Work Completed

This week saw the completion of many critical steps in our two projects. With regards to the paint cap remover we were able to manufacture a piece of Aluminum that will house the paint tube. Another crucial aspect of the project that was posing problems had to do with how we were going to mount the motor to the machined piece. The problem was solved by drilling a hole in the center of the bottom of the Al piece and then drilling and threading a set screw hole perpendicular to the bottom hole to affix the motor stem to the device.

The paint cap remover was drilled on the bottom with a type B drill bit that was identical in size to the stem of the motor. We then drilled a center hole and a pilot hole for the set screw. The hole was drilled so that the set screw would hit half way between the flat face of the motor stem. The motor stem set into the bottom of the Al block a half inch. This was the entirety of the flat space on the motor stem that was in the half inch. The set screw hole was then drilled perpendicular on the side at a height of a quarter inch. The set screw was drilled to hit directly in the middle of the motor stem. The piece was then affixed to the motor stem and the motor was tested.

The first test on the motor was to make sure that the affixed Al piece would spin unobstructed over the motor. The next test was to see if the motor was capable of un-spinning the paint tube cap. We placed the paint tube cap in the vice and tightened. Next we placed the bottom of the tube into the Al block piece that was now affixed to the motor. We then set the current and the voltage and started the motor from a stand still. The motor provided more than enough torque to completely remove the cap from the paint tube. This was a big milestone of the project and showed that this motor was capable of spinning the cap as well as the Al block containing the tube throughout the whole un-spinning process.
Below is a mock up of how the device will be mounted to a frame.

Figure 1.1- depiction of how the paint cap remover will be functioning on a frame.

The linear actuator also progressed this week as we mounted the actuator to a frame of plastic. The means by which this was done was that a hole was drilled along the side of a plastic sheet thick enough for the bottom of the actuator. Next a hole was drilled above that previous hole to insert the bottom affixture of the actuator to the plastic piece. Next the bottom of the actuator was placed flat on the sheet of plastic so as the bottom of the actuator fit within the hole drilled. The final step was to hammer in a pin into the perpendicular hole that was drilled first. This allowed for no motion of the actuator as well as a weight supporting base and upright position of the actuator. Below is a depiction of how the holes were drilled and their ultimate function can be implied through the below diagram.
Figure 1.2- Depiction of the side hole and the top hole to be drilled as well as the direction of the side hole along the inside of the piece.

The actuator was affixed and is a solid base for the upright attachment of the base to a larger base.

**Future Work**

Future work will consist of mounting the base plate with the upright linear actuator to a more stable and wider based platform. Also we must mount the switch some place on the platform in an easy place to access. The other major hurdle is to obtain the monitor and develop a way of mounting it to the linear actuator.

The next step with the paint cap remover is to provide a framework system for the motor and the Al piece to function on. Also we will need a place to mount the vice above the paint tube placement. Most likely we will have a better idea of how it will function at the end of the week.

**Hours Worked**

In Lab: 7

Out of Lab: 7

Total Hours Worked: 14