Standing Gardener and Multi-Terrain Wheelchair

Team 2:
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Client

- Sean Stenglein
  Condition: Cerebral Palsy
  Effects:
    - Limited motor function of arms and legs.
    - Unable to speak.
    - However, his mind is sharp.
  More Info:
    - Cannot walk so he needs a wheelchair.
    - Cannot stand on his own so he needs extra support.
Multi-Terrain Wheelchair

Objective

- Most wheelchairs do not have the best traction in snowy conditions. Most wheelchairs do not operate well on sand.

- Therefore we have been asked to design a wheelchair which will work on both surfaces.

- The purpose of this wheelchair is to be able to traverse sand, snow, and ice with relative ease.
Previous Work for Wheelchairs

• Lasher Sport, LLC BT-Trail Off-road Wheelchair

• Steven L. Weybrecht’s Patent on All Terrain Wheelchair
Design Features

Large front and rear wheels for more surface area of the tires in contact with the ground than in a normal wheelchair. Also low pressure (2-4 psi) air inflated tires to obtain more surface area.

New Tires

Old Wheels
Design Features

Multiple Wheel Positions

Because the wheels are so large the foot holsters will only fit in the full downward position when the wheels are in the outward position.

However, When the wheels are moved outward the device is less stable. Therefore, wheels can be moved into a forward position.
Design Features

- Straps were made to support Sean’s feet as well as his lower legs.
Rear Wheel Attachment

Rear wheel attachment with washer and cotter pin.

Rear wheel bracket with brass spacer.
Front Wheel Attachment

Front wheel attachment bracket

Front wheel spacer
Multi-Terrain Wheelchair
Standing Gardener Objective

- Add features that Sean’s current standing aid does not have.
  - Adjustable size
  - Specifically designed for gardening
- Exercise
  - It is important that Sean gets used to standing to help maintain his muscle mass.
Standing Gardener Frame

- 304 Stainless Steel
- 2 1/8\textsuperscript{th} Inch Plates
- 8 Telescoping Legs
- 6 Caster Wheels
Support System

- Chest, Knee, and Foot Supports
Standing Gardener Workspace

Tray holders
Handles
Soil Catching Drawer

Pot Holding Template
Standing Gardener Testing
# Budget

<table>
<thead>
<tr>
<th>Order</th>
<th>Price</th>
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<tbody>
<tr>
<td>Cushion Poly Foam 6 x 50 x 60 inches</td>
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<td>Naugahyde All American Royal Blue Vinyl AM37 54</td>
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<td>Caster City – 6 Casters</td>
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<td>Yarde Metals – Stainless Steel</td>
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<td>Wheeleez – Wheelchair Wheels and Casters</td>
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<td>McMaster Hardware</td>
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<td>Mansfield Supply</td>
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<td>Machine Shop Assistance</td>
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**TOTAL PRICE**  
$2583.62
Conclusion

- This design of the Standing Gardener will not only allow Sean to do what he can with his current standing aid but it will increase the ease of all his tasks.

- Sean can be mobile on terrain he could not go on before with the Multi-Terrain Wheelchair.
Acknowledgements

• National Science Foundation
• Yarde Corporation for giving us a deal on the Stainless Steel.
• Dr. John Enderle
• Mr. David Price
• Rich and Serge in the UConn Machine Shop
• The Stenglein Family
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• Dr. Shiva Kotha
• Mr. Richard Scarpetti
• Michael Sedlack & Matthew Eschbach
Thank you.

- Questions??
- Comments??