

Tilt-a-Toilet

Orange B



- Mockup Review
- Tuesday, October 19, 2006
- Marcus Carson, Christina Gomez, Brian LaCrosse, Justin Lai, Janet Lieberman, Sharon Prange, Miguel Saez

Concept

- Assists in both standing up and sitting down on the toilet
 - Safe and natural motion
 - One-touch controls
 - Powered by water already in your home
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Compelling Need

- 2.5 million people in the US have difficulty getting to and using the toilet
- 1.7 million of these need personal assistance

- <http://www.census.gov/hhes/www/disability/sipp/disab02/ds02t2.pdf>
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Issues in Existing Products



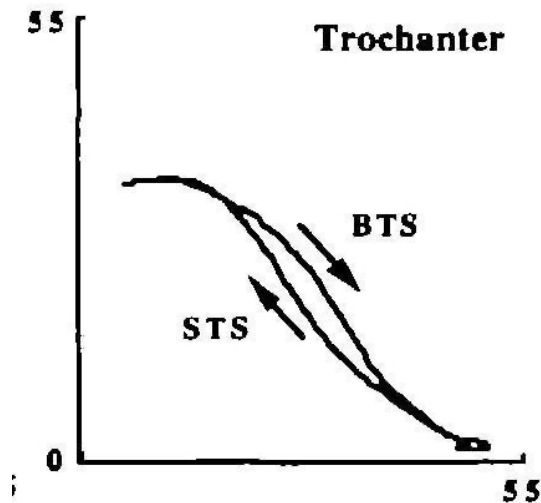
- Expensive: \$700-\$2000
 - Unwieldy/appearance
 - Electric power
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Technical Concerns

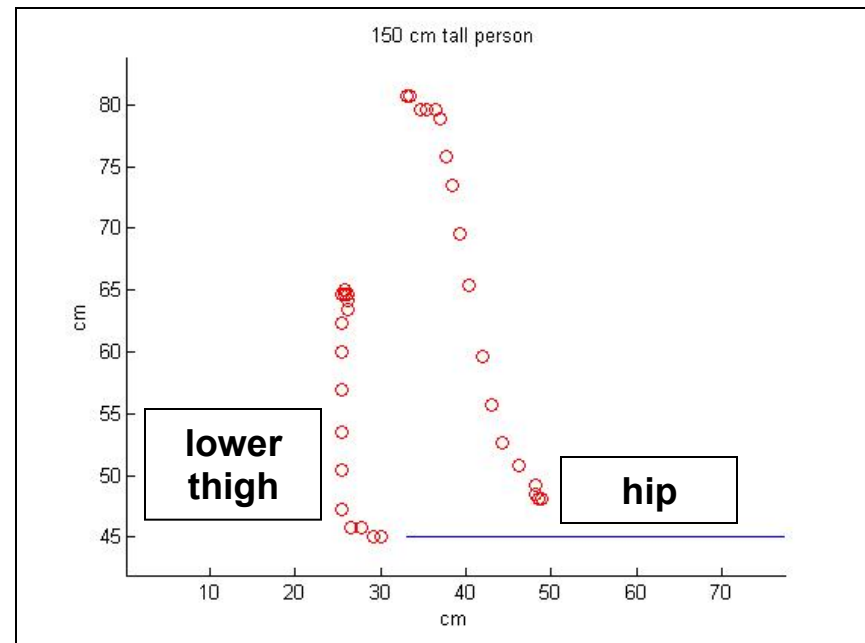
- Ergonomics- fluid movement, comfort, degree of assistance
 - Actuation- water power, stable chair position
 - Aesthetics and Hygiene- material, smooth surfaces, footprint
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Motion: Sitting Down and Standing Up

- Literature:



- Our Data:



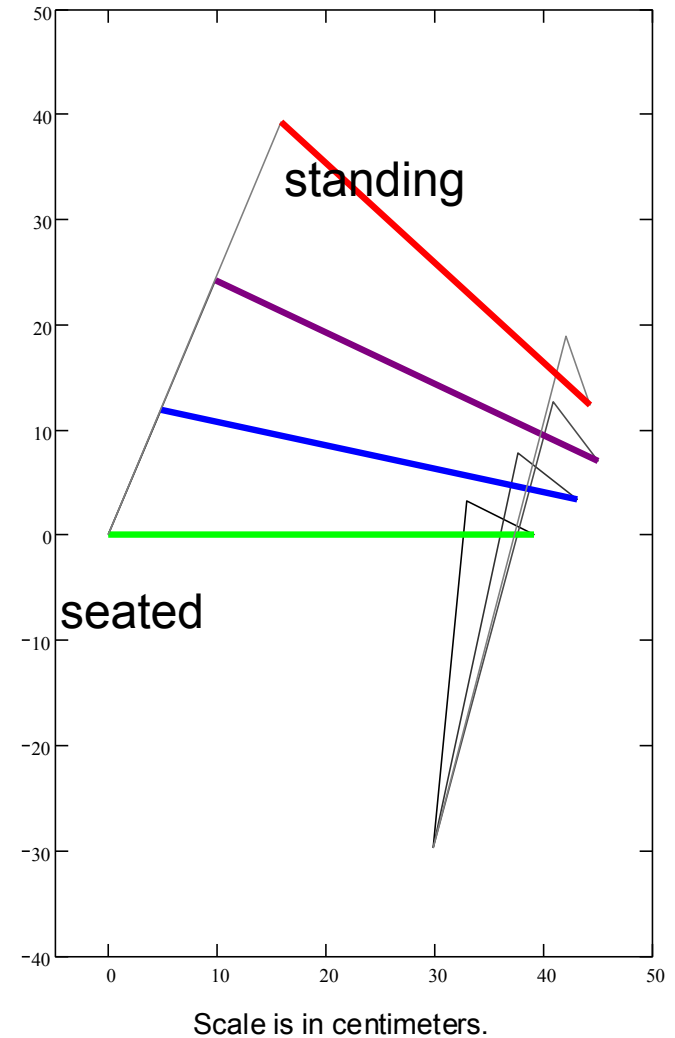
- Time: 1.3 sec to stand
1.7 sec to sit (for elderly)

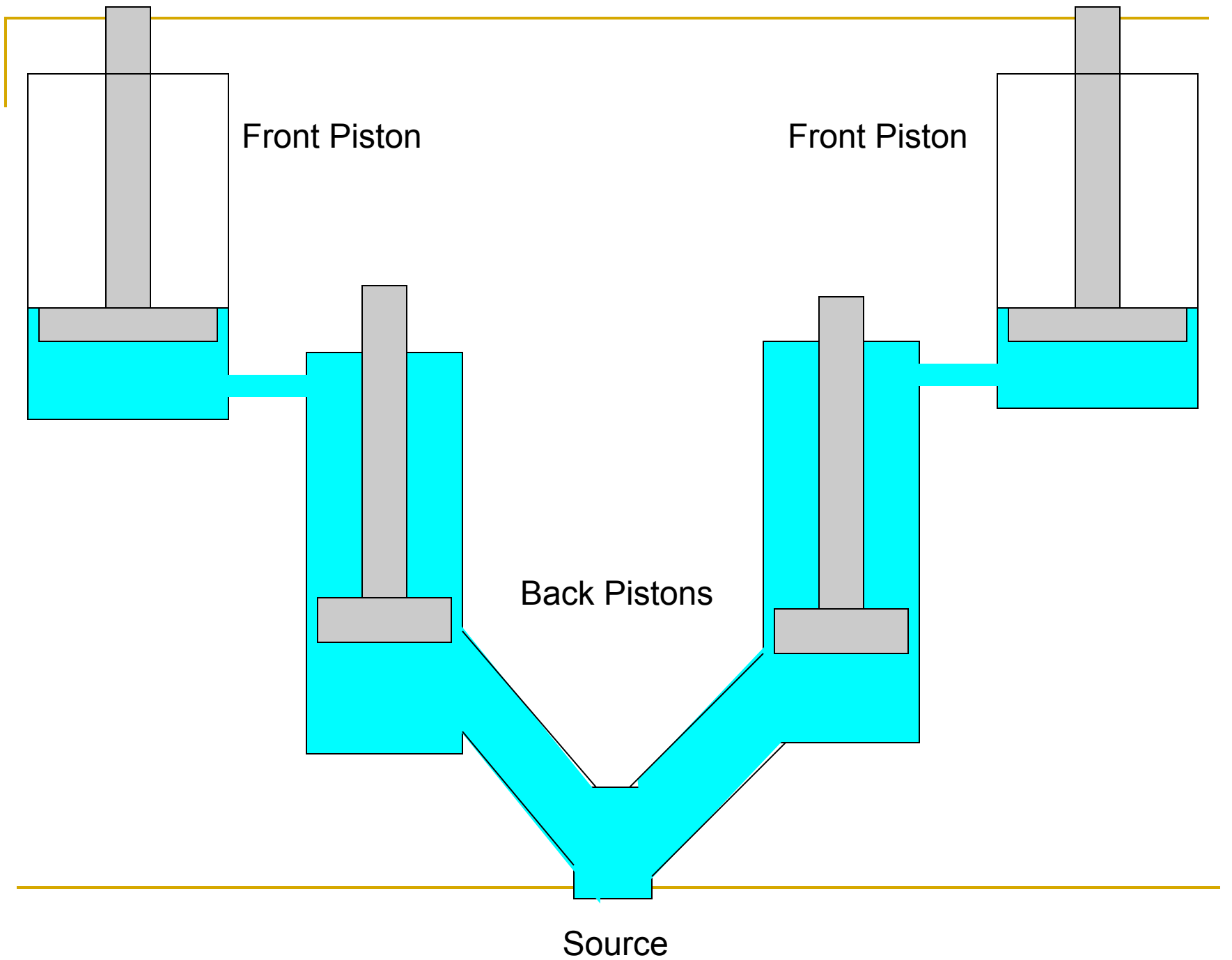
Motion Studies



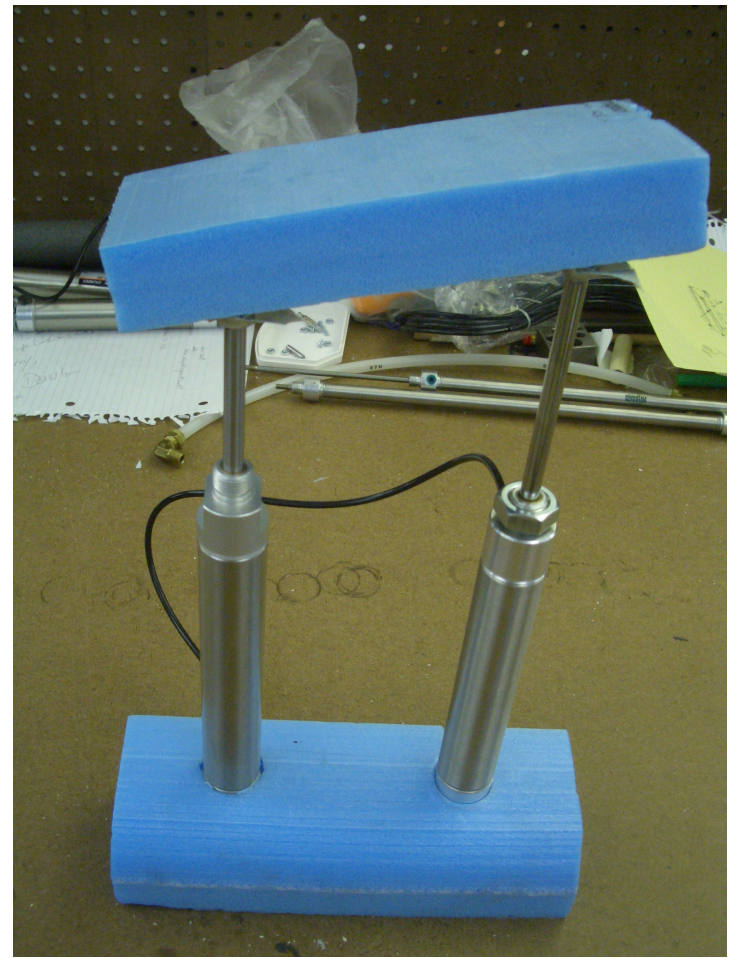
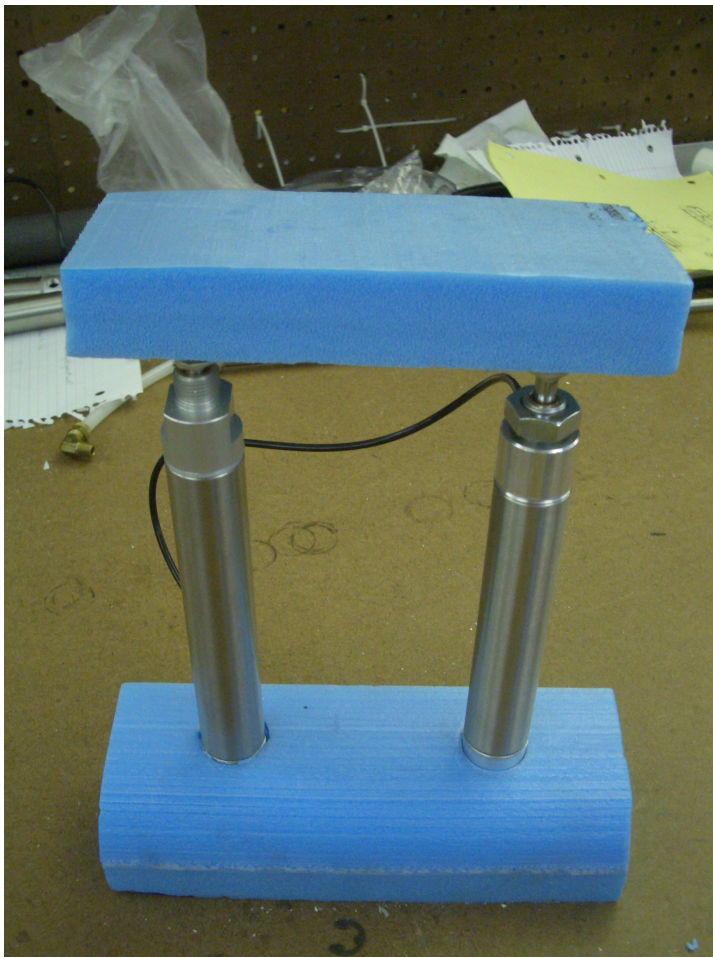
Mockup: Ergonomics

- Linkage design replicates unassisted motion
- Hand holds maintain orientation
- Controls integrated on hand hold





Mockup: Actuation



Mockup: Aesthetics and Hygiene

- Compact footprint
 - Plans for future:
 - Hinge on seat
 - Plastic cover for mechanisms
 - Research hygienic materials
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Conclusion: What did we learn?

- Four pistons is problematic – switch to two-piston design
 - Coupling left and right
 - Feedback causes tilting where load is placed
 - Concerns with corrosion, cost, and leaking remain
 - To a first order, kinematics work
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Future Design

