Published by :
http://www.ijert.org

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 10 Issue 10, October-2021

KIT-SAFE: Kitchen Safety Device based on Temperature, Smoke Detection and IR Sensor

[1.] Mr. Kalen Darang
Arunachal Pradesh

[2.] Mr. Risso Apataya
Arunachal Pradesh

Abstract **: The sole purpose of this project is for the household safety while working in the kitchen by using an automated device which will notify the user about any kitchen hazard, if there is any. A DHT11 temperature sensor is used for the detection of temperature and humidity of the room. A MQ2 Gas sensor is used for the detection of any gas leak and presence of the smoke in the room and an IR Sensor is also used in the system for detection of physical presence while working on the Gas Stove.**

I. INTRODUCTION :

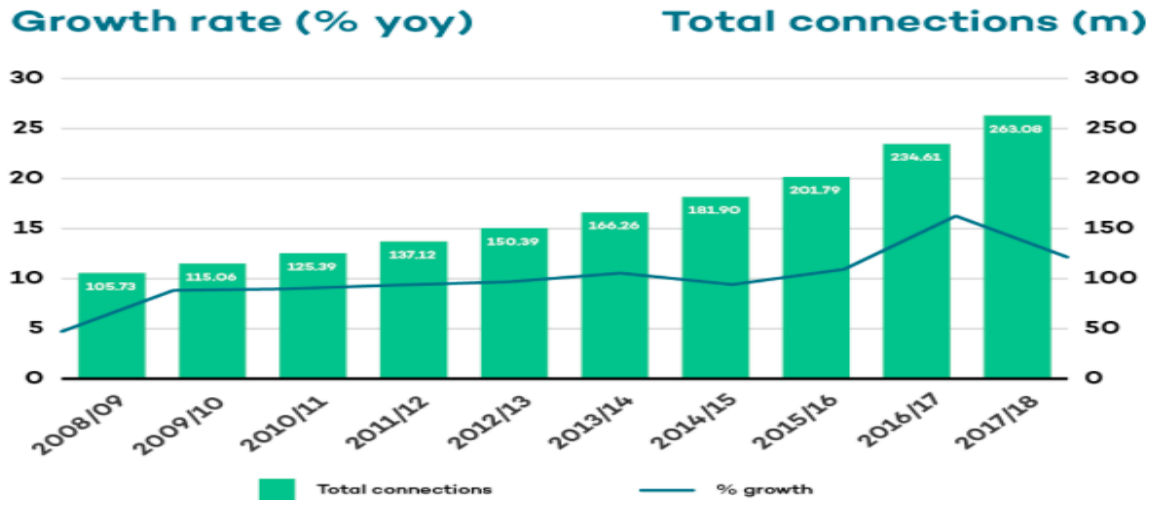
This research paper is an approach to create a safety device which is of utmost requirement for the safety of our household. We must have already experienced the need of this device once in a while cooking a meal in the kitchen. From boiling milk to cooking a full pledged meal, one must have already imagined what if the gas stove tells us when we leave it unattended so our milk don't spill and the meal is not overcooked or burnt. Not ignoring the fact that there can be a scenario of gas leakage in the room which is very hazardous for us and it can lead also to loss of life.

It is a human tendency to forget something and get diverted to a totally different thing. This also happens when it comes to cooking, we leave a thing to cook on the gas stove and end up gossiping and doing something else. Keeping this in mind, we have developed a safety device which we call KIT-SAFE : Kitchen Safety Device. We have certain sensors inbuilt in the system which will notify us about the kitchen surroundings and some major components include DHT11 Temperature sensor, MQ2 Gas Detecting Sensor, IR sensor, Arduino etc.

II. NEED OF THE PROJECT :

The Kitchen is supposed to be the safest place in our house because we live on eating meals cooked by us. Numerous amount of accidents happens around us due to unattended gas stoves and gas leakage with number of accidents constant on a daily basis.

National Crime Records Bureau shows at least 10 people die every week in a state due to gas explosion and 82% victims are mainly women. As per the record, there are currently 263 million connections in India out of which 224 millions are active. With Govt. of India providing subsidies, the number of users are likely to increase every year. This provides a potential threat to our lives when it is not used and handled properly.



Source : Ministry of Petroleum and Natural Gases

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 10 Issue 10, October-2021

The benefits of using this proposed system :

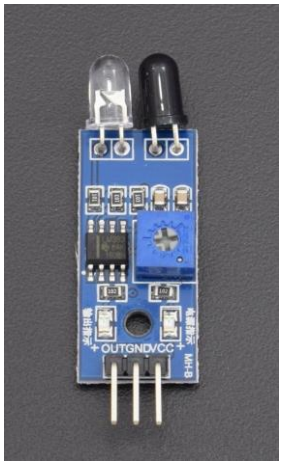
i. Automatic detection of any undesired phenomenon.
ii. Easier way of cooking and handling the system.
iii. Reducing the risk of losing life due to gas leakage.

III. TECHNOLOGY USED :

In this project, there are components and sensors used for the implementation of the desired system. They are :

i. Arduino Uno : It is the main controller and brain of the system. The codes defines the condition and the working criteria of the entire system.
ii. DHT11 : It is a temperature sensor which will detect the temperature and humidity of the system as well as the surrounding.
iii. MQ2 sensor : It is a gas detecting sensor which will detect the presence of any gas leakage in the room as well as presence of smoke.
iv. IR sensor : infrared Sensor will detect any physical movement around the gas stove.
v. OLED display : This will show the data accumulated in real time.
vi. Buzzer : It will be used for notifying the user about any undesired phenomenon.

IV. IMPLEMENTATION :



IR Sensor

The IR sensors are very active sensors which can be used to trigger the circuit when any physical movements are detected in the surrounding. The sensitivity can be adjusted by using potentiometers on the sensors which will vary the range of the sensor and any physical movement outside its range won't cause any interference in the circuit.

However, the DHT11 heat detection and MQ2 gas detection will be working in real time and the data will be displayed to the user through the OLED screen.

Working :

When the user turns on the knob of the gas stove, the circuit will auto start and starts reading the data of the surrounding. The InfraRed sensor will detect the presence of user near the stove. The sensors has been coded with a condition that if it doesn't detect any physical movement near it for long, then it will trigger the buzzer and notify the user on attending the gas stove.

OLED Display

Suppose the InfraRed sensor is facing a physical interference and it doesn't trigger the buzzer circuit and the user fails to attend the stove. In this case, the heat detection sensor will come in play.

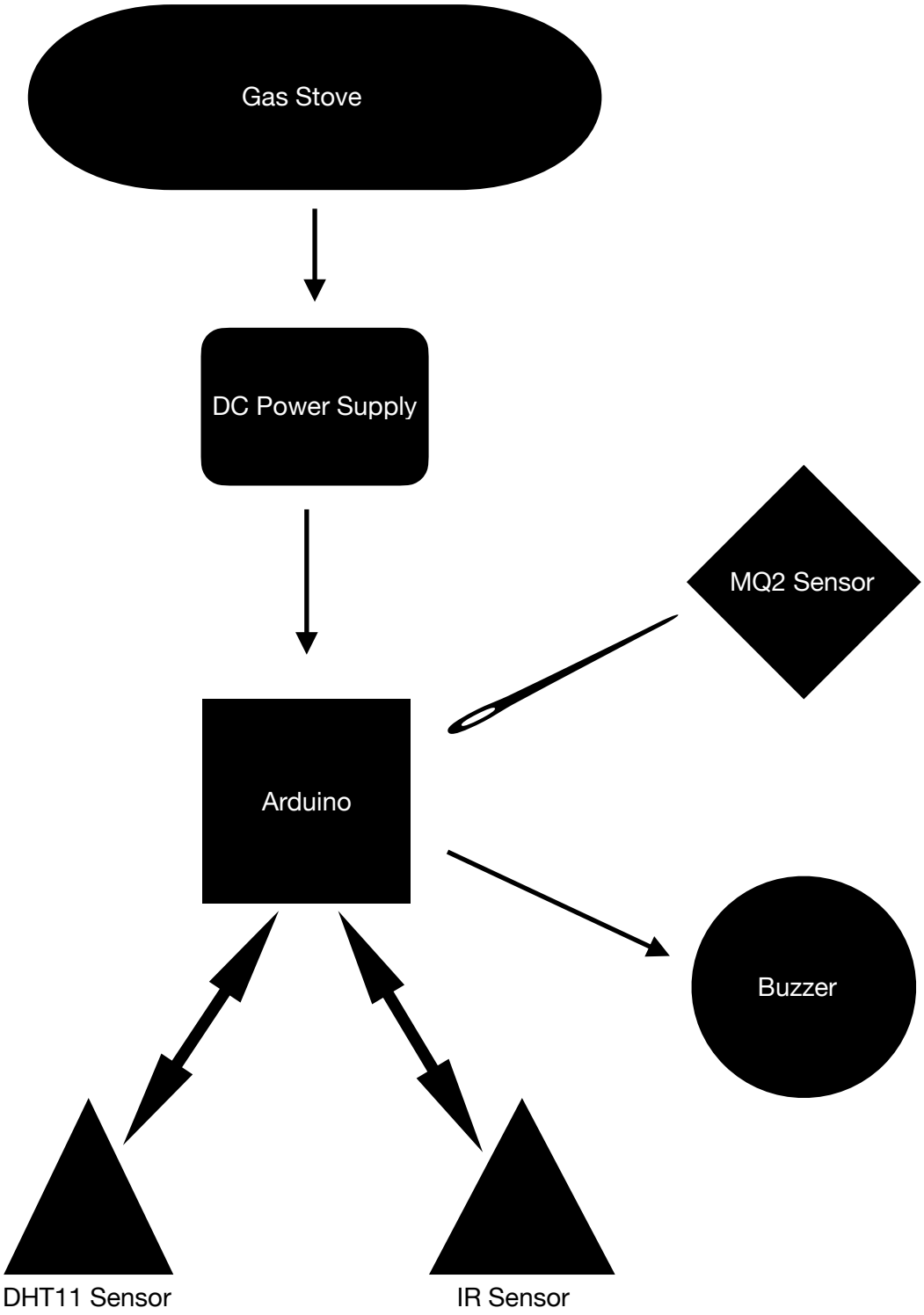
The DHT11 have been reading the temperature of the room for long and when the temperature rises to a certain level it will again trigger the buzzer circuit for notifying the user.

All of this process is established with the work of Arduino UNO which contains a very advanced version chip ATMEGA 328p for fast processing of data. The system is power with a 9 volt battery pack which is removable with the usage of time. However the sensors and components used in the system operates on 5 volt and the Arduino have it inbuilt to convert the 9 volt input into 5 volt output for the sensors to function accordingly.

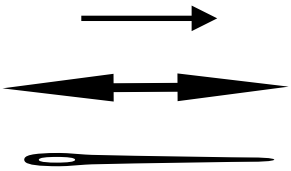
The system starts operating when the stove is turned on, but keeping in mind about the gas leakage in the room, the MQ2 gas sensor is coded specifically to work overtime even when the stove is not turned on. So, if there is any gas or smoke detection in the room, it will notify the user about the phenomenon.

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 10 Issue 10, October-2021

CIRCUIT FLOW DIAGRAM :



Reference :



One way circuit. No feedback.

Feedback Signal and Supply.

Independent Signal.

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 10 Issue 10, October-2021

V. CONCLUSION :

With the rise in usage of Gas for cooking meals, increases the chances of encountering life hazard phenomenons which can be due to Gas Leakage, unattended cooking on the stove, Burnout flames etc,.

In this paper, we have presented an awareness model to reduce risking of life due to any hazardous phenomenon in the house. This system will reduce significant amount of human effort by implementing various sensors in the safety system. This project is an effort to save number of lives while everyone in the home can have a healthy meal.

VI. REFERENCE :

[1] Global Subsidies Initiative https://www.iisd.org/story/cooking-with-gas-in-india/
[2] Ministry of Petroleum and Natural Gases, Govt. Of India.
[3] Smart Kitchen Articles - https://www.cnet.com/home/kitchen-and-household/what-the-smart-kitchen-still-needs/