



Portable Elevating and Transfer Seat for Wheelchair Users

Design Team:

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Advisor:

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Client:

Dan Dorszynski

Problem Statement

- Wheelchairs offer limited mobility when transferring between surfaces
- Existing devices can be expensive or ineffective
- Manual transfers can be difficult
- Our device will help with seat elevation and transfer assistance.



Background: Muscular Dystrophy

- Group of more than 30 inherited diseases
- Cause muscular weakness and muscle loss
- Can appear early in life but sometimes middle age or later
- Can continue to decrease muscle mass over time
- Physical therapy, surgery, medications
- Devices can help make it easier

Background: Current Methods



Figure 1: Uplift Premium Power Seat



Figure 2: Wheelchair Transfer Board

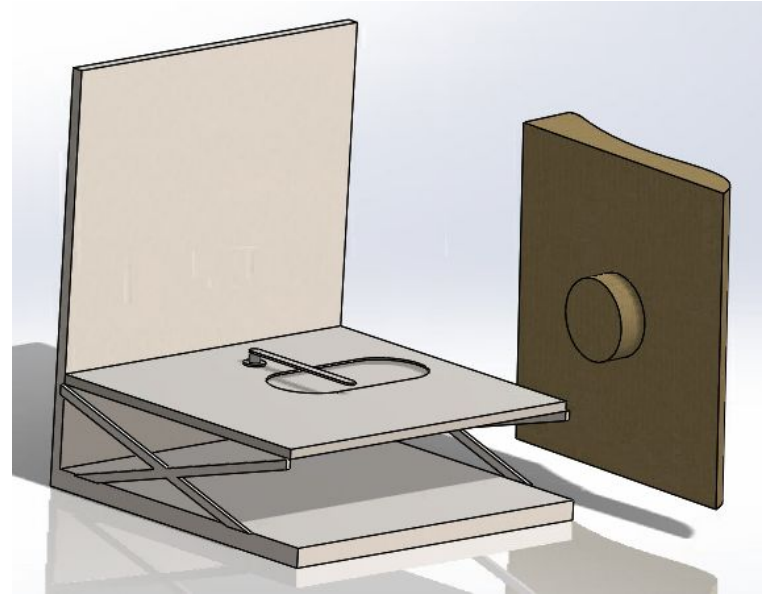
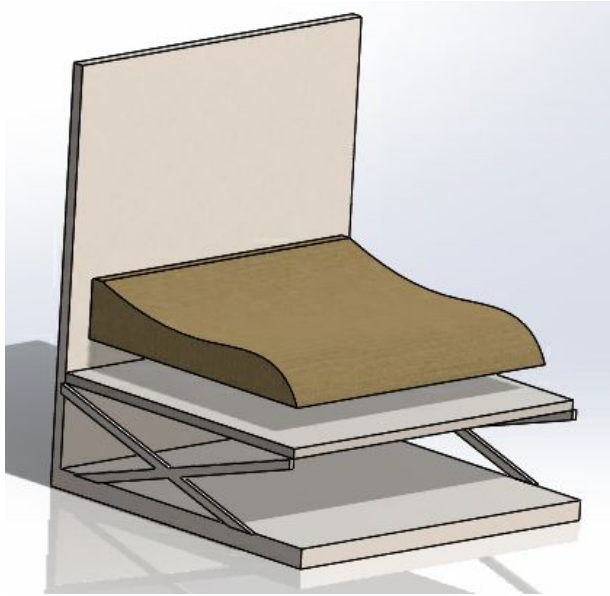
Product Design Specifications

Client Requirements

- Ability to elevate the user 6 inches (152.4 mm)
- Maximum height of device is 2 inches (50.8 mm)
- Ability to safely lower and raise 250 lbs (113.4 kg)
- Comfortable and frictionless seat material
- Ability to operate indoors and outdoors

Budget: \$250

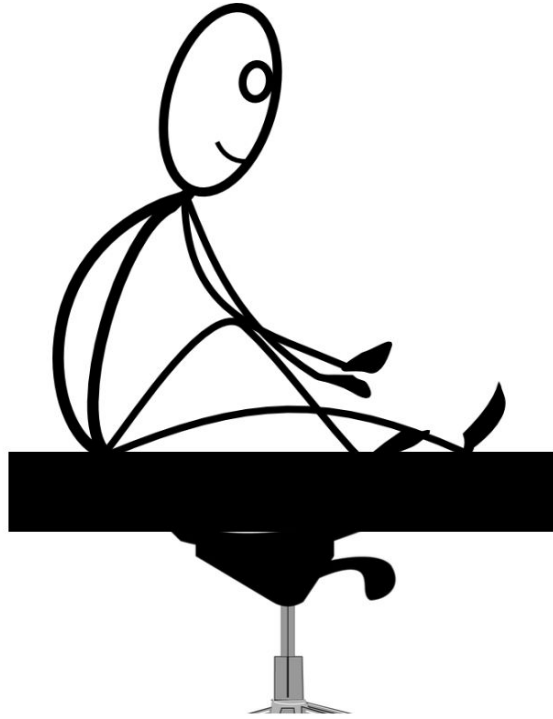
Designs: Scissor Lift






Designs: Car Jack



Designs: Gas Spring



Design Matrix

Design	Car Jack		Gas Spring/ The Office Chair		Scissor Lift	
						
Criteria (weight)						
Effectiveness(20)	4/5	16	4/5	16	4/5	16
Comfortability (15)	3/5	9	2/5	6	4/5	12
Ease of fabrication (15)	4/5	12	3/5	9	2/5	6
Ease of Use (15)	1/5	3	2/5	6	5/5	15
Durability (15)	4/5	12	3/5	9	3/5	9
Safety (10)	3/5	6	2/5	4	4/5	8
Weight (5)	1/5	1	4/5	4	3/5	3
Cost (5)	3/5	3	4/5	4	2/5	2
Total (100)	62		58		71	

Future Work

- Fabrication of Product
 - Materials, final design
- Lowering/Lateral Motion
 - Allow user to get closer to the ground/side
- Portable Device
 - User can remove device
- Integration to Joystick
 - Allow joystick to control lifting/lowering



Acknowledgements

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Mr. Dan Dorszynski