

Phone Grip for People with Hand Disabilities

Mechanical Engineering

FRESNO STATE

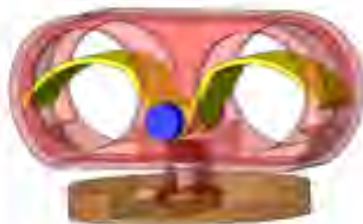
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Abstract

- The goal of this project is to design and manufacture a small phone holder grip that will mount on the back of a mobile device.
- The design primarily focus on people with hand disabilities.
- The product was designed to reduce most of the mechanical stress and fatigue involved with grasping a mobile device.

Our design

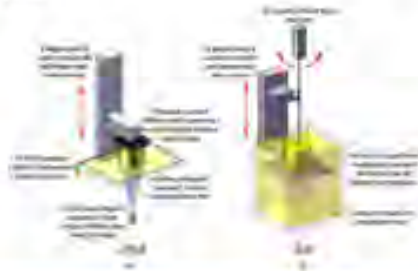


•Dimensions:
Width: 2.5 inch
Depth: 0.75 inch
Height: 1.62 inch

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Additive manufacturing approach

- 3-D printing is an additive manufacturing technology that builds a 3-D object by adding material layer upon layer.
- The stereolithography process is a form of 3-D printing that converts liquid resin into solid layers by projecting patterns of UV light.



Introduction

- According to the Centers for Disease Control and Prevention, over 9 million Americans will experience short-term injury or permanent disability of the hand or wrists.
- Disability problems like these make grasping small objects extremely difficult.
- Handling a mobile device can become an unpleasant, painful or even an impossible task.

Civilians with Self-Care Disability
Ages 18-64, by State, 2013



Improvements

- Focus primarily on people with hand disabilities.
- Adjustable finger holes that fits all.
- Safe and comfortable grip.
- Durable material.
- Rotational body.
- Fits any smart device (phones, tablets).

Manufacturing time and cost considerations

- With the current 3-D printing technology available, the estimated manufacturing time is around 2 hours;
- Since 3-D printing is less expensive than other manufacturing technologies, the estimated price will be less than 10 dollars.

Existing products and their problems

- The existing products in the market focus on the general public.
- Are overpriced for the overall quality offered.
- Do not present ergonomic design.
- Lack in durability.



Working mechanism

- The torsional spring, attached to the arms, provides the adjustable grip for the fingers.
- The base is fixed to the device using a double sided tape.
- The upper part can be easily removed from the base when it is not being used.

Conclusion

- Since 3-D printing technology is relatively cheap, the product could be individually customized for a perfect fitting.
- Mass producing the product can further reduce the manufacturing and commercial costs.