Project Proposal: Accessible Weight Scale for Seated Users

By Gregory Whitehouse
Patrick Tshilenge
James I. Johnson

RERC-AMI Client Contact: Dr. Enderle
University of Connecticut • (860) 486-5521
jendlerle@uconn.edu
Overview

- Background Information
- Currently Available Products
- Clientele
- Design Objectives
- Methods
- Budget
- Conclusion
- Questions and Answers
Background Information

- 50 million Americans with physical or mental impairments
- Obesity is linked with diabetes and osteoarthritis
- Aging baby boomers
- Purpose of project
  - Design accessible weight scale that is:
    - Convenient
    - Easy-to-use
    - Easy-to-sanitize
    - Inexpensive
    - Accurate
Currently Available Products

- Sitting Scale (MODEL 6461)
- Detecto Model 6876 Euro Chair Scale w/ Flip-Seat
- Healthometer Model 595KL Digital Chair Scale
Clientele

- Limited leg strength
- Limited arm and/or hand strength
- Limited eyesight
- Poor memory
Design Objectives

- Easy-to-use
  - Usable for left and right handed users
  - Simple interface
  - Large display
  - Easy to get on and off
- Convenient
- Safe
- Aesthetically pleasing
- Accurate
Methods

- Three main components
  - Electrical component compartment
  - Handheld console
  - Toilet seat
Handheld Console

Front View

Toggle Switch

Side View

LCD Screen Displays Measurements

Measure ▲▼ Tare
Toilet Seat

Load Cell

Toilet Seat

Electrical Component Compartment
Operation Procedure

1. Power Switch Switched “On”
   - Device Powers Up
     - User Presses “Tare” Button
       - Scale Tares Itself
         - Scale Prompts User “Please be seated on the scale and press the measure button when ready.”

Continued on next slide
User Gets On Device

User Presses "Measure" Button

Scale Measures Weight

Scale Records Weight

Scale Displays Weight

Power Switch Switched "Off"

Device Powers Off

User Gets Off Device

User Presses "Up Down Arrow"

Scale Displays Previous Weight Measurements

Scale Prompts User "Please be seated on the scale and press the measure button when ready."

User Presses "Measure" Button

Scale Measures Weight

Scale Records Weight

Scale Displays Weight

Power Switch Switched "Off"

Device Powers Off

User Gets Off Device
<table>
<thead>
<tr>
<th>Product</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet Seat</td>
<td>$50 - $100 (due to choice of either standard</td>
</tr>
<tr>
<td></td>
<td>toilet seat or raised with possible handrails)</td>
</tr>
<tr>
<td>Support Handles</td>
<td>$50</td>
</tr>
<tr>
<td>Electrical Components</td>
<td>$100</td>
</tr>
<tr>
<td>LCD Screen</td>
<td>$10</td>
</tr>
<tr>
<td>Buttons/Toggle Switch</td>
<td>$20</td>
</tr>
<tr>
<td>Casing Enclosures</td>
<td>$50 - $75</td>
</tr>
<tr>
<td>PIC Microprocessor</td>
<td>$5</td>
</tr>
<tr>
<td>Lithium Batteries</td>
<td>$20 - $30</td>
</tr>
<tr>
<td>PCB Board</td>
<td>$200</td>
</tr>
<tr>
<td>Strain Gauges/Weight Sensors</td>
<td>$300 (Waiting for official quote)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$890</strong></td>
</tr>
</tbody>
</table>
Conclusion

- Many people in need of accessible weight scale
  - Obesity and old age lead to increased number of wheelchair bound
  - Diabetes leading cause of amputation
- Current products inconvenient
  - Bulky
  - Expensive
  - Additional assistance required
- Our device allows for more independence
  - Easy to use
  - Stores previous readings
Sources

http://www.webmd.com/cholesterol-management/obesity-health-risks
http://www.abledata.com/abledata.cfm?pageid=113583&top=0&productid=81062&trail=0
http://www.northshorecare.com/detecto-chair-scale.html#
http://www.freepatentsonline.com/20070061953.html
Questions and Answers