Central PA SCI Support Group 3

Overview
Charcot Marie Tooth (CMT) disease is a neurological disease that deteriorates muscles over a person's life span. Marty Kester was diagnosed with CMT at a young age and as an adult no longer has muscle strength in his limbs. Marty is unable to use current market reaching arm devices due to his disability. A reaching arm device must be designed around Marty's limitations to enable him to pick objects up off of the ground.

Objectives
Central PA SCI Support Group 3 had the objective of creating a device that allowed Marty Kester to get small objects off of the ground while at a seated position. Items that were requested to be picked up were socks, coins, paper, napkins, and food scraps.

Approach
- Researched current market products and patents
- Benchmarked current market products
- Used brain writing technique to generate concepts
- Selection matrix was used to determine best concepts
- Visited with sponsor and Marty to gather customer needs and deliverables
- Created CAD models and drawings for entire project
- Fabricated 4 prototypes and a final product
- Performance testing was done on each prototype, FEA analysis completed on CAD models
- Testing was used to validate that Marty's strength was sufficient to operate device
- Results proved the shaft was strong enough to support an object Marty is able to pick up
- Results proved the force required to operate the device was within Marty's capabilities

Outcomes
The following are outcomes of the project at the end of the semester:
- Marty Kester will now have more independence.
- The product is adaptable to other patients.
- The product reduces time and effort for Marty to pick up an object.
- The project provides a unique solution for patients with neurological diseases.