Controller for fully Automatic Rotary Oven

Dr.K.Vasudevan[1], Mr.J.Dineshkumar[2],M.Anbumani[3], M.Ramachandran[4], P.Saran[5]

[1]Head and Associate professor
[2]Assistantprofessor
[3,4,5]BSc Final Year
Department of ECS
VLB Janakiammal College of Arts and Science, Coimbatore, India

--***--

Abstract - Fully automatic oven are very essential in the field food processing industries and they play the major role but they remain very backward in technology they are fully based on electrical logics and external modules like temperature controller and timer module which is bit costly the other option for this is in the market is PLC which is more costly compared to normal electrical circuit and plc need converters to read sensor value, But with the help of single microcontroller based system we can upgrade this system and more advanced features can be added and stability can be provided with in low cost.

Key words: Timer, Temperature controller, Automation, baking, control systems, user interface, wireless communication, sensor network, arduino.
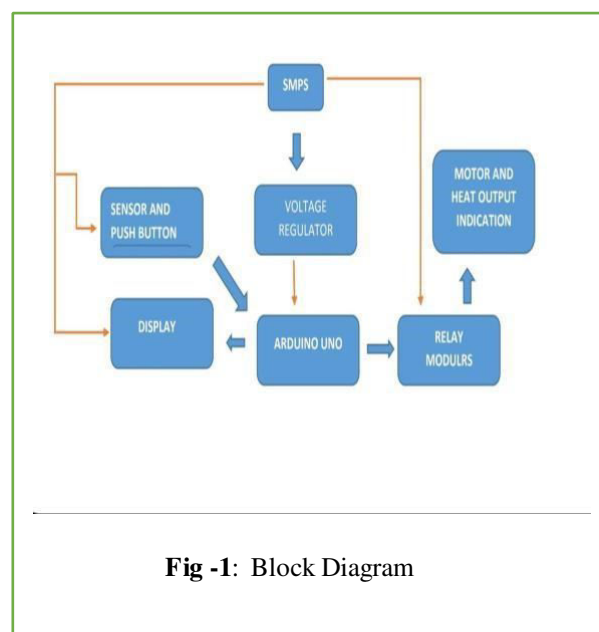
1.INTRODUCTION *(Size 11, Times New roman)*

According to todays world, the automation plays a major role in all kind of industry due to its stability, standard production and many advantages all kind of industries prefer automation. Our proposed system of rotary oven plays a major role in all kind of baking industry it is cheaper, it is popularly known for its low maintenance cost by the users So rotary oven has already established its Name. But the reason for proposing our system is the automatic concept of this oven is same for long based on contactors, timers and temperature controllers this system is very old, requires much space, and to much money and power The other option for this is in the market is PLC which is more costly compared to normal electrical circuit and plc need converters to read sensor value, But with the help of single microcontroller based system we can upgrade this system and more advanced features can be added and stability can be provided with in low cost which is impossible in above device All can be achieved 7 times lesser than the above modules. The proposed system is based on single Micro controller unit Atmega 328P which is Easily available and can do all the work which is done by the above modules hence it is very advanced and developed method .

Hence this will improve the efficiency of the oven in all term.

Fig -1: Block Diagram

2. WORKING METHODOLOGY

The atmega 238P will be monitoring all the inputs like pushbuttons and sensor values whenever the trigger is given by the push buttons it will show the data to the user using the display ,the display is acting as an user interface , if the oven function is started, the timer will start according to the food, and if the timer is running and the set temperature is ok the gear motor and blower will run alone if the temperature is less than the set temperature the heating element will also run along the temperature reading is taken using the temperature sensor. This how the oven controller works, all outputs are turned on and off using relays because the micro controller cannot power up the devices connected to it .
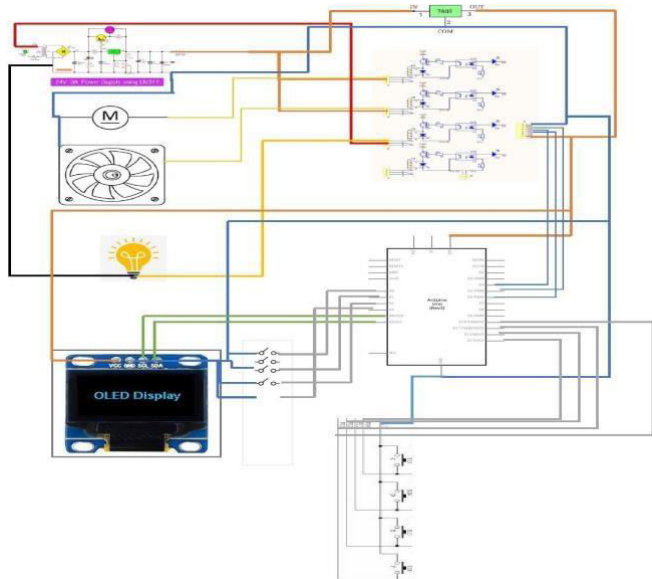
3. CIRCUIT DIAGRAM

Fig -2: Circuit diagram

4. FUTURE IMPLEMENTATIONS AND ADVANTAGES

The proposed system is capable of holding special functions and is capable of wireless communication with additional modules and touch screen GUI can be used for user interface

4.1 TIMEFACTOR

Like temperature controller the timer also plays a major role in the oven so these both combine, and work to gather for the good Quality of food the reason behind timer is if a food is only cooked for less time it will not properly baked if I it is baked too much the food will not be tasty to consume this is why the timer is used.

REFERENCES

[1].Programming Arduino: Getting Started with Sketches (Tab) 2nd Edition,- by Simon Monk

[2].Exploring Arduino: Tools and Techniques for Engineering Wizardry 1st Edition by Jeremy Blum

[3].Arduino Cookbook, 2nd Edition 2nd Edition by Michael Margolis

[4].Arduino Workshop: A Hands-On Introduction with 65 Projects 1st Edition by John Boxall

[5].The Best Convection Oven Cookbook Paperback – Import, 1 March 2003 by Lindra Stephen.

[6].The Convection Oven Bible Paperback – Illustrated, January 1, 2007 by Linda Stephen
indaStephen (Author The Convection Oven Bible Paperback – Illustrated, January 1, 2007 by Linda Stephen)

[7].Environmental Temperature and Material Characterisation with Planar Evanescent Microwave Sensors for Environmental Analysis Kindle Edition by The Book Club And Books About Everything (Author)Handbook of Gear Design Hardcover – 4 September 2001 by Gitin Maitra (Author)

[8].Easy Furnace Blower Motor Diagnostic Guide: Simple Permanent Split Capacitor (PSC) Furnace Fan Blower Motor Diagnostic Manual (Easy HVAC Guides Book 2) Kindle Edition by J S (Author)

[9].Industrial and Process Furnaces: Principles, Design and Operation Hardcover – 6 March 2008

[10] Encyclopedia of Electronic Components Volume 1 by Barrie Jenkins Dr. (Author), Peter Mullinger Dr. (Author)

[11].Practical Electronics for Inventors, Fourth Edition 4th Edition by Paul Scherz

[12].Electronics All-in-One For Dummies (For Dummies (Computers)) Paperback – February 6, 2017 by Doug Lowe.

[13].Cracking the Coding Interview Gayle McDowell ,2015

[14].The C Programming Language, 2nd Edition Brian W. Kernighan , 1988

[15].The Hundred-Page Machine Learning Book Andriy Burkov , 2019

[16].Programming Arduino: Getting Started with Sketches, Second Edition (Tab) Simon Monk, 2016

[17].Exploring Arduino: Tools and Techniques for Engineering Wizardry Jeremy Blum, 2013

[18].PIC Microcontroller Projects in C, Second Edition: Basic to Advanced Dogan Ibrahim, 2014

[19].The AVR Microcontroller and Embedded Systems Using Assembly and C: Using Arduino Uno and Atmel StudioSepehrNaimi, 2017

[20].Introduction to Mechatronics and Measurement Systems David Alciatore , 2011