SOLAR CAR WITH ANTI DRUNK AND DRIVE SYSTEM

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ABSTRACT

A solar vehicle is an electric vehicle powered by solar electricity. This is achieved by photovoltaic cell that converts the solar power directly into electrical energy. Solar operated car is working in two systems one is fuel-operated system and another one is battery-operated system. Battery is automatically charged through solar panel, which is mounted over the car model. Solar car is connected with microcontroller through the relay driver circuit.

A drunken sensor placed in the drivers area, which detects whether the driver has in took the alcohol or not. By inserting the key, the sensor starts sensing the air present in the vehicle. If the air contains any alcoholic substance, the sensor detects the percentage of it, thereby limits the speed of car as programmed in the controller, and the sensor connected to the fuel injector gradually stops the fuel flow to the engine. Thus, the engine stops the car as per the programmed distance. Speed sensor senses the speed of the car. When the vehicle speed is reached to above the set level, then micro controller sense the over speed. In this paper three types of speed control are there which are low speed (100% of alcoholic content), medium speed (up to 60%), and high speed (below 30% of alcoholic content)

GSM (Global positioning for mobile communication) is connected with the microcontroller. Based on the microcontroller program GSM short message service (sms) the over speed signal to owner's mobile. The main aim of our paper is to avoid accidents due to drunk and drive.
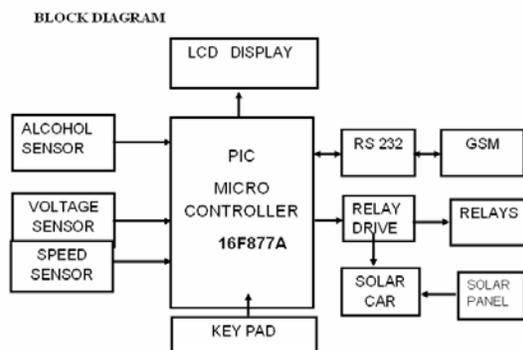
Fig. 1 block diagram of solar car with anti-drunk & drive control system

PIC MICROCONTROLLER

Features of PIC

PIC16F877 features 256 bytes of EEPROM data memory, self programming, an ICD, 8 channels of 10-bit Analog-to-Digital (A/D) converter, 2 additional timers, 2 capture/compare/PWM functions, the synchronous serial port can be configured as Either 3-wire Serial Peripheral Interface (SPI) or the 2-wire Inter-Integrated Circuit (I²C) bus and a Universal Asynchronous Receiver Transmitter (USART). All of these features make it ideal for more advanced level A/D applications in automotive, industrial, appliances and consumer applications.

Typical Behavior of PIC

If we blow, it will react. Depending on the environment, it gives little bit of different values. Moreover, in our case, it gives 0 as the lowest value and 260 as the highest value and when it detects the alcohol in the air, actually, it is sensitive, the value gets higher very quickly but we to wait for about 1 to 2 minutes to reset it. So that means getting values is fast but resetting is so slow.The sensitivity of this sensor is affected by time span

POWER SUPPLY

The main function of power supply is to convert AC to DC . The first stage is to make full wave rectifier to the AC signals by using bridge rectifier, filter the rectified wave by using filtering capacitor and finally select the appropriate voltage regulator to generate pure DC signal. The DC Power Supply circuit is based around the 7805 voltage regulator. It has only 3 connections (input, output and ground) and it provides a fixed output. The last two digits of the part number specify the output voltage.

The second 7805 has a resistor divider network on the output. A variable 500 ohm potentiometer is used to vary the output voltage from a minimum of 5V up to the maximum DC voltage depending on the input voltage. It will be about 2V below the input DC voltage.

RELAY

A relay is a simple electromechanical switch made up of an electromagnet and a set of contacts relay is an electrically operated switch. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.
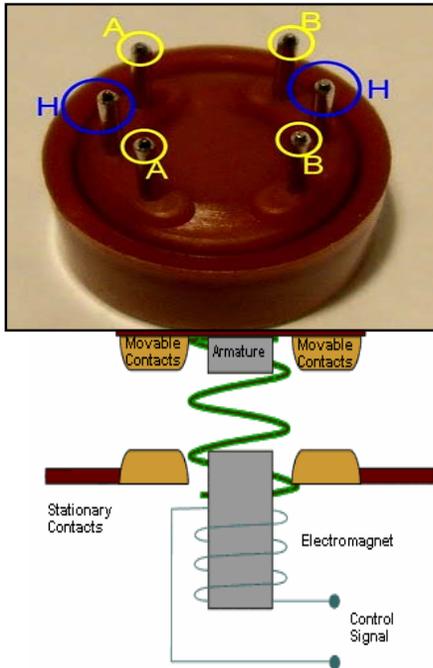
Sensor provides an analog resistive output based on alcohol concentration. The drive circuit is very simple; all it needs isone resistor. A simple interface could be a 0-3.3V ADC

PRINCIPLE It has six pins, the cover and the body. Even though it has six pins, sensors can use only four of them. Two of them are for the heating system, which is **H** and the other two are for connecting power and ground, which is **A** and **B**.

MQ3 GAS SENSOR

This alcohol sensor is suitable for detecting alcohol concentration on your breath; just this alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer.
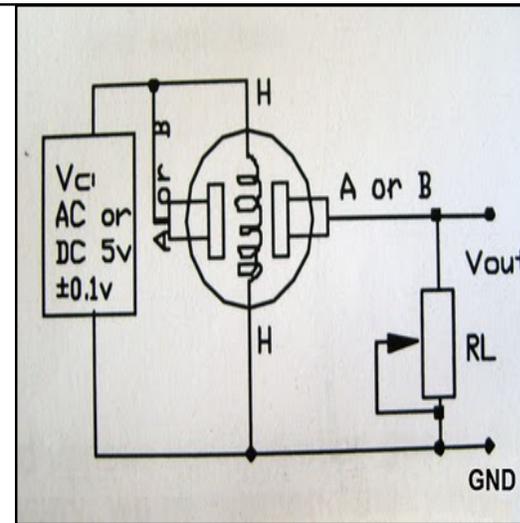

Fig.4 Parts of sensor

Little tube is inside the sensor which is a heating system that is made of aluminum oxide and tin dioxide and inside of it; there are heater coils, which practically produce the heat. Moreover, can find six pins two pins that is H that are connected to the heater coils and the other pins are connected to the tube.

MICROCONTROLLER CONNECTIONS

Fig. 5 Microcontroller Connections

Here is the schematic diagram. It is simple. In addition, one of H pins goes to the power and the other one is connected to the ground. Moreover, the pin A is connected between the power and the pin H and the pin B is goes to the microcontroller. Also between the ground and the Arduino, need the resistor for getting values that are more accurate. In the datasheet, sensor can use 100k ohm to 470k ohm.

GEAR MOTOR

Gear motor is a motor that have a gear reduction system or gear box that forms an integral part of the motor. The gear boxes are used to offer continuous torque to the motors while reducing the output speed. The major advantage of using gear motors is that driving shaft can be directly coupled to the driven shaft.

This greatly reduces the complexity and cost of designing and constructing power tools, machines and appliances calling for high torque at relatively low shaft speed or RPM. Gear motors allow the use of economical low-horsepower motors to provide great motive force at low speed such as in lifts, winches, medical tables, jacks and robotics. They can be large enough to lift a building or small enough to drive a tiny clock.

GSM

GSM, together with other technologies, is part of an evolution of wireless mobile telecommunication that includes High-Speed Circuit-Switched Data (HSCSD),

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General Packet Radio System (GPRS), Enhanced Data GSM Environment (EDGE),

and Universal Mobile Telecommunications Service (UMTS).

GSM IN OUR PROJECT

The GSM module is interfaced with microcontroller through the communication port RS 232. The relay circuit switches the GSM with the microcontroller. The abnormal condition is identified by the sensor output voltage. The GSM is used for sends the message to the owner of the vehicle or to police to avoid the accidents due to drunkards.

CONCLUSION

By using this system number of accidents will be decreased to a touchable percent due to drunkards. Instead of fuel we are employing the solar energy; so it prevents the environment from greenhouse effect. Moreover power consumption of the system is also very less. It is highly reliable system. By implementing this design drunken drivers can be controlled and substantially decrease the alcohol-related deaths on our highways.

FUTURE ENHANCEMENT

An anti drunk-driving technology includes alcohol odor sensors, facial recognition system, and monitoring driving behavior.

The Driver Alcohol Detection Systems for Safety, as the new approach is called, would use sensors that would measure blood alcohol content in one of two possible ways: either by analyzing a driver's breath or through the skin using sophisticated touch-based sensors placed strategically on steering wheels and door locks.

A camera mounted on the instrument panel monitors the driver's face to detect the driver's consciousness through the blinking of the eyes. When the system detects signs of sleepiness, the seatbelt is tightened around the driver to wake him or to catch the driver's attention, additionally, a voice and message alert also sounds.

An alcohol odour sensor integrated into the gear shift knob and can detect the presence of alcohol through perspiration from the driver's palm as the driver starts to drive.

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