



# MagiCane

## *A "No-Fall" Cane*

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# Team “We Cane Do It!”



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# Abstract

- We were tasked with designing a solution to the falling cane problem
- We considered two potential solution paradigms:
  - Modifying the cane
  - Modifying the environment
- Based on our research, we learned what solution paradigm users preferred in different scenarios
  - Including interviews w/ cane users
- We had several prototype iterations and are looking at better manufacturability options

# Project Goal

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to explore designs for  
a normal, one-pointed cane  
that does not fall over.

# What is the Cane?

- **Dictionary Definition**

- Sugar cane.
- A rod used for flogging.
- A stick used as an aid in walking or carried as an accessory.



- **Users:**

- Individuals, especially older adults, with gait disturbances, balance disorders, joint replacements
- Need assistive devices such as walkers or canes to provide stability while walking, standing, sitting down, and getting up

# The Cane Problem

*Cane falls, but people who use canes are not often able to bend over safely to pick them up.*

- Situations where this occurs:
  - Something trips the cane over
  - Lean the cane against something and it falls (our focus)
- Magnitude of problem:
  - Affects 100% of cane users with varying frequency
  - Hazard for individuals surrounding cane user

# MagiCane Product Goals

(based upon interviews)

- *Lightweight:* Lightweight aluminum canes are most popular now.
- *Simple:* Something that you would do relatively automatically; seniors do not want another thing to have to remember doing.
- *Discreet:* Don't want something that's too conspicuous.
- *Affordable:* Seniors would probably only spend a couple dollars more for a cane that doesn't fall over.

# Existing Solutions

- Quad cane
- Cane wrist straps
- Cane clips
- Cane magnets
- "No Fall" walking safety cane
- Weighted cane



# Existing Solutions: Quad Cane



# Existing Solutions: Cane Magnets



# Existing Solutions: Wrist Straps



# Existing Solutions: Cane Clips



# Existing Solutions: "No Fall" Walking Safety Cane



# Existing Solutions: Self-Balancing Staff



# Things Considered When Designing

- Stable bases are a big plus
- People walk with cane on opposite side of that which needs most support
- Must take into account wide range of user dexterity
- Aesthetics are important

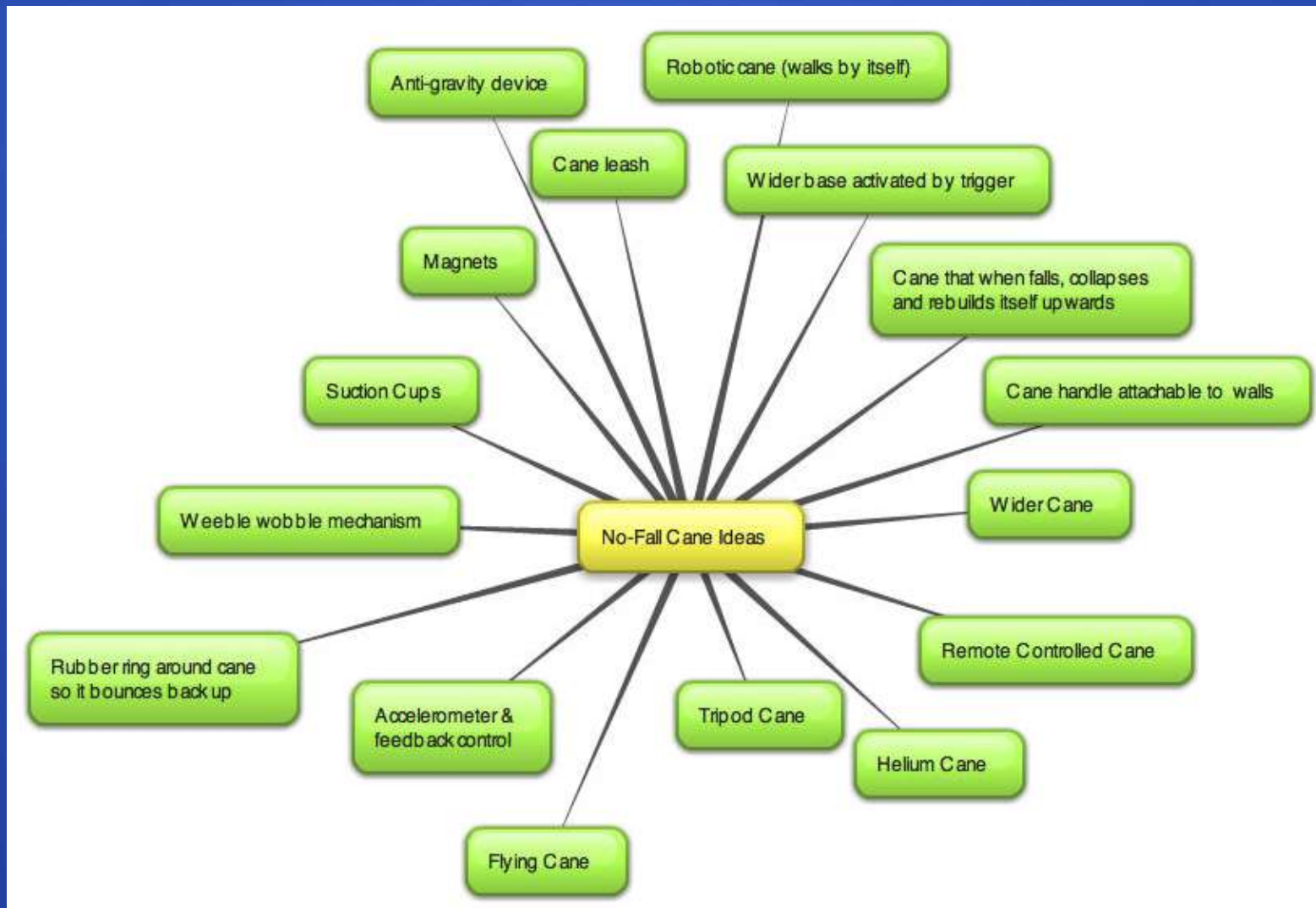
# Approaches to the Problem

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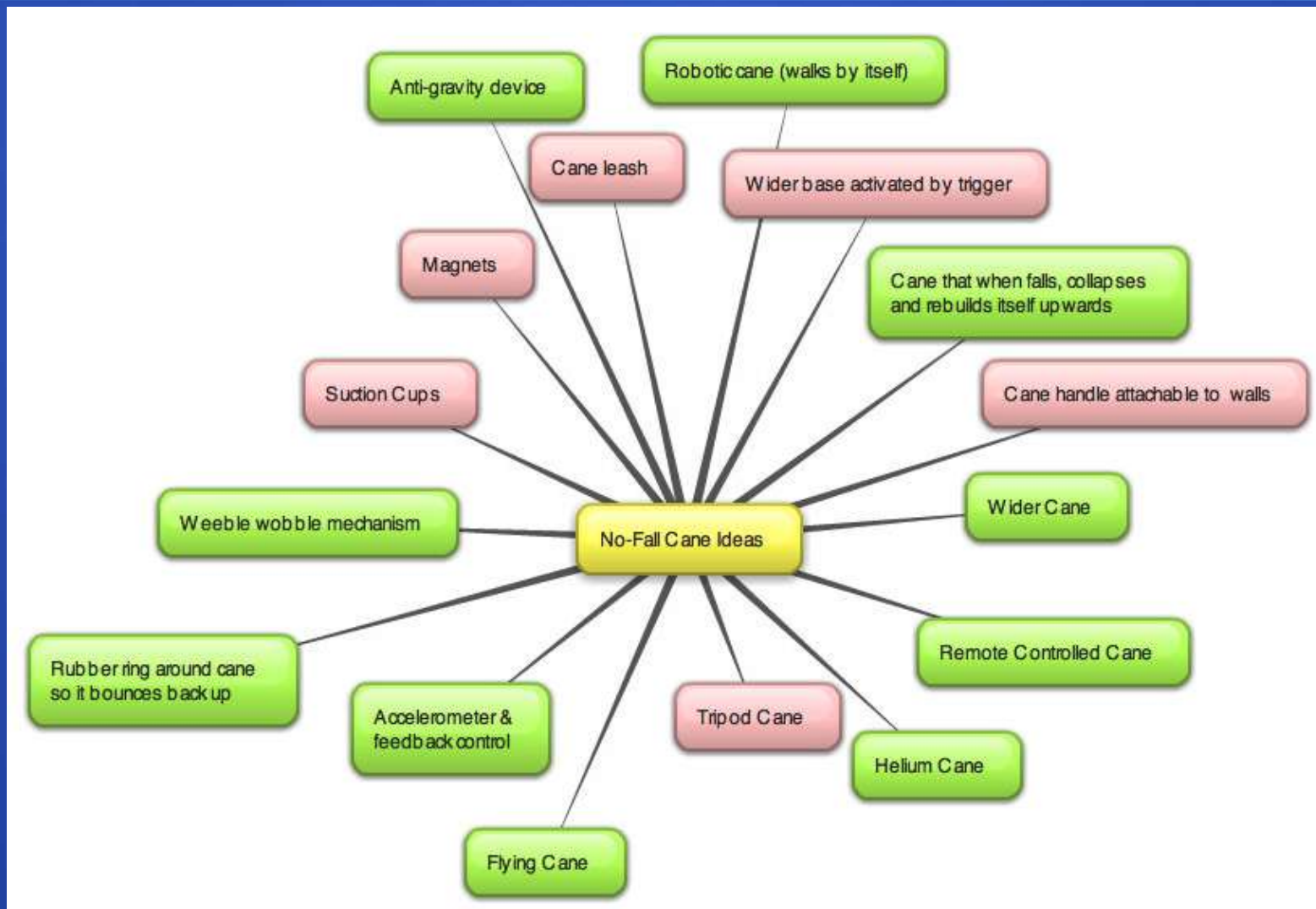
- 1. Modifying the cane
  - Situations in which modifying the cane would help solve the problem
  
- 2. Modifying the environment
  - Situations in which modifying the environment would help solve the problem



# Preliminary Brainstorming



# Potential Ideas to Pursue



# Solutions to Modifying the Environment

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*Modifications to the user's  
familiar environment(s)  
should take into account  
individual routines,  
preferences, and abilities.*

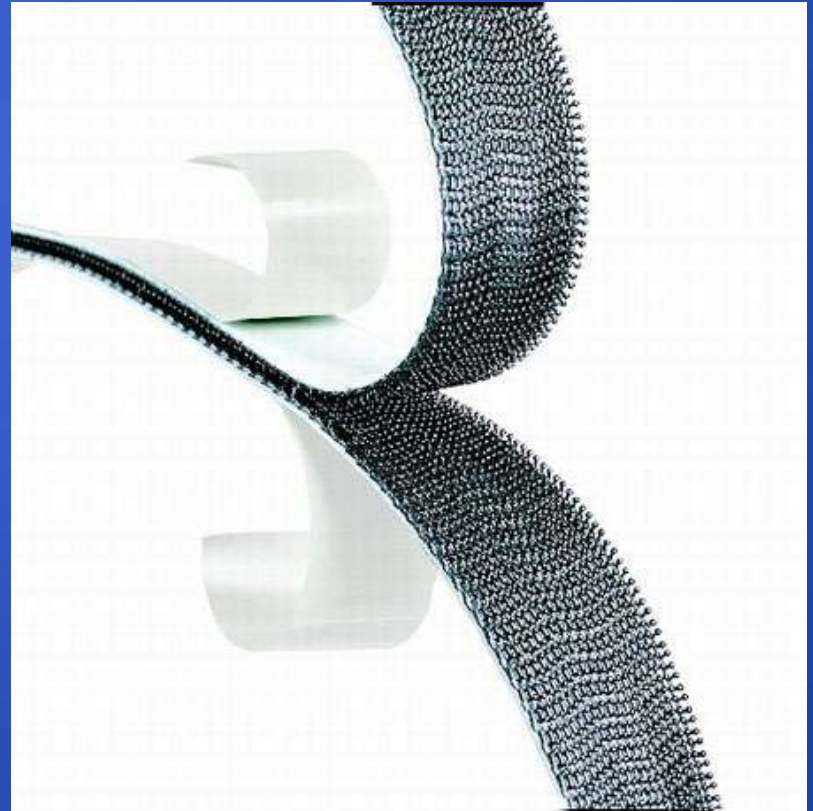
# Solutions to Modifying the Environment

## *Portable Pins & Suction Cups*



# Solutions to Modifying the Environment

## *Magnets & Velcro*



# Solutions to Modifying the Environment

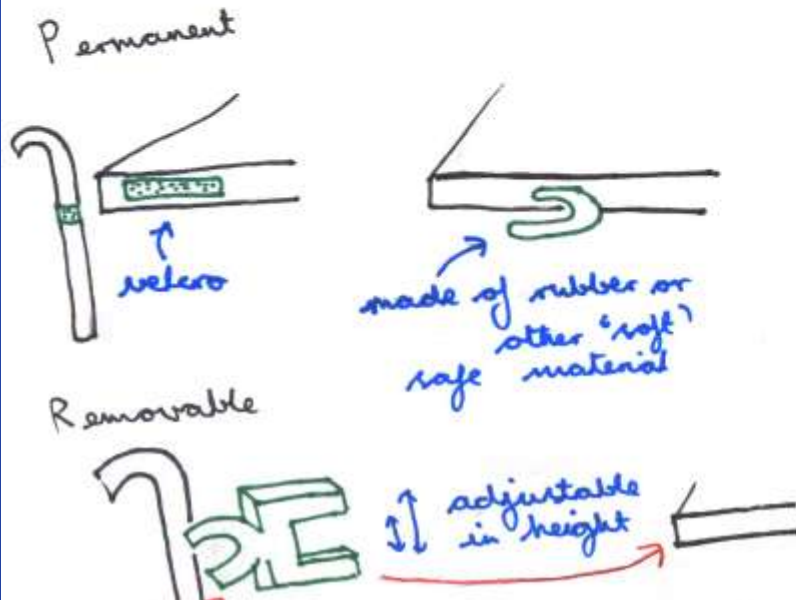
## *Clips & Holders*



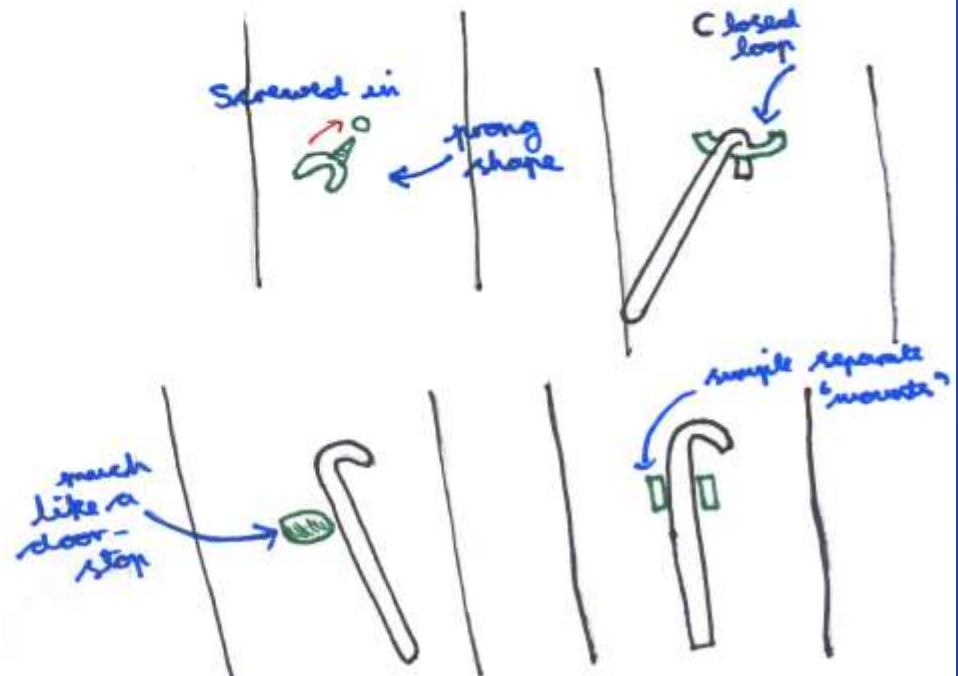
# Solutions to Modifying the Environment - Prototyping

## Modifying the Environment

### Surface fixtures



### Wall fixtures



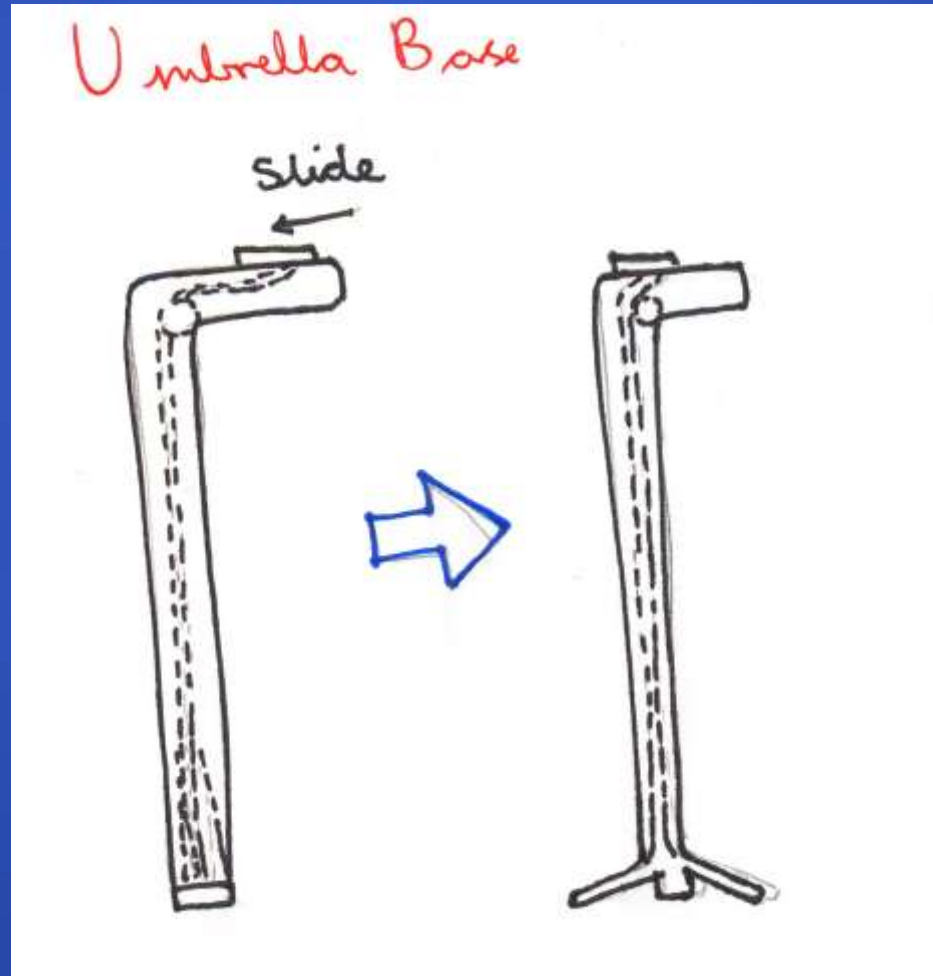
# Solutions to Modifying the Environment - User Feedback

- Users wouldn't install fixtures in their homes; they'd use available nooks and crannies
- Some users would consider carrying a removable cane fixture in their purses/pockets if it was light
- Users would use fixtures available in public places (restaurant, cinema, etc.)
- All users said they would love a comprehensive solution - a modified cane

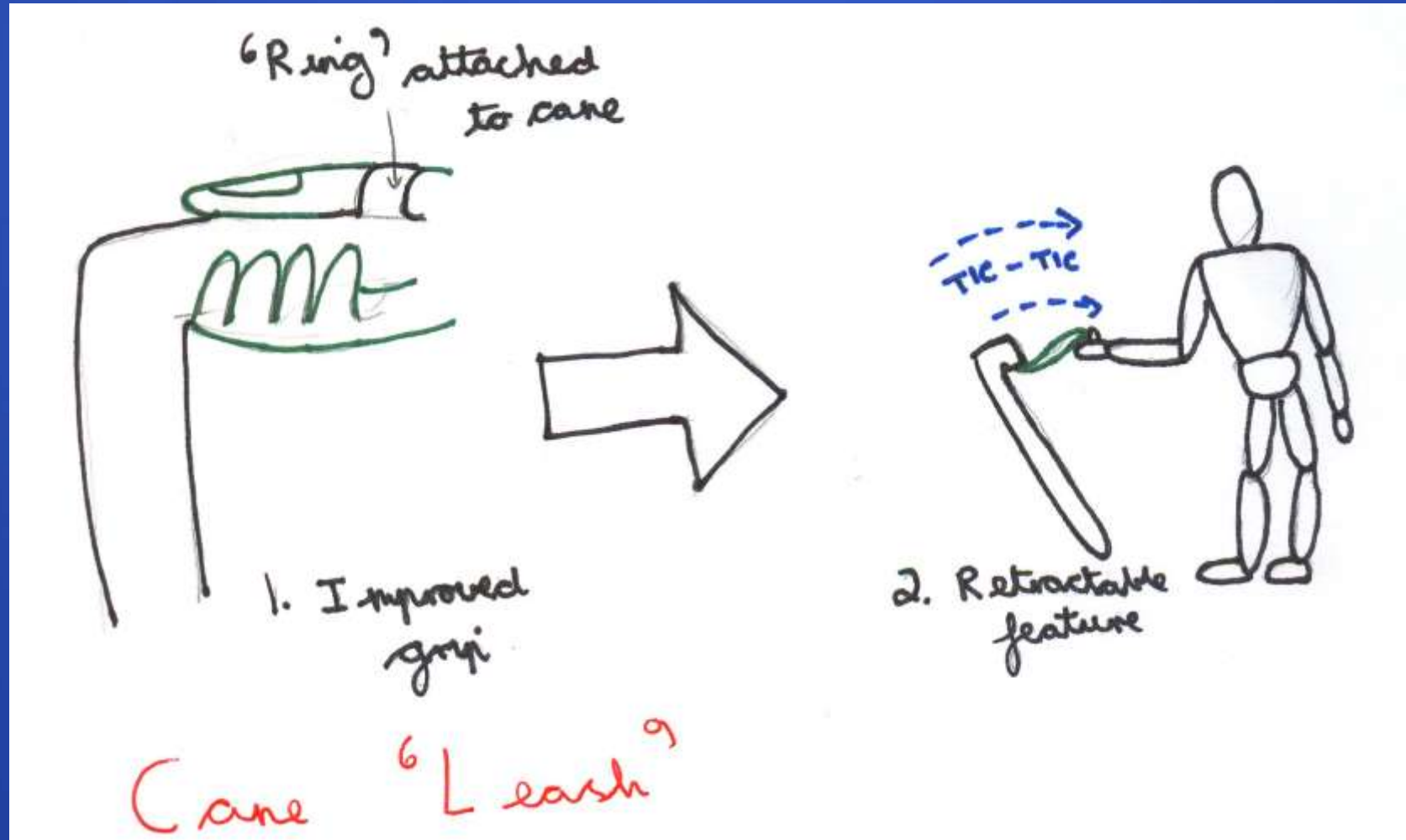




# Solutions to Modifying the Cane

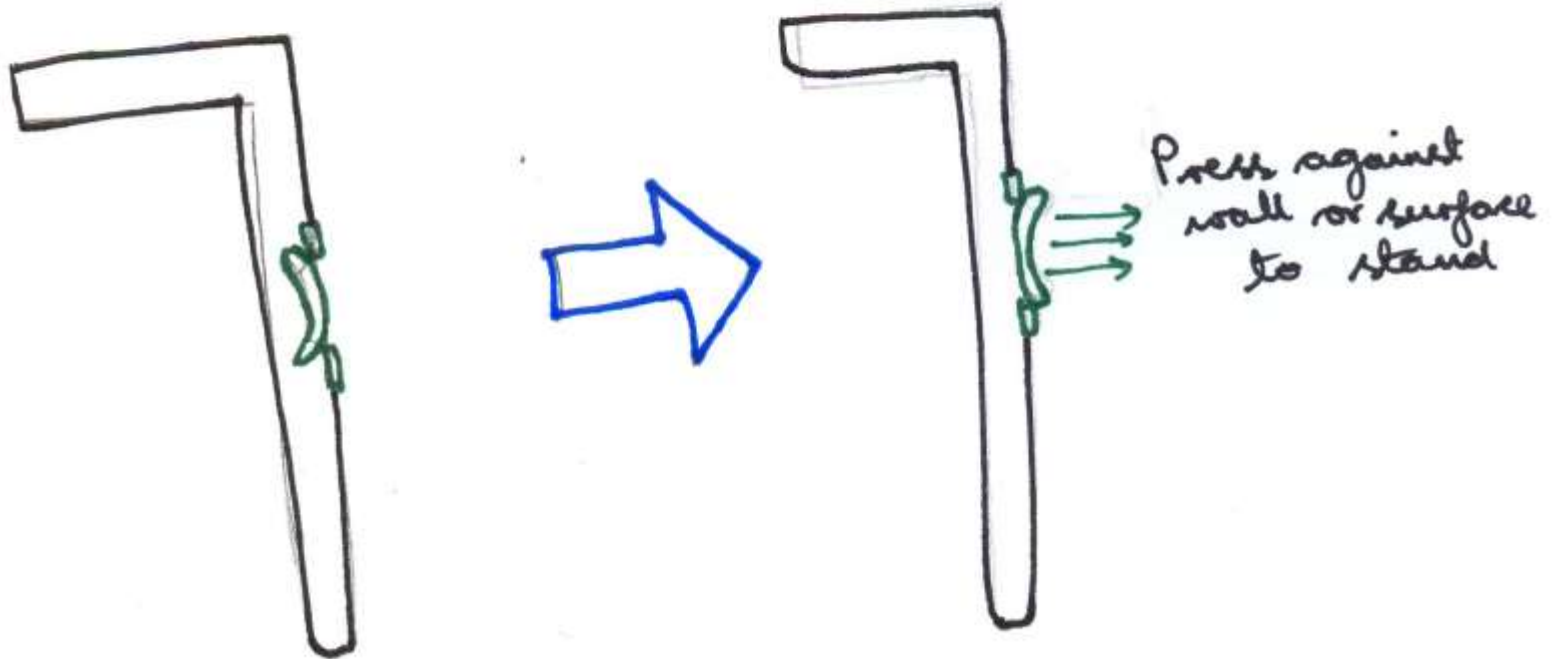


# Solutions to Modifying the Cane

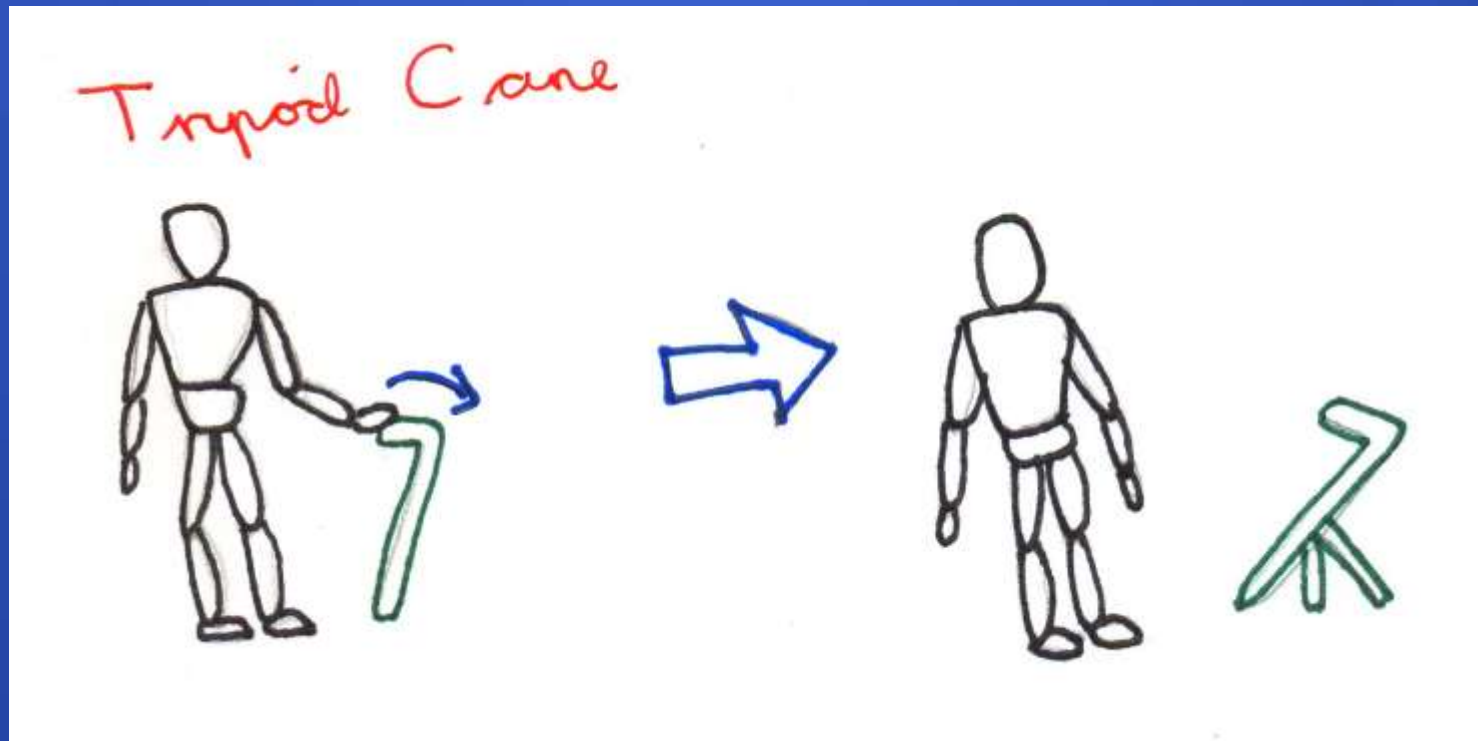


# Solutions to Modifying the Cane

Revolving Suction Cup



# Solutions to Modifying the Cane

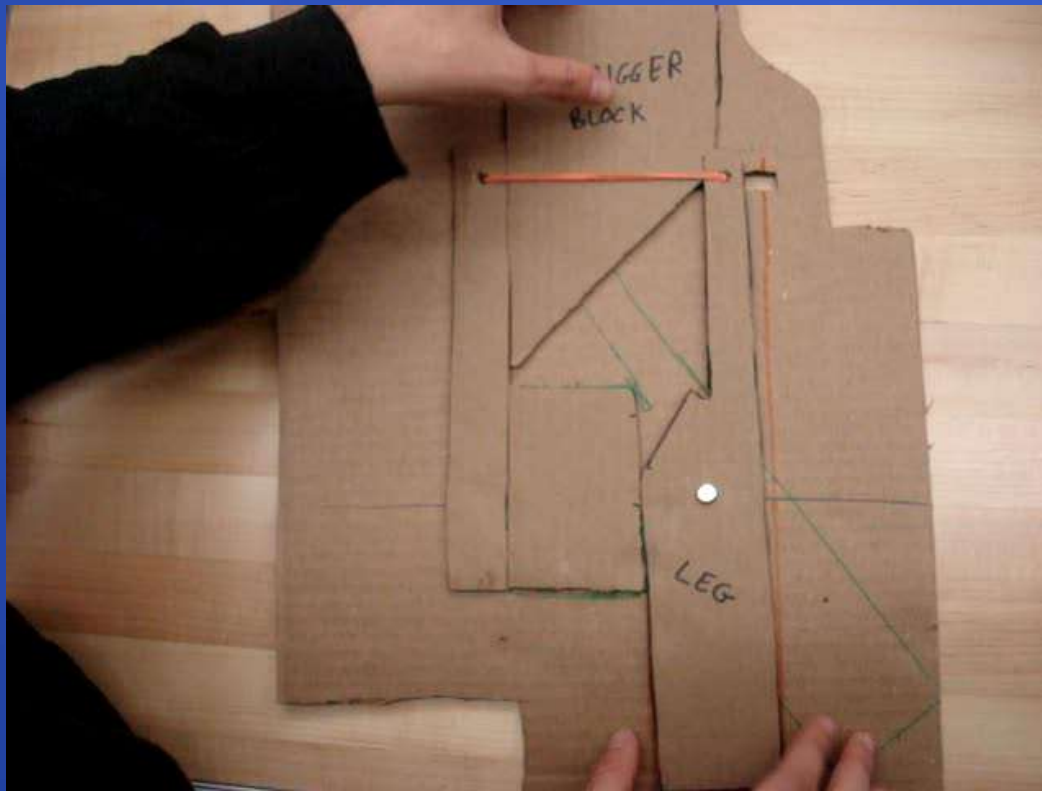


# Solutions to Modifying the Cane - Prototyping

- Trickier than we expected!
- We wanted an idea of dimensions and possible issues concerning our design.
- Take-away points:
  - One retractable leg wouldn't be enough to steady the cane
  - A mechanism is needed to keep the leg from sliding all the way out (spring or other)
  - Gravity isn't a convenient trigger for the mechanism



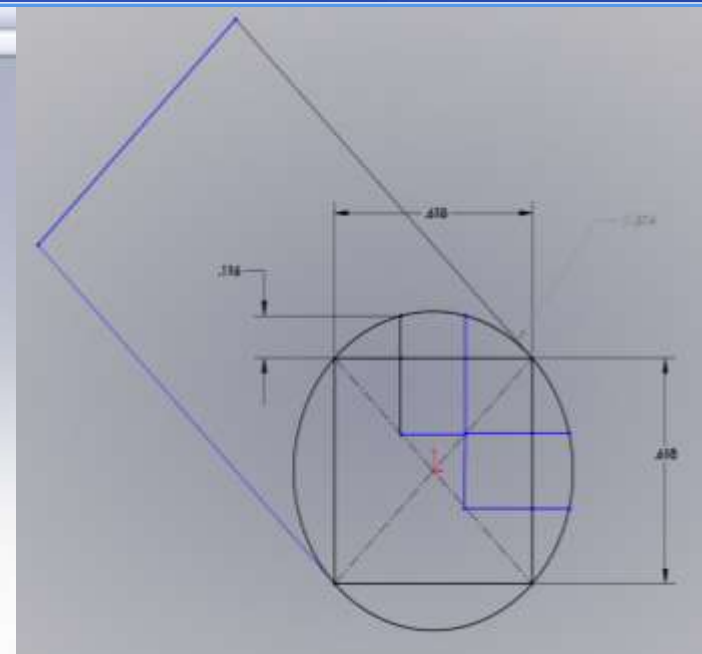
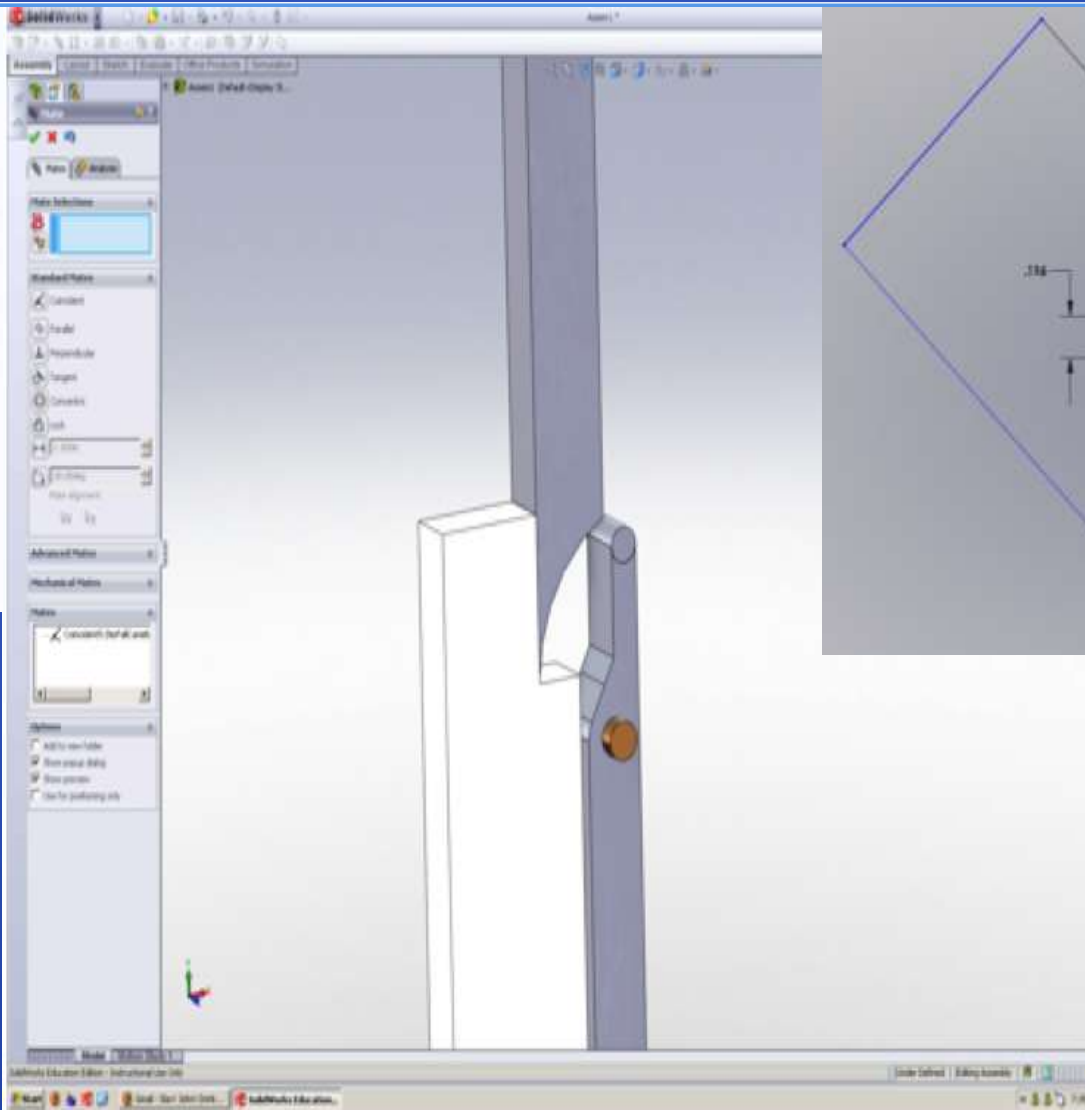
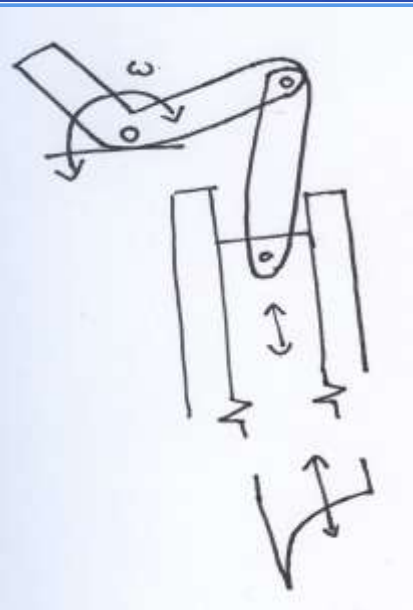
# Solutions to Modifying the Cane - Mechanism



In coming up with a mechanism, we tried to incorporate:

- As many standard parts as possible
- Lightweight parts
- Inexpensive parts – by using mechanical principles

# Solutions to Modifying the Cane – CAD Model



# Solutions to Modifying the Cane – Talking to Vendors

We compiled the following list of prototype vendors to approach:

- Plastic Resource Group/Realize Inc.
- Ricman Manufacturing Inc.
- CK Tool Company, Inc
- Focus Product Design and Manufacturing  
Advanced prototype Engineering LLC

We have already contacted a couple of vendors who seem receptive and willing to advise us on product.



# What We've Achieved

