Alcohol Detection Sensor- An Apprise

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Abstract

Mishaps squander human life which creates permanent disorder consequence as victim of life. Disaster may occur due to many reasons which includes brake failures, mislead of traffic signals, inefficient driving skills and distraction while driving. Perhaps ample victims of misfortune are often due to drunken drive. Though there are many amendments to punish drunken drivers whichever is not effective for rapidly increasing traffic. Because traffic police cannot stand on each and every road to check the car driver whether he/she has drunk or not. So, there is a need for an effective system to check drunken drivers. Therefore, a detailed review is analysed and presented below based on the existing system. According to the reflection of the survey, detect the alcohol content using MQ3 alcohol sensor, send value to microcontroller, fuel supply will be cut-off, intimate a message using GSM module, the rate of accidents will be depreciated.

Keywords: Driver Fatigue, Infrared Sensor, Alcohol Sensor, ILS Detector and Ignition Interlocking System

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I. INTRODUCTION

Traffic survey shows that driver fatigue may be a contributory factor in up to 20% and due to alcohol drinking it is about 31% of all road accidents. [1]In one embodiment, a detector module comprises a sensor that produces an electrical signal corresponding to a predetermined blood alcohol content of the driver.[2]Embodiments of the present disclosure provide a system for improving automobile safety.[3]The alcohol sensor works as a breath analyzer and calculate blood alcohol content from breath alcohol content, [14] it can also be used to investigate the reason for collapse of vehicle on road. [4] Alcohol levels are also estimated by breath alcohol sensor which can be pre and re-calibrated.[5] On technological development, sensors are replaced by nano sensor, with respect to customization of electrode desired gases can be analyzed.[6] Electrical signals was correlated with the concentration of alcohol present in the body, its analyzed by allowing the breathe to travel through as passage.[7] A non - invasive epidermal electrochemical sensor device includes an adhesive membrane, used to estimate alcohol content by electrochemical method.[8] A systems and methods was coded for an exhaust gas sensor coupled to an exhaust system of an engine and detection is analysed based on voltage pulse fluctuation.[9] There also sensor which detects alcohol by calculating time lag to heat the temperature sensor.[10] A device was elucidated with respect to sweat from the drivers body and predicts the alcohol ratio with the blood oxygen content.[11]Driver drowsiness and fatigue drunk driving reduces the driver decision making capability and perception level with respect to ILS sensor.[12]By using a transdermal blood alcohol concentration reader, which is attached to the steering wheel and controls ignition of the vehicle.[13] A band is designed with a proximity sensor detects the proximity of the transdermal alcohol sensor relative to the vehicle operator area. In case of Infrared sensor[15], it is adopted to identify the blinking instances of the driver and compare with the regular instances, also [16] it can also be embrace to identify skin texture and detect with the drivers skin texture which in turn connected with the ignition system.

II. LITERATURE REVIEW

Marwan Hannon et al[1] developed a system, where blood alcohol content of the driver is determined by sampling the alcohol content of the air within a predetermined vehicle zone. A control module is coupled to the detector module to control at least one vehicle operations in response to the electrical signal from the detector module. In another embodiment cellphone contains the detector module and is wirelessly coupled to the control module. A vehicle status module is included in some embodiments.

Jones et al[2] provided an automotive safety system, comprising the steps of collecting and analysing data from the proximity of a potential drive. System comprises an intoxicating substance sensor for detecting the presence of intoxicating substances in a potential drive and disabling the automotive ignition system if the potential driver is determined to be under the influence of intoxicating substances. Stephanie Sofer et al[3] invented An alcohol monitoring system for monitoring a driver of a car includes a vapor analyzer system for detecting the amount of alcohol in a driver operating the car through hand perspiration. A speed controller is provided for setting the maximum speed of the car to a predetermined level in the event that the amount of alcohol detected in the driver is above a predetermined threshold.

Matthew Hogyun Son et al[4] invented a sensor which is a replaceable breath alcohol sensor module that can be replaced with a new pre-calibrated breath alcohol sensor module or re-calibrated. The breath alcohol sensor module requiring calibration can be removed from the body of a Breath Alcohol Testing Device (commonly called "breathalyser" or "breathalyzer"). Marc A. Deshusses et al[5] reviewed a gas sensing device (nanosensor) includes a Substrate with at least a pair of conductive electrodes spaced apart by a gap, and an electrochemically functionalized semiconductive nanomaterial bridging the gap between the electrodes to form a nanostructure network. depending on the nanoparticles employed in the functionalization, the nanosensor may be used to detect a selected gas.Do Joon Yoo et al [6]designed a system in which alcohol sensor includes a sample gas passage and reaction cell arranged within the sample gas passage to output an actual detection signal value corresponding to an alcohol concentration in a sample gas. Joseph Wang et al[7] discovered a flexible or stretchable substrate disposed over the adhesive membrane and an anodic electrode assembly disposed over the flexible or stretchable substrate including. The iontophoretic electrode in either the anodic electrode assembly or the cathodic electrode assembly that includes the sensing electrode Richard E. Soltis et al[8] One example method comprises, during selected engine fueling conditions, alternating between applying different Voltages to the sensor, and identifying an amount of alcohol in fuel injected to the engine based on sensor outputs at the different Voltages. Lambert et al [9] examined the collection of ethanol vapours at the first temperature of the device using sensing machine. The unit is also adapted to delay the operation of the heating device for a period of time sufficient to allow the collecting device to absorb ethanol vapour from the air contained in the confined environment (ethanol). More precisely, this invention relates to an ethanol sensor which is capable of passively operating to determine a person's level of intoxication in a confined space.

Julien Biscay et al[10] developed a Rapid, periodic monitoring and detection of ethanol (EtOH) after consumption A low cost, portable and novel approach is developed here for real-time monitoring over several days utilising electrochemical techniques. The sensor shows oxidation of the ethanol in phosphate buffer and artificial sweat using the amperometric response from the application of +0.9 V to the polyaniline modified screen printed electrode using 1 mM EtOH as the averaged amount of EtOH eliminated in sweat after the consumption of one alcoholic beverage. Atkinson et al [11] installation of a small and inexpensive ILS alcohol sensor inside the vehicle that monitors the alcohol content of the air continuously through a small input port situated in front of the driver Once alcohol has been detected inside the vehicle, feedback from the sensor could be available for vehicle occupants allowing them to make a responsible decision whether to use the vehicle or abstain from driving. BJ Brown et al [12] reviewed about the alcohol ignition interlock system. It senses the alcohol content and sends the data to microcontroller. If alcohol concentration exceeds the normal value, ignition interlock circuit disables the start-up of vehicle. It also allows certain time and distance to pull-off the vehicle from road. Brian McMillin et al [13] designed a Vehicle Ignition Interlock System using transdermal alcohol sensor. The transdermal alcohol sensor is configured to be worn by the vehicle operator, and is configured to detect alcohol through the skin of the vehicle operator. The controller is configured to override one or more periodic breath analyser retests if alcohol is not detected through the skin of the operator by the transdermal alcohol sensor. The controller is configured to increase the frequency of periodic breath analyser retests of the vehicle operator in response to the transdermal alcohol sensor detecting alcohol through the skin of the operator.

Kwang Hee Park et al[14] presented an invention which relates to a device for measuring blood alcohol concentration, and more particularly, to a device for measuring blood alcohol concentration for quickly and easily measuring blood alcohol concentration or blood alcohol content (BAC) of a bled unconscious examinee through blood at the site of car accident as well as the examinee's breath. B.Praveenkumar et al[15] examined about the accidents due to drowsy and The drowsiness is identified by the eye blink closure and blinking frequency through infrared sensor worn by driver by means of spectacles frame. The alcohol consumption is also verified during the starting process of the vehicle using alcohol detector. If the driver is drunk then the buzzer indicates and the vehicle doesn't allow the driver to start the vehicle. If the driver is drowsy, then the system will give buzzer signal and the speed of the vehicle is reduced. Harry Karsten et al[17] reviewed about his device incorporates a breath alcohol detection device that employs an electrochemical fuel cell and an optical skin sensor that positively identifies the operator. The skin sensor is designed to sense skin on the operator's face or in the operator's mouth. Before a vehicle's Starter is enabled, the operator must pass a breath alcohol test and the operator must be positively identified. If not means, vehicle's starter will be disabled and thus preventing vehicle from being operated.

Faysal Iqbal, Sandipa Biswas et al[18] proposed a hexagonal photonic crystal fiber sensor model for sensing and classifying alcohol using the optical properties provides enough flexibility in the optical parameters and shows a high sensing performance. This paper proposed a hexagonal PCF sensor model for sensing and classifying alcohol because of providing a greater sensing performance for liquid and chemical sensing. The proposed model with this effective optical parameter is better than any other existing model and this can prove itself.

III. CONCLUSIONS

1) The following are the summarization of the alcohol sensor:
2) These sensors are broadly divided into intrusive and non-intrusive types
3) Usually, theses sensor estimates the concentration of alcohol content with respect to breath vapors, which categories under intrusive type
4) Alcohol detection sensor also employ transdermal sensor, which compares the skin of driver with pre verified skin texture.
5) These sensors are also installed in exhaust of the vehicle and ethanol detection is done.
6) Alcohol can also be measured through sweat of the vehicle operator using band.
7) Infrared sensors are adopted to surveillance the eye blink as well hand perseverance.
8) Usually, these sensors are interlocked with ignition system and hence therefore detection of toxic drivers will not lead to ignition of vehicle.
9) The derived systems are also used to investigate accidents, by collecting blood samples and examine the presence of alcohol content.
10) Nano-sensors are also adopted for detecting alcohol, by capturing the ethanol with respect to customized electrode.
11) A step ahead, its also used to investigate drunken person inside a confined space which is applicable for rental drives.

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