

Design and Fabrication of Mudde Making Machine

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Abstract - A mudde (type of food made out of flour of Ragi, Maize, Jowar, and other millets) making machine is designed and fabricated. The specified machine is capable of producing 6 kg of mudde in an hour. This machine is useful for domestic usage and also for small hotels. Mudde, a lump of boiled; perfectly kneaded food made out of flours of Ragi, Jowar, Rice and other millets is very nutritional. The conventional method of preparation of mudde is laborious and time consuming. To ease the preparation of mudde and to save time, a simple machine is designed and fabricated. This machine mainly consists of a stainless steel tube which houses a stainless steel screw conveyor. The stainless steel tube assembly rests on a mild steel stand. The other components of the machine are; feeder (hopper), handle, exit cone, Plummer block bearings, cup, swivel L tube, parting plate. A gas burner is used to supply heat to the stainless steel tube. In this paper, preparation of only Ragi mudde is described.

Keywords -Mudde, Ragi, Screw conveyor, Stainless steel tube.

I. INTRODUCTION

MILLETS: Millets are often called as a group of variable small grass seeds. Ragi, Pearl millet, and Foxtail millet are some of the important millets. Consumption of the millets has been practiced since the beginning of the ancient civilization of the world; generally the millets are small grained, annual, warm weather cereals belonging to grass family. They are highly tolerant of extreme weather conditions such as drought and are similarly nutritious among major cereals such as Rice and wheat. Millets are most important crops in the semiarid tropics of Africa and Asia like in Mali, Niger, India, and Nigeria. More than 99% of production is done in developing countries. Millets play an important role in food staples of human history, particularly in Africa and Asia. Millets have been in cultivation in Asia from last 15,000 years.

II. TYPES OF MILLETS GROWN IN INDIA

- Sorghum (jowar)
- Foxtail millet
- Finger millet (Ragi)
- Pearl millet (Bajra)
- Barnyard millet
- Kodo millet
- Little millet
- Proso millet

III. RAGI (FINGER MILLET)

Eleusine coracana, or finger millet, is an annual herbaceous plant widely grown as a cereal crop in the arid and semiarid areas in Africa and Asia. It is a tetraploid and self-pollinating species probably evolved from its wild relative Eleusine Africana. Interesting crop characteristics of finger millet are the ability to withstand cultivation at altitudes over 2000 meters above sea level, its favorable micronutrient contents (high iron and methionine content in particular), its high drought tolerance and the very long storage time of the grains [1]. Finger millet is native to the Ethiopian and Ugandan highlands [2].

IV. TRADITIONAL METHOD OF MAKING RAGI MUDDE

Ragi mudde, a store house of multi nutrients, has only two ingredients, the Ragi flour and water. A known quantity of water is boiled in a wide mouthed vessel. A known quantity of Ragi floured is poured gradually into boiling water. A steady heat is supplied (medium flame in case of gas stove).

Now the batter (mixture of flour and hot water) gets lump like structure. Later with the help of a wooden stick the lump is kneaded to get smooth dough like consistency with no lumps. This hot dough is then rested on low heat before rounding them on a wooden board into tennis sized balls with wet hands. Thus prepared Ragi balls are served along with sambar (saru) in a plate. The served mudde is made into small pieces called tutthu (Kannada word mouth sized piece) using fingers and swallowed hot dipping them in 'saru'. It is not supposed to be chewed. Mudde, by itself, does not have a strong taste. Hence Ragi mudde is traditionally eaten with saru.



Fig.1.RagiMudde

III. PARTS DIMENSIONS

Parts used for making Mudde Making machine are mentioned in the table 1 below.

Table 1

PARTS DIMENSIONS	
SS TUBE	82mm diameter, 500mm length,
SS SHAFT	20mm diameter, 800mm length
PLUMMER BLOCK	20mm diameter bearing
CAST IRON FLANGE	170 mm external diameter, 82mm internal diameter, 10mm thickness
ALUMINIUM FLANGE	170mm external diameter, 20mm internal diameter, 250mm length
OIL SEAL	20mm diameter seal
GAS BURNER	290mm length
EXIT CONE	95mm length
CUP	90mm diameter
PARTING PLATE	90mm length, 110mm width, 1mm thickness
NUT,BOLT,WASHER	M10 nut, bolt with washer

VI. ISOMETRIC VIEW OF MODEL

Geometric Modelling of the Mudde making Machine was done using Solid works software and Fig. 2 shows Isometric View of the Prototype.

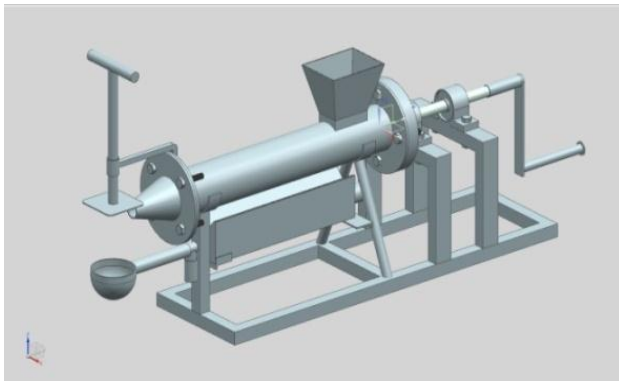


Fig. 2. Mudde Making Machine

PROCEDURE

- It consists of SS Tube, Flange, Screw conveyor, Plummer block, cup, Parting plate, Hopper, Exit Cone, Handle, Gas burner, Stand, Handle etc.
- Through the hopper, required quantity of water is poured into the stainless steel tube housing. Heat is supplied to the housing with the help of burner.
- When the water is start boiling, calculated amount of desired flour (or mixture of flours) is poured gradually. With the continuous supply of heat, the batter is getting hard. After required consistency is obtained, stop the supply of heat.
- The main process in the preparation of the mudde is kneading. Conventionally, kneading is done manually.
- The process of kneading is a hard job for women cooks. With this mudde making machine, kneading and thorough mixing of lump of mudde is done using screw conveyor by rotating the handle which is mounted at one end of the screw conveyor.
- After proper kneading, the lump of mudde is taken out by opening the end cap through the exit cone by rotating the handle. The mudde is then taken into the cup to have hemispherical shape.

- After the cup is filled, with the help of parting plate, parting off is done. The parting plate also presses mudde to exactly fit to the cup for easy serve.

VII. RESULTS

- This machine takes time for mudde in 20mins and it produces 30 mudde in 1 hour.
- Mudde weight will be 200gms.
- It costs about 15000.
- It can be used for hotels and canteen.
- It is continuous process of making ragimudde.

VIII. ADVANTAGES

- Mass production is easy.
- Procedure is more hygienic compared to manual.
- Time reduction.
- Shape and size of Mudde can be maintained accurately

IX. CONCLUSION

- Time required for preparing mudde in houses and hotels can be significantly reduced by using this machine.
- Time required to prepare mudde is 20 minutes and it produces 30 mudde in 1 hour.Hence the time required to cook large amount of mudde is minimized.
- This device is not specific only for ragi. I.e. other type of flours can also be made used like Rice, Wheat etc.
- The cost of the machine is ₹ 15000 and it is easy to handle when it comes to operation
- This machine is aimed to produce mudde in large scale, hence it is not recommended to use in houses.

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