing portion of the cleat base and the sole. Concurrently, the side walls of the locking member confined in the recess 45 are forced into very snug and firm frictional gripping relationship with the side walls of the latter which in the form shown in Figs. 7 and 8 conform or substantially conform to the initial transverse cross sectional shape and size of the locking member and the walls of the locking member bore are pressed against the threaded stud.

Advantageously and as shown in Fig. 9 the bushing receiving recess 45 may be formed with a plurality of pocket portions 49, similar to the pocket portions in the forms illustrated in Figs. 1-6, laterally offset from and communicating with the main portion of the recess into which the locking member is initially inserted to provide a modified cleat 39a. With this construction, it will be readily appreciated, circumferentially spaced portions, exactly like the portions 34 shown in Fig. 4, are laterally distorted on the locking member to engage in the pocket portions 49 when the cleat is screwed up on the sole.

Also advantageously and as shown in Fig. 9, teeth 50 may be formed on the countersunk

pressing portion of the cleat base to engage with the distorted flangelike portion 48 of the locking member when the latter is pressed axially intermediate the inner closed terminus of the recess and the sole upon the screwing up of the cleat.

The more positive holding action achieved in an assembly including a cleat provided with the pocket portions 49 and in addition or alternatively thereto the teeth 48, is particularly advantageous and is preferred. However, the forced gripping of the locking member relative to the side walls and to the inner terminus of the recess 47, and the forced gripping of the distorted flangelike portion 48 with the pressing portion of the cleat, apart from the more positive action made possible by the utilization of the pocket portions 49 and the teeth 48, and as shown in Fig. 7, also serve to maintain the locking member and cleat against unforced turning relative to each other.

The action of the radially extending flange 43 in engaging the outer end of the locking member is similar to the action of the slots 18 and ribs 20 of the washer shown in connection with Figs. 1-6 in most effectively maintaining the locking member against unforced turning movement relative to the sole and stud.

While preferably and as shown, the bushing-like locking member is proportioned to initially fit into the locating and confining recess in the cleat in the several forms illustrated in Figs. 1-10, it should be appreciated and understood that certain advantageous features of the invention may still be realized even though the locking member initially be of a somewhat larger transverse cross section than the recess. In such a case, upon axially compressing the locking member on drawing up the cleat, the central portion thereof will be distorted up into the recess and into gripping relation with the side walls thereof and with the threaded stud, and the projecting end portion laterally distorted intermediate the cleat and sole.

With the forms of the invention shown in Figs. 7-10 as with the forms of the invention shown in Figs. 1-6, therefore, it is seen that a cleat assembly is provided in which the removable cleat is securely held in position on the shoe sole and yet in which, because of the distortable and preferably resilient nature of the simple and easily made bushinglike locking member 29, the cleat may be removed by forced unscrewing without damaging the cleat or the elements by which it is secured to the sole. Should the locking member become worn or otherwise damaged it may be readily replaced, and, because of its simplicity of form and ease of making, this at a negligible cost.

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, a cleat having formed in the base thereof a recess with a plurality of pocket portions communicating therewith and extending laterally therefrom; a bushinglike locking member of distortable material, having a normal nondistorted form, located in said recess and in its nondistorted form being clear of said pockets; a washerlike member on said sole, underlying said base and said locking member; gripping means on said washer co-operable with said locking member; and means including a stud threadedly connected to said

cleat and extending through said locking member, for drawing said cleat toward said sole, thereby axially compressing said locking member and distorting the same laterally into said pockets.

2. In combination with a shoe sole, a cleat having formed in the base thereof a recess with at least one pocket communicating therewith and extending laterally outward therefrom; a locking member of distortable material, located in said recess; gripping means on said sole; and screw means for drawing said cleat towards said sole, causing said locking member to pressingly engage with said gripping means and to be distorted laterally into said pocket.

3. In combination with a shoe sole, a cleat having a base with a recess formed therein defined at its outer terminus by a pressing portion of said base, said recess having a main portion and at least one pocket portion, said pocket portion extending laterally from said main portion, communicating therewith and being of limited circumferential extent relative thereto; a bushinglike locking member of distortable material, having a portion confined in said recess main portion and having a portion projecting axially therebeyond; and screw means for drawing said cleat towards said sole, causing said confined portion to be distorted laterally into said pocket and said projecting portion to be distorted laterally between said pressing portion and the sole.

4. A cleat device for association with a shoe sole, including a cleat having a base with a recess therein defined laterally by side walls; an inset pressing portion on said base, encircling said recess; first gripping means on said pressing portion; second gripping means on said sole; a bushinglike locking member of distortable material, having a nondistorted normal form, located in said recess and having a portion projecting outwardly therebeyond, said projecting portion being in its nondistorted normal form of no greater lateral extent than said recess; and means including a threaded stud adapted to extend through said locking member, for drawing said cleat toward said sole, thereby axially pressing said locking member therebetween to force the latter tightly against said recess side walls, to distort said projecting portion laterally intermediate said pressing portion and said sole, and to cause opposed gripping action on said locking member by said first and second gripping means.

5. In combination with a shoe sole, a cleat having a base with a recess therein, said recess having at least one pocket portion of limited circumferential extent relative thereto, communicating therewith and extending laterally outward therefrom; means including a threaded stud extending through said recess, for drawing said cleat toward the sole; gripping means on said cleat and sole; and a bushinglike locking member of distortable material, on said threaded stud intermediate said cleat and said sole and

pressed axially between the latter and in said recess, with portions distorted into locking engagement with said gripping means, into said pocket and into gripping engagement with said threaded stud, when the cleat is screwed up towards the sole.

6. In combination with a shoe sole, a cleat having a base with a recess formed therein, said recess having at least one pocket portion of limited extent perimetrically relative thereto, communicating therewith and extending laterally outward therefrom; means including a threaded stud adapted to extend through said recess, for drawing said cleat toward said sole; and a bushinglike locking member of distortable material on said stud intermediate said cleat and said sole, adapted to be pressed axially in said recess and distorted into said pocket portion when said cleat is drawn towards said sole.

7. In combination with a shoe sole, a cleat having in the base thereof a recess defined laterally by a perimetric wall formation with at least one section offset laterally and defining a pocket portion of said recess of limited perimetric extent; a bushinglike locking member of distortable material, having a normal nondistorted form, located in said recess and in its nondistorted form being clear of said pocket portion; gripping means on said sole, cooperable with said locking member; and means including a threaded stud extending through said locking member, for drawing said cleat toward said sole, causing said locking member to be pressed axially between said cleat and said gripping means and to be distorted laterally into said pocket portion.

8. In combination with a shoe sole, a cleat having formed in the base thereof a recess with at least one pocket communicating therewith and extending laterally outward therefrom; a locking member of distortable material, located in said recess; and screw means for drawing said cleat toward said sole, causing said locking member to be axially pressed between the cleat and sole and to be distorted laterally into said pocket.

9. A cleat device for association with a shoe sole, including a cleat; a bushinglike locking member of distortable material having a normal nondistorted form; and screw means for drawing said cleat towards said sole, said cleat having a base with a recess therein for receiving a portion of said locking member with another portion of the latter projecting axially therebeyond, said recess being defined at its outer terminus by an inset pressing portion of said base, and said recess having at least one pocket portion extending laterally therefrom, said locking member in its nondistorted form being clear of said pocket portion and adapted to be pressed axially intermediate said cleat and said sole, whereby said portion of said locking member in said recess is distorted laterally into said pocket portion and said projecting portion is distorted laterally between said inset pressing portion and the sole.

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