Automatic Speed Control In Speed Limit Zone

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Abstract- *The aim of this project is to automatically control the speed of the vehicles at speed restricted areas such as school and hospital zones etc. This project is mainly developed to avoid accidents due to high speed vehicles and also to enable the public to cross the road in speed zones without any danger from high speed vehicles. Here RF communication method is used for controlling purpose. In order to implement this in public the RF receiver is to be installed in the vehicle and the Transmitter within these zones. These transmitters are programmed to send the coded signals continuously at regular interval. Whenever the vehicle enters inside these zones their receiver will receive this code and then the speed of the vehicle is controlled automatically with the help of the micro controller unit present inside the vehicle which activates the braking system.*

Keywords- Arduino UNO, Disc Brake, Radio Frequency Identification, Solenoid

I. INTRODUCTION

This project is mainly developed to avoid road accidents due to high speed vehicles and also to enable the public to cross the roads in speed limited zones without any danger from high speed vehicles. Usually, the drivers drive the vehicles at high speed without considering the public in speed limited areas which leads to fatal accidents. This project aims to bring road safety to the public.

In this project, an IR communication method is used to detect and control over speeding. To implement this system transmitter will be attached to the sign board and receiver will be installed in the vehicle which is to be controlled in the restricted speed zones. When a vehicle passes through this zone, a signal will be sent by the transmitter and it will be received by the receiver.

This project is performed on a motor which is connected to a circuit bridge and a microcontroller. The programming in the microcontroller will control the speed of the motor according to the speed zone by applying the brake.

The aim of the project is to control the speed of the vehicle, to avoid rash driving and to avoid any kind of collision between vehicles. The D.C. motor is indicating the speed of the vehicle and the disc brake is used in the braking system to control the violated speed.

RF transmitter is in the speed zone areas and receiver is placed in the vehicle. Then it transfers the information to the controller. The current speed will be monitored by a separate module or by the use of IR sensor that also sends information to controller. The controller compares both the speeds and if the driver does not decrease the speed, the braking system gets activated and reduces the speed to the restricted speed in that zone

II. AREA OF RESEARCH

[1] Gummarekula Sattibabuet (2014) proposed a system that describes the advancement in the processor technology and microcontrollers has opened a new system designed to prevent the accidents caused due to negligence of drivers in seeing traffic signals alongside the road and other anomalies on the roads. By means RF technology, the drivers are intimated about the zones and to automatically maintain the speed. The main objective is to design an Electronic Display controller, meant for vehicle's speed control and monitors the zones, which runs on an embedded system and can be custom designed to fit into a vehicle's dashboard. This system, if adopted by some state, it can effectively reduce the number of road accidents caused by speeding vehicles or by driver's negligence towards traffic signals.

[2] R.Prajit proposed an idea which uses photoelectric sensor, electrical power source and micro-controller for controlling the vehicle speed. The arrangement of the components used in this system. By using this simple system we can control automatically the speed of the vehicle. The vehicle will move with designated speed (low speed) of the control system even though the driver wants to drive the vehicle with high velocities.

III. METHODOLOGY

Flow Chart of the working process:

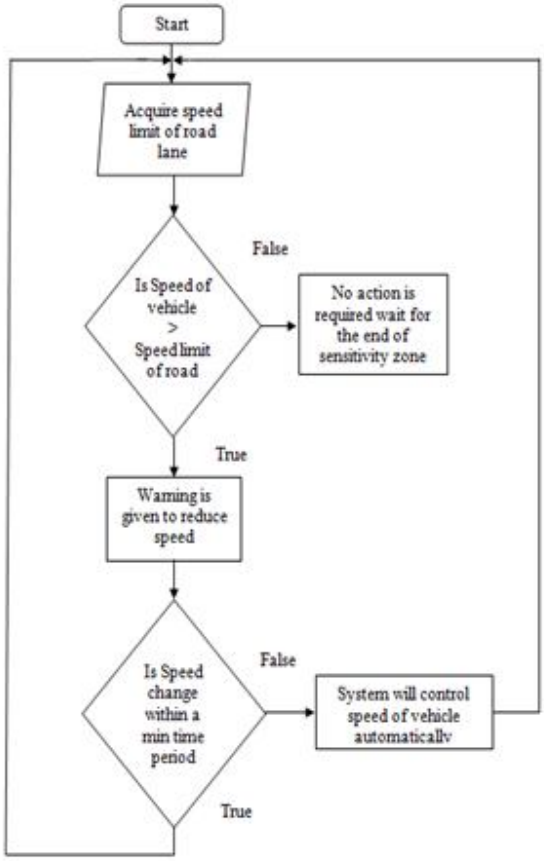

Fig. 1

IV. LAYOUT OF EXPERIMENT

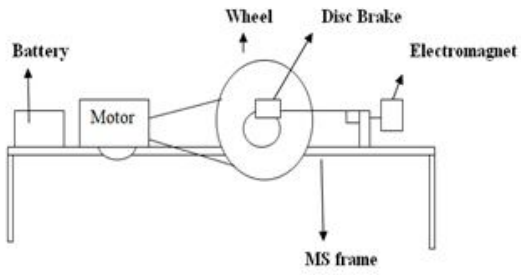

Fig. 2

V. WORKING

The wheel rim is rotated by the chain drive mechanism which is connected to the DC motor, powered by a 12V Lithium ion battery. The electrical energy from the battery is converted into mechanical energy by the motor and is transmitted to the wheel.

Firstly, IR sensor is used to monitor the speed and the speed is displayed on the LCD panel. If the speed is within the speed mentioned on the speed limit zone, then no action will be taken by the ECU. But if the speed is found to be more than the mentioned speed, then the RFID comes into picture. The RFID gives command to the relay which then pulls the brake lever using an AC solenoid. The brake lever exerts pressure on the brake caliper which reduces the speed of the wheel due to the friction between the brake pads and the disc brake.

The RF tag can be placed on an existing sign board to transmit the information provided by signals placed on the road to adapt the vehicle's speed. Once the information is received from the RF tags the vehicle's Electronic Display Controller automatically warns the driver to reduce the speed according to the sign board. It waits for few seconds for the driver's response to the information received; otherwise vehicle's ECU automatically reduces the speed.

The non-contact or contact-less optical tachometers usually use laser or Infrared beam to monitor the rotation of any body. This is done by calculating time taken for one rotation.

Fig. 3

VI. ADVANTAGES

1. Accidents are avoided in the speed restricted areas such as school and hospital zones.
2. It also ensures safe transportation of vehicles.
3. Restricted areas are controlled automatically rather than manually.
4. Ease of checking process at highways and check points.
5. The proposed on-board architecture is portable and easily adaptable to any commercial car with minimal modifications.

VII. LIMITATIONS

1. This project can only be implemented currently on gearless and automatic vehicles.
2. The Range of the RFID needs to be increased

3. The vibration caused by the braking system needs to be reduced

VIII. CONCLUSIONS

In this paper, a new design to control the speed of automobiles has been developed. With the successful implementation of the automatic breaking system, the road traffic violation due to over speeding can be reduced and the accident rate can be controlled.

The speed of the vehicle on the road can be controlled which can help to decrease one of the major causes of fatalities. Since active RFID technology permits to detect the presence and identity of the vehicles reliably and sufficiently in advance, so corrective actions on the vehicle's behavior can be taken. The vehicle's speed is successfully controlled as a result of the detection of the signals, increasing the driver's safety.

REFERENCES

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