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Team G: Bobs the Builders

Teammates: Christian Heaney-Secord, Eric Newhall, Guillermo Cirde

ILR 6 – System Demonstration

March 26, 2015

Individual Progress

System Demonstration:

For this week's system demonstration I worked to design and fabricate wire feeder and cutter assembly that will be capable of pulling a wire off of a spool, feed it between a pair of bolt cutters, and actuate the bolt cutters to cut a piece of wire. I laser-cut acrylic gears and pulleys to use to feed the wire through this subassembly. I also made an attachment for a gearmotor to actuate the bolt cutters. I added these components and attached rubber material to allow for a compressible, high friction surface to pull the wire on(Figure 1). I also assisted Christian with the wire placer assembly, helping him 3D-print a component and add plastic tubing to the system(Figure 2).

Website:

I have made sure to update sections of the website as I have worked on different parts of the project.

Challenges and Issues

Our team faced several mechanical challenges leading up to this system demo. While we completed our wire feeder system and attached our actuated bolt cutters to our system, they did not work in conjunction as we had hoped. The displacement that the head of the bolt cutters experienced while closing is enough to cause the wire to kink so that more wire cannot be fed through the system after a cut. We also had difficulty with our wire holder and placer system. We had the unexpected issue that as wire is fed into the system it sometimes gets jammed between our revolver piece and an acrylic plate.

Cross-Referencing with Teammates

Christian focused mainly on the design and fabrication of the revolver system that would hold and release the cut pieces of wire while I worked on the wire feeder and cutter system.

Eric and Guillermo were able to significantly reduce the amount of time needed for our camera to recognize the position of the part by moving the processing to one of their personal laptops.

Eric also worked to clean up the electrical wiring of our system and began putting together a protoboard to hold several important components. Guillermo worked to simplify our program and GUI, creating functions that allow for easier motor control and positioning.

Figures

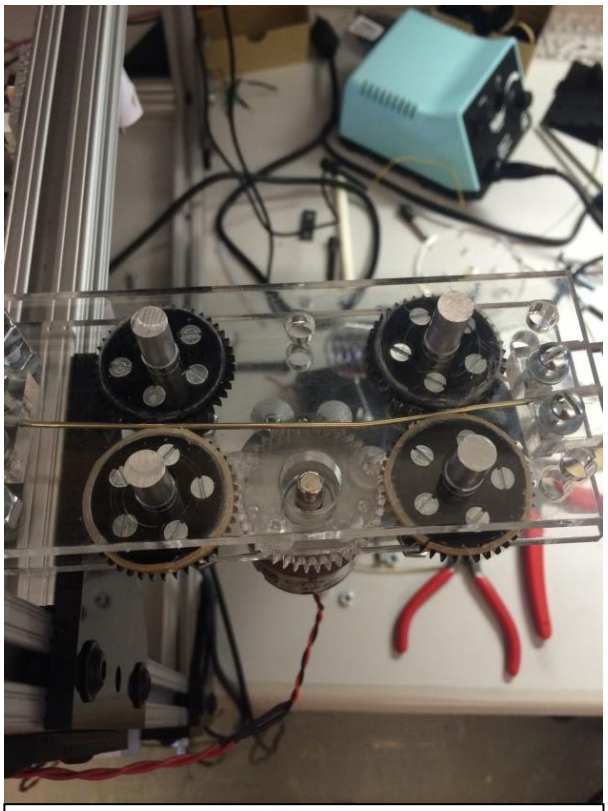

Figure 1: Top view of wire feeder with wire being fed through two sets of acrylic gears.

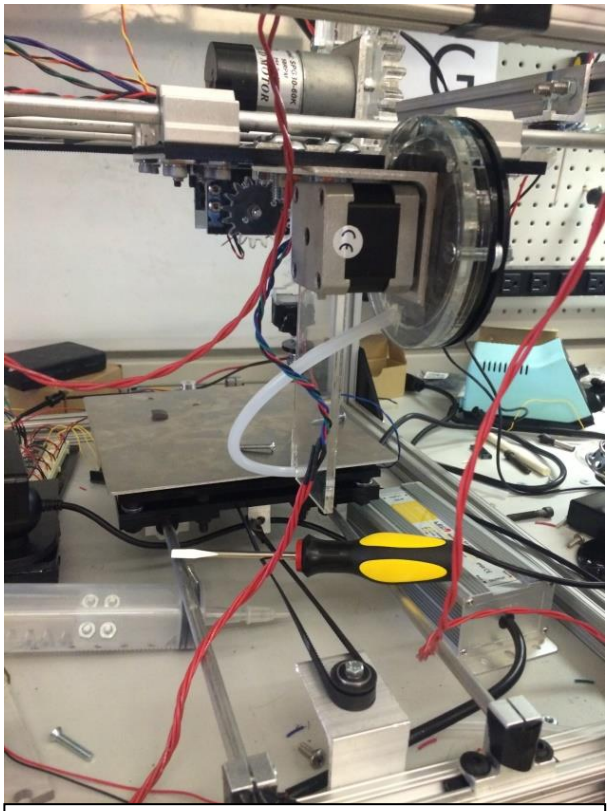

Figure 2Back view of revolver mechanism actuated via stepper motor with tube leading down to top of part.

Plans for Following Week

My plan for next week is to fix the wire feeder and cutter systems so that we can reliably show wire being fed and cut and the next system demo. I also intend to help Christian as needed to get our revolver system working properly. After these systems are function I want to begin working on our part hopper system.