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(54) **Article of footwear with forefoot secondary studs**

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Description

BACKGROUND

[0001] The present embodiments relate generally to an article of footwear, and in particular to an article of footwear with secondary studs on the perimeter of the forefoot region of the sole.

[0002] Various competitive athletic activities require players to make changes in directional movement quickly on a variety of playing surfaces. For example, the game of soccer requires players to make many directional changes in response to the position of a soccer ball on the playing field. In order to allow the player to quickly change directions while moving at high rates of speed, studs may be provided on the sole of athletic footwear. The studs may provide a sufficient amount of friction between the ground and the player's foot in order to provide the player with the stability needed to keep their balance while changing directions. In particular, studs may be located on the forefoot region of the sole of the shoe to provide the necessary friction.

[0003] The documents DE8511418U and US 2007/0079530 for instance disclose articles of footwear which are provided with wedge shaped studs extending from the side surfaces of the sole structure.

SUMMARY

[0004] An article of footwear is disclosed according to the subject-matter of independent claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The embodiments can be better understood with reference to the following drawings and description. The components in the figures are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the embodiments. Moreover, in the figures, like reference numerals designate corresponding parts throughout the different views.

FIG. 1 is a bottom view of one embodiment of an article of footwear;

FIG. 2 is an enlarged perspective view of an embodiment of a wedge-shaped stud in the forefoot region;

FIG. 3 is a perspective view of the embodiment of an article of footwear shown in FIG. 1;

FIG. 4 is a cross-section of the sole of the article of footwear shown in FIG. 1 taken along the line 4-4 in the midfoot region;

FIG. 5 is a cross-section of the sole of the article of footwear shown in FIG. 1 taken along the line 5-5 in the forefoot region;

FIG. 6 is a cross-section of the sole of the article of footwear shown in FIG. 1 taken along the line 6-6 in the forefoot region;

FIG. 7 is an enlarged bottom view of an embodiment

of the article of footwear in the forefoot region;

FIG. 8 is an enlarged view of an embodiment of wedge-shaped studs as the foot of a player is planted on the ground;

FIG. 9 is an enlarged view of an embodiment of wedge-shaped studs as the foot of a player is disengaging from the ground;

FIG. 10 is an isometric view of an embodiment of a bottom surface of a sole structure including a cleat system;

FIG. 11 is a bottom view of the sole structure of FIG. 10;

FIG. 12 is an isometric view of an embodiment of a sole structure including an enlarged view of a forefoot region;

FIG. 13 is an enlarged view of an embodiment of a forefoot region of a sole structure; and

FIG. 14 is an enlarged view of an embodiment of a heel region of a sole structure.

DETAILED DESCRIPTION

[0006] FIG. 1 illustrates a plan view of an embodiment of a sole structure 100, which may be incorporated into an article of footwear. For clarity, the following detailed description discusses an exemplary embodiment, in the form of a soccer shoe, but it should be noted that the present embodiment could take the form of a sole structure for any article of footwear including, but not limited to: hiking boots, soccer shoes, football shoes, sneakers, rugby shoes, basketball shoes, baseball shoes as well as other kinds of shoes. As shown in FIG. 1, sole structure 100 is intended to be used with a left foot; however, it should be understood that the following discussion may equally apply to a mirror image of sole structure 100 that is intended for use with a right foot.

[0007] For consistency and convenience, directional adjectives are employed throughout this detailed description corresponding to the illustrated embodiments. The term "longitudinal" or "longitudinally" as used throughout this detailed description and in the claims refers to a direction extending a length of a component. In some cases, the longitudinal axis is the axis extending through the longest dimension of a component. For example, the longitudinal axis of an elongated stud may be the direction extending through the longest portion of the elongated stud.

[0008] The term "medial plane of the body" as used throughout this detailed description and in the claims refers to the plane that divides the human body into a right and left side. The term "lateral" as used throughout this detailed description and in the claims refers to a region or direction extending away from the medial plane of the body. For example, the lateral side of the foot may refer to the side of the foot facing away from the center of the body. Similarly, the term "medial" as used throughout this detailed description and in the claims refers to a region or direction extending towards the medial plane of the

body. For example, the medial side of the foot may refer to the side of the foot facing towards the center of the body.

[0009] Furthermore, the term "vertical" or "central" as used throughout this detailed description and in the claims refers to a direction that is generally perpendicular to a direction that is parallel to the ground when the sole of the shoe is facing the ground. Furthermore, the term "vertical axis" or "central axis" as used throughout this detailed description and in the claims refers to a direction that extends generally away from the sole of the foot and towards the ground when the sole of the shoe is facing the ground. For example, in cases where a sole is planted flat on a ground surface, the vertical or central direction may extend from the sole towards the ground surface. In some embodiments, the term "vertical," "central," "vertical axis," and/or "central axis" may refer to a direction that is substantially parallel to the bottom surface of the sole. For example, in cases where the sole is not planted on a ground surface, the vertical or central direction may extend substantially perpendicular to the bottom surface of the sole. It will be understood that each of these directional adjectives may be applied to individual components of an article, such as an upper and/or a sole structure.

[0010] The studs discussed herein may vary in size in different dimensional directions. It should be understood that the terms "length" and "width" as used throughout this detailed description and in the claims refers to a direction generally associated with the longest and shortest dimensions, respectively, of an element in the plane parallel to the sole structure. It should also be understood that the term "height" as used throughout this detailed description and in the claims refers to a direction generally associated with the distance of an element as measured from the sole structure in the plane perpendicular to the sole structure. In some embodiments, the length and/or width of the studs may vary. Similarly, in some embodiments, the approximate heights of each stud may vary.

[0011] Additionally, it will be understood that while the current embodiments use elongated, rectangular and/or round cross-sectional shaped cleat or stud members, cleat or stud members may be formed in any of various shapes, including but not limited to hexagonal, cylindrical, conical, circular, square, rectangular, trapezoidal, diamond, ovoid, as well as other regular or irregular and geometric or non-geometric shapes.

[0012] Referring to FIG. 1, for purposes of reference, sole structure 100, or simply sole 100, may be divided into a forefoot region 10, midfoot region 13, and heel region 14. Forefoot region 10 may be generally associated with the toes and joints connecting the metatarsals with the phalanges. The forefoot region 10 may further include a front-tip region 12 associated with the front tip of the sole 100. Midfoot region 13 may be generally associated with the arch of a foot. Likewise, heel region 14 may be generally associated with the heel of a foot, in-

cluding the calcaneus bone.

[0013] In addition, sole 100 may include a medial edge 16 and lateral edge 18. In particular, medial edge 16 may refer to the edge of the sole 100 facing away from the center of the body. Similarly, the lateral edge 18 may refer to the region of the sole 100 that is facing towards the center of the body. Furthermore, both medial edge 16 and lateral edge 18 may extend through forefoot region 10, midfoot region 13, and heel region 14.

[0014] It will be understood that forefoot region 10, midfoot region 13, and heel region 14 are only intended for purposes of description and are not intended to demarcate precise regions of sole 100. Likewise, medial edge 16 and lateral edge 18 are intended to represent generally two portions or sides of the sole 100, rather than precisely demarcating the sole 100 into two halves. In addition, forefoot region 10, midfoot region 13, and heel region 14, as well as medial edge 16 and lateral edge 18, can also be applied to individual components of an article of footwear, such as a sole structure and/or an upper.

[0015] In some embodiments, sole 100 may be configured to provide traction for the wearer. In addition to providing traction, sole 100 may attenuate ground reaction forces when compressed between the foot and the ground during walking, running or other ambulatory activities. The configuration of sole 100 may vary significantly in different embodiments to include a variety of conventional or non-conventional structures. In some embodiments, sole 100 may include different components. For example, sole 100 may include an outsole, a midsole, and/or an insole. In some cases, one or more of these components may be optional.

[0016] In some cases, sole 100 may be configured according to one or more types of ground surfaces on which sole 100 may be used. Examples of ground surfaces include, but are not limited to: natural turf, synthetic turf, dirt, natural grass, soft natural grass, as well as other surfaces. In some embodiments, sole 100 may be provided with one or more cleat or stud systems comprising a plurality of cleat members. The term "cleat members" or "stud members" as used in this detailed description and throughout the claims includes any provisions disposed on a sole for increasing traction through friction or penetration of a ground surface. Typically, cleat systems, stud systems, cleat members and/or stud members may be configured for football, soccer, baseball or any type of activity that requires traction.

[0017] Sole 100 may include one or more cleat or stud systems comprising a plurality of cleat or stud members that extend away from the surface of the sole 100. Generally, cleat or stud systems and/or cleat or stud members may be associated with sole 100 in any manner. In some embodiments, cleat or stud systems and/or cleat or stud members may be integrally formed with sole 100. In other embodiments, sole 100 may include a partially rigid plate that extends across a substantial majority of a lower surface of sole 100. In some cases, cleats or stud systems

and/or cleat or stud members may be attached to a partially rigid plate, such as by being screwed into holes within the plate or using any other provisions. Still further, in some cases, some cleat or stud systems and/or cleat or stud members may be integrally formed with sole 100.

[0018] An article of footwear including cleat or stud systems and/or cleat or stud members can include provisions for maximizing traction between a sole and multiple types of ground surfaces. In some embodiments, a sole 100 can include cleat or stud systems and/or cleat or stud members disposed in different locations to achieve maximum traction on multiple types of surfaces. In other embodiments, a sole 100 can include distinct types of cleat or stud systems and/or cleat or stud members that each maximize traction for a distinct type of surface.

[0019] In some embodiments, sole 100 may include cleat or stud members arranged as shown in FIG. 1 in the forefoot region 10 and midsole region 13. In other embodiments, the sole 100 may include cleat or stud members and/or cleat or stud systems arranged in any other kind of configuration.

[0020] FIG. 1 also shows cleat or stud members in the forefoot region 10 according to one embodiment. Referring to FIG. 1, the medial edge 16 of the forefoot region 10 of the sole may include a first wedge-shaped stud 30 and a second wedge-shaped stud 32 extending outwardly from the surface of the sole. Similarly, the lateral edge 18 of the forefoot region 10 of the sole may include a third wedge-shaped stud 34 and a fourth wedge-shaped stud 36. In some embodiments, first wedge-shaped stud 30, second wedge-shaped stud 32, third wedge-shaped stud 34, and fourth wedge-shaped stud 36 may be wedge-shaped. Also shown in FIG. 1 is fifth wedge-shaped stud 42 and a sixth wedge-shaped stud 44 associated with the front tip region 12 of the forefoot 10.

[0021] Although the studs along the perimeter of the forefoot region 10 shown in FIG. 1 are wedge-shaped, these studs may be in the form of other shapes. For example, the cross-section of the studs may form a trigon, or triangular shape. As further example, the cross-section of the studs may form a quadrilateral, or any other polygon.

[0022] FIG. 1 also shows a plurality of elongated studs in the forefoot region 10 of the sole located in an inward direction relative to the wedge-shaped studs. In some embodiments, "elongated studs" or "elongated cleats" may also be referred to as "blade studs" or "blade cleats." Referring to FIG. 1, the forefoot region 10 may include a first elongated stud 52 and second elongated stud 54 associated with the medial edge 16 of the sole. The first elongated stud 52 may be located inward of the first wedge-shaped stud 30, and second elongated stud 54 may be located inward of the second wedge-shaped stud 32. In some cases, the first elongated stud 52 and second elongated stud 54 may be elongated in a direction that

is substantially parallel to the medial edge 16 of the sole in the forefoot region 10.

[0023] The forefoot region 10 may also include a third elongated stud 56 and fourth elongated stud 58 associated with the lateral edge 18 of the sole. The third elongated stud 56 may be located inward of the third wedge-shaped stud 34 and fourth elongated stud 58 may be located inward of the fourth wedge-shaped stud 36. In some cases, the third elongated stud 56 and fourth elongated 58 may be elongated in a direction that is substantially parallel to the lateral edge 18 of the sole in the forefoot region 10.

[0024] In some embodiments, sole structure 100 can include a fifth elongated stud 62 that is disposed in the center of the sole structure 100 in the forefoot region 10. In some cases, the fifth elongated stud 62 may be elongated in a direction that is substantially transverse to the medial edge 16 and/or lateral edge 18 of the sole. In some embodiments, the fifth elongated stud 62 may generally provide increased friction between the player and the ground surface in order to improve the player's stability. In some embodiments, the fifth elongated stud 62 may also provide the player with enough friction to more quickly accelerate to an increased speed. In other embodiments, however, fifth elongated stud 62 may be optional.

[0025] FIG. 2 is an enlarged perspective view showing the dimensions of one embodiment of a second wedge-shaped stud 32 on sole 100. As can be seen in FIG. 2, second wedge-shaped stud 32 may be approximately wedge-shaped. In other words, the length L of second wedge-shaped stud 32 may be larger than its height H and its width W. Similarly, the width W of second wedge-shaped stud 32 may be smaller than both its height H and its length L. In some embodiments, these proportional dimensions may also be similar for the first wedge-shaped stud 30, third wedge-shaped stud 34, fourth wedge-shaped stud 36 and/or any other wedge-shaped stud located on the sole 100. In some embodiments, these proportional dimensions may also be similar for the fifth wedge-shaped stud 42 and sixth wedge-shaped stud 44 in the front tip 12 of the forefoot region 10 of the sole 100.

[0026] FIG. 3 is an enlarged perspective view of the embodiment of the forefoot region 10 shown in FIG. 1. FIG. 3 shows one embodiment of the placement of studs on a curved bottom surface of the forefoot 10 of the sole 100. Referring to FIG. 3, the forefoot 10 of the sole 100 may include a bottom surface region 38 that is designed to be facing the ground when worn on a foot. The sole may have a transition region 39 along the outer perimeter of the forefoot region 10 where the sole 100 of the foot begins to curve upwards from the ground. The sole 100 may have a side region 40 outward of the transition region 39. The side region 40 is designed to be substantially perpendicular to the ground when worn on the foot. In other words, the side region 40 is designed to be substantially perpendicular to the bottom surface region 38.

[0027] In some embodiments, a sole structure 100 can include provisions for facilitating pulling ground engaging studs out of the ground as a player makes lateral and/or medial cuts on the playing field. This may enable a player to make lateral and/or medial cuts more easily and more quickly. In some embodiments, a sole structure 100 may include studs that are primarily configured for ground engagement. In some embodiments, the sole structure 100 may include studs that provide leverage for helping to pull or remove the ground engaging studs from the ground while making lateral and/or medial cuts. In some embodiments, the studs that provide leverage may be disposed on a side of the sole surface, e.g., outside of a peripheral edge, which is discussed in more detail below.

[0028] As can be seen in the FIG. 3, the first elongated stud 52, second elongated stud 54, third elongated stud 58, fourth elongated stud 56 and fifth elongated stud 62 may be located in the bottom surface region 38. Since these studs are positioned on the bottom surface region 38 of the sole 100, the primary purpose of the first elongated stud 52, second elongated stud 54, third elongated stud 56, fourth elongated stud 58 and fifth elongated stud 62 may be to engage the ground in order to provide friction between the player and the ground. However, these studs may also serve various other purposes, such as to anchor a foot into the ground. In other embodiments, these studs can provide other functions for sole 100.

[0029] In some embodiments, fifth wedge-shaped stud 42 and a sixth wedge-shaped stud 44 associated with the front tip region 12 of the forefoot 10 may also be located in the bottom surface region 38. However, in some embodiments, fifth wedge-shaped stud 42 and a sixth wedge-shaped stud 44 may be located in the side region 40 of the sole 100. In some embodiments, as shown in FIG. 3, the first wedge-shaped stud 30 and second wedge-shaped stud 32 may be located in the side region 40 of the forefoot 10. Similarly, the third wedge-shaped stud 34 and fourth wedge-shaped stud 36 may be located in the side region 40 of the forefoot 10. However, in some embodiments the first wedge-shaped stud 30, second wedge-shaped stud 32, third wedge-shaped stud 34 and fourth wedge-shaped stud 36 may be located in the transition region 39 or in the bottom surface region 38 of the forefoot 10.

[0030] FIG. 4 shows a cross-section of the sole 100 shown in FIG. 1 along line 4-4 in the midfoot region 13. FIG. 4 shows a more detailed view of the bottom surface region 38, transition region 39, and side region 40. The sole 100 in FIG. 4 is shown facing the ground 25 as when worn by a player or user. The "outer medial peripheral edge" 20 as used throughout the specification and claims may be defined as the outermost medial surface along the medial side 16 of the sole 100. In some embodiments, the outer medial peripheral edge 20 may be defined by the medial surface of the sole 100 that passes through the outermost plane 21 that forms a right angle with the ground 25, when bottom surface region 38 is facing the ground 25. In some embodiments, the outermost plane

21 will extend in a vertical direction from the sole 100. In some embodiments, the outermost plane 21 will extend in a direction that is substantially perpendicular to the bottom surface region 38 of the sole 100. The outer medial peripheral edge 20 in FIG. 4 may extend the entire medial side of the sole 100, from the forefoot region 10 through the heel region 14 (see FIG. 1). Generally, the outer medial peripheral edge 20 is located in the side region 40 of the sole 100. However, the outer medial peripheral edge 20 may also be located in the transition region 39 of the sole 100.

[0031] Similarly, the "outer lateral peripheral edge" 22 as used throughout the specification and claims may be defined by the outermost lateral surface along the lateral side 18 of the sole 100. In some embodiments, the outer lateral peripheral edge 22 may be defined by the lateral surface of the sole 100 that passes through the outermost plane 23 that forms a right angle with the ground 25, when the bottom surface region 38 is facing the ground 25. In some embodiments, the outermost plane 23 will extend in a vertical direction from the sole 100. In some embodiments, the outermost plane 23 will extend in a direction that is substantially perpendicular to the bottom surface region 38 of the sole 100. The outer lateral peripheral edge 22 in FIG. 4 may extend the entire lateral side of the sole 100, from the forefoot region 10 through the heel region (not shown in FIG. 4). Generally, the outer lateral peripheral edge 22 is located in the side region 40 of the sole 100. However, the outer lateral peripheral edge 22 may also be located in the transition region 39 of the sole 100.

[0032] In some embodiments, different regions of the sole may have studs located within the outer lateral peripheral edge 22 and/or the outer medial peripheral edge 20 of the sole 100. For example, in some embodiments, the forefoot region 10 may include studs located within the outer lateral peripheral edge 22 and/or the outer medial peripheral edge of the forefoot region 10 of the sole 100. In some embodiments, studs may be located within the outer lateral peripheral edge 22 and/or the outer medial peripheral edge 20 of the heel region 14 of the sole 100. In some embodiments, studs may be located within the outer lateral peripheral edge 22 and/or the outer medial peripheral edge 20 of the midfoot region 13 of the sole 100. In some embodiments, studs may be located within the outer lateral peripheral edge 22 and/or the outer medial peripheral edge 20 of any combination of the forefoot region 10, midfoot region 13 or heel region 14 of the sole 100. In other embodiments, studs may be located within the outer lateral peripheral edge 22 and/or the outer medial peripheral edge 20 in areas other than the forefoot region 10, midfoot region 13 and heel region 14 of the sole 100. In still other embodiments, different regions of the sole 100 may have no studs located within the outer lateral peripheral edge 22 and/or outer medial peripheral edge 20.

[0033] In some embodiments, as shown in FIG. 4, the midfoot region 13 may have no studs located along the

outer lateral peripheral edge 22 or outer medial peripheral edge 20. However, some embodiments may include studs along the outer lateral peripheral edge 22 and/or outer medial peripheral edge 20. In some embodiments, the midfoot region 13 may include a first midfoot elongated stud 64 and second midfoot elongated stud 66 located on the bottom surface region 38 of the sole 100, which inside the transition region 39. However, in some embodiments the midfoot region 13 may have no elongated studs located on the bottom surface region 38 inside the transition region 39 of the sole 100.

[0034] FIG. 5 shows a cross-section of the sole 100 shown in FIG. 1 along line 5-5 in the forefoot region 10. FIG. 5 shows a more detailed view of the positioning of the second wedge-shaped stud 32 and the fourth wedge-shaped stud 36 on the surface of the sole 100. The sole 100 shown in FIG. 5 has an outer medial peripheral edge 20 that extends the entire medial side 16 of the sole 100, including the forefoot region 10. As shown in FIG. 5, the second wedge-shaped stud 32 may be located in the side region 40 of the sole 100 of the forefoot 10. The second wedge-shaped stud 32 may extend beyond the outer medial peripheral edge 20, and/or outer medial plane 21, as shown in FIG. 5.

[0035] In some embodiments, the second wedge-shaped stud 32 may include an angled surface 433 and a downward facing surface 432. In some embodiments, both the angled surface 433 and the downward facing surface 432 extend beyond the outer medial peripheral edge 20, and/or outer medial plane 21. In some embodiments, the downward facing surface 432 may extend substantially parallel to the ground 25, when bottom surface region 38 is parallel with ground 25. In some embodiments, the downward facing surface 432 may extend substantially parallel with the bottom surface region 38 of the sole 100. In some embodiments, the bottom surface region 38 may be curved or rounded, in which case the downward facing surface 432 may be substantially parallel to the flattest portion (e.g., near the center) of bottom surface region 38. However, in some embodiments, the downward facing surface 432 may extend at some angle relative to the ground 25 and/or bottom surface region 38 of the sole 100.

[0036] Similarly, the sole 100 shown in FIG. 5 has an outer lateral peripheral edge 22 that extends the entire lateral side 18 of the sole 100, including the forefoot region 10. As shown in FIG. 5, the fourth wedge-shaped stud 36 may be located in the side region 40 of the sole 100 of the forefoot 10. The fourth wedge-shaped stud 36 may extend beyond the outer lateral peripheral edge 22, and/or outer lateral plane 23, as shown in FIG. 5.

[0037] In some embodiments, the fourth wedge-shaped stud 36 may include an angled surface 437 and a downward facing surface 436. In some embodiments, both the angled surface 437 and the downward facing surface 436 extend beyond the outer lateral peripheral edge 22, and/or outer lateral plane 23. In some embodiments, the downward facing surface 436 may extend

substantially parallel to the ground 25, when bottom surface region 38 is parallel with ground 25. In some embodiments, the downward facing surface 436 may extend substantially parallel with the bottom surface region 38 of the sole 100. In some embodiments, the bottom surface region 38 may be curved or rounded, in which case the downward facing surface 436 may be substantially parallel to the flattest portion (e.g., near the center) of bottom surface region 38. However, in some embodiments, the downward facing surface 436 may extend at some angle relative to the ground 25 and/or bottom surface region 38 of the sole 100.

[0038] FIG. 6 shows a cross-section of the sole 100 shown in FIG. 1 along line 6-6 in the forefoot region 10. FIG. 6 shows a more detailed view of the positioning of the third wedge-shaped stud 34 and the first wedge-shaped stud 30 on the surface of the sole 100. The sole 100 shown in FIG. 6 has an outer medial peripheral edge 20 that extends the entire medial side 16 of the sole 100, including the forefoot region 10. As shown in FIG. 6, the first wedge-shaped stud 30 may be located in the side region 40 of the sole 100 of the forefoot 10. The first wedge-shaped stud 30 may extend beyond the outer medial peripheral edge 20, and/or outer medial plane 21, as shown in FIG. 6.

[0039] In some embodiments, the first wedge-shaped stud 30 may include an angled surface 532 and a downward facing surface 530. In some embodiments, both the angled surface 532 and the downward facing surface 530 extend beyond the outer lateral peripheral edge 20, and/or outer lateral plane 21. In some embodiments, the downward facing surface 530 may extend substantially parallel to the ground 25, when bottom surface region 38 is parallel with ground 25. In some embodiments, the downward facing surface 530 may extend substantially parallel with the bottom surface region 38 of the sole 100. In some embodiments, the bottom surface region 38 may be curved or rounded, in which case the downward facing surface 530 may be substantially parallel to the flattest portion (e.g., near the center) of bottom surface region 38. However, in some embodiments, the downward facing surface 530 may extend at some angle relative to the ground 25 and/or bottom surface region 38 of the sole 100.

[0040] Similarly, the sole 100 shown in FIG. 6 has an outer lateral peripheral edge 22 that extends the entire lateral side 18 of the sole 100, including the forefoot region 10. As shown in FIG. 6, the third wedge-shaped stud 34 may be located in the side region 40 of the sole 100 of the forefoot 10. The third wedge-shaped stud 34 may extend beyond the outer lateral peripheral edge 22, and/or outer lateral plane 23, as shown in FIG. 6.

[0041] In some embodiments, the third wedge-shaped stud 34 may include an angled surface 536 and a downward facing surface 534. In some embodiments, both the angled surface 536 and the downward facing surface 534 extend beyond the outer lateral peripheral edge 22, and/or outer lateral plane 23. In some embodiments, the

downward facing surface 534 may extend substantially parallel to the ground 25, when bottom surface region 38 is parallel with ground 25. In some embodiments, the downward facing surface 534 may extend substantially parallel with the bottom surface region 38 of the sole 100. In some embodiments, the bottom surface region 38 may be curved or rounded, in which case the downward facing surface 534 may be substantially parallel to the flattest portion (e.g., near the center) of bottom surface region 38. However, in some embodiments, the downward facing surface 534 may extend at some angle relative to the ground 25 and/or bottom surface region 38 of the sole 100.

[0042] The configuration of the first wedge-shaped stud 30, second wedge-shaped stud 32, third wedge-shaped stud 34 and fourth wedge-shaped stud 36 provides leverage on the outer side region 40 of the sole 100. By providing leverage in the outer side region 40 of the sole, the player is able to more easily pull the elongated cleats located on the bottom surface region 38 of the sole out of the ground. This allows the player to make lateral and/or medial cuts more easily and more quickly.

[0043] FIG. 7 is an enlarged bottom view of the embodiment of the forefoot region 10 shown in FIGS. 1 and 3. As can be seen in FIG. 7, the wedge-shaped studs along the edge of the forefoot region 10 may extend beyond the perimeter of the sole 100. Referring to FIG. 7, the forefoot region 10 may include a medial peripheral edge 20 and a lateral peripheral edge 22. The first wedge-shaped stud 30 and second wedge-shaped stud 32 may extend beyond the outer medial peripheral edge 20 of the medial edge 16 of the sole 100. Similarly, the third wedge-shaped stud 34 and fourth wedge-shaped stud 36 may extend beyond the outer lateral peripheral edge 22 of the sole 100.

[0044] As can be seen in FIG. 7, the orientation of the wedge-shaped studs in the forefoot region 10 may extend beyond the outer medial peripheral edge 20 and/or outer lateral peripheral edge 22 of the sole 100. FIG. 7 also shows one embodiment of orienting the elongated cleats in the forefoot region 10.

[0045] FIG. 7 also shows a fifth wedge-shaped stud 42 and a sixth wedge-shaped stud 44 in the front tip 12 region of the sole 100. Although FIG. 7 shows only two studs in the front tip 12 of the forefoot region 10 of the sole 100, other embodiments may include more or less studs. In some embodiments, the fifth wedge-shaped stud 42 may extend beyond the outer medial peripheral edge 20 of the lateral side 16 of the forefoot 10 of the sole 100. In other embodiments, the fifth wedge-shaped stud 42 may not extend beyond the outer medial peripheral edge 20 of the forefoot 10 of the sole 100. In some embodiments, the sixth wedge-shaped stud 44 may extend beyond the outer lateral peripheral edge 22 of the forefoot 10 of the sole 100. In other embodiments, the sixth wedge-shaped stud 44 may not extend beyond the outer lateral peripheral edge 22 of the forefoot 10 of the sole 100.

[0046] In some embodiments, as shown in FIG. 7, a first elongated stud 52, second elongated stud 54, third elongated stud 56 and fourth elongated stud 58 may extend from the bottom surface 60 of the forefoot 10 of the sole 100. As can be seen in FIG. 7, longitudinal axis A of first elongated stud 52 may be substantially parallel to the adjacent outer medial peripheral edge 20 of the medial side 16 of the forefoot 10 of the sole 100. Similarly, longitudinal axis B of the second elongated stud 54 may be substantially parallel to the adjacent outer medial peripheral edge 20 of the medial side 16 of the forefoot 10 of the sole 100.

[0047] Additionally, the longitudinal axis C of the third elongated stud 56 may be substantially parallel to the adjacent outer lateral peripheral edge 22 of the lateral side 18 of the forefoot 10 of the sole 100. Similarly, the longitudinal axis D of the fourth elongated stud 58 may be substantially parallel to the adjacent outer lateral peripheral edge 22 of the lateral side 18 of the forefoot 10 of the sole 100.

[0048] In one embodiment, as shown in FIG. 7, a fifth elongated stud 62 may extend from the bottom surface 60 of the forefoot region 10 of sole 100. The fifth elongated stud 62 may be located near the center of the forefoot region 10 of the sole 100. The fifth elongated stud 62 may have a longitudinal axis E that runs substantially transverse to the other elongated studs in the forefoot region 10. In other words, the longitudinal axis E of the fifth elongated stud 62 may be oriented substantially perpendicular to the axis of elongation of the first elongated stud 52, second elongated stud 54, third elongated stud 56 and/or fourth elongated stud 58. In some embodiments, the fifth elongated stud 62 may have a longitudinal axis E that runs substantially transverse to the outer medial peripheral edge 20 and/or outer lateral peripheral edge 22 of the forefoot 10 of the sole 100.

[0049] FIGS. 8-9 illustrate how the wedge-shaped studs provide additional leverage in order to disengage the elongated studs on the bottom surface of the sole. Referring to FIG. 8, the player's foot may be planted on the ground with at least a lateral elongated stud 830 and a medial elongated stud 820 inserted into the playing surface 805. The sole 800 may include at least a lateral wedge-shaped stud 815 and a medial wedge-shaped stud 810, which is not engaged in the ground 805.

[0050] In FIG. 9, the player is attempting to make a lateral cut, causing the sole 800 to tilt to the lateral side. As the sole 800 tilts to the lateral side, the lateral wedge-shaped stud 815 engages with the ground 805 providing sufficient leverage to remove medial elongated stud 820 from the ground 805. The lateral wedge-shaped stud 815 also provides leverage in order to eventually remove lateral elongated stud 830 from the ground 805 in order to complete the player's lateral cut. Although FIGS. 8-9 illustrate a lateral cut, wedge-shaped studs may also provide leverage for medial cuts.

[0051] FIGS. 10 through 14 illustrate an alternative embodiment of a sole structure 1000. Referring now to FIGS.

10 and 11, sole 1000 can be divided into forefoot region 1010, midfoot region 1012 and heel region 1014. Additionally, sole 1000 can be divided into medial side 1016 and lateral side 1018.

[0052] Sole 1000 could be substantially similar to sole 100 of the embodiments disclosed above with reference to FIGS. 1 through 9. In particular, sole 1000 may include one or more cleat or stud systems comprising a plurality of cleat or stud members that extend away from the surface of the sole 1000. Generally, cleat or stud members may be associated with sole 1000 in any manner. In some embodiments, cleat or stud members may be integrally formed with sole 1000. In other embodiments, sole 1000 may include a partially rigid plate that extends across a substantial majority of a lower surface of sole 1000. In some cases, cleat or stud members may be attached to a partially rigid plate, such as by being screwed into holes within the plate or using any other provisions. Still further, in some cases, some cleat or stud members may be integrally formed with sole 1000. In still other cases, cleat or stud members may be attached to and/or integrally formed with a partially rigid plate.

[0053] As with the previous embodiments, sole 1000 may include a cleat system 1001 that comprises one or more types of cleats. In some cases, sole 1000 may include one or more elongated studs. In one embodiment, sole 1000 includes plurality of elongated studs 1050. Plurality of elongated studs 1050 can include studs arranged in a substantially similar configuration to the studs of the previous embodiments. For example, one possible configuration includes first set of elongated studs 1060 that comprises stud 1062, stud 1064, stud 1066, stud 1068, stud 1070 and stud 1072. First set of studs 1060 generally extend around lower periphery 1071 of forefoot region 1010. Additionally, second set of elongated studs 1080, including stud 1082, stud 1084, stud 1086 and stud 1088 may be arranged in forefoot region 1010 as well. In some cases, second set of studs 1080 may be arranged in a generally lateral direction on sole 1000.

[0054] In some embodiments, plurality of elongated studs 1050 can further include third set of elongated studs 1090, comprising stud 1092, stud 1094, stud 1096 and stud 1098. Third set of studs 1090 may include studs that are arranged around lower periphery 1073 of heel portion 1014.

[0055] Although the arrangement of elongated studs 1050 on sole 1000 may be similar to the arrangement of elongated studs of the previous embodiments, it will be understood that in still other embodiments any other arrangement of elongated studs on a sole structure could be used. Furthermore, the specific number of studs, as well as their size, geometry, orientation and relative spacing, could be varied according to the desired traction properties for sole 1000.

[0056] As shown in FIG. 12, some embodiments can include elongated studs with provisions for enhancing traction, especially on hard surfaces. In some embodiments, at least some of plurality of elongated studs 1050

can include traction elements 1200 that facilitate enhanced traction under various conditions. As one example, stud 1068 and stud 1070 include first group of traction elements 1202 and second group of traction elements 1204, respectively. First group of traction elements 1202 comprises first traction element 1210, second traction element 1212 and third traction element 1214 that are disposed on tip portion 1220 of stud 1068. In some cases, traction element 1210, traction element 1212 and traction element 1214 all comprise approximately triangular traction elements arranged in an alternating configuration on tip portion 1220. In particular, traction elements 1202 may be separated by spaces 1240. In some cases, second set of traction elements 1204 are similarly arranged on tip portion 1222 of stud 1070.

[0057] Although the current embodiment illustrates triangular shapes for traction elements, in other embodiments the geometry of one or more traction elements could vary. Examples of shapes for traction elements include, but are not limited to: rounded shapes, square shapes, rectangular shapes, triangular shapes, polygonal shapes, regular shapes, irregular shapes as well as any other kinds of shapes. Likewise, the relative height of each traction element could vary from one embodiment to another. Furthermore, the relative spacing between traction elements could vary.

[0058] This arrangement of traction elements on the tips of one or more elongated studs may help enhance traction on hard surfaces, especially in wet conditions. In some cases, when a user is moving across a wet surface, water could be channeled through spaces 1240 to improve the friction between the elongated studs and the surface.

[0059] In different embodiments, traction elements could be optional. For example, in one embodiment, traction elements 1200 may be absent from plurality of elongated studs 1050. In other cases, some of plurality of elongated studs 1050 could include traction elements while others may not include traction elements. Moreover, in some embodiments where no traction elements are present, the tips of plurality of elongated studs 1050 could be configured as substantially smooth. In still other embodiments where no traction elements are present, the tips of plurality of elongated studs 1050 could be substantially textured.

[0060] Sole 1000 can include provisions for enhancing stability at the forefoot and/or heel regions. In some cases, sole 1000 may include one or more peripheral studs that help prevent elongated studs from digging too deeply into a ground surface. In one embodiment, sole 1000 can include peripheral studs that are arranged to improve stability while minimizing interference of the peripheral studs with the motion of a user.

[0061] Referring now to FIGS. 10 and 11, sole 1000 may include one or more peripheral studs. In some cases, sole 1000 includes plurality of peripheral studs 1100. Plurality of peripheral studs 1100 may comprise at least one stud that extends outwardly from a peripheral side region

1030 of sole 1000. Peripheral side region 1030 may be a region of sole 1000 that extends between bottom surface 1003 of sole 1000 and a top surface (not shown) that is disposed opposite of bottom surface 1003. For example, in one embodiment, plurality of peripheral studs 1100 includes forefoot peripheral studs 1106. In contrast to the embodiments described above with reference to FIGS. 1 through 9, the current embodiments may also incorporate one or more peripheral studs at the heel of sole 1000, in order to enhance stability and prevent elongated studs at the heel from penetrating too deeply into a ground surface. In some cases, plurality of peripheral studs 1100 may also include heel peripheral studs 1108.

[0062] Referring to FIG. 11, forefoot peripheral studs 1106 may include peripheral stud 1110 and peripheral stud 1112 that are disposed on lateral side 1018 of peripheral side region 1030. In addition, forefoot peripheral studs 1106 includes peripheral stud 1114, peripheral stud 1116 and peripheral stud 1118, referred to collectively as group of peripheral studs 1119. Group of peripheral studs 1119 may be disposed on medial side 1116 of peripheral side region 1030. In some cases, peripheral studs 1119 may be disposed on toe portion 1011 of sole 1000. In addition, in some cases, forefoot peripheral studs 1106 may include peripheral stud 1117, which is also disposed on medial side 1116.

[0063] Heel peripheral studs 1108 can include peripheral stud 1122, peripheral stud 1124 and peripheral stud 1126 that are disposed on rear peripheral region 1032 of sole 1000. In some cases, heel peripheral studs 1108 can be further associate with stud 1130. Stud 1130 may be disposed inwardly of peripheral stud 1122, peripheral stud 1124 and peripheral stud 1126.

[0064] Referring now to FIGS. 13 and 14, the geometry of one or more peripheral studs could vary. As previously discussed, some peripheral studs could have a wedge-like shape. In other cases, however, peripheral studs could have any other shapes including, but not limited to: various types of prism shapes, cuboid shapes, conical shapes, rounded shapes, regular shapes, irregular shapes as well as any other shapes including shapes comprising convex and/or concave portions.

[0065] In one embodiment, the generally wedge-like shape of peripheral studs 1100 provides an approximately flat downwardly facing surface that is configured to engage a ground surface and resist penetration of the ground surface at the contact point. For example, peripheral stud 1110 presents surface 1160, which is approximately parallel with lower surface 1080 of sole 1000. Each of the remaining peripheral studs 1100 could also include similar downwardly facing surfaces that confront a ground surface during use and help improve stability.

[0066] In some embodiments, one or more peripheral studs could be configured as teeth-like projections that extend down from a peripheral side region of an outsole. In particular, rather than having a generally flat downwardly facing lower surface, the peripheral studs could be configured with rounded lower edges that can contact

a ground surface.

[0067] Generally, the sizes of one or more peripheral studs could vary. In some cases, the size of a peripheral stud could vary according to its location on sole 1000. For example, in one embodiment, peripheral stud 1110 and peripheral stud 1112, which are disposed on lateral side 1018, may be substantially larger than studs of group of peripheral studs 1119, which are disposed on medial side 1016. For example, peripheral stud 1110 and peripheral stud 1112 may have an approximate length L1 while peripheral stud 1114, peripheral stud 1116 and peripheral stud 1118 may have an approximate length L2. In some cases, length L1 is substantially greater than length L2. In other cases, length L1 could be substantially less than length L2. In still other cases, length L1 could be approximately equal to length L2. Additionally, in some cases, peripheral stud 1110 and peripheral stud 1112 may have an approximate width W1 while peripheral stud 1114, peripheral stud 1116 and peripheral stud 1118 may have an approximate width W2. In some cases, width W1 is substantially greater than width W2. In other cases, width W1 could be substantially less than width W2. In still other cases, width W1 could be approximately equal to width W2. Additionally, in some cases, peripheral stud 1110 and peripheral stud 1112 may have an approximate height H1 while peripheral stud 1114, peripheral stud 1116 and peripheral stud 1118 may have an approximate height H2. In some cases, height H1 is substantially greater than height H2. In other cases, height H1 could be substantially less than height H2. In still other cases, Height H1 could be approximately equal to height H2.

[0068] With this arrangement, sole 1000 enhances stability for lateral cuts while minimizing the interference of peripheral studs as a user pushes off from the medial and/or toe of sole 1000. In particular, in some cases, peripheral stud 1110 and peripheral stud 1112 are sized to provide sufficient engagement with a ground surface during lateral cuts or similar maneuvers where the lateral edge of sole 1000 tilts towards a ground surface. However, in situations where a user launches from his or her toes and/or from the medial side, group of peripheral studs 1119 are sized to provide some engagement with a ground surface, but not a degree of engagement that might interfere with a user from rolling forward off the front medial side of the foot.

[0069] In some cases, group of peripheral studs 1108 may also be sized to provide some stability while minimizing interference with the desired motion of the user. For example, peripheral stud 1122, peripheral stud 1124 and peripheral stud 1126 may be relatively small peripheral studs that are configured to provide some ground engagement. In particular, in some cases, the sizes of peripheral studs 1108 are large enough so that some ground engagement occurs in situations where a user leans back on his or her heel, but not so large that peripheral studs 1108 significantly engage with the ground during running motions or other typical movements of the

foot.

[0070] Different embodiments could use different methods for forming peripheral studs. For example, some embodiments may include provisions for forming peripheral studs during a molding process. In particular, in some cases, peripheral studs could be molded studs that are integrally formed with a portion of an outsole at the time of manufacturing.

Claims

1. An article of footwear, comprising:

a sole structure (100; 1000) having a forefoot region (10; 1010) and heel region (14; 1014), wherein the sole structure includes a bottom surface (38; 1003), a medial side and a lateral side, wherein an outermost surface of the medial side forms an outer medial peripheral edge (20), wherein an outermost surface of the lateral side forms an outer lateral peripheral edge (22);

a first wedge-shaped stud (30; 1118) having a height and a length extending from the medial side of the forefoot region (10; 1010) of the sole structure (100; 1000), wherein the first wedge-shaped stud (30; 1118) extends beyond the outer medial peripheral edge (20) of the forefoot region (10; 1010) of the sole structure (100; 1000); and

a second wedge-shaped stud (34; 1110) having a height and a length extending from the lateral side of the forefoot region (10; 1010) of the sole structure (100; 1000), wherein the second wedge-shaped stud (34; 1110) extends beyond the outer lateral peripheral edge (22) of the forefoot region (10; 1010) of the sole structure (100; 1000),

wherein

the height of the first wedge-shaped stud (30; 1118) is less than the length, and the height of the second wedge-shaped stud (34; 1110) is less than the length, and **characterized in that:** the article of footwear further comprises

a first plurality of elongated studs (52, 54; 1064, 1066) extending from the bottom surface (38; 1003) of the sole structure (100; 1000) adjacent to the medial side surface in the forefoot region (10; 1010), wherein a longitudinal axis of each of the elongated studs (52, 54; 1064, 1066) runs in substantially the same direction as the medial side surface; and

a second plurality of elongated studs (56, 58; 1068, 1070) extending from the bottom surface (38; 1003) of the sole structure (100; 1000) adjacent to the lateral side surface in the forefoot region (10; 1010), wherein a longitudinal axis of each of the elongated studs (56, 58; 1068, 1070)

runs in substantially the same direction as the lateral side surface.

2. An article of footwear according to claim 1, wherein the medial side of the sole structure (100; 1000) includes a medial side surface that is substantially perpendicular to the bottom surface (38; 1003), and the lateral side of the sole structure (100; 1000) includes a lateral side surface that is substantially perpendicular to the bottom surface (38; 1003), wherein the outermost surface of the medial side surface forms the outer medial peripheral edge (20), and the outermost surface of the lateral side surface forms the outer lateral peripheral edge (22);

wherein the article of footwear further comprises:

a first plurality of wedge-shaped studs (30, 32; 1117, 1118) which includes the first wedge-shaped stud (30; 1117) and extends from the medial side surface of the forefoot region (10; 1010) of the sole structure (100; 1000), wherein the first plurality of wedge-shaped studs (30, 32; 1117, 1118) extends beyond the outer medial peripheral edge (20) of the forefoot region (10; 1010) of the sole structure (100; 1000), wherein at least one surface (432; 530) of the each stud in the first plurality of wedge-shaped studs (30, 32; 1117, 1118) extends substantially parallel to the bottom surface (38) of the sole structure (100; 1000); and

a second plurality of wedge-shaped studs (34, 36; 1110, 1112) which includes the second wedge-shaped stud (34; 1110) and extends from the lateral side surface of the forefoot region (10; 1010) of the sole structure (100; 1000), wherein the second plurality of wedge-shaped studs extends beyond the outer lateral peripheral edge (22) of the forefoot region (10; 1010) of the sole structure (100; 1000), wherein at least one surface (436; 534) of the each stud in the second plurality of wedge-shaped studs (34, 36; 1110, 1112) extends substantially parallel to the bottom surface (38; 1003) of the sole structure (100; 1000).

3. The article of footwear according to one of claims 1 or 2, further comprising:

an elongated stud (62; 1082) extending from the bottom surface (38) of the sole structure (100; 1000) in the forefoot region (10; 1010), wherein the longitudinal axis of the elongated stud (62; 1082) extends substantially from the medial side of the forefoot to the lateral side surface of the forefoot.

4. The article of footwear according to one of claims 1 to 3, further comprising:

a third wedge-shaped stud (42, 44; 1112, 1114) extending from a front tip portion (12; 1011) of the fore-

foot region (10; 1010) of the sole structure (100; 1000).

5. The article of footwear according to claim 4, wherein the first wedge-shaped stud (30; 1117), second wedge-shaped stud (34; 1110) and third wedge-shaped stud (42, 44; 1112, 1114) are molded onto the sole structure (100; 1000). 5
6. The article of footwear according to one of claims 4 and 5, wherein the third wedge-shaped stud (42, 44) does not extend beyond the outer peripheral edge of the forefoot of the sole. 10
7. The article of footwear according to any one of claims 1 to 3, further comprising: 15
 . a third plurality of wedge-shaped studs (42, 44; 1112-1118) extending from a front tip portion (12; 1011) of the forefoot region (10; 1010) of the sole structure (100; 1000). 20
8. The article of footwear according to claim 7, wherein the third plurality of wedge-shaped studs (42, 44; 1112-1118) do not extend beyond the outer medial peripheral edge (20) or the outer lateral peripheral edge (22) of the forefoot region (10; 1010) of the sole structure (100; 1000). 25
9. The article of footwear according to one of claims 7 and 8, wherein the first plurality of wedge-shaped studs (30, 32; 1117, 1118) and the second plurality of wedge-shaped studs (34, 36; 1110, 1112) are molded onto the surface of the sole structure (100; 1000). 30
10. The article of footwear according to claim 1, wherein the medial side of the sole structure (1000) and the lateral side of the sole structure (1000) include a peripheral side region (1030) extending between the bottom surface (1003) of the sole structure (1000) and a top surface of the sole structure (1000); and wherein the first wedge-shaped stud (1118) which extends from the medial side of the peripheral side region (1030) has a first size with a first length (L2), a first width (W2) and a first height (H2) and the second wedge-shaped stud (1112) which extends from the lateral side of the peripheral side region (1030) has a second size with a second length (L1), a second width (W1) and a second height (H1), wherein the second size is greater than the first size (22) with the second length (L1) being greater than the first length (L2) and/or the second width (W1) being greater than the first width (W2) and/or the second height (H1) being greater than the first height (H2). 40 45 50 55
11. The article of footwear according to claim 10, wherein the first wedge-shaped stud (1118) and the second

wedge-shaped stud (1112) are integrally formed with the sole structure (1000).

12. The article of footwear according to one of claims 10 and 11, wherein the first wedge-shaped stud (1118) is disposed in a toe region (1220) of the sole structure (1000).

10 Patentansprüche

1. Fußbekleidungsgegenstand, welcher aufweist:

eine Sohlenstruktur (100; 1000) mit einem Vorderfußbereich (10; 1010) und einem Fersenbereich (14; 1014), wobei die Sohlenstruktur eine Bodenfläche (38; 1003), eine mediale Seite und eine laterale Seite aufweist, wobei eine äußerste Oberfläche der medialen Seite einen äußeren medialen Umfangsrand (20) bildet, wobei eine äußerste Oberfläche der lateralen Seite einen äußeren lateralen Umfangsrand (22) bildet; einen ersten keilförmigen Stollen (30; 1118) mit einer Höhe und einer Länge, die sich von der medialen Seite des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) erstreckt, wobei sich der erste keilförmige Stollen (30; 1118) über den äußeren medialen Umfangsrand (20) des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) hinaus erstreckt; und

einen zweiten keilförmigen Stollen (34; 1110) mit einer Höhe und einer Länge, die sich von der lateralen Seite des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) erstreckt, wobei sich der zweite keilförmige Stollen (34; 1110) über den äußeren lateralen Umfangsrand (22) des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) hinaus erstreckt;

wobei die Höhe des ersten keilförmigen Stollens (30; 1118) kleiner als die Länge ist und die Höhe des zweiten keilförmigen Stollens (34; 1110) kleiner als die Länge ist, und **dadurch gekennzeichnet, dass:**

der Fußbekleidungsgegenstand ferner aufweist:

eine erste Mehrzahl von länglichen Stollen (52, 54; 1064, 1066), die sich von der Bodenfläche (38; 1003) der Sohlenstruktur (100; 1000) benachbart der medialen Seitenfläche in dem Vorderfußbereich (10; 1010) erstrecken, wobei eine Längsachse von jedem der länglichen Stollen (52, 54; 1064, 1066) im Wesentlichen in der gleichen Richtung verläuft wie die mediale Seitenfläche; und
 eine zweite Mehrzahl von länglichen Stollen

- (56, 58; 1068, 1070), die sich von der Bodenfläche (38; 1003) der Sohlenstruktur (100; 1000) benachbart der lateralen Seitenfläche in dem Vorderfußbereich (10; 1010) erstrecken, wobei eine Längsachse von jedem der länglichen Stollen (56, 58; 1068, 1070) im Wesentlichen in der gleichen Richtung wie die laterale Seitenfläche verläuft.
2. Fußbekleidungsgegenstand nach Anspruch 1, wobei die mediale Seite der Sohlenstruktur (100; 1000) eine mediale Seitenfläche enthält, die im Wesentlichen senkrecht zur Bodenfläche (38; 1003) ist, und die laterale Seite der Sohlenstruktur (100; 1000) die laterale Seitenfläche enthält, die im Wesentlichen senkrecht zur Bodenfläche (38; 1003) ist, wobei die äußerste Fläche der medialen Seitenfläche den äußeren medialen Umfangsrand (20) bildet, und die äußerste Fläche der lateralen Seitenfläche den äußeren lateralen Umfangsrand (22) bildet; wobei der Fußbekleidungsgegenstand ferner aufweist:
- eine erste Mehrzahl von keilförmigen Stollen (30, 32; 1117, 1118), die den ersten keilförmigen Stollen (30; 1117) enthält und sich von der medialen Seitenfläche des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) erstreckt, wobei die erste Mehrzahl von keilförmigen Stollen (30, 32; 1117, 1118) sich über den äußeren medialen Umfangsrand (20) des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) hinaus erstreckt, wobei zumindest eine Oberfläche (432; 530) jedes Stollens in der ersten Mehrzahl von keilförmigen Stollen (30, 32; 1117, 1118) sich im Wesentlichen parallel zur Bodenfläche (38; 1003) der Sohlenstruktur (100; 1000) erstreckt; und
- eine zweite Mehrzahl von keilförmigen Stollen (34, 36; 1110, 1112), die den zweiten keilförmigen Stollen (34; 1110) enthält und sich von der lateralen Seitenfläche des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) erstreckt, wobei die zweite Mehrzahl von keilförmigen Stollen sich über den äußeren lateralen Umfangsrand (22) des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) hinaus erstreckt, wobei zumindest eine Oberfläche (436, 534) jedes Stollens in der zweiten Mehrzahl von keilförmigen Stollen (34, 36; 1110, 1112) sich im Wesentlichen parallel zur Bodenfläche (38; 1003) der Sohlenstruktur (100; 1000) erstreckt.
3. Der Fußbekleidungsgegenstand nach einem der Ansprüche 1 oder 2, der ferner aufweist: einen länglichen Stollen (62; 1082), der sich von der Bodenfläche (38) der Sohlenstruktur (100; 1000) in dem Vorderfußbereich (10; 1010) erstreckt, wobei sich die Längsachse des länglichen Stollens (62; 1182) im Wesentlichen von der medialen Seite des Vorderfußes zur lateralen Seitenfläche des Vorderfußes erstreckt.
4. Der Fußbekleidungsgegenstand nach einem der Ansprüche 1 bis 3, der ferner aufweist: einen dritten keilförmigen Stollen (42, 44; 1112, 1114), der sich von einem vorderen Endabschnitt (12; 1011) des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) erstreckt.
5. Der Fußbekleidungsgegenstand nach Anspruch 4, wobei der erste keilförmige Stollen (30; 1117), der zweite keilförmige Stollen (34; 1110) und der dritte keilförmige Stollen (42, 44; 1112, 1114) auf die Sohlenstruktur (100; 1000) geformt sind.
6. Der Fußbekleidungsgegenstand nach einem der Ansprüche 4 und 5, wobei sich der dritte keilförmige Stollen (42, 44) nicht über den Außenumfangsrand des Vorderfußes der Sohle hinaus erstreckt.
7. Der Fußbekleidungsgegenstand nach einem der Ansprüche 1 bis 3, der ferner aufweist: eine dritte Mehrzahl von keilförmigen Stollen (42, 44; 1112-1118), die sich von einem vorderen Endabschnitt (12; 1111) des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) erstrecken.
8. Der Fußbekleidungsgegenstand nach Anspruch 7, wobei die dritte Mehrzahl von keilförmigen Stollen (42, 44; 1112-1118) sich nicht über den äußeren medialen Umfangsrand (20) oder den äußeren lateralen Umfangsrand (22) des Vorderfußbereichs (10; 1010) der Sohlenstruktur (100; 1000) hinaus erstreckt.
9. Der Fußbekleidungsgegenstand nach einem der Ansprüche 7 und 8, wobei die erste Mehrzahl von keilförmigen Stollen (30, 32; 1117, 1118) und die zweite Mehrzahl von keilförmigen Stollen (34, 36; 1110, 1112) auf die Oberfläche der Sohlenstruktur (100; 1000) geformt sind.
10. Der Fußbekleidungsgegenstand nach Anspruch 1, wobei die mediale Seite der Sohlenstruktur (1000) und die laterale Seite der Sohlenstruktur (1000) einen Umfangsseitenbereich (1030) enthalten, der sich zwischen der Bodenfläche (1003) der Sohlenstruktur (1000) und einer Oberseite der Sohlenstruktur (1000) erstreckt; und wobei der erste keilförmige Stollen (1118), der sich von der medialen Seite des Umfangsseitenbereichs (1030) erstreckt, eine erste Größe mit einer ersten Länge (L2), einer ersten Breite (W2) und einer ersten Höhe (H2) aufweist, und

der zweite keilförmige Stollen (1112), der sich von der lateralen Seite des Umfangsseitenbereichs (1030) erstreckt, eine zweite Größe mit einer zweiten Länge (L1), einer zweiten Breite (W1) und einer zweiten Höhe (H1) aufweist, wobei die zweite Größe größer als die erste Größe ist, während die zweite Länge (L1) größer als die erste Länge (L2) ist, und/oder die zweite Breite (W1) größer als die erste Breite (W2) ist und/oder die zweite Höhe (H1) größer als die erste Höhe (H2) ist.

11. Der Fußbekleidungsgegenstand nach Anspruch 10, wobei der erste keilförmige Stollen (1118) und der zweite keilförmige Stollen (1112) mit der Sohlenstruktur (1000) einstückig ausgebildet sind.
12. Der Fußbekleidungsgegenstand nach einem der Ansprüche 10 und 11, wobei der erste keilförmige Stollen (1118) in einem Zehenbereich (1220) der Sohlenstruktur (1000) angeordnet ist.

Revendications

1. Article chaussant, comprenant :
- une structure de semelle (100 ; 1000) ayant une région d'avant-pied (10 ; 1010) et une région de talon (14 ; 1014), dans lequel la structure de semelle inclut une surface inférieure (38 ; 1003), un côté médian et un côté latéral, dans lequel une surface la plus externe du côté médian forme un bord périphérique médian externe (20), dans lequel une surface la plus externe du côté latéral forme un bord périphérique latéral externe (22) ;
- un premier crampon en forme de coin (30 ; 1118) ayant une hauteur et une longueur s'étendant depuis le côté médian de la région d'avant-pied (10 ; 1010) de la structure de semelle (100 ; 1000), dans lequel le premier crampon en forme de coin (30 ; 1118) s'étend au-delà du bord périphérique médian externe (20) de la région d'avant-pied (10 ; 1010) de la structure de semelle (100 ; 1000) ; et
- un deuxième crampon en forme de coin (34 ; 1110) ayant une hauteur et une longueur s'étendant depuis le côté latéral de la région d'avant-pied (10 ; 1010) de la structure de semelle (100 ; 1000), dans lequel le deuxième crampon en forme de coin (34 ; 1110) s'étend au-delà du bord périphérique latéral externe (22) de la région d'avant-pied (10 ; 1010) de la structure de semelle (100 ; 1000),
- dans lequel la hauteur du premier crampon en forme de coin (30 ; 1118) est inférieure à la longueur, et la hauteur du deuxième crampon en forme de coin (34 ; 1110) est inférieure à la lon-

gueur, et caractérisé en ce que :

l'article chaussant comprend en outre une première pluralité de crampons allongés (52, 540 ; 1064, 1066) s'étendant depuis la surface inférieure (38 ; 1003) de la structure de semelle (100 ; 1000) adjacente à la surface du côté médian dans la région d'avant-pied (10 ; 1010), dans lequel un axe longitudinal de chacun des crampons allongés (52, 54 ; 1064, 1066) se prolonge sensiblement dans la même direction que la surface côté médian ; et

une seconde pluralité de crampons allongés (56, 58 ; 1068, 1070) s'étendant depuis la surface inférieure (38 ; 1003) de la structure de semelle (100 ; 1000) adjacente à la surface du côté latéral dans la région d'avant-pied (10 ; 1010), dans lequel un axe longitudinal de chacun des crampons allongés (56, 58 ; 1068, 1070) se prolonge sensiblement dans la même direction que la surface du côté latéral.

2. Article chaussant selon la revendication 1, dans lequel
- le côté médian de la structure de semelle (100 ; 1000) inclut une surface du côté médian qui est sensiblement perpendiculaire à la surface inférieure (38 ; 1003), et le côté latéral de la structure de semelle (100 ; 1000) inclut une surface du côté latéral qui est sensiblement perpendiculaire à la surface inférieure (38 ; 1003), dans lequel la surface la plus externe de la surface du côté médian forme le bord périphérique médian externe (20), et la surface la plus externe de la surface du côté latéral forme le bord périphérique latéral externe (22) ;
- dans lequel l'article chaussant comprend en outre :
- une première pluralité de crampons en forme de coin (30, 32 ; 1117, 1118) qui inclut le premier crampon en forme de coin (30 ; 1117) et s'étend depuis la surface du côté médian de la région d'avant-pied (810 ; 1010) de la structure de semelle (100 ; 1000), dans lequel la première pluralité de crampons en forme de coin (30, 32 ; 1117, 1118) s'étend au-delà du bord périphérique médian externe (20) de la région d'avant-pied (10 ; 1010) de la structure de semelle (100 ; 1000), dans lequel au moins une surface (432 ; 530) de chaque crampon dans la première pluralité de crampons en forme de coins (30, 32 ; 1117 ; 1118) s'étend sensiblement parallèle à la surface inférieure (38) de la structure de semelle (100 ; 1000) ; et
- une deuxième pluralité de crampons en forme de coin (34, 36 ; 1110, 1112) qui inclut le deuxiè-

- me crampon en forme de coin (34 ; 1110) et s'étend depuis la surface du côté latéral de la région d'avant pied (10 ; 1010) de la structure de semelle (100 ; 1000), dans lequel la deuxième pluralité de crampons en forme de coin s'étend au-delà du bord périphérique latéral externe (22) de la région d'avant-pied (10 ; 1010) de la structure de semelle (100 ; 1000), dans lequel au moins une surface (436 ; 534) de chaque crampon dans la deuxième pluralité de crampons en forme de coin (34, 36 ; 1110, 1112) s'étend sensiblement parallèle à la surface inférieure (38 ; 1003) de la structure de semelle (100 ; 1000).
3. Article chaussant selon l'une des revendications 1 ou 2, comprenant en outre :
un crampon allongé (62 ; 1082) s'étendant depuis la surface inférieure (38) de la structure de semelle (100 ; 1000) dans la région d'avant-pied (10 ; 1010), dans lequel l'axe longitudinal du crampon allongé (62 ; 1082) s'étend sensiblement depuis le côté médian de l'avant-pied à la surface du côté latéral de l'avant-pied.
4. Article chaussant selon l'une des revendications 1 à 3, comprenant en outre :
un troisième crampon en forme de coin (42, 44 ; 1112, 1114) s'étendant depuis une partie de pointe avant (12 ; 1011) de la région d'avant-pied (10 ; 1010) de la structure de semelle (100 ; 1000).
5. Article chaussant selon la revendication 4, dans lequel le premier crampon en forme de coin (30 ; 1117), le deuxième crampon en forme de coin (34 ; 1110) et le troisième crampon en forme de coin (42, 44 ; 1112, 1114) sont moulés sur la structure de semelle (100 ; 1000).
6. Article chaussant selon l'une des revendications 4 et 5, dans lequel le troisième crampon en forme de coin (42, 44) ne s'étend pas au-delà du bord périphérique de l'avant-pied de la semelle.
7. Article chaussant selon l'une quelconque des revendications 1 à 3, comprenant en outre :
une troisième pluralité de crampons en forme de coin (42, 44 ; 1112-1118) s'étendant depuis une partie de pointe avant (12 ; 1011) de la région d'avant-pied (10 ; 1010) de la structure de semelle (100 ; 1000).
8. Article chaussant selon la revendication 7, dans lequel la troisième pluralité de crampons en forme de coin (42, 44 ; 1112-1118) ne s'étend pas au-delà du bord périphérique médian externe (20) ou du bord périphérique latéral externe (22) de la région d'avant-pied (10 ; 1010) de la structure de semelle (100 ; 1000).
9. Article chaussant selon l'une des revendications 7 et 8, dans lequel la première pluralité de crampons en forme de coin (30, 32 ; 1117, 1118) et la deuxième pluralité de crampons en forme de coin (34, 36 ; 1110, 1112) sont moulés sur la surface de la structure de semelle (100 ; 1000).
10. Article chaussant selon la revendication 1, dans lequel le côté médian de la structure de semelle (1000) et le côté latéral de la structure de semelle (1000) incluent une région de côté périphérique (1030) s'étendant entre la surface inférieure (1003) de la structure de semelle (1000) et une surface supérieure de la structure de semelle (1000) ;
et dans lequel le premier crampon en forme de coin (1118) qui s'étend depuis le côté médian de la région de côté périphérique (1030) a une première taille avec une première longueur (L2), une première largeur (W2) et une première hauteur (H2) et le deuxième crampon en forme de coin (1112) qui s'étend depuis le côté latéral de la région de côté périphérique (1030) a une seconde taille avec une seconde longueur (L1), une seconde largeur (W1) et une seconde hauteur (H1), dans lequel la seconde taille est supérieure à la première taille (22) avec la seconde longueur (L1) étant supérieure à la première longueur (L2) et/ou la seconde largeur (W1) étant supérieure à la première largeur (W2) et/ou la seconde hauteur (H1) étant supérieure à la première hauteur (H2).
11. Article chaussant selon la revendication 10, dans lequel le premier crampon en forme de coin (1118) et le deuxième crampon en forme de coin (1112) sont formés de façon solidaire avec la structure de semelle (1000).
12. Article chaussant selon l'une des revendications 10 et 11, dans lequel le premier crampon en forme de coin (1118) est disposé dans une région d'orteils (1220) de la structure de semelle (1000).

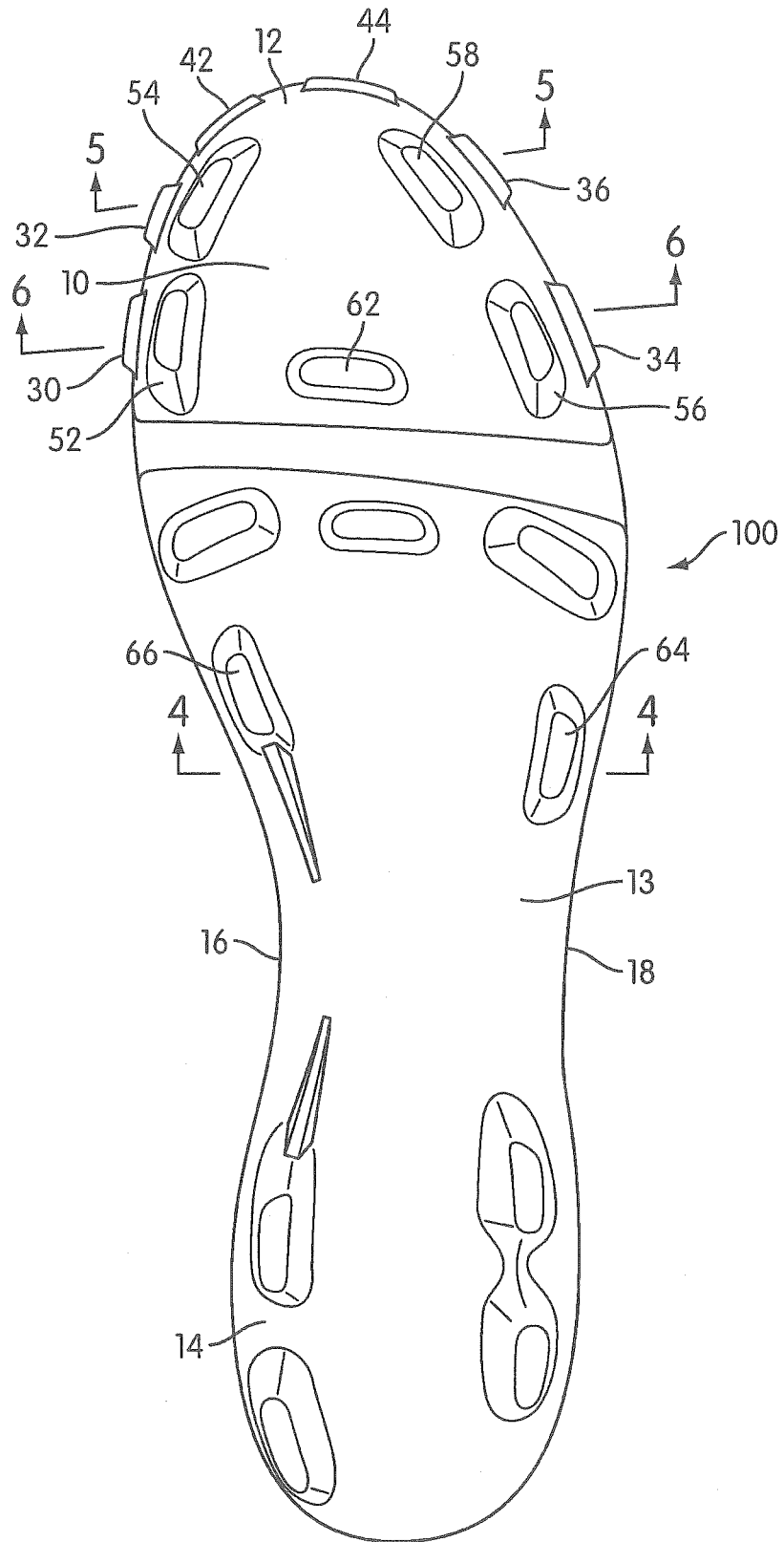


FIG. 1

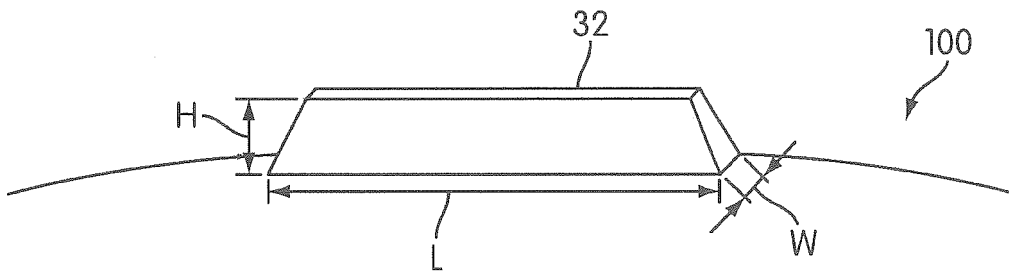


FIG. 2

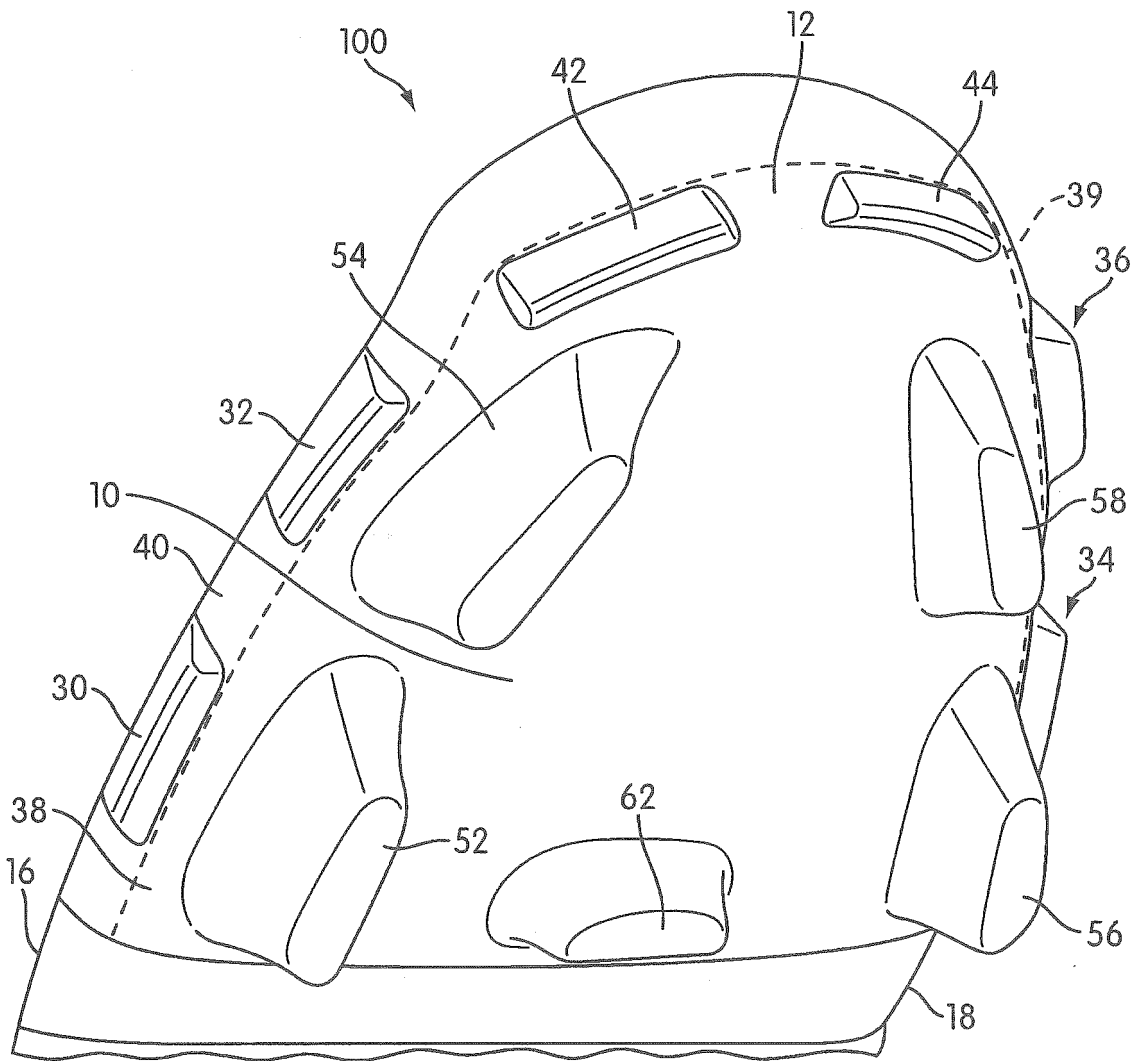


FIG. 3

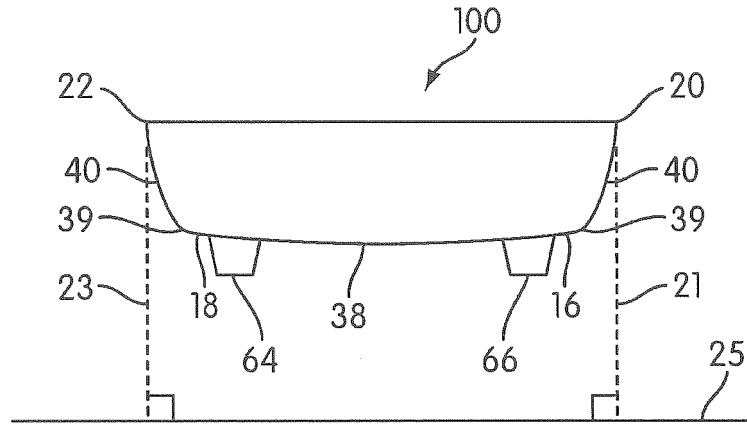


FIG. 4

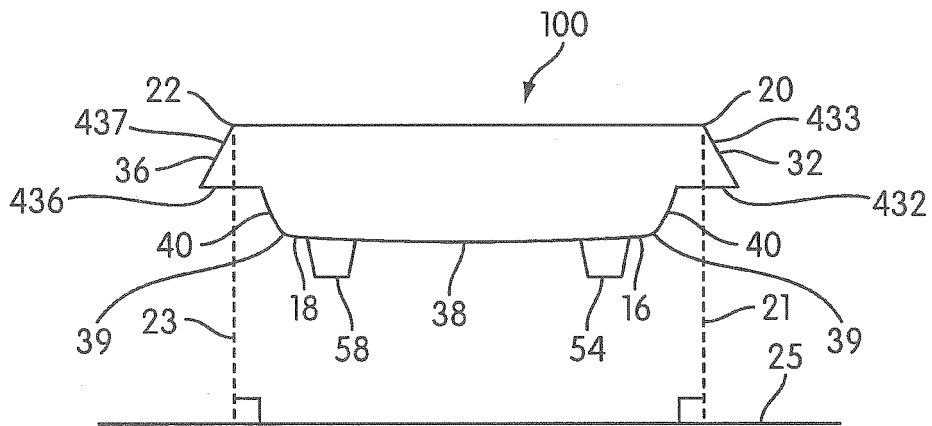


FIG. 5

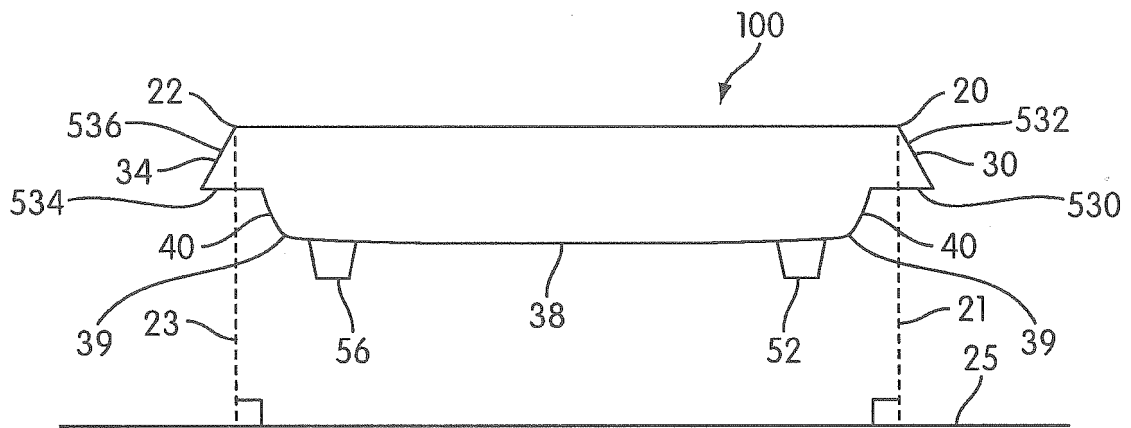


FIG. 6

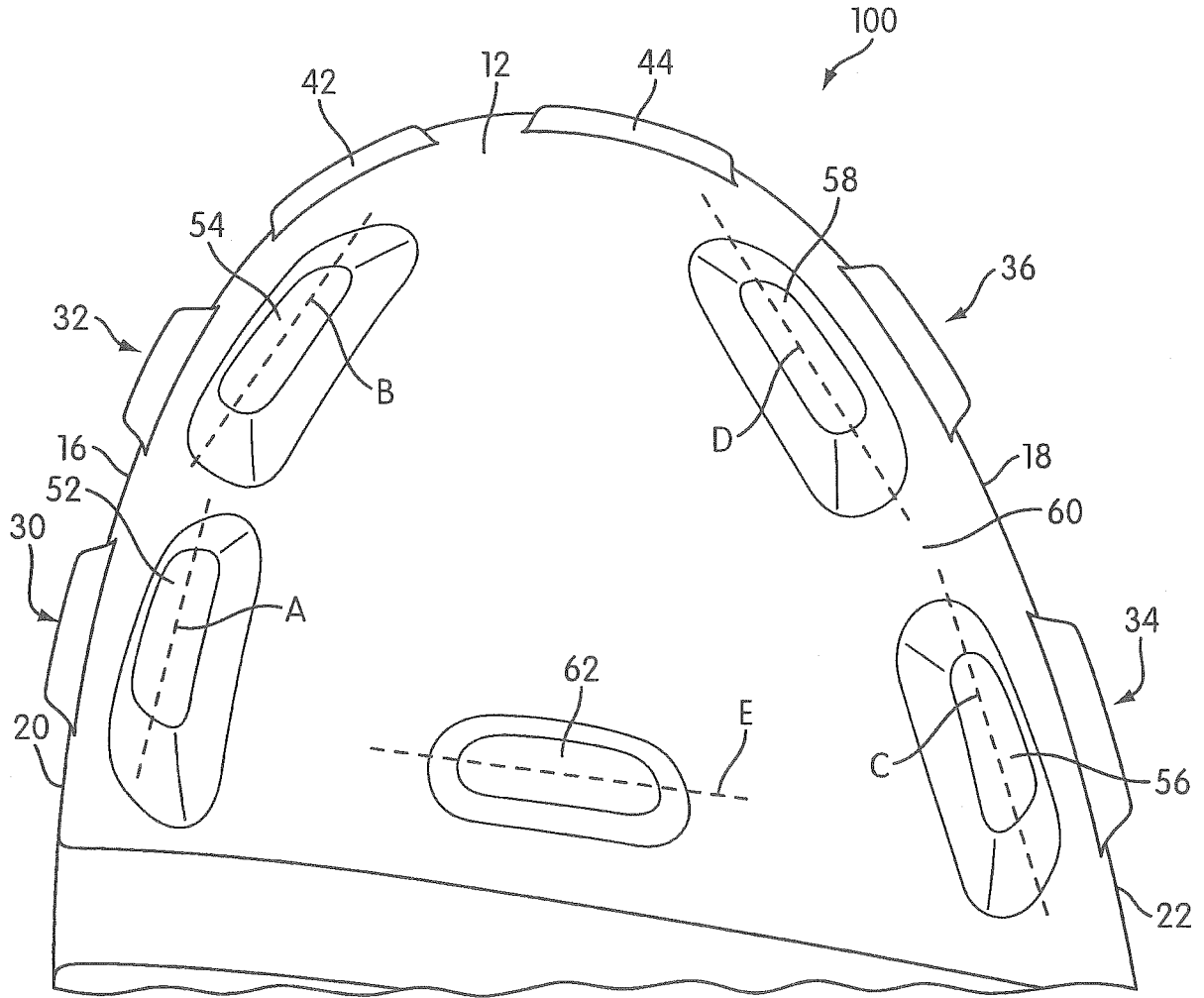


FIG. 7

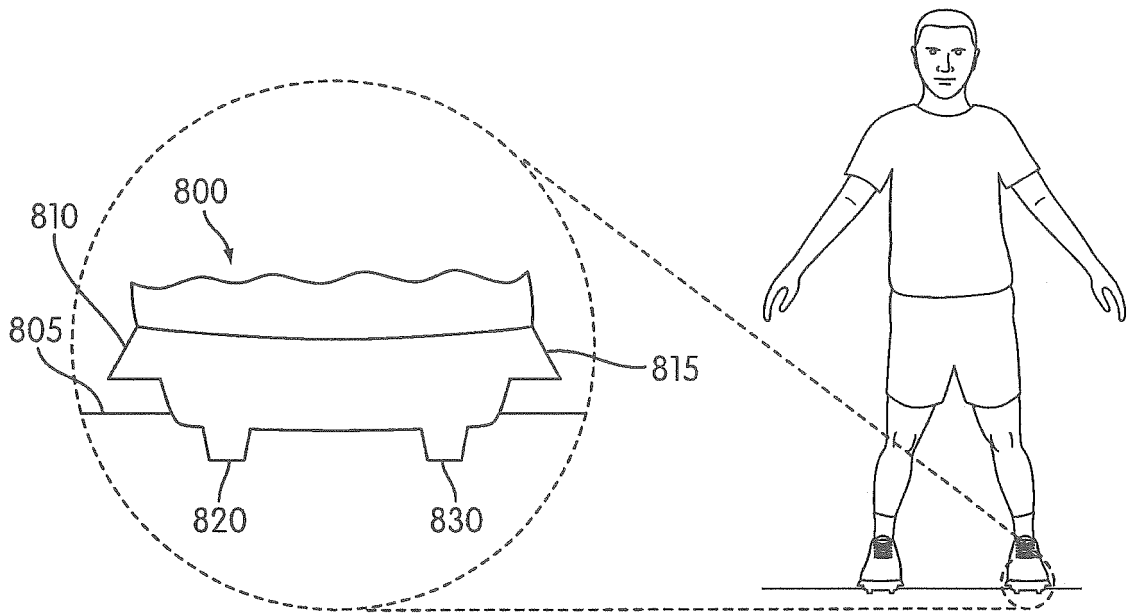


FIG. 8

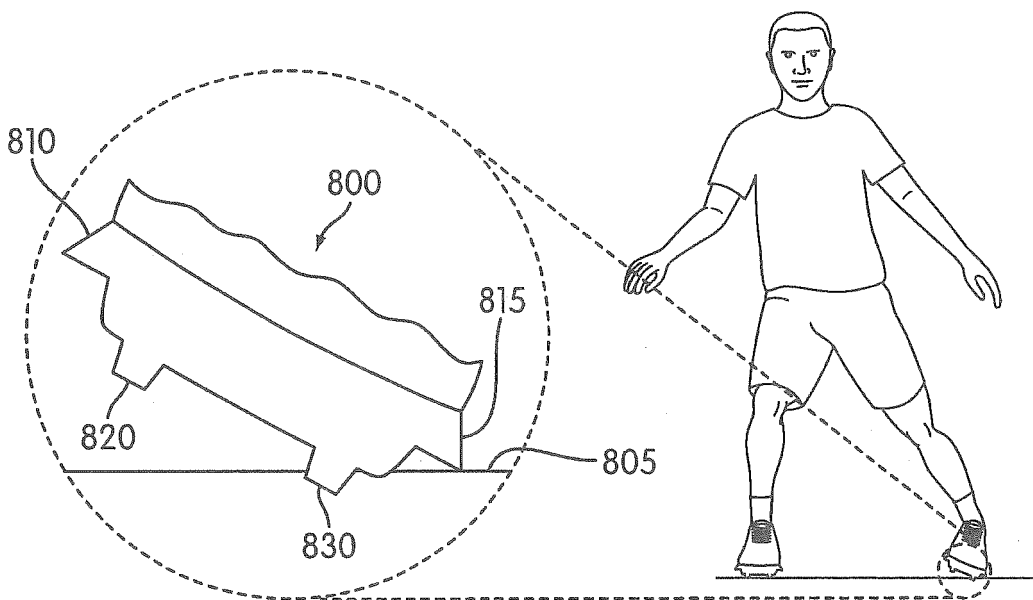


FIG. 9

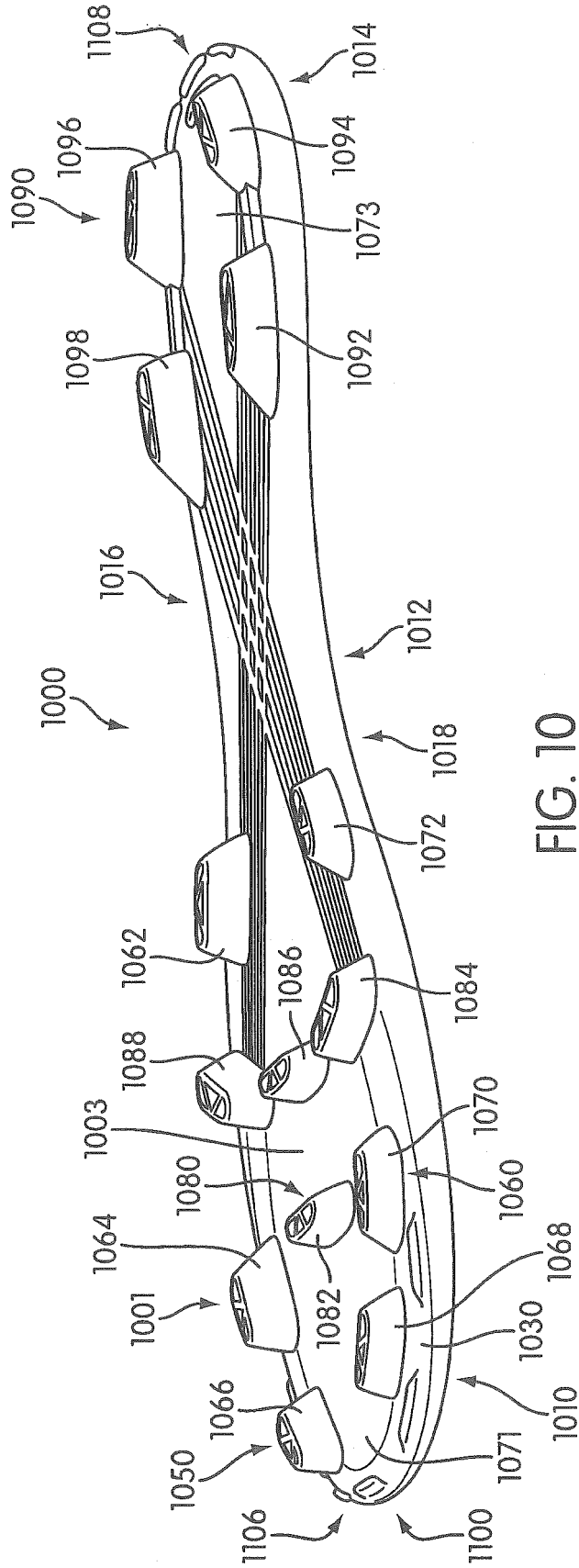


FIG. 10

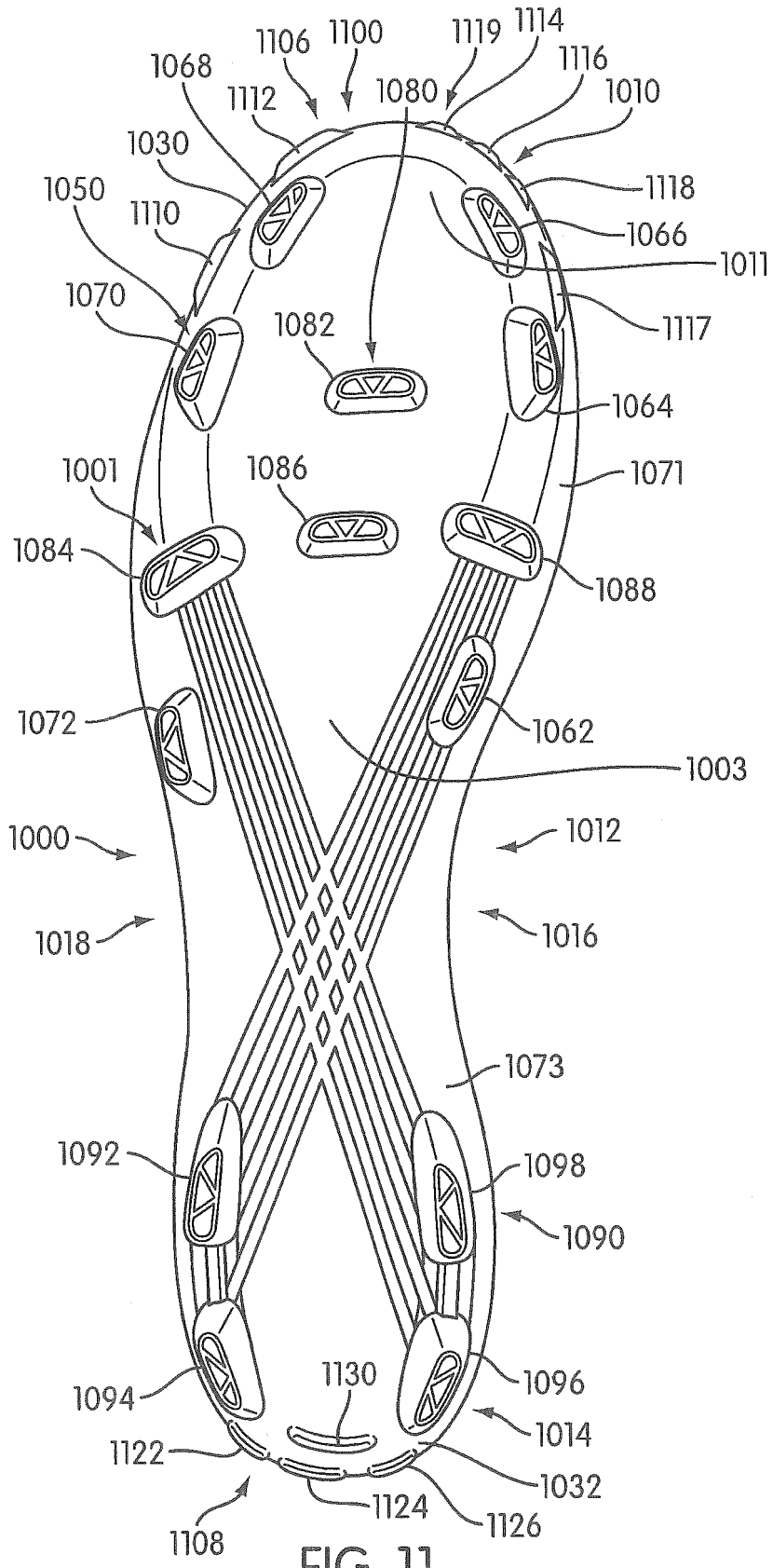


FIG. 11

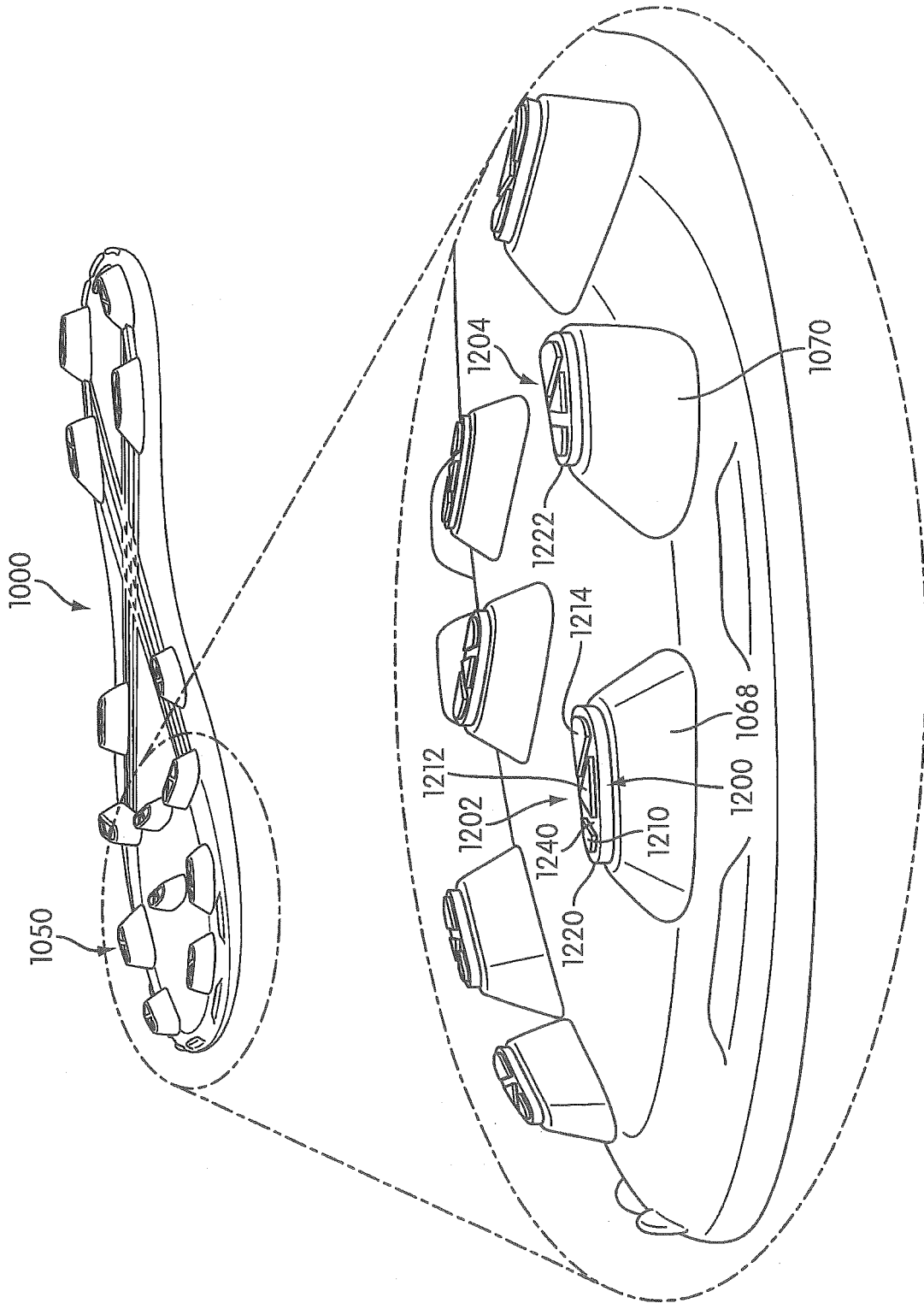


FIG. 12

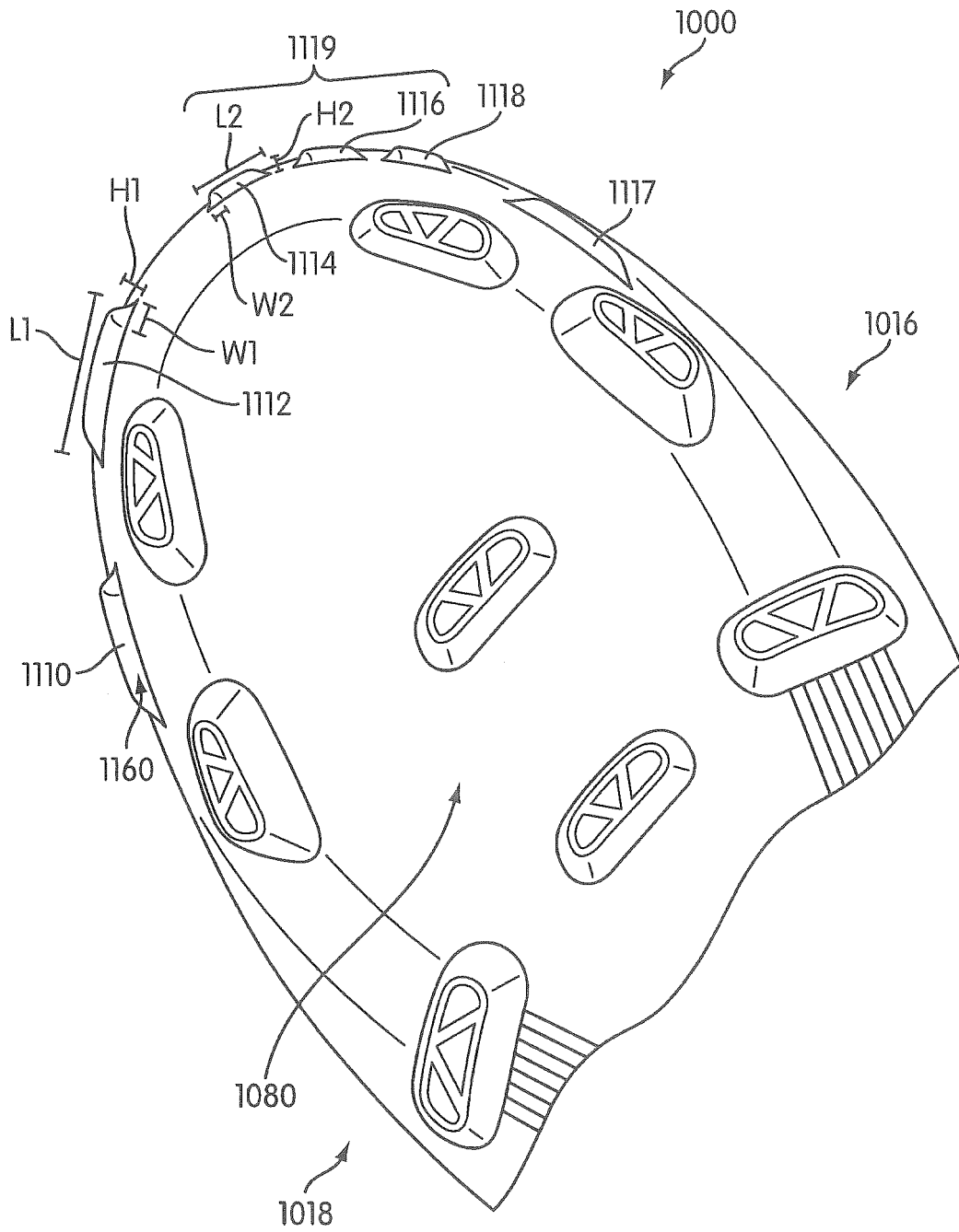


FIG. 13

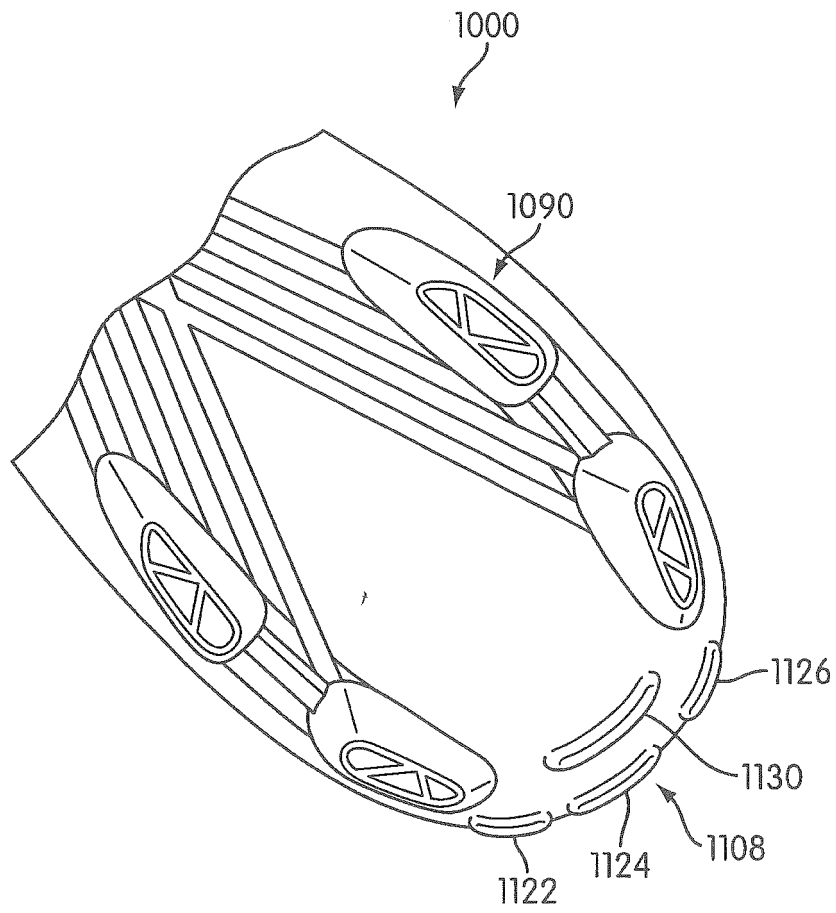


FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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