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[54] Title

Prosthetic foot

[57] Abstract

A prosthetic foot (1) configured to improve gait and comfort of amputees during walking, running and jumping. The prosthetic foot permits tri-planar motion of the hindfoot, kinetic responsiveness between the hindfoot, mid-foot and front foot, and di-planar motion of the mid-foot and front foot. The superior ankle joint (4) and subtalar joint (5) of the hindfoot (2C) are responsible for closed-chain kinetic motion of the prosthetic foot. In a specific configuration, the ankle joint and subtalar joint are joined to the hindfoot via respective struts of resilient material (4B and 5B) of the hindfoot to form an integral structure. In another specific configuration, the ankle joint and subtalar joint are joined to the support component (51) of the ankle joint located on the keel (54) of the prosthetic foot (50). The support component of the ankle joint can be used to upgrade the functions of current models of low-profile prosthetic foot, for example.

1. A prosthetic foot comprising a forefoot part, a mid-foot part and a hindfoot part, said hindfoot part including a device for modulating gait which permits the prosthetic foot's tri-planar closed kinetic chain motion, the sole plane of the said mid-foot part contains a longitudinal foot arch support, the said foot arch support forms a depressed surface, which contains a lengthwise axial line, which runs through the positive plane at an angle of 25° to 42° against the transverse plane. This said feature bestows on the user a movement ability between the positive plane and sagittal plane. The inner lateral section of the said depressed surface support is larger in radius and closer in proximity than the outer lateral section of the said depressed surface.

2. The prosthetic foot according to claim 1, wherein the posterior part of the said forefoot includes at least one adjustable intra-articular aperture extending between the dorsal surface and the sole of the said forefoot. From the said adjustable intra-articular aperture, the adjustable articulation extends to the frontal margins of the said forefoot part, forming multiple adjustable buttresses. The said adjustable buttresses permit improved diplanar movement ability of the said front foot of the prosthetic foot.

3. The prosthetic foot according to claim 1, wherein the said mid-foot part is composed of semi-rigid materials, and conformation of the said longitudinal foot arch support permits the dynamic response ability in gait of the said prosthetic foot, wherein it was designed in such a way that the inner lateral section of the said longitudinal foot arch support possesses relatively high dynamic response ability, while the outer lateral section of the said longitudinal foot arch support possesses relatively low dynamic response ability.

4. The prosthetic foot according to claim 1, wherein the said components of the forefoot, mid-foot and hindfoot are composed of a single piece of resilient material.

5. The prosthetic foot according to claim 4, wherein the said resilient materials are semi-rigid materials.

6. A prosthetic foot comprising a forefoot part, a mid-foot part and a hindfoot parts, said hindfoot part including a device for modulating gait which permits the prosthetic foot's tri-planar closed kinetic chain motion, the posterior part of the said forefoot includes at least one adjustable intra-articular aperture extending between the dorsal surface and the sole of the said forefoot. From the said adjustable intra-articular aperture, the adjustable articulation extends to the frontal margins of the said forefoot part, forming multiple adjustable buttresses. The said adjustable buttresses permit improved diplanar movement ability of the said forefoot of the prosthetic foot.

7. The prosthetic foot according to claim 6, wherein the said mid-foot part is composed of semi-rigid materials, and conformation of the said longitudinal foot arch support permits the dynamic response ability in gait of the said prosthetic foot, wherein it was designed in such a way that the inner lateral section of the said longitudinal foot arch support possesses

relatively high dynamic response ability, while the outer lateral section of the said longitudinal foot arch support possesses relatively low dynamic response ability.

8. The prosthetic foot according to claim 7, wherein the said components of the forefoot, mid-foot and hindfoot are composed of single-piece resilient materials.

9. The prosthetic foot according to claim 8, wherein the said resilient materials are semi-rigid plastic materials.

