

Individual Lab Report 7

Christian Heaney-Secord

Team G-Bobs the Builders

Teammates-Michael O'Connor, Eric Newhall, Guillermo Cidre

ILR07

4/2/15

Individual Progress:

Since the last checkpoint, I spent the majority of my efforts finishing the designing and manufacturing process for the wire transporter subassembly. I made a CAD model for the funnel that transports the wire from the PVC pipe to the revolver and I printed the design for the funnel in the IDeATE lab. You can see the 3-d printed funnel in Figure 1. I also designed and fabricated the connection between the wire cutter and the PVC pipe. I had to file away at one of the plates that kept that kept the two bolt cutter blades in line in order to get the PVC piping close enough to the bolt cutters' head so that the wire would fall through the PVC pipe after being cut. I also designed a CAD model of the mount that held the PVC piping in place and I fabricated the design. Additionally, I designed and manufactured the front plate that connected the funnel to the revolver. The designing for the front plate proved to be very difficult since the alignment for the funnel and revolver had to be nearly perfect to ensure that the wire was fed through into the revolver on a consistent basis. I designed and fabricated the mount for the tubing that transported the wire from the revolver onto where the part would be. I worked a lot with the laser cutter, creating different profiles for various pieces. I also used the drill press and mill to fabricate numerous pieces for our design. I used the countersink drill to create indents in the acrylic for the countersink bolt heads to fit in. Lastly, I played a major part in installing the subassembly. You can see the complete subassembly for the wire transporter system in Figure 2.

Challenges/Issues:

An issue that we ran into this week was that the revolver was not flush with the two acrylic plates that were supposed to keep the wires from falling out of the holes as the revolver spun. After quite a bit of testing I discovered that the reason for this was that the bolt holes for the motor were too close to the filet in the L-bracket that we used to mount our motor. As a result, the motor hit the filet and we were not able to get a flush fit against the aluminum L-bracket with the motor. This caused the motor's shaft to come out at an angle which consequently prevented the revolver from being flush against the two acrylic plate covers. In order to remedy this issue, I disassembled our subassembly and used the milling machine to get rid of the filet. Getting rid of the filet alleviated our issue of not getting a flush fit against the two plate covers for the revolver.

Another issue occurred when we chose to use a different pair of bolt cutters. Since we mounted the bolt cutters to the 80/20 where the rivets on the bolt cutters' head used to be, we ran into the issue of not being able to raise the bolt cutters' head that high off the top of the 80/20. This created too big of a height difference between where we were feeding the wire and the bolt cutters' head. In order to remedy this issue I modified the wire feeder subassembly so that the wire came out of the wire feeder at an angle downwards to where the bolt cutters were.

Cross-Referencing:

This past week I collaborated with Mike in creating a design for the wire feeder and wire transporter subassembly. We also went into the machine shop to manufacture the various parts used for our subassembly. Mike did the majority of the design and fabrication work for the wire feeder and wire cutter subassemblies.

While Mike and I did the majority of the work to assemble the wire feeder and wire transporter subassembly, Guillermo and Eric worked to operate the motor controls using their computers. They were able to create a program that allowed the system to pick up a part, move the part to the appropriate location, feed a certain amount of wire, cut the wire, and transport the wire from the bolt cutters to the part. Eric also worked to update the website.

Figures:

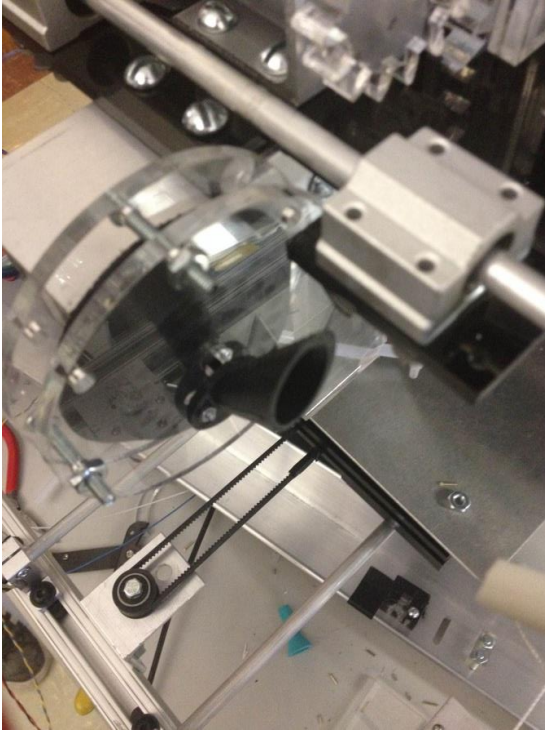


Figure 1: Funnel

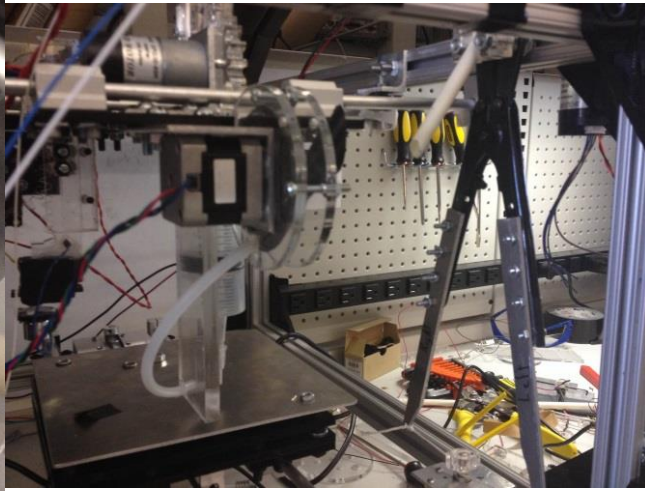


Figure 2: Wire Transporter Subassembly

Future plans:

For the upcoming week we plan on designing and manufacturing our sorting method for the various parts. We have figured out how we are going to go about sorting the parts for the most part but there are still some minor details that we need to figure out. We plan on having a subassembly that is able to take all 20 parts at once and isolate a single part to be looked at in the next step of our system. The next subassembly will take that individual part and orientate it in one of 4 different ways. Our stretch goal is to then design and manufacture a way of transporting that sorted part from the end of the previous subassembly to right in front of the camera. We also hope to get motor controls running for these two subassemblies. In addition to this, we want to move forward with designing the subassembly that deals with transporting the piece from the camera to a point in line with the part placer's axis.

Individually, I will work on making a CAD model for our sorting method after we are able to isolate a single piece. The design will be able to narrow the piece to one of four different orientations for the two different sized pieces. In addition to this I will fabricate the different pieces of this design and assemble it. Also, I will continue to hash out our design plan for dealing with the two different part sizes as we transport them from the end of the sorting subassembly, to the camera, and then to a point in line with the axis of our part placer.