

Individual Lab Report 5

Christian Heaney-Secord

Team G-Bobs the Builders

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

ILR05

3/19/15

Individual Progress:

Since the last checkpoint, I spent the majority of my efforts working on designing and manufacturing the subassembly for the wire cutter and flux extruder. I made a CAD model for the wire cutter subassembly. This subassembly included the bolt-cutters, sheet metal mount for the bolt cutter, motor mount, and the motor. I worked a lot with the laser cutter, creating different profiles for various pieces. I also used the drill press and lathe to fabricate numerous pieces for our design. In addition to this I designed and fabricated a connection for the smaller electromagnet on the part placer. This change served to replace the heavier electromagnet with a smaller electromagnet that would hopefully stop the rack and pinion from falling when the motor was off (due to the previously overweight assembly). 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. I screwed in various bolts to mount certain connections. Examples being the sheet metal platform for the bolt cutter, the motor mount for the motor that pulled the wire used to actuate the bolt cutter, and the smaller electromagnet. You can see the complete subassembly for the flux extruder in Figure 1 and the wire cutter subassembly in Figure 2.

Challenges/Issues:

A big issue that we have to overcome was our oversight in understanding that the bolt cutters' head displaces fairly significantly while being actuated when one side is fixed. This is problematic because when the wire is fed to the bolt cutters, the bolt cutters' head will displace and shorten the initial amount of wire that was fed into the bolt cutters before cutting the wire. We will have to do some trial and error to determine how much wire needs to be fed into the bolt cutters for us to get the wire length that we desire.

Another issue occurred when we were trying to install the motor mount for the wire cutter. The end point of the screw hits the 80/20 before the screw head is tight enough on the acrylic mount. This causes the motor mount to have a very loose fit in our subassembly and this looseness makes our subassembly inefficient. In order to remedy this issue we plan on installing washers between the screw head and the acrylic mount in order to make it a tighter fit.

Cross-Referencing:

This past week I collaborated with Mike in creating a design for the flux extruder and wire cutter 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.

While Mike and I did the majority of the work to assemble the flux extruder, Guillermo and Eric worked to operate the motor controls using their computers. They were able to create a program that allowed the user to specify the location of the subassembly based upon their input into the program. Eric worked on updating the website and getting the computer vision to work. Guillermo also worked on updating motor controls for the part picker upper.

Figures:

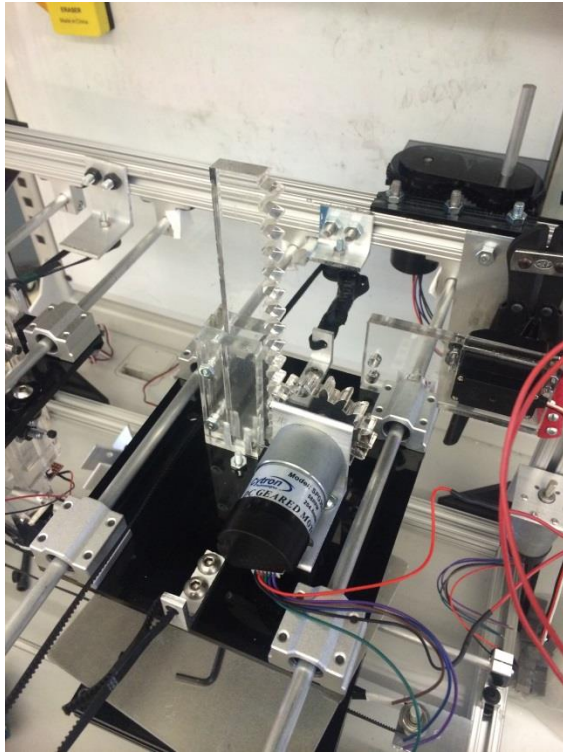


Figure 1: Flux Extruder Subassembly

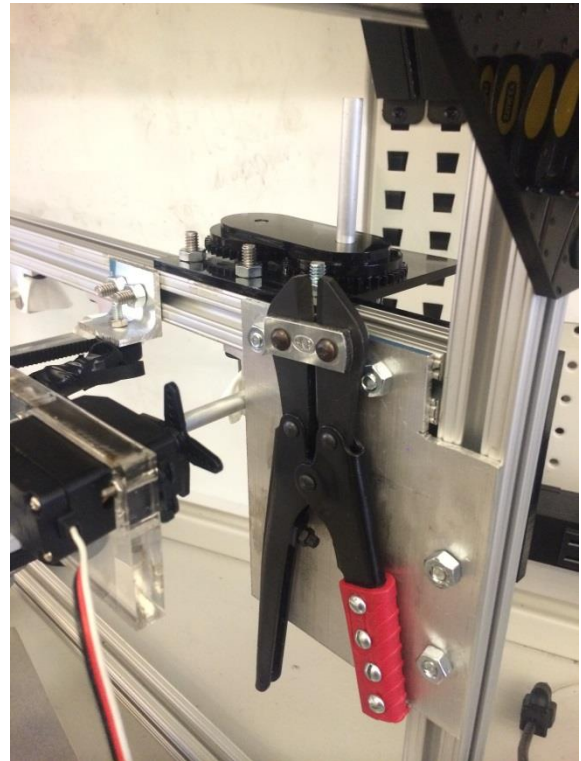


Figure 2: Wire Cutter Subassembly

Future plans:

For the upcoming week we plan on trying to finish our installation of the wire cutter and wire feeder subassembly. The design work for this subassembly is fairly complete; we just need to finish the fabrication. We will also try to complete the subassembly for moving the cut wire to the parts. We are still trying to hash out our design for this process. We do not think it is an efficient use of time for us to wait for each piece of wire to be placed before cutting more wire so we are brainstorming design ideas to store the cut wire.

Mike and I will also brainstorm different ways to separate the parts. This is the portion of our design that we have been struggling with the most and we want to figure out a way to efficiently sort through parts in order to move forward with our

Individually, I will continue working on the fabrication and assembly work for the wire cutting subassembly. In addition to this I will start coming up with more design ideas for ways to transport the cut wire to the parts and to efficiently sort through our parts.