Project Identity

Adjustable Back Angle Controller
Week 9
April 4, 2007
Alena DeStefano

Work Completed

This week we started by purchasing some supplies at Mansfield Supply. Last Friday we went to Mansfield Supply and came back with many crucial parts, such as a rod to be cut as spring supports, a 3 inch coupling for use on the motor support, plywood for the bed back, and 16 angle braces to be used in the combined bed support, and lifting support.

One development that we came up last week is the idea for supporting the scissor jack on the ground. Below in Figure 1 shows the base of bed plate layout. We found a veneered particle board in the lab from a previous project that we could use. The idea is to attach four legs from the board and onto the bed frame and bolt the jack down to the board. This way the jack can be separated from the bed with the board if it needs to be removed.

![Figure 1: Base Plate Layout](image)

On Tuesday morning a lot of time was spent in the machine shop working on the construction of the bed back frame. The wood was cut to fit the frame and the slotted angle steel was screwed to support the bed back. Figure 2, next page, shows the progress made on the bed back.
Another important part to this project is the control box. We have come to the conclusion that the best design for this may be to house the springs and lever attached to the potentiometer inside the box and secure the PCB outside the box underneath the bed. If this ends up being the case, long leads will connect the potentiometer to the circuit below the bed. Figure 3 below shows the inner workings of the control box. The teal pins inside the springs pictured are actually there to support the springs, but not completely because we need to allow for them to compress.

The jack will lift the load vertically, eliminating all angle changes. Since the jack would no longer tilt with the back of the bed, a wheel will be attached to the top of the jack and ride in the track placed on the back of the bed. As the jack rises, the bed back will rise smoothly along the wheel-in-track system. A simple polyurethane fixed castor wheel would be sufficient. This castor has been ordered and is expected to arrive this Wednesday. It is rated for 275lbs of force. Its overall height is 2-3/8”; which still gives plenty of clearance under the bed when it is attached to the top of the screw jack. The parallel metal bars, like the slotted steel angle plates we purchased, can be built around it on the back of the bed to roll straight on track.
Future Work

In the coming week we are putting in a rush order for the last few parts for the circuit design to be in by Friday. Also, we plan on submitting the work order by Friday for Serge to start welding the motor cage together for us. A lot of dimensions depend on the wheel placement which is why the bed frame has not been completed. The complete construction of the bed is aimed to be completed by early next week. We plan on doubling our efforts in the lab to ensure this device is built in time. Future expenses include labor and cost of welding (~$80) and small parts for the circuit (~$35).

Project Review

At this point we have received the wheel castor and purchased the final major supplies at Mansfield Supply. This past week our efforts were spent constructing the bed frame and deciding the exact location of the track with the castor wheel. We are still within budget with about $568 remaining. We have currently spent about $1432 of our $2,000 budget.

Hours Worked
16 hours