Blind Assistance System Using Refreshable   Braille   Display

[1]Yugal Devhare , [2]Tejaswini Raut, [3]Suraj Lokhande, [4]Anjali Ramteke, [5]Jaishree Sambhare

[1,2,3,4,5]*UG Student*

[1,2,3,4,5]*Electrical Department,*

[1,2,3,4,5]*Anjuman College Of Engineering And Technology ,Nagpur,India*

[6]*Prof. Ruhi Uzma,* [7]*Prof. Ishraque Ahmed*

[6,7]*Assistant Proffesor*

[6,7]*Electrical Department,*

[6,7]*Anjuman College Of Engineering And Technology, Nagpur,India*

Abstract: *The main aim of this paper is to design an affordable refreshable braille display for the blind or visually impaired people. This device allows the blind or visually impaired people to do reading in Braille language and documents. It is a portable device which can be used for indoor guidance system as well. Braille language is used mainly by the people who are blind and deaf blind. Blind and deaf-blind braille readers often prefer electronic braille displays which are not affordable and costly. In these paper we demonstrate that the braille embosser is a type of device which is very useful for initial stage braille language learner. Here, the input is in the alphabetical form which is converted into Braille language and displayed with the help of servomotors. This device detect the obstacles and also determine at what distance obstacle is, a blind person can safely use this device.*

Keywords: *Braille, Blindness, Microcontroller, Sensors*

I.   Introduction

Globally the number of people of all ages visually impaired is estimated to be 285 million,of whom 39 million are blind. The life of blind or visually impaired person is very difficult in our society as they need someone to give right direction while crossing the road, travelling, walking and many more of our daily activities. Like a normal people who can see this world they can able to read and write the sentences, words normal laguages.

But as the blind person cannot see the word, sentences they are not able to read or write in normal lagauage.So for the literacy of blind people only braille laguage can be used. Braille lagauage for the blind person was invented by Louis Braille in 19th century. In most of countries there are some blind schools and colleges which used brailler or braille embosser to teach their students in braille lagauge. But this devices are very costlier as well as they need paper for printing in braille . Only the portable and affordable refreshable braille display can overcome this demerits of those devices.

II. Refreshable Braille Display

Braille displays provide acess to information on a   computer screen by electronically raising and lowering the different combinations of pins. A braille character of six to eight dots depicts one to two character in a word. As a result, the reader reads serveral words on the display to read the next set of words.

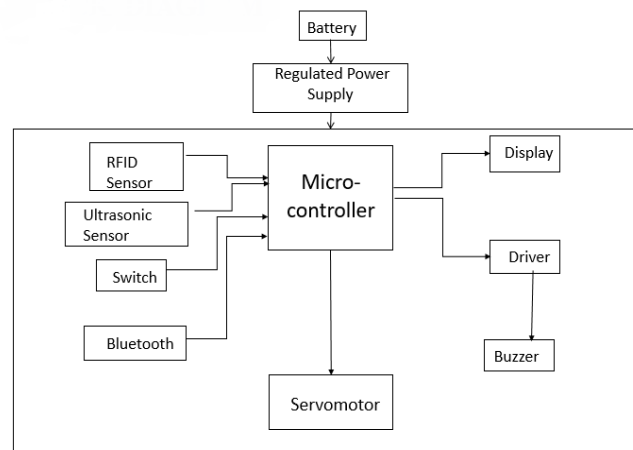## III. Ease of use

Schematic Diagram:

Fig. 1. Block diagram

3.1: The PIC18F25K20:

I/SP is a high-performance PIC18 family 8-bit powerful (200 nanosecond instruction execution) yet easy-to-program CMOS flash based Microcontroller packs powerful PIC®(RISC) architecture with up to 16 MIPS of processing power with benchmark nanoWatt XLP extreme low power consumption. This product offer all of the advantages of the well recognized high-performance x16 architecture with standardized features including 32kB of addressable program memory size, 1536bytes of data memory size, 25 general-purpose I/O pins, two comparators and 10-channel 10-bit analog-to-digital (A/D) converter. This device operates at a maximum frequency of 64MHz wide operating voltage of 1.8 to 3.6V .

3.2: RFID Reader:

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically-stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves.The working range of this RFID reader is upto 3 to 300m. The industry has worked diligently to standardize three main RF bands – low frequency, highfrequency, and ultra-high frequency. Most countries have assigned the 125 or 134 kHz areas of thespectrum for low-frequency RFID systems, and 13.56 MHz is generally used around the world for high-frequency RFID systems.

3.3 : Ultrasonic sensor:

An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay backinformation about an object's proximity. High-frequency sound waves reflect from boundaries to produce distinct echo patterns. A sound wave of a frequency greater than 20,000 Hz, typically above the range of human hearing. A transducer converts one form of energy to another. Senix ultrasonic sensors use combination ultrasonic transducers. These transducers produce and also detect ultrasonic signals.

3.4 : Bluetooth Module:

HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband.

3.5 : Servo motors:

Servo motor works on PWM (Pulse width modulation) principle, means its angle of rotation is controlled by the duration of applied pulse to its Control PIN. Basicallyservo motor is made up of DC motor which is controlled by a variable resistor and some gears.

IV. Architectural Model

The explanation of architecture module is as follows :

- In this system we are using microcontroller PIC18F25k20,By using bluetooth module input is given to the microcontroller.Here we are using two sensor one is ultrasonic to measure the distance and RFID sensor to read the card.
- The working range of RFID sensor is upto 3 to 300 feet.Genrally the frequncy of RFID sensor 13.56 MHZ.
- By using bluetooth module device the normal laguage will be converted into braille lagauage which will in the form of output on servo motor.Also ultrasonuc sensor detect the obstacle as well as there is also buzzer which will buzz if obstacle is nearer to the person.
- The output is in the form of six servo motor which will be show six dots for braille laguage.
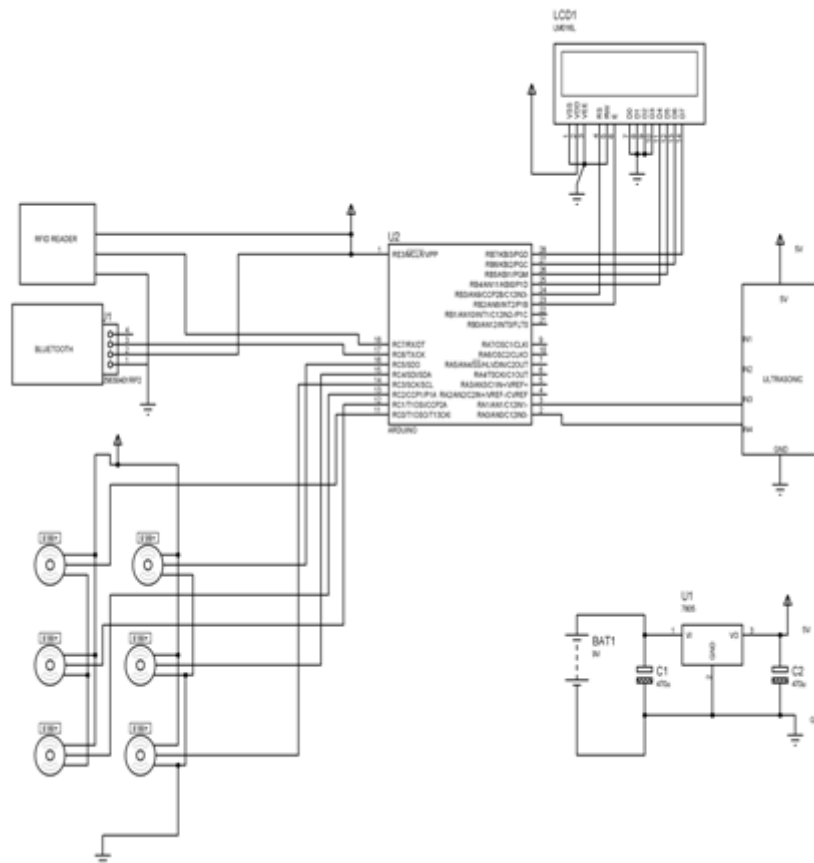- According to the given input this six servomotors will be raised up for the given alphabates or words.

Fig. 2. Circuit Diagram

Acknowledgment

V. Conclusion

A practical model of "Blind asistance system using refreshable display" has been attempted to assist the blind persons in our society,so that they also get the same opportunities like normal people.Blind assistance system allows to do every task as common people can do such as reading in braille laguage,reading documents,walking. This device can detect the obstacle and also calculate the distance of obstacle,thus blind person can easily travel independently anywhere. Since this device is portable and economical as compared to other devices it is very beneficial for the blind person. Also,as there is no need of any paper like in the braille printer or braille embosser it is ecofreindly as well as socially oriented model.

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