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GRABBING AID FOR DISABLED USERS AND USERS WITH LONG NAILS

Loo Jian Chuan, Chin Alicia

Tenby Schools Ipoh, Perak, Malaysia.

Email: austin.ljc@outlook.com

ABSTRACT

The paper presents the development of an innovative idea to design a grabbing aid for disabled users and users with long nails. The paper consists of the process gone through in making the grabbing aid, as well as the designs created for the grabbing aid.

Keywords: grabbing aid, long nail problems, arthritis, weak hands, weak grip, disabled people; Plucky

1. INTRODUCTION

Long nails have been one of the focus points when it comes to woman fashion. However, long nails have posed a problem. Viral videos show women with long nails having difficulty with grabbing thin objects (Alannized, 2021). For example, women with long nails find it hard to pull their credit card out of an ATM machine. Within the same topic of limited dexterity and weak grip, more than 350 million people have arthritis globally (Alannized, 2021). When arthritis affects the hands, it causes pain in parts that are responsible for gripping things (Anderson, 2020). This causes a weak hand grip for arthritis patients. Disabled people with affected hand functions will also have limited or no grip. To solve all these problems, we aim to innovate and design a grabbing aid that would replace the lost grip strength and bring ease to their daily activities.

2. THE GRABBING AID & ITS FUNCTIONS

The grabbing aid is designed to make grabbing easier for those in need, while utilizing minimum grip. Nicknamed “Plucky”, it helps those in certain physical disability or with long nails from reaching the ticket collector to grabbing objects with more ease. Moreover, Plucky has the capability to become an adaptive door handle in situations where poor grip can’t open doors, as well as a button presser.

3. METHODOLOGY

When making Plucky, sustainability comes in mind. Thus, we decided that Plucky should be made from plastic waste. However, due to time and resource constraints, the prototype of Plucky will be made from acrylic. Using an acrylic bending machine, we bent a piece of acrylic board into the desired shape. For Plucky to function, a compliant mechanism was applied to the design, meaning that Plucky will be made of one whole component. This reduces costs in

manufacturing when Plucky is mass-produced. We tested multiple designs of Plucky to ensure the best results were obtained.

4. FINDINGS

Plucky demonstrated great grip in grabbing thin objects (such as payment cards and tickets). Large objects became a difficulty for Plucky due to its mouth size. To solve this problem, we added an adjustable mouth, so that larger objects could be gripped without change in grip strength. While testing Plucky, we discovered that the aid could serve as a jar opener. However, due to its mouth size, Plucky could only open jar lids that are at least 10 cm in radius. Despite having an adjustable mouth, Plucky still has its limits in grabbing larger objects. This issue was discarded in favour of making a small, compact, and lightweight tool. In the end, a particular design was chosen for Plucky (Figure 1).

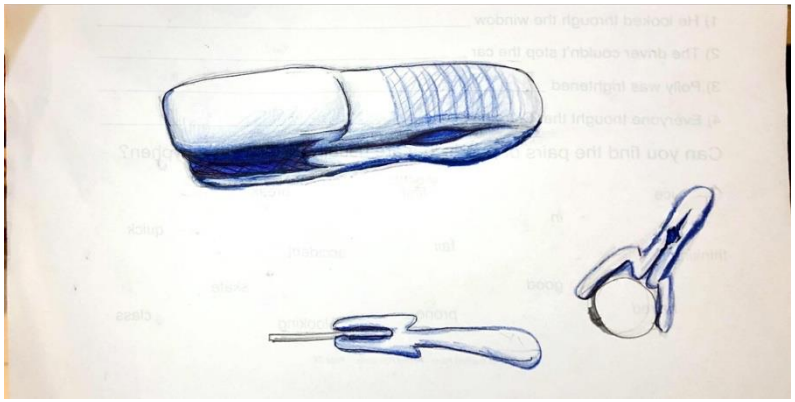

Figure 1 Final Design of Plucky

5. CONCLUSION

Plucky was finally designed to fulfil the goals intended for it. To ensure that Plucky provides the best benefits to the intended consumers, we have created a survey to get feedback on the grabbing aid. We also plan to get a test group, so that we can get instant feedback and observe the use of Plucky in real-life scenarios. After sufficient data is collected, we hope to bring Plucky to the mass market, so that Plucky can bring change to the future of the disabled users and long nail users.

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