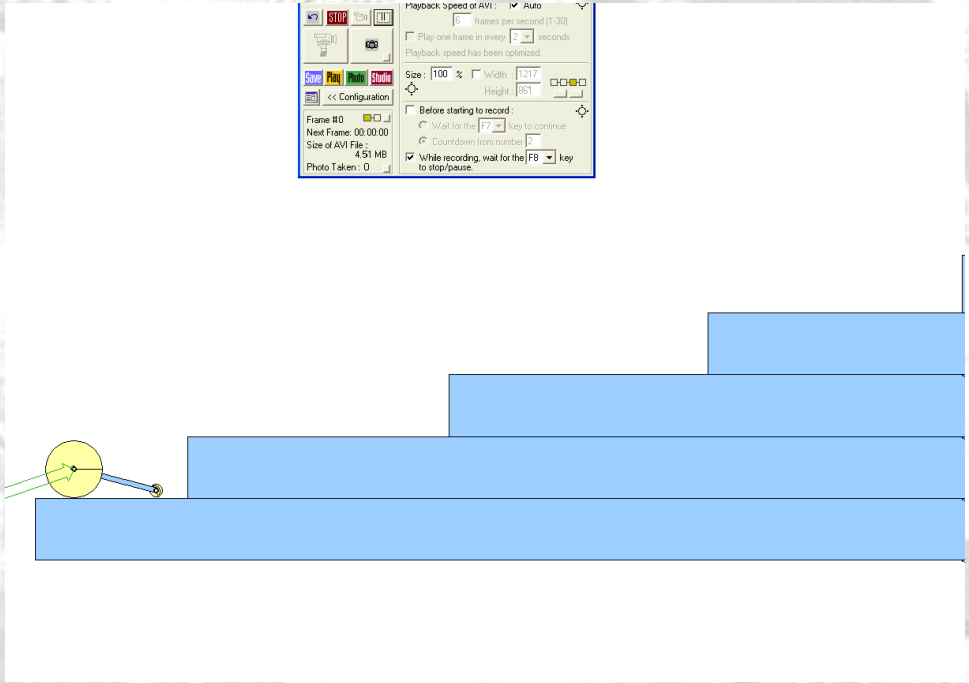
start: The Super Stair Cart

Blue Team
Section B

Goal

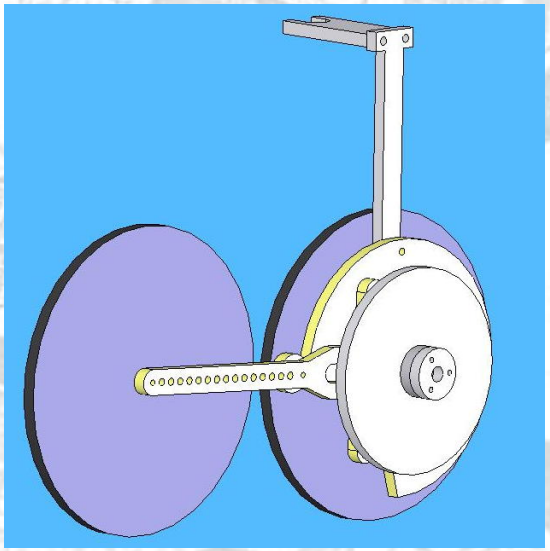
- *Start* makes it easier, safer and more comfortable to move large and small items up and down stairs



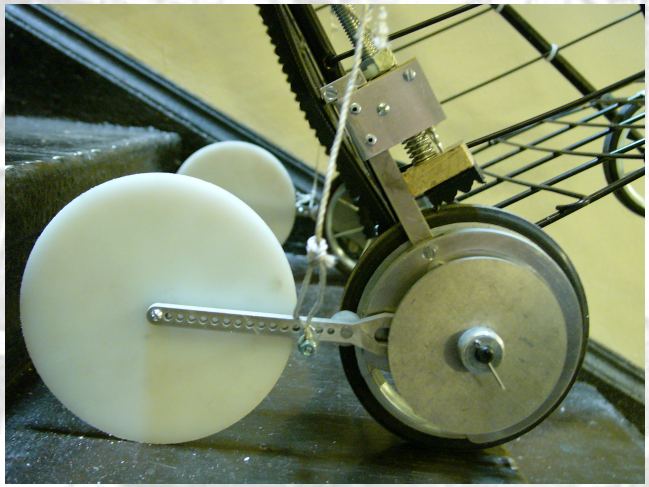
Design Parameters Critical Modules

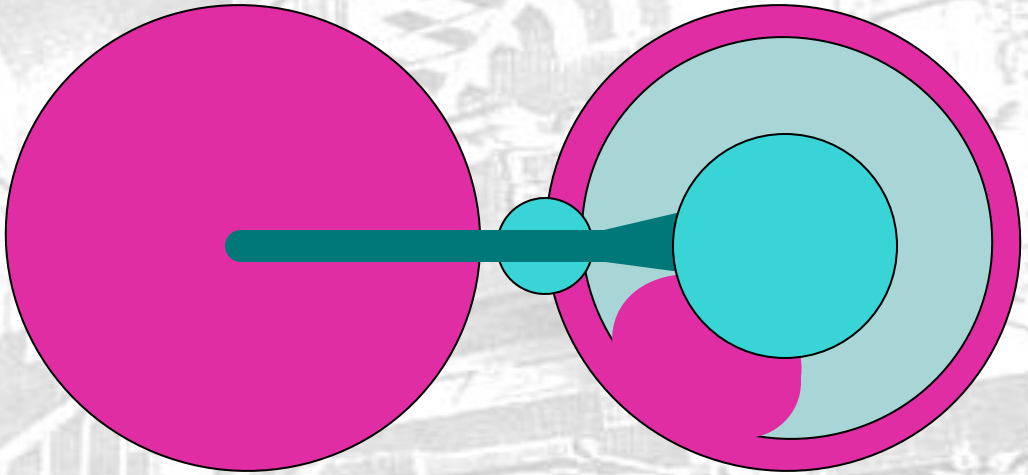
- Stair Mechanism
  - Ascent
  - Descent
- Safety
  - Tipping forward
  - Tipping backwards
- User Interface
  - Stability
  - Ergonomic

Progress: Stair Ascent

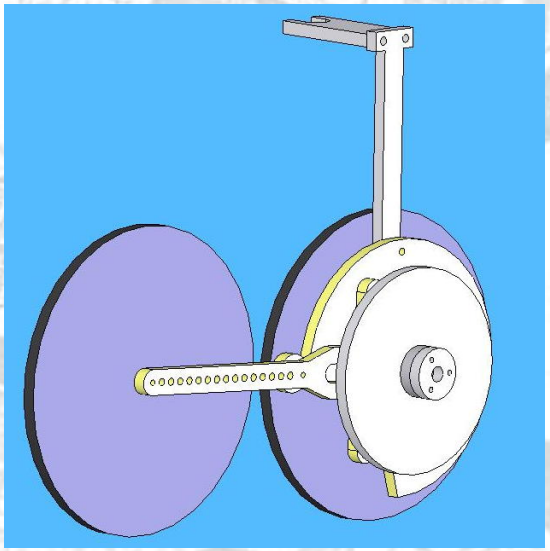


- Minimizes force required by user
- Variable radius arm
- Maintains Constant 45deg. Slope
- Roller guided along Cam





Progress: Stair Ascent



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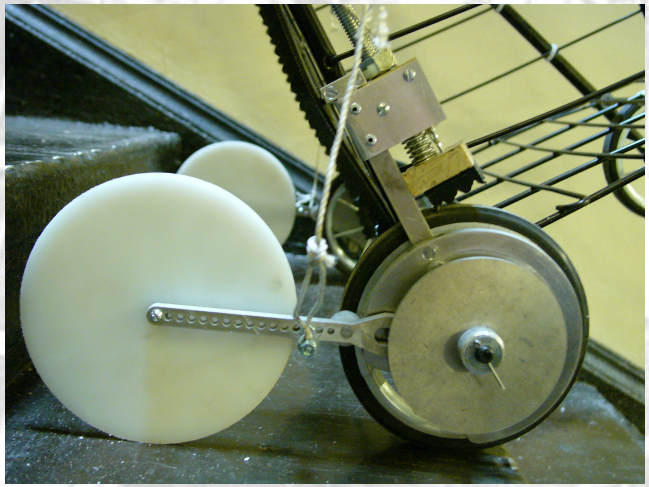
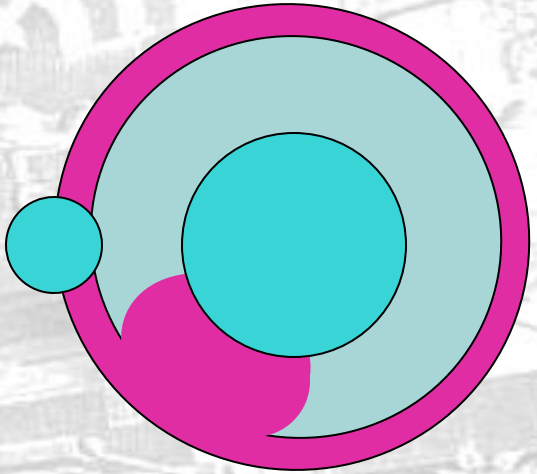
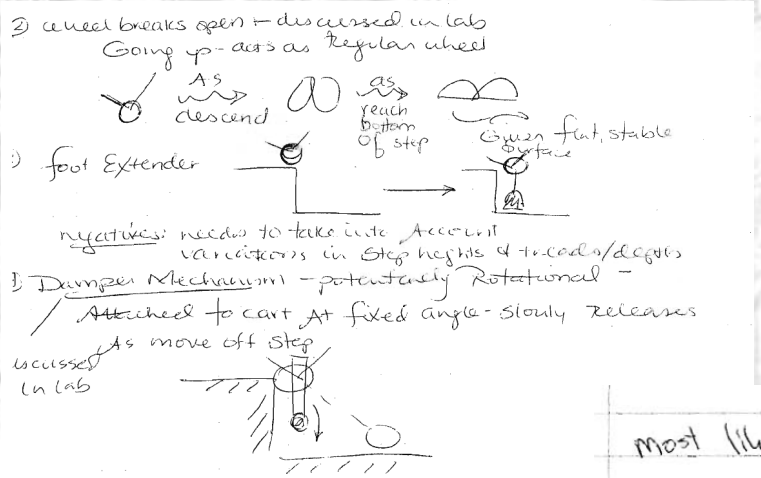
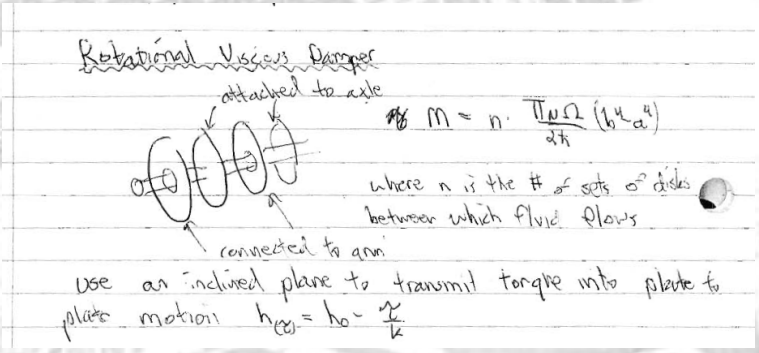


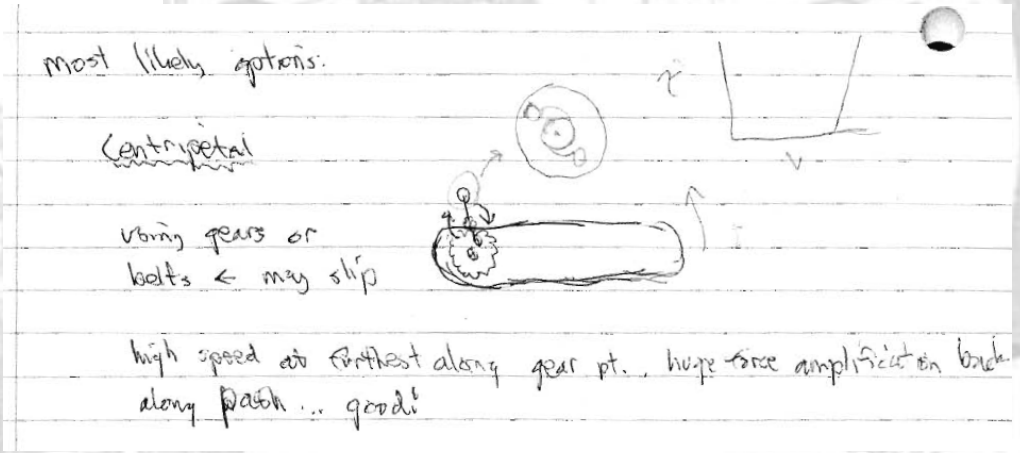


Progress: Stair Descent

Alternate Design Ideas:

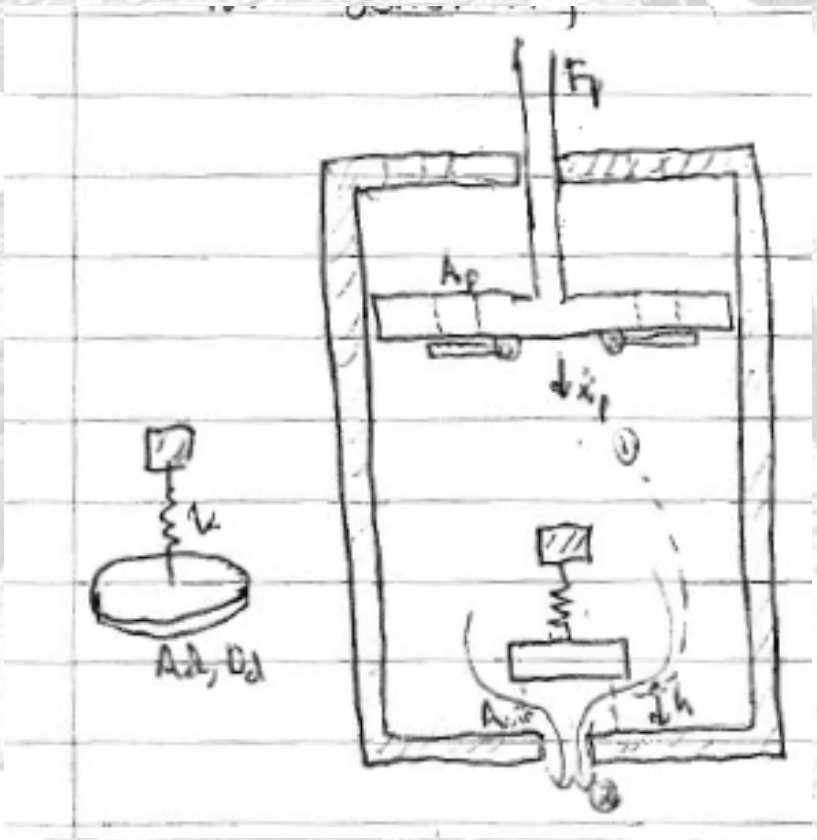




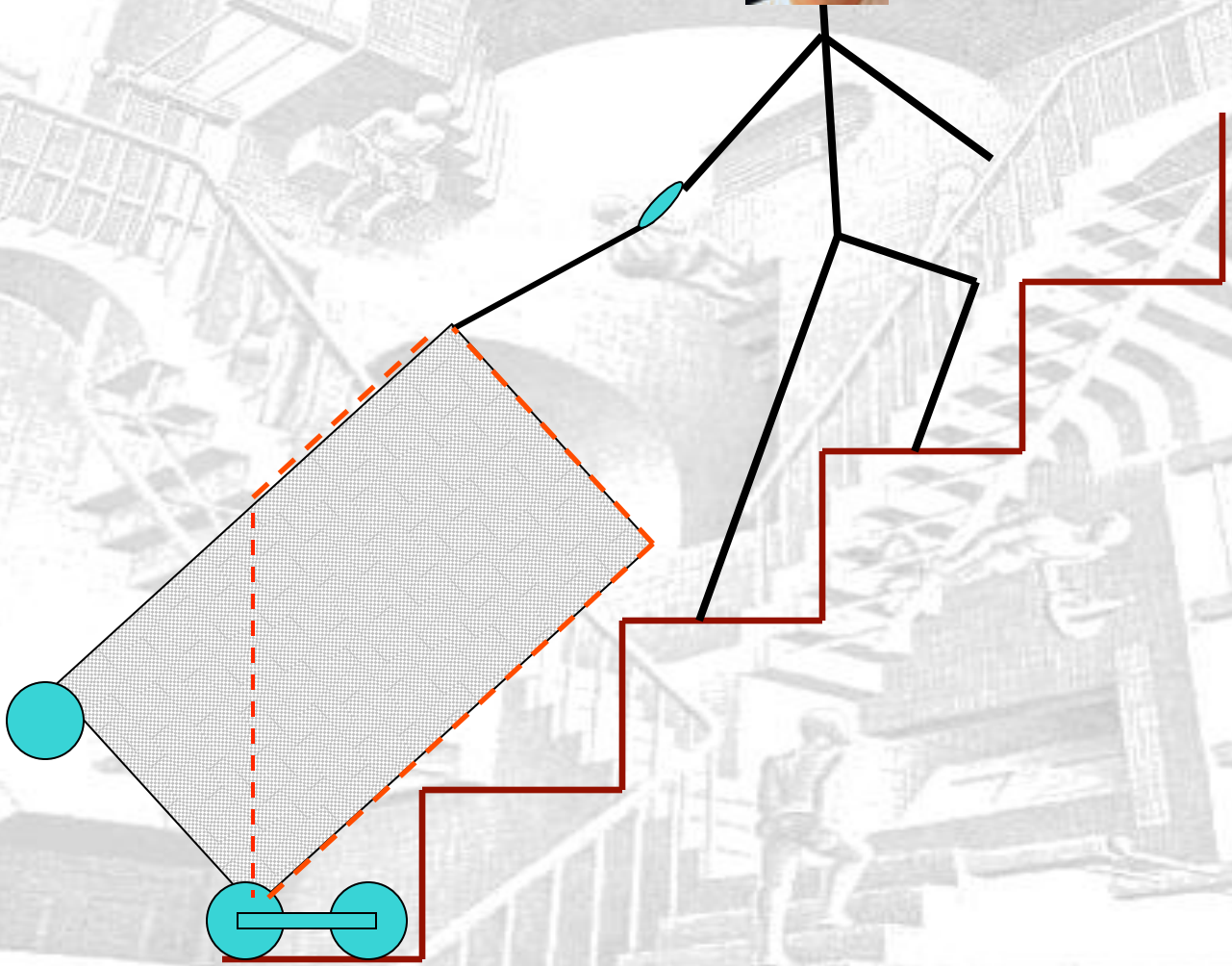


Progress: Down Mechanism

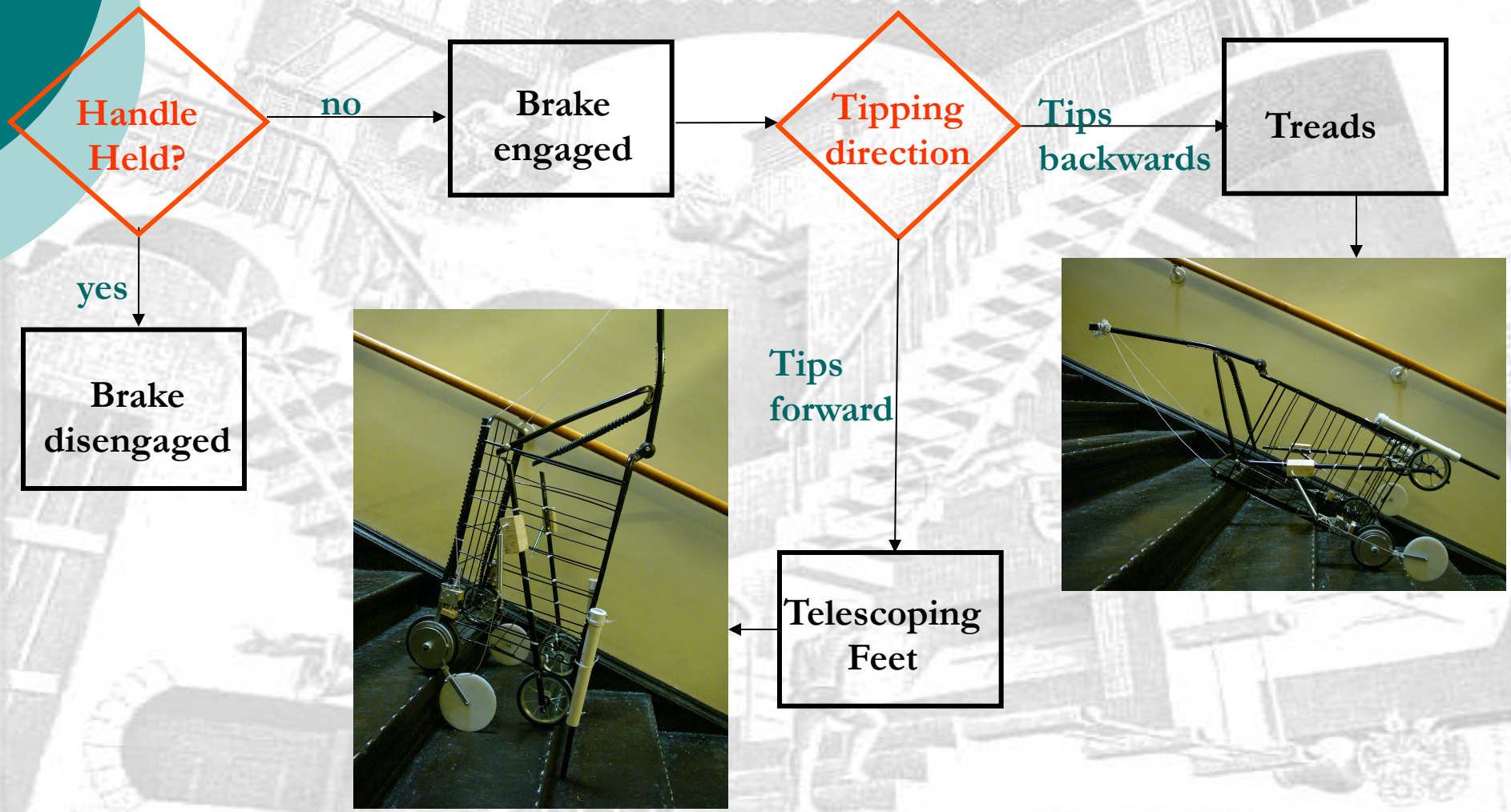
- *Criteria*
  - **Easy to integrate**
  - **Ease of Use**
  - **Maintenance**
- *Parameters*
  - **Torque ~3-30 lb-ft**
  - **Unidirectional**
  - **Rotational**
  - **Operates at constant velocity**



Progress: User Interface and Stability



Progress: Safety



Looking Ahead….

- Edit Cam Design
- Optimization of Damper Design and manufacturability
- Costs
- User Interface