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A NOVEL APPROACH FOR A PORTABLE WIRELESS AUTOMATIC CALLING BELL FOR DEAF AND DUMB PEOPLE

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ABSTRACT

This present research paper proposes every problem human race has ever faced, technology has given its answer. Technology has now evolved in each and every aspect of human world, from electric cars to smart washing machine and what not. Our motivation for this research is to assist deaf and dumb persons in effectively responding to non-speech critical noises so that they can live a normal life. This project a user module is designed which will notify the user whenever the doorbell is do not want to pressed. The notification will be send through a wireless module which covers a good amount of range. One module will be hooked at the doorbell while other will be connected to the user module (a wearable device) with some vibrating motor for the indication purpose. The LCD screen will display the text for notification purpose. These modules are controlled by Arduino control Unit. Without knocking on the door or using the door bell, the message is instantly send to the deaf and dumb people automatically. We've connected some vibrators to their bodies in the shape of wrist band. So the LCD sensor analyses the person standing outside the door. As a result, the wireless RF frequency indicates vibration. As a result, he can feel the presence of the person at the door.

Keywords: RF frequency Transmitter, RF frequency Receiver, LCD sensor.

1. INTRODUCTION

According to World Health Organization figures, over 300 million people are deaf, 1 million are dumb, and many more suffer from severe physical disabilities. With the advancements in science and technology, human life and comfort have reached new heights in a short period of time. Various advanced technologies have arisen in recent decades that have made our lives so much easier and more pleasant that we no longer need to move our bodies to complete tasks. However, we have always placed a premium on the average man, and we have neglected a segment of our society known as the Physically Disabled, who are often denied access to scientific and technological developments. This is because science has not provided them with the level of comfort that they require to feel like they are a member of this evolved civilization and that they, too, have the right to walk alongside the greatest. Communication, which is a vital component of human life, is extremely difficult for Deaf or Dumb people.

This study will focus on this fact and attempt to establish a new wireless calling bell system that is specifically built for the Deaf and can assist him in communicating easily with the outside world with other normal people or people of their own kind.

The major goal of this study is to close a communication gap by developing basic technology that allows a deaf person to sense the presence of someone at the door.

We have shown a prototype that will assist a deaf person in recognising the presence of a person at the door. [2] discussed about an eye blinking sensor. Nowadays heart attack patients are increasing day by day."Though it is tough to save the heart attack patients, we can increase the statistics of saving the life of patients & the life of others whom they are responsible for. The main design of this project is to track the heart attack of patients who are suffering from any attacks during driving and send them a medical need & thereby to stop the vehicle to ensure that the persons along them are safe from accident.

The prototype is based on the concept of Wearable Technology, which requires the user to wear the device on their wrist as a wrist band, and the sensor will scan and deliver vibrations to anyone standing outside the door.The vibration might be felt on his or her hand.

2. PROPOSED METHOD

In this paper we have designed a automatic calling bell for deaf and dumb. Generally we have the normal calling bell but we never thought of how to call a physically handicapped (a deaf person). Here we have made a wireless automatic calling bell which is very useful for a deaf person. When somebody stands outer the door the calling bell is automatically on, the calling bell then sends the signal to the receiver unit which in turn activates the vibrator so a deaf can feel the vibration and know that somebody is calling/knocking at the door. It uses RF (Radio frequency) technology (434 MHz).

The micro controller now displays the associated message on the LCD screen. It also sounds a buzzer along with message as soon as it receives motion signal from the sensor. The patient motion recorder device consists of an RF transmitter in order to transfer the data signal. An RF receiver on the other side receives the data and then decodes it before passing it to the micro controller for processing the input and responding to it. The situation would have been different if the person inside would have some portable/wearable device on which the notification would have been popped up whenever the doorbell would have been pressed, thus helping deaf people reach the door whenever the door is knocked. Here the transmitter contains an Arduino module connected with a doorbell along with wireless module, while the receiver's module contains Arduino, LCD display, vibrating motor/flashing LED and wireless module.

Here the process is divided into two segments. The region above "Medium/Channel" is transmitter's region and the region below it is receiver's region. One Arduino unit will be attached at the doorbell. The Arduino connected over there will continuously monitor whether the doorbell is pressed or not, if Yes, then send the signal "open the doorbell" via wireless module.

3. WORKING PRINCIPLE

In this project we have designed a calling bell for deaf and dumb. Generally we have the normal calling bell but we never thought of how to call a physically handicapped (a deaf person). Here we have made a wireless calling bell which is very useful for a deaf person. When somebody stands outside the door the bell is automatically on, the calling bell then sends the signal to the receiver unit which in turn activates the vibrator so a deaf can feel the vibration and know that somebody is calling/ knocking at the door. It uses RF (Radio frequency) technology (434 MHz). When someone stands outside the door the bell is automatically on, the signal from the calling bell is send to the encoder IC which is then fed to the Transmitter Module for the wireless transmission through Transmitting antenna at the same time the signal is also send to the relay driver which operates the Calling Bell. The Receiving antenna receives the signal from the Transmitting antenna which is received by the receiver module then the signal is fed to the Decoder for decoding so that it can effectively operate the Vibrator attached in the wrist band unit. The Calling Bell switch is connected to a 5V DC. HT12E is the Encoder IC capable of encoding information which consists of N address bits and 12- N data bits. Each address or data input can be set to either 1 or 0.

The programmed addresses or data are transmitted together with the header bits via an infrared transmission medium or RF upon receipt of a trigger signal.After the data being received by the receiving antenna the data is then given to the decoder IC HT12D through the Receiver Module.Then the decoded data is fed to the Vibrator for vibration and the same data is also fed to the led for visualization. Hence the deaf person can sense the vibration as well as he can also visualize the effect by the LED. We propose a system which mainly consists of a transmitter and a receiver section. In the transmitter section (at the patient side), a four axis accelerometer will be placed on the any movable part of the patient. This accelerometer is capable of measuring the static acceleration due to gravity and thus finding the angle at which the device is tilted with respect to the earth. Whenever patient needs any help he tilts the accelerometer in different directions. This acts as an input to the accelerometer while output of it is in volts that is connected to the controller board which acts as the processing unit. The output of the accelerometer depends on the tilt angles and is read by the controller. The controller maps the input voltages between 0 and 5 volts into integer values between 0 and 1023 as analog data from the range of 0-1023. The switch S1 is the calling bell switch which is connected to the 5v DC supply. When anyone presses the switch, the 5v DC is fed to the 10th pin i.e. AD8 of HT12E all other pins (AD9-AD11) are grounded as they are of no need. When 5V is fed LED1 glows and at the same time it also triggers the relay so the calling bell also beeps. The data being fed to the encoder encodes the data and the encoded data is given out through the 17th pin. DOUT pin of HT12E. The encoded data is given to the Transmitter Module (434 MHz) which modulates (ASK Modulation) the data and send the same through the transmitting antenna. The receiving antenna receives the modulated signal then it fed the signal to the RX Module which is then fed to the HT12D for decoding the signal back to 4bit. As there no addresses to be received so all the pins (A0-A7) are grounded. The encoded data is reflected in the D0 pin which triggers the BC547 an as a result the vibrator vibrates. A capacitor is connected across the vibrator because when the calling bell is pressed it will keep on vibrating for some time to help the deaf respond respectively.

4. BLOCK DIAGRAM

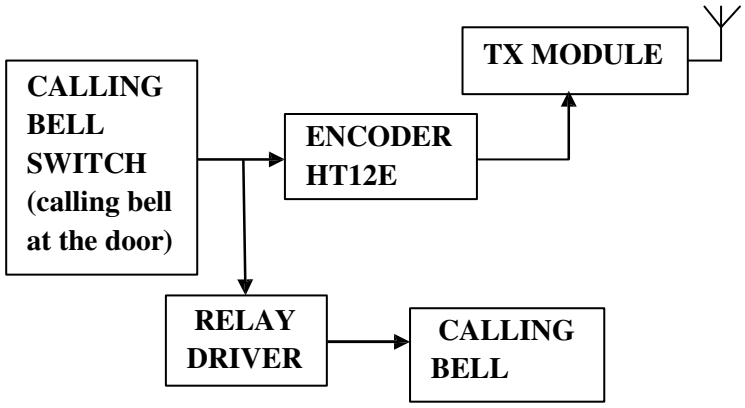


Fig.4.1 Transmitter Section

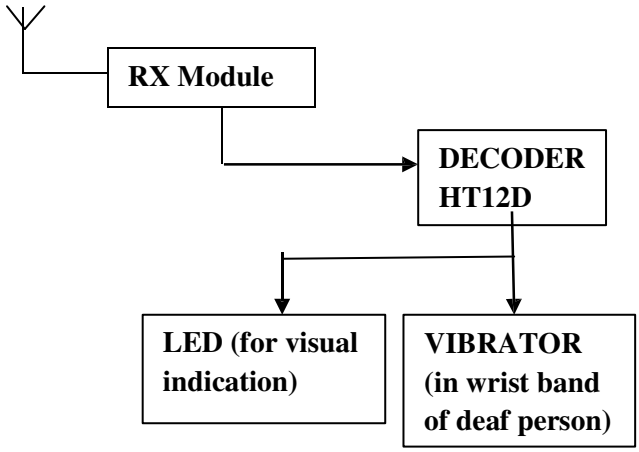


Fig.4.2 Receiver Section

5. CIRCUIT DIAGRAM

The Step down 12V AC is fed to the bridge rectifier. The rectifier converts AC to DC and it gives the DC voltage to the 2Voltage Regulators (7812 and 7805). IC1-7812 is used to provide the power supply to the relay (here 12V SPDT relay is used). IC2-7805 is used to provide the power supply to the rest of the components. LED1 is used for the indication purpose that the system is powered ON.

A. Transmitter Section Circuit

The switch S1 is the calling bell switch which is connected to the 5v DC supply.

[4] discussed about Nanorobots Control Activation For Stenosed Coronary Occlusion, this paper presents the study of nanorobots control activation for stenosed coronary occlusion, with the practical use of chemical and thermal gradients for biomedical problems. The recent developments on nanotechnology new materials allied with electronics device miniaturization may enable nanorobots for the next few years. [6] emphasized that people who are visually impaired have a hard time navigating their surroundings, recognizing objects, and avoiding hazards on their own since they do not know what is going on in their immediate surroundings. We have devised a new method of delivering assistance to people who are blind in their quest to improve their vision.

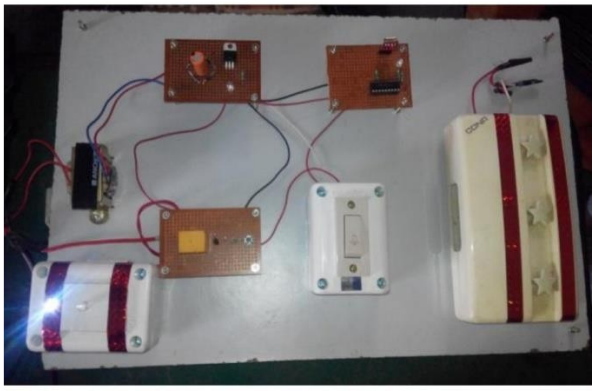
B. Receiver Section Circuit

The receiving antenna receives the modulated signal then it fed the signal to the RX Module which is then fed to the HT12D for decoding the signal back to 4bit.

As there is no address to be received so all the pins (A0-A7) are grounded. The encoded data is reflected in the D0 pin which triggers the BC547 an as a result the vibrator vibrates. A capacitor is connected across the vibrator because when the calling bell is pressed it will keep on vibrating for some time to help the deaf respond effectively.

Here 7805 IC is used for the vibrator in order to provide the constant 5v DC to the vibrator. We can also use a rechargeable battery.

6. EXPERIMENTAL SETUP



We have tested the prototype and also tested it with a deaf person. In future we shall expand the prototype for the 2 way communication.

7. CONCLUSION

As it can be seen in the figure that when the human being stands outside the door the calling bell is automatically on . Then immediately the message was displayed on the screen with motor vibrating and flashing led. The doorbell notification for deaf people is a practical solution has been experimentally proven to work satisfactorily. The handshaking between Arduino with various sensors has been done successfully. Thus the wearable device for deaf people was successfully designed, implemented and tested.

8. REFERENCES

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