

Wonder Factory Senior Capstone Project

Operations Manual

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INTRODUCTION

This report will be discussed who to operations and who to build our project. Section 2 covers how to Manufacturing the project. Section 3 will be discussing the Safety of the project and who to maintenance the parts of the project.

MANUFACTURING

This section covers the process of building the slingshot project by each part. We as a team worked on the project part by part to finish it in the best form. We will start with the slingshot than the booth including the picture of each part.

The slingshot was build with help of welding machine shop; we started with paying the materials that we need to manufacturing the slingshot. The first thing we did is start to do the Y-shape. We cut the materials to be look like Y-shape, than we welding them together. We make 3 wholes on the Y-shape to but an eye screws to give the kids on all the lengths to play on our project. The second thing was to start with the I-shape. We just cut it to be on the length that we needs, than we welding it to the Y-shape. The third part was to welding the O-shape to the shape we just cut the steel to a circle than we welding it to the base. We cut the circle 45 degree on both sides, to make the slingshot rotate. Also we put a screw to make it study. The last part is that we bought a pulley and we welding it on the I-shape. Below in Figure 1.1 is the picture of the slingshot.



Figure 1.1: Slingshot

The second part of the manufacturing process is building the booth. The booth is a 1.5x1.5 meters room that will be the place that we will insert the targets on. The building of the booth takes a lot of time from us. We started with making contract with the wood place to build it on their place. The first part was paying the materials. When we received the materials we start cutting it on the way that we needs. After that we started to make the special joint that will help the client to assemble and dissemble the booth very easy. When we finish we started to make the edges not sharp to follow the safety persuaders. We installed the coaster wheels that will make the booth easy to move. The last thing that we did is panting the booth on the blue color.



Figure 1.2: The booth

Below shows the chosen model through the decision-making criteria. Our choice was a customized slingshot that would be able to throw a ball into a target, which is a boxing ball. Once the ball was thrown into the target, a pulley made out of steel would be used to drag the ball back to the slingshot for it to be thrown again instead of someone going there to pick the ball. A cubic wooden booth with dimensions of 1.5x1.5 meters will be built and in the middle of the booth will be the dangling targets. On the opposite side, a slingshot made of steel capable of rotating up to 45 degrees will be built and the pulley will be connected to a tube on the left side of the slingshot. The shooting ball will be covered in netting made of polyethylene twine, which will be connected to a rope. The first end of it will connect to the net and the other end will connect to the pulley to drag the ball down again to the slingshot. Finally, a plastic fence with blunt edges will be built in front of the slingshot so as to contain the ball and prevent it from getting lost.

The design won due to its additional customized features that made it fit for the task intended. Additionally, the materials used in this design were durable and of high quality yet cost effective and easily available in the market. Most of all, the design brought out the “wonder factor” in an outstanding way since it had customized features that were not available in any of the other designs. This would result in the kids yearning to play with the device while learning about projectile motion at the same time. The Final CAD design is shown below from Figure 1.2.

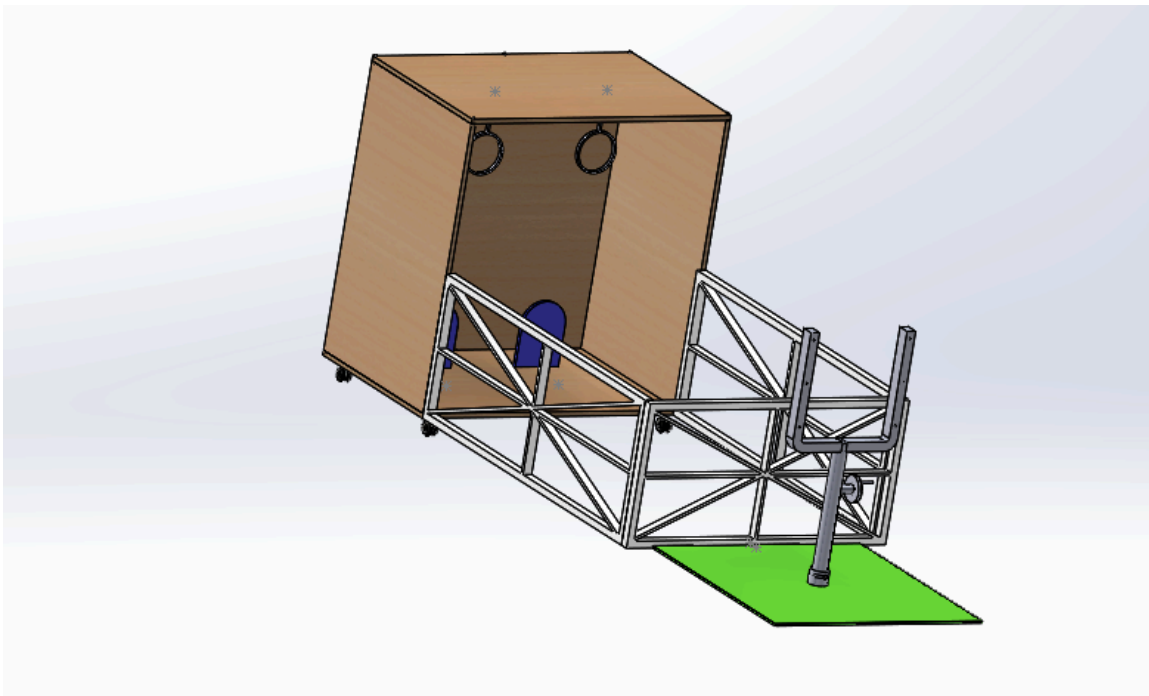


Figure 1.3: Final CAD

MAINTENANCE

This section covers how to make the project last more than the project life span. This will help the project owners to benefits more of the project.

1. The project has a lot of things that can be replaceable included (eye bolts, targets, screws and the caster wheels).
2. Oil will be helpful to make the slingshot move 45 degree smooth.

4 APPENDIX

The following are the picture of the part of the slingshot project used in the above process.

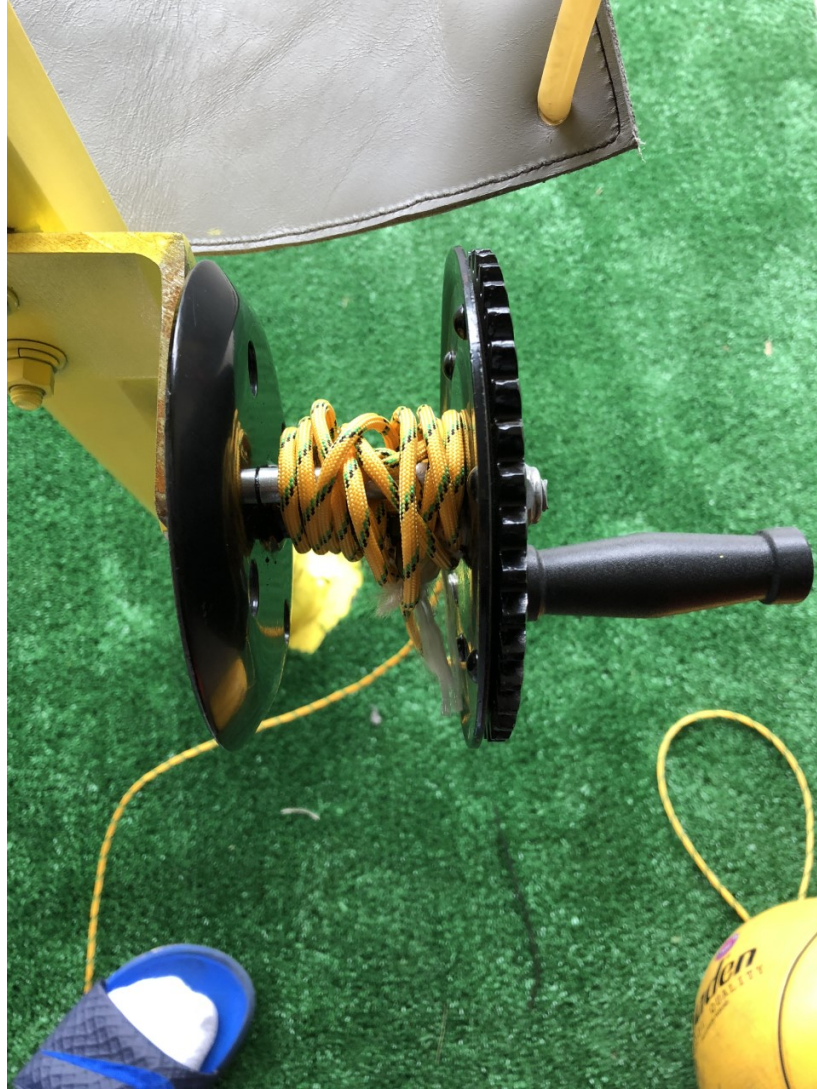


Figure 1.4: The pulley



Figure 1.5: the rubber with the wholes



Figure 1.6: The patch



Figure 1.7: The target



Figure 1.8: The O-shape