

The Revolving Refrigerator

Team 5: ISEN 489-503

Anthony Arambula

Aaron Kim

Erin Sylve



**INDUSTRIAL & SYSTEMS
ENGINEERING**

TEXAS A & M UNIVERSITY

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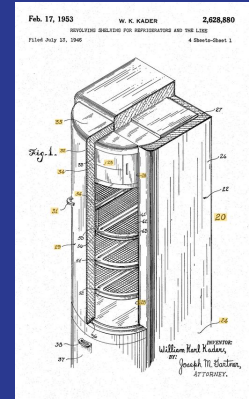
Defining the Problem



- ❑ People restricted to wheelchairs are unable to reach the top shelf of their refrigerators
 - ❑ Specialized refrigerators are too small
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Background Research

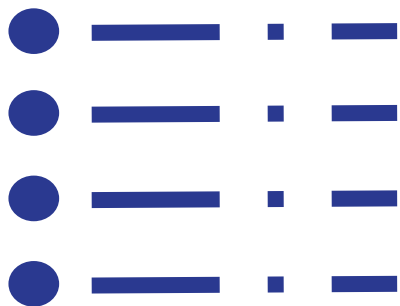


SIDE-BY-SIDE REFRIGERATOR ADA REQUIREMENTS

To be considered ADA compliant, GE side-by-side refrigerators must meet the following requirements:

- Controls must:
 - Allow parallel approach by a person in a wheelchair with maximum high side reach of 54 inches for operation
 - Be operable with one hand and not require tight grasping, pinching or twisting of the wrist
 - Require force of less than 5 lbs to activate

- ❑ Current Patents
- ❑ ADA Compliant Refrigerator Sizes
- ❑ Common Refrigerator Materials



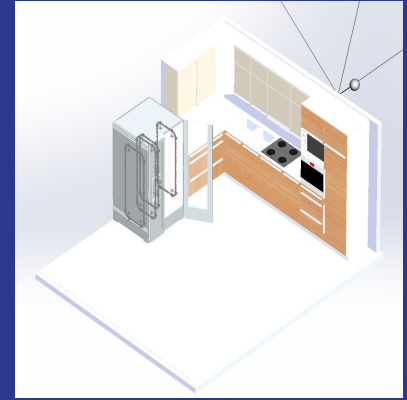
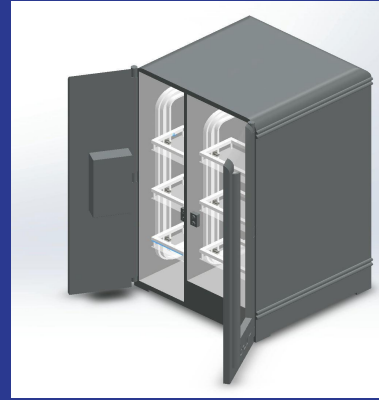
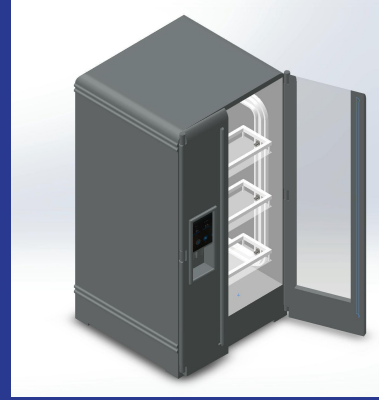
Requirements

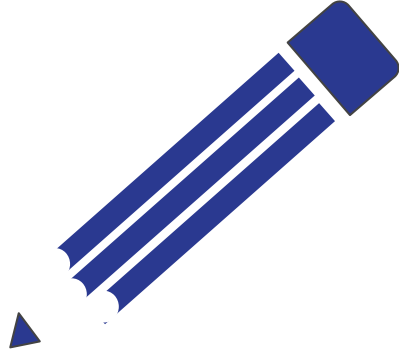
The Refrigerator System:

- I. Shall move shelves to the user reach
 - II. Shall operate at the push of a button
 - III. Will be ADA Compliant
 - IV. Shall fit in the standard kitchen refrigerator size
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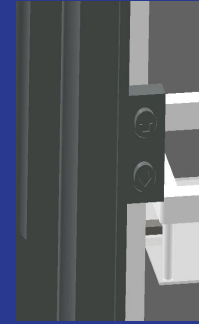
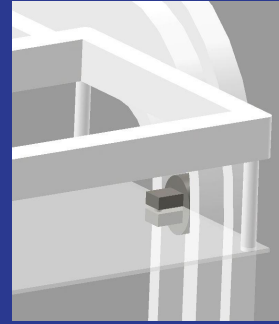


Introducing the Solution





Fridge Design



Featured Systems:

- ❑ Pins made for Adjustable Shelf Height
 - ❑ Two-Button Shelf Rotation Control
 - ❑ Modern Design!
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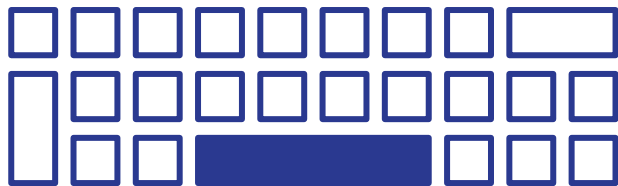


Prototyping



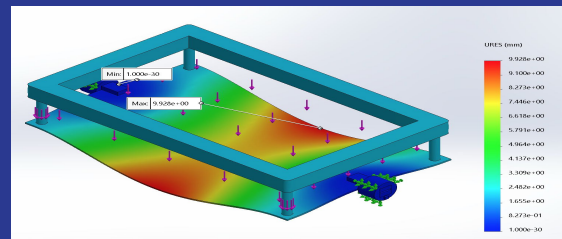
3D Printed Model (1/40 Scale)





Testing

Fridge Shelf Load Testing

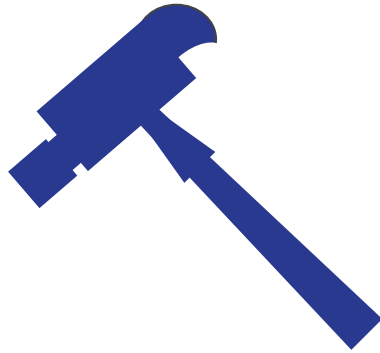


User Testing

User 1: “Even if I am tall, I believe it is useful for people to use this revolving refrigerator to reach the deep inside part of the refrigerator. I always had trouble reaching the end part of the shelf, but this refrigerator is so helpful!”

User 2: “I am so grateful that this refrigerator exists as it lets me use a refrigerator without any help from my family members.”

User 3: “I really like this product! It is really creative! I can now drink chocolate [milk] hidden from my brother!”



Manufacturing

Process Plan:

- I. Stamp and Bend Sheet metal to form outside of refrigerator.
 - II. Form inside of refrigerator, rail, shelf clips, and shelves with vacuum injection molding.
 - III. Assemble machined parts with electronics, weld sheet metal, and inject insulating foam.
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Further Development

1. Individualized Shelf Temperatures
2. Design Smart Hub GUI
3. Create different Refrigerator Layouts



Thank you.

If you have questions, comments or concerns, feel free to email sylveerin@gmail.com.