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“AUTOMATIC LPG LEAKAGE DETECTION, USAGE LEVEL
INDICATION AND REAL TIME LPG MONITORING SYSTEM
USING GSM”

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Abstract

Now a days gas leakage and gas detection is a major problem in our daily lives. Also gas wastage is a major issue that needs to be countered. LPG gas is highly flammable and can inflict damage to life and property. To avoid such situations, we are presenting this project that includes leakage detection, usage level indication and real time monitoring of the LPG.

Keywords: *GSM, Sensors, Buzzer, Microcontroller.*

I INTRODUCTION

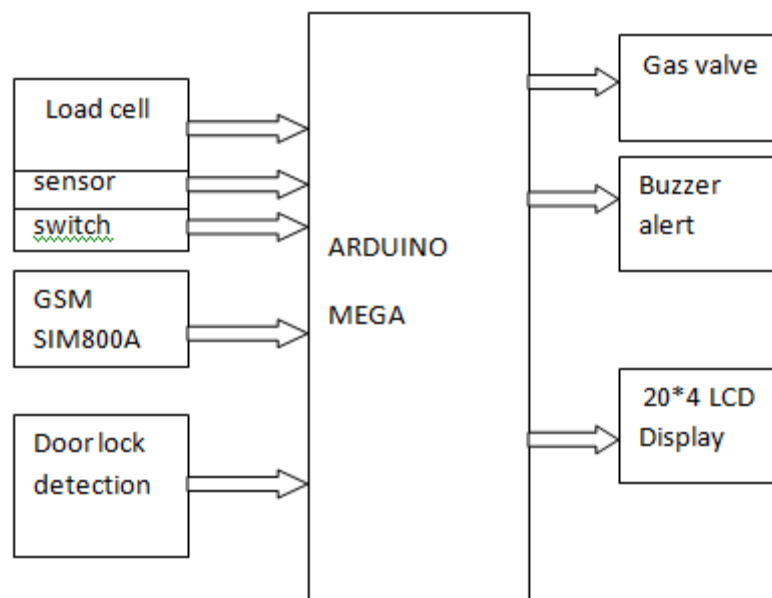
The Liquefied petroleum gas (LPG) is currently the most used gas in our home for cooking purposes. LPG gas is a flammable gas, if leaked it can cause major damage to life and property. Therefore it should be used in safe handling manner and additional care has to be taken in order to prevent any leakage possible. The main features of LPG is that being heavier than air, it do not disperse easily and may lead to suffocation when inhaled. The leaked gases when ignited may lead to explosion. The number of deaths due to the explosion of gas cylinders has been increasing in recent years. A major amount of gas is being wasted due to the carelessness of consumers. Sometimes they forget to turn off the burner which may also could lead to damages. Our proposed topic aims at detection of gas leakage, usage level indication and to provide real time monitoring of LPG. The smart gas system which provides home safety, detects the leakage of the LPG and alerts the consumer about the leak by the notification through the SMS alerts using GSM and solenoid which automatically turns off the gas valve. The additional advantage of the system is that it continuously monitors the level of the LPG present in the cylinder

using load sensor and if the gas level reaches below the threshold limit of gas so that the user can replace the old cylinder with new one through automatic booking. An added feature is that if the user accidentally forget to turn off the gas burner, the system will inform by activating an alarm and sending warning SMS to the user so that the user can turn it off by sending an OFF message from the users cellphone from anywhere in the world. So the problem wastage of the energy is solved and thereby providing the consumer security and home safety.

II SCOPE / OBJECTIVES OF THE PROJECT:

- Liquefied petroleum gas (LPG) is most commonly used in home, hotels and industries for cooking. LPG is a highly flammable gas, if leakage occurs it can cause major damage to life and property.
- Therefore it should be used in safe handling manner and additional care has to be taken in order to prevent any leakage.
- A major amount of gas is being wasted due to the carelessness of consumers. Sometimes they forget to turn off the burner which may also could lead to damages.
- Our proposed topic aims at detection of gas leakage, usage level indication, auto booking and to provide real time monitoring of LPG.
- The smart gas system which provides home safety, detects the leakage of the LPG and alerts the consumer. Also it continuously monitors the level of the LPG present in the cylinder.

III BLOCK DIAGRAM



IV METHODOLOGY

WEIGHT DETECTION

- We have used strain gauge as a weight sensor. It converts the applied force into corresponding electrical signal, if the gas is below some preset value that is 50% and 20% then microcontroller communicates with GSM modem and sends alert to the user.
- Once the gas level reaches 20%, the system will automatically book the LPG and sends the confirmation message to the user. At the same time the weight of the gas is displayed on the LCD screen.

LEAKAGE DETECTION

- If any leakage occurs in the LPG, the gas sensor MQ-6 will detect the leakage and it communicates with the microcontroller and automatically turns OFF the gas valve using relay and activates the Buzzer and also it sends an alert message to the user.

REAL TIME MONITORING

In real time monitoring system we have two instance

- 1. When the LPG gas is continuously switched ON for some preset time that is 30 min, then the GSM module sends the alert message to the user, and the user can turn it OFF by sending an OFF message to the module.
- 2. The system also provides an automatic gas valve turn OFF function once the main door of the house has been locked.

V EXPECTED OUTCOME OF THE PROJECT

- The outcome of the project is, when leakage occurs, the system will detect the leakage and sends an alert SMS to the user and activates the buzzer simultaneously to turn off the gas valve, also provides protection by controlling the flow of LPG from gas valve, at the same time the user can turn OFF the knob of the cylinder from any distance by sending the OFF message in case if it is left ON. If the gas is about 20%, the system will perform automatic gas booking and sends the confirmation message to the user.
- It also provides an automatic gas valve turn OFF function once the main door of the house has been locked.
- At any instance the user can get to know the status of the cylinder, by sending a STATUS message to the system.

VI APPLICATION OF THE PROJECT

- [1.] Consumer safety and Energy saving, Also used in industrial application.
- [2.] Used in both hotels and restaurants.