Artificial prosthetic knee joint

Country of origin | Canada

Health problem addressed

Over 25 million people living in developing countries require the use of prosthetic and orthotic devices. Individuals who have had their leg(s) amputated above the knee joint due to trauma, disease or a congenital reasons and are unable to walk without the use of a lower-limb prostheses are the target population for this product. With an above-knee prosthesis, people with above-knee amputations will be able to walk, remain independent, productive and healthy.

Product description

The artificial knee joint is an integral part of the above-knee prostheses. The knee unit is simple in design and made of fiber-reinforced polymer construction. The lower end connects to a modular prosthetic system, which ultimately connects to an artifical foot. The upper end connects to a prosthetic socket with an attachment.

Product functionality

The knee unit utilizes a proprietary stance-phase control mechanism, termed the 'Automatic Stance-Phase Lock (ASPL)'. It is composed of a knee lock that is automatically engaged as the knee becomes fully extended thus preventing the knee from bending. A combination of a hip flexion moment and loading of the forefoot unlocks the knee. This is a natural sequence of events that occurs at each step of walking and allows the knee to be stable as needed while facilitating natural swing-phase flexion.

The knee joint is fitted by a trained technician during the fabrication of the above-knee prostheses.

Developer's claims of products benefits

One of the most common types of knee joints used in low resource settings is the manually locking knee that requires walking with either a straight leg or an unlocked one that is very unstable. This product provides a high level of stability during weight bearing and at the same time a high level of mobility. It is easy to assemble, can be used in water and wet environments without being damaged and is also low-cost.

Development stage

Independent product evaluations and clinical trials have been conducted in Canada, Chile, El Salvador, Germany, India and Myanmar. It was tested as part of the ISO 10328 standard-Prosthetics structural testing of lower-limb prostheses.

Future work and challenges

There is a need to establish a partnership with an international distributor. In addition, finalization of negotiations in regards to production is required in order to decrease further the product cost while ensuring high and consistent quality.

Use and maintenance

User: Self-use

Training: Not required

Maintenance: On-site as needed

Environment of use

Settings: Rural, urban, ambulatory, at home

Requirements: A facility with tools and materials and trained clinical/technical personnel to fit the product into a prosthesis

Product specifications

Dimensions (mm): 60 x 80 x 180

Weight (kg): 0.7

Consumables: None

Life time (years): 3-5

Shelf life (years): 10

Retail price (USD): NA

List price (USD): 100

Other features: Reusable

Year of commercialization: Premarket launch 2013

Currently sold in: Germany and used in Chile, Myanmar, Tanzania, India, Nicaragua and Canada.

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