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Road Spike System Used For Different Application

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ABSTRACT

A Road spike system, the road spike system used for various application like consoling traffic on road with help of vehicle density sensor also used in BRT for avoiding the entering non permitted vehicles used for security in industries and in one way road .In that the spike which can be fixed on shaft who receive power from DC stepper motor .A motor which control by microcontroller and microcontroller r commanded by sensor. The system with spring operated used for one way road. This system ensures to obey traffic rules properly and reduces accident.

Keywords: Road spike system, BRT system, Traffic Controlling, one way road.

I INTRODUCTION

A Road spike system is used for various applications like traffic controlling according to vehicle density present on road, for BRT to avoiding non permitted vehicle entering, on one way road, security system. According to WHO the traffic accident is about 1.25 million annually .This system helps to reducing the accident and people obey the traffic rule properly.

In modern world, vehicle user increases largely. As the vehicle count increases the traffic also gets rises. By this effect, we can see a lot of road accidents. To rescue the victims, several problems have to be faced by the ambulance because of traffic problems. The main objective of this system is to stop the vehicle at signal and also restrict the vehicle which is entering in to the BRT road. This system can be used in the retractable spikes before the zebra crossing that comes out when the traffic signal is red and goes off when the traffic signal turns to green. This is an innovative idea mainly to avoid congestion and rescue the ambulance. In the usual traffic system the peoples were not following the traffic rules properly. To overcome this problem we were using this system. The main aim of this system is to obey the traffic rules properly if not there will be an opening of spikes. It will make all the people to obey the traffic rules correctly.

In cities, there is separate transportation road for BRT Bus for time consumption & controlling the traffic. But some time other vehicles also use the BRT road. So to avoid them we use some mechanical instrument which

can restrict the. The major objective of this system is to provide a safety secured system for our society this .On using the spikes module, the spikes system operates using DC motor. In case ambulance reaches signal the spikes will gets OFF and other signals gets ON with an emergency alert. This system provides a secured system for our society. No other way of breaking the traffic rule.

The system will analyze the traffic at four way junction and adjust green light intervals for variable densities of traffic. E.g. If at a traffic signal number of vehicles coming from north & south is too much and that of coming from the east & west is very little, the green light interval for north & southbound traffic will be longer and that for east & westbound traffic will be shorter. The system will be comprised of sensors and a microcontroller. Sensors will be fitted at appropriate positions at the four way junction. The sensors will measure the density and will communicate the same to a microcontroller. Microcontroller will use these to adjust timing intervals of green lights.

We also would implement a feature to ensure integrity of traffic rules at the signal. A spike strip will be introduced at the front of each lane before the zebra crossing. The spike strip will be engaged once the signal goes red. Once the strip is engaged, if any, vehicle tries to cross the strip; the vehicle tire would get punctured. Once the light goes green the spike strips will be disengaged and vehicles could move freely.

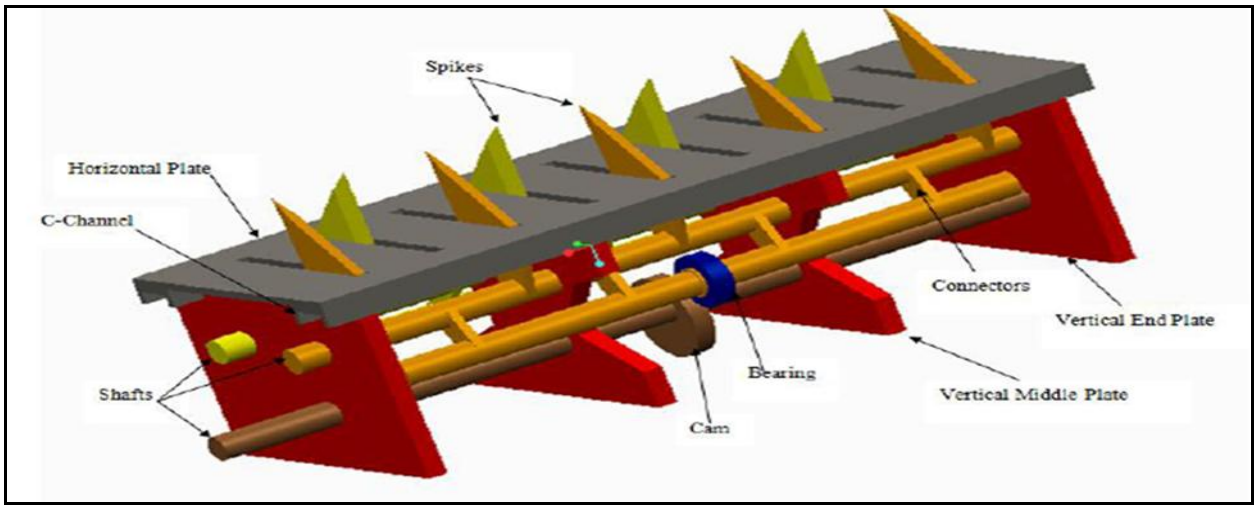

Fig.1.1 Road spike mechanism

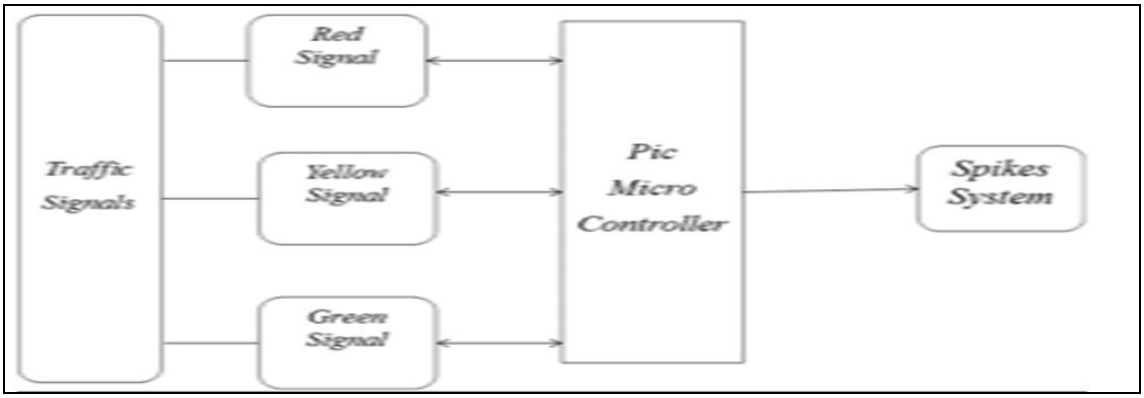

Fig.1.2 Block diagram of spike system

II LITERATURE REVIEW

1. K.Vishnusaravanabharathi: From this paper he said that the in the usual traffic system the peoples were not following the traffic rules properly. To overcome this problem we were using this system. The main aim of this project is to obey the traffic rules properly if not there will be an opening of spikes. It will make all the people to obey the traffic rules correctly. The major objective of our project is to provide a safety secured system for our society. This project is used to reduce the major accidents in traffic areas and to control the traffic systematically. In addition it also reduces the work of traffic police mans.

2. Fred Wegman: From this paper he Estimates that according to World Health Organization suggest that, on a yearly basis, road crashes kill 1.25 million people—nearly 3400 road fatalities per day—and injure up to 50 million. Traffic injuries are not equally spread over the world, however; some countries are hit harder than others, and the chance of being killed in a road crash depends on where one lives. Almost 90% of all traffic casualties occur in low- and middle-income countries (LMIC). Globally, the number of fatalities per 100,000 populations (mortality rate) ranges from less than 3 to almost 40.

3. Sanket Bhansali: From this paper he said that Industrialization and modernization has led to advancements in the field of automobiles. This has eventually led to increase in production rates of vehicles for satisfying the demands for the customers. The ever increasing production rates are thereby contributing to large extent for traffic problems all over world. This project aims to serve as a solution to traffic problems faced in urban cities. For this "Road Spike System" has been developed which probably helps to control the traffic. The system consists of knife edge elements arranged in series. It punctures the tires if vehicle tries to cross the traffic signal.

4. Sanjeev Udenia1: From this paper he said that Guardian Traffic Systems road blockers, traffic spikes, access controls and CCTV are used to control access to or from airport parking and ground transportation, car rental agencies, car parks, parking garages and airport freight delivery. The Guardian product line is the most extensive, well-engineered and best built product for effective and economical controlled access. Guardian Traffic Systems' tire spike units are available in either surface mount or in-ground applications. Guardian Traffic

access controls manage who can go where and when in designated areas. Access Control means management can control who has access to secured areas and at what time, while recording and storing the information.

5. Ashwini Basavaraju: From this paper he said that to solve traffic congestion which is a severe problem in many modern cities all over the world. To solve this problem, we have a framework for a dynamic and automatic traffic light control system. Generally, each traffic light on an intersection is assigned a constant green signal time. It is possible to propose a dynamic time-based coordination schemes where the green signal time of the traffic lights is assigned based on the present conditions of the traffic. In this study, we adapt the approach to take data/input/image from object/ subject/vehicle and to process the input data by Computer and Microcontroller and finally display it on the traffic light signal to control the Closed Loop System.

III OBJECTIVES

1. Improve public transport facilities: As the system which operated vehicle density due to this chance of traffic jam is reduces and public transport facilities improve.

2.To provide the safety security system to our society: In our society there are no. of accident happens due to breaking traffic signal this difficulty can reduces by operating this system.

3. Saving the manpower at a signal: There are lots of manpower required to manage the traffic issues by uses of this system less manpower are uses.

4. Reducing the pollution and saving fuel: As we no lots of people are not off the car even signal off so increase in pollution and wastage of fuel. Due to implement of this system as vehicle density sensor is uses the signal on which has maximum vehicle.

IV METHODOLOGY

Fig.3.1 Experimental setup

The given fig .shown experimental setup which consist various element like spike system, microcontroller, stepper motor .As shown in fig1.2 if red signal then microprocessor command to the stepper motor which rotate at specified angle then open the spike .If green and yellow signal is on then microprocessor command to the stepper motor and it will come back to the original position.

4.1 Details of required setup

SPIKE: It mounted on shaft for quick reaction it provided with spring .it will operated by motor according o input motion provided t it. Spikes are made from high graded steel.

Fig 3.3 spike

Microcontroller: A microcontroller is a small computer on a single integrated circuit. In modern terminology, it is similar to, but less sophisticated than, a system on a chip; a may include a microcontroller as one of its components.

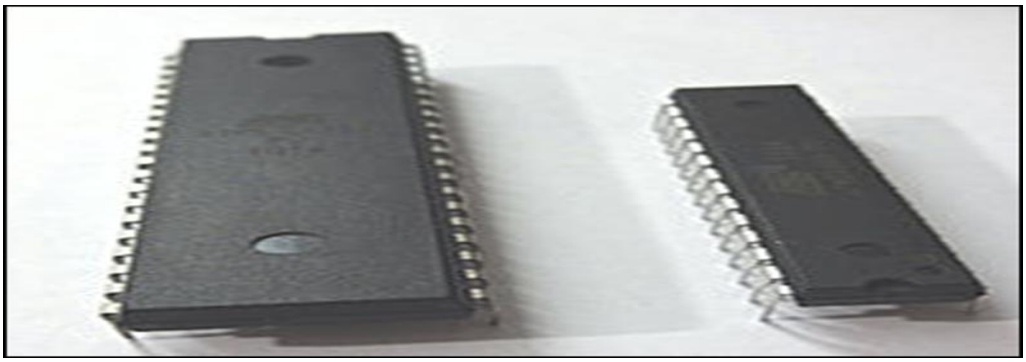

Fig 3.4 Microcontroller

Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input output devices, microcontrollers make it economical to digitally control even more devices and processes.

DC Motor: A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly

all types of DC motors have some internal mechanism, either electromechanical or electronic; to periodically change the direction of current flow in part of the motor.

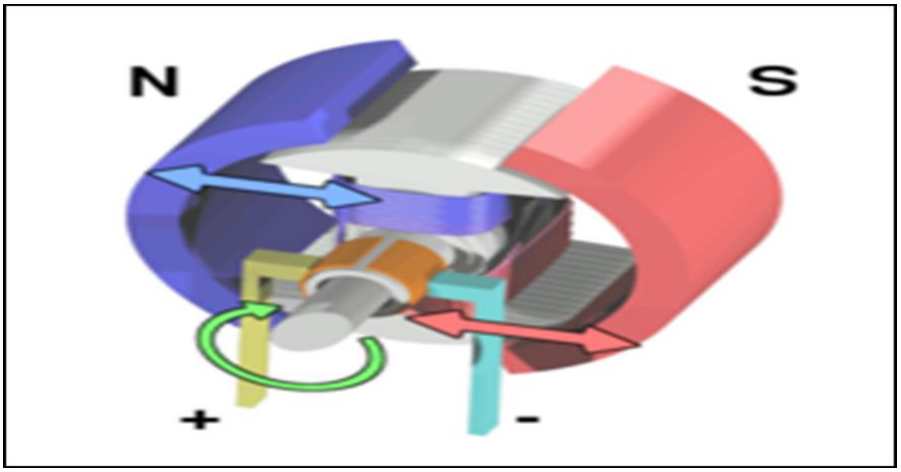

Fig 3.5 motor

DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. DC motor is used to operate the spikes.

V SPECIFICATION

PARAMETER	DETAILS
Material	Galvanized mild steel
Type	Flat/Hump
Drive	Electro-mechanical
System configuration	3-6m
Operating closing time	3-5sec
Power supply	230V,50HZ
Spike material	AISI 304
Blocking angle	60^0
Load capacity	25/50 TON
Environment temperature	-20^0C TO 55^0C %95 non-condensing humidity
Power consumption	100W

Table 4.1

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V FEATURE

- Selective high security and safety mode.
- Spike sector can move independently.
- Manual operation in case of power failure
- High torque DC motor for greater rehabilitee.
- External limit switches provide fail safe operation.
- Robust construction builds to with stand greater impact.
- Emergency lowering or up possible in case of threat fire.
- Electronic forces can be adjusted through programming levels.
- Indirect drive modal can operate independently of traffic barrier unit.

VI APPLICATION

1. Traffic controlling on road: For controlling traffic on road & to obey traffic system road spike system is used. For automatic controlling vehicle density sensor used in this according to the presence of vehicle on road the signal get changes and system operated discus below.

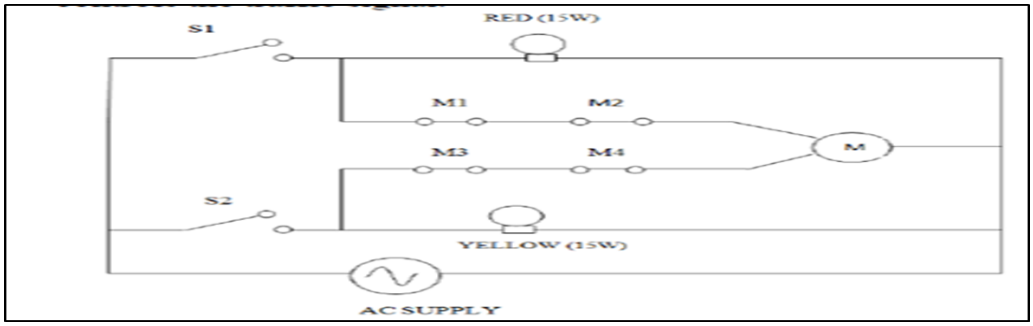

Fig 6.1 Circuit Diagram

It consists of following parts: Synchronous Motor, Micro switches, Shaft, Spikes, spring .The working of the circuit has been done using normally open switches, for ease of demonstration. IN actual practice it would be actuated using a micro controller AT89S51 which controls the traffic signal.

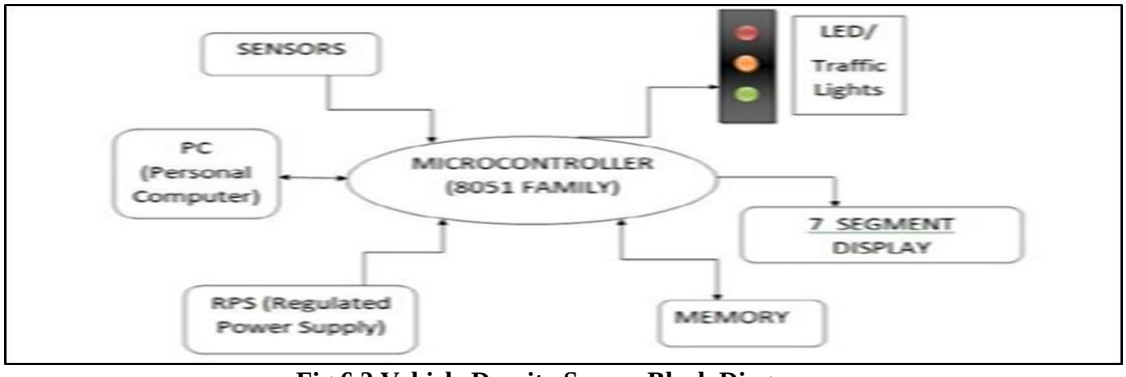

Fig 6.2 Vehicle Density Sensor Block Diagram

Case 1: When the signal changes to red

When the red switch is pressed it closes the switch S1 while switch S2 remains open. When switch S1 is activated it simulates a red signal which runs two parallel circuits one which switches on the red light and the other which activates the motor , the motor circuit has limit switches M1 and M2 (normally closed) in series with the motor. When the red light is ON the motor rotates in a anticlockwise direction (when viewed from the motor to the model). The spike will move up.

Case2: When the signal changes to amber.

When the amber switch is pressed it closes the switch S2while switch S1 remains open. When switch S2 is activated it simulates amber signal which runs two parallel circuits, one which switches on the amber light and the other which activates the motor. The motor circuit has limit switches M3and M4 (normally closed) in series with the motor. When the amber light is ON the motor rotates in a clockwise direction (when viewed from the motor to the mode). The spike moves down.

Case 3: When the signal changes to green.

During the red signal the spikes rises above the road surface and during the amber signal the spikes lowers below the road surface and stays stable throughout during the green signal. Hence during the green signal there would be no change in the system that is both the witches S1 & S2 remain open during the green signal.

2.For BRT: As BRT only use for government vehicle &ambulance only, but lot of other vehicles are pass through BRT so to avoid this the road spike system is used as shown in in Fig.

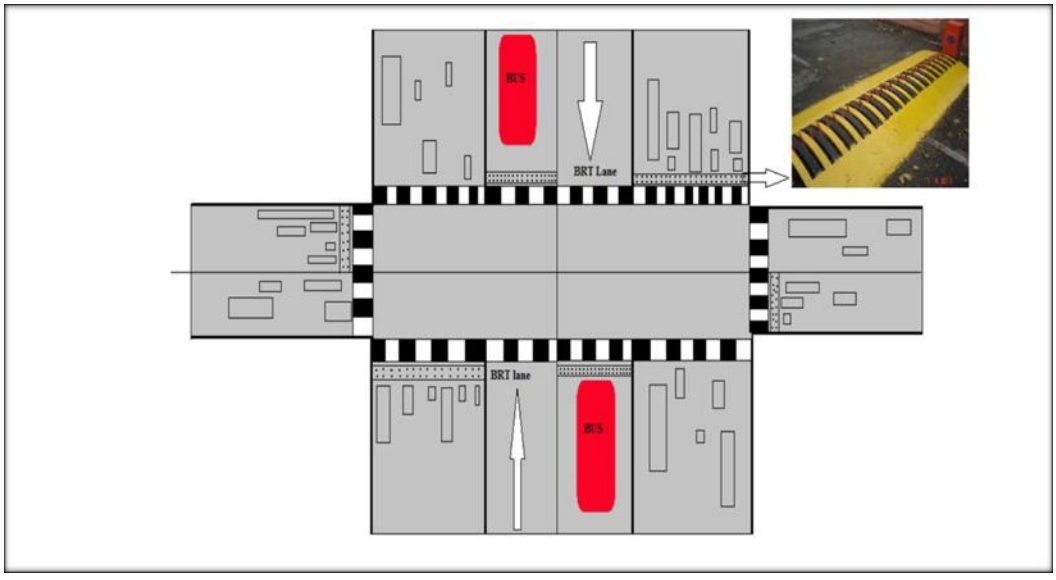

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Fig 6.3 Road Spike Place on Road

The system operation done by providing RFID tag to the all government vehicle (buses), ambulance. The RFID reader sense the when vehicle pass close through it and pass signal to microcontroller. The microcontroller controls the motor and up down movement of spike can be done. Radio Frequency Identification Sensor (RFID): Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects.

Fig 6.4 RFID

The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC).

3. One way road: For on way road the vehicle goes only on one directional only.so,to obey this rule the spike system can operated on only direction in which vehicle has permeation in this when vehicle goes on the spike will move downward direction due to spring and when vehicle goes wrong direction then it kill tires

Fig 6.5 One Way Mechanism

Security system : For industries and office this type of system is very useful to permitted to only those vehicle that the industries want.in this the system will similar to operate on RRFID the vehicle which have perdition to come that vehicle provided RFID tag and RFID redder read when vehicle come across and pull down spike.

VII CONCLUSION

In this study, conclude that The road spike system is used for various application according to condition like controlling traffic management ,BRT system, one way road direction this ensure to obey traffic rules properly, because of according to WHO 1.25 million people nearly 3400 road fatalities per day and injure up to to 50 million. By using this system the count of accident happened be reduces.