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GHEE MAKING MACHINE

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Abstract: Ghee-making machine is a device designed to facilitate the process of making ghee. Ghee is a type of clarified butter commonly used in Indian cuisine. There are various types of ghee-making machines available in the market, ranging from small household appliances to larger industrial-scale equipment.

The basic functioning of a ghee-making machine involves heating butter in a vessel or tank, separating the milk solids from the liquid fat (clarification), and filtering the pure ghee through a fine mesh or cloth. Some machines also come with features such as automatic stirring, temperature control, and in-built filtration systems. While a ghee-making machine can save time and effort compared to traditional methods of making ghee, it is important to note that the quality of the final product depends on the quality of the butter used and the skill of the operator.

Sensors and the microcontroller-based automated intelligent ghee-making unit will greatly add technology to the individual kitchen. The proposed unit will increase the quality of ghee prepared and ensure uniform ghee. It is also cost-effective so that units can be greatly accepted by individual kitchens, especially in India.

Index Terms - Clarification, Thermocouples and Integrated Development Environment.

I. INTRODUCTION

Ghee (clarified butter) is a high-fat dairy product that has been widely used in India since ancient times. It was part of our culture. It is mainly used as food and fragrance. However, today ghee is still produced in steam-jacketed kettles in organizational departments, which inherently has several drawbacks such as low heat transfer coefficients, and unsanitary handling.

Mechanization of ghee production overcomes many of the problems associated with traditional methods but integrates large surface areas and high manufacturing costs to build machines. Considering the above issues, we decided to develop a system that can produce products of the same quality with a minimum capital investment so that they can be used for home use. It is an automatic machine that supplies fresh curd (yogurt) as raw material as ghee. Reduce human labor by replacing domestic ghee manufacturing processes with new automated processes. One of the main advantages is that the waste product from the process is just buttermilk, which can be used as a drink.

India is the world's largest producer and consumer of milk and dairy products. Ghee currently holds the second-largest share of the Indian market in terms of sales. With the growth of the organized sector of the dairy industry and the establishment of a modern dairy industry, the emphasis is on conducting research into newer, large-scale ghee production methods that can be economically adopted for routine ghee production by the Dairy industry. has moved. The method used by dairy products.

Various methods are used to produce ghee in the dairy industry. However, all ghee manufacturing processes are based on the same methodology or preparation process. Traditional ghee-making processes were mainly used to make homemade ghee. But rather than making butter from milk, dairy companies typically use a different commercial process. The ghee-making machine revolutionizes the traditional ghee-making process by incorporating advanced technology and automation.

II. LITERATURE SURVEY

Ghee-making machines that can streamline the ghee-making process at home. This literature survey examines the different types of ghee machines available on the market, their characteristics, and their advantages. A ghee machine is a valuable tool for anyone who wants to make quality ghee at home. Streamline your ghee manufacturing process and get consistent results. Literature research shows that there are different types of ghee-making machines on the market, such as solar-powered machines, machines for mass production, and machines that are easy to operate and clean. Consumers should check the features and prices of various machines before purchasing.

[1] "Development of ghee-making machine" by T. A. Sheik et al. (2019) This article describes the design and development of a ghee-making machine capable of processing up to 20 liters of milk at one time. The machine is made of stainless steel and designed for easy cleaning. The authors report that this machine can produce high-quality ghee in a relatively short time.

[2] "Evaluation of Ghee Machines Available on the Market" M.R. Singh and S. K. Gupta (2021) This paper provides a comprehensive overview of ghee-making machines. Available on the market. Authors rate machines based on characteristics such as capacity, materials, and ease of use. We also compare the prices of different machines and provide recommendations for consumers who wish to purchase a ghee-making machine.

[3] "Ghee Production from Milk by Ghee Machine" S. M. Tandel et al. (2021) This article describes the process of making ghee using a ghee machine. The authors report that the machine can produce high-quality ghee in a relatively short time and with minimal effort. We also provide a detailed analysis of the nutritional content of the ghee produced by this machine.

[4] "Design and Development of Solar-powered Ghee Machine," B.J. Patil et al. (2020) This article describes the design and development of a ghee-making machine powered by solar energy. The authors report that the machine can process up to 15 liters of milk at a time and produce high-quality ghee with minimal energy consumption. The machine is designed to be easy to use and operate even in rural areas where access to electricity is limited.

[5] Ghee-making machines can be a valuable tool for those who want to make high-quality ghee at home. They can streamline the process of making ghee and produce consistent results. The literary survey has shown that there are various types of ghee-making machines available in the market, including solar-powered machines, machines designed for largescale production, and machines that are easy to operate and clean. Consumers should evaluate the features and prices of different machines before making a purchase.

III. IMPLEMENTATION

The methodology to implement project is described as below.

1. Hardware Implementation
2. Software Implementation

1. Hardware Implementation:

- We give 12V supply to Arduino board through SMPS which is connected to power source.
- Load cell connected to HX77 module to convert analog readings to digital and connected to pin A0 and A1 pins of Arduino.
- Two channel relay acts like a switch between Arduino interface to motor and induction coil.
- Relay is connected to Arduino pins of 8 and 9 to receive instruction turn on and off.
- Induction coil is 230 V supply from source is connected to relay.
- DC motor is connected to relay and power supply is given from SMPS of 12V to provide mechanical stirring to the vessel.
- Readings from all the sensor is interface at Arduino and display using LCD board which is connected via pins 12,11,5,4,3 and 2.
- Arduino connections are made according to the requirements.
- A18V fan is put to radiate the heat, from the induction panel.
- Platform is made for loadcell to provide proper balance, so we can get the accurate reading.
- PVC stand is made to support the DC motor to work as the stirrer.

2. Software Implementation:

Include libraries.

- Define constants and variables.
- Pin assignments.
- Set up the Arduino board.
- Set the pin modes and initialize the LCD.
- Initialize Sensors.
- Start weight calibration.
- Calculate weight and display.
- Read and display temperature readings.
- Calculate calibration value difference between reference and current readings.
- If below threshold weight turn off the coil and retake readings.

This project involves several steps to set up and utilize an Arduino board with various components. First, the necessary libraries for the project should be included to access specific functionalities. Then, constants and variables are defined to store data and parameters used throughout the code.

Next, pin assignments are made to connect the components to the Arduino board properly. This ensures that each component is connected to the correct pin for data transfer and control. After pin assignments, the Arduino board is set up, initializing the necessary configurations for communication and operation.

Following the board setup, pin modes are set for the connected components, specifying whether each pin will be used for input or output. Additionally, the LCD (Liquid Crystal Display) is initialized, allowing for the display of information and feedback. The block diagram of ghee making machine is represented in the below fig.

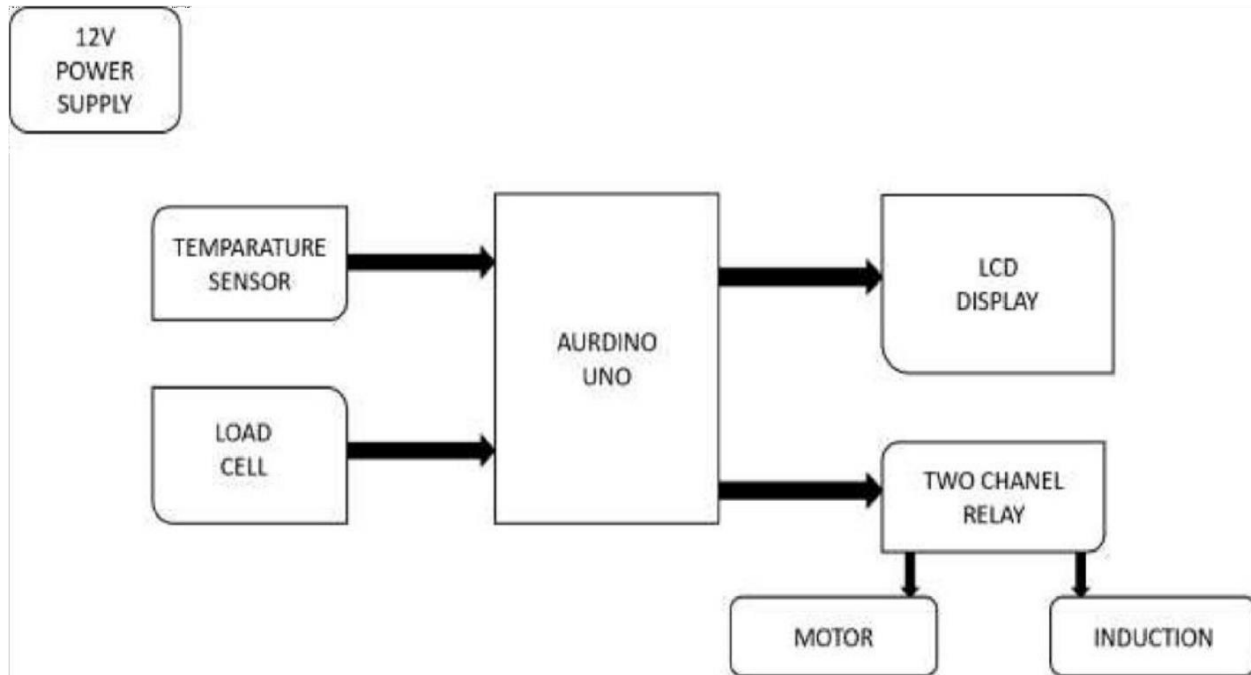


Fig: Block diagram of ghee making machine

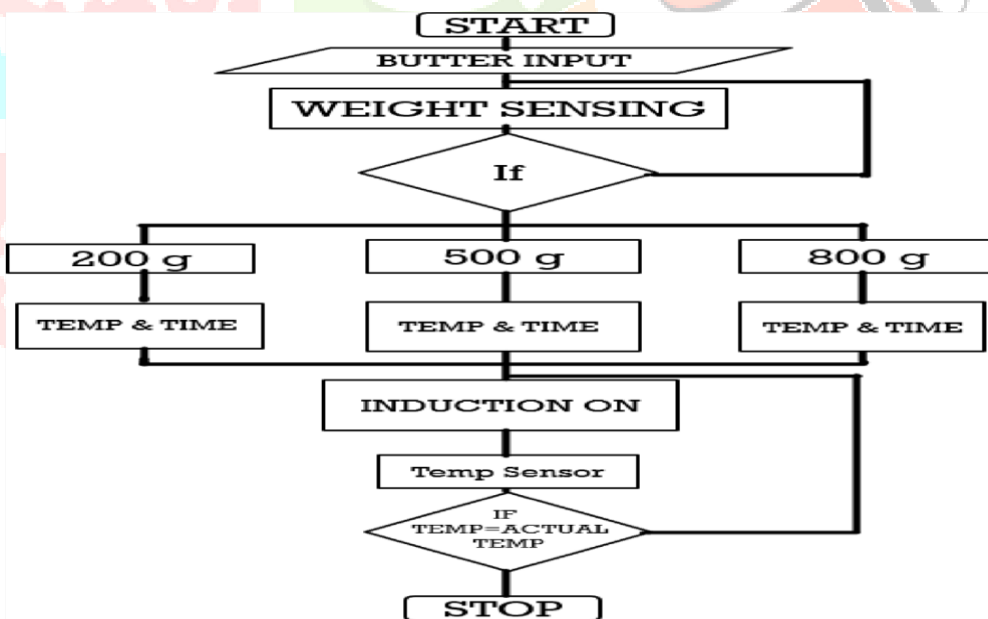


Fig: Flow chart of ghee making machine

IV. CONCLUSION AND FUTURE SCOPE

The ghee-making machine is a promising technology that can significantly improve the efficiency, accuracy, and quality of the ghee-making process. The machine consists of several critical components, such as the induction coil, temperature sensor, pump, valve, display, and servomotor, which work in tandem to perform the different steps of the ghee-making process. The use of the Arduino Uno board and the Arduino IDE for programming further enhances the capabilities of the machine. The ghee-making machine has several advantages, including increased productivity, reduced labor cost, improved process control, and consistent product quality. Additionally, it has the potential to cater to the growing demand for ghee, particularly in the food industry. Future work in this area can focus on several aspects, such as further automation of the gheemaking process, integration of machine learning algorithms to optimize the process parameters and the use of more advanced sensors for better

monitoring and control. Additionally, research can focus on the development of more cost-effective and sustainable methods for ghee production, such as using renewable energy sources for powering the machine.

Overall, the ghee-making machine presents a promising solution to meet the increasing demand for ghee while ensuring a consistent and high-quality product. With continued advancements in technology and research, the future of ghee-making is bright.

V. REFERENCES

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