Amputee Advanced Donning Device

Client: Mr. Daniel Kutschera

Advisor: John Pucinelli

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Date: September 12th 2025 - September 18th 2025

Problem Statement:

During rehabilitation, it is critical for amputee patients to wear a specialized compression garment known as a shrinker. A shrinker aims to shape the residual limb in preparation for prosthetic fitting and prevent post-operative complications like swelling and excessive fluid retention. For application of the shrinker, patients currently rely on basic donning tubes, in which the shrinker is stretched over a plastic tube and pulled over the residual limb. Because shrinkers are designed to apply strong, consistent compression, they can be very difficult to stretch over donning tubes. This challenge is especially significant for elderly patients, who may have limited strength, dexterity, or mobility. This project aims to create an advanced donning device that stretches the garment to the desired diameter using electronics, simplifying shrinker application and eliminating the need for the user to manually stretch the garment.

Brief Status Update

This week, the team began the brainstorming process. Team members individually drew 2-3 designs to bring to the team meeting held on Wednesday 09/25. During the team meeting, team members shared and explained their designs. Then, the team established a set of design criteria and produced a design matrix. Finally, the team obtained a sample shrinker and currently existing donning device from the client to use as a reference during the design process.

Summary of Weekly Team Member Design Accomplishments

- Team:
    - Individually brainstormed designs
    - Met as a team and shared designs
    - Established design criteria
    - Produced design matrix

- Carly:
    - Created designs for design matrix consideration
    - Researched expansion mechanisms
    - Worked on the design criteria
    - Researched materials for our product
- Eleanor
    - Individually produced design drawings
    - Conducted materials research, specifically targeting potential 3D printed materials
    - Contributed to establishment of design criteria
    - Contributed to production of design matrix
- Ava:
    - Individually research materials for design ideas
    - Come up with two design ideas for product
    - Research pricing for certain materials
- Anna:
    - Conducted further individual research
    - Produced two sample designs
    - Collected our materials from client
- Sam:
    - Drew out different design ideas
    - Researched important features included in my design ideas
    - Contributed to establishment of design criteria
    - Contributed to production of design matrix

Difficulties / advice requests

N/A

Upcoming Team and Individual Goals

- Team:
    - Produce preliminary presentation
    - Establish fabrication timeline for selected design
    - Touch base with client and discuss the team's current progress
- Carly:
    - Prepare for the preliminary presentation
    - Finalize design matrix based on input from the advisor meeting
    - Continue needed research
    - With the design selected begin looking into hardware
- Eleanor
    - Produce preliminary presentation

    - Select design to move forward with and start considering how this design should be executed
    - Continue conducting research as needed
- Ava:
    - Select design(s) to work with
    - Narrow down materials based on design
    - Work on preliminary presentation
    - Continue individual research
- Anna:
    - Continue doing research
    - Work on preliminary presentation
    - Assist team in developing our chosen design
- Sam:
    - Continue researching
    - Create preliminary design presentation
    - Research concepts needed for the design the team ultimately chooses to move forward with

Expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Category 1										
									$0.00	
									$0.00	
Category 2										
									$0.00	
									$0.00	
								TOTAL:	**$0.00**	

Project Timeline

Task	September			October				November					December			
Project R&D																
Empathize																
Background…																
Prototyping																

Testings																
Deliverables																
Progress Reports																
Prelim presentation						10/3										
Final Poster														12/5		
Meetings																
Client																
Advisor																
Website																
Update																

Dates & Deadlines:

- Product Design Specifications: Friday, September 19th
- Design Matrix Criteria: Friday, September 26th
- Preliminary Presentations: Friday, October 3rd
- Preliminary Report: Wednesday, October 9th
- Show and Tell: Friday, October 31st
- Final Poster Presentations: Friday, December 5th
- Final Deliverables Due: Wednesday, December 10th