UTSouthwestern
Medical Center

TITLE: Low profile and passive wearable orthosis to assist hip flexion and mitigate excessive hip rotation during ambulation

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TECHNOLOGY: Device

UTSD: 3276

SUMMARY:

This technology is a low profile hip flexion assist device that provides energy to the hip during the early swing phase of the gait cycle and mitigates excessive hip rotation. This is a solution for patients with difficulty initiating swing due to hip flexor weakness.

The hip flexor is a group of muscles that allow patients to lift their knees and bend at the waist. There are several conditions that cause hip flexor dysfunction, including multiple sclerosis, muscular dystrophy, stroke and polio. These patients need assistance walking to correct gait and improve endurance.

The wearable device currently on the market offers hip flexion assistance using resistance tubes that span from the waist to the foot in a parallel configuration, anchoring to the shoe laces. Although they claim it can be worn under clothes, the online videos suggest this would be very uncomfortable (https://goo.gl/4SqWgc). Also, the fact that it attaches to the shoelaces presents challenges to patients that take care of themselves.

This device provides energy to the hip during the early swing phase of the gait cycle, mitigates excessive hip rotation, potentially stabilizes the knee, and allows for adjustment of femur rotation during ambulation.

The device employs two antagonistically-configured resistance exercise bands that span from the waist to the knee, crossing over at mid-thigh. The bands store energy during hip extension that is released during hip flexion (https://goo.gl/NoerbZ).

The device described here uses **flat resistance bands** that span from the waist to the knee in an antagonistic configuration and it **uses suspenders to support the waist belt**. This allows for a more conforming fit, making it possible to **easily be worn under the clothes**.

The **bands are attached using quick-release mechanisms similar to those on overalls**, for ease of use by individuals with impaired hand function.

Please contact the Office for Technology Development for more details:

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