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Mission to Vision
An Innovative Braille System Keyboard for the Visually Impaired

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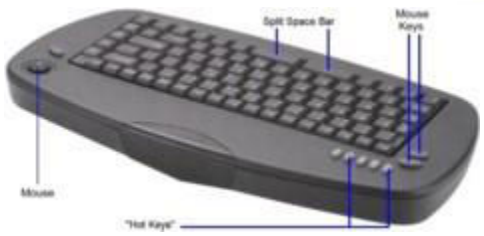
1. Introduction

The world today demands people to be independent, irrespective of their challenges, mentally or physically. Visually impaired people have to rely on someone for fulfilling even the minor needs. The probability for them to interact with the computer is very minimal except for the speech recognition technology which is really complicated and unreliable. Thus to make them stronger in their working on the computers, this project provides them the total enhancements for interaction with the system and servicing their necessities.

This project is anoriginal project work of ours, which is a unique innovation making them visual across the globe, interact with computers easily and independently.

A keyboard is an external input device that is connected to the computer using a fiber optic cable. An ordinary conventional keyboard contains around 104 keys in it, buried inside the keyboards case is an 8042 microcontroller chip that constantly scans the switches on the keyboard to see if any keys are down. A typical keystroke starts with the user pressing a key on the keyboard.



This closes an electrical contact in the switch so that the microcontroller can sense that you've pressed the switch. The PC keyboard actually generates two scan codes for every key you press. It generates a down code

when you press a key and an up code when you release the key. But it is definitely impossible for every visually impaired people to learn the regular typing pattern and work on these keyboards.

Thus there must be an alternative for the blind people to interact with the computer to meet their needs. Hence there were projects introduced for making them to interact with the computer, but really failed to prove their qualities.

2. Existing scenarios

For enhancing the interaction with the computers by the visually impaired, there were many systems that were created like E touch, speech recognition interacting system etc.

Several companies today market computer programs that allow a blind person to use a standard computer. These computer programs are called "**speech recognizers**". A speech recognizer is itself a standard Windows computer application, but its job is to run alongside the other programs running on a computer and makes the blind person to speak out to enter the text on the screen. Because a blind person cannot see what is on the

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screen, a screen reader typically has a built-in speech synthesizer which, perhaps sounding a bit like a robot, speaks information to the user through the normal sound speakers of the computer itself.

The speech recognition system is highly complicated to work on as everyone needs to wisp the exact language and also that it keeps the visually impaired

away from the common users by not using a keyboard by hands.

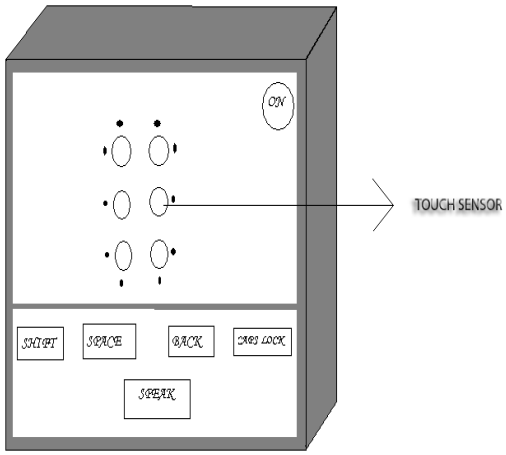
The another System is **E-touch**, in which major disadvantages are

1) The person must be given a separate coaching to use the keyboard, which is different from the usual way of writing by blind persons. Hence it becomes quite tedious.
2) In that keyboard "special characters "cannot be used. Because of that the size of the keyboard increases as usual keyboard and manyComplexity arises.

3) The size of the keyboard is comparatively greater than our project.
Thus a newer technology is necessitated for those people to work as a common man on interacting with the computer, which is provided by our project for satisfying their needs.

3. Architecture of the project

The below given diagram is just a design of our project. The specifications of the design are as follows



- . There are 6 logical switches (or touch sensors) which are used to sense the characters
- The **specialfour switches** are explained below:

SHIFT – This key is used to toggle between the alphabet and number mode.If this key is switched on, then the sensors give output as numbers only.

SPACE – This key is used to create a blank space character.

BACK – This key is used as backspace character.

4. Braille Language

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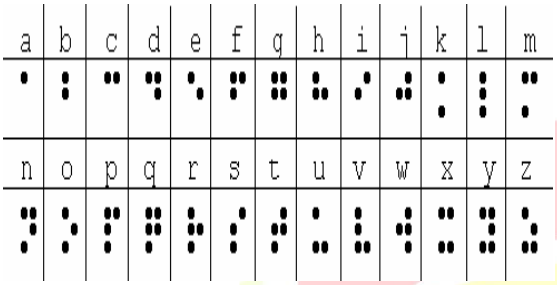
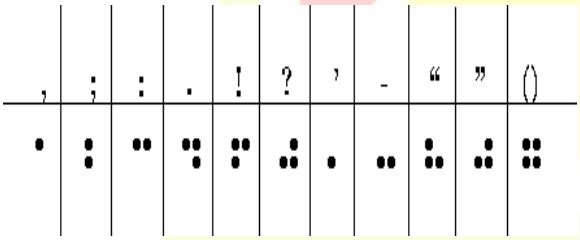
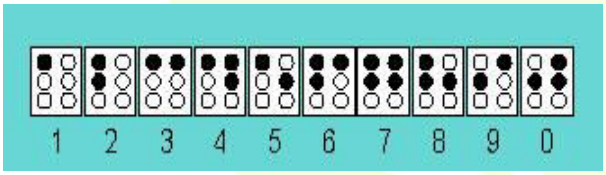
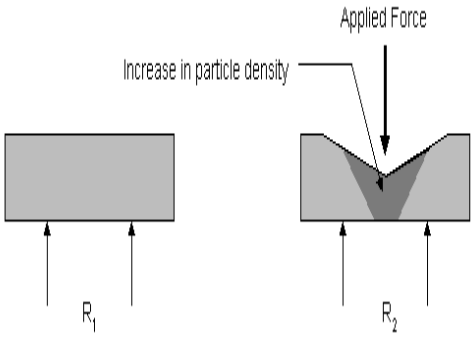




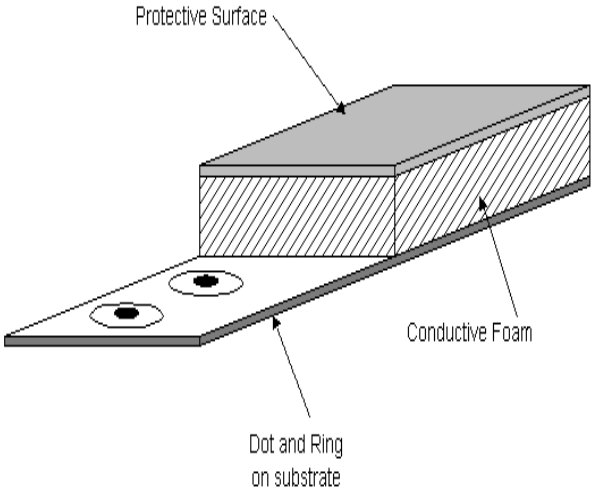


5. Logical Switching

The 6 logical switches are made up of 'TOUCH SENSORS'. Touch sensing is the detection and measurement of a contact force at a defined point. A touch sensor can also be restricted to binary information, namely touch, and no touch. It should be recognized that the operation of a touch sensor is very dependant on the material of the object being gripped. The touch sensor is a resistive based sensor where the change in the resistance produced (R_2-R_1) produces the change in the current and hence is used in selecting of characters.



The basic principle of this type of sensor is the measurement of the resistance of a conductive elastomer or foam between two points. The majority of the sensors use an elastomer that consists of a carbon doped rubber. In the above sensor the resistance of the elastomer changes with the application of force, resulting from the deformation of the elastomer altering the particle density.



If the resistance measurement is taken between opposing surfaces of the elastomer, the upper contacts have to be made using a flexible printed circuit to allow movement under the applied force. Measurement from one side can easily be achieved

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by using a dot-and-ring arrangement on the substrate.

6. Features

- The typing in this keyboard is very easy and simple for the visually impaired.
- It needs no prior practice for those who are well versed in BRAILLE language.
- It takes around only 5 days to learn the typing on the board for those who aren't familiar in BRAILLE language.
- The special 5 keys provided and the modes of operation chosen in the system makes the task of typing comfortable for the blind.

7. Advanced enhancements

As far as the implementation part of the project is concerned, the text to speech conversion is a future enhancement of the project. The text to speech conversion allows, talking word processing program, allows visually impaired to hear the letter, word, sentence or phrase as it is entered into the computer. We can use existing Text Aloud, Intellitalk as a software part for hearing the speech as the text is entered. The SPEAK button in the design is used to verify/hear the text entered. Thus it makes the

probability of error to minimize and makes comfortable position for the people who are visually impaired.

8. Conclusion

The KEYBOARD is aimed towards the welfare of visually impaired people. The visually impaired have an exposure to all the latest equipments made especially for them, but none has attempted a better research over this issue. Hence, this project is sure to create a revolution in its own field and ensure complete support from people of different societies. **This project helps the visually impaired to interact** with the computer system at a maximum probability and easier to communicate. At the international arena this project will definitely achieve greater heights and is expected to be welcomed by communities for helping the blind.

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