

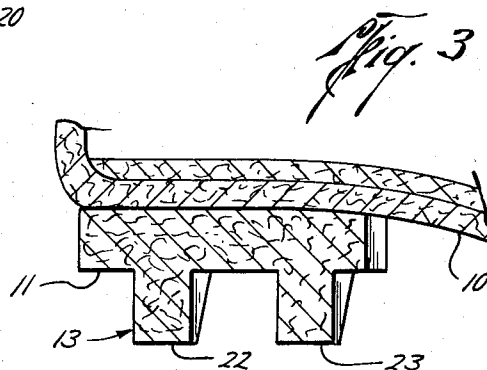
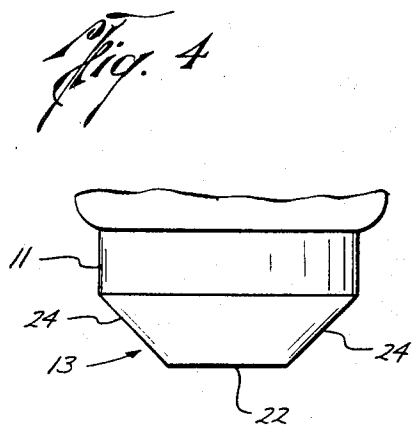
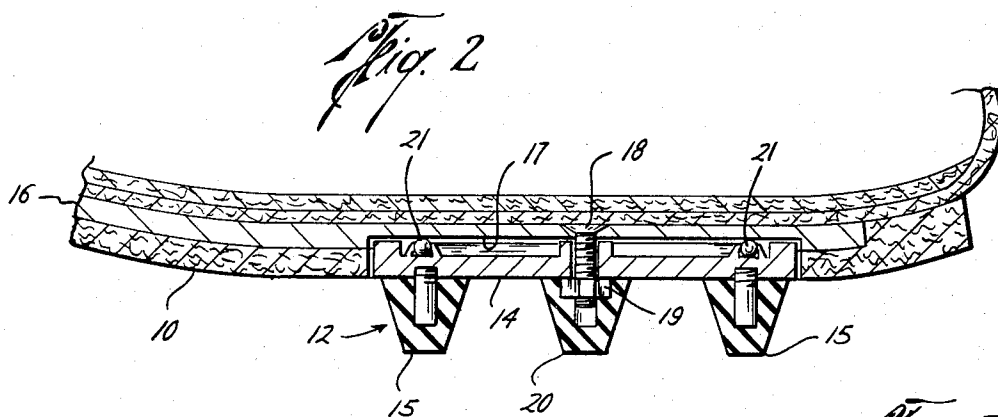
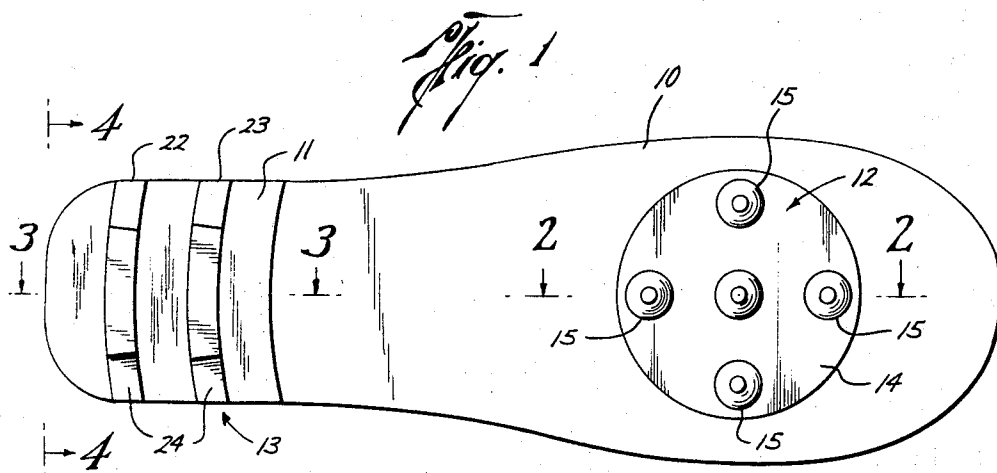
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ATHLETIC SHOE HAVING ROTATABLE CLEAT MEANS

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## ATHLETIC SHOE HAVING ROTATABLE CLEAT MEANS

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The present invention relates to an improved athletic shoe and particularly to an improved athletic shoe having cleates or traction elements projecting from the sole and heel of the shoe.

For many years the design of football and other cleated athletic shoes worn in games of body contact has not been changed or improved. Body contact sports, such as football and soccer, require a cleated athletic shoe so that the players will have adequate traction to attain maximum speed, power and maneuverability in running.

Injuries to the lower extremities occur most frequently in those games requiring body contact, running, sudden changes in direction and footwear with cleats. Such injuries include injuries to the hip, knee and ankle joints and to the bones of the leg, ankle and foot. Of the cleated sports, injuries are most numerous in football and diminish in frequency in soccer, baseball and track, respectively. The relationship of the number of injuries to the lower extremities in such sports is directly related to the activities required in each sport.

Injuries to the lower extremities in all of these sports could be substantially reduced by causing the participants to use shoes without cleats. The reason why the use of an uncled shoe would minimize such injuries is that a major portion of such injuries results from forces imparted to the leg in a direction in which the normal shock-absorbing mechanisms of the leg are not brought into play since the foot is fixed to the earth by the cleated shoe. The foot may be thought of as two levers, the forefoot and the heel, attached to a fulcrum, the ankle and tibia. From this analogy it may be seen that if both arms of the lever bear cleats, there is a limited possibility that the foot will slip, slide, rotate or otherwise move when the cleats are implanted in the ground and a force is imparted to the foot or leg. This rigidity or binding of the foot results in a great danger of injury of the lower extremity during play when cutting sharply, being tackled and being blocked. Thus, the cleated shoes, while providing traction for running, also are responsible to retaining the foot immobile and this immobility causes a substantial portion of the injuries to the lower extremities. Therefore, one of the objects of the present invention is to provide an improved athletic shoe which will have sufficient traction for running with speed, power and maneuverability and further will allow a sufficient movement of the foot even when the shoe is cleated in the ground to prevent many of the injuries to the lower extremities.

Another object of the present invention is to provide an improved athletic shoe having running traction but allowing a twisting or rotational movement of the shoe whereby the natural shock-absorption mechanisms of the leg of the wearer are allowed to come into play when the leg is subjected to force not aligned with such shock-absorption mechanism.

A further object of the present invention is to provide an improved athletic shoe having a maximum longitudinal traction but having a reduced transverse traction at the heel of the shoe.

A still further object of the present invention is to provide an improved athletic shoe having heel traction elements extending substantially transversely of the heel.

Still another object of the present invention is to provide an improved athletic shoe having traction elements

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for the ball of the wearer's foot which maintain their traction with the ground but allow the shoe to pivot thereabout.

Still another object of the present invention is to provide an improved athletic shoe having cleats which allow pivoting of the shoe with respect to the cleats whereby movement of the foot is allowed to reduce the strain on the leg of the wearer when subjected to a force which is misaligned with the natural shock-absorption mechanisms of the leg.

These and other objects of the present invention are hereinafter more fully described and discussed in detail in relation to the accompanying drawings wherein:

FIGURE 1 is a view of the sole of a shoe constructed in accordance with the present invention.

FIGURE 2 is a sectional view of the sole of the shoe taken along line 2-2 in FIGURE 1.

FIGURE 3 is a sectional view of the heel of the shoe taken along line 3-3 in FIGURE 1.

FIGURE 4 is an end view of the heel of the shoe in FIGURE 1 taken in the direction of the line 4-4 in FIGURE 1.

Referring more in detail to the drawing, the view of the sole of the athletic shoe of the present invention illustrates the sole and heel configurations of the preferred form of the present invention. From FIGURE 1 it can be seen that the sole 10 and heel 11 are provided with novel traction means 12 and 13, respectively.

As best shown in FIGURE 2 the traction means 12 comprises a plate 14 which is pivotally secured to the sole 10. The plate 14 is provided with a plurality of cleats 15 projecting downwardly and suitably secured to the plate 14. Suitable means should be provided to allow the plate 14 to pivot or rotate with respect to the remainder of the shoe, such as the metal plate 16 extending under the sole 10. Metal plate 16 has a recess 17 into which the plate 14 is inserted as illustrated in the drawings. The screw 18 extends through the metal plate 16 and the plate 14 with nut 19 securing the plate 14 in position with respect to the sole 10. A central cleat 20 is provided to cover the end of screw 18 and nut 19. Bearing 21 is provided to facilitate the movement of plate 14.

The heel 11, as shown in FIGURES 1, 3 and 4, is provided with two arcuate ribs 22 and 23 as the traction means 13 previously mentioned. The ribs 22 and 23 are curved and have the center of curvature at the center of the plate 14 for the reasons hereinafter more fully discussed. The ribs 22 and 23 are provided with beveled ends 24, or some other suitable shape, which provide sufficient traction in a direction longitudinally of the shoe but a minimum amount of traction transversely of the shoe.

It is preferred that the plate 14 be fitted tightly into the recess 17 in the plate 16 so as to absorb some of the thrust which will be placed upon the screw 18 when the shoe is in use. Also, it is suggested that the fit of plate 14 in the sole 10 be as tight as possible to prevent dirt and bits of turf from entering into the recess 17 and interfering with the pivoting of plate 14.

With the structure described and shown, the shoe will readily rotate when cleated to the earth since the sole cleats are mounted on the pivotal plate 14 and the heel ribs 22 and 23 have a minimum resistance to movement about the center of rotation of the plate 14.

While the structure illustrated is shown to have a free pivoting plate 14, it is contemplated that some resistance to the pivoting of the plate 14 may be desirable. Therefore, it is contemplated that the bearing 21 may be replaced with another type of bearing in which the amount of tightening of the nut 19 on the screw 18 will control the frictional resistance to the pivoting of the plate 14. The same result could be accomplished with a projec-

tion and detent arrangement (not shown) whereby a projection on plate 14 would remain in a detent in plate 16 until the torque on the plate 14 with respect to the shoe exceeded a predetermined force at which time the projection and detent arrangement would release and allow the plate 14 to rotate freely.

Another factor that should be considered carefully in the construction of athletic shoes in accordance with the present invention is to keep the weight of the shoes as low as possible. Consideration in the selection of materials should be given to the performance of the desired pivoting function, the traction and also the weight of the shoe.

It is contemplated by the present invention that a standard set of cleats may be used on the sole of the foot of an athletic shoe and that the heel cleats or traction elements be changed in accordance with the present invention to provide a greatly reduced transverse traction at the heel. Such a shoe would be an improvement over the prior athletic shoes as it would allow the movement of the foot to align the natural shock-absorption mechanisms of the leg when the leg of the wearer was subject to external forces. Even a very slight movement of the foot of the individual will many times be sufficient to prevent or substantially lessen the degree of injury which would occur due to the imparting of an external force on a leg or foot, which force does not align itself with the normal shock-absorption mechanism of the leg.

From the foregoing it may be seen that the athletic shoe of the present invention provides adequate traction for maneuverability, power and speed during running but even when cleated in the ground will allow the foot to pivot. This pivoting of the foot when cleated is distinguished from the prior art athletic shoes which bind the foot and hold it immobile when the cleats are set in the turf. Such pivoting and allowing even slight movement of the foot will greatly reduce the extent and number of injuries to the lower extremities in athletic contests, such as football and soccer. In addition, the athletic shoe of the present invention will provide a maneuverability which is considered to be superior to that provided by shoes of the prior art in that the leg of an athlete in the act of cutting or abruptly changing direction will not be restrained by the locking of the foot when the shoe is cleated to the ground. The shoe of the present invention will allow a runner to plant one foot firmly in the ground, pivot on that foot and stride off in a substantially different direction at full speed and without loss of traction. In the practical aspect of what is termed broken field running, it is desirable that the runner be able to change direction while running at full speed without any appreciable loss of speed except when the runner desires to alter his speed for deception. The shoe of the present invention will allow the runner after pivoting in an abrupt turn to utilize the full strength of the pivoting leg since it will turn to a direction where it is in alignment with the new direction of movement and it will not be restrained or twisted by the cleats of the shoe. It

should be understood that when the cleats of the sole of the shoe of the present invention are completely unrestrained in pivoting, the individual using such shoes should be careful until he has become accustomed to the pivoting of the foot.

What I claim is:

1. An athletic shoe, comprising  
an upper,  
a sole secured to said upper,  
a plate having cleat means, and  
means rotatively mounting said plate to said sole  
whereby traction is provided by said cleat means  
without restricting the pivotal movement of said plate.
2. An athletic shoe according to claim 1, wherein  
said sole defines a circular recess, and  
said plate is circular and adapted to be positioned within  
said recess defined by said sole.
3. An athletic shoe according to claim 2, wherein  
said plate fits closely into the recess defined by said sole  
to assist in supporting said plate and to provide a  
seal preventing dirt and other material from entering  
said recess.
4. An athletic shoe, comprising  
an upper,  
a sole secured to said upper,  
a cleat assembly, and  
means rotatively mounting said cleat assembly to said  
sole whereby said cleat assembly provides maximum  
traction without restricting the pivotal movement of  
said cleat assembly with respect to said sole.
5. An athletic shoe according to claim 4, wherein  
said mounting means includes means for preselecting  
the amount of resistance to pivoting of said cleat assembly.
6. An athletic shoe according to claim 4, wherein  
said mounting means provides a limited frictional  
resistance to the pivotal movement of said cleat  
assembly with respect to said sole.
7. An athletic shoe according to claim 1, wherein said  
cleat means includes,  
a cleat assembly pivotally mounted to the forward portion  
of said sole.
8. An athletic shoe according to claim 7, where said  
cleat means also includes,  
at least one traction element secured transversely to the  
rear portion of said sole.

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