Work Completed

This week I finished the bed as a whole. This includes the base support for the scissor jack, the upholstery, and the attachment of the castor wheel. A lot of time was spent in the machine shop attaching the castor wheel to the jack and measuring out the exact location of the track. Below in Figure 1 shows the base of bed plate layout all built with the upholstered bed and castor wheel attached. It consists of a veneered particle board, four legs made of slotted steel, and various nuts and bolts to attach the jack down to the board. This separate ground plate not only stabilizes the jack, but also allows it to be separated from the bed if it needs to be removed or repaired.
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 is used. 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. To stabilize the wheel on top the jack a metal or PVC plate was built with the appropriate holes.

A lot of time was spent supporting the bed back frame properly so that the wheel will move in the track correctly. However, the original design of the back with the slotted steel and such was not stable enough. Also, the wheel did not fit well enough in the track and the steel frame had to be adjusted anyway. Since the design was not supporting the opposite corner of the bed and it created a wobble, I reiterated the design by removing all the slotted steel and simply laid down two 2x4s, one at top and bottom, parallel to the hinge to eliminate the wobble. This easy fix also created a lighter weight bed back. Below in Figure 2 is a picture of the modified bed back.

Figure 2: Modified Bed Back Frame Design
Future Work

In the coming week I will finish the handle construction and we’ll wire the connection to the circuit. The final week will consist of testing the device and writing the final reports. We plan on doubling our efforts in the lab to ensure this device is finished in time. Future expenses include labor and cost of small hardware (~$50) and small parts for the circuit (~$35).

Project Review

At this point I have constructed the entire bed frame including the upholstery and hinge for the back. The handle construction is also underway. Various hardware supplies of screws, bolts and washers as well as 3.5 hours of their labor have been used from the machine shop and are waiting to be charged to the account. However, we are still within budget with about $568 remaining. We have currently spent about $1432 of our $2,000 budget.

Hours Worked
25 hours