Alternative Design Three

Assisted Walking Device

Team 3:
Scott Kopp, Andrew Czyzowski, Jason Wang

Project for Annalee Hughes
Susan Lucek, slucek@nerac.com, 860-872-7000 ext 1008
Alternative Design 3

The third alternative design is the most complex system. For this design, the walker will be fully fabricated by the design team. This will be made out of light weight metal rods. Springs will be built coaxially into the mounts, delivering an appropriate level of tension to the legs in order to keep Annalee upright. This could be a powerful, yet very natural-feeling feedback mechanism. As she tires, she will sink lower to the ground. In order to remain in the standing position, she will have to use her own leg strength to lift herself back up. There are no medical walkers that are manufactured with this characteristic motion. In addition, most walkers tend to be utilitarian designs that have little aesthetic appeal. This proposed design would not only be functional, but its style would give users a sense of individuality that other designs cannot match.

The leg braces will be much more intricate in this design. Instead of using a strap behind the legs, the padded metal constraints will act as a clamp and will close around the legs once Annalee has entered the device. To accomplish this action, the device will use common bicycle brake levers and cables to create leverage for opening the brace. As Annalee pulls on the levers, the constraints will open and she can mount the device. Once positioned correctly, she can release the levers and the clamps will close on her legs. This leg brace design is not meant to support her weight, but only fix the path of her leg swing. Her body weight will be supported in the hip and chest plates which will be fabricated from steel sheet metal and use Velcro straps to harness her in.

Again, the handle bars will be commercially purchased, so there will not be much variation in their design. The ankle foot orthosis will be the same design as Alternative Designs 1. The metal rods used to position her legs will be fabricated from light weight aluminum and will allow for ten to fifteen degrees of freedom at the hip and knees.

The alterations to the leg restraints cannot be seen on the three dimensional CAD model due to limited software experience. Figures 6-9 depict the third alternative design as previously described.
Figure 6. Technical Drawing of Alternative Design 3
Figure 7. Three Dimensional Model of Alternative Design 3

Figure 8. Spring Design
Figure 9. Rendering of Leg Restraint Design