Automatic Gas off Mechanism for LPG Gas Stove

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ABSTRACT

Cooking food is a very necessary thing for every human life. Pressure cookers are the main role in preparing food but remembering the number of whistles is the most difficult task. This paper explains how we will overcome the problem by counting the number of whistles and turning off the knob automatically. This device presents a system consisting of an Arduino Uno as the control platform, Dual shaft BO Motor for turning off the knob, sound detector, and motor driver module. The system can also be useful for people with disabilities.

Keywords: ArduinoUNO, Dual shaft BO Motor, Cooker, Sound Sensor, IR Remote and Sensor.

I. INTRODUCTION

Cooking can be done by any cooking utensils using fire, LPG gas, etc. Nowadays LPG gas is the main resource for cooking, so a pressure cooker is an effective utensil for cooking.

The first acknowledged attempt at occurred in 1679 when French physicist, Denis , who is most noted for his work with steam power, invented the "Steam " to reduce the time needed to cook foods.

A pressure cooker can complete the cooking process about 30% faster than conventional cooking methods. Foods that are cooked within a pressure cooker maintain more of their vitamins and minerals compared to foods that are boiled. For that reason, many foods that come out of a pressure cooker are said to taste better. Water boils at lower temperatures at higher elevations. A pressure cooker can create a stable atmosphere with its unique design, allowing for constant and precise pressures to be used for cooking. That creates faster and more consistent results.

In the domestic pressure cooker, a major flaw is that one has to keep an account of the number of whistles generated by the pressure regulator. Otherwise, the food turns out under-cooked or overcooked and even leads to wastage of fuel. The problem becomes particularly acute for the hearing impaired. Also, for normal people remembering the number whistle count is the most difficult task.

This smart device will help to overcome these problems. It will count the number of whistles and turn off the knob after the required number of whistles occurred.

II. LITERATURE REVIEW

In the Automatic Gas Cooker Control System, the servo motor only turns in a counterclockwise direction to allow a flow of gas upon meeting two conditions; that a utensil is detected and a spark is also present. Once this condition is met, the gas flows, and a flame is ignited allowing for cooking [1]. Design and Analysis of Smart Whistle for Pressure Cooker device work on the same principle of a pressure regulator. The cylinder and pin of a device play the role of Dead weight. The bottom opening of the pin will be subjected to pressure inside the cooker. As soon as the pressure force acting on the pin gets equal to the weight of the dead weight cylinder and the pin this pin will have upward vertical motion. The pin in turn will force the dead weight cylinder in an upward direction [2]. In Novel Mechanical Whistle Counter Device for Pressure Cooker as the pressure in the cooker rises it exerts a force on the regulator/dead weight, making it traverse from the point to the topmost point. The link will move the rocker arm and correspondingly the other link will move down leading to a 180-degree rotation of the disc. As pressure is released the whistle falls to its initial position and the disc covers the remaining 180 degrees of rotation. Thus, a complete 360-degree rotation is made by the disc when the whistle travels back to its initial position [3]. Sensor-aided pressure cooker whistle counter is a type of equipment wherein any user would be able to count the number of whistles coming out from a pressure cooker as a result of the releasing of pressure. It tracks the movement of the weight in the upward direction using a proximity sensor mounted close to the weight. The Arduino Uno is programmed in such a manner that for a lift of the weight, the counter increases its value by one. It is also programmed in a fashion that a buzzer alerts the user once the number of whistles exceeds the desired number set at the initial stage. The counter displays the required number of whistles

and the present number which has gone by [4]. In Pressure Cooker with a digital display and control magnet is placed at the top of the whistle which generates a magnetic field around it. the movement of the whistle takes place Hall Effect sensor sense the presence of the magnetic field. This will cause a change in voltage across Hall Effect sensor 3333 [5]. In Automatic Gas Cooking Control System based on Microcontroller atmega32 microcontroller controls all communication signals between these electronic instruments in this system. In this system the word automatic means that the system has some automatic jobs like discovering leakage gas and stop working in the case of finish cooking time or in case of precarious cases. So the users start the working by inserting some inputs data to the system like time of cooking and amount of gas. When the time of cooking finished or when gas leakage happen the system will stop ignition automatically [6]. In Gsm Based Automation Of Gas Stove device one of the features is Timing Mode, in which the stove will automatically shut off after the given time by using servo motor which was controlled with the help of Arduino processor. Another is Whistle Mode, in which the number of the whistles are counted by the sound sensor LM 293. When the number of whistles counted equals the given count, the stove automatically switches off with the help of the motor drive [7]. In Implementation dc motor as servomotor by using arduino and optical rotary encoder, servo motor that can be controlled to rotate in even 360 degree using normal DC motor and an optical encoder . This helps to reduce the cost required to buy a servo motor spatially for heavy duty tasks. It is important to mention that the prices of servo motors increase as the rotation range of the servo is wider. In addition, the prices increase as the torque of the servo motor is higher. Therefore, using a normal DC motor with gearbox and optical encoder, will reduce the cost significantly because we have provided a high torque using the gearbox and also provided a 360-

degree controllable rotation range using the optical encoder [8].

III. PROBLEM STATEMENT

In the domestic pressure cooker a major flaw is that one has to keep an account of the number of whistles generated by the pressure regulator. Otherwise, the food turns out umber of whistles generated by the pressure regulator. Otherwise, the food turns out under-cooked or Over- cooked and even leads to wastage of fuel. The problem becomes particularly acute for the hearing impaired.
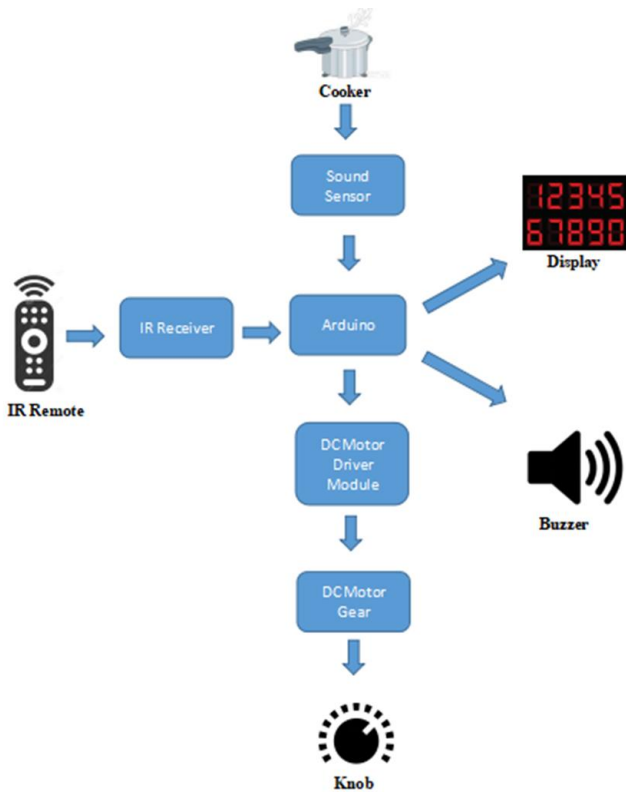
IV. METHODOLOGY

Fig. 1 Block Diagram

The proposed system block diagram is shown in the figure 1 and it of an Arduino Uno, Sound Sensor, IR Remote, IR Receiver, DC Driver Motor, Buzzer Alarm, Display, Cooker and knob. For this device

initially, a user needs to set the total number of whistle count using an IR remote. The signal from the IR remote will receive by the IR receiver then it will be transmitted to the Arduino Uno. The will give input to the display, then will display the total count given by the user. Then the system is ready for its work. Users need to turn on the gas stove and keep the pressure cooker for preparing food.

For the next operation, a sound sensor is used. The whistle sound generated by the pressure cooker is recognized by the sound sensor then it is given to the ADC (Analogue to Digital Converter) port of the . will filter only high pitch sound via ADC port. Then it will check the condition that is if the total whistle count equals the present whistle count. the condition fails then the same operation will be continued until they become equal. The display will show the present whistle count. they are equals then the motor driver module is used to turn off the knob. The motor driver module will rotate the DC gear motor to turn off the knob and at the same time buzzer will beep.

Fig. 2 Block Diagram of working of IR remote and IR receiver

In the figure 2 it shows the working of IR Remote in the proposed project.At the first total number of whistle count given as the input from the remote.Which is then received by the IR receiver and given as the input to the Arduino .Then Arduino checks for the input which is received by the sound sensor ,then Arduino moniters the DC gear motor to rotate the knob to off position.
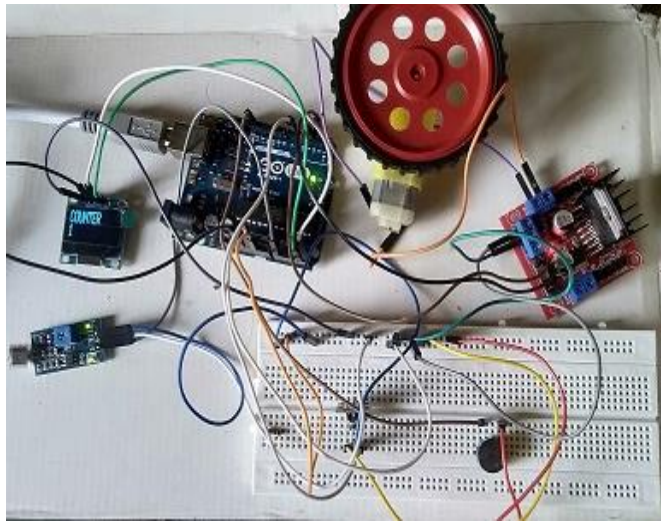
V. RESULT

Fig. 2 Implementation

This picture elaborates the final connection of the components. It consists of the components like Arduino UNO, BO shaft motor, Driver module, Display, Sound sensor and a Breadboard for connection.

VI. CONCLUSION

There is no such "smart device" currently in existence, which can be used to keep track of the number of whistles produced by the pressure cooker. Such counting devices will help the problems faced while using the pressure cooker, especially for the hearing impaired and thus, in maintaining the quality of food being prepared. So, in this project we are going to develop a device which will count the whistle of the pressure cooker and switch off gas automatically. Further we will be working more on optimization of sound sensor.

In conclusion any work in the field of reducing the efforts and user intervention has a very bright future.

VII. REFERENCES

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