CLAIMS

What is claimed is:

1. A device for treating a subject afflicted with a lower limb joint pathology comprising a foot securing mean, a support member operably attached to said securing mean, and a moveable anterior protuberance and a moveable posterior protuberance; said posterior protuberance and said anterior protuberance are calibrated to a balanced position, said balanced position comprises a position whereby said device provides a reduced inversion or a reduced eversion during the stance phases, wherein said anterior protuberance and said posterior protuberance have a diameter of 50 to 150 mm.

2. A device for treating a subject afflicted with a lower limb musculoskeletal pain comprising a foot securing mean, a support member operably attached to said securing mean, and a moveable anterior protuberance and a moveable posterior protuberance; said posterior protuberance and said anterior protuberance are calibrated to a balanced position, said balanced position comprises a position whereby said device provides a reduced inversion or a reduced eversion during the stance phases and a minimal lower limb musculoskeletal related pain position, wherein said anterior protuberance and said posterior protuberance have a diameter of 50 to 150 mm.

3. The device of anyone of claim 1 and 2, whereby said calibrated further comprises adjusted: (a) resilience of said anterior protuberance, said posterior protuberance, or a combination thereof; (b) hardness of said anterior protuberance, said posterior protuberance, or a combination thereof; (c) 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 anyone of claims 1 to 3, whereby said calibrated further comprises adjusted (a) height of said anterior protuberance, said posterior protuberance, or a combination thereof; (b) convexity of said anterior protuberance, said posterior protuberance,

or a combination thereof; (c) 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 anyone of claims 1 to 4, whereby said balanced position further comprises balancing timing of heel rise.

6. The device of anyone of claims 1 to 5, whereby said balanced position further comprises toe balanced position.

7. The device of anyone of claims 1 to 6, whereby said balanced position further comprises a position whereby minimal valgus, varus, dorsal or plantar torque about the ankle is exerted by said device on said subject's foot.

8. The device of claim 1, whereby said lower limb joint pathology is lower limb osteoarthritis or knee osteoarthritis.

9. The device of anyone of claims 1 to 8, whereby 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.

10. The device of anyone of claims 1 to 9, whereby said posterior protuberance and said anterior protuberance are moveably mounted to said support member.

11. The device of anyone of claims 1 to 10, whereby said posterior protuberance is movable within a calcaneus support portion of said support member and said anterior protuberance is movable within phalanges or metatarsals support portion of said support member.

12. The device of anyone of claims 1 to 11, whereby the bases of said anterior protuberance and said posterior protuberance are positioned on the centerline and wherein the peaks of said anterior protuberance and said posterior protuberance are positioned on opposite sides of said centerline.

13. The device of anyone of claims 1 to 12, wherein said anterior protuberance and said posterior protuberance: are movable within an area of 1 to 18 cm2, have a shore hardness of between 30 to 90 Sh A, or both.

14. A set of footwear (10) components comprising: a pair 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) 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 to a subject's foot during stance phases; wherein said protuberances (22): (a) have a diameter of 50 to 150 mm; (b) a shore hardness of 30 to 90 Sh A; (c) are ground engaging; (d) are positioned offset from the centreline (28) of said support member (12); and (e) are positioned on opposite sides of the latitudinal midline (30).

15. The set of footwear components according to claim 14, wherein the bulbous protuberances (22) are height-adjustable in relation to the lower surface of the support member.

16. The set of footwear components according to anyone of claims 14 and 15, further comprising: spacer(s) for adjusting height of the bulbous protuberances, said spacer(s) being configured to be inserted between the support member and the bulbous protuberance attached thereto.

17. The set of footwear components according to anyone of claims 14 to 16, wherein the spacer(s) are a plurality of spacers of different weights.

18. The set of footwear components according to anyone of claims 14 to 17, for treating a lower limb joint pathology, a lower limb musculoskeletal pain or a combination thereof.

19. The set of footwear components according to anyone of claims 14 to 18, for treating osteoarthritis or knee osteoarthritis.

DEVICE AND METHODS FOR TREATING A LOWER LIMB JOINT PATHOLOGY AND LOWER LIMB PAIN

Abstract

A method of treating a patient suffering from pain in the lower limb or a lower limb musculoskeletal disease is provided. The method includes placement of at least two calibrated, differential disturbances or protuberances under the patient's feet.

"FIGURE 1"