Work Completed

Dampening System

This week involved further research in the accessory portion of the easel. The easel has to have a dampening effect similar to the hatchback of a car. The purpose of this feature is so when the user adjusts the easel, after un-tightening the L brake, the entire extension off of the easel base does not fall onto the artist. This is another safety precaution being used. In further looking into this topic, contact with David Kaputa was made. He was able to talk and suggest some ideas on how this feature may be implemented easiest and possibly cheapest. Ideas include limiting the movement of the joints to put a stopper so that it is impossible for the adjustable joint to move any farther than a specific point. Another idea was to use nylon washers at the adjustable joints. Adding nylon washers would in effect increase the friction at the joint, thus making each joint stiffer, and less likely to fall quickly onto the artist. The use of springs was an idea as well as gas springs or pistons in order to act as a true dampener at each of the joints.

Unfortunately, each of these methods has downsides. The use of springs, gas springs, or pistons would be very expensive to incorporate, and would be unpredictable. The unpredictability comes into play due to the fact that the joints are adjustable up to 180 degrees. If a true dampening solution was to be used, these joints would be limited to one side of the 180 degree joint, thus making it act more like a 90 degree joint. The stopper idea would also limit the joint, making the articulation less adjustable. Overall, nylon washers were decided as the only method at this time. Though nothing is still absolute, it was decided that the method for dampening would be finally decided at the time of product testing. Nylon washers were purchased at the hardware store.
**Attaching Easel for Use**

The dimensions for the wheelchair tray were received. It is now known that the tray is approximately 1.5 inches thick. With this new information, a system for attaching the easel straight onto the wheelchair tray is needed. The easiest way to do this was decided. The easel’s frame will be drilled through at two points along the periphery. These drilled holes would then be tapped to fit a specific sized screw. At each side of the easel, there will be two large knob screws that can provide pressure against the wheelchair tray, thus holding the easel in place. At the hardware store, similar knob screws were found, though none as long as desired. It would be possible to buy the knobs and screws separately in order to assemble them to the exact dimensions desired. This process will be finalized at another time.

**LED System**

As the LED design is coming closer to completion, the LED system needs to be mounted onto the easel. With help from Chris Liebler, we were able to find a punchboard from Vector in order to mount the LED system onto.

**80/20 Parts**

With the arrival of 80/20 parts, the first step in assembling units for the easel is to machine the extrusions received into usable lengths for construction. Two of the extrusions were machined and cleaned up into individual pieces. In total, there were four sections of 16 inch long rounded extrusions to be used for the easel frame. One section of 16 inch long rectangular extrusion acts as the sliding track system for the easel. However, without the square extrusion, much of the assembly for any subunit involved with the easel is halted.
Measuring for part machining

Working on track assembly
**Future Work**

Future work consists of finalizing the LED design and assembly. The battery options will be chosen and ordered and construction for the mounting system will start. This includes information and research on battery charging and further schematics with dimming effects. This upcoming week will have major construction work on the easel itself. With the 80/20 parts shipped completely, they can begin to be machined and put together to produce the easel. Future work will be mostly construction from now on.

**Project Review**

For the first quarter of the semester, the easel design is on a very good track. Design work is practically completed as well as all the ideas necessary to continue forth from now on to construction phases. With parts arriving now and machine-work well under way, the easel will be completed on time. The only problem presented thus far is a piece of 80/20 square extrusion which has arrived with shipping damage. This problem is being dealt with, and a new extrusion is already sent. The damaged piece may or may not have to be shipped back, essentially with some possibility of having a large excess of materials in which revisions can be done after completion and testing of the initial prototype. The updated timeline is shown following.
### Hours Worked

11 hours.