CompactiWalker

Mockup Review
10/20/11

Green B

Problem

- Unfriendly Environments
  Many everyday environments are inhospitable to walkers.
- Storage
  Storing a walker on an airplane, at a concert, at a ballgame, or in a car trunk can be difficult.
- Stability
  In narrow or crowded environments where walkers cannot fit, users may lack stability.

Walker user descending stairs with the help of a physical therapist.

Solution

CompactiWalker

A **walker**

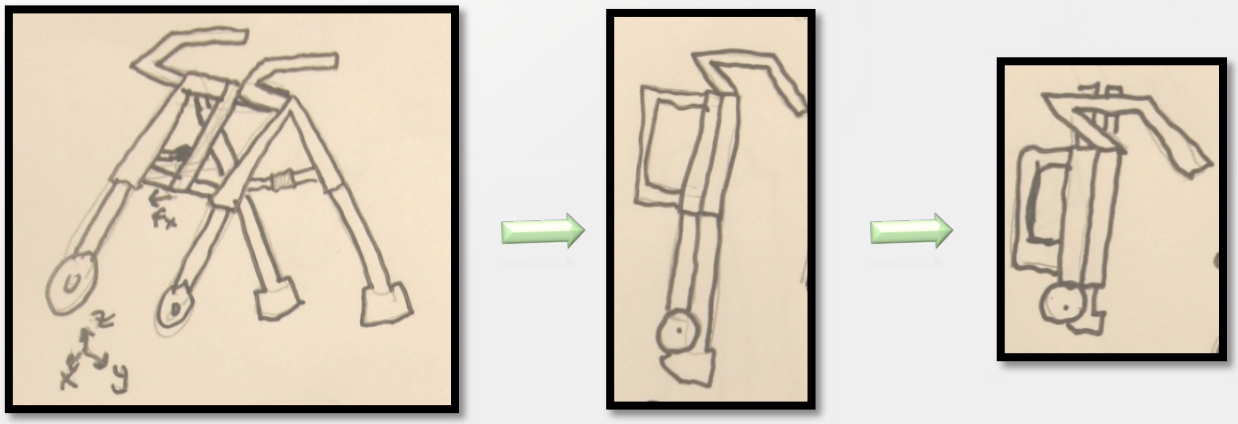
that transforms into a **cane**

and then compacts small enough to

store under an airplane seat.

Solution

CompactiWalker



Walker → Cane → Storage

Current Walker Market

"Mine folds up, but it doesn't fit under anything!"

– Kenneth Nicholson, walker user

HUGO Walker

2 button Folding Walker

Metro Walker

Most current walkers fold in only **one** dimension.

The Metro Walker is an exception – it folds in **two** dimensions.

CompactiWalker folds in **three**.

User Research

User	Owns and Uses Cane	Owns and Uses Walker	Owns Cane and Walker, Use depends on Situation
1	X		
2			X
3			X
4			X
5		X	

Target Market

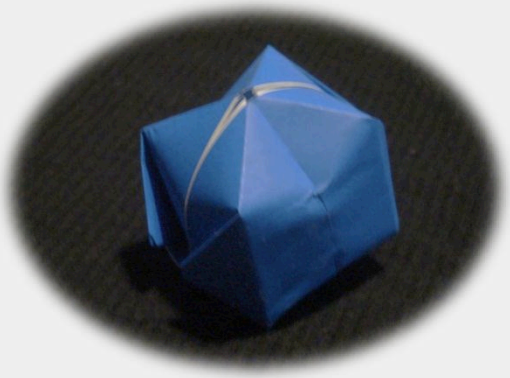
Customers
Elderly walker users who want to maintain independence
Market
Personal Mobility Assistance Devices

Product Contract

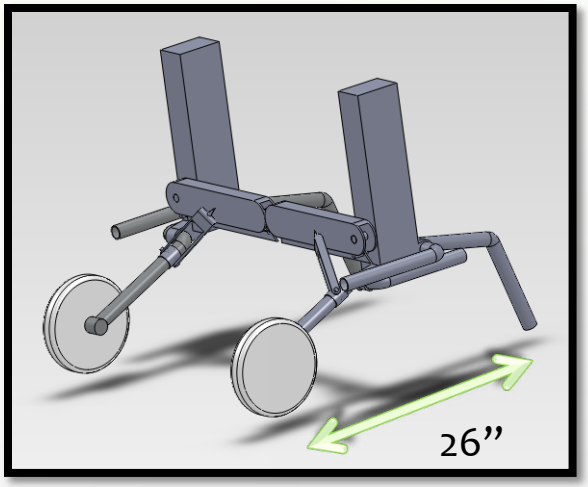
Customer Need	Product Attribute(s)	Engineering Specifications
Can easily fit under chair or airline seat	Mode Dimensions	Fits in 18" wide, 9.5" high, 18" deep envelope
Can be easily carried by user	Total weight	Less than 8 lbs
Can safely support user	Strength	Supports at least 1115 lbs vertical load and 100 lbs horizontal load without deforming or changing modes.
Can change between modes quickly	Time to change modes	Less than 15 seconds from one mode to another
Can be changed between modes easily	Force and torque necessary to activate locking mechanisms	Less than 10 N Less than 0.5 N-m
Can be used in cane mode in tight spaces	Cane mode dimensions	Less than 6" wide and 7" deep
Can fit most potential users	Height in walker and cane modes	Adjustable 27" - 36" floor to handle in walker and cane modes
Can be used on different surfaces	Friction of end caps	$0.2 < \mu < 0.8$

Key Risks: Folding geometry

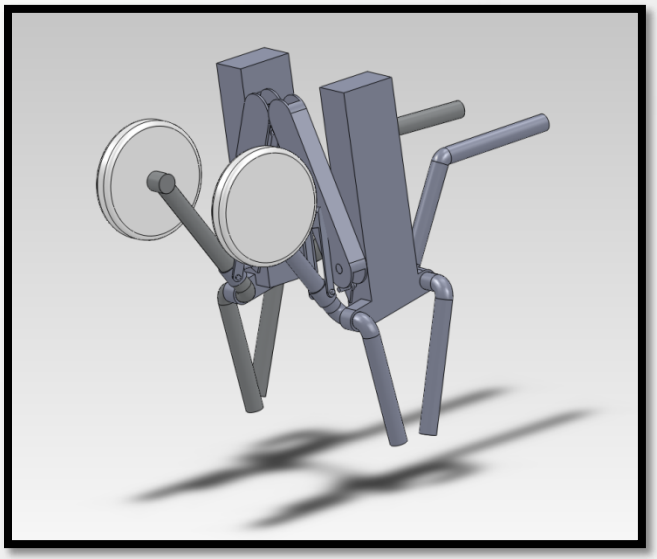
- Can we efficiently collapse the product into the envelope dimensions specified in the product contract?



Key Risks: Folding geometry

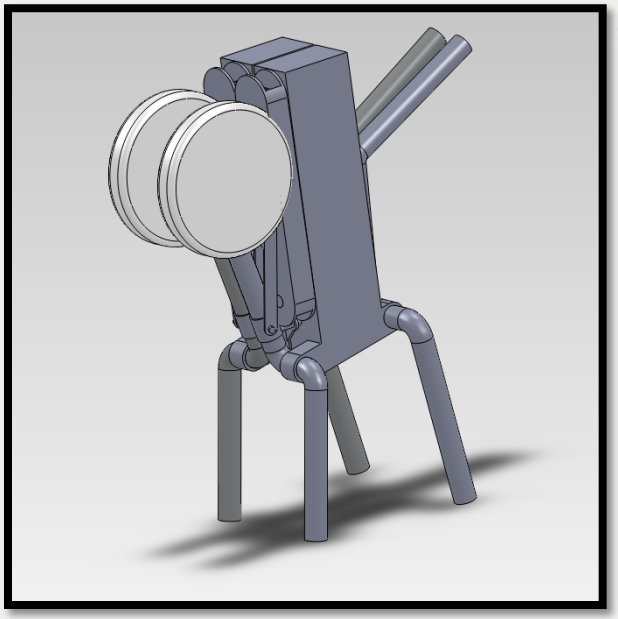


Walker Base



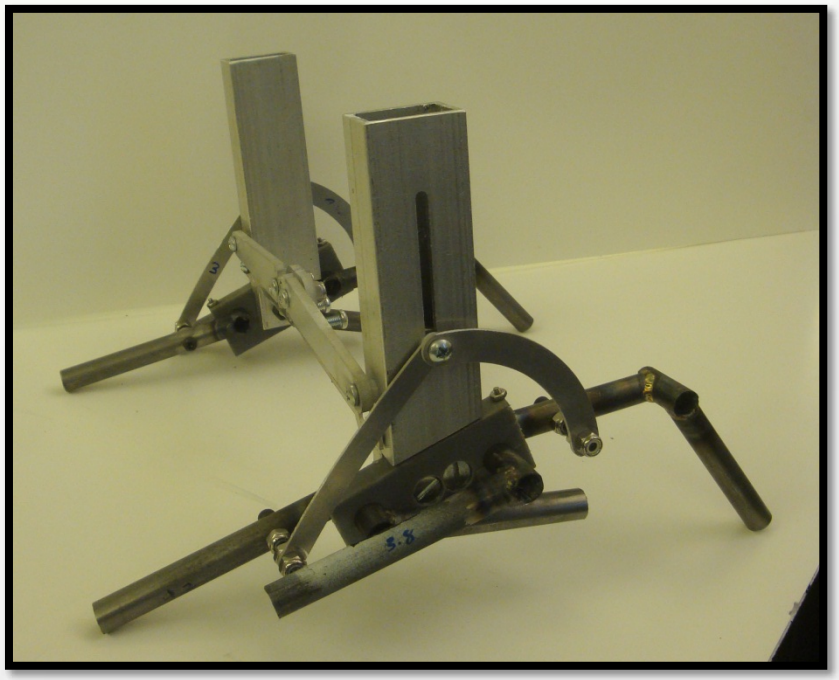
Compacting

Cane Base

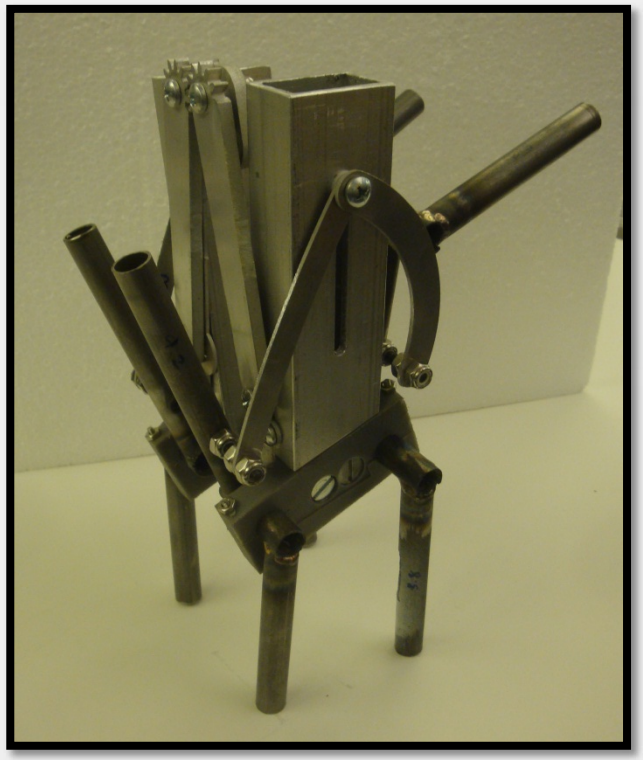


SolidWorks Model of Lower Third of CompactiWalker

Key Risks: Folding geometry



Walker Base



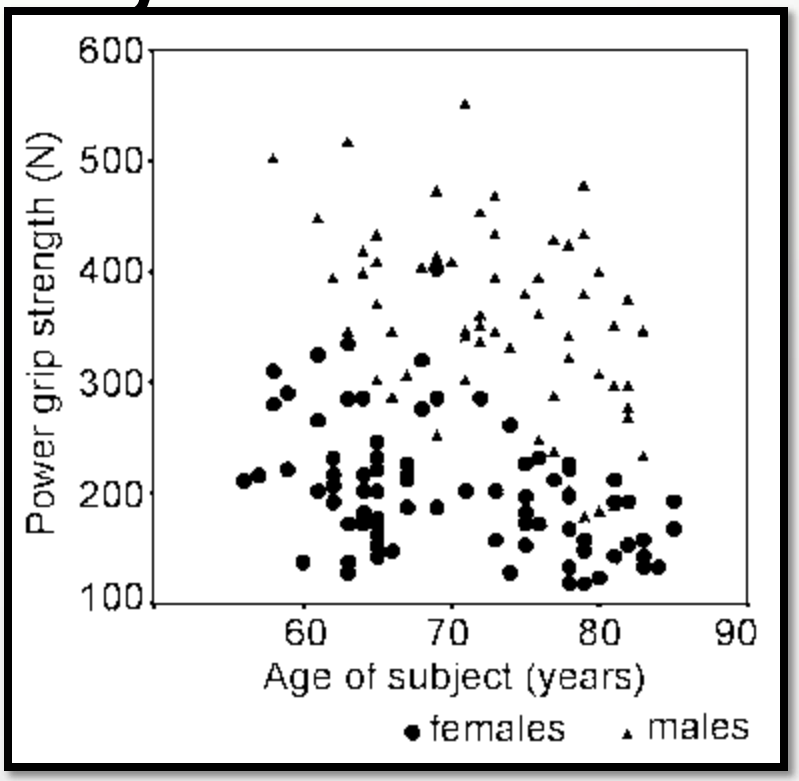
Cane Base

Half Scale Physical Model of Lower Third of CompactiWalker

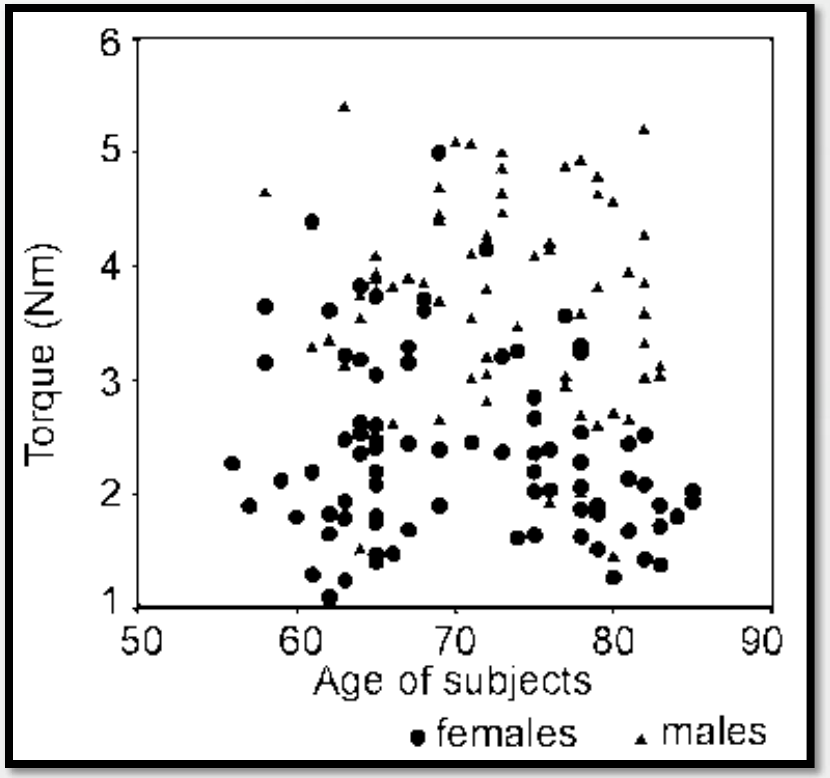
Key Risks: User Actuation

- Can our target end users independently and easily actuate all folding mechanisms?

Key Risks: User Actuation



Average ~ 276.5 N
5th Percentile ~ 194.5 N
95th Percentile ~ 404.5 N



Average ~ 3.0 N-m
5th Percentile ~ 1.6 N-m
95th Percentile ~ 4.4 N-m

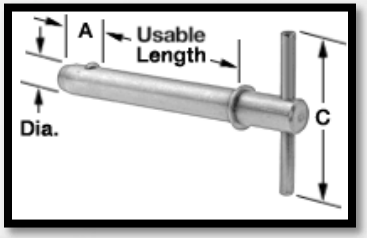
Work done by Centre for Applied Gerontology, Birmingham, UK, 2004

Key Risks: User Actuation

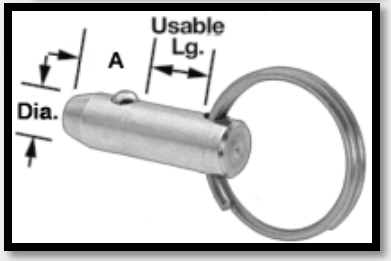
Comfortable Pulling Force

User	F (N)
1	2.2
2	3.3
3	3.3
4	2.2

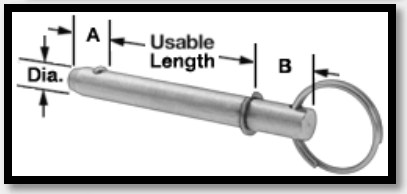
Average Pulling Force to Remove



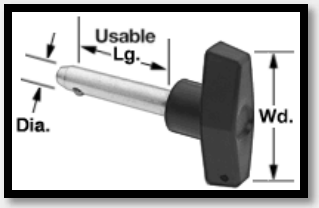
7.2 N



7.7 N



10.1 N



8.0 N

Next Steps

- Full Scale Model
- Material Selection
- Design of Actuation Controls
- Further User Research