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Gas Explosion Prevention System (Gepres)

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ABSTRACT

The gas Explosion Prevention System (GEPRES) is a prototype to prevent gas explosions and focuses on the kitchen area, where common gas leakage happened. With Internet of Things (IoT) technology, this prototype provides a wireless device to assist users to control gas leakage. Using a gas sensor or MQ9 sensor Arduino component, this prototype will detect gas leaks. Once it detects up to 30% of the gas, the prototype will send alert notifications to the user's phone. The user can cut off electricity to the whole house to prevent fire by just using the click button on the phone. The users can control the flow of gas trapped in the house by opening windows using button controls from the phone to reduce the gas. Using the MQ9 gas sensor, this prototype can help to reduce or stop the gas explosion. In conclusion, GEPRES can reduce the rate of gas explosions, can save many people from losing their homes, and prevent deaths. In the future, the system can be improved by adding more safety features to reduce the number of gas leakage accidents to a smaller percentage, thereby increasing the safety of the house even more.

Keywords: Gas; gas leakage; gas explosion; sensor

INTRODUCTION

Gas leakage has been one of the most dangerous scene causes in most of the countries including Malaysia. A study published by the American Chemical Society found there is an estimation of 630000 gas leaks every year, just in the local distribution systems. Most of the cases proved that they happened in the kitchen area where there are lots of electric utensils. The gas Explosion Prevention System (GEPRES) is designed to prevent gas explosions and it is specifically focused on the kitchen area, where the common gas leakage happened. This product is designed to deal with this problem where it is able to detect gas leakage and send an SMS to the owner so that the owner can cut off the electricity supply remotely if there is no one in the house. In addition, a small window will automatically open to allow the gas to flow out from the house and prevent the gas from trapped in the house.

This product is designed due to the rate of house explosions increasing every year, gas leakage occurs without one's consciousness, is able to harm people's lives, and can affect people's properties and belongings. The objective of this product is to reduce the rate of gas leakage that happens, to provide a device that can be controlled anywhere and is wireless, and to assist users that rarely stay at home to control the leakage.

INNOVATION DEVELOPMENT

The mechanism of this product is very simple. First, we have the gas sensor or MQ9 sensor that will detect if there are gas leaks, especially in the kitchen. Once it detects up to 30% of the gas,

it will send the alert notifications to the user. To prevent fire, users can cut off electricity to the whole house just by using the button on their phone. Users also can open their windows to allow all the gases to exit the house so their houses will be free from dangerous gases that can lead to death once it has been sniffed.

COMMERCIAL POTENTIAL

We specifically designed this product to prevent gas leakage around the kitchen area. It can be supplied to any place that uses LPG gas. It is also convenient for workaholics that rarely spend time at home. This product can help users to reduce the possibility of a gas explosion. This will save many lives and properties which are very significant. GEPRES will get its marketability because it fulfilled users' needs in every aspect such as it is convenient for people who spend less time at home. In order to commercialise this product, we have already made a few calculations to fix the price at RM 150. We come up with this affordable price to make sure everyone can buy and use this product.



Figure 1: Innovation prototype

CONCLUSION

In conclusion, GEPRES will save many people from losing their homes and prevent the deaths of so many people, particularly their neighbours. By doing this project, we learned how the mechanism of the MQ9 gas detector works after conducting additional research and study. We hope to improve the system in the future by adding more safety features to reduce the number of gas leakage accidents to a smaller percentage, thereby increasing the safety of the house even more. We hope that this product that has an MQ9 gas sensor can help to reduce or fully stop the accident caused by a gas explosion. This product is very important to monitor the gas leaked percentage and to give a one step ahead from gas explosions. On top of that, this GEPRES product is highly aimed at worldwide marketing because we want to help as much life as we can. Furthermore, this product price is very cheap and easy to use so we think that this product is reasonable and a must for a house to have one of these products. We came with the plug-and-play installment so it is very easy to set this product up. We really hope that this product will receive a huge welcome in the market and can make a huge innovation improvement due to the modern era.

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