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Gas level Detection and Automatic Booking system using Arduino

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Abstract:

As we know that there is rapid development in technology which makes human life easier to live. In our country production of LPG is less, so we cannot supply gas through pipelines to each and every home. So, we are using Interactive voice responsive system (IVRS) to book a gas cylinder. While using this system many of illiterate people facing issues. Another major problem consumers are facing is they don't know the status of cylinder. To avoid all these problems, we are proposing a new model. This model consists of GSM-based automatic booking of new LPG cylinder and also it detects the gas leakage.

Keywords:

Arduino uno, GSM modem, Gas sensor, Load cell.

Introduction:

In India there are 30crore LPG users in the country in which mostly 40% of the population. The several standards have been implemented for gas leakage detection system. The main objective is it continuously measure the weight of the cylinder and when it reaches the minimum threshold level it automatically sends an SMS alert to the user as well as authorized agent so that they can act accordingly to it. The consumption of LPG gas is more but we still hear the news about gas leakage accidents in household s and industries. Our new model provides an alarm system which detects the gas leakage in the house and commercial premises. Here, to detect leakage of gas we use gas sensor which senses the gases like propane and butane. The system measures the weight of cylinder by using load cell and display corresponding weight on LCD display.

Literature survey:

In the year 2011, "Design and Implementation of an Economic Gas Leakage Detector" is proposed by A. Mahalingam, R.T. Naayagi, N. E. Mastorakis. This project is used to detect the gas leakage and providing immediate alarm or intimation to user. Later in 2013, few people developed the design proposed for home safety. This system also detects the leakage of the gas and alerts the consumer aboutthe leak by buzzer.

In the year 2014, Hitendra Rawat, Ashish kushwah, Khyati Asthana, Akanksha shivare, designed one more new system that provides security issues against thieves, leakage and fire accidents. In this cases system sends SMS to the emergency number provided to it. Now, in this proposed system we have designed "LPG gas monitoring and automatic cylinder booking with alert system". This focuses on leakage of some economic fuels like petroleum, Liquid petroleum gas…etc., and alert the surrounding people about Leakage through buzzer and also through SMS. This project alerts the user by sending message to mobile through SMS in three conditions mainly, they are

- When the gas level reaches maximum threshold level.
- When the LPG gas exceed its peak value.
- When there is leakage of gas occurs

When these actions are occurred, system sends an alert message through buzzer or through SMS.

Existed system:

At present we are having IVRS or online platform for booking the LPG where we need to go through

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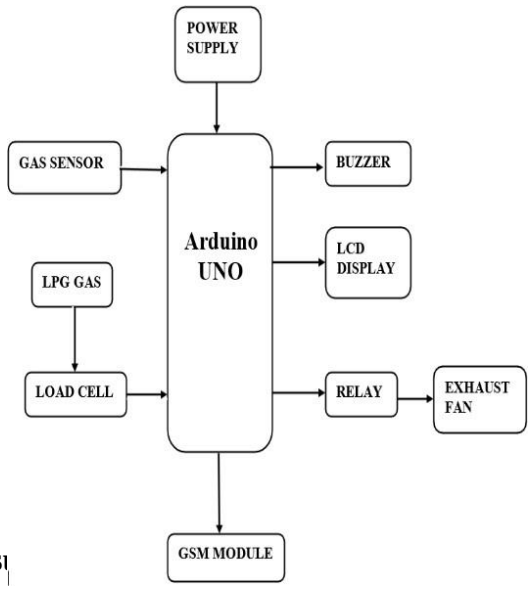
few steps to confirm the booking of gas cylinder. Firstly, we need to need to dial to the particular authorized number then the caller listens to the IVR system menu, responds by pressing a key on his/her phone, and then the system acts accordingly. Bytaking all responses into consideration our gas got booked within few days it will be delivered to our location. And also, if we not registered our mobile number then through online website, by giving required details we can book gas cylinder.

Proposed system:

In proposed system the weight of LPG is calculated continuously. On LCD weight of cylinder is displayed we can see it on any time. And when the weight of cylinder reaches threshold level then system automatically sends an SMS alert to the consumer and LPG agent by that booking is done. When there is any gas leakage occurred, we are having gas spray bottle by spraying these gas/fire accidents can be controlled to some instant. But here we are proposing one more feature that when gas leakage is occurred system detects it through gas sensor and it will give a buzzer sound which will alert user regarding leakage of gas. In the absence of user if any leakage is occurred in order to avoid the gas leakage accident, we use servo motor which automatically turn on the exhaust fan in order to drive the gas present in room to outside. These two features we are added in this proposed system.

Block diagram:



Resu

Fig:1.1 Final kit

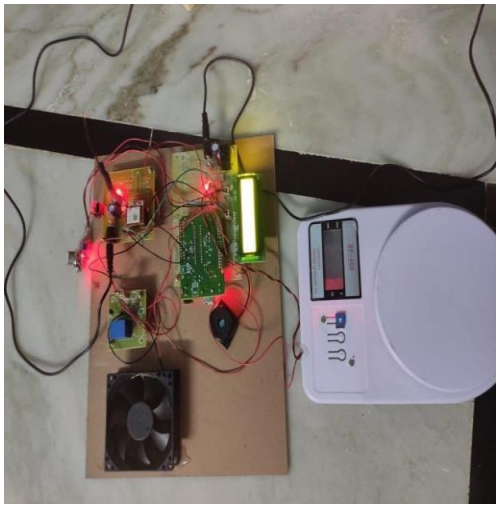


Fig: 1.2 Outputs displayed on LCD

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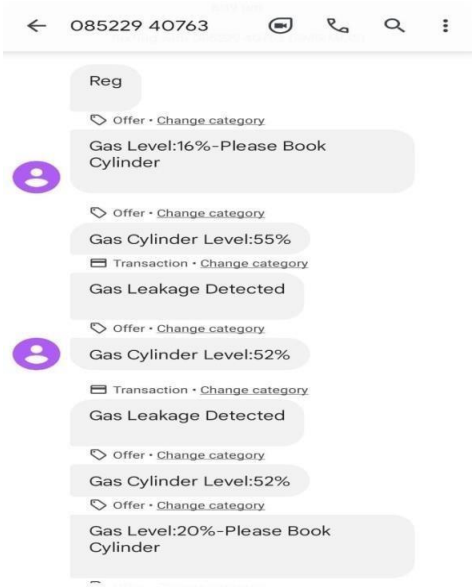
Fig: 1.3 SMS got to phone



Future scope:

This monitoring system can be further enhanced by using Bluetooth in place of GSM to send the alert messages to user, which supports another real-time application. For industrial purposes mobile robot can be developed for detecting multiple gas concentrations. Addition of load cell can also be used as pressure sensor which detects the amount of gas in the cylinder and also detects high pressure gas in cylinder pipe, displaying the alert messages via SMS and LCD display.

Conclusion:

As we sorted out the problems faced by LPG gas consumers so here we come up with some solutions to meet the few requirements of them, as we made our system is completely automate the process of refilling the gas without human intervention. Our system is also reasoned to help customers to upgrade their safety norms, act in accordingly with minimum requirements on environmental issues and mostly the basic function being prevented by major disasters and protect life and property from reputed Accidents. The primary objective of our project is to measure the gas present in the cylinder when weight of the cylinder is below the fixed load, this can be done using the weight sensors. The gas retailer gets the order for a new cylinder and the house owner (consumer) receives the message regarding the status and the secondary objective is to provide any malfunction in gas servicing system in order to prevent damage or explosion of LPG. Thus, the system developed by us will somehow help the LPG Gas Consumers to lead a comfortable life.

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