SEAT BELT BUDDIES

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Overview

Our goal was to produce an ergonomic handle/guide used to help users suffering from physical disabilities to buckle and secure themselves into standardized 3-point car seat belts.



Problem at Hand

- Client background
- Arthrofibrosis
- Looking for seat belt assist/guide





Goal of the Project

- Male Part \rightarrow Female Part
- Strength/reach to clasp together
- Not hinder other functionalities





Functional Decomposition



Basic User Requirements

- Attachments to both the male and female parts
- A guide to lead the male towards the female part to be clipped in
- Easy installation
- Universal design for any car type
- Safety of passengers



Target Specifications

Functional Requirements	Constraints	Non-Functional Requirements
Extra reach A guide/track Safety of passengers Does not disrupt normal function of the seatbelt	\leq \$50 \leq 400 g < 30 cm in length < 5 cm in width Operates between -40 to 60 °C	< 5 minutes to install < 10 years of product life Durability Aesthetics

Products that Currently Exist



lSeat Belt Handle by SBEP



Buckle Booster by SBEP



Seat Belt Grabber by Veigel

Benchmarking #1- Seat Belt Grabber Handle



Benchmarking #2 - Veigel Seat Buckle Assist





Conceptual Idea #1



Conceptual Idea #2



Conceptual Idea #3



Conceptual Idea #4





Our Chosen Concept







Is it Feasible?

- Similar products on the market that received positive feedback from client
- Our concept will be a synthesis of the previously mentioned existing products
- Sourced materials within budget (3D printing at the MakerSpace)



Concept Sketches before First Prototype Development





First Prototype







Second Prototype - Latch Plate Holder CAD Drawing



Second Prototype - Buckle Raiser CAD Drawing



Second Prototype







Third Prototype - Latch Plate Holder CAD Drawing



Third Prototype - Buckle Booster CAD Drawing



Final Product





Final Product





Bill of Materials

Description	Unit Price	Quantity	Cost
80 g for the latch holder 20 g for the buckle raiser	\$40	1/10 of a 1kg roll	\$4
Roll of hockey tape used for grip	\$3.79	1/50 of a roll	\$0.08
36" strap with a securing cam	\$3.49	1	\$3.49
	Description 80 g for the latch holder 20 g for the buckle raiser Roll of hockey tape used for grip 36" strap with a securing cam	DescriptionUnit Price80 g for the latch holder 20 g for the buckle raiser\$40Roll of hockey tape used for grip\$3.7936" strap with a securing cam\$3.49	DescriptionUnit PriceQuantity80 g for the latch holder 20 g for the buckle raiser\$401/10 of a 1kg rollRoll of hockey tape used for grip\$3.791/50 of a roll36" strap with a securing cam\$3.491

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Triple Bottom Line Business Model

<u>Manufacture model</u> :

The product is designed on CAD software and is printed using a 3D printer.



Business Model Assumption

- 1. The consumer demographic being that of people with physical disabilities similar to that of arthrofibrosis (and any other mobility related ones), young children, and elderly people that has difficulty securing themselves in car seat belts
- 2. the company will focus on the production and selling of the product, no refilling, repairing, maintenance, or subscription services will be provided
- 3. the only source of income of the company will be from the sales of the seat belt guide products

Economics Report over 3 year period



What makes us better?

- Extendable strap providing extra reach
- Rigid and ergonomic handle
- Multi-purpose (attach/detach)
- Easy installation and use
- More affordable than competitors
- Market for people with physical disabilities children, and elderly



Demonstration



Demonstration



