

[54] **SHOE CONSTRUCTION AND METHOD**

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[52] U.S. Cl.**36/2.5 T, 36/59 B, 12/142 P**

[51] Int. Cl.**A43b 23/28, A43d 9/00**

[58] Field of Search**36/2.5 R, 2.5 T, 32 R, 59 R, 36/59 A, 59 B; 12/142 R, 142 P**

[56] **References Cited**

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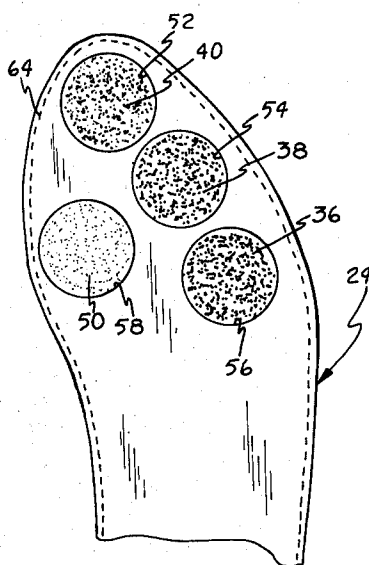
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[57] **ABSTRACT**

A shoe construction including a shoe sole having a plurality of apertures therein. A cleat is removably attached in each aperture and is formed of material having predetermined traction characteristics. Thus, when the shoe construction is used, for example, with bowling shoes, specific cleat compositions for right or left shoes can be selected to best accommodate right or left hand bowlers. The method includes selectively replacing predetermined ones of the cleats with other cleats formed of different material to incrementally change the gripping or traction characteristics of the shoes.

10 Claims, 10 Drawing Figures



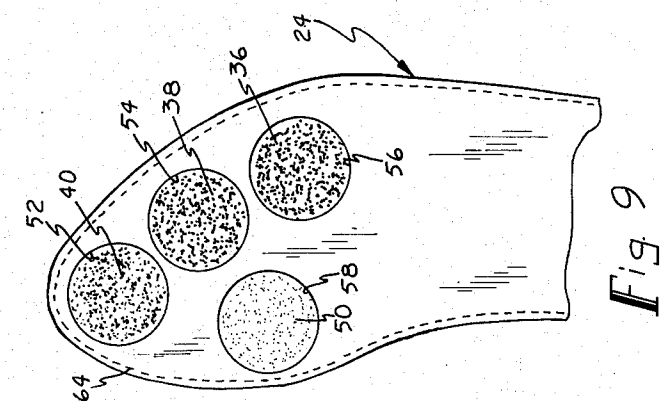


Fig. 9

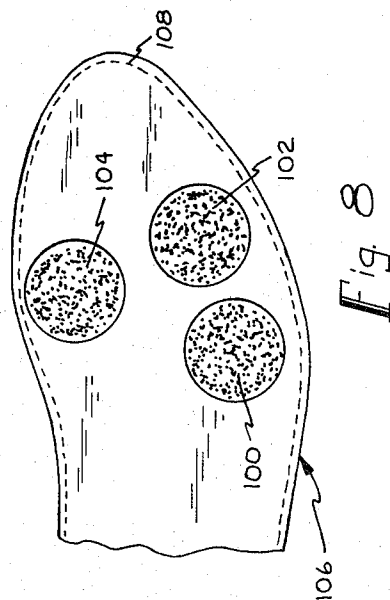


Fig. 8

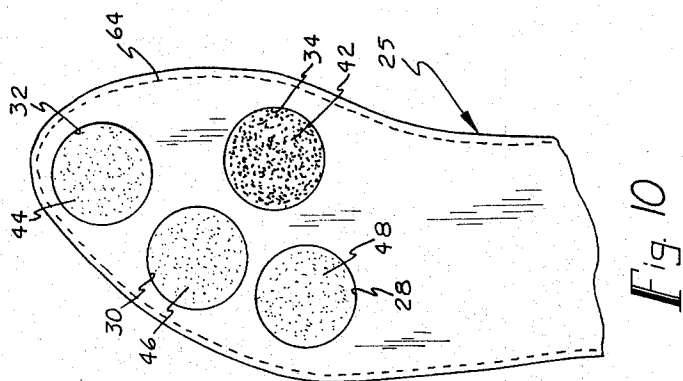


Fig. 10

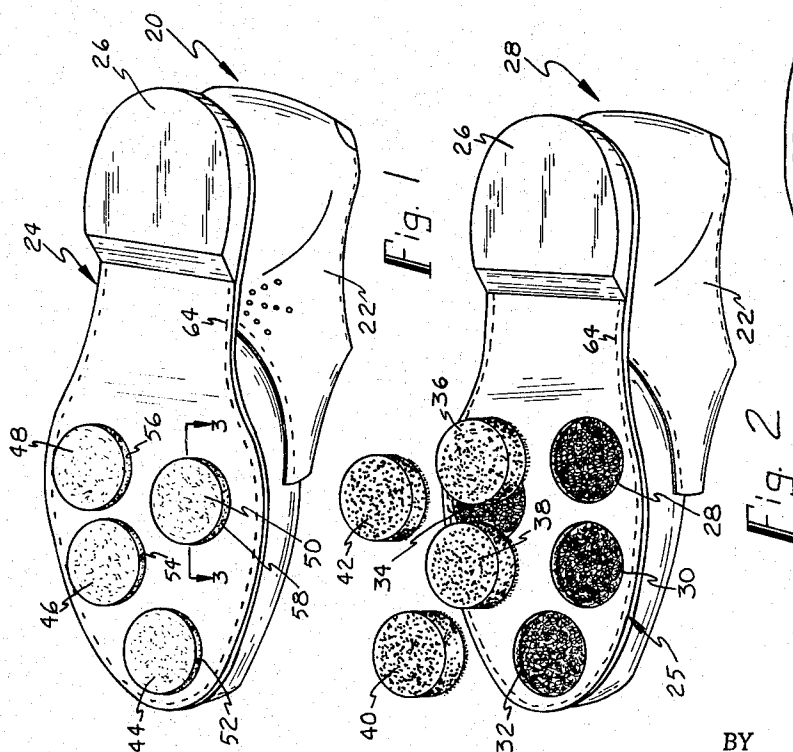


Fig. 1

Fig. 2

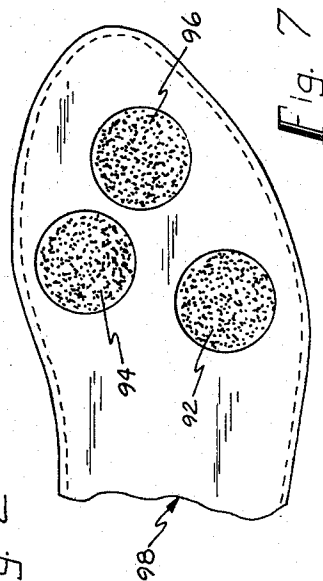


Fig. 7

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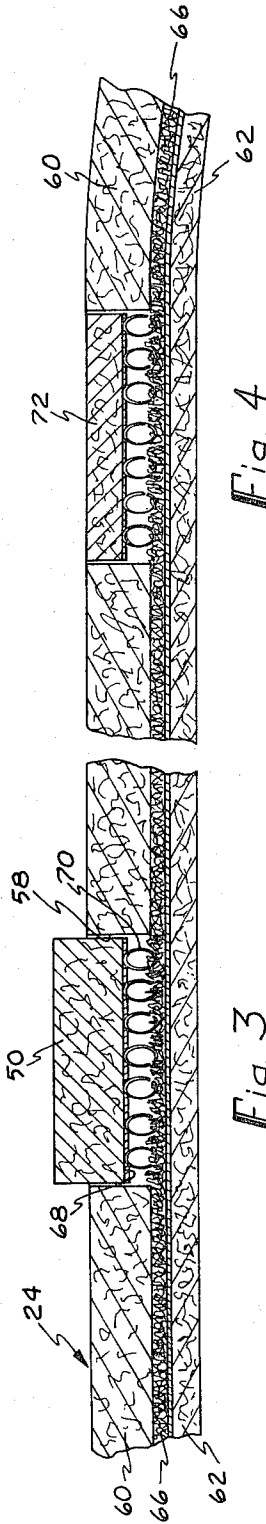


Fig. 3

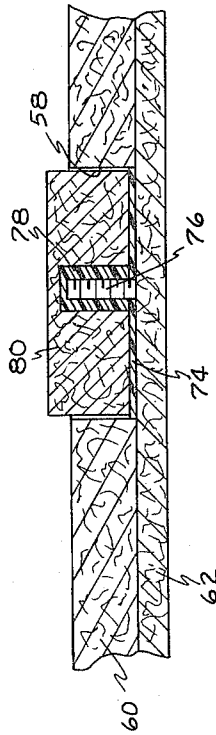


Fig. 5

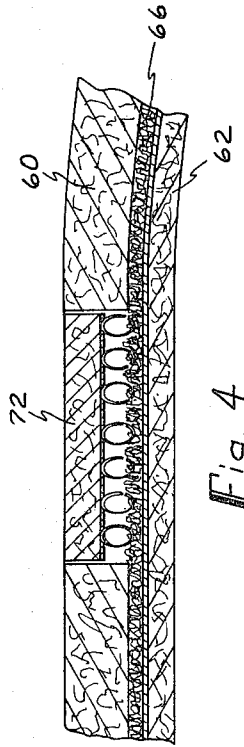


Fig. 4

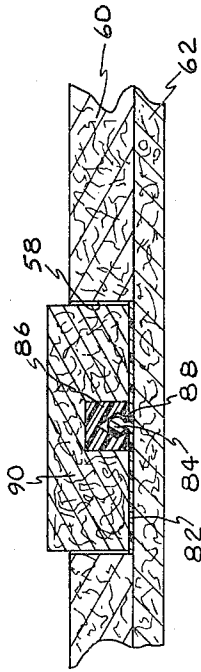


Fig. 6

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SHOE CONSTRUCTION AND METHOD

BACKGROUND

1. Field of the Invention

The invention relates to a shoe construction and method and more particularly to structure and method accommodating selective adjustment of the traction provided by the shoe construction upon a supporting surface.

2. The Prior Art

Historically, bowling shoes have been constructed so that the right and left shoes have soles presenting different traction characteristics. For example, a right handed bowler, upon approaching the lane, normally prefers a certain amount of reduced traction or slideability between his left shoe and the floor allowing the bowler to glide on his left foot for a short space at the termination of his approach to the lane. Conversely, a left handed bowler prefers to have a certain degree of reduced traction or slideability between his right foot and the floor.

It is also desirable for a right handed bowler to have a right bowling shoe which firmly grips the floor during his approach to the lane so that the bowler has sufficient traction to properly position his body when the ball is cast. The left handed bowler normally prefers a high traction capability between his left bowling shoe and the floor. It is well-known that the diversity of traction requirements required for the shoes of right and left hand bowlers has made it essential that distributors of bowling shoes maintain an inventory of shoes specially made for left hand bowlers in addition to the shoes required for right hand bowlers. Further, the necessity of maintaining an inventory of shoes for both right and left hand bowlers has substantially increased the inventory cost and space requirements which must be provided by shoe distributors. Unfortunately, because there are fewer left hand bowlers than right hand bowlers many distributors of bowling shoes have chosen to reduce costs by stocking and selling only a minimum variety of shoe styles and sizes for left hand bowlers.

In addition, it is well-known that the floor surfaces of the approach lane of the bowling alley normally used by a bowler during play are very often variable in their adhesiveness, sometimes being excessively smooth or slippery and other times being excessively rough, tacky or sticky. Where the sliding sole of the bowler's shoe is of constant composition, the player may slip on excessively smooth surfaces, and excessively rough or sticky surfaces may impede the bowler's movement over the floor. In either event, the cast of the bowling ball into the alley may be interfered with to such an extent as to materially affect the score of the bowler.

Efforts have been made in the past to minimize this problem by providing a removable sole which allows for substitution of another sole having different traction characteristics. See, for example, U.S. Pat. Nos. 2,640,283 and 3,027,661.

Teachings of the prior art have not, however, overcome the problem of distributing different types of shoes for both right and left hand bowlers. Additionally, the prior art solutions to the above set forth problems require that a bowler carry with him replaceable soles so that the bowler may select among them the sole most appropriate for the particular surface condition of the approach lane.

BRIEF SUMMARY AND OBJECTS OF THE INVENTION

The present invention, including structure and method, accommodates manufacture of essentially identical shoes for both right and left hand bowlers which may be easily adapted for right or left hand use at the moment of purchase or at any convenient time thereafter. Further, the present invention accommodates changes in the traction capability of various selected portions of the sole of the shoe.

It is, therefore, a primary object of the present invention to provide an improved shoe construction.

It is another primary object of the present invention to provide a method of selectively adjusting the traction accommodated between a shoe sole and a supporting surface.

These and other objects and features of the present invention will become more fully apparent from the following description and appended claims taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one presently preferred shoe construction;

FIG. 2 is a perspective illustration similar to the view of FIG. 1 of an opposite hand shoe with traction cleats shown in exploded relation to the shoe;

FIG. 3 is a cross-section taken along line 3—3 of FIG. 1;

FIGS. 4-6 respectively illustrate alternative ways of removably attaching the cleats in the corresponding apertures; FIGS. 7 and 8 are bottom plan views illustrating other presently preferred cleat positions; and

FIGS. 9 and 10 illustrate the method of adjusting the traction accommodated on portions of each shoe by the cleats.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention is best understood by reference to the Figures wherein like parts are designated with like numerals throughout. Although the present invention has application to shoe constructions utilized for a variety of purposes, the following description relates to bowling shoes which are exemplary of the type of application in which the invention may be utilized.

THE EMBODIMENT OF FIGS. 1-6

FIG. 1 illustrates a bowling shoe generally designated 20 having a shoe upper 22 as is conventional. The upper 22 is mounted on a shoe sole generally designated 24 covering the entire bottom of the shoe and also presenting an attachment site for the heel 26. The shoe sole 24 is preferably formed of leather or suitable leather substitute.

A complementarily configured "right" shoe generally designated 28 is shown in FIG. 2. The right shoe 28, including sole 25, is essentially identical to the left shoe 20 and sole 24 shown in FIG. 1 except that the shoe 28 and sole 25 are opposite hand. As best shown in FIG. 2, the sole 25 is provided with apertures 28, 30, 32 and 34. Although any desired plurality of apertures could be used, four apertures are shown in the illustrated embodiment of FIGS. 1 and 2. The apertures 28, 30, 32 and 34 are, for example, annular in configuration and are adapted to receive corresponding cleats 36, 38, 40 and 42.

Referring again to FIG. 1, it can be appreciated that similar cleats 44, 46, 48 and 50 are disposed in corresponding apertures 52, 54, 56 and 58 in sole 24.

The cleats in the sole 24 differ from the cleats in the sole 25 principally in the amount of traction developed between the cleat and the floor of the approach lane to a bowling alley. One of the ways in which the difference in traction between the cleats in sole 24 and the cleats of sole 25 may be represented is through the coefficient of friction. In this specification, the coefficient of friction between a cleat and the floor is the ratio of the force required to move the cleat over the floor to the total force pressing the cleat and floor together.

In the illustrated embodiments, the darkly shaded cleats are intended to represent material having a greater coefficient of friction than the lightly shaded cleats. For example, cleats 44, 46, 48 and 50 may be formed of the same type of leather as sole 24. Cleats 36, 38, 40 and 42 may be formed of a non-skid rubber. Thus, when all of the cleats are properly secured in place, the shoes 20 and 28 shown in FIGS. 1 and 2 are most appropriately used by a right hand bowler since the left shoe 20 develops less traction and therefore allows a greater degree of slideability than the right shoe 28.

The attachment of the cleat in its corresponding aperture can best be understood by reference to FIGS. 3-6. Referring

to FIG. 3, the sole 24 has an outer floor-engaging layer 60 and an inner layer 62. Normally, the inner and outer layers are stitched together as at 64 (FIGS. 1 and 2). At the interface of the layers 60 and 62, a layer of fabric 66 is bonded. Preferably, the fabric 66 is bonded to the layer 62 and presents outwardly projecting tiny loops. The normally concealed surface 68 of the cleat 50 is bonded to a second fabric material formed of a plurality of small hooks or split loops 70. Together, the hooks 70 and fabric 66 form a fastener known by the trademark Velcro manufactured by American Velcro, Inc.

Advantageously, the Velcro fastening accommodates facile detachment of the cleat 50 and replacement of the cleat 50 or another cleat having a different coefficient of friction for the purpose subsequently more fully described. Also, as can be appreciated by reference to FIG. 3, the cleat 50 projects a short distance beyond the periphery of the floor-engaging layer 60. Alternatively, if desired, the cleat 50 may be substituted with a similar cleat 72 which is configured so as to remain flush with the layer 60 as shown in FIG. 4.

If desired, the detachable couplings illustrated in FIGS. 5 or 6 could be used. In the FIG. 5 embodiment, the outer floor-engaging layer 60 is bonded, sewn or otherwise permanently secured directly to the layer 62. The aperture 58 projects completely through the layer 60 and is terminated by the layer 62. An annular disc 74 is bonded or otherwise permanently secured to the layer 62 at the bottom of aperture 58. Preferably, the shank of a screw or other threaded shaft 76 is immovably mounted in the disc 74 essentially central thereof. The shaft 76 is received in mating relation by an internally threaded insert 78 which has been bonded centrally within the cleat 80. Thus, the cleat 80 may be removed by rotating the cleat relative to the shank 76 until the shank becomes disengaged from the insert 78.

The FIG. 6 embodiment is similar to the embodiment illustrated in FIG. 5 except that in FIG. 6 a disc 82 is mounted at the base of aperture 58, disc 82 having an integral outwardly projecting male coupling 84. The male coupling 84 is releasably received in mating relation by female coupling 86. Coupling 86 comprises an insert bonded centrally within the cleat 90. The female coupling 86 is preferably formed of yieldable material with memory and has a diametrically reduced orifice 88 so that the cleat 90 may be "snapped" into position in the aperture 58. As can be appreciated, if the apertures 58 or any of the other apertures in the shoes 20 and 28 (FIGS. 1 and 2) are other than annular in configuration, the discs 74 and 82 may be of any suitable complementary configuration. Furthermore, although the drawings illustrate the aperture 58 as penetrating the entire thickness of layer 60, it is also contemplated that the aperture be a recess extending into the layer 60 less than the entire thickness of the layer.

THE EMBODIMENTS OF FIGS. 7 AND 8

The FIG. 7 embodiment illustrates cleats 92, 94 and 96 arranged in a sole 98 so that cleats 92 and 94 are directly over the ball of the foot and cleat 96 is adjacent the toe. However, as shown in FIG. 8, it is also desirable to locate cleats 100, 102 and 104 in sole 106 so that the traction developed by the cleats is exclusively in the region of the ball of the foot. This leaves the toe portion 108 of the sole free of traction modifying cleats.

THE METHOD

According to the presently preferred method embodiment of the invention, the traction created by either the left or right shoe may be incrementally changed at specific locations on the sole of the shoe to maximize the efficiency of the shoe sole during use.

The method can best be understood by reference to FIGS. 9 and 10. FIG. 9 illustrates sole 24 (also shown in FIG. 1) with cleats 36, 38 and 40 substituted for cleats 44, 46 and 48. In the illustrated embodiment, cleats 36, 38 and 40 have a greater coefficient of friction than cleats 44, 46 and 48.

Similarly, sole 25 (shown also in FIG. 2) carries cleats 44, 46 and 48 which have replaced corresponding cleats 36, 38 and 40 (FIG. 2). Cleats 44, 46 and 48 have a coefficient of friction which is less than the coefficient of friction of cleats 36, 38 and 40. Thus, it can be appreciated that the sole 24 now accommodates greater traction than the sole 25. The same shoes 20 and 28 may, therefore, be used by a left hand bowler when the cleats are arranged as illustrated in FIGS. 9 and 10. It should be apparent that although cleats 42 and 50, shown in FIGS. 10 and 9, respectively, have not been exchanged in the illustrated embodiment, such an exchange is clearly within the scope of this invention.

The presently preferred method embodiment of the invention also accommodates selective adjustment of specific areas of the sole 24 or 25 to present a greater traction than another area of the sole. For example, as shown in FIG. 9, the outside periphery of the sole has increased traction because cleats 36, 38 and 40 have a greater coefficient of friction. Similarly, cleat 50, at the instep of the sole, has a reduced coefficient of friction to accommodate greater maneuverability. If the approach lane to the bowling alley upon which the sole 24 is used is comparatively sticky or tacky, any selected one of the cleats 36, 38 or 40 may be replaced with another cleat (not shown) having a reduced coefficient of friction. Similarly, any two of the cleats 36, 38 or 40 may be replaced with other cleats having a reduced coefficient of friction.

Thus, the illustrated and described method uniquely provides a way of adjusting the total traction accommodated by a shoe sole to correspond to the particular floor or other supporting surface. Moreover, selected portions of the shoe sole may be provided with cleats having a coefficient of friction which maximizes the effectiveness and utility of the shoe.

It should be appreciated that while the cleats disclosed in this specification have generally been referred to as having a greater coefficient of friction than the material forming the sole of the shoes, the inverse could as well be equally appropriate. For example, the leather or leather substitute material forming shoe soles 24 and 25 may have a very high coefficient of friction accommodating a high degree of traction. Cleats mounted in the shoe soles may have a coefficient of friction which is incrementally reduced over that material forming the sole. In that event, the cleats would be selected to provide greater slideability rather than greater traction. Moreover, although not illustrated in the drawings, cleats may be provided in the heel of the shoe, when desired.

The invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive and the scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed and desired to be secured by United States Letters Patent is:

1. A shoe construction comprising

a shoe upper;

a shoe sole mounted upon the shoe upper, the sole having a plurality of spaced apertures therein; and

a plurality of cleats removably mounted within the spaced apertures, at least one of the cleats being formed of material having a coefficient of friction which differs from the coefficient of friction of other of the cleats so that the slideability of the shoe sole can be varied.

2. A shoe construction as defined in claim 1 wherein said apertures are located adjacent the periphery of the shoe sole.

3. A shoe construction as claimed in claim 1 wherein said cleats are removably mounted within the apertures with a male-female coupling.

4. A shoe construction as defined in claim 1 wherein said cleats are removably mounted within the apertures by a threaded coupling.

5. A shoe construction as defined in claim 1 wherein said sole comprises inner and outer layers, the inner layer presenting a fabric and wherein said cleat presents another fabric, one of said fabrics comprising a plurality of thread loops and the other of said fabrics comprising a plurality of hooking members, said hooking members and loops detachably joining the cleat to the sole support.

6. A shoe construction as defined in claim 1 wherein at least one of said cleat means, when mounted within the aperture, is flush with the exposed surface of the shoe sole.

7. A shoe construction as defined in claim 1 wherein at least one of said cleat means, when mounted within the aperture, projects beyond the exposed surface of the sole.

8. A shoe sole construction for right and left shoes comprising:

means for carrying the corresponding right or left sole upon the feet of a user;

a shoe sole mounted upon both the right and left carrying means, each shoe sole comprising a plurality of peripherally located, substantially similarly configured apertures;

cleat means comprising first and second types sized and configured to substantially fill the apertures, the first type of cleat means being formed of material having a coefficient of friction which differs from the coefficient of friction of the second type; and

means for mounting the first type of cleat means in one of the right or left carrying means and means for mounting

the second type of cleat means in the other of the right or left carrying means.

9. A method of adjusting the amount of slideability accommodated between a supporting surface and a shoe sole, the steps of:

providing a plurality of apertures in the sole of a shoe; removably attaching a plurality of cleats at least one having a different coefficient of friction than other of the cleats within the apertures; and

selectively detaching at least one of the cleats and replacing the one cleat with another cleat having a coefficient of friction differing from at least one of the other cleats so as to vary the slideability of the sole.

10. A method of manufacturing bowling shoes having general application to both right and left hand bowlers, the steps of:

forming a plurality of attachment sites in the soles of each of the right and left shoes;

providing cleat means comprising first and second types removably mountable upon the attachment sites, the first type of cleat means having one coefficient of friction and the second type of cleat means having a different coefficient of friction; and

mounting the first type of cleat means in one of the right or left shoes and the second type of cleat means in the other of the right or left shoes.

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