ABSTRACT

Bicycle Mounted iPhone 5 Case with Charging System

Patrick Goebel

This purpose of this project is to design and manufacture a bicycle handlebar mounted case that will house Apple’s iPhone 5 and a charging system that utilizes a charge from a generator hub in the front wheel of a bicycle. The charging system and software for this project will be developed by an Electrical Engineering Graduate student. The case and charging system must be a self-contained unit that is weather-proof and esthetically pleasing. It must allow the user to use all of the features of the iPhone 5 under a wide range of speeds. It must be adjustable between portrait and landscape orientations.

The necessary components of the case, a liner, and handlebar mount were developed, designed, sourced and prototyped to create a functioning prototype using a variety of industrial and manufacturing engineering skills. The designed components were 3D modeled using SolidWorks Computer Aided Design software. These parts were then rapid prototyped using a Stratasys 3D printer. A liner was made by pouring silicone into a wax mold that was machined on a Hass MiniMill. Documents were produced that would aid in the manufacture of this case as a consumer product. A cost analysis was completed that compare multiple manufacturing options for a case, one an injection molded plastic case and the other a machined aluminum case. The breakeven point for these two processes was found to be 266 units with a cost per unit of $73.

Many things were learned though the course of this project. Skills that were learned through many courses taken at Cal Poly were applied to a real problem and then used to solve the problem. Through research and with the guidance of peers and professors I was able to take this project from an idea to a functioning prototype. I learned how to look at the bigger picture when developing ideas and products and to explore all avenues for the best solution. In the future I would obtain more feedback from potential users and peers because they often can offer advice and solutions that may have been over looked. I would recommend that this idea and product be further developed into a consumer product.