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3,101,763

CLEAT MOUNTING WASHER

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FIG. 1.

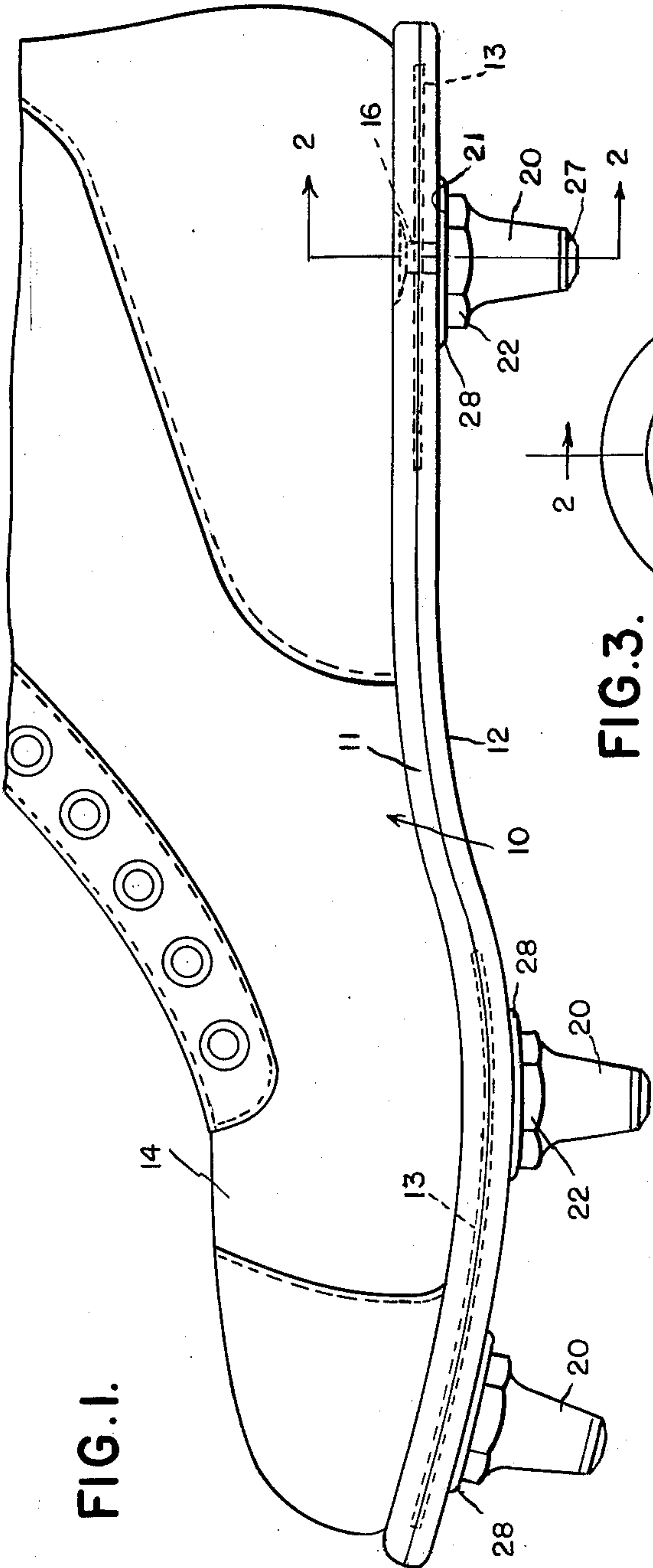


FIG. 3.

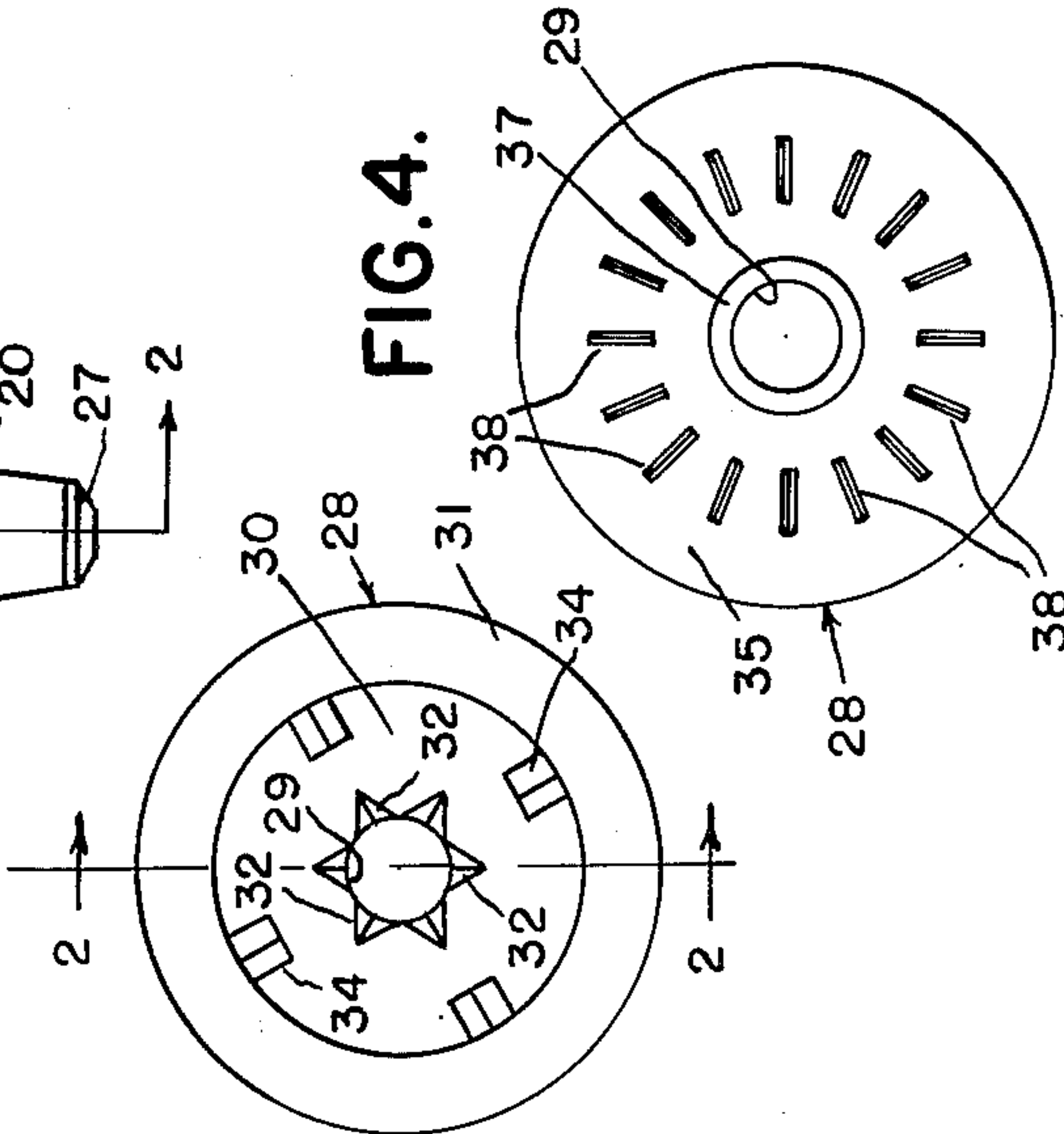


FIG. 2.

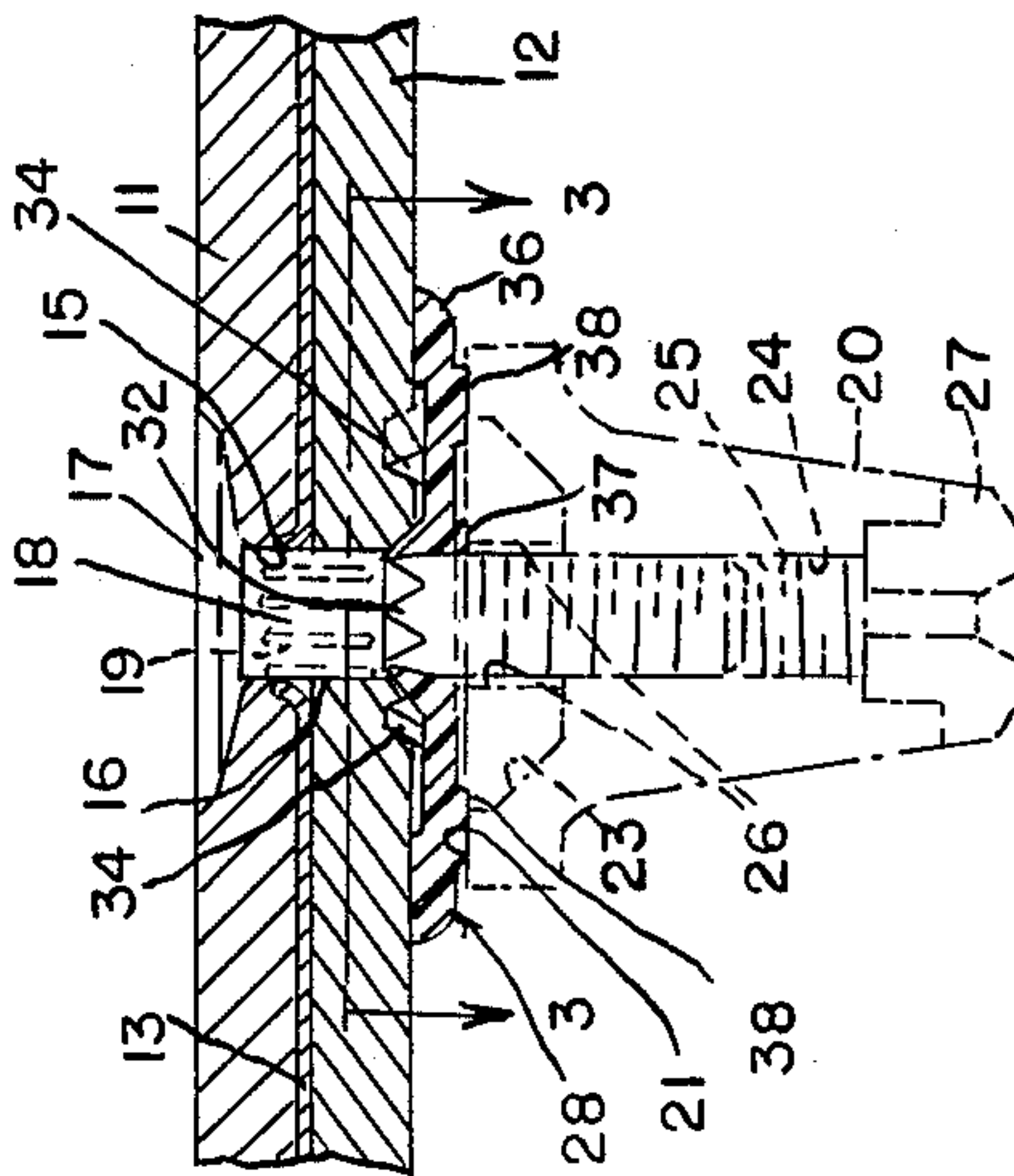
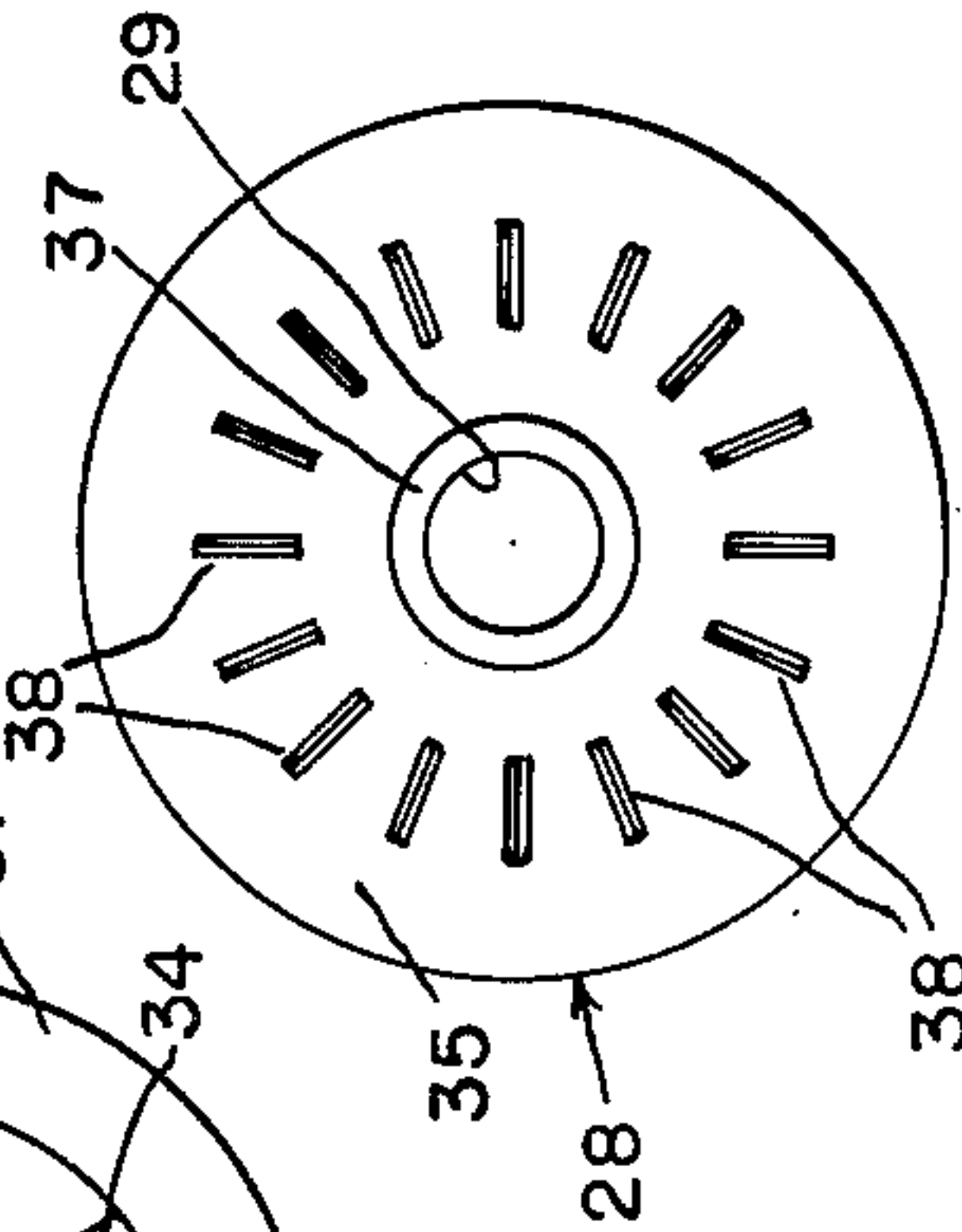


FIG. 4.



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CLEAT MOUNTING WASHER

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1 Claim. (Cl. 151—35)

The present invention relates to an improved washer for the mounting of cleats on sport shoes such as football shoes, although it will be evident as the description proceeds that the improved cleat mounting washer is by no means limited in application to this particular type of sport shoe. In general, the invention deals with improvements in a non-metallic washer, the washer being of the general type of one employed as a component of an improved football shoe cleat construction which is the subject matter of my copending application, Serial No. 787,647, filed January 19, 1959, and now abandoned.

The application thus identified deals with a cleat construction employing three component elements all fabricated of a non-metallic, preferably synthetic plastic composition having appropriate qualities of strength, rigidity, moldability, etc.; these components being an inner sole insert member, an external cleat member and the washer in question. The improved washer of the present invention may be employed as the washer component of such an all-plastic cleat combination; however, it is to be understood that this is not necessarily the case, and that the washer has many advantages when utilized in a more conventional assembly or organization employing, for example, inner and outer sole insert and cleat members of metal which are in threaded engagement with one another, with the improved washer interposed between the outer cleat member and the outer sole of the shoe.

It is an object of the invention to provide an improved cleat mounting washer which, whether employed in association with metallic cleat and sole insert members or otherwise, has important advantages in that it eliminates the effect of previously employed metal washers of deforming the shoe sole when the cleat is taken up tightly, thereby setting up a source of discomfort for the wearer; of holding the cleat very firmly and in a way to resist loosening in use, without requiring that excessive force be applied in tightening the cleat, as to a metal insert post with which the external cleat member has threaded engagement; of possessing a flexing and floating action in its external annular zone surrounding such cleat member, thus to conform itself to the external sole surface in this zone as the cleat is threadedly taken up on the insert post or other coacting member; of becoming embedded locally in material of the outer sole immediately surrounding a hole in the sole receiving the post, and thereby becoming anchored to the sole at the outset of the threading operation, then further anchored to the sole by embedding therein as the take-up of the cleat by threading proceeds; and, in general, of providing a better appearing, lighter weight, rust-free cleat construction, in so far as the washer is concerned at least, and at considerable less cost than conventional washers which are presently employed.

More specifically, it is an object to provide an improved washer which attains these objectives in being characterized by its synthetic plastic construction in an annular outline and flat cross sectional thickness to provide a series of sharpened embedding points or nibs immediately surrounding the hole thereof on the side facing the outer shoe sole. These penetrate the material of the sole as pressure is inwardly applied in taking up the outer cleat and, in the case in which a special type

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of inner insert post is employed having axially expanding serrations on its shank to embed in the hole of the sole which receives the shank, the points or nibs coact with such post serrations insuring a good distribution of sole gripping action of both post and washer in the zone immediately surrounding the post.

Another object is to provide a cleat mounting washer as described which, in addition to the gripping point or nib formations mentioned above, is provided with a further annular series of sharpened gripping teeth in an annular zone radially outwardly of such formations. These teeth also face the outer shoe sole and take embedding gripping engagement with the latter as the tightening of the external cleat member on the insert post proceeds, the material of the washer flexing and accommodating itself in this phase to the external contour of the sole without deforming the latter, as is the case when metal washers are employed.

A further object is to provide a cleat washer of the foregoing type which, on its external flat surface opposite the sole-engaging surface, carries a series of radial serrations somewhat outwardly of its post-receiving hole, as well as an annular, outwardly projecting shoulder or rib of slight axial width directly surrounding said hole. In some installations, this rib or shoulder will be in sliding bearing engagement with a surface of the cleat as the latter is taken up, and as a surface of the cleat member radially outwardly of the rib or shoulder comes into frictional sealing and holding engagement with the radial serrations mentioned. Thus the cleat member is brought into firm frictional holding engagement with the washer with ease, and without causing the washer to deform the sole. The amount of force applied in taking up the cleat member may be only what is necessary to prevent the cleat member from becoming loosened under manual force in the opposite threading direction.

The foregoing as well as other objects will become more apparent as this description proceeds, especially when considered in connection with the accompanying drawings illustrating the invention, wherein:

FIG. 1 is a fragmentary view in side elevation of an athletic shoe having cleats mounted by washers in accordance with the invention;

FIG. 2 is a fragmentary view in enlarged scale and in section on a line corresponding to line 2—2 of FIGS. 1 and 3, conventional insert posts and cleat members being indicated in dot-dash line;

FIG. 3 is a plan view of the improved washer, as from the line 3—3 of FIG. 2; and

FIG. 4 is a view of the washer from its opposite, external and cleat-engaged surface.

FIG. 1 of the drawings shows the invention as applied to a football shoe 10, although, as indicated above, the improved washer may also be employed, with obvious or indicated changes in size, proportions, etc., in mounting cleats to various types of athletic shoes, such as golf shoes and the like.

As illustrated in FIG. 2, the shoe 10 conventionally features an inner leather sole 11, an outer sole 12, and one or more flat steel piece 13 interposed therebetween; and with the soles 11, 12 conventionally secured together and to the upper 14 of the shoe.

The soles 11, 12 and piece 13 are punched or otherwise formed to provide a hole 15 to receive an inner sole insert post 16, whose enlarged head 17 is received flush with the inner surface of the inner sole 11, as shown in FIG. 2. It is preferred that the hole 15 be punched in the soles 11, 12 somewhat undersize, in reference to the shank 18 of post 16, and the latter is sometimes provided with circumferentially spaced, axially extending serrations 19 about its periphery to take biting and embedding en-

gagement with the sole members as the post is applied. Suitable steps are taken to secure the post, as applied, for example, by upsetting its material to grip outer sole 12, by applying a suitable clinching member, etc.

As indicated above, the external cleat members 20 may be formed of any appropriate material, and conventionally feature an annular flat rim or land 21 around the inner surface thereof, being formed in a hex outline at 22 on their outer sides to receive a suitable tightening tool. Inwardly of the land 21, the cleat is usually (although not always) recessed at 23 (FIG. 2) surrounding the post 16, and has a central bore 24 threaded to receive the threads 25 of the post. However, it is also contemplated that a cleat may be employed which will have a center zone closely surrounding the shank 18 of post 16, as indicated by the reference numeral 26 in FIG. 2. The cleat 20 may be armored in a conventional way by a hardened steel piece 27 applied to its end.

The reference numeral 28 generally designates the improved washer of the invention. It is preferably fabricated of a suitable synthetic plastic composition having desired hardness and toughness combined with a suitable degree of flexibility, as well as good molding quality and low cost; and I find that the nylon molding composition produced by E. I. du Pont de Nemours & Company, Inc., of Wilmington, Delaware, and marketed as "Zytel 101," has such advantages. However, other equivalent compositions having necessary hardness along with good compressive and flexural strength may be employed in the production of the washer 28.

As illustrated in FIGS. 2, 3 and 4, the washer 28 is of circular outline in a flat annular cross section; and its diameter slightly exceeds that of the width of the cleat member 20 at the hex formation 22 of the latter. It has a central opening or hole 29 of a size to receive the shank 18 of post 16 with only necessary sliding clearance; and immediately surrounding this opening the inner, sole-engaging surface of the washer is molded to provide a slightly depressed flat annular area 30 surrounded by a flat annular area or zone 31 which is adapted to engage the external surface of outer sole 12.

Washer 28 is molded, as shown in FIGS. 2 and 3, to provide a circumferential series of sharpened points or nibs 32 immediately surrounding the opening 29 and projecting substantially upwardly from the face of the washer, as appears in FIG. 2. These points taper outwardly of the surface on which they are formed in a direction toward the axis of opening 29 and in the circumferential direction of or about said opening. Thus the formations 32 are of a sharpened, pyramid-like outline, and they are adapted to penetrate and embed in the material of sole 12 as the washer is applied to post 16 and the cleat member 20 threadedly taken up. In the event the post shank 18 is one having axial serrations 19 it is found that such penetration and embedding by the points 32 enhances the securement of the cleat as a whole by producing a uniformly distributed locking action on the sole 12 in the area receiving post 16.

The points 32 are six in number, in a washer 28 of the size and proportioning illustrated, although it will be appreciated that the number of the points is selected to afford an optimum locking action at the sole.

Outwardly of the nib formations or points 32, and just inwardly of the annular surface 31 of the washer, the latter is molded to provide four equally spaced further embedding formations 34, which are sharpened in a triangular cross section, and are of a height approximating that of the points 32. These formations 34, as illustrated in FIG. 2, are adapted to have progressive embedding action on the outer sole 12 as the cleat member 20 is tightened, force being transmitted thereto in a manner to be described.

The opposite or outer surface 35 of washer 28 is molded to provide a rounded periphery 36 (FIG. 2); and immediately adjacent the washer opening 29 it is provided with an annular shoulder, rib or rim formation 37. This provides an increased axial thickness of material in a zone surrounding opening 29 to rigidify the washer locally without detracting particularly from a desired degree of flexibility; and, as indicated above, the shoulder 37 is adapted to have rotative sliding and bearing engagement by certain types of cleat member 20 as the latter is inwardly screwed against the washer.

In radially outwardly spaced relation to the shoulder 37, the washer is provided with a circumferential series of spaced radial serrations 38, these being radially inward of the rounded periphery 36 of the washer. As the cleat member 20 is taken up, its annular peripheral face surface or land 21 has sliding engagement along the edges of the serrations to exert force urging the peripheral zone of the washer into engagement with the outer sole 12, with the embedding of the sharpened formations 34 in the sole.

The serrations 38 are in approximate axial register with the sharpened formations 34 on the opposite side of the annular washer, just as the inner series of points 32 registers axially with the rim 37; and it is seen that, with the cleat member taken up, the serrations 38 are frictionally engaged by the cleat member to directly force and embed the formations 34 in sole 12, and to prevent retrograde rotation and loosening of the cleat member in the normal usage to which the shoe is subject.

It is seen that the invention affords a special improved washer for cleated shoes of various types, which is inexpensive of production, does not dig or bite into the shoe sole over a large area so as to deform the latter, does not rust, and of itself provides the appropriate frictional action against the cleat member to hold the latter in place, once applied and tightened.

What I claim as my invention is:

A flexible plastic washer for mounting cleat members to a shoe sole, comprising an annulus of generally flat cross section adapted to surround a projecting sole post at the opening of the annulus, said annulus having sole embedding means on one side thereof in the form of a series of sharpened projecting formations immediately surrounding said opening, said formations tapering from said first named side in the direction toward the axis of said opening and in the direction of its circumference to provide points embeddably engageable in the sole about the sole post, said annulus having on the same side thereof a series of further circumferentially spaced sharpened formations located substantially radially outwardly of said first formations but still substantially within the outer periphery of the annulus, said annulus having an annular shoulder projecting from the other side thereof in approximate axial register with said first series of formations, and an annular series of radial serrations projecting from said other side in the approximate circumferential zone of said further formations.

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