motor functions. Neurogenic shock lasts for weeks and can lead to a loss of muscle tone due to disuse of the muscles below the injured site.

SUMMARY

[009] In one example, the present disclosure provides a method of treating a subject afflicted with a spinal pathology comprising the steps of: (a) securing a device to a subject's foot, whereby said device comprises a foot securing mean, a support member operably attached to said securing mean, and a moveable anterior protuberance and a moveable posterior protuberance, said anterior protuberance and said posterior protuberance are ground engaging; (b) calibrating said posterior protuberance and said anterior protuberance to: a balanced position, said balanced position comprises a position whereby said device provides a reduced inversion, a reduced eversion, or both to said subject's foot during the stance phases; and (a) fixing said posterior protuberance and said anterior protuberance to said support member; wherein said subject is able to walk, thereby treating a subject afflicted with a spinal pathology.

[009a] In one aspect, the present disclosure refers to a device suitable for treatment of a subject afflicted with scoliosis comprising the steps of: (a) securing the device to the subject's foot, wherein said device comprises a foot securing mean, a support member operably attached to said securing mean, and a relocatable anterior protuberance and a relocatable posterior protuberance, said anterior protuberance and said posterior protuberance are ground engaging; (b) calibrating said posterior protuberance and said anterior protuberance to: a balanced position, said balanced position comprises a position wherein said device provides a reduced inversion, a reduced eversion, or both to said subject's foot during the stance phases; and (c) fixing said posterior protuberance and said anterior protuberance to said support member; wherein said subject is able to walk, thereby treating a subject afflicted scoliosis, wherein each of said anterior protuberance and said posterior protuberance is characterized by: (a) convexity A of a base diameter of 70 to 100 mm and a height of 10 to 13 mm, said height is a perpendicular line connecting the highest point and said base; (b) convexity B of a base diameter of 70 to 100 mm and a height of 14 to 16 mm, said height is a perpendicular line connecting the highest point and said base; (c) convexity C of a base diameter of 70 to 100 mm and a height of 16 to 18 mm, said height is a perpendicular line connecting the highest point and said base; (d) convexity C of a base diameter of 70 to 100 mm and a height of 19 to 22 mm, said height is a perpendicular line connecting the highest point and said base.

[010] In another example, there is provided a method of reducing pain associated with a spinal pathology in a subject afflicted with a spinal pathology, comprising the steps of: (a) securing a device to a subject's foot, whereby said device comprises a foot securing mean, a

support member operably attached to said securing mean, and a moveable anterior protuberance and a moveable posterior protuberance, said anterior protuberance and said posterior protuberance are ground engaging; (b) calibrating said posterior protuberance and said anterior protuberance to: a balanced position, said balanced position comprises a position whereby said device provides a reduced inversion, a reduced eversion, or both to said subject's foot during the stance phases; and (c) fixing said posterior protuberance and said anterior protuberance to support member, wherein said subject is able to walk, thereby reducing pain associated with a spinal pathology in a subject afflicted with a spinal pathology.

[010a] In another aspect, the present disclosure refers to a device suitable for reducing low back pain in a subject, comprising the steps of: (a) securing the device to the subject's foot, wherein said device comprises a foot securing mean, a support member operably attached to said securing mean, and a relocatable anterior protuberance and a relocatable posterior protuberance, said anterior protuberance and said posterior protuberance are ground engaging; (b) calibrating said posterior protuberance and said anterior protuberance to: a balanced position, said balanced position comprises a position wherein said device provides a reduced inversion, a reduced eversion, or both to said subject's foot during the stance phases; and (c) fixing said posterior protuberance and said anterior protuberance to said support member wherein said subject is able to walk, thereby reducing low back pain in a subject, wherein each of said anterior protuberance and said posterior protuberance is characterized by: (a) convexity A of a base diameter of 70 to 100 mm and a height of 10 to 13 mm, said height is a perpendicular line connecting the highest point and said base; (b) convexity B of a base diameter of 70 to 100 mm and a height of 14 to 16 mm, said height is a perpendicular line connecting the highest point and said base; (c) convexity C of a base diameter of 70 to 100 mm and a height of 16 to 18 mm, said height is a perpendicular line connecting the highest point and said base; (d) convexity C of a base diameter of 70 to 100 mm and a height of 19 to 22 mm, said height is a perpendicular line connecting the highest point and said base.

[011] In some examples, the calibrating comprises adjusting: (a) a resilience of said anterior protuberance, said posterior protuberance, or a combination thereof; (b) a hardness of said anterior protuberance, said posterior protuberance, or a combination thereof; (c) an elasticity of said anterior protuberance, said posterior protuberance, or a combination thereof; (d) or any combination of (a), (b), and (c). In further examples, calibrating further comprises balancing timing of heel rise.

[012] According to additional examples, calibrating comprises adjusting: (a) a height of said anterior protuberance, said posterior protuberance, or a combination thereof; (b) a convexity of said anterior protuberance, said posterior protuberance, or a combination thereof; (c) a weight of said anterior protuberance, said posterior protuberance, or a combination thereof (d) and a combination of (a), (b), and (c).According to some examples, the balanced position further comprises a position whereby a reduced valgus, varus, dorsal or plantar torque about the ankle is exerted by said device on said subject's foot.

[013] According to additional examples, the posterior protuberance is a bulbous protuberance, said anterior protuberance is a bulbous protuberance, or both said posterior protuberance and said anterior protuberance are bulbous protuberances.

[014] In further examples, the posterior protuberance and the anterior protuberance are moveably mounted to said support member. In some examples, the posterior protuberance is movable within a calcaneus support portion of said support member. In further examples, the anterior protuberance is movable within phalanges or metatarsals support portion of said support member. In some examples, the anterior protuberance, said posterior protuberance, or their combination comprise a cross-section with a shape of a conic section, said conic section comprising at least one of a circle, ellipse, parabola and hyperbola. In another example, the anterior protuberance is shaped differently from said posterior protuberance.

[014a] In another aspect, the present disclosure refers to a set of footwear (10) components comprising: a pair of support members, wherein each support member (12) having an upper surface (14) attachable to a foot and a lower surface (24) configured to hold two bulbous protuberances (22) , an anterior protuberance and a posterior protuberance in a position-adjustable manner in an anterior area and a posterior area thereof, wherein the two bulbous protuberances are adjustable to a balanced position where the footwear provides a reduced inversion or a reduced eversion during stance phases, wherein said protuberances (22): (a) have a a shore hardness of 30 to 90 Sh A; (b) are ground engaging; (c) are positioned on the centerline and the peaks positioned on opposite sides of the centerline (28) of said support member (12); and (d) are positioned on opposite sides of the latitudinal midline (30) and wherein each of said anterior protuberance and said posterior protuberance is characterized by : (a) convexity A of a base diameter of 70 to 100 mm and a height of 10 to 13 mm, said height is a perpendicular line connecting the highest point and said base; (b) convexity B of a base diameter of 70 to 100 mm and a height of 14 to 16 mm, said height is a perpendicular line connecting the highest point and said base; (c) convexity C of a base diameter of 70 to 100 mm and a height of 16 to 18 mm, said height is a perpendicular line connecting the highest point and said base; (d) convexity C of a base diameter of 70 to 100 mm and a height of 19 to 22 mm, said height is a perpendicular line connecting the highest point and said base.

BRIEF DESCRIPTION OF THE DRAWINGS

[015] The present invention will be understood and appreciated more fully from the following detailed description taken in conjunction with the appended drawings in which :

[016] FIG. 1 is a simplified pictorial illustration of footwear constructed and operative in accordance with an embodiment of the present invention

[017] FIGS. 2 and 3 are simplified side-view and rear-view illustrations, respectively, of the footwear of FIG. 1 ;

[018] FIG. 4 is a simplified top-view illustration of the footwear of FIG. 1, showing further features of other embodiments of the present invention ;

[019] FIG. 5 is a simplified pictorial illustration of an alignment of the anterior (forward) and posterior (rearward) protuberances on a support member, according to embodiments of the present invention.

[020] FIG. 6 is a simplified pictorial illustration of another alignment of the anterior and posterior protuberances on a support member, according to embodiments of the present invention.

[021] FIG. 7 is a simplified pictorial illustration of a sneaker constructed and operative in accordance with an embodiment of the present invention, whose rearward protuberance has a greater height than the height of the forward protuberance.

Claims

What is claimed is:

1. A device suitable for treatment of a subject afflicted with scoliosis comprising the steps of: (a) securing the device to the subject's foot, wherein said device comprises a foot securing mean, a support member operably attached to said securing mean, and a relocatable anterior protuberance and a relocatable posterior protuberance, said anterior protuberance and said posterior protuberance are ground engaging; (b) calibrating said posterior protuberance and said anterior protuberance to: a balanced position, said balanced position comprises a position wherein said device provides a reduced inversion, a reduced eversion, or both to said subject's foot during the stance phases; and (c) fixing said posterior protuberance and said anterior protuberance to said support member; wherein said subject is able to walk, thereby treating a subject afflicted scoliosis, wherein each of said anterior protuberance and said posterior protuberance is characterized by : (a) convexity A of a base diameter of 70 to 100 mm and a height of 10 to 13 mm, said height is a perpendicular line connecting the highest point and said base; (b) convexity B of a base diameter of 70 to 100 mm and a height of 14 to 16 mm, said height is a perpendicular line connecting the highest point and said base; (c) convexity C of a base diameter of 70 to 100 mm and a height of 16 to 18 mm, said height is a perpendicular line connecting the highest point and said base; (d) convexity C of a base diameter of 70 to 100 mm and a height of 19 to 22 mm, said height is a perpendicular line connecting the highest point and said base.

2. The device of claim 1, wherein said calibrating further comprises balancing timing of heel rise.

3. The device of claim 1, wherein said calibrating comprises adjusting: (a) a resilience of said anterior protuberance, said posterior protuberance, or a combination thereof; (b) a hardness of said anterior protuberance, said posterior protuberance, or a combination thereof; (c) an elasticity of said anterior protuberance, said posterior protuberance, or a combination thereof; (d) or any combination of (a), (b), and (c).

4. The device of claim 1, wherein said calibrating comprises adjusting a height of said anterior protuberance, said posterior protuberance, or a combination thereof; (b) a convexity of said anterior protuberance, said posterior protuberance, or a combination

thereof; (c) a weight of said anterior protuberance, said posterior protuberance, or a combination thereof (d) and a combination of (a), (b), and (c).

5. The device of claim 1, wherein said balanced position further comprises a position wherein reduced valgus, varus, dorsal or plantar torque about the ankle is exerted by said device on said subject's foot.

6. The device of claim 1, wherein said posterior protuberance is a bulbous protuberance, said anterior protuberance is a bulbous protuberance, or both said posterior protuberance and said anterior protuberance are bulbous protuberances.

7. The device of claim 1, wherein said anterior protuberance, said posterior protuberance, or their combination comprise a cross-section with a shape of a conic section, said conic section comprising at least one of a circle, ellipse, parabola and hyperbola.

8. The device of claim 1, wherein said anterior protuberance is shaped differently from the outer contour of said posterior protuberance.

9. A device suitable for reducing low back pain in a subject, comprising the steps of: (a) securing the device to the subject's foot, wherein said device comprises a foot securing mean, a support member operably attached to said securing mean, and a relocatable anterior protuberance and a relocatable posterior protuberance, said anterior protuberance and said posterior protuberance are ground engaging; (b) calibrating said posterior protuberance and said anterior protuberance to: a balanced position, said balanced position comprises a position wherein said device provides a reduced inversion, a reduced eversion, or both to said subject's foot during the stance phases; and (c) fixing said posterior protuberance and said anterior protuberance to said support member wherein said subject is able to walk, thereby reducing low back pain in a subject, wherein each of said anterior protuberance and said posterior protuberance is characterized by : (a) convexity A of a base diameter of 70 to 100 mm and a height of 10 to 13 mm, said height is a perpendicular line connecting the highest point and said base; (b) convexity B of a base diameter of 70 to 100 mm and a height of 14 to 16 mm, said height is a perpendicular line connecting the highest point and

said base; (c) convexity C of a base diameter of 70 to 100 mm and a height of 16 to 18 mm, said height is a perpendicular line connecting the highest point and said base; (d) convexity C of a base diameter of 70 to 100 mm and a height of 19 to 22 mm, said height is a perpendicular line connecting the highest point and said base.

10. The device of claim 9, wherein said calibrating further comprises balancing timing of heel rise.

11. The device of claim 9, wherein said calibrating comprises adjusting: (a) a resilience of said anterior protuberance, said posterior protuberance, or a combination thereof; (b) a hardness of said anterior protuberance, said posterior protuberance, or a combination thereof; (c) an elasticity of said anterior protuberance, said posterior protuberance, or a combination thereof; (d) or any combination of (a), (b), and (c).

12. The device of claim 9, wherein said calibrating comprises adjusting a height of said anterior protuberance, said posterior protuberance, or a combination thereof; (b) a convexity of said anterior protuberance, said posterior protuberance, or a combination thereof; (c) a weight of said anterior protuberance, said posterior protuberance, or a combination thereof (d) and a combination of (a), (b), and (c).

13. The device of claim 9, wherein said balanced position further comprises a position wherein reduced valgus, varus, dorsal or plantar torque about the ankle is exerted by said device on said subject's foot.

14. The device of claim 9, wherein said posterior protuberance is a bulbous protuberance, said anterior protuberance is a bulbous protuberance, or both said posterior protuberance and said anterior protuberance are bulbous protuberances.

15. The device of claim 9, wherein said anterior protuberance, said posterior protuberance, or their combination comprise a cross-section with a shape of a conic section, said conic section comprising at least one of a circle, ellipse, parabola and hyperbola.

16. The device of claim 9, wherein said anterior protuberance is shaped differently from the outer contour of said posterior protuberance.

17. A set of footwear (10) components comprising:
a pair of support members, wherein each support member (12) having an upper surface (14) attachable to a foot and a lower surface (24) configured to hold two bulbous protuberances (22), an anterior protuberance and a posterior protuberance in a position-adjustable manner in an anterior area and a posterior area thereof, wherein the two bulbous protuberances are adjustable to a balanced position where the footwear provides a reduced inversion or a reduced eversion during stance phases, wherein said protuberances (22): (a) have a shore hardness of 30 to 90 Sh A; (b) are ground engaging; (c) are positioned on the centerline and the peaks positioned on opposite sides of the centerline (28) of said support member (12); and (d) are positioned on opposite sides of the latitudinal midline (30) and wherein each of said anterior protuberance and said posterior protuberance is characterized by : (a) convexity A of a base diameter of 70 to 100 mm and a height of 10 to 13 mm, said height is a perpendicular line connecting the highest point and said base; (b) convexity B of a base diameter of 70 to 100 mm and a height of 14 to 16 mm, said height is a perpendicular line connecting the highest point and said base; (c) convexity C of a base diameter of 70 to 100 mm and a height of 16 to 18 mm, said height is a perpendicular line connecting the highest point and said base; (d) convexity C of a base diameter of 70 to 100 mm and a height of 19 to 22 mm, said height is a perpendicular line connecting the highest point and said base.

ABSTRACT

A method of treating spine pathologies and related outcomes in a subject in need thereof is provided. The method includes placement of at least two calibrated, differential disturbances or protuberances under the subject's feet.