CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
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Project Number
S1018

Project Title
Drunk Driving Prevention Key (DDPKey)

Abstract

Objectives/Goals
The objective of this project is to create a key accessory that will hopefully reduce the incidents of drunk driving by preventing the key to be inserted into the ignition of the car when the alcohol level in the breath of the user is too high.

Methods/Materials
The main components of the device consist of an alcohol gas sensor to sense the alcohol level in the surrounding air, a programmable IC chip to control all the components, a plastic sleeve that covers the blade of a key to prevent the key to be inserted into the ignition, and a solenoid to block and prevent the sleeve from moving. The concept behind this device is when the alcohol sensor detects a high level of alcohol, it tells the IC to stop the solenoid from retracting so that the sleeve cannot move, and therefore the key cannot be plugged into the the ignition of the car. If the alcohol level is at a normal level, then the solenoid is allowed to be retracted so the plastic sleeve covering the key blade will be able to move, letting the key able to be inserted in the ignition of the car.

Results
It had been tested with multiple types of liquor, including red wine, white wine, rice wine, and beer to see the reactivity of the device toward different types of liquor. It works best with the liquor that has the highest concentration of alcohol, but its performance with other types liquor is good enough for the objective.

Conclusions/Discussion
Using a alcohol sensor, a solenoid, a plastic sleeve, a programmable IC chip and a software script for the IC, a device is created that forces users to blow into this device in order to insert their car keys into the ignition. Therefore, many drunk drivers can be stopped before they attempt to start their car, reducing incidents of drunk driving.

Summary Statement
This project describes the creation and design of a key accessory that helps reduce the incidents of drunk driving.

Help Received
I did not receive any professional help. I searched the internet for inspiration to solutions when I encounter a problem and my parents helped with purchasing parts and provided some feedback.