Individual Lab Report 9

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Team B: Monkey Bot
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Individual Progress

Manufacturing and Assembling Components

This week, I assembled the support slide for the power chain. This required me to mount an aluminum beam as well as 3D printed supports to the extending arm. Last week, it was determined that there was too much space in the gripper which caused it to slip on the frame. I improved the gripper by adding foam padding on the side for more traction and ABS spacers on the top and bottom to constrain movement. This is shown in Figure 1 below.

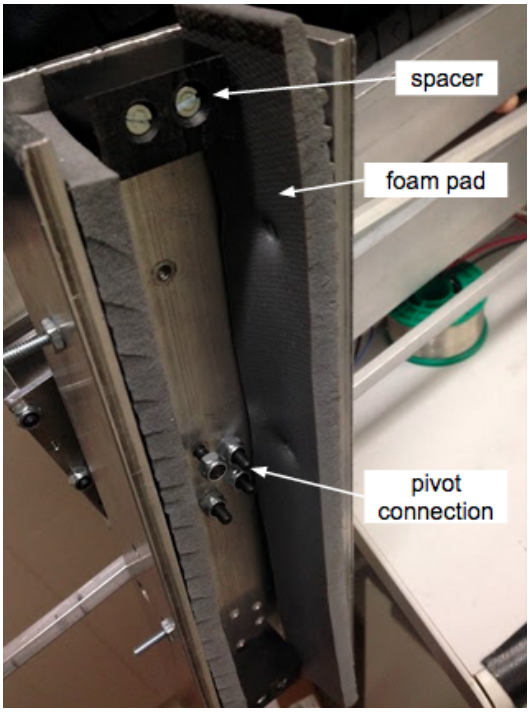

Figure 1. Most recent gripper design

I also assembled the second pivot gearbox so we had the option of testing the robot when it is gripper on both sides.

Challenges

The power chain drops down when the cleaning unit leaves the track of the top beam of the extending unit. The challenge was overcome by the added beam to provide a rail for the power chain. The cleaner slider also needed to be re-designed this week since the current cleaner has trouble transitioning between the two beams of the extending arm. The acrylic cut pieces for the new cleaner design was not robust enough so we need to make sure to use a different material for later iterations.

The gripper will now hold the robot on the window from the torque applied to the frame from the weight of the robot. Due to these changes in the gripper, we will not be able to drive the grippers together. As a result, we decided order another VEX motor which will add significant weight to our gripper. Overall, more testing is required to perfect and coordinate the motions between the various units of the robot.

Cross-Referencing with Other Team Members

This week Ian H. worked on motor control with the Discovery board. Ian R. and Trevor worked on perfecting the motion of the sliding power chain. Trevor also laser cut a new support for the cleaner and developed the idea for the rotating cleaning pad.

Future Work

The team will be working together for most of this last stretch of the project. I will need to test the robot with both grippers attached and work on the movement of grippers up the window. Since this is a passive gripper, we will have to pay special attention to the orientation of the gripper to make sure the robot does not fall down or away from the window. I will also need to build the full cleaner and test the efficacy of the rolling cleaner. Once the VEX motor for the pivot unit arrives, I will have to figure out the effects the extra weight has on the motion of the robot. My goal is to make sure all the currently components are built so that the climbing motion can be tested with the full weight of the robot when the motor arrives.