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(54) **SHOE OUTSOLE**

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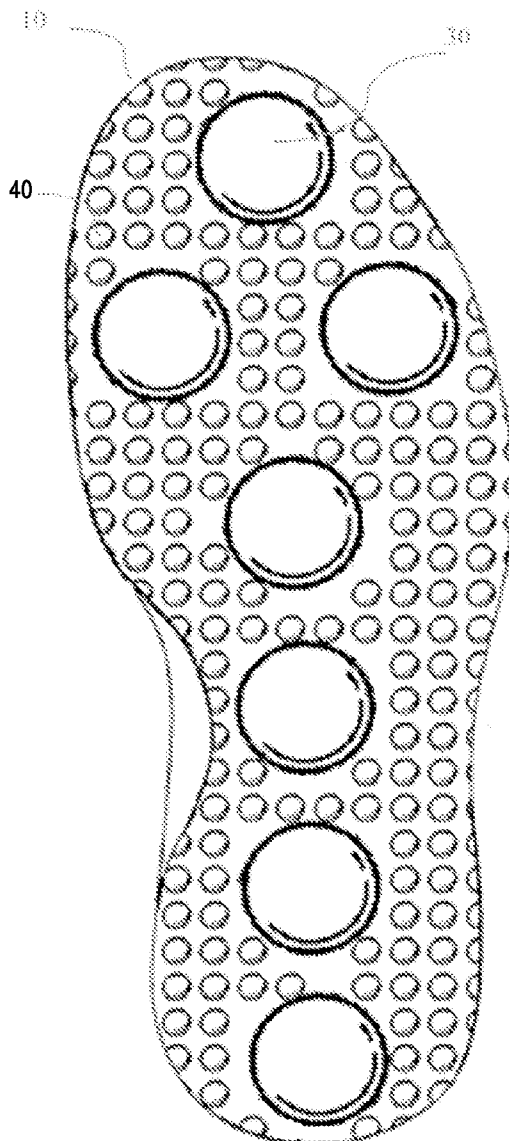
(57) **ABSTRACT**

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An outsole for a shoe having a plurality of convex shaped protrusions, which may be substantially spherical in shape, with predetermined lateral diameter to vertical height ratios. In some embodiments said convex shaped protrusions have different diameters, with some protrusions having a larger diameter and being located on a bottom outward surface of said outsole over acupressure points on the bottom of the foot.

**Related U.S. Application Data**

(60) Provisional application No. 61/716,418, filed on Oct. 19, 2012.



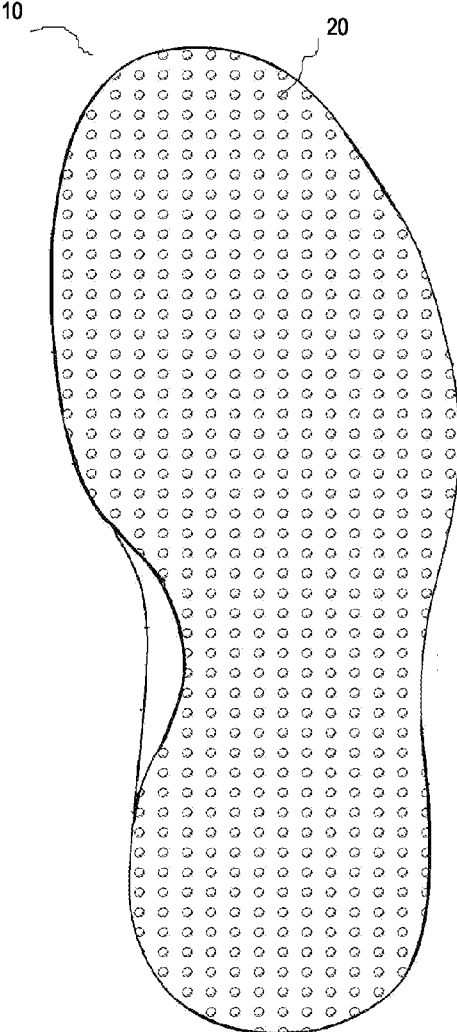


FIG. 1

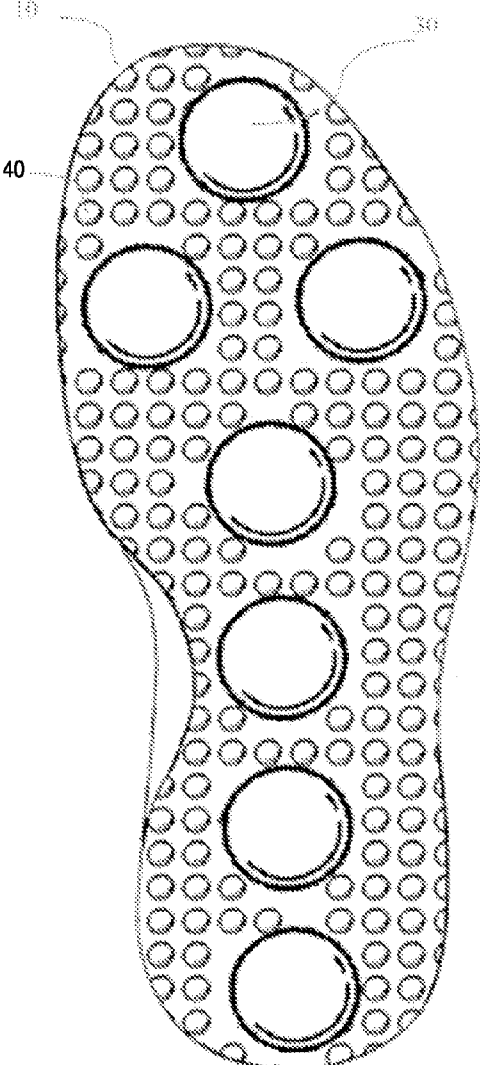


FIG. 2

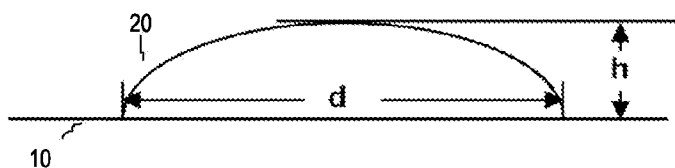


FIG. 3

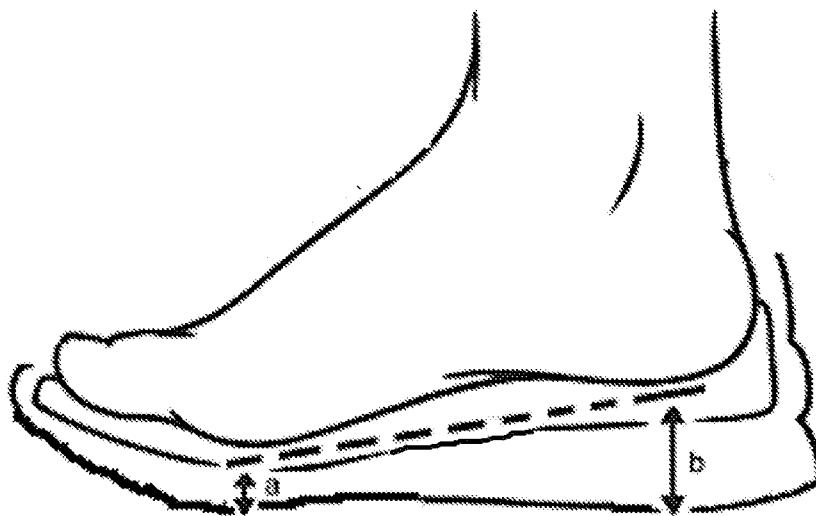


FIG. 4

**SHOE OUTSOLE**

[0001] This application claims the benefit of priority to U.S. provisional patent application 61/716,418 filed on Oct. 19, 2012, the contents of which are hereby incorporated by reference.

**BACKGROUND OF THE INVENTION**

[0002] The present invention is an outsole for a shoe, and one that is particularly applicable to athletic shoes. Shoes are used to protect and comfort the human foot during various activities. Athletic shoes are designed to be worn for participating in various sports.

[0003] Shoes for running are one type of athletic shoe. Shoes for running may affect many parts of the body of a runner. Even small variations in the design of a running shoe may cause foot pain, ankle pain, back pain, or even headaches. Some of the many considerations that go into the design of a shoe for running are shock absorption, flexibility, fit, traction, sole wear, weight, etc. . . . Indeed, the design of a running shoe may involve contributions from both the fields of podiatry and biomechanics. Functional running shoes are designed primarily to provide maximum overall shock absorption for the foot. This can help to prevent shin splints, tendonitis, heel pain, stress fractures and other overuse syndromes.

[0004] A typical shoe consists of three basic components: the outsole, the midsole, and the upper. The outsole is the bottom part of the shoe, and is the part that comes in direct contact with the ground. Outsoles can be made of a variety of materials. Certain types of outsoles provide more traction than others, by using specific materials or designs. Tread pattern of the shoe outsole also affects friction. The shape and composition of the outsole tread also impacts the shock absorption properties of the shoe.

**BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS**

[0005] FIG. 1 is a bottom side view of a first embodiment of a shoe outsole.

[0006] FIG. 2 is a bottom side view of a second embodiment of a shoe outsole.

[0007] FIG. 3 is a side section view of a convex shaped protrusion of a shoe outsole.

[0008] FIG. 4 is a side section view of a shoe with a sole, illustrating the shoe drop.

**DETAILED DESCRIPTION OF THE INVENTION**

[0009] FIG. 1 shows an outsole 10. Outsole 10 may be comprised of, for example, rubber, polyurethane, or any other suitable material for outsoles as known to those skilled in the art. The bottom outward surface of outsole 10 contains a plurality of spaced apart integral convex shaped protrusions 20 extending away from the bottom outward surface towards the ground. The convex shaped protrusions, which may be substantially spherical in shape, facilitate the dispersion of impact energy both laterally and vertically. This allows the user of a shoe having such an outsole to run on hard surfaces such as concrete or asphalt with more comfort. As shown in FIG. 3 convex shaped protrusions have a lateral diameter (d) and a vertical height (h).

[0010] In a first preferred embodiment as shown in FIGS. 1 & 3 it is contemplated that the integral convex shaped protrusions

20 would have a lateral diameter (d) across the bottom outward surface of outsole 10 that is in the range of three to four times the vertical height (h) that the convex shaped protrusion 20 extends away from the bottom outward surface of outsole 10 towards the ground. For example, in an exemplary embodiment, where the vertical height (h) of convex shaped protrusion 20 is approximately 0.5 millimeters (mm) the lateral diameter (d) of the convex shaped protrusion 20 across the bottom of outward surface of outsole 10 would be in the range of approximately 1.5-2.0 (mm).

[0011] FIG. 2 shows an outsole 10 for a second embodiment. In the second preferred embodiment first convex protrusions 40 are contemplated to have a lateral diameter (d) across the bottom outward surface of outsole 10 that is in a 1:1 ratio with the vertical height (h) of convex protrusions 40. For example, it is contemplated in such an embodiment that first convex protrusions 40 have a lateral diameter (d) of approximately 5 mm and a vertical height (h) of approximately 5 mm. Furthermore, the second embodiment has in addition to said first convex protrusions 40 at least one second convex protrusion 30. Each of said at least one second convex protrusion 30, which may be surrounded by said first convex protrusions 40, is contemplated to be placed at a location on outsole 10 that match acupressure points on the bottom of a user's foot. It is contemplated that second convex protrusions 30 would have a lateral diameter (d) to vertical height (h) ratio of 4:1. For example, a second convex protrusion 30 may have a lateral diameter (d) of approximately 20 mm across the bottom outward surface of outsole 10 and a vertical height (h) of approximately 5 mm.

[0012] It is contemplated that the embodiments of the outsole invention described herein would be particularly well suited for applications with minimalist, or minimal drop, style running shoes, such as for example a shoe with a 4 mm drop. Referring to FIG. 4 the drop of a shoe has its customary and ordinary meaning of the difference between the height (b) above the ground where a heel of a foot sits in the shoe and the height (a) above the ground where the forefoot sits in the shoe. However, the invention described herein is not limited to just minimal drop shoes, and may be applied successfully to any type of shoe.

1. An outsole for a shoe comprising:
  - A bottom outward outsole surface;
  - said bottom outward outsole surface having a plurality of outward extending protrusions;
  - said outward extending protrusions having a convex shaped outer surface;
  - said outward extending protrusions having a lateral diameter across said outward outsole surface and a vertical height above said outward outsole surface;
  - wherein the ratio of said lateral diameter to said vertical height for said outward extending protrusions is in the range of 3:1 to 4:1.
2. The outsole for a shoe of claim 1 wherein said vertical height of said outward extending protrusions is approximately 0.5 millimeters and said lateral diameter is in the range of 1.5 millimeters to 2 millimeters.
3. The outsole for a shoe of claim 1 wherein said shoe has a minimalist drop.
4. The outsole for a shoe of claim 3 wherein said minimalist drop is approximately 4 millimeters.

**5.** An outsole for a shoe comprising:  
a bottom outward outsole surface;  
said bottom outward outsole surface having a plurality of first outward extending protrusions each with a convex shaped outer surface, a lateral diameter, and a vertical height;  
said first outward extending protrusions having a ratio of said lateral diameter to said vertical height of approximately 1:1;  
said bottom outward outsole surface having at least one second outward extending protrusion with a convex shaped outer surface, a lateral diameter, and a vertical height;  
said at least one second outward extending protrusion having a ratio of said lateral diameter to said vertical height of approximately 4:1.

**6.** The outsole for a shoe of claim **5** wherein said at least one second outward extending protrusion is located on said bot-

tom outward outsole surface at a position adjacent to an acupressure point location on a user's foot.

**7.** The outsole for a shoe of claim **5** wherein:  
said first outward extending protrusions have a lateral diameter of approximately 5 millimeters and a vertical height of approximately 5 millimeters; and  
said second outward extending protrusions having a lateral diameter of approximately 20 millimeters and a vertical height of approximately 5 millimeters.

**8.** The outsole for a shoe of claim **5** wherein said shoe has a minimalist drop.

**9.** The outsole for a shoe of claim **8** wherein said minimalist drop is 4 millimeters.

**10.** The outsole for a shoe of claim **5** wherein at least one second outward extending protrusion is surrounded by said first outward extending protrusions.

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