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Cars for Deaf People

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Abstract

Since the invention of cars no effort has been made to modify a car according to the deaf people. In some countries the deaf people are not allowed to drive vehicles and they are not issued with driving licence and in many other countries the deaf people don't drive cars in fear of accident. This paper is to bring forward an idea of a car which can be driven by deaf people. The car will consist of sensors which will convert sound vibrations created by horns of cars around and the frequency will be converted to light energy that will result in glowing of Light Emitting Diode (LED). Till date no comprehensive study has been made on this issue. The sensors are applied on the current designed cars by which the deaf driver will get a detailed idea about the backside of car without seeing it. The sound intensity will differ with variation in distance, it will be high for nearer and low for a far away vehicle. The sensors will be placed at the backside of the car so that it can absorb sound with more accuracy. The sensor will absorb the sound vibrations of higher sound intensity and machine will differentiate the sound energy as per intensity by software coding and will emit different LED lights as per the intensity. The cost of sensor is very less compared to the car. This car will be useful not only for the deaf population but for all people in the world. The sensors which are used are available anywhere so there will no problem in maintenance. By providing this feature, deaf population will be able to drive cars in nearly the same price as the manufacturing cost (for sake of humanity)

Keywords: Deaf People, Car, Transformation of Energy, Sensor, LED.

1. Introduction

In the current scenario, world says that deaf people cannot drive cars and in about 26 countries the deaf population will not be issued the driving licence. Therefore, deaf population face a major problem in transportation and they have to be dependent on others. This is the daily challenge for deaf population to travel out of their home that will affect on their everyday life. In this study an attempt has been made to tackle these issues through introducing a modification in car for deaf population. The change consists of sensors which absorb sound vibration from horns of cars and the vibrations will transform into electrical energy which afterward tends to glow LED signal by which the deaf driver gets a proper detail of vehicle around car. The reason of introduction of such a car is that it will be helpful to not only deaf people but also normal people that they don't have to concentrate at rear side of car at the same time as people watching in front. The manufacturing cost of car does not change much as compared to the current cars. The sensors will be attached to the rear side of car that will give more accuracy about sound vibration coming from random cars.

2. Car for Deaf People

2.1 Microphone

Here the dynamic microphone is used as a transducer which will absorb the sound vibration and then these vibrations produce electrical energy. The microphone with the sensitivity of 0.50mV/Pa . The reason behind selecting this type of microphones is frequently useful in all conditions.

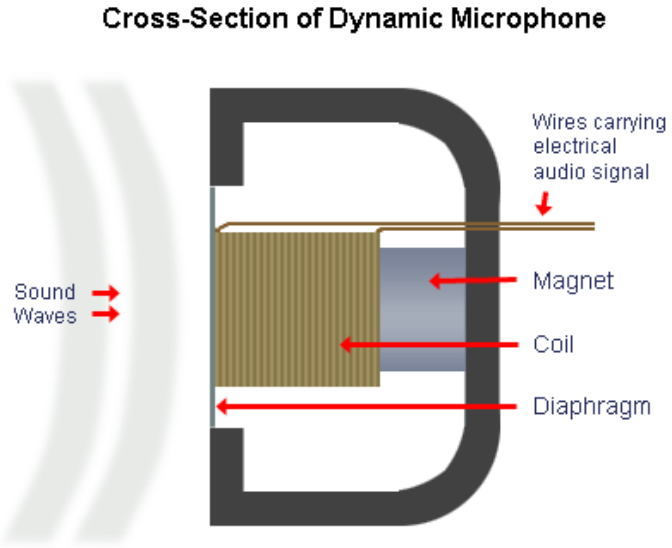

Fig. 1: Conversion of sound vibration to electric energy using dynamic microphone.

2.2 Amplifier

Amplifier is an electronic device for increasing the amplitude of electrical signals. Here the amplifier is used to amplify electrical signal to electrical energy. Here the input voltage passed through the amplifier will be in range of 0.10 to 0.25 volt and it will give the output in the range of 0.5volts to 2volts which is sufficient range of voltages to glow LED. The amplifier is placed near backseat or under the backseat of car.

2.3 Transmitter

The current from amplifier passes through transmitter to convert electrical energy into messages or electrical signals. The transmitter produces electrical signal which will be connected to LED which will glow as per the signal strength. The transmitter is fixed in between the backseat and driver seat in the car most probably near front seat and due this modification the comfort of car won't get affected

2.4 LED (Light Emitting Diode)

The electrical signal produced by the transmitter is passed to LED which will glow as per the strength of the signal. Three LED will be as per green, yellow and red as per the intensity of signal strength. The LED's are placed next to the speedometer. The voltage needed to glow LED is minimum 0.5 volts. Three different types LED are chosen in the basis of voltage in ascending order. The range selected between 0.5 volts to the 2 volts as per condition.

Working

A microphone is selected in the range of 50db to 130db absorption capacity of sound intensity. The reason of choosing this range is the car horn has the intensity about 90db to 120db.this range can be divided in three different parts as low range , moderate range and high range of sound intensity. As per the intensity of sound the production of electricity will takes pace. That current will be in the range of 0.15mV to 0.3mV. Then the current is passed through the amplifier which enhances the electric signal and makes it in the range of 0.5V to 2.0V. Then the current passed through the transmitter and it transmits electric signal to LED's. The LED's are differentiated as per the strength of current produced. For the low intensity of current that is for (0.5 to 1.0) V the LED will be chosen which will glow below 1V current. For the moderate range that means the range of (1.0 to 1.5) V the LED will be chosen which should glow by passage of current beyond 1V and below 1.5V. The third LED will be chosen as the LED should glow beyond 1.5 V.

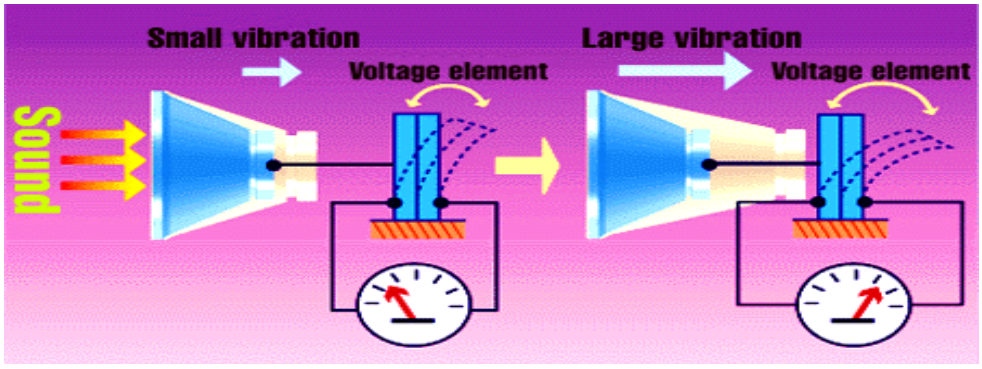

Fig. 2: production of electricity varies with intensity of sound.

To differentiate the LED glowing software is introduced in transmitter and that will be simultaneously working with transmitter. Software also gives the loop for avoiding its own horn.

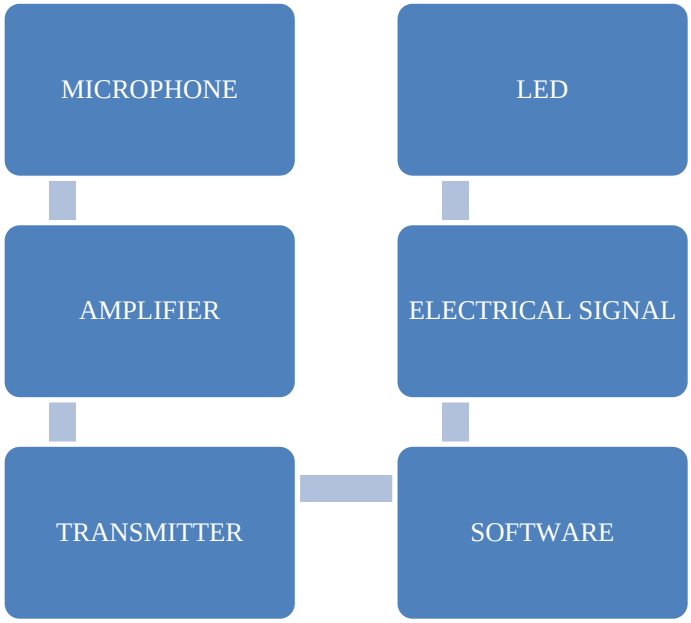

Fig. 3: Block diagram of the system process.

2.5 Calculation

Assume the intensity of sound of horn is 100db.

v=The velocity of sound=340m/s

p=pressure of sound in Pascals.

I=pv

p=I/v = 100/340 = 0.3Pascals.

Sensitivity of microphone = 0.50mV/pa (assume) (differs per microphone.)

now product of sensitivity and pressure gives the voltage rate.

voltage per sec=sensitivity * pressure
= 0.3*0.5= 0.15 mV/s

This voltage passes through the amplifier and enhances and becomes in the range of 0.5 to 2.0 volt .
The voltage is enough to glow LED.

2.6 Expected result

The range of microphone will be 50 db to 130 db so that it will absorb minimum as well as maximum intensity of sound of horn of car.

The software differentiates the signal send by transmitter as the basis of intensity of sound.

As per the different loops three types of LED glows as per their respective range of current passage.

The rough estimation of distance can be made by glowing of LED

2.7Cost

The cost of this instrument is not much and will not affect anything in cars infrastructure as well as in efficiency also. The approximated cost also will be much less in comparison with a car cost.

3. Conclusions

3.1 The LED glows b

y transmitter signals which give driver the approximate distance of car coming from backside. Because of that the deaf drivers can drive car and also can get their driving licence issued. The countries who do not allow deaf population to drive a car may change their law and this will be a big change in low cost. The sensors are very easily available in market and there is no much complex design to understand so that it's easy to maintain. As well as the sensors and all instruments don't need much space to make work happen. The instruments and sensors are safe enough to place in a car. These sensors are applicable to all cars. All the sensors will work on battery of a normal car so that any car can be manufactured with this modification. These modifications are done theoretically no practical approach has been made.

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