Thigh Walker: Assistive Mobility Device for Pediatric Patients with Lower Limb Injuries

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→ Children < 7 y/o are unable to use crutches
→ >24,000 lower leg injuries annually (5-7 y/o)
→ Parents required to carry around the child with non-weight bearing injury

Need

Children < 7 y/o are unable to use crutches
>24,000 lower leg injuries annually (5-7 y/o)
Parents required to carry around the child with non-weight bearing injury

Solution

Design

Key Features

Stainless Steel Support

Intended Use

Bending Base

Adjustable Clamp

Verification Testing

VT1: Friction Testing
Test if base slips on common floor types
PASS: \( \mu > 0.202 \)

VT2: Stair Climbing
Create model to test device can ascend stairs
FAIL: cannot climb with knee attachment

VT3: Load Bearing
Test if device components can withstand patient load
Adjustable Clamp
Pass: \( \mu > 515.47 \)
Loop Clamp
Fail: \( \mu < 419.65 \)
Main Bend
Pass: \( \mu > 515.47 \)

Future

Revisions

→ Lighter metal
→ Additional loop clamps
→ Alter knee adjustability

Impact

→ Returns independence to patients
→ Reduces caretaker burden

Design Inputs

Constraints

Device Weight
< 6.58 lbs

Dimensions
61.7 x 44.2 x 23.6 cm

Knee Angle
< 15°

Requirements

Friction
\( \mu \geq 0.202 \)

Stair Ability
17.8 x 27.9 cm

Adjustability
11.7 cm

Load
> 515.47 N