

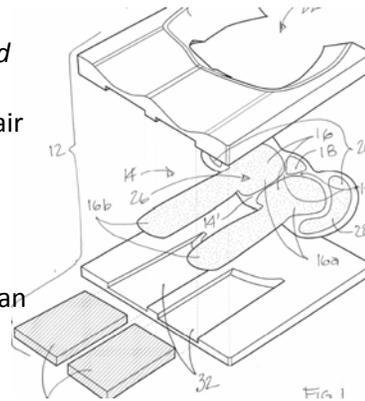
Introduction

Rehabilitation engineering embodies the application of engineering and scientific principles to addressing the functional needs of persons with disabilities. The nature of this topic is both interesting and challenging for students. Typically, engineering design courses that undertake assistive technology projects are challenged to establish sustainability of their projects. In other words, how can device support continue to be offered to the recipients of assistive technology prototypes?

Objectives when designing course:

- Develop a design course to maximize the potential for projects to continue after a semester's end.
- Undertake projects that have commercial potential as a means to attract industry partners
- Insure multidisciplinary student enrollment reflective of the diverse nature of assistive technology
- Model industry product development by utilizing an experienced product manager to oversee the design teams

Patent drawing of a *adjustable fluid-based wheelchair cushion*: Fluid-based wheelchair cushions have been available for many years, but none are able to adjust fluid volume according to an individual's changing needs.



Pediatric Personal transporter: A small, versatile and fun transporter for children who ambulate with walkers or crutches allow them to move about their homes and schools.



Stander designed to off-load one lower extremity: This project adapted a Standing Frame to allow a therapist to offload one lower extremity to work on weight shifting and gait initialization activities.



Stakeholder roles and responsibilities

Industry Sponsor: must assign a "Product Manager" to work with design teams to develop design criteria and market strategy. The Product Manager becomes the key decision maker in deciding how design compromises are reconciled. The company is also required to contribute between \$5000-\$9000 to cover expenses.
Clinicians and persons with disabilities: are regularly engaged during all phases of the project and are challenged to reconcile conflicts that arise when addressing technical feasibility, usability and commercial viability.

Conclusions

- The course requires effort to identify projects and secure industry stakeholders.
- Identifying clinicians and persons with disabilities that are willing and able to assist students throughout the semester is non-trivial.
- Fabrication expertise is needed to facilitate iterative design- if fabrication is a barrier, students will not iterate enough to optimize design
- Functional prototypes should be completed at least 5 weeks before semester's end to permit evaluation and re-design.
- Testing of prototypes requires review by an Institutional Review Board. Timely submission is paramount to allow for adequate evaluation time.
- Industry is the driving stakeholder in insuring continuity of projects after semesters end.