Mockup Review: Adjustable Height Crib

Team Red A
(Safety and Security)
Adjustable Height Crib

- Product Description: Adjustable Height Crib
- Intended Customer: Parents and Child Care Givers
- Market: Infant Furniture

Mockup model
Key Design Criteria

- **Pinch Point**
  - Hide pinch points exposed to baby.

- **Lifting Mechanism**
  - Select and design appropriate lifting mechanism.

Sketch Model (scary)

Customer’s sense of safety
- Lifting performance requirements
Pinch Point Guard

- Moving liner

Springs (to keep fabric taught)

Necessary Spring Force with:
- 6 springs
- 0.68 m displacement

<table>
<thead>
<tr>
<th>Force to Pull Fabric (N)</th>
<th>Force perSpring (N)</th>
<th>Spring constant necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>15</td>
<td>21.87</td>
</tr>
<tr>
<td>120</td>
<td>20</td>
<td>29.16</td>
</tr>
<tr>
<td>180</td>
<td>30</td>
<td>43.74</td>
</tr>
<tr>
<td>60</td>
<td>10</td>
<td>14.58</td>
</tr>
<tr>
<td>30</td>
<td>5</td>
<td>7.29</td>
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Fabric & Netting Liner

Inside Frame

Outer Frame
Lifting Mechanism

- Scissor Linkage

Two sets of scissor linkages driven in opposing directions by left and right lead screws.

- Lead screw: 10 revolution/inch
- Traveling 22 inches in 10 seconds
- Motor ~800 rpm
Customer Feedback

• **Buy Buy Baby Customers**
  - Current crib could not prevent child from climbing out, even at it’s lowest position.
  - Child learned how to drop lowering side walls.
  - Current cribs are too hard to adjust.
  - Wooden cribs are highly preferred.
  - Price is important, but most will pay up to $700.

• **Pediatric Nurse Practitioner**
  - Height Concern
## Product Contract

<table>
<thead>
<tr>
<th>Customer Needs</th>
<th>Design Attributes</th>
<th>Engineering Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wooden Frame/ Nice Aesthetics</td>
<td>Visible Structure=Wood</td>
<td>Hide all metal parts</td>
</tr>
<tr>
<td>Price</td>
<td>Price range</td>
<td>$350-$700</td>
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<tr>
<td>Ease of Adjustability</td>
<td>Motorized Lifting Mechanism</td>
<td>27’’ in 10-15 seconds</td>
</tr>
<tr>
<td>Child Climbing Prevention</td>
<td>Wall height when lowered</td>
<td>h=36”</td>
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<tr>
<td>Crib Size</td>
<td>Standard Bed Dimension (between rails),</td>
<td>52” x 28”</td>
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<tr>
<td></td>
<td>Height</td>
<td>H=40”-45”</td>
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</table>
Future Considerations

• Safety Regulations and Testing
  • According to Federal Regulation Documents
• Scissor geometry
• Appropriate motor
• Weight of Assembly