

# **Design Process of the Dual-Grip Mug Intended for Disabled Individuals**

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## **Abstract**

Finger amputation is the most common type of amputation. Approximately in any given year, a rough number of 61,000 of Americans are suffering a form of fingers amputation of 1 or more fingers [1]. Majority of fingers amputation occurred to children below the age of 4 and men of age 55 and above [2]. The disability that they have may limit their normal daily activities such as drinking coffee and beverages from a common type of mug that can be found in the market. The idea of helping the disabled people is what motivated us to carry out this investigation and research. In our proposed approach, The Dual-Grip Mug could accommodate the needs of the disabled individuals. Not just that, the mug could also be used by children as it has two handles.

## **Key words:**

Dual-Grip, Design Process, Disabled individuals, Engineer, Finger Amputation

## **Introduction**

Design process is a procedure of finalizing concept based on customers' need. There are four stages of design process. The first stage is to collect customers' need and rank them according to the respective weightage. Next, generating concept based on customers' need. This is the stage where the product descriptions of how well it would be produced are taken into account. The third stage is concept selection, where the best concept based on weightage will be chosen. Last but not least, a prototype and testing is carried out.

## **Literature Review**

The reviewing the patent of the Thermal coffee cup[3], which was invented by Delbert E Phinney, greatly helped shape the design of our coffee cup. At first when designing the dual-grip mug we had difficulty with how to insulate the cup so that any individual's hands wouldn't be burned while trying to drink something warm that was held in the cup. However, this problem was solved when we reviewed this patent showing an insulated container jacket which lead us to design our cup with a stainless steel body, and a vacuum inside the insulated jacket of the cup keeping heat or cold from the hands of anyone trying to drink something from our mug.

## **Design Process**

To begin the design process, the team conceptualized qualities of the mug that are most essential for the consumer. The primary aspects were determined to be ease of use, durability, eco-friendliness, portability, and safety. From each primary aspect, a list of secondary aspects was generated for later use. A concept generation tree was then created to provide a full set of potential combinations for the final design of the mug. The most important concepts of the mug were categorized into three components - material, body and handle. Each category included three to four options of possible concepts, each of which were considered suitable for the final product. In order to obtain the best possible combination, each individual concept was weighted and ranked against the secondary aspects that had been previously decided upon. The highest ranked combination of concepts ultimately became the prototype for the coffee mug design.

## **Design Result**

Through careful deliberation, concept generation and selection, the best design was determined to be a cylindrical coffee mug with two wide-set handles located on opposite sides of the mug. The handles will be wider towards the base of the mug and narrower at the top in order to accommodate hands of different sizes. The product will be made from stainless steel material to ensure that it is lightweight and dishwasher safe. All areas of the mug that the hands come in contact with during use, including the inside of the handle and some of the outer surface of the mug, will be lined with rubber so as to protect against burning.

## **Conclusion & Summary**

In conclusion what started as nothing more than some initial brainstorming between our group about the qualities we thought our mug should have grew through the design process. From the initial primary aspects, through the final concept selection phase, our ideas grew into a working product due to our work as a team. This team work lead to the creation of a mug that could solve the problem of drinking hot beverages for the disabled. The Multi-Grip coffee mug while initially meant to be used by the disabled is now not only usable by the disabled, but also comfortably useable by anyone who would choose to disabled or not.

## **References**

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