MODULAR ARTICLES WITH CUSTOMIZABLE SOLE INSERTS

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ABSTRACT

An insert system includes a first article of footwear and a second article of footwear. The first article of footwear includes a first upper and first sole structure. The first sole structure includes a first midsole, the first midsole having a first side peripheral portion, a first bottom portion, a first top portion, and a first cavity. The second article of footwear includes a second upper and second sole structure. The second sole structure includes a second midsole, the second midsole having a second side peripheral portion, a second bottom portion, a second top portion, and a second cavity. The first side peripheral portion and the second side peripheral portion have different thicknesses. The first cavity and the second cavity have substantially similar geometries.
FIG. 1
MODULAR ARTICLES WITH
CUSTOMIZABLE SOLE INSERTS

CROSS-REFERENCE TO RELATED
APPLICATION(S)

[0001] This application is a continuation-in-part of co-pending application Ser. No. 14/248,431 filed Apr. 9, 2014 (Attorney Docket No. 51-4034), the disclosure of which is hereby incorporated by reference. This application is related to U.S. Pat. No. __________, currently U.S. patent application Ser. No. 14/248,414, filed Apr. 9, 2014, and entitled “Articles of Footwear Having a Similar Appearance and Different Sole Assemblies” (Attorney Docket Number 51-3669), which application is hereby incorporated by reference in its entirety.

BACKGROUND

[0002] The present embodiments relate generally to articles of footwear, and in particular to articles of footwear with interchangeable inserts.

[0003] Articles of footwear generally include two primary elements: an upper and a sole structure. The upper is often formed from a plurality of material elements (e.g., textiles, polymer sheet layers, foam layers, leather, synthetic leather) that are stitched or adhesively bonded together to form a void on the interior of the footwear for comfortability and securely receiving a foot. More particularly, the upper forms a structure that extends over instep and toe areas of the foot, along medial and lateral sides of the foot, and around a heel area of the foot. The upper may also incorporate a lacing system to adjust the fit of the footwear, as well as permitting entry and removal of the foot from the void within the upper. In addition, the upper may include a tongue that extends under the lacing system to enhance adjustability and comfort of the footwear, and the upper may incorporate a heel counter.

SUMMARY

[0004] In one aspect, an insert system includes a first article of footwear and a second article of footwear. The first article of footwear includes a first upper and a first sole structure. The first sole structure includes a first midsole. The first midsole has a first side peripheral portion, a first bottom portion, a first top portion, and a first cavity. The first cavity has a first cavity sidewall associated with the first side peripheral portion of the first midsole. The first cavity has a first lower cavity surface associated with the first bottom portion of the first midsole. The first cavity sidewall is tapered. The second article of footwear includes a second upper and a second sole structure. The second sole structure includes a second midsole. The second midsole has a second side peripheral portion, a second bottom portion, a second top portion, and a second cavity. The second cavity has a second cavity sidewall associated with the second side peripheral portion of the second midsole. The second cavity has a second lower cavity surface associated with the second bottom portion of the second midsole. The second cavity sidewall is tapered. The first side peripheral portion and the second side peripheral portion have different thicknesses. The first cavity and the second cavity have substantially similar geometries.

[0005] In another aspect, a set of sole structures includes a first sole structure and a second sole structure. The first sole structure has a first cavity. The first cavity has a first inner surface and a first sidewall surface. The second sole structure has a second cavity. The second cavity has a second inner surface and a second sidewall surface. The first inner surface and the second inner surface have substantially similar geometries. The first sidewall surface and the second sidewall surface have substantially different geometries.

[0006] In a further aspect, a set of sole structures includes a first sole structure and a second sole structure. The first sole structure has a first cavity, the first cavity having a first inner surface and a first sidewall surface. The second sole structure has a second cavity. The second cavity has a second inner surface and a second sidewall surface. The first inner surface and the second inner surface have substantially similar geometries. The first sidewall surface and the second sidewall surface have substantially different geometries. The first midsole includes a first cavity, the first cavity having a first inner surface and a first sidewall surface. The second article of footwear has a second upper attached to a second midsole. The second midsole includes a second cavity. The second cavity has a second inner surface and a second sidewall surface. The first inner surface and the second inner surface have substantially similar geometries. The first upper and the second upper are different.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] 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.

[0009] FIG. 1 is a schematic isometric view of an embodiment of a footwear system including an article of footwear and a set of removable inserts;

[0010] FIG. 2 is a schematic exploded isometric view of an embodiment of an article of footwear configured to receive a removable insert;

[0011] FIG. 3 is a schematic isometric view of a removable insert, including two enlarged cross-sectional views, according to an embodiment;

[0012] FIG. 4 is a schematic bottom isometric view of a set of removable inserts;

[0013] FIG. 5 is a schematic isometric view of an embodiment of an article of footwear and a removable insert being inserted into the article of footwear;

[0014] FIG. 6 is a schematic isometric view of an embodiment of an article of footwear with a removable insert disposed in a cavity of a midsole of the article of footwear;

[0015] FIG. 7 is a schematic view of an embodiment of a configuration of an article of footwear as an athlete is standing in place;

[0016] FIG. 8 is a schematic view of an embodiment of a configuration of an article of footwear as an athlete is applying a downward force to an insert within the article of footwear;
FIG. 9 is a schematic isometric view of an embodiment of a footwear system including a set of articles of footwear and a set of removable inserts;

FIG. 10 is a schematic exploded isometric view of an embodiment of a sandal configured to receive a removable insert of the set of removable inserts;

FIG. 11 is a schematic isometric view of the sandal of FIG. 10 with a removable insert disposed in a cavity of a midsole of the sandal;

FIG. 12 is a schematic exploded isometric view of an embodiment of a truck shoe configured to receive a removable insert of the set of removable inserts;

FIG. 12 is a schematic exploded isometric view of an embodiment of a truck shoe configured to receive a removable insert of the set of removable inserts;

FIG. 13 is a schematic exploded isometric view of an embodiment of a low-cut basketball shoe configured to receive a removable insert of the set of removable inserts;

FIG. 14 is a schematic exploded isometric view of an embodiment of a low-cut basketball shoe configured to receive a removable insert of the set of removable inserts;

FIG. 14 is a schematic exploded isometric view of an embodiment of a low-cut basketball shoe configured to receive a removable insert of the set of removable inserts;

FIG. 15 is a schematic exploded isometric view of an embodiment of a high-cut basketball shoe configured to receive a removable insert of the set of removable inserts; and

FIG. 15 is a schematic exploded isometric view of an embodiment of a high-cut basketball shoe configured to receive a removable insert of the set of removable inserts.

DETAILED DESCRIPTION

FIG. 1 is a schematic view of an embodiment of footwear system 101. In some embodiments, footwear system 101 may include at least one article of footwear 100, as well as a set of inserts 150. Although a single article is shown in the embodiments for purposes of clarity, footwear system 101 may include a corresponding first article of footwear and second article of footwear (not shown), configured for a left and right foot, respectively. Thus, it will be understood that the principles discussed herein may equally apply to another article of footwear corresponding to article of footwear 100. Likewise, the principles taught in association with set of inserts 150 may equally apply to additional inserts that could be included in set of inserts 150 in other embodiments.

Article of footwear 100, also referred to simply as article 100, may be configured as various kinds of footwear including, but not limited to: hiking boots, soccer shoes, football shoes, sneakers, running shoes, cross-training shoes, rugby shoes, basketball shoes, baseball shoes as well as other kinds of shoes. Moreover, in some embodiments article 100 may be configured as various other kinds of non-sports related footwear, including, but not limited to: slippers, sandals, high heeled footwear, and loafers.

Referring to FIG. 1, for purposes of reference, article 100 may be divided into forefoot portion 10, midfoot portion 12 and heel portion 14. Forefoot portion 10 may be generally associated with the toes and joints connecting the metatarsals with the phalanges. Midfoot portion 12 may be generally associated with the arch of a foot. Likewise, heel portion 14 may be generally associated with the heel of a foot, including the calcaneous bone. In addition, article 100 may include lateral side 16 and medial side 18. In particular, lateral side 16 and medial side 18 may be opposing sides of article 100. Furthermore, both lateral side 16 and medial side 18 may extend through forefoot portion 10, midfoot portion 12 and heel portion 14.

It will be understood that forefoot portion 10, midfoot portion 12 and heel portion 14 are only intended for purposes of description and are not intended to demarcate precise regions of article 100. Likewise, lateral side 16 and medial side 18 are intended to represent generally two sides of an article, rather than precisely demarcating article 100 into two halves. Moreover, throughout the embodiments, forefoot portion 10, midfoot portion 12, heel portion 14, lateral side 16 and medial side 18 may be used to refer to portions/sides of individual components of article 100, as well as portions/sides of any inserts from set of inserts.

For consistency and convenience, directional adjectives are employed throughout this detailed description corresponding to the illustrated embodiments. The term “longitudinal” as used throughout this detailed description and in the claims refers to a direction extending a length of a component (e.g., article of footwear or insert). In some cases, the longitudinal direction may extend from a forefoot portion to a heel portion of the component. Also, the term “lateral” as used throughout this detailed description and in the claims refers to a direction extending along a width of a component. In other words, the lateral direction may extend between a medial side and a lateral side of a component. Furthermore, the term “vertical” as used throughout this detailed description and in the claims refers to a direction generally perpendicular to a lateral and longitudinal direction. For example, in cases where an article is planted flat on a ground surface, the vertical direction may extend from the ground surface upward. In addition, the term “proximal” refers to a portion of a footwear component that is closer to a portion of a foot when an article of footwear is worn. Likewise, the term “distal” refers to a portion of a footwear component that is further from a portion of a foot when an article of footwear is worn. This detailed description makes use of these directional adjectives in describing both a midsole and an insert.

The following embodiments can include any of the features and/or components described in the “Articles of Footwear Having a Similar Appearance and Different Sole Assemblies” application described above and incorporated by reference.

Article 100 may include an upper 102 as well as a sole structure 110. Generally, upper 102 may be any type of upper. In particular, upper 102 may have any design, shape, size and/or color. For example, in embodiments where article 100 is a basketball shoe, upper 102 could be a high top upper that is shaped to provide high support on an ankle. In embodiments where article 100 is a running shoe, upper 102 could be a low top upper.

In some embodiments, upper 102 includes opening 120 that provides entry for the foot into an interior cavity of upper 102. In some embodiments, upper 102 may include a tongue 122 that provides cushioning and support across the instep of the foot. Some embodiments may include fastening provisions, including, but not limited to: laces, cables, straps, buttons, zippers as well as any other provisions known in the art for fastening articles. In some embodiments, a lace 125 may be applied at a fastening region of upper 102.

In some embodiments, upper 102 could be open on a lower portion. In such cases, upper 102 may be associated with a lower opening that is bounded by a lower peripheral portion 103. In other embodiments, upper 102 could be closed on a lower portion. In such cases, upper 102 could have a lower portion of material separated from the side portions of upper 102 by lower peripheral portion 103. In some embodi-
ments, as depicted in FIGS. 6-8, upper 102 includes portions extending below lower peripheral portion 103 and may even be closed beneath a foot.

[0035] In some embodiments, sole structure 110 may be configured to provide traction for article 100. In addition to providing traction, sole structure 110 may attenuate ground reaction forces when compressed between the foot and the ground during walking, running or other ambulatory activities. The configuration of sole structure 110 may vary significantly in different embodiments to include a variety of conventional or non-conventional structures. In some cases, the configuration of sole structure 110 can be configured according to one or more types of ground surfaces on which sole structure 110 may be used. Examples of ground surfaces include, but are not limited to: natural turf, synthetic turf, dirt, as well as other surfaces.

[0036] Sole structure 110 is secured to upper 102 and extends between the foot and the ground when article 100 is worn. In different embodiments, sole structure 110 may include different components. For example, sole structure 110 may include an outsole, a midsole, and/or an insole. In some cases, one or more of these components may be optional. In the embodiment of FIG. 1, sole structure 110 includes a midsole 112 and an outsole 114.

[0037] FIG. 2 illustrates an exploded isometric view of an embodiment of article of footwear 100, including upper 102, midsole 112 and outsole 114. Referring to FIG. 2, midsole 112 may be characterized as having various portions. In one embodiment, midsole 112 includes a top portion 202 and a bottom portion 204, which is disposed opposite of top portion 202. Additionally, midsole 112 may include a front peripheral portion 206 and a rear peripheral portion 208. Midsole 112 may also include a first side peripheral portion 210, which extends from front peripheral portion 206 to rear peripheral portion 208. Also, midsole 112 may include a second side peripheral portion 212, which extends from front peripheral portion 206 to rear peripheral portion 208. It will be understood that first side peripheral portion 210 and second side peripheral portion 212 are intended to characterize opposing side portions of midsole 112. In at least one embodiment, it may be seen that first side peripheral portion 210 is associated with lateral side 16 of article of footwear 100, while second side peripheral portion 212 is associated with medial side 18 of article of footwear 100.

[0038] As shown in FIG. 2, midsole 112 may include a cavity 230 that is configured to receive one or more inserts from set of inserts 150. Generally, cavity 130 of midsole 112 may be disposed in top portion 202 of midsole 112. In some embodiments, cavity 230 may extend through forefoot portion 10, midfoot portion 12 and/or heel portion 14 of midsole 112. In an exemplary embodiment, cavity 230 extends from forefoot portion 10 through midfoot portion 12 and to heel portion 14 of midsole 112.

[0039] FIG. 2 includes an enlarged cross-sectional view of a portion of midsole 112 in forefoot portion 10, as well as an enlarged cross-sectional view of a portion of midsole 112 in heel portion 14. These enlarged cross-sectional views are intended to illustrate the details of cavity 230. Referring to FIG. 2, especially the enlarged cross-sectional views of forefoot portion 10 and heel portion 14, cavity 230 may include a first cavity sidewall 232 that is associated with first side peripheral portion 210 of midsole 112. In addition, cavity 230 may include a second cavity sidewall 234 that is associated with second side peripheral portion 212 of midsole 112. In addition, cavity 230 may include a lower cavity surface 236 that is associated with bottom portion 204 of midsole 112. In some embodiments, lower cavity surface 236 could be approximately parallel with a ground contacting surface of sole structure 110, such as, for example, an outer surface 115 of outsole 114 (see FIG. 6).

[0040] In different embodiments, the number of inserts comprising set of inserts 150 may vary. In some embodiments, set of inserts 150 may comprise a single insert that may be used with article of footwear 100. In other embodiments, set of inserts 150 may comprise two inserts that may be removably inserted into article of footwear 100. In still other embodiments, set of inserts 150 could comprise three or more inserts that may be removably inserted into article of footwear 100.

[0041] FIG. 3 is a schematic isometric view of first removable insert 152 including two enlarged cross-sectional views. FIG. 4 is a schematic isometric view of set of inserts 150, in which the bottom sides of the inserts are visible. Referring now to FIGS. 1 and 4, set of inserts 150 may further comprise a first removable insert 152 and a second removable insert 154. Each insert comprise of a top portion, a bottom portion and various peripheral sidewalls. For example, first removable insert 152 may comprise top portion 160 (FIG. 1) and bottom portion 162 (FIG. 4). In addition, as best seen in FIG. 3, first removable insert 152 may include first insert sidewall 164 and second insert sidewall 166. Here, it may be understood that first insert sidewall 164 is disposed on an opposite side of second insert sidewall 166. As clearly shown in FIG. 3, first insert sidewall 164 and second insert sidewall 166 connect an outer periphery 170 of top portion 160 to an outer periphery 172 of bottom portion 162. In other words, first insert sidewall 164 and second insert sidewall 166 are associated with the outermost boundary of first removable insert 152.

[0042] In the embodiment of FIGS. 1 and 4, first removable insert 152 and second removable insert 154 may be full length inserts. In particular, first removable insert 152 and second removable insert 154 may each extend through forefoot portion 10, midfoot portion 12 and heel portion 14 of midsole 112 when inserted within midsole 112 (see FIG. 1). However, in other embodiments, one or more inserts of set of inserts 150 may be partial length inserts, including inserts that extend through any combination of forefoot portion 10, midfoot portion 12 and/or heel portion 14 of midsole 112.

[0043] As seen in FIG. 4, some embodiments may include inserts with different materials, material characteristics and/or components. For example, while first removable insert 152 and second removable insert 154 may both have cavity gripping portions (namely, first cavity gripping portion 302 and second cavity gripping portion 304), they may differ in some other respects. First removable insert 152 may have a smooth base portion 306 that extends through heel portion 14, midfoot portion 12 and into forefoot portion 10. In contrast, smooth base portion 308 of second removable insert 154 may primarily extend through heel portion 14 and midfoot portion 12. Instead, second removable insert 154 may include a surface pattern 312 that may enhance engagement between forefoot portion 10 and a portion of a cavity. Additionally, in at least some embodiments, first removable insert 152 may be configured with a cushioning device 310. In some cases, cushioning device 310 could be an air-filled bladder embedded within forefoot portion 10 of first removable insert 152.
It will be understood that each insert of set of inserts 150 could vary in any manner, including variations in materials and/or material characteristics. For example, embodiments can differ in rigidity, flexibility, cushioning, support, weight as well as in other ways. Embodiments can include inserts made of any materials including, but not limited to: plastics, foams, woven and/or non-woven fabrics, composite materials as well as other kinds of inserts. In some embodiments, first removable insert 152 and second removable insert 154 may each be made of a foam material. In at least some embodiments, each insert may comprise a different foam material with different rigidities and/or cushioning properties. Moreover, it will be understood that in some embodiments, the materials used for one or more inserts may be complementary to the materials used in constructing midsole 112. In particular, in some embodiments, at least some portions of either first removable insert 152 and/or second removable insert 154 may comprise substantially similar materials to those used for making midsole 112.

Varying the properties of each insert allows for a customizable experience. In particular, a user may select an insert that achieves desired functionality from two or more inserts in a set of inserts. Thus, different inserts can be used to achieve different degrees of support, cushioning, rigidity, energy return, weight reduction, as well as possibly other features.

Embodiments can include provisions to facilitate improved support for a foot using an insert. In some embodiments, an insert and corresponding cavity of the midsole may have geometries that enhance support for the foot. In an exemplary embodiment, an insert and corresponding midsole cavity can have tapered geometries that enhance support for the foot during some kinds of maneuvers, such as cutting, backpedaling, foot strikes or other maneuvers where forces are applied by the foot to the insert and midsole.

Referring now to FIG. 3, first removable insert 152 may have one or more tapered portions, including sidewalls, portions and/or surfaces. In some embodiments, first insert sidewall 164 may have a tapered geometry. Also, in some embodiments, second insert sidewall 166 may have a tapered geometry. In the embodiment of FIG. 1, both first insert sidewall 164 and second insert sidewall 166 have tapered geometries.

The term “tapered” as used herein refers to the angled or sloped configuration of each sidewall. In some embodiments, each sidewall may be tapered in an approximately linear manner. Specifically, each sidewall may be an approximately straight surface that forms non-right angles with respect to a top portion and/or a bottom portion of the insert. In other embodiments, each sidewall could be tapered in a non-linear manner. Specifically, each sidewall could be contoured in a convex and/or concave manner, or could be comprised of a combination of convex and/or concave contours.

As seen in the enlarged cross-sectional view of FIG. 1 taken at forefoot portion 10 of first removable insert 152, first insert sidewall 164 and second insert sidewall 166 may be angled with respect to top portion 160 and bottom portion 162 of midsole 112. In this exemplary configuration, first insert sidewall 164 forms a first angle 191 with bottom portion 162 and first insert sidewall 164 forms a second angle 192 with top portion 160. Likewise, second insert sidewall 166 forms a third angle 193 with bottom portion 162 and second insert sidewall 166 forms a fourth angle 194 with top portion 160.

In different embodiments, the value of first angle 191, second angle 192, third angle 193 and fourth angle 194 can vary. In some embodiments, first angle 191 and third angle 193 may both have values approximately in the range between 90 degrees and 150 degrees. In other words, in some embodiments, first angle 191 and third angle 193 may be obtuse angles. In some embodiments, second angle 192 and fourth angle 194 may both have values approximately in the range between 20 degrees and 90 degrees. In other words, in some embodiments, second angle 192 and fourth angle 194 may be acute angles. In some embodiments, the acute angles of first removable insert 152 may be substantially less than 75 degrees, while the obtuse angles may be substantially greater than 105 degrees.

In some embodiments, first angle 191 and second angle 192 could be approximately similar, however, in other embodiments first angle 191 and second angle 192 could have different values. Likewise, in some embodiments, second angle 192 and fourth angle 194 could be approximately similar, however in other embodiments second angle 192 and fourth angle 194 could have different values. In at least some embodiments, for example, the degree of tapering, slope, or slanting, of first insert sidewall 164 could be different from the degree of tapering, slope, or slanting of second insert sidewall 166. In such embodiments, the differences in tapering, slope or slanting results in different values of first angle 191 and third angle 193, as well as different values of second angle 192 and fourth angle 194. Differences in tapering between first insert sidewall 164 and second insert sidewall 166 could provide variations in support when leaning towards one side (e.g., a lateral side) or towards another side (e.g., a medial side).

In some embodiments, the degree of tapering of one or more insert sidewalls could vary over the length of an insert. For example, as indicated in FIG. 1, first removable insert 152 may have a first cross-sectional area 140 at a forefoot portion 10 of first removable insert 152 and a second cross-sectional area 142 at a heel portion 14 of first removable insert 152. In some embodiments, first cross-sectional area 140 and second cross-sectional area 142 could be substantially similar. In other embodiments, first cross-sectional area 140 and second cross-sectional area 142 could be substantially different. In the embodiment of FIG. 1, first cross-sectional area 140 and second cross-sectional area 142 are substantially different. More specifically, first insert sidewall 164 and second insert sidewall 166 may have a steeper tapering. For purposes of reference, first insert sidewall 164 and bottom portion 162 form first angle 191 in forefoot portion 10, and first insert sidewall 164 and bottom portion 162 form seventh angle 197 in heel portion 14. Here, seventh angle 197 may be a smaller angle than first angle 191. Additionally, first insert sidewall 164 and top portion 160 form second angle 192 in forefoot portion 10, and first insert sidewall 164 and top portion 160 form eighth angle 198 in heel portion 14. Here, eighth angle 198 may be larger than third angle 193. In a similar manner, sixth angle 196 (formed between top portion 160 and second insert sidewall 166 in heel portion 14) may be greater than fourth angle 194. Also, fifth angle 195 (formed between bottom portion 162 and second insert sidewall 166 in heel portion 14) may be greater than angle third angle 193.

Although the illustrated embodiments show top portion 160 and bottom portion 162 as approximately flat, in other embodiments top portion 160 and/or bottom portion
In different embodiments, the cross-sectional geometry of first removable insert 152 could vary. In some embodiments, the cross-sectional geometry could comprise any approximate geometry, including, but not limited to: a rounded geometry, a rectilinear geometry as well as any other kind of geometry. In an exemplary embodiment, first removable insert 152 may have an approximately trapezoidal cross-sectional geometry resulting from the approximately parallel arrangement of top portion 160 and bottom portion 162, and the acute/obtuse orientations of first insert sidewall 164 and second insert sidewall 166. As discussed in further detail below, this approximately trapezoidal cross-sectional geometry may result in a wedge-like configuration for first removable insert 152 that may act to expand midsole 112 in a widthwise direction as vertical forces are applied to first removable insert 152 by a foot.

For purposes of clarity, the geometry of first removable insert 152 is discussed in detail and shown in the figures. However, it should be appreciated that other inserts, including second removable insert 154, may have substantially similar geometries to first removable insert 152. Using a common geometry (and size) for each insert in set of inserts, may allow multiple inserts to be interchangeably received within cavity 230 of midsole 112.

Referring now to FIG. 2, the geometry of cavity 230 may vary in different embodiments. In some embodiments, the geometry of cavity 230 may be configured to accommodate removable inserts from set of inserts 150. In particular, in some embodiments, the geometry of cavity 230 may be configured to receive the tapered insert sidewalls of, for example, first removable insert 152.

In some embodiments, first cavity sidewall 232 may have a tapered geometry. Also, in some embodiments, second cavity sidewall 234 may have a tapered geometry. In the embodiment of FIG. 2, both first cavity sidewall 232 and second cavity sidewall 234 have tapered geometries.

The term “tapered” as used herein refers to the angled or sloped configuration of each sidewall. In some embodiments, each sidewall may be tapered in an approximately linear manner. Specifically, each sidewall may be an approximately straight surface that forms non-right angles with respect to a top portion and/or a bottom portion of the insert. In other embodiments, each sidewall could be tapered in a non-linear manner. Specifically, each sidewall could be contoured in a convex and/or concave manner, or could be comprised of a combination of convex and/or concave contours.

As seen in the enlarged cross-sectional views of FIG. 2, first cavity sidewall 232 and second cavity sidewall 234 may be angled with respect to lower cavity surface 236 of cavity 230. In this exemplary configuration, first cavity sidewall 232 forms an angle 290 with lower cavity surface 236. Likewise, second cavity sidewall 234 forms an angle 291 with lower cavity surface 236.

In different embodiments, the value of angle 290 and angle 291 can vary. In some embodiments, angle 290 and angle 291 may both have values approximately in the range between 90 degrees and 150 degrees. In other words, in some embodiments, angle 290 and angle 291 may be obtuse angles.

In at least some embodiments, angle 290 and angle 291 may both be substantially greater than 105 degrees.

In some embodiments, angle 290 and angle 291 could be approximately similar, however, in other embodiments angle 290 and angle 291 could have different values. In at least some embodiments, for example, the degree of tapering, slope, or slanting, of first cavity sidewall 232 could be different from the degree of tapering, slope, or slanting of second cavity sidewall 234. In such embodiments, the differences in tapering, slope or slanting results in different values of angle 290 and angle 291. Differences in tapering between first cavity sidewall 232 and second cavity sidewall 234 could provide variations in support when leaning towards one side (e.g., a lateral side) or towards another side (e.g., a medial side).

In embodiments where an insert has sidewalls that vary in geometry (for example, in slope or length) over the length of the insert, cavity 230 can include cavity sidewalls that vary in a corresponding manner. For example, as seen in FIG. 2, first cavity sidewall 232 forms an angle 294 with lower cavity surface 236 in heel portion 14 that is generally smaller than angle 290 that is formed between first cavity sidewall 232 and lower cavity surface 236 in forefoot portion 10. Similarly, second cavity sidewall 234 forms an angle 293 with lower cavity surface 236 in heel portion 14 that is generally smaller than angle 291 that is formed between second cavity sidewall 234 and lower cavity surface 236 in forefoot portion 10. In other embodiments, these angles could vary in any other manner and may generally be selected to accommodate the angles formed by sidewalls of a corresponding insert.

In the embodiment depicted in FIG. 2, lower cavity surface 236 is seen to be generally flat. In particular, the approximate depth of lower cavity surface 236, indicated schematically as depth 239, may be approximately constant between first cavity sidewall 232 and second cavity sidewall 234 (in a lateral direction). However, in other embodiments, lower cavity surface 236 could be a contoured surface, including convex and/or concave portions. In such other embodiments, the approximate depth of lower cavity surface 236 could be variable. Of course, as seen by comparing depth 239 of cavity 230 in forefoot portion 10 with depth 237 of cavity 230 in heel portion 14, it will be understood that the depth of cavity 230 may vary in the longitudinal direction of midsole 112.

In different embodiments, the cross-sectional geometry of cavity 230 could vary. In some embodiments, the cross-sectional geometry could comprise any approximate geometry, including, but not limited to: a rounded geometry, a rectilinear geometry as well as any other kind of geometry. In an exemplary embodiment, cavity 230 may have an approximately trapezoidal cross-sectional geometry resulting from angled arrangement of first cavity sidewall 232 with lower cavity surface 236 and of second cavity sidewall 234 with lower cavity surface 236. Moreover, as with first removable insert 152, cavity 230 can have a cross-sectional geometry that varies over its length. In particular, cavity 230 may have a first cross-sectional geometry 240 in forefoot portion 10 and a second cross-sectional geometry 242 in heel portion 14.

In some embodiments, the configuration of cavity 230 provides first side peripheral portion 210 and second side peripheral portion 212 of midsole 112 with variable thicknesses. In particular, the thicknesses of each side peripheral portion may vary at different vertical positions (i.e., positions
along a direction between top portion 202 and bottom portion 204 of midsole 112). In the embodiment depicted in FIG. 2, for example, second side peripheral portion 212 has a first lateral thickness 280 at top portion 202 of midsole 112. Further, second side peripheral portion 212 has a second lateral thickness 282 between top portion 202 and lower cavity surface 236. Also, second side peripheral portion 212 has a third lateral thickness 284 at lower cavity surface 236. Moreover, third lateral thickness 284 is greater than second lateral thickness 282. Also, second lateral thickness 282 is greater than first lateral thickness 280.

[0066] It will be understood that the thicknesses may vary in this manner due to the difference in geometries of the recess sidewalls and corresponding outer sidewalls of midsole 112. For example, while first cavity sidewall 232 is tapered (or sloped with respect to a vertical direction), first outer sidewall 270 of midsole 112 is approximately vertical (i.e., forms approximately right angles with top portion 202 and bottom portion 204 of midsole 112). Similarly, while second cavity sidewall 234 is tapered, second outer sidewall 272 of midsole 112 is approximately vertical.

[0067] FIG. 5 illustrates a schematic view of an embodiment where first removable insert 152 is being inserted into opening 120 of article of footwear 100. FIG. 6 illustrates a configuration of article of footwear 100 with first removable insert 152 disposed within cavity 230. Referring to FIG. 6, one or more portions of first removable insert 152 may be in contact with portions interior to article of footwear 100. In some embodiments, portions of upper 102 may extend into cavity 230 and may therefore contact first insert sidewall 164, second insert sidewall 166 and/or bottom portion 162 of first removable insert 152. In this exemplary embodiment, for example, a first lower peripheral portion 512 of upper 102 may contact first insert sidewall 164 and a second lower peripheral portion 514 of upper 102 may contact second insert sidewall 166. Additionally, in some embodiments, a lower portion 516 of upper 102 may be disposed between bottom portion 162 of first removable insert 152 and lower cavity surface 236 of cavity 230. In other embodiments, however, portions of upper 102 may not extend into cavity 230, and/or may only partially extend into cavity 230. Thus, in some other embodiments, first insert sidewall 164 could be in contact with first cavity sidewall 232. Also, in some embodiments, second insert sidewall 166 could be in contact with second cavity sidewall 234. Still further, in some embodiments, bottom portion 162 of first removable insert 152 could be in contact with lower cavity surface 236 of cavity 230.

[0068] In still other embodiments, rather than a portion of upper 102 extending beneath bottom portion 162 of first removable insert 152, a sockliner or strobe sock may be disposed between bottom portion 162 and lower cavity surface 236.

[0069] FIGS. 7 and 8 are schematic views illustrating the change in configuration of first removable insert 152 and article of footwear 100 between a static configuration (FIG. 7) and a dynamic configuration (FIG. 8), according to an embodiment. Referring first to FIG. 7, when a wearer 600 is at rest, standing, or walking with relatively low impact forces being applied to first removable insert 152, first removable insert 152 rests within cavity 230 of midsole 112 as described above and shown in FIG. 6. In this configuration, a foot 602 rests on top portion 160 of first removable insert 152. Moreover, in this case, top portion 160 of first removable insert is disposed a distance 702 above lower cavity surface 236. In this case, distance 702 approximately corresponds to the thickness of first removable insert 152 in the static configuration of FIG. 7.

[0070] Referring now to FIG. 8, as higher impact forces are applied by foot 602, the configuration of first removable insert 152 and article of footwear 100 may vary. Specifically, a generally downward force applied to first removable insert 152 by foot 602 results in the downward compression of first removable insert 152. Although first removable insert 152 is compressed vertically, in at least some embodiments, portions of first removable insert 152 may retain an approximately constant lateral width. As indicated in FIGS. 7 and 8, for example, top portion 160 of first removable insert 152 has a width 640 in the static configuration of FIG. 7 and in the dynamic configuration of FIG. 8. Because top portion 160 does not contract in the widthwise direction, as top portion 160 is pushed down by forces from foot 602, first insert sidewall 164 and second insert sidewall 166 apply an outward lateral force against first cavity sidewall 232 and second cavity sidewall 234, respectively. These laterally oriented forces, generated as first removable insert 152 "wedges" itself deeper into cavity 230 without substantial lateral compression, cause an outward bending of the peripheral sides of midsole 112. Specifically, as shown in FIG. 8, first side peripheral portion 210 and second side peripheral portion 212 are bent outwardly and away from the vertical direction, such that the lateral width of midsole 112 is momentarily increased in at least some portions.

[0071] As seen in FIG. 8, in this dynamic configuration, top portion 160 of first removable insert 152 is disposed a distance 704 from lower cavity surface 236. In this case, distance 704 is approximately equal to the thickness of first removable insert 152 in this configuration. It can be seen by comparing distance 702 in FIG. 7 with distance 704 in FIG. 8, that top portion 160 has receded further into cavity 230 as first removable insert 152 is compressed.

[0072] This outward bending of first side peripheral portion 210 and second side peripheral portion 212 may result in a temporary increase in the width of midsole 112, especially near top portion 202. For example, in the configuration shown in FIG. 7, top portion 202 of midsole 112 may have a width 680, as measured between first outer sidewall 270 and second outer sidewall 272. In the expanded configuration of FIG. 8, top portion 202 of midsole 112 may have width 682, which may be substantially greater than width 680.

[0073] As first side peripheral portion 210 and second side peripheral portion 212 are bent outwardly and away from their default vertical orientations, adjacent portions of upper 102 may likewise be pulled in a similar outward manner. As shown in FIG. 8, first lower peripheral portion 512, which may be permanently attached to first cavity sidewall 232, may be pulled outwardly (i.e., distally) as first side peripheral portion 210 bends outwardly. Likewise, second lower peripheral portion 514, which may be permanently attached to second cavity sidewall 234, may be pulled outwardly (i.e., distally) as second side peripheral portion 212 bends outwardly. This distal movement of first lower peripheral portion 512 and second lower peripheral portion 514 of upper 102 may result in a top portion 510 of upper 102 being pulled down closer to (and tighter against) foot 602. In at least some embodiments, top portion 510 acts to apply a momentary clamping force to foot 602 in order to increase support and stability for foot 602 during the maneuver depicted in FIG. 8.
It is contemplated that in some embodiments, the outward expansion of midsole 112 under loads applied to an insert could be varied according to the construction of the insert. For example, a more rigid top portion for the insert may limit any widthwise contraction of the insert and thus maximize outward expansion of the midsole. In contrast, using a less rigid top portion may allow for some widthwise expansion of the insert (at the top portion especially), thereby reducing the outward expansion of the midsole. Thus, it will be understood that the properties of an insert may be tuned to vary the effect described and shown in FIGS. 7 and 8.

In some instances a footwear system may include various types of articulation of footwear configured to receive a one or more inserts. As shown in FIG. 9, footwear system 201 may include a set of articles of footwear 250, as well as a set of inserts 180. Such a system may allow for customization of an article of footwear. For example, the system may allow for a user to use either a first insert to correct for pronation or a second insert to correct for supination. In another example, the system may allow for a single user to use a first insert to support a training day that is, for example, selected to minimize the risk of injury and a second insert for game day that is, for example, selected to maximize a performance.

In some embodiments, the set of inserts 180 of system 201 (see FIG. 9) are substantially similar to the set of inserts 150 of system 101 (see FIG. 1). For example, as shown in FIG. 9, the set of inserts 180 may include the first removable insert 182 that is identical to the first removable insert 152 of the set of inserts 150. In the example, the set of inserts 180 may also include the second removable insert 184 that is identical to the second removable insert 154 of the set of inserts 150. In other embodiments, the set of inserts 180 of system 201 are different than the set of inserts 150 of system 101 (not shown). For example, the set of inserts 180 may include one insert, or more than two. In another example, the set of inserts 180 may include inserts having different physical properties (e.g., elasticity) than the first removable insert 182 and the second removable insert 184. As such, it should be understood that the system 201 utilizes the set of inserts 180 for exemplary purposes only and that various other types of inserts may alternatively be used.

As noted above, the footwear system may include various types of shoes. As shown in FIG. 9, the set of articles 250 may include a sandal 300, track shoe 900, low-cut basketball shoe 1000, high-cut basketball shoe 1100, and boot 1200. In other embodiments, the set of articles 250 may include fewer articles of footwear (e.g., two, three, four), or more articles of footwear (e.g., six, seven, etc.). Additionally, in some embodiments, the various shoes of the set of articles 250 may include different styles of articles of footwear or articles of footwear intended for different purposes. For example, the set of articles may include an article of footwear having a hook and loop attachment. In another example, the set of articles may include an article of footwear intended for golfing. As such, it should be understood that the set of articles 250 of FIG. 9 is for exemplary purposes only.

In some instances, the various types of shoes may be configured with different uppers to support various styles and/or functions of the set of articles of footwear. For example, as shown in FIG. 9, set of articles 250 includes sandal upper 852, track shoe upper 952, low-cut basketball upper 1052, high-cut basketball upper 1152, and boot upper 1252. In the example, each of the different uppers is attached to a sole structure configured to accept include the first removable insert 182 and the second removable insert 184. As such, first removable insert 182 and second removable insert 184 may be utilized to customize shoes with different uppers to support numerous styles and functions of the set of articles of footwear. Similarly, each of the uppers may be formed of different materials. For example, sandal upper 852 may be formed of a water resistant thermal plastic, while boot upper 1252 may be formed of leather. Further, each of the uppers may have different heights. For example, low-cut basketball upper 1052 may have a height substantially less than high-cut basketball upper 1054. Accordingly, system 201 may allow use of various materials and or sizes of uppers to support numerous styles and functions.

Similarly, in certain instances, the various types of shoes may be configured with different outsoles to support numerous styles and/or functions of the set of articles of footwear. For example, as shown in FIG. 9, set of articles 250 may include sandal outsole 864, track shoe outsole 964, low-cut basketball outsole 1064, high-cut basketball outsole 1164, and boot outsole 1264. In the example, each of the different outsoles is attached to a sole structure configured to accept the first removable insert 182 and the second removable insert 184. As such, first removable insert 182 and second removable insert 184 may be utilized to customize shoes with different outsoles to support numerous styles and functions of the set of articles of footwear.

As shown, in some embodiments, the outsole may include ground engaging elements. For example, as shown in FIG. 9, the track shoe outsole 964 may include cleat 963 as a ground engaging element while sandal 800 may use a flat ground engaging element as a ground engaging element (not shown). In the example, low-cut basketball outsole 1064 may include an integrated protrusion as a ground engaging element (not shown). Similarly, high-cut basketball outsole 1164 may include an integrated protrusion as a ground engaging element (not shown). In the example, boot outsole 1264 may include integrated protrusion 1263 as a ground engaging element. The various outsoles of system 201 may use various other ground engaging elements known in the art. For example, system 201 may include an outsole using a replaceable cleat as a ground engaging element.

Similarly, the ground engaging elements may be formed using different materials. For example, the cleat 963 may be formed of a metal and/or polymer while integrated protrusion 1263 is formed of an elastomer such as polyurethane. It is contemplated that cleats of different articles of footwear may have different materials. Similarly, in some embodiments, integrated protrusions of different articles of footwear may have different material. For example, integrated protrusion 1263 may be formed of a soft polymer to allow better traction. In another example, integrated protrusion 1263 may be formed of a hard polymer to improve a wear and tear of the outsole 1264.

Similarly, as shown, the outsoles may, in certain embodiments, have different thicknesses. For example, outsole 864 of Sandal 800 may be thin while outsole 1264 of boot 1200 may be thick. Further, as shown, the outsoles may, in certain embodiments, have different tread patterns. For example, outsole 864 of Sandal 800 may be substantially flat, outsole 1064 of low-cut basketball outsole 1064 and outsole 1164 of high-cut basketball outsole 1164 may include a tread pattern having a moderate density for use indoors, and outsole 1264 of boot 1200 may include a tread pattern having a high density for use outdoors.
It should be understood that the various characteristics of the set of articles 250 described herein and illustrated in the figures are intended to be only illustrative and should not be interpreted as limiting. For example, one article of the set of articles 250 may use an elastomeric shoe lace and another article of the set of articles 250 may use a hook and loop fastener. In another example, an article of the set of articles 250 may use a thick collar and another article of the set of articles 250 may use a thin collar. In yet another example, an article of the set of articles 250 may have an upper formed primarily utilize yarns and knitting techniques and another article of the set of articles may be formed primarily using rubber, plastics, and petrochemical-derived materials.

FIG. 10 illustrates an exploded isometric view of an embodiment of sandal 800, including sandal upper 852, midsole 862, and outsole 864. Midsole 862 may include a front peripheral portion 806 and a rear peripheral portion 808. Midsole 862 may also include a first side peripheral portion 810, which extends from front peripheral portion 806 to rear peripheral portion 808. Similarly, midsole 862 may also include a second side peripheral portion 812, which extends from front peripheral portion 806 to rear peripheral portion 808.

As shown in FIG. 10, midsole 862 may include a cavity 830 that is configured to receive one or more inserts from set of inserts 180 and/or the set of inserts 150. Generally, cavity 830 of midsole 862 may be disposed in top portion 802 of midsole 862. In some embodiments, cavity 830 may extend through forefront portion 10, midfoot portion 12 and/or heel portion 14 of midsole 862. In an exemplary embodiment, cavity 830 extends from forefront portion 10 through midfoot portion 12 and to heel portion 14 of midsole 862.

FIG. 10 includes an enlarged cross-sectional view of a portion of midsole 862 in forefront portion 10, as well as an enlarged cross-sectional view of a portion of midsole 862 in heel portion 14. These enlarged cross-sectional views are intended to illustrate the details of cavity 830. Referring to FIG. 10, especially the enlarged cross-sectional views of forefront portion 10 and heel portion 14, cavity 830 may include an inner surface 873 and an outer surface 874.

As shown, the inner surface 873 includes a first cavity sidewall 832, second cavity sidewall 834, and lower cavity surface 836. It should be noted that the first cavity sidewall 832, second cavity sidewall 834, and lower cavity surface 836 of the sandal 800 may have one or more features similar to the first cavity sidewall 232, second cavity sidewall 234, and lower cavity surface 236 of the article of footwear 100. For example, the first cavity sidewall 832 may be associated with first side peripheral portion 810 of midsole 862. In the example, cavity 830 may include a second cavity sidewall 834 that is associated with second side peripheral portion 812 of midsole 862. In addition, cavity 830 may include a lower cavity surface 836 that is associated with bottom portion 804 of midsole 862. In another example, lower cavity surface 836 could be approximately parallel with a ground contacting surface of sole structure 860.

As seen in the enlarged cross-sectional views of FIG. 10, first cavity sidewall 832 and second cavity sidewall 834 may be tapered with respect to lower cavity surface 836 of cavity 830. In this exemplary configuration, first cavity sidewall 832 forms an angle 890 with lower cavity surface 836 forefront portion 10. Likewise, second cavity sidewall 834 forms an angle 891 with lower cavity surface 836 forefront portion 10. In some embodiments, angle 890 is substantially similar to angle 290 and/or angle 891 is substantially similar to angle 291. For example, angle 890 and angle 891 may both have values approximately in the range between 90 degrees and 150 degrees. In another example, angle 890 and angle 891 could be approximately similar, however in other embodiments, angle 890 and angle 891 could have different values.

It should be understood that the first cavity sidewall 832 of the sandal 800 and the second cavity sidewall 834 of the sandal 800 may have similar features as the first cavity sidewall 232 of the article of footwear 100 and the second cavity sidewall 234 of the article of footwear 100. For example, the degree of tapering, slope, or slanting, of first cavity sidewall 832 could be different from the degree of tapering, slope, or slanting of second cavity sidewall 834. In another example, as seen in FIG. 10, first cavity sidewall 832 forms an angle 894 with lower cavity surface 836 in heel portion 14 that is generally smaller than angle 890 that is formed between first cavity sidewall 832 and lower cavity surface 836 in forefront portion 10. Similarly, second cavity sidewall 834 forms an angle 893 with lower cavity surface 836 in heel portion 14 that is generally smaller than angle 891 that is formed between second cavity sidewall 834 and lower cavity surface 836 in forefront portion 10. In other embodiments, these angles could vary in any other manner and may generally be selected to accommodate the angles formed by sidewalls of a corresponding insert.

In the embodiment depicted in FIG. 10, lower cavity surface 836 of the sandal 800 may be substantially similar to the lower cavity surface 236 of the article of footwear 100. For example, the lower cavity surface 836 may be generally flat. In another example, the approximate depth of lower cavity surface 836, indicated schematically as depth 839, may be approximately constant between first cavity sidewall 832 and second cavity sidewall 834 (in a lateral direction). In yet another example, as seen by comparing depth 839 of cavity 230 in forefront portion 10 with depth 837 of cavity 830 in heel portion 14, it will be understood that the depth of cavity 830 may vary in the longitudinal direction of midsole 862.

It should be understood that the cross-sectional geometry of the cavity 830 of the sandal 800 may be similar to the cross-sectional geometry of the cavity 230 of the article of footwear 100. For example, the cross-sectional geometry could comprise any approximate geometry, including, but not limited to: a rounded geometry, a rectilinear geometry as well as any other kind of geometry. In another example, cavity 830 may have an approximately trapezoidal cross-sectional geometry resulting from angled arrangement of first cavity sidewall 832 with lower cavity surface 836 and of second cavity sidewall 834 with lower cavity surface 836. In yet another example, cavity 830 may have a first cross-sectional geometry 840 in forefront portion 10 and a second cross-sectional geometry 842 in heel portion 14.

The first side peripheral portion 810 and second side peripheral portion 812 of the sandal 800 may have one or more features similar to the first side peripheral portion 210 and second side peripheral portion 212 of the article of footwear 100. For example, second side peripheral portion 812 has a first lateral thickness 880 at top portion 802 of midsole 862. Further, second side peripheral portion 812 has a second lateral thickness 882 between top portion 802 and lower cavity surface 836. Also, second side peripheral portion 812 has a third lateral thickness 884 at lower cavity surface 836. It should be understood that the first lateral thickness, the sec-
second lateral thickness, and/or the third lateral thickness may be similar in different portions of the sole. For example, first lateral thickness 880, second lateral thickness 882, and third lateral thickness 884 may be similar in the forefoot portion 10 and in the heel portion 14. Moreover, the third lateral thickness 884 may be greater than second lateral thickness 882. Also, second lateral thickness 882 may be greater than first lateral thickness 880. In other embodiments, first side peripheral portion 810 and second side peripheral portion 812 of sandal 800 and first side peripheral portion 210 and second side peripheral portion 212 of article 100 are different. For example, thickness 880 at top portion 802 of midsole 862 may be different than first lateral thickness 880 at top portion 202 of midsole 262 (not shown).

As shown, outer surface 874 of the cavity 830 may include first outer sidewall 870, second outer sidewall 872, and bottom portion 804. It should be noted that the first outer sidewall 870, second outer sidewall 872, and bottom portion 804 of the sandal 800 may have one or more features similar to the first outer sidewall 270, second outer sidewall 272, and bottom portion 204 of the article of footwear 100. For example, outer surface 874 may extend from front peripheral portion 806 to rear peripheral portion 808.

In order to support an insertion of a single insert into each article of footwear of a set of articles of footwear, each article may have a cavity with a standardized inner surface. For example, article 100 (see FIG. 2) includes a cavity 230 that is substantially similar to a cavity 830 of sandal 800 (see FIG. 10). As such, a single insert may be used in a first article of footwear as well as a second article of footwear, thereby allowing further flexibility in a customization of footwear. For example, first removable insert 152 and/or first removable insert 182 may be positioned into article 100 (see FIG. 6), as well into sandal 800 (see FIG. 11).

In certain embodiments, inner surfaces of articles of footwear may have substantially similar geometries by having lower cavity surfaces of approximately equal widths. For example, the cavity surface 236 of article 100 has a width 235 that is approximately equal to width 835 of the lower cavity surface 836 of sandal 800 (see FIGS. 2 and 10). As used herein, two widths are approximately equal when a difference between the two widths is less than ten percent of either of the two widths. It should be understood that the width of the lower cavity surface may change depending on the longitudinal position of the article of footwear. So, widths may be taken at approximately similar longitudinal position to account for the change depending on the longitudinal position of the article of footwear. For example, width 235 and width 835 are both positioned in heel portion 14 (see FIGS. 2 and 10). Accordingly, an insert may be sized to have a bottom portion associate with the width, thereby allowing for a single insert to be utilized by a set of articles of footwear.

Similarly, in some embodiments, inner surfaces of articles of footwear may have substantially similar geometries by tapering the cavities of each article of the set of articles to approximately equal angles. For example, angle 190 of article 100 and angle 890 of sandal 800 may approximately equal. As used herein, two angles are approximately equal when a difference between the two angles is less than ten degrees. Similarly, in the example, angle 291 of article 100 and angle 891 of sandal 800 may substantially equal. Accordingly, an insert may be sized to have a first angle (e.g., first angle 191) and a second angle (e.g., second angle 192) to associate with the angle (e.g., angle 190, angle 291, etc.), thereby allowing for a single insert to be utilized by a set of articles of footwear.

In order to allow for different properties, in some embodiments, outer surfaces of articles of footwear may have substantially different geometries. In one embodiment, outer surfaces of articles of footwear may have substantially different geometries by varying a height of a first side peripheral portion and/or a second side peripheral portion of a midsole. For example, as shown in FIGS. 10 and 11, it may be desirable for sandal 800 to have a sole structure 860 with a reduced size and weight to support amphibious activities. In some embodiments, a sole structure may have a reduced size and weight by reducing a height of the first side peripheral portion and/or a second side peripheral portion. For example, sandal 800 may have first side peripheral portion 810 and second side peripheral portion 812 with height 869. In other embodiments, heights of the first side peripheral portion and second side peripheral portion of each article of the set of articles 250 are substantially equal (not shown).

In certain embodiments, the insert may extend above the first side peripheral portion and/or a second side peripheral portion. For example, as shown in FIG. 11, first removable insert 182 may extend above first side peripheral portion 810 and second side peripheral portion 812 a distance 868. In other embodiments, the insert may remain above the first side peripheral portion and/or a second side peripheral portion (see FIG. 7). Thus, in certain embodiments, the system 201 may include an article configured for an insert to extend above the first side peripheral portion and the second side peripheral portion as well as another article configured to have the insert remaining below a first side peripheral portion and a second side peripheral portion (see FIG. 7).

Similarly, in one embodiment, outer surfaces of articles of footwear may have substantially different geometries by varying a height of a first outer sidewall and/or a second outer sidewall of a midsole. For instance, as shown in FIG. 11, sandal 800 may have a first outer sidewall 870 and a second outer sidewall 872 with height 869. As shown, in certain embodiments, a set may extend above the first outer sidewall and/or the second outer sidewall. For example, as shown in FIG. 11, first removable insert 152 may extend above first outer sidewall 870 and second outer sidewall 872 a distance 868. In other embodiments, the set may remain below the first outer sidewall and/or the outer sidewall (see FIG. 7).

FIG. 12 illustrates an exploded isometric view of an embodiment of track shoe 900, including track shoe upper 952 and sole structure 960. As shown, the sole structure 960 includes midsole 962, and outsole 964. Midsole 962 may include a front peripheral portion 906 and a rear peripheral portion 908. Midsole 962 may also include a first side peripheral portion 910, which extends from front peripheral portion 906 to rear peripheral portion 908.

FIG. 12 includes an enlarged cross-sectional view of a portion of midsole 962 in forefoot portion 10, as well as an enlarged cross-sectional view of a portion of midsole 962 in heel portion 14. These enlarged cross-sectional views are intended to illustrate the details of cavity 930. Referring to FIG. 12, especially the enlarged cross-sectional views of forefoot portion 10 and heel portion 14, cavity 930 may include an inner surface 973 and an outer surface 974.

As shown, the inner surface 973 includes a first cavity sidewall 932, second cavity sidewall 934, and lower
cavity surface 936. It should be noted that the first cavity sidewall 932, second cavity sidewall 934, and lower cavity surface 936 of the track shoe 900 may have one or more features similar to the first cavity sidewall 232, second cavity sidewall 234, and lower cavity surface 236 of the article of footwear 100. That is, the inner surface 973 may be substantially similar to the inner surface 873.

[0103] As shown, outer surface 974 of the cavity 930 may include first outer sidewall 970, second outer sidewall 972, and bottom portion 904. It should be noted that the first outer sidewall 970, second outer sidewall 972, and bottom portion 904 of the track shoe 900 may have one or more features similar to the first outer sidewall 270, second outer sidewall 272, and bottom portion 204 of the article of footwear 100. For example, outer surface 974 may extend from front peripheral portion 906 to rear peripheral portion 908. However as discussed further, the outer surface 974 may be substantially different from the outer surface 874.

[0104] In some embodiments, outer surfaces of articles of footwear may have substantially different geometries by varying an outer angle of a first outer sidewall and/or a second outer sidewall of a midsole. In one embodiment, an outer angle of an outer sidewall may vary between sole structures of different articles of footwear while maintaining substantially similar inner cavities. For example, second side peripheral portion 212 of article 100 has an approximately vertical second outer sidewall 272 (see FIG. 2) while second side peripheral portion 912 of the second outer sidewall 972 of the track shoe 900 is tapered. As shown in FIG. 12, the second outer sidewall 972 of the outer surface 974 forms an outer angle 986 with bottom portion 904 of the outer surface 974 that is less than 270 degrees. It should be understood that the tapering of the first outer sidewall 970 of the first side peripheral portion 910 may be similar or equal to the second outer sidewall 972 of the second side peripheral portion 912. Similarly, it should be understood that the tapering of first outer sidewall 970 and/or second outer sidewall 972 in the forefoot portion 10 may be similar or equal in the midfoot portion 12 and/or the heel portion 14.

[0105] Similarly, in certain embodiments, the thicknesses of each side peripheral portion may vary between sole structures of different articles of footwear while maintaining substantially similar inner cavities. For example, the second outer sidewall 972 of the outer surface 974 has a first lateral thickness 980 at top portion 902 of track shoe 900, a second lateral thickness 982 between top portion 902 and lower cavity surface 936, and a third lateral thickness 984 at lower cavity surface 936. As shown, the first lateral thickness 980 of the track shoe 900 is approximately equal to the first lateral thickness 280 of the article of footwear 100 while the second lateral thickness 982 of the track shoe 900 is less than the second lateral thickness 282 of the article of footwear 100 and the third lateral thickness 984 of the track shoe 900 is approximately equal to the third lateral thickness 284 of the article of footwear 100. As shown in FIG. 12, third lateral thickness 984 is greater than second lateral thickness 982. Also, second lateral thickness 982 is greater than first lateral thickness 980. It should be understood that the various thicknesses of the first outer sidewall 970 may be similar or equal to the second outer sidewall 972. Similarly, it should be understood that the various thicknesses of the first outer sidewall 970 and/or the second outer sidewall 972 in the forefoot portion 10 may be similar or equal in the midfoot portion 12 and/or the heel portion 14.

[0106] FIG. 13 illustrates an exploded isometric view of an embodiment of low-cut basketball shoe 1000, including low-cut basketball upper 1052 and sole structure 1060. As shown, the sole structure 1060 includes midsole 1062, and outsole 1064. Midsole 1062 may include a front peripheral portion 1006 and a rear peripheral portion 1008. Midsole 1062 may also include a first side peripheral portion 1010, which extends from front peripheral portion 1006 to rear peripheral portion 1008.

[0107] FIG. 13 includes an enlarged cross-sectional view of a portion of midsole 1062 in forefoot portion 10, as well as an enlarged cross-sectional view of a portion of midsole 1062 in heel portion 14. These enlarged cross-sectional views are intended to illustrate the details of cavity 1030. Referring to FIG. 13, especially the enlarged cross-sectional views of forefoot portion 10 and heel portion 14, cavity 1030 may include an inner surface 1073 and an outer surface 1074.

[0108] As shown, the inner surface 1073 includes a first cavity sidewall 1032, second cavity sidewall 1034, and lower cavity surface 1036. It should be noted that the first cavity sidewall 1032, second cavity sidewall 1034, and lower cavity surface 1036 of the low-cut basketball shoe 1000 may have one or more features similar to the first cavity sidewall 232, second cavity sidewall 234, and lower cavity surface 236 of the article of footwear 100. That is, the inner surface 1073 may be substantially similar to the inner surface 873 and/or inner surface 973.

[0109] As shown, outer surface 1074 of the cavity 1030 may include first outer sidewall 1070, second outer sidewall 1072, and bottom portion 1004. It should be noted that the first outer sidewall 1070, second outer sidewall 1072, and bottom portion 1004 of the low-cut basketball shoe 1000 may have one or more features similar to the first outer sidewall 270, second outer sidewall 272, and bottom portion 204 of the article of footwear 100. For example, outer surface 1074 may extend from front peripheral portion 1006 to rear peripheral portion 1008. However as discussed further, the outer surface 1074 may be substantially different from outer surface 874 and/or outer surface 974.

[0110] In some embodiments, outer surfaces of articles of footwear may have substantially different geometries by varying a shape of the outer surfaces. For example, second outer sidewall 272 of second side peripheral portion 212 has an approximately linear shape (see FIG. 2) while second outer sidewall 1072 of second side peripheral portion 1012 has an approximately non-linear shape. As used herein, a shape may be approximately linear when the shape has an angle of less than ten degrees. Similarly, as used herein, a shape may be approximately non-linear when the shape has an angle of more than ten degrees. It should be understood that the shape of first outer sidewall 1070 may be similar or equal to second outer sidewall 1072. Similarly, it should be understood that the shape of first outer sidewall 1070 and/or second outer sidewall 1072 in the forefoot portion 10 may be similar or equal in the midfoot portion 12 and/or the heel portion 14.

[0111] Similarly, in certain embodiments, outer surfaces of articles of footwear may have substantially different geometries by varying the respective thicknesses of each side peripheral portion may vary between sole structures of different articles of footwear while maintaining substantially similar inner cavities. For example, the second outer sidewall 1072 of the outer surface 1074 has a first lateral thickness 1080 at top portion 1002 of low-cut basketball shoe 1000, a second lateral thickness 1082 between top portion 1002 and
lower cavity surface 1036, and a third lateral thickness 1084 at lower cavity surface 1036. As shown, the first lateral thickness 1080 of the low-cut basketball shoe 1000 is approximately equal to the first lateral thickness 980 of the track shoe 900 and the second lateral thickness 1082 of the low-cut basketball shoe 1000 is approximately equal to the second lateral thickness 982 of the track shoe 900 while the third lateral thickness 1084 of the low-cut basketball shoe 1000 is greater than the third lateral thickness 984 of the track shoe 900. As shown in FIG. 13, third lateral thickness 1084 is greater than second lateral thickness 1082. Also, second lateral thickness 1082 is greater than first lateral thickness 1080. It should be understood that the lateral thickness of first side peripheral portion 1010 may be similar or equal to a shape of second side peripheral portion 1012 (see FIG. 13). Similarly, it should be understood that the lateral thickness of first side peripheral portion 1010 and/or second side peripheral portion 1012 in forefoot portion 10 may be similar or equal in the midfoot portion 12 and/or heel portion 14 (see FIG. 13).

FIG. 14 illustrates an exploded isometric view of an embodiment of a high-cut basketball shoe 1100, including high-cut basketball shoe upper 1152 and sole structure 1160. As shown, the sole structure 1160 includes midsole 1162, and outsole 1164. Midsole 1162 may include a front peripheral portion 1106 and a rear peripheral portion 1108. Midsole 1162 may also include a first side peripheral portion 1110, which extends from front peripheral portion 1106 to rear peripheral portion 1108.

FIG. 14 includes an enlarged cross-sectional view of a portion of midsole 1162 in forefoot portion 10, as well as an enlarged cross-sectional view of a portion of midsole 1162 in heel portion 14. These enlarged cross-sectional views are intended to illustrate the details of cavity 1130. Referring to FIG. 14, especially the enlarged cross-sectional views of forefoot portion 10 and heel portion 14, cavity 1130 may include an inner surface 1173 and an outer surface 1174.

As shown, the inner surface 1173 includes a first cavity sidewall 1132, second cavity sidewall 1134, and lower cavity surface 1136. It should be noted that the first cavity sidewall 1132, second cavity sidewall 1134, and lower cavity surface 1136 of the high-cut basketball shoe 1100 may have one or more features similar to the first cavity sidewall 232, second cavity sidewall 234, and lower cavity surface 236 of the article of footwear 100. That is, the inner surface 1173 may be substantially similar to inner surface 873, inner surface 973, and/or inner surface 1073.

As shown, outer surface 1174 of the cavity 1130 may include first outer sidewall 1170, second outer sidewall 1172, and bottom portion 1104. It should be noted that the first outer sidewall 1170, second outer sidewall 1172, and bottom portion 1104 of the high-cut basketball shoe 1100 may have one or more features similar to the first outer sidewall 270, second outer sidewall 272, and bottom portion 204 of the article of footwear 100. For example, outer surface 1174 may extend from front peripheral portion 1106 to rear peripheral portion 1108. However as discussed further, outer surface 1174 may be substantially different from outer surface 874, outer surface 974, and/or outer surface 1174.

In varying embodiments, outer surfaces of articles of footwear may have substantially different geometries by varying an average lateral thickness of each side peripheral portion may vary between sole structures of different articles of footwear while maintaining substantially similar inner cavities. For example, the second outer sidewall 1172 of the outer surface 1174 has a first lateral thickness 1180 at top portion 1102 of high-cut basketball shoe 1100, a second lateral thickness 1182 between top portion 1102 and lower cavity surface 1136, and a third lateral thickness 1184 at lower cavity surface 1136. As shown, first lateral thickness 1180 of the high-cut basketball shoe 1100 is greater than first lateral thickness 1080 of the low-cut basketball shoe 1000. In the example, second lateral thickness 1182 of the high-cut basketball shoe 1100 is greater than second lateral thickness 1082 of the low-cut basketball shoe 1000. Further, in the example, third lateral thickness 1184 of the high-cut basketball shoe 1100 is greater than third lateral thickness 1084 of the low-cut basketball shoe 1000. It should be understood that the various lateral thicknesses of the first side peripheral portion 1110 may be similar or equal to the various lateral thicknesses of the second side peripheral portion 1112 (see FIG. 14). Similarly, it should be understood that the various lateral thicknesses of the first side peripheral portion 1110 and/or the second side peripheral portion 1112 in the forefoot portion 10 may be similar or equal in the midfoot portion 12 and/or the heel portion 14 (see FIG. 14).

FIG. 15 illustrates an exploded isometric view of an embodiment of boot 1200, including boot upper 1252 and sole structure 1260. As shown, the sole structure 1260 includes midsole 1262, and outsole 1264. Midsole 1262 may include a front peripheral portion 1206 and a rear peripheral portion 1208. Midsole 1262 may also include a first side peripheral portion 1210, which extends from front peripheral portion 1206 to rear peripheral portion 1208. Similarly, midsole 1262 may also include a second side peripheral portion 1212, which extends from front peripheral portion 1206 to rear peripheral portion 1208.

FIG. 15 includes an enlarged cross-sectional view of a portion of midsole 1262 in forefoot portion 10, as well as an enlarged cross-sectional view of a portion of midsole 1262 in heel portion 14. These enlarged cross-sectional views are intended to illustrate the details of cavity 1230. Referring to FIG. 15, especially the enlarged cross-sectional views of forefoot portion 10 and heel portion 14, cavity 1230 may include an inner surface 1273 and an outer surface 1274.

As shown, the inner surface 1273 includes a first cavity sidewall 1232, second cavity sidewall 1234, and lower cavity surface 1236. It should be noted that the first cavity sidewall 1232, second cavity sidewall 1234, and lower cavity surface 1236 of the boot 1200 may have one or more features similar to the first cavity sidewall 232, second cavity sidewall 234, and lower cavity surface 236 of the article of footwear 100. That is, the inner surface 1273 may be substantially similar to inner surface 873, inner surface 973, and/or inner surface 1073.

As shown, outer surface 1274 of the cavity 1230 may include first outer sidewall 1270, second outer sidewall 1272, and bottom portion 1204. It should be noted that the first outer sidewall 1270, second outer sidewall 1272, and bottom portion 1204 of the boot 1200 may have one or more features similar to the first outer sidewall 270, second outer sidewall 272, and bottom portion 204 of the article of footwear 100. For example, outer surface 1274 may extend from front peripheral portion 1206 to rear peripheral portion 1208. However as discussed further, the outer surface 1274 may be substantially different from outer surface 874, outer surface 974, outer surface 1074, and/or outer surface 1174.

In some embodiments, outer surfaces of articles of footwear may have substantially different geometries by
varying a bottom thickness of each midsole of different articles of footwear while maintaining substantially similar inner cavities. As used herein, a bottom thickness may be a spacing of a bottom portion from a lower cavity surface. For example, midsole 1262 of boot 1200 has bottom thickness 1286 spacing bottom portion 1204 of the outer surface 1274 from lower cavity surface 1236. In the example, the bottom thickness 1286 is substantially larger than thickness 286 of article of footwear 100. It should be understood that the various thicknesses of the midsole 1262 in the forefoot portion 10 may be similar or equal in the midfoot portion 12 and/or the heel portion 14 (see FIG. 15). For example, thickness 1286 of the midsole 1262 in the forefoot portion may be thicker or thinner than the thickness 1288 of the midsole 1262 in the heel portion 14. In the example, the midsole 1262 of boot 1200 has thickness 1286 in the forefoot portion 10 that is substantially larger than thickness 286 of article of footwear 100 and the midsole 1262 of boot 1200 has thickness 1288 in the heel portion 14 that is substantially larger than thickness 288 of article of footwear 100.

[0122] While various embodiments have been described, the description is intended to be exemplary, rather than limiting and it will be apparent to those of ordinary skill in the art that many more embodiments and implementations are possible that are within the scope of the embodiments. Any feature of any embodiment may be used in combination with or substituted for any other feature or element in any other embodiment unless specifically restricted. Accordingly, the embodiments are not to be restricted except in light of the attached claims and their equivalents. Also, various modifications and changes may be made within the scope of the attached claims.

What is claimed is:

1. An insert system comprising:
   a first article of footwear comprising:
   a first upper;
   a first sole structure comprising a first midsole, the first midsole having a first side peripheral portion, a first bottom portion, a first top portion, and a first cavity; wherein the first cavity has a first cavity sidewall associated with the first side peripheral portion of the first midsole and wherein the first cavity has a first lower cavity surface associated with the first bottom portion of the first midsole; and wherein the first cavity sidewall is tapered;
   a second article of footwear comprising:
   a second upper;
   a second sole structure comprising a second midsole, the second midsole having a second side peripheral portion, a second bottom portion, a second top portion, and a second cavity; wherein the second cavity has a second cavity sidewall associated with the second side peripheral portion of the second midsole and wherein the second cavity has a second lower cavity surface associated with the second bottom portion of the second midsole; and wherein the second cavity sidewall is tapered;
   wherein the first side peripheral portion and the second side peripheral portion have different thicknesses; and wherein the first cavity and the second cavity have substantially similar geometries.

2. The insert system according to claim 1, wherein the first lower cavity surface is approximately parallel with a first ground contacting surface of the first article of footwear; wherein the second lower cavity surface is approximately parallel with a second ground contacting surface of the second article of footwear; and wherein the first lower cavity surface and the second lower cavity surface have substantially equal widths.

3. The insert system according to claim 1, wherein a first angle formed between the first cavity sidewall and the first lower cavity surface is in a range between 100 and 150 degrees; and wherein a second angle formed between the second cavity sidewall and the second lower cavity surface is in a range between 100 and 150 degrees.

4. The insert system according to claim 3, further comprising:
   a removable insert being configured to fit within the first cavity and the second cavity;
   wherein the removable insert includes an insert sidewall;
   wherein the insert sidewall is tapered;
   wherein the first cavity sidewall is associated with the insert sidewall when the removable insert is disposed in the first cavity; and wherein the second cavity sidewall is associated with the insert sidewall when the removable insert is disposed in the second cavity.

5. The insert system according to claim 4, further comprising:
   wherein the removable insert includes an insert bottom portion; and wherein the first lower cavity surface is associated with the insert bottom portion when the removable insert is disposed in the first cavity; and wherein the second lower cavity surface is associated with the insert bottom portion when the removable insert is disposed in the second cavity.

6. The insert system according to claim 5, wherein a first insert angle formed between the insert sidewall and the insert bottom portion is in a range between 100 and 150 degrees.

7. The insert system according to claim 5, wherein an insert angle formed between the insert sidewall and the insert bottom portion is substantially equal to the first angle and the second angle.

8. The insert system according to claim 1, wherein the first cavity has a first geometry, the first geometry being an approximately trapezoidal cross-sectional geometry at a longitudinal position of the first midsole; wherein the second cavity has a second geometry, the second geometry being an approximately trapezoidal cross-sectional geometry at a longitudinal position of the second midsole; and wherein the removable insert has an insert geometry, the insert geometry being an approximately trapezoidal cross-sectional geometry corresponding to the first geometry and the second geometry.

9. A set of sole structures comprising:
   a first sole structure having a first cavity, the first cavity having a first inner surface and a first outer surface; a second sole structure having a second cavity, the second cavity having a second inner surface and a second outer surface; wherein the first inner surface and the second inner surface have substantially similar geometries; and wherein the first outer surface and the second outer surface have substantially different geometries.
10. The set of sole structures according to claim 9, further comprising:

wherein the first inner surface includes a first lower cavity surface;
wherein the second inner surface includes a second lower cavity surface; and
wherein the first lower cavity surface and the second lower cavity surface have substantially equal widths.

11. The set of sole structures according to claim 10, wherein the first lower cavity surface is approximately parallel with a ground contacting surface of the first article of footwear; and

wherein the second lower cavity surface is approximately parallel with a ground contacting surface of the second article of footwear.

12. The set of sole structures according to claim 10, wherein the first outer surface includes a first bottom portion spaced from the first lower cavity surface by a first bottom thickness;

wherein the second outer surface includes a second bottom portion spaced from the second lower cavity surface by a second bottom thickness; and

wherein the first bottom thickness and the second bottom thickness are substantially different.

13. The set of sole structures according to claim 12, further comprising:

wherein the first inner surface further includes a first cavity sidewall having a first angle with the first lower cavity surface;
wherein the second inner surface includes a second cavity sidewall having a second angle with the second lower cavity surface; and
wherein the first angle is substantially equal to the second angle.

14. The set of sole structures according to claim 13, wherein the first angle is in a range between 100 and 150 degrees.

15. The set of sole structures according to claim 13, wherein the first outer surface includes a first outer sidewall; wherein the second outer surface includes a second outer sidewall; and

wherein the first outer sidewall and the second outer sidewall are different.

16. The set of sole structures according to claim 15, wherein the first outer sidewall is spaced from the first side cavity surface by a first lateral thickness;

wherein the second outer sidewall is spaced from the second side cavity surface by a second lateral thickness; and
wherein the first lateral thickness and the second lateral thickness are substantially different.

17. The set of sole structures according to claim 15, wherein the first outer sidewall forms a first outer angle with the first bottom portion;

wherein the second outer sidewall forms a second outer angle with the second bottom portion; and
wherein the first outer angle and the second outer angle are substantially different.

18. The set of sole structures according to claim 15, wherein the first outer sidewall has a substantially linear shape; and

wherein the second outer sidewall has a substantially non-linear shape.

19. The set of sole structures according to claim 9, wherein the first cavity and the second cavity are configured to receive identical inserts.

20. A set of articles of footwear comprising:

a first article of footwear having a first upper attached to a first midsole;
wherein the first midsole includes a first cavity, the first cavity having a first inner surface and a first outer surface;

a second article of footwear having a second upper attached to a second midsole;
wherein the second midsole includes a second cavity, the second cavity having a second inner surface and a second outer surface;

wherein the first inner surface and the second inner surface have substantially similar geometries; and
wherein the first upper and the second upper are different.

21. The set of articles of footwear according to claim 20, wherein the first upper is formed of a material different than the second upper.

22. The set of articles of footwear according to claim 20, wherein the first upper and the second upper have different heights.

23. The set of articles of footwear according to claim 20, wherein the first article of footwear includes a first ground engaging element;

wherein the second article of footwear includes a second ground engaging element; and
wherein the first ground engaging element and the second ground engaging element are different.

24. The set of articles of footwear according to claim 23, wherein the first ground engaging element and the second ground engaging element are formed using different materials.

25. The set of articles of footwear according to claim 23, wherein the first ground engaging element and the second ground engaging element have different thicknesses.

26. The set of articles of footwear according to claim 20, wherein the first upper and the second upper are different selections of a group consisting of a sandal, track shoe, low-cut basketball shoe, high-cut basketball shoe, and a boot.

27. The set of sole structures according to claim 20, where the first cavity and the second cavity are configured to receive identical inserts.

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