CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

J0307

Project Title

Comparing Grip Materials to a Cylinder Using a Hydraulic Arm

Abstract

Objectives

The objective of this study is to find grips that are affordable and effective so that the cost of prosthetic arms could be lowered while the effectiveness of the prosthetic arm could remain the same or even become more effective.

Methods

Materials that I used was a Hydraulic arm, 4 different grip materials, and a soda can. These materials helped me measure the effectiveness of different grips based on if the arm was able to hold the soda can or not.

Results

Grips that were stickier or stretchier were over 50% more effective than the grips that were more silk-like and slippery when holding the can. Several trials were recorded and the averages were the results. The results showed that the stretchier the material, the better.

Conclusions

In conclusion, multiple trials show that grips that were more stretchy were more likely to be able to hold the can than the grips that were slippery. This shows that my Hypothesis was on the right track and that there were other factors that I did not think about before that I needed to research in order to do the experiment. I have concluded that the grips that I have tested are more effective than those, more expensive material, used for prosthetic arms.

Summary Statement

I created a hydraulic arm that would be able to hold a soda can to test different grips that were less than $5 to find which materials were the most effective to help make prosthetic arms more effective and affordable at the same time.

Help Received

I designed the hydraulic arm myself, using a few different ideas I found online while I was researching and I also designed some of it myself. I built the whole arm by myself with no help.