Intelligent Protective Helmet

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Abstract: **Nowadays most of accidents happen due to drunken Conditions. Most of the countries are forcing the motor riders to wear a helmet, but rules are being violated by users. To overcome this situation a safety system has been embedded inside the "Intelligent Protective Helmet" where a circuit working reader will be installed inside the bike. When this reader will sense the RF signals from helmet transmit signal only if helmet is placed on head because of hidden switch which gets activated and helmet transmits the RF Signal and the signal detected by IR sensor from the earlobe region and an alcohol sensor will be transmitted to the vehicle control circuit. It will not turn on the vehicle. There will be micro switch mounted on helmet in all four directions. If accident occurs then GSM receiver inside the reader circuit will automatically transmit the co-ordinates of accident to the emergency control room, from where immediately ambulance can be dispatched to location of accident which can save life of victim.**

Keywords: **Accident, Drunken Driving, Helmet, Safety, Intelligent system, Alcohol Detection, GSM, GPS.**

I.   INTRODUCTION

By looking at present scenario in our country the thought of making this project came to our mind. In today's world accidents are increasing and in most of the cases accidents are due to two wheelers. According to one of the surveys in India, it was found that approx. 698 accidents occur due to bike crashes per year. The main reasons for such bike accident are no proper driving knowledge, fast riding of bike and Drink and Drive etc. Deaths are not only due to accidents but also due to lack treatment immediately. The other reason is that when the accident occurs there are no persons to give information to the ambulance and relatives of the victim. This situation occurs daily in many cases and thus to find the solution to this problem we have designed this project.

Considering three major factors for avoiding the accidents in such cases as I. Making helmet compulsory II. Avoiding drink and drive III. If a person meets with an accident no one takes responsibility to help him. Simply leaving or ignoring the person might cause death of that person. In such situation informing the ambulance and relatives through a message might help.

Bike accidents are more fatal then bus or car accidents. Nearly 600 people lost their lives in road accidents last year. 1/3rd of them could've been saved had they worn a helmet. Studies show that death due to accidents can be lesser by 30% to 40% if the rider wares the helmet. The risk of deaths due to accidents is 2.5 times more when a person doesn't wear a helmet than when he wears.

We have chosen GSM technology to give information about the accident by sending SMS and through GSM module which has SIM slot to place the SIM. We have also added GPS system to provide an exact location of the accident in co-ordination with GSM module. GPS data will provide. The latitude and longitude values using which the accident location can be traced. Another technology we have used is alcohol sensing and detecting technique. We have used MQ-3 gas sensor as alcohol sensor it checks the breath of the rider and detects the presence of alcohol. Once the presence of alcohol is detected, the sensor will not allow the bike to start. Thus this project will help in curbing the present accident scenario in our country.

II.   BLOCK DIAGRAM

Our focus is on avoidance of drunken driving. Hence this system will not turn on the vehicle, when the driver is in drunken condition. In addition to this, The system will send short message service to the friends or relatives when an accident occurs. It also gives theft detection. This system consists of two major parts, 1) Helmet section and 2) Vehicle section as shown.
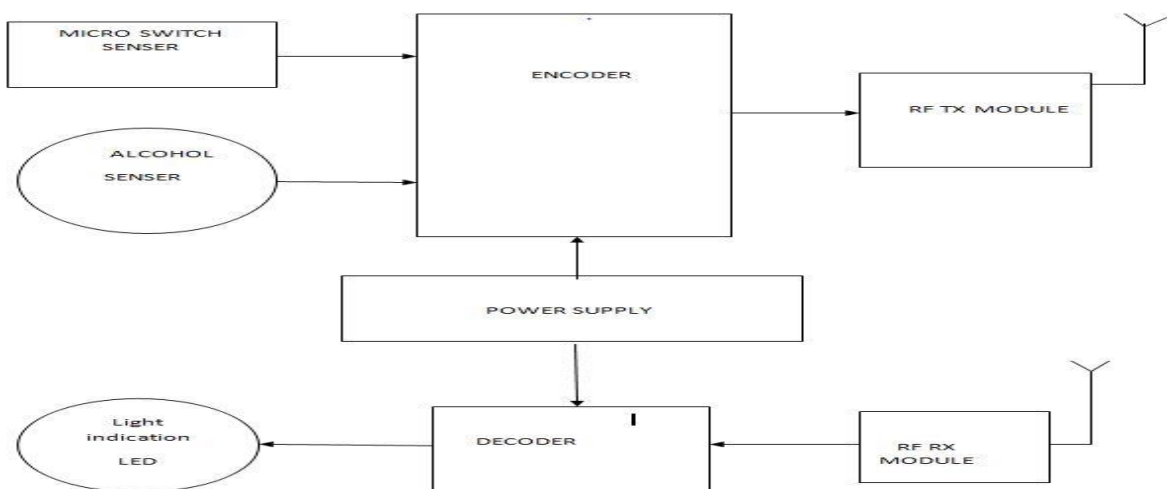

Fig.1 Helmet Section

This project is the design of an intelligent effective security system for a bike, in order to prevent accidents and other dismissals. Vehicle accidents due to the use of alcohol are increased nowadays and the wearing of the helmet reduces the chances of the accidents. In this project we combine these two aims in a single embedded system.

Given block diagram is of transmitter section. Transmitter section contains helmet switch, alcohol sensor, encoder, RF transmitter and antenna.

In Helmet Switch there is a small switch inside the controller connected to the total on power and total off brake. It gives positive contact and eliminates the resistor from the circuit. It is a very efficient way of handling power, even in the newer electronic controllers. The alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breath analyser. It has a high sensitivity and fast response time. Sensor provides an Analog resistive output based on alcohol concentration. The encoders are a series of CMOS LSIs for remote control system applications. They are capable of encoding information which consists of N address bits and 12_N data bits. Each ad-dress/data input can be set to one of the two logic states.
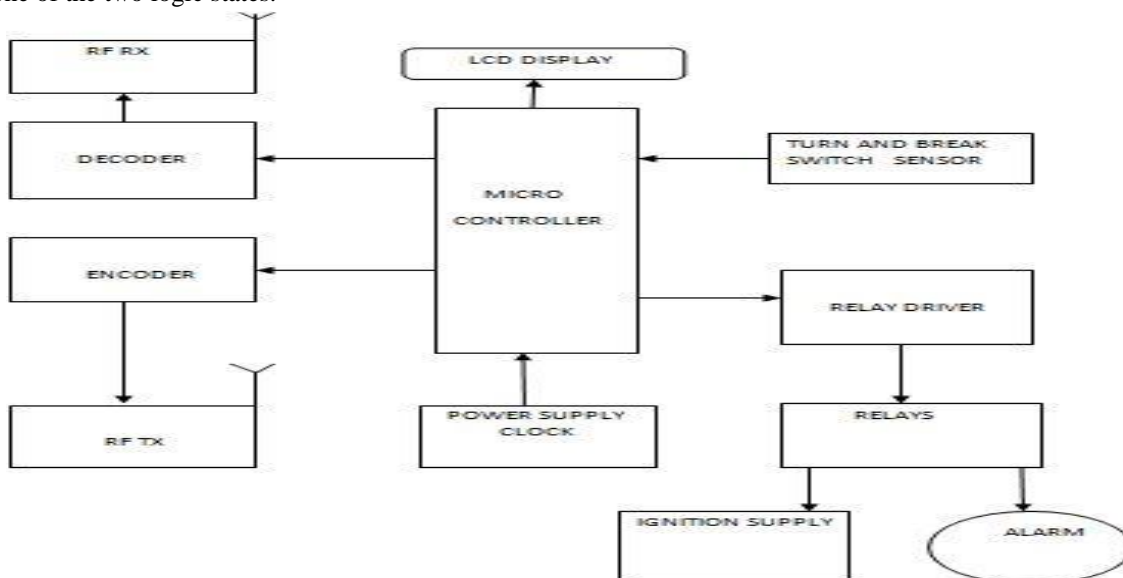

Fig.2 Vehicle Section

Vehicle section contains RF receiver, decoder, panic button, bumper switch, LCD display, microcontroller, RS232 communication, GSM modem and power supply.

The Radio Frequency receiver operates at 433.92MHz, and has 3uV sensitivity. The RWS-434 receiver operates at 4.5 to 5.5 volts-DC, and it has both linear and digital outputs. The 212 decoders are a series of CMOS LSIs for remote control system operation. For proper operation, a pair of encoder/decoder with the same number of ad-dresses and data format must be chosen. Serial addresses and data from a programmed 2 12 series of encoders that are transmitted by a carrier using an RF or an IR transmission medium are received by the decoders.

There are Tactile Bump Sensors which have good capability of collision detection, but the circuit itself also works fine for user buttons and switches as well.

Bump switches have many possible designs, mostly depending on the design and goals of the system itself. But the circuit remains the same. They usually implement a mechanical button to short the circuit, pulling the signal line high or low. Panic button is used to give signal to the GSM modem which sends a message to predefined number. It consists of a two regulating IC 7805 and a bridge rectified and it provides a regulated supply approximately 5V.Thus above explanation explains the working of 'Intelligent Protective Helmet'.

III. CONCLUSION

This project will ensure that the rider has worn the helmet compulsorily. If he doesn't wear the helmet then the bike will not start and also when the driver is in drunken condition the 'alcohol sensor' will not allow the bike to start. The 'display' which is set up on the bike will give us notifications whether the rider has worn helmet or not as well as rider is in drunken state or not. The 'GSM module and GPS' will help to provide location and co-ordinates of the place where accident has occurred to the control room and relatives. In this way the accident scenario in our country will reduce and safety will be provided to the rider.

The severities of those accidents are increased because of the absence of helmet or by the usage of alcoholic drinks. In our project we have a tendency to develop an electronic smart helmet system that efficiently checks the wearing of helmet and drunken driving. By implementing this system a safe 2 wheeler journey is possible which would decrease the head injuries throughout accidents caused from the absence of helmet and additionally reduce the accident rate due to drunken driving. We have a tendency to introduce advanced sensors techniques and radio frequency wireless communications are included in this project to make it a good one. Our system efficiently checks the wearing of helmet and drunken driving.

ACKNOWLEDGEMENT

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