



Automatic Cooking Machine using Arduino

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Abstract: 'Automatic cooking machine' as the name itself implies, cooking of food automatically without any human effort. Main aim is to make cooking easier, simple and less time consuming.[1] The machine will have pre-loaded recipes of your choice and the amount of ingredients will be specified in a C-language program, so you just have to choose the recipe you want to eat and the machine will start to prepare your food and notify you when the food is ready.[2] In present day scenario there is a rapid increase in inventions of machines which are based on automation process and they are used in every sector from home to industries. Our machine consists of induction cooker, bowls, oil and water pump, spice dispenser and some other components whose purpose is for stepwise addition of ingredients and cooking the food eventually. We have newly designed cooking pot which avoids the foods from burning. This machine can prepare food as close as food which can be prepared by a human hand. For communicating with the machine, we have installed a HMI interface through which we give command to the machine and every working process of the machine is controlled by Arduino2560 kit. This machine can be used in our day to day life and even in industries for mass production of certain food products.

Index Terms: Pre-loaded recipes, C-language program, Spice dispenser, Designed cooking pot, HMI interface.

I. INTRODUCTION

Automation process was introduced to society for human welfare. Quality of food prepared by different individuals differ in the taste but it is overcome in case of a machine, we can create the same quality of food every time. We can minimize errors and wastage of food in case of a machine. The machine provides quality food, reduction in cooking time and less supervision is required by the user. Industries use automation process in case of production of food products over a large scale.

I. OBJECTIVES

This machine can be used either on a small scale or even on large scale purpose i.e. it can be used in homes or even in industries respectively.

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If it is used on small scale then we can reduce the supervision time which we give in normal cooking of our food and we can reduce the chances of any errors which may change the quality of food which we are preparing. If it is used on large scale it will reduce the production time of food products, quality is not compromised, labour cost is decreased since there will be need of less supervision, so ultimately industries can gain huge profits by the help of automation process. We can store vast number of food products in the memory of machine for the production and a proper hygiene is maintained throughout the process.

This machine has following objectives:

- Automatic cooking of food is done.
- It does not use any gas so any hazard can be avoided.
- Quality of food is not compromised.
- We can store variety of recipes in the memory of machine.
- Less supervision is required in food preparation
- Proper Hygiene is maintained.
- Reduction in wastage of food.

Mechanical Parts and its working:

- 1) Bowls: We will put raw food ingredients in this.
- 2) Liquid Containers: For dispensing of water and oil in food preparation.
- 3) Main shaft: It will move the bowl carrying raw food ingredients and dispense it into the cooking pot.
- 4) Motor with pump: It gives water and oil for food preparation into the cooking pot.
- 5) Induction cooker: It is used to provide different heat temperatures to the cooking pot for food preparation.
- 6) Stirrer: It rotates the food ingredients present in the cooking pot so that the food do not get burned.
- 7) Spice dispenser: It will dispense required amount of spices and required spices into cooking pot.
- 8) CookingPot: It collects the spices, raw food ingredients, oil and water and prepares the food inside.

Electrical Parts and its working: -

- 1) HMI: It is used for communicating with the machine.
- 2) Arduino 2560: It supervises all the process of the machine and every instruction is loaded in it.
- 3) Power Supply: It gives power to every electrical equipment present in the machine.
- 4) Servo motor: It is used to move vegetables bowls and also in spice dispenser.

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- 5) Induction cooker: For providing heat to cooking pot.
- 6) Relay: For operating various switches automatically.

II. METHODOLOGY

For every food preparation there are different instructions provided and measures which should be taken before we start the cooking process. In our project we have provided instructions for cooking of these products: i.e. Maggi, Kadhai Paneer, Chilly Paneer.[2] Each dish has their own set of instructions provided and the dish will be prepared in stepwise manner. Induction is turned on and the heat is also adjusted automatically for every dish preparation and proper cooking of food.[3]

Note: We have to put vegetables or raw food into the bowl provided. Suppose we want to cook maggi then we have to put raw maggi into the bowl provided.

Various steps for cooking are:

Step 1

Select the recipe from the HMI which you want to cook



Step 2

A new spice control menu will be open asking Automatic or Manual



Step 3

After choosing automatic a new menu will open as shown below



Step 4

After selecting manual option, you need to select the spices and its quantity.



Step 5

On choosing next induction is powered on automatically

Step 6

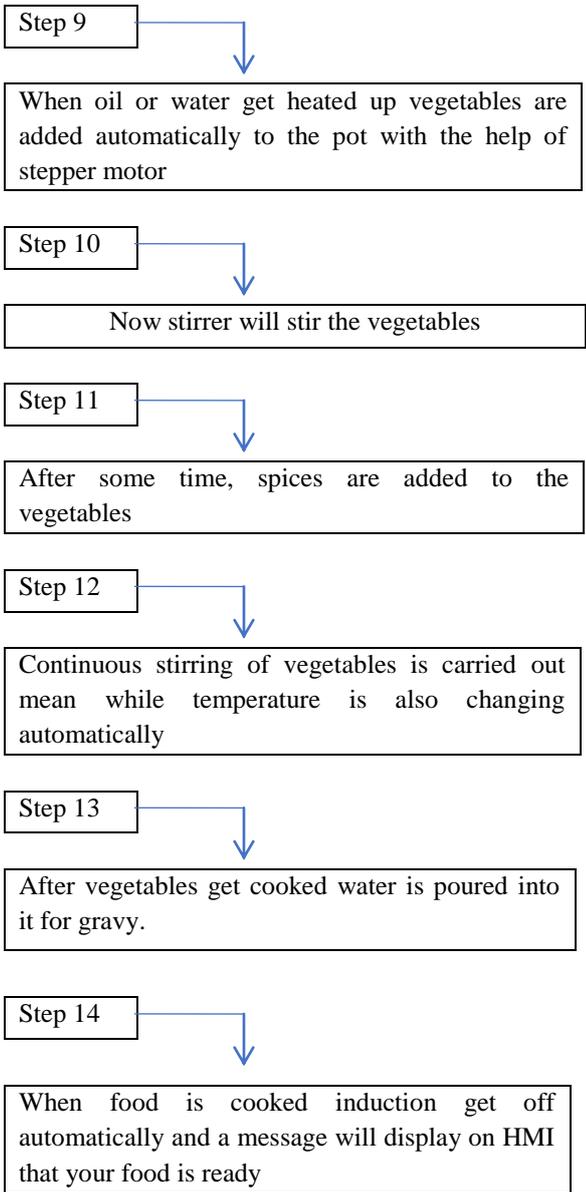
After that cooking pot lid automatically opens with the help of stepper motor

Step 7

Now the oil or water pump will on according to recipe selected and required amount of water or oil is poured into cooking pot.

Step 8

After that induction will automatically set the required temperature



III. EXPERIMENTAL VERIFICATION



Figure 1- Front view of cooking machine.

Each ingredient is added in step to step wise manner with addition of oil and water with the help of motors and

pumps respectively. Raw food and spices are also added in stepwise manner.[4]



Figure 2- Cooking Pot Design

We have shown our cooking pot in above figure which is placed on the induction and every food is prepared in this pot within the specified time.



Figure 3- Result of selecting maggi recipe

Maggi is prepared within specified time without any complications in the process.

V. RESULT AND ANALYSIS

These are the results obtained after various experimental verifications:

1. Test is carried out repeatably.
2. Wastage of food is reduced.
3. Proper hygiene is maintained in food preparation.
4. Those who even don't know cooking can cook with the help of this machine.
5. This machine can be used in home as well as in restaurants.



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6. Burning of food due to human mistake is eliminated.
7. Quality of food is same all the time.
8. Labour cost is reduced since less supervision is required.

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