SAFETY REDEFINED

K.Sudha[1], Ajay Kumar[2], Ritika Jaiswal[3], Shakshi Bhardwaj[4], Abhishek Matlotia[5]

[1]Asst.Prof., Department of EEE, Bharati Vidyapeeth's College of Engineering, New Delhi.

[2,3,4,5]Students,Department of EEE, Bharati Vidyapeeth's College of Engineering, New Delhi.

ABSTRACT

The craze for motorbikes is remarkable in today's era and it is increasing day by day, especially in young generation. There is an increase in the rise of road mishaps as the use of two wheelers are increased to two fold. This paves the way for the accidents due to which serious injuries and death of a person occurs. Many times the accidents are due to the sheer negligence of road rules by the bikers. The idea behind the 'Safety redefined' is a measure to ensure safety of two-wheelers on the road. This is a safety helmet which safeguards the bikers on two-wheelers, in a boozed up condition. The safety helmet consists of a module which ensure that the biker is inebriated or not before wearing the helmet. The proposed system used microcontroller to control the interaction between the modules and RF transmitter and receiver to interact. An alcohol sensor is used to detect the level of alcohol the biker consumed.This system is modelled for the road safety to make Indian roads a much safer place for the riders. Also, it ensures that the drunken riders may not be able to start the ignition engine of the motorcycle, protecting both the riders and the walkers on the road.

Keywords:- Engine, safety, helmet, alcohol sensor.

1.INTRODUCTION

In today's era, the use of motorbikes has remarkably increased, especially in the young generation. The present market scenario provides motorbikes with affordable prices and substantial varieties. Day-by-day as the bikers are increasing the accident rate is also increasing at an alarming rate. Most of the accidental death occurs due to the most common negligence of not wearing the helmets and drunken driving. Considering all these factors the safety helmet aims at the security and the safety of the bikers against road accidents [1].The proposed system make sure that the bike will not start without wearing the helmet.

2. PROPOSED SYSTEM

To overcome the hindrances of the bikers, the proposed system provides a circuit design that can improve thesafety of the motorcyclists. This smart safety helmet is developed in such a way that it is cost effective and pragmatic to implement.
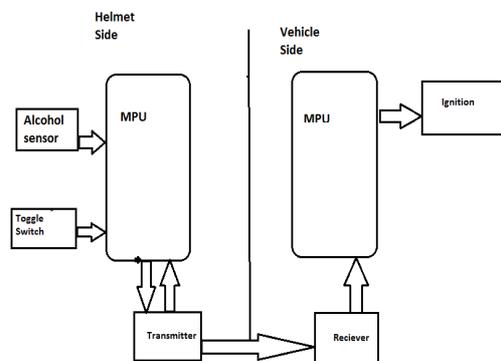
3. SYSTEM DEVELOPMENT

3.1. Block diagram

Fig.3.1: Block digram

3.2. Block diagramdescription
3.2.1. Helmet Side
This module consists of

[1] Toggle switch: This is used to scrutinize that whether a helmet is worn or not.

[2] Alcohol sensor: This detects the concentration level of alcohol of the rider. This is designed that the sensor is placed near the mouth of the rider.

[3] RF transmitter: This can transmit data up to 3KHZ from any microcontroller or standard Encode IC can be used.

The RF transmitter channels the data from microcontroller on the helmet side to a receiver on the vehicle side.

3.2.2. Vehicle Side
This module consists of

[1] RF receiver: This receives the data and communicates it to the microcontroller for the further processing.

[2] MPU: The ignition is controlled by the microcontroller depending on conditions such as wearing of helmets and alcohol concentration level.

The proposed system ensures safety of riders as well as people on the roads.

The system works in the following way:

1. When a user approaches a vehicle with the proposed system installed and tries to turn on the vehicle ignition, the vehicle module communicates with the helmet module to check if the helmet has been worn by the user.
2. The helmet module confirms if the sensor has been activated. If it is activated it starts the signal as helmet being worn and therefore communicate the signal to vehicle module.

On receiving the correct combination, the vehicle module, precedes the electrical system of the vehicle accordingly.
The whole working is shown in block diagram as explained in Figure.3.1.

4. HARDWARE REQUIREMENT
4.1. Transmitter-Receiver module:

This module consists of both transmitter and receiver. They both interact with each other using Radio frequency waves. The corresponding frequency range varies between 30 kHz and 300 GHz. In this RF system, the digital data are represented as variations in the amplitude of carrier waves. This transmission is better than IR because inthis system the signals through RF can travel longer distances.
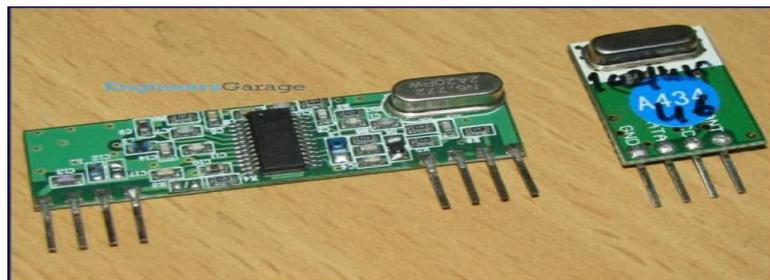

Fig.4.1.RF transmitter-receiver module

4.2. Arduino Nano:
This is a small complete and breadboard-friendly board based on the ATmega328.This is used to start and control the ignition of the engine by checking the status of the helmet and alcohol.

Fig.4.2. Arduino nano

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4.3. Toggle switch

It is a class of electrical switches which is manually operated. This switch gets off automatically when the helmet is worn off by the rider or alcohol is sensed by alcohol sensor.

Fig.4.3. Toggle switch

4.4. Alcohol sensor:

It is used to sense the concentration of alcohol in the air. So, if the person who is riding the bike has consumed alcohol, then ignition wouldn't start. The sensor used in our model is MQ-3.

Fig.4.4. MQ-3 Alcohol sensor

5. SOFTWARE REQUIREMENT

Embedded C:

It is the language in which program is written in Arduino nano.This software is used by the programmer to program the Arduino board and control the output of our system using inputs.

6. WORKING

Alcohol sensor (MQ-3gas detector), used in our model is suitable for the detection of alcohol from the breath of the person near to it. So, it should be placed just below the face defend and above the additional face protection. The sensor's surface is sensitive to the various concentrations of alcohol. It is used to detect the concentration of alcohol from rider's breath. According to government actions, illegal consumption of alcohol is 0.08mg/L, but for demonstration purpose, we can decrease the alcohol concentration up to 0.04mg/L. A threshold value of voltage is adjusted to find the accurate results. Therefore, it is placed in front of the mouthpiece of helmet to detect the content of alcohol in the breath of the biker. When the helmet is worn by the biker the push button is pressed and the helmet is detected by using ultrasonic sensors and transmitter-receiver module. If both of the criteria's are met in an appropriate manner, then the two control signals are taken from the helmet unit and sent to the vehicle control unit. The communications between both the units are done using ultrasonic sensors. In the absence of the helmet and under the influence of alcohol the ignition of the bike will be suspended and hence the bike will not start.

7. ADVANTAGES

1. The safety helmet can be used by four wheeler riders as well.
2. Great help to protect life in case of accidents

3. To avoid violating the traffic rules.

8.RESULT

This smart helmet which consists of alcohol sensor along with the transmitter- receiver module is thus used to sense the presence of alcohol in the breath of the rider. If the rider is not wearing helmet, then he won't be able to ride the bike. In THE PRESENCE of a helmet and absence of alcohol, the rider would be able to ride the bike. When a rider wears the helmet, push button gets on and helmet circuit gets connected with the vehicle circuit and thus, presence of a helmet would be sensed.Alcohol's presence would be tested using an alcohol sensor. Thus, using this simple circuitry, the rider would be much safer on roads.

9. CONCLUSION

The developed system is very effective for the safety of bikers. It makes mandatory for the user to wear helmet and follow the traffic rules. It is very compact, handy and easy to use. The proposed system is very economical and affordable.

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AUTHOR

K.SUDHA received her Bachelor's degree in Instrumentation and Control Engineering from University of Madras, India and Master's in Electronics and Control Engineering from Satyabhama University, India. Currently, she is a Ph.D. scholar at St. Peter's University, Chennai, India. She is working as an Asst.Prof. in the Department of Electrical and Electronics Engineering at Bharati Vidyapeeth's College of Engineering, New Delhi.Her professionalinterests includeprocess control,fault liberal control. Her current research interests are neuralnetworks, Adaptive control,and swarm intelligence concepts. She is a Life member of ISTE.

AJAY KUMAR, RITIKA JAISWAL,SHAKSHI BHARDWAJ and ABHISHEKMATLOTIA, students, Department of Electrical and Electronics Engineering at Bharati Vidyapeeth's College of Engineering, New Delhi.