Work Completed:

Progress of the fabrication of the easel was continued during the past week. The cardboard prototype is almost finished. I was able to help cut cardboard pieces to scale of the actual parts to help model the moving parts and correct positions of each piece of the frame. The pivoting motion of the carriage was modeled using cardboard slabs reinforced with tape. Two mock pins made of small pencil parts acted nicely to help model the tilting functions of the easel. Both front and back tilting motions have been successfully completed with the prototype. A slight delay in our progress with the cardboard model was due to the lack of having our ordered actuators. Their dimensions will certainly influence the ultimate scheme of how the easel will look and function. This hindrance was avoided by developing models for the actuators as well. Dimensions taken from the fergelli auto website were correctly used to make Styrofoam replica’s of the actuators at full extension. They were then integrated successfully into the cardboard prototype.

Another design alteration that was conceived was offsetting the tilting actuator. Since the device must be collapsible, positioning the tilting actuator directly behind the vertical channel piece of the swing arm frames would result in a conflict of proper closing. By offsetting the actuator to the side of the channel piece and attaching to an aluminum bracket, the device will collapse all the way to the base.

Another important addition to the project made came from the demonstration of the 80/20 parts showcase. More ideas and brainstorming came on how we will make the easel face itself be manually adjustable. One of the main concerns facing the project is its failure to work in an environment outside the lab. Our wheelchair model, table dimensions, etc. will allow the easel to function properly. However, these details change in different environments. The height of the table which will be used at Passionworks® has not been included to the list of specifications. By attaching the easel face to 80/20 tracks along a bracket attached to the last motion of the easel, the device is more compatible for any type of table or chair dimensions.

On Saturday morning, I took my team down to the welding shop where most of the fabrication of the easel has and will take place. I introduced them to the founder of Independent Welding and gave them an in-depth tour of the shop. I showed them the different machines, cutting and shearing equipment used, as well as other tools including the soft wheel grinder that will give a nice finish to the aluminum. Pictures of the aluminum stock as well as a list of materials were taken and recorded.
While at the shop I also showed my team proper techniques on using the equipment and other safety procedures they may not have encountered at the UConn engineering shop. I showed them how to use the chop saw, shear press, band saw, etc. Once comfortable with the equipment we started to cut more aluminum pieces for the carriage that were properly modeled with the cardboard prototype. Once cut I proceeded to clean the burrs and other rough edges with a wire brush.
Future Work:

During the next week, completion of the cardboard prototype will be achieved for vertical and horizontal movements. The cut parts for the carriage will be matched to the cardboard parts and further worked to fit the project. The tubing pieces need to be rounded to avoid the corners from connecting to the bracket when pivoting. Using a soft wheel grinder borrowed from the welding shop, edges will be rounded and safely cornered.

The ordered actuators have arrived to the lab. These will certainly help in the progress of the easel. We will begin testing of the actuators and begin work on the circuitry of the project. We will also begin building bracket prototypes onto which the actuators will attach.

Project Review:

The objectives of our project are being fulfilled nicely. With the arrival of the wheelchair, we saw it fit perfectly between the clamping arms. As mentioned earlier, the tilting actuator is going to be offset to the side of the channel piece of the pivoting arms to allow full collapsing features for the project. After contacting Passionworks® we also found out that our client only has one arm. However, this important detail does not effect our project greatly. We already removed one of the actuator movements, reducing the number of switches to six. Using a joystick similar to the one attained in the lab, (four positions; front, back, left and right, with two more switches controlled from the top of the joystick) Harry should have no trouble using the one joystick as opposed to the original two joystick set-up. Passionworks® has also requested a separate switch for Harry to turn the device on and off along with the key switch accessible for the supervisors.

Hours Worked:

This week my total time spent working on the project was around 11.5 hours. Including travel time brings the total time to 13 hours.