

Introduction

The current process of dispensing the pads is inefficient and wasteful; the proposed project is to develop a solution that is easily accessible and reduces the amount of unnecessary waste thrown out during patient turnover.

Requirements

- The materials used to build the dispenser should be easy clean such as smooth plastic or metal.
- The dispenser must be partially sealed to access the pads and prevent contamination.
- The sizes required for the dispenser to hold the incontinence pads are primarily medium, large, extra-large.
- The dispenser will function manually.

Constraints

- The design needs to hold and dispense different sizes of incontinence pads and does not influence wheelchair accessibility.
- Start in October 2019 and must complete by April 2020
- \$500 budget

Ideation

After the team defined the requirements and constraints based on the presented problem, possible designs were developed. There were 7 ideas originally developed, using a decision matrix the designs were narrowed down to 3 ideas. The design that was chosen used a dispensing mechanism that resembled that of a PEZ Dispenser [1].

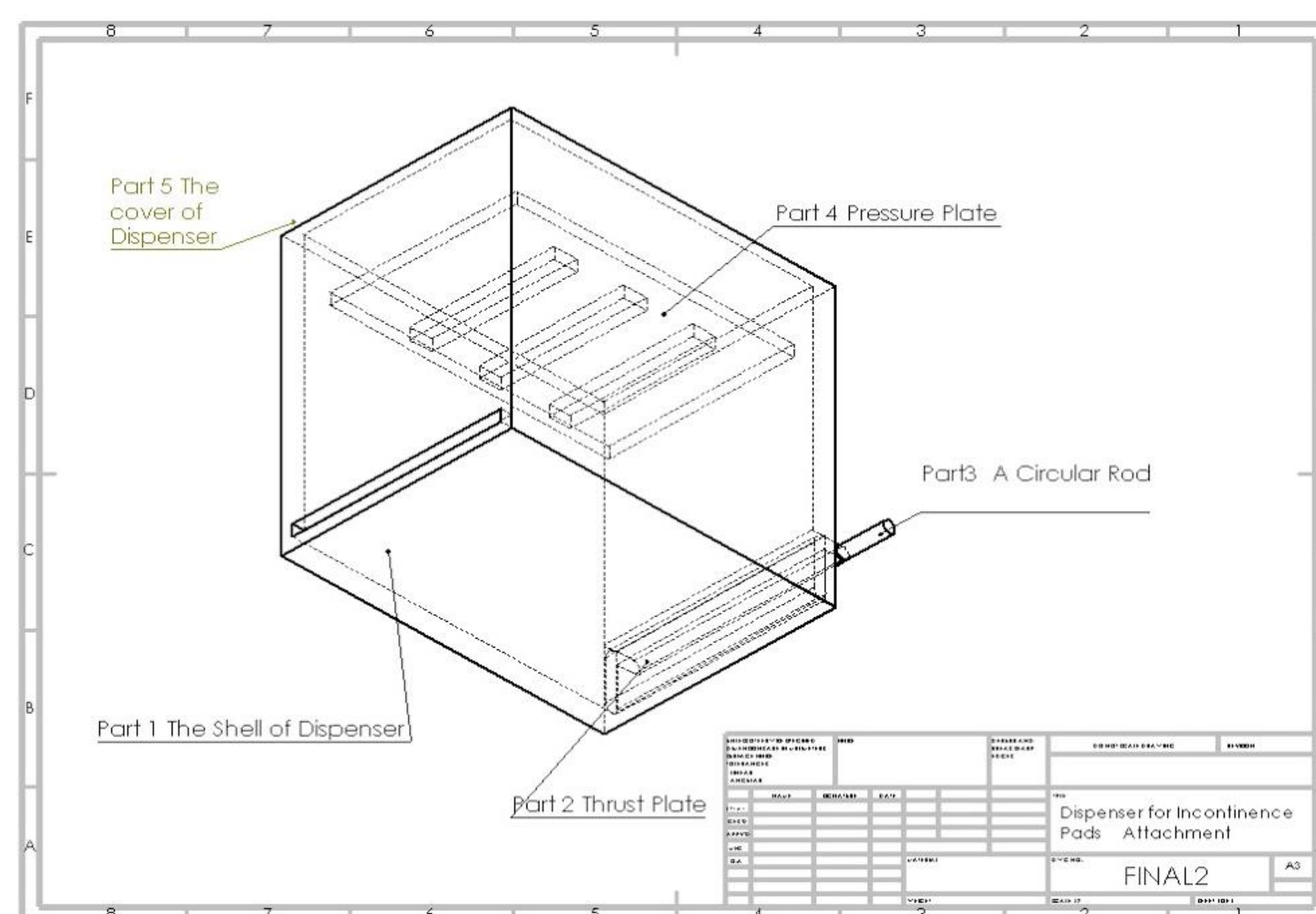


Figure 1: Initial design for prototype (at the end of first semester) [1]

Analysis

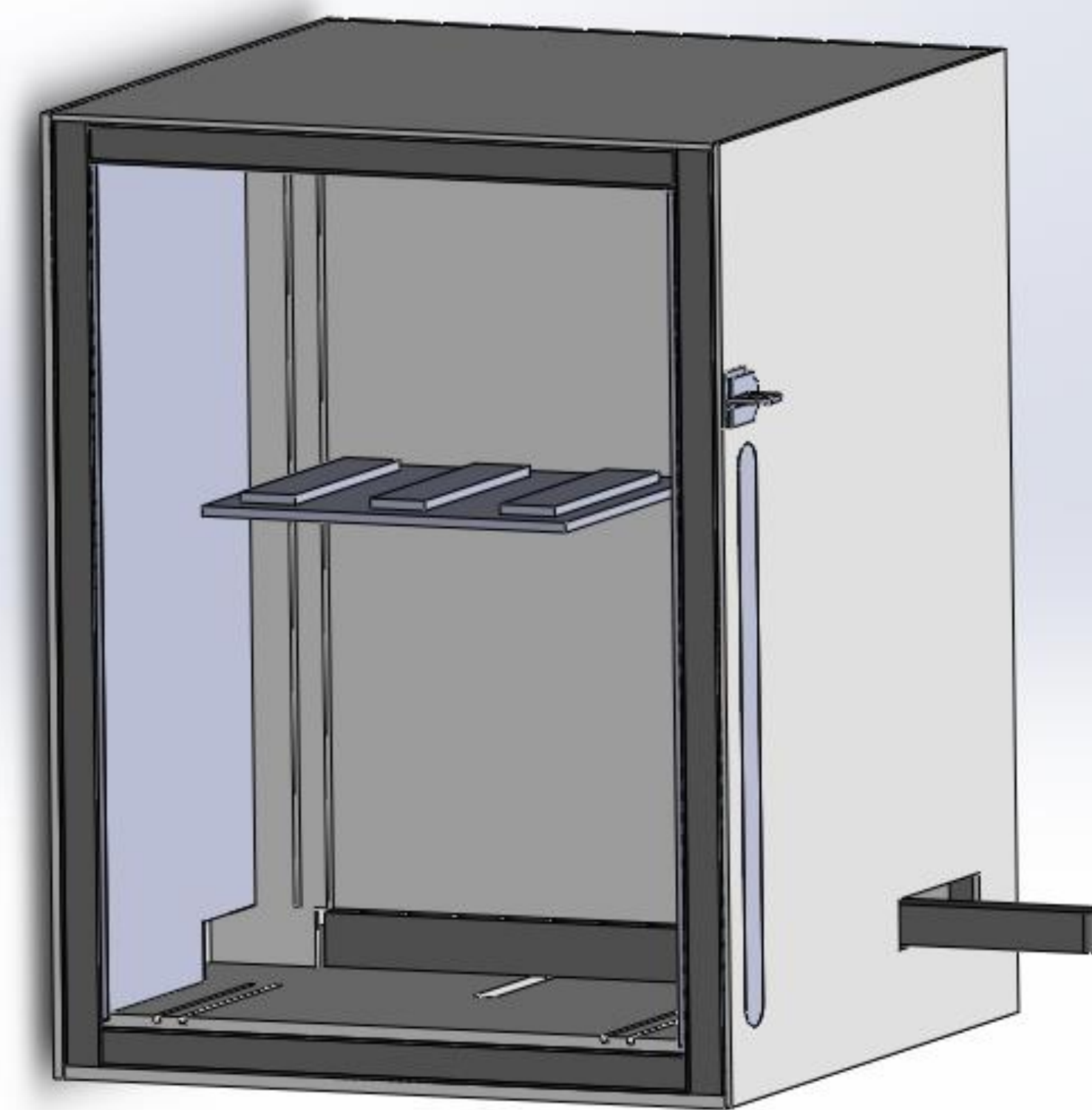


Figure 2: CAD drawing of the final design (inside mechanics) [2]

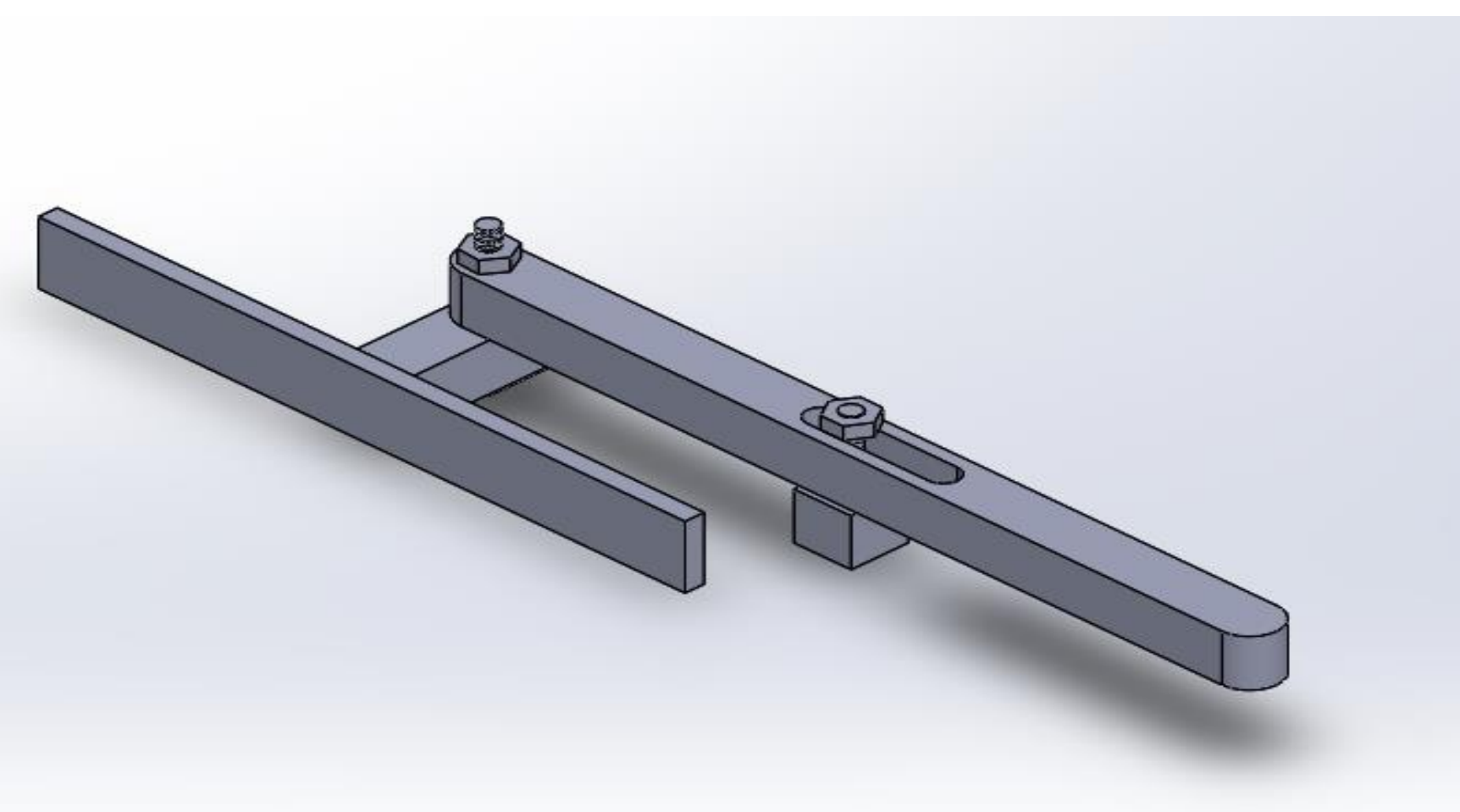


Figure 3: CAD drawing of the dispensing mechanism. [3]



Figure 4: CAD drawing for the frame of the dispenser [4].

The dispenser is made to enclose a stack of incontinence pads, the dispenser will accommodate for three sizes used in the hospital, medium, large, and extra large. There is a weighted board that is used to keep the pads compressed towards the pushing board, making dispensing easier. The dispenser contains adjustable partitions inside which users can adjust depending on the pads placed inside. The dispenser is partially divided into two sections, one where the stack is enclosed, and the other is a space giving the dispensing mechanism space to move around without having the stack fall on the mechanism itself.

After many iterations, the final design has a dispensing mechanism that rotates around a pivot point where the user can push the bar from outside the dispenser, which will have the pushing board moves forward pushing one pad out enough for the user to remove the pad from the unit.

- The outer structure is built used white acrylic sheets, which are attached to a frame made from 0.75" squared hollow aluminum using rivets.
- The bottom is made from 2 boards, 0.75" apart.
- The inner bottom aluminum sheet has a slots made in it, this is intended to be a track for the dispensing mechanism to run along so it remains stable and moving in a straight line.
- There is another slot in the push arm that the user will use to function the dispenser. This slot allows for the push arm to move smoothly on the track in the base.
- The outer bottom is there to ensure minimal contamination going into the dispenser.

Decision/ Implementation

After several iterations of the design, the team came to a final decision seen in Figure 5. This design meets all the requirements and constraints that were set during first semester. This includes the reduced exposure to contamination and a clear slot on the right side of the dispenser to show the quantity of pads left in the dispenser.

Dimensions:

- Height: 11.8"
- Width: 9.9"
- Depth: 9.9"

Cost:

- Majority of the materials were purchased from McMaster Carr, other materials such as the aluminum sheet used for the base plate of the design was to be purchased elsewhere.
- The projects cost would have fallen within the \$500 budget.

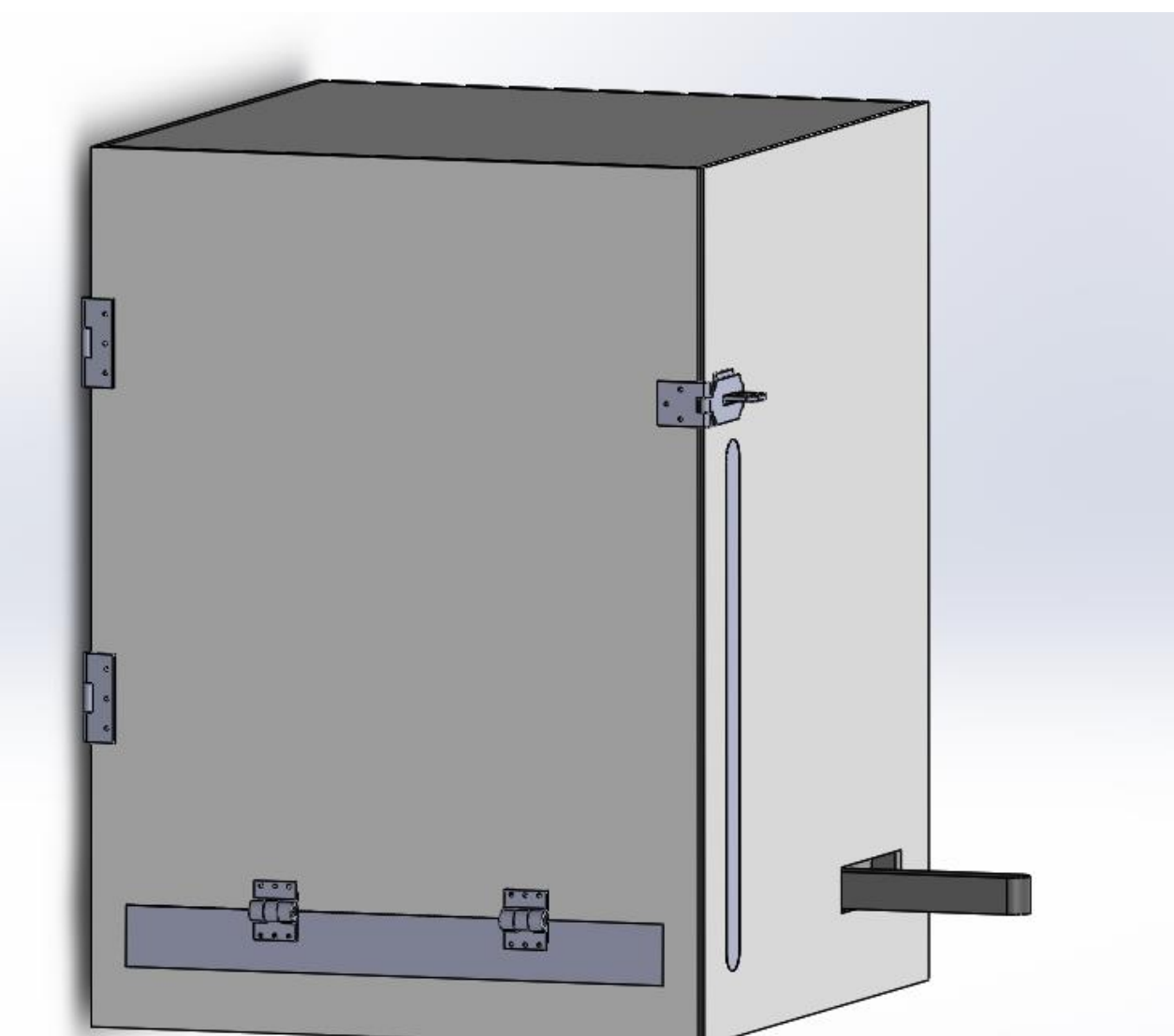


Figure 5: CAD drawing of the final exterior design [5].

Total Cost:

- \$454.83 (CAD)

Conclusion

While the dispensing unit designed meets the requirements of the client, it needs to undergo testing to ensure everything will function as expected.

If the project were to continue as planned, the team would follow through to the building and testing phases. This includes modifying certain aspects of the project, listed below:

- The separating boards inside the dispenser will need to be tested to confirm that they are functioning as intended, by holding the various sized pads in place.
- The team would design a wall bracket that will be able to secure the dispensing unit to the wall, made of aluminum or stainless steel.
- After all components of the design are assembled the team would test the entire dispenser with all pad sizes, using the samples that were provided to the team by the hospital.

Acknowledgements:

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