An insole for athletic shoe including a body having an outermost perimeter configured to fit within an athletic shoe, the outermost perimeter defining a top surface having forefoot, midfoot, and rearfoot portions. The insole having a first raised portion on the top surface which is positioned around the outermost perimeter at the rearfoot portion, and at least one structural element provided to improve support of the athletic shoe.
SPORT SPECIFIC FOOTWEAR INSOLE
CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of priority to U.S. Provisional Patent Application No. 61/295,030, filed Jan. 14, 2010, the entire content of which is hereby incorporated by reference in its entirety for all purposes.

FIELD OF THE INVENTION

[0002] The present invention relates to footwear insoles and, more specifically, to insoles designed for athletics footwear.

BACKGROUND

[0003] The movement that is required for playing a particular sport puts unique pressures and strains on a player’s feet. Footwear worn for certain sports does not always provide sufficient support, e.g. pressure distribution, shock absorption, and stabilization, to protect the wearer from potential injury. Further, sport-specific footwear does not adequately address the anatomical differences between the feet of adults and youth, which is necessary in order to provide proper support and prevent injury.

[0004] In light of these and other deficiencies related to athletics footwear, there exists a need to provide a solution which takes into account the particular requirements of each sport from the aspects of foot comfort and support, as well as the state of the anatomical development of the wearer.

SUMMARY

[0005] In one embodiment, the invention provides an insole for athletics footwear, which includes a body having an outermost perimeter configured to fit within an athletic shoe, the outermost perimeter defining a top surface having forefoot, midfoot, and rearfoot portions. The insole has a first raised portion of the top surface positioned around the outermost perimeter at the rearfoot portion and at least one structural element provided to improve support of the athletic shoe.

[0006] In another embodiment, the invention provides an insole for athletics footwear, which includes a body having an outermost perimeter configured to fit within an athletic shoe, the outermost perimeter defining a top surface having forefoot, midfoot, and rearfoot portions. The insole has a first raised portion of the top surface positioned around the outermost perimeter at the rearfoot portion and a second raised portion of the top surface positioned between the forefoot and midfoot portions. The insole has at least one structural element provided to improve support of the athletic shoe.

[0007] In yet another embodiment, the invention provides an insole for athletics footwear, which includes a body having an outermost perimeter configured to fit within an athletic shoe, the outermost perimeter defining a top surface having forefoot, midfoot, and rearfoot portions. The insole has a thickness differential between the forefoot portion and midfoot portion extending to the rearfoot portion. The insole has a first raised portion of the top surface positioned around the outermost perimeter at the rearfoot portion at least one structural element provided to improve support of the athletic shoe.

[0008] Various embodiments provide structurally distinct features which are purposefully designed to benefit athletes engaged within particular sports, such as basketball, baseball, football and soccer, by example.

[0009] Other aspects of the present invention will become apparent by consideration of the detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by an adult baseball player.

[0011] FIG. 2 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 1 taken along line 2-2.

[0012] FIG. 3 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by an adult basketball player.

[0013] FIG. 4 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 3 taken along line 4-4.

[0014] FIG. 5 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by an adult football player.

[0015] FIG. 6 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 5 taken along line 6-6.

[0016] FIG. 7 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by an adult lacrosse player.

[0017] FIG. 8 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 7 taken along line 8-8.

[0018] FIG. 9 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by an adult soccer player.

[0019] FIG. 10 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 9 taken along line 10-10.

[0020] FIG. 11 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by a youth baseball player.

[0021] FIG. 12 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 11 taken along line 12-12.

[0022] FIG. 13 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by a youth football player.

[0023] FIG. 14 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 13 taken along line 14-14.

[0024] FIG. 15 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by a youth lacrosse player.

[0025] FIG. 16 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 15 taken along line 16-16.

[0026] FIG. 17 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by a youth soccer player.

[0027] FIG. 18 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 17 taken along line 18-18.

[0028] FIG. 19 is a bottom plan view of an athletic footwear insole in accordance with at least one embodiment of the present invention designed for use by a youth basketball player.

[0029] FIG. 20 is a longitudinal cross-sectional view of the athletic footwear insole of FIG. 19 taken along line 20-20.

DETAILED DESCRIPTION

[0030] In reference to FIGS. 1-20, various embodiments of an athletic footwear insole are provided. The various insole embodiments are configured to be worn while playing a
specific sport or type of sport, such as, for example, baseball, soccer, football, lacrosse and basketball. The insole 30 includes an outermost perimeter 32, a flat portion 34, a raised portion 36, a forefoot portion 40, a midfoot portion 42, and a rearfoot portion 44. The insole body 30 can be shaped for accommodation within the standard footwear for a particular sport. For example, the insole illustrated in FIGS. 1 and 2 can be inserted into a cleated shoe worn for playing baseball or sports requiring movement similar to that of playing baseball.

The insole body 30 has a top side 38 and a bottom side 39. The top side 38 is generally in contact with the bottom surface of the wearer's foot. Included on the top side 38 are one or more generally flat portion(s) 34 and one or more raised portion(s) 36. In the illustrated embodiments, the dashed lines in the bottom plan views indicate the perimeters distinguishing the flat portion(s) 34 from the raised portion(s) 36.

In the illustrated embodiments of FIGS. 1-10, which are designed for adult athletes, flat portion 34a can include the forefoot 40, peripheral portions of the midfoot 42, and interior portion of the rearfoot 44, and can include a slight increase in the thickness of the insole body 30 between the forefoot 40 and the rearfoot 44 (about 2 mm). In some embodiments, flat portion 34a can include a slight increase in the thickness of the insole body 30 between the forefoot 40 and the midfoot 42.

The thickness of the insole is the measurement of the distance between the top side 38 and bottom side 39 taken perpendicularly from the bottom side 39. The thickness can be measured at different positions within the body 30, preferably at a position located along the line shown in any one of FIG. 1, 3, 5, 7, 9, 11, 13, 15, 17, or 19. For the forefoot 40, an exemplary thickness is in a range of about 2 mm to about 7 mm, preferably the thickness is between about 3 mm to about 6 mm, and more preferably the thickness is about 3 mm, 4 mm, 5 mm or 6 mm. For the rearfoot 44, an exemplary thickness is in a range of about 6 mm to about 10 mm, and more preferably the thickness is about 7 mm or 9 mm. In one embodiment, the thickness of the forefoot 40 is 5 mm and the thickness of the rearfoot 44 is 7 mm. In another embodiment, the thickness of the forefoot 40 is 6 mm and the thickness of the rearfoot 44 is 7 mm. In another embodiment, the thickness of the forefoot 40 is 4 mm and the thickness of the rearfoot 44 is 7 mm. In another embodiment, the thickness of the forefoot 40 is 3 mm and the thickness of the rearfoot 44 is 9 mm.

In one embodiment, the thickness differential is determined by subtracting the thickness measured along the line in the forefoot 40 portion from the thickness measured along the line in the rear foot 44 portion. In another embodiment, the thickness differential is determined by subtracting the thickness measure along the line in the forefoot 40 portion from the thickness measured along the line in the midfoot 42 portion.

Flat portion 34b, visible in the cross-sectional views of the embodiments designed for youth athletes (FIGS. 11-20), are elevated from flat portion 34a to provide a thickness differential. An exemplary thickness differential between the forefoot 40 and rearfoot 44 is in a range of about 1 mm to about 10 mm, preferably the thickness differential is between about 4 mm to about 8 mm, and more preferably the thickness differential is about 6 mm. Providing the thickness differential between the rearfoot 44 and the forefoot 40 in insoles for youth athletes can reduce the tensile strain on the Achilles tendon and prevent the resulting inflammation of the growth center where the tendon is attached, a condition known as Sever's Disease or calcaneal apophysitis.

Raised portion 36a, visible in the cross-sectional views of the illustrated embodiments in FIGS. 1-10 in the mid-forefoot area, can be provided as a support for the distal aspects of the 2nd, 3rd, and 4th metatarsal bones to prevent strain-induced injury. This metatarsal support is particularly beneficial to late adolescent and adult players, whose feet are more fully developed than those of youths. Raised portion 36b, visible in the cross-sectional views of all the illustrated embodiments, can slope upward from the flat portion(s) 34 to the dashed profiles. Raised portion 36b can include a heel ridge 50 which wraps around the posterior portion of the outermost perimeter 32 to support and stabilize the rearfoot of the wearer. The heel ridge 50 can extend on the medial side of the insole body 30 into an instep support 52 and on the lateral side into a peripheral ridge 54.

Intensity of movement (e.g., speed, impact, changes in direction) is required for most sports and is often the cause of injury, which in many cases is more severe when caused by playing sports. The heel ridge 50, instep support 52, and peripheral ridge 54 can provide positional stabilization to the foot of the wearer. The positional stabilization provided by these elements can prevent over-pronation, over-supination, and/or sliding of the foot within the shoe or cleat, which can greatly reduce the propensity for repetitive stress injuries. Further, these elements can reduce the possibility of acute injuries from ankle rolls or twisting.

The insoles of the present invention can be manufactured from various types of material which can be chosen for specific physical, chemical, and morphological properties. For example, Ethylene-vinyl acetate (EVA), a polymer that approaches elastomeric materials in softness and flexibility can be processed like other thermoplastics. EVA has several properties which make it a good choice for the body of an insole 30 (or portions thereof). Engage® (Dow Chemicals) EVA is a particular blend of foam that maintains springiness and provides superior shock absorption and cushioning. In various embodiments, different portions of the insole body 30 can be formed from different densities of Engage® EVA, or other material to improve comfort or support aspects of the insole. A nylon top cover (not shown) can be applied to the top surface 38 of the insole body 30 for aesthetic purposes and/or to protect the foam from wear. Alternatively, various other suitable materials can be used to make insoles according to different embodiments of the invention.

All sports involve the same types of motion. As a result, various embodiments of the insole 30 provide support elements of varying material properties and/or design at the impacted areas of the insole 30. For example, baseball, football, and basketball all require fast lateral movements and changes in lateral motion. Consequently, a heel cradle 60 is included in the insoles 30 designed for these sports (FIGS. 1-6, 11-14, 19, and 20) to provide additional support. The heel cradle 60 is formed, by example, as a separate piece of the insole 30 from a material having different properties, higher density and/or rigidity, and glued to or attached to the body of the insole 30 by other means. For example, the heel cradle 60 can be formed from a thermoplastic polyurethane (TPU) by injection molding or other processes (e.g., basketball embodiments). Alternatively, the heel cradle 60 is integrally formed of the same material as the insole body 30 (e.g., die cut EVA). In at least one embodiment, the heel cradle 60 preferably has a higher density or hardness as compared to the other
portions of the insole 30. The heel cradle 60 can have various shapes and thicknesses depending on the desired results.

[0040] In an alternative embodiment, a cushion 62 is provided in the flat portion 34 of the rear foot portion 44 primarily for shock absorption. This feature is anticipated for insoles 30 designed for use playing baseball (FIGS. 1, 2, 11, and 12) and other sports played on hard surfaces. Footwear does not always provide adequate cushioning to the heel, which can be problematic for high impact sports played on hard surfaces. The cushion 62 can comprise a gel or a softer, more compressible material than the body of the insole 30. In some embodiments, the cushion 62 is 3 mm thick. Alternatively, a cushion is provided in other locations of the insole 30. The cushion can have various shapes and thicknesses depending on the desired results.

[0041] As illustrated in the embodiments of FIGS. 1, 2, and 5-10, a forefoot plate 64 can be provided for insoles designed for use with cleated footwear. The shape of the plate 64 can be determined based on the configuration of the cleated footwear in order to distribute pressure from the clents across the forefoot, thereby providing additional comfort to the wearer. In order to allow for necessary flexibility, in some embodiments the forefoot plate 64 can define one or more grooves 66 (FIGS. 5-10). Forefoot plates 64 are not provided in the youth insole embodiments for these sports because the feet of younger players do not experience the same magnitude of forces and shoe configurations for youth and adults often differ. However, in other embodiments, plates 64 can be provided in insoles 30 designed for youth footwear.

[0042] The forefoot plate 64 can be formed as a separate piece of the insole from a material having different properties, higher density and/or rigidity, and glued to or attached to the body of the insole 30 by other means. For example, the forefoot plate 64 can be formed of thermoplastic polyurethane (TPU) by injection molding or other suitable processes. Alternatively, the plate 64 can be formed of the same material as the insole body 30 but having a higher density or hardness. The forefoot plate 64 can have various shapes and thicknesses depending on the desired results.

[0043] FIGS. 5 and 6 illustrate another embodiment designed for use with footwear for playing football. An additional structure plate 68 is included at the medial portion of the forefoot 40 providing additional rigidity to prevent an injury commonly referred to as “Turf Toe.” Plate 68 is separately formed of a composite material and positioned between the insole body 30 and the forefoot plate 64. Alternatively, the plate 68 can be formed of another material or may be provided as an increased thickness in the forefoot plate 64 on the medial aspect of the forefoot 40.

[0044] Alternatively, a midfoot plate 70 can be provided extending substantially between the medial and lateral sides of the midfoot portion to improve midfoot stability. This feature is anticipated for insoles designed for use playing lacrosse, soccer, and basketball (FIGS. 3-4, 7-10, and 15-20) and other sports having footwear that is typically flat and flexible.

[0045] It is specifically intended that the present invention not be limited to the embodiments and illustrations contained herein, but include modified forms of those embodiments including portions of the embodiments and combinations of elements of different embodiments as come within the scope of the following claims.

What is claimed is:
1. An insole for athletic shoe comprising:
   a body having an outermost perimeter configured to fit within an athletic shoe, the outermost perimeter defining a top surface having forefoot, midfoot, and rearfoot portions;
   a first raised portion of the top surface positioned around the outermost perimeter at the rearfoot portion; and
   at least one structural element provided to improve support of the athletic shoe.
2. The insole of claim 1, wherein the structural element comprises a midfoot plate.
3. The insole of claim 1, wherein the structural element comprises a heel cradle.
4. The insole of claim 3, wherein the heel cradle is manufactured from thermoplastic polyurethane.
5. The insole of claim 1, wherein the structural element comprises a rearfoot cushion.
6. The insole of claim 1, wherein the structural element comprises a first forefoot plate.
7. The insole of claim 6, wherein a medial portion of the first forefoot plate is stiffer than a lateral portion.
8. The insole of claim 6, wherein the first forefoot plate defines a plurality of grooves.
9. The insole of claim 6, further comprising a second forefoot plate positioned between the body and the first forefoot plate.
10. The insole of claim 1, further comprising a second raised portion of the top surface positioned between the forefoot and midfoot portions.
11. The insole of claim 1, further comprising a thickness differential between the forefoot portion and midfoot portion extending to the rearfoot portion.
12. The insole of claim 11, wherein the thickness differential is in the range of about 1 mm to about 10 mm.
13. The insole of claim 11, wherein the thickness differential is in the range between about 4 mm to about 8 mm.
14. The insole of claim 11, wherein the thickness differential is about 6 mm.
15. The insole of claim 11, wherein the thickness differential is 2 mm.
16. The insole of claim 1, wherein the body is manufactured from ethylene-vinyl acetate.
17. The insole according to claim 1 configured for use in an athletic sport selected from the group consisting of soccer, football, long distance running, basketball, baseball, and lacrosse.
18. An athletic shoe insole configured for use in a particular sport as described herein.
19. An insole for athletic shoe comprising:
   a body having an outermost perimeter configured to fit within an athletic shoe, the outermost perimeter defining a top surface having forefoot, midfoot, and rearfoot portions;
   a first raised portion of the top surface positioned around the outermost perimeter at the rearfoot portion;
   a second raised portion of the top surface positioned between the forefoot and midfoot portions;
   at least one structural element provided to improve support of the athletic shoe.
20. An insole for athletic shoe comprising:
   a body having an outermost perimeter configured to fit within an athletic shoe, the outermost perimeter defining a top surface having forefoot, midfoot, and rearfoot portions;
a thickness differential between the forefoot portion and midfoot portion extending to the rearfoot portion; a first raised portion of the top surface positioned around the outermost perimeter at the rearfoot portion; at least one structural element provided to improve support of the athletic shoe.

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