Project Progress Report

1) Backpack Lever Arm System
2) Shampoo-Conditioner Identification Device

Week 8
March 21, 2008

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1) Backpack Lever Arm System

Work Completed

Most of this week was spent designing and making a stronger hinge design in the machine shop. Primarily, this involved milling thick aluminum rectangular blocks to specific dimensions. In addition, once the three-component hinge was made, we had to search for thick screws, with which the hinges affixed to the 80/20 material. Once this was completed, the material had to be tapped (for the appropriate screw size). For both hinges, the rectangular blocks are about 2.6 cm in width and .6 cm in height, making them sufficiently strong and less prone to bending with high torques. Two rectangular blocks are horizontally placed to cover the upper and lower surfaces of the 80/20 material (at the location of the hinge) on a single limb. Another rectangular piece is placed vertically between them, and connected to a separate limb. The vertically placed rectangular piece is connected to the upper and lower ones by a 1.5 inches long, 5/16 screw.

Using our new setup, we clamped the attachment points (where it would generally connect to the wheelchair) to the end of a table. Using the PIC setup, we attempted to move a backpack. However, there is still a problem with the torque. The limbs are no longer bending at hinge, but at the weakest points, the T-nuts, which are somewhat loose inside the 80/20 material.
Learning from our previous mistakes, we made hinges for the third time. This time, they were thicker aluminum and L-shaped, to allow for full rotation. In this manner, we were able to achieve better results and less bending.

In addition, work with the PIC is still continuing. We are in the process of making the circuit design in the ExpressPCB software. At the same time, we are still modifying the code to get optimal results with hardware PWM and functioning of the motors. Rotation of about 240 degrees has been achieved.
with the larger motor, however, we are experiencing some issues with the delay function, and are unable to attain the complete 270 degree rotation. The 90 degree rotation with the second motor has not been achieved yet.

We have verified that the motor itself, is in fact working properly and it is some issue in the code that we will have to modify.

**Future Work**

Future work will involve making stable T-nuts, or making a full 4-sided sleeve (as suggested by the adviser) to go around the lever arm.

In addition, work with the PIC will continue. My goal is to finish this by next week, so we have plenty of time to order the PCB, put the components together and finalize the setup. In addition, we have to make an insulating box for the motors.

**Project Review**

The team will have to speed up with the PIC, as debugging is taking longer than expected.

**Hours Worked: 12**

2) Shampoo-Conditioner Identification Device

**Work Completed**

We have all the components necessary to start prototyping the shampoo/conditioner circuit; one issue is that of the surfboards, since we have still not received the 8-pin samples. Currently, we are trying to work with the 10-pin boards and manually solder each pin of the chip. This may or may not work.
**Future Work**

After verification that the circuit is working correctly, we merely have to order the board and solder the parts. In addition, we will mount the button. Once this is working, this project will be in its final stages, of insulating and making sure that battery replacement and occasional maintenance is easy to carry out.

**Project Review:**
This project is on track, and should be completed a few days before the deadline.

**Hours Worked:** 1