International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 02 Issue: 08 | Nov 2015 www.irjet.net p-ISSN: 2395-0072

Food Pan Temperature Controller

A. Mohamed Nazeer

Lecturer, Electrical and Electronics Engineering ,PSG Polytechnic college ,Coimbatore

---

Abstract: The aim of this proposed system is making quality food without burning ashes by means of temperature control of food pan. It assures the quality of food and avoiding manual negligence. This model make sure in maintain consistency while preparing particular food like dosa, chappathi, poori etc., when it is prepared in bulk in hotels and functions. It also saves time and consumption of fuel. This automatic food pan uses a microcontroller to produce an automatic function. The major components are Food Pan, LPG Gas, Gas Stove, Microcontroller, Solenoid Valve, Temperature Sensor, Alarm and Indication LED's. The gas stove will produce the heat for food pan. The temperature sensor is fixed nearby the food pan. The temperature sensor senses the temperature of food pan. The temperature level and time of cooking are set based on the type of food. The rice flour is poured on food pan. If the temperature level is below or above the required level, the temperature sensor will sense the temperature and send the signal to microcontroller. The microcontroller sends the control through the solenoid valve. The solenoid valve is an electromechanically operated valve. Whenever the solenoid valve receives the signal from microcontroller, the solenoid valve automatically controls the gas flow to stove. When the dosa is ready the alarm sound is generated. This consistent quality making food products machine can be for making all types of food in homes, hotels and halls. This project is economical. This device is used in day to day life and easy to handle. There is no wastage of gas, time, and rice flour. This is way to make many other products like chappathi, poori, vadai etc.

Keywords: Temperature Sensors, Microcontroller

I. INTRODUCTION

Temperature is one of the main parameters to control in most of the manufacturing Industries like chemical, food processing, pharmaceutical etc., in these kinds of industries some product needs the required temperature to be maintained at highest priority otherwise the product will fail to deliver the quality. The temperature controller o control the processing is widely used in almost all the industries. The goal of this proposal is to design an ambient temperature measurement and control circuit. The motivation for the proposal is the fact that temperature measurement has become an integral part of any control system operating in temperature sensitive environment and the various learning outcomes associated during the implementation of the model. Closed loop digital control system is employed . There are two modes of operation and one is ON-OFF type or continuous type system. In ON-OFF type- Temperature is sensed, displayed and it is compared with set value. If it is greater, then it switches OFF the heating controller and if it is less, then switches ON the heating controller. In Continuous type- Temperature is sensed, displayed and it is compared with set value, If it in greater/less, then control the heat produced by heating element by changing its supply current. In this prototype ON-OFF type controller has been

developed. Here the sot value for temperature can be externally set by the user. The actual temperature is sensed by the temperature sensor. When displayed on LCD with the set value, If it exceeds the set value the heater is turned off. Alter then when temperature falls below the specified limit again heater is turned on.

II. PROPOSED SYSTEM

Fig. 1 shows the block diagram which has the temperature sensor to sense the temperature of food pan. The analog signal sent is converted into digital signal by means of analog to digital converter. The digital signal is received by the microcontroller. The set value for temperature for a particular dish is programmed. After receiving the signal, the microcontroller compares the set value and measured valve and activates the solenoid to open or close the gas input to stove. The LCD display shows the current temperature of the food pan.

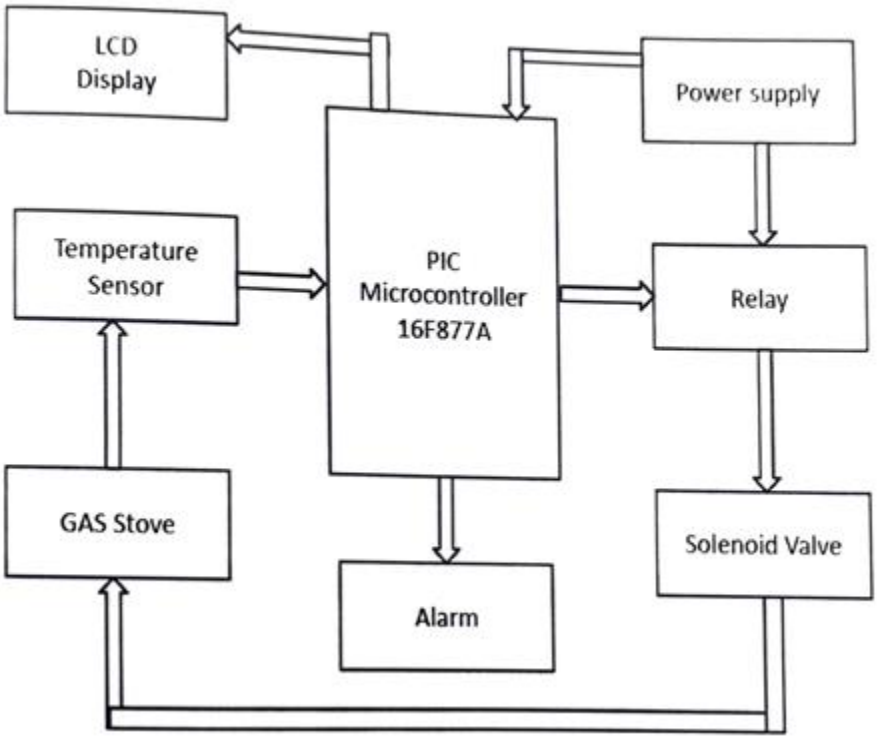

Fig. 1 Block Diagram

The model uses a precision centigrade temperature sensor LM35 which is capable of sensing the temperature. It gives the output in mV. This output is converted into corresponding digital data using in built ADC of the PIC microcontroller. LCD is interfaced with the microcontroller and the value of the actual temperature is displayed on the LCD. The LCD displays the present temperature as well as set temperature. If the temperature crosses the maximum value the solenoid valve is switched

OFF through a relay driven by a transistor connected to the microcontroller, If the temperature goes below the set value the solenoid valve is ON.

III. CIRCUIT DESCRIPTION

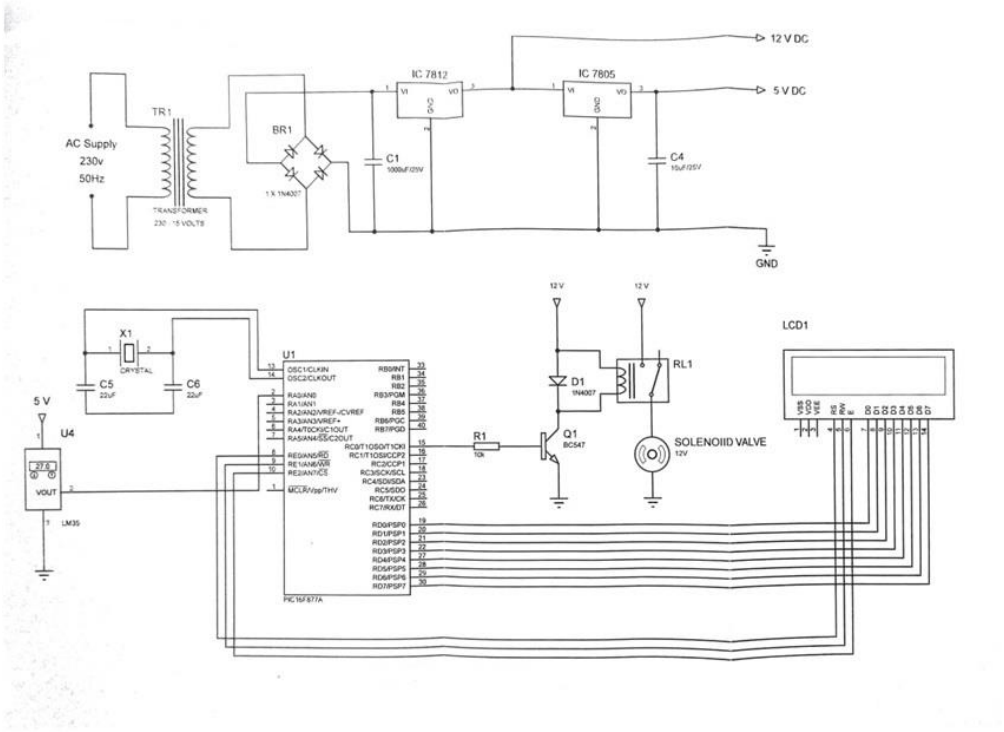

Fig 2. Overall Circuit Diagram

The output pin of LM35 temperature sensor is connected to the ADC inputs pin to convert analog to digital signal and then to port pin of microcontroller. LCD was connected to Port of the microcontroller.. ADC is put in use for interfacing with the temperature sensor and a program is written so that whatever temperature the sensor senses it can be displayed on LCD screen. A normally open relay was interfaced to Port C of the PIC microcontroller with the help of driver transistor to turn OFF the heater when temperature is above the set point Transistor was acting as a switch to turn ON/OFF the relay. A solenoid valve was interfaced with the microcontroller with the help of relay. Code was written such that the microcontroller can switch ON/OFF Solenoid with respect to set temperature.

IV.OUTPUT AND RESULT

Step by step procedure for testing:

- LPG Gas is connected to solenoid valve.
- Solenoid valve is connected to gas stove
- Temperature sensor is connected in food pan.

- Temperature sensor sense the temperature of food pan
- Compare the signal value with set value in the microcontroller.
- Display the value of current and set temperature.
- If the temperature is more than set value then the solenoid valve is closed condition.
- If the temperature is less than set value than the solenoid valve is open condition

When temperature varies ,the solenoid valve function automatically On/OFF.. If the temperature is more than the set value, the solenoid valve goes to OFF condition and the gas flow is stopped. If the temperature is less than the set value the solenoid valve turned to ON condition and the gas starts flowing to gas stove.

Temperature level (°C)	Solenoid valve
35	ON CONDITION
50	ON CONDITION
55	OFF CONDITION

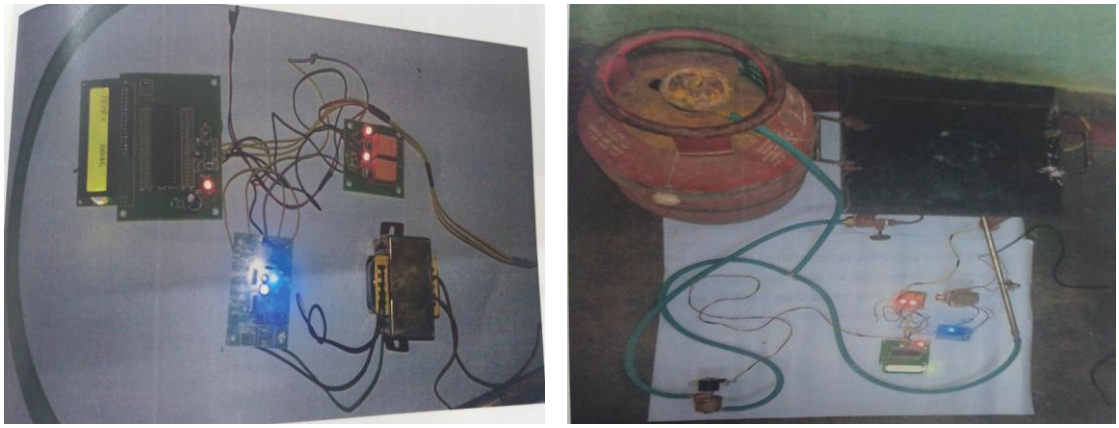

Fig.3 Prototype circuit and hardware model

V. CONCLUSION

The proposed system with prototype model is tested for selected food items like dosai and poori to maintain the texture and taste. The model is developed to ON/OFF the gas in flow to the stove to maintain the temperature of the food pan remain constant while cooking. The temperature sensor is fitted on the food pan as an embedded structure. Future model may be enhanced to control the gas inflow to the stove by automatically to keep constant temperature condition.

VI. BIBILOGRAPHY

1. Sandeep Kaushik, Charanjeet Singh, "Monitoring and Controlling in Food Storage System using Wireless Sensor Networks Based on Zigbee & Bluetooth Modules", International Journal of Multidisciplinary in Cryptology and Information Security,Vol.2, no.3, 2013.

2. Manoj Kumar Tyagi, Balanagu Raviteja, Rammohanarao Koduri and Gangi Raghu Ram, "Warehouse monitoring and management with the help of WSN and Solar energy", International journal of engineering science and advanced technology, Volume-2, Issue-3, pp 503–507, 2012.

3. Jedermann, R.; Lang, W.: Semi-passive internet of things and beyond: steps towards automated quality tracing in the food chain. In: International Journal of Radio Frequency Identification Technology and Applications(IJRFITA), Vol. 1(2012)3, pp. 247 – 259

4. LiuChuanju. the cluster greenhouse optimization design of the remote monitoring system under thenetworkenvironment.Journal of Multimedia .2012 (12): P82-84.