Project Specifications

Assisted Walking Device

Team 3:
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Project for Annalee Hughes
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Operational Specifications:

The goal of this project is to help Annalee attain a walking gait, and to ultimately train her muscles to walk small distances without support. Challenges that must be overcome include the internal rotation tendency of her legs, the involuntary flexion of her knee, and her weak upper body. The device must be able to traverse flat surfaces including the lower floor of her house, enabling her to travel independently between the living room, computer room, kitchen, and dining room. She can produce a walking stride, but bracing and harnesses will be required to keep her body in the correct stance. A walker-type device with a small motor will be employed to support her weight and supplement her weak leg muscles. All parts must be lightweight, durable, safe, interchangeable, and inexpensive. Since she is a growing girl, the walker and harness mechanisms must be adjustable to different sizes. Finally, Annalee should be able to equip the device with a minimum of assistance from others. She has limited control of her left arm, but strong coordination in her right arm. Therefore, the controls and equipping mechanisms should be oriented to her right hand if possible.

Technical Specification:

Physical:

Body: -Structure based on common walkers with lightweight aluminum metal

Wheels: -Hard rubber with non slip coating/tread

Harness: -Neoprene/Nylon harness with back and stomach support

Handles and Elbow Pads: -Based on bike handle bars with elbow rests and angled handles; adjustable throughout walking progression

Leg Supports: -support to allow for proper walking posture and prevent legs from crossing (braces; straps; bars; plastic shell)
Motor Cage: - either light weight metal or plastic casing with easily accessible battery chamber near front of device

Mechanical:

Height elbow rests: adjustable between 30-50 in
Width: less than 36 in
Length: less than 36 in
Weight: less than 30 lbs
Power: less than or equal to 1 hp
Speed: between 30-100 RPM

Electrical:

Battery Voltage: Undecided based on motor used
Battery Current: Amps (A)
Battery Life: 2-5 hrs
Charger: Portable battery charger

Environmental:

Operating Battery Temperature: Running at less than 120°F
Storage Temperature: 30-100°F
Operating Environment: Indoors (Tile, Carpet, Wood)
Indoor Limitations: Wood sills from room to room; rough pattern carpet with uneven (indented) pattern; counter tops

Safety:
- Maximum user weight for the device not to exceed 150 lbs
- Not meant for staircases
• Indoor use only
• Avoid use on inclines greater than 10 degrees
• May require assistance to get into device until comfort level reached
• (support for loss of balance)
• Keep battery and electronics away from moisture
• Do not touch battery terminals

Maintenance:
• Possible need for replacement motors and batteries
• Adjustments necessary to allow for proper form for walking assistance.
• Remove parts as necessary as walking ability improves