CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)
Matthew Cho

Project Number
35648

Project Title
Braille Pad: An Electric Braille Display Using Solenoids

Abstract

Objectives/Goals
My project goal was to make a braille pad that would be able to display braille characters for the blind using solenoids. This is beneficial to the blind because as of right now braille books are heavy, expensive, and infrequent. This device will allow the blind to read without carrying around heavy braille books with them. I was inspired when I was browsing my local library and came upon a shelf labeled braille books and it surprised me how thick an edition of Charlottes Web was.

Methods/Materials
I made my solenoids by wrapping magnet wire around a straw and I designed braille cells with solenoids to work out the flaws such as interaction when more than one solenoid was grouped together. I modified the core by making it into a iron nail with a flat tip so that I could attach a plastic bar. As for the circuit, a matrix circuit was implemented to drive the solenoids more efficiently. The circuit was prototyped on a bread board then transferred onto a solder board so that it would more sturdy. A 12 volt battery was added to power the system. All of the components were put in a plastic case along with a fan to cool the solenoids and a few buttons to control the pages.

Results
I was successful in making the braille pad and it is able to display all the characters in the number system and alphabet. The pad has a total of two braille cells and the current braille size is 2 times the size of standard braille. It has basic controls that are able to navigate the pages in a braille book.

Conclusions/Discussion
The braille pad is implemented with braille cells that have a set of solenoids. I plan to improve the braille pad in many aspects. To start off, I plan on making a locking mechanism so that the solenoids are not needed to keep the pins in an on position. Even though the current design only has two letters due to issues such as uniformity and manual work, more cells need to be integrated for practical use.

Summary Statement
My project is an electronic pad that helps the visually disabled read braille by displaying braille characters using solenoids.

Help Received
My dad helped me make the case.