Design Project "Energy-Harvesting Walker"

EDSGN 100, Spring 2015

Team 3 Engineering

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Dubois

Problem Statement

Goal: The goal of our project was to create an energy-harvesting device that can be used to charge some type of light(s) (mini headlights) on a walker for use in the middle of the night or in dark areas.

Objectives: The objectives of our project were to create a low cost device that is easy-to-use, safe, and effective.

Constraints: The constraints of this project were to create it for under $100 and can be installed on any walker.

In this project we adapted a previous design for an energy harvesting device on a walker.

Product Specification

Based on the customer assessment, literature review, and preliminary analysis, the following are some of the product specifications considered in this design:

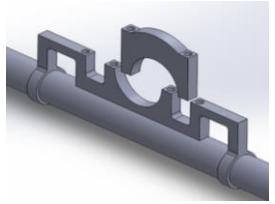
- Low cost (affordable)
- Easy to install
- Efficient
- Safe to use
- Be able to remove and place on any walker (interchangeable)

		Concept					
		Concept #1		Concept #2		Concept #3	
Selection Criteria	Weight	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score
Low Cost (affordable)	20%	3	.6	4	.8	4	.8
Easy to Install	10%	2	.2	4	.4	4	.4
Efficient	30%	1	.3	4	1.2	5	1.5
Safe to use	30%	4	1.2	3	.9	3	.9
Interchangeable	10%	3	.3	3	.3	3	.3
	Total Score	2.6		3.6		3.9	
	Rank	3		2		1	
	Continue?	No		Yes		Yes	

Design Concepts

Concept #1

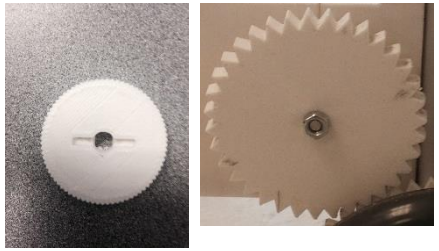
In this concept we tried to create maximum stability by having two holsters. This allows the entire system to be supported in two areas on the walker.



Concept #2

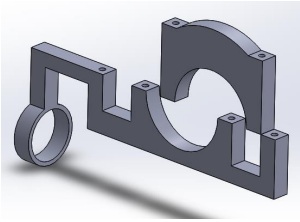
This concept was adapted from the previous design. In the first design the teeth on gear was too shallow. As a result, this allowed minimum contact and slippage.

Before **After**



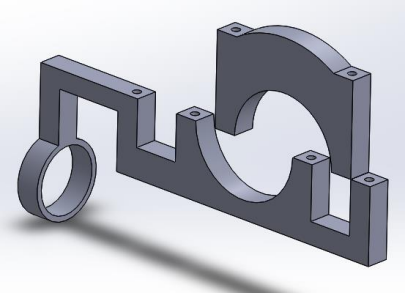
Concept #3

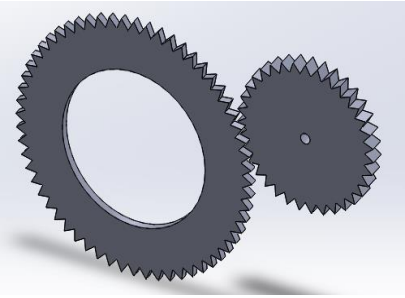
This concept was adapted from concept #1. We removed the second holder because of interference with the tire on walker. Maximum stability was still achieved. Therefore, we chose this concept as our final design.



Final Design

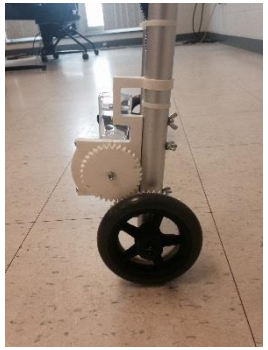
Our final design was overall the best design. The added holder gave extra support and the adaptive design of the gears allowed maximum contact.





Manufacturing and Testing

A proof of concept was manufactured and tested despite several setbacks and design modifications



Conclusion

The design and prototype (proof and concept) developed in the project shows and overall success even though additional testing is still required. The designers are confident that with a few design modifications the prototype would efficient and effective.