AUTOMATIC DOSA MAKING MACHINE

Mr.D.Meganathan[1], J.Rajasekar[2], V.Praveen Kumar[3], S.Rajesh[4], S.Umashankar [5], M.S.Prakash[6], N.Saravanan[7], P.J.Moneshraj[8], Sundar[9],Tejkiran[10]
Assistant professer[1]
Department Of Mechanical Engineering
Prathyusha Engineering College,
Aranvoyal kuppam, Thiruvallur.
Email: d.meganathan17@gmail.com

Abstract: *The aim of the project was to "Design and fabrication of automatic dosa making machine" for commercial usage in modern lifetime by considering expenditure, useability, safety, uncomplicated maintenance. Dosa is an unavoidable food item in most of the indian holds.*

In this paper, research has been conducted around countryside areas of Kerala, by asking more than a few questions to understand the requirements and difficulties of the rural people for making dosa. During the research some simple conventional dosa making method were studied and adopted for concept selection and mechanism. Market study was conducted to understand the current dosa making methods, and several dosa making machines were studied in this market study. In this paper, project has been conducted by asking several questions to understand the requirements and difficulties of the people for making dosa. The product design specifications have been observed and procedure for design and fabrication of automatic dosa making machine. The final design was modeled and it consist several mechanism.

Key Words: *Automatic dosa making machine, heating assembly, pouring assembly, rotating part.*

1. INTRODUCTION:

The main aim of this project is to conceptualize, design and fabricate a fully functional automated portable Dosa making machine. It makes Dosas automatically at the press of a button without the need for human intervention in its cycle of operation. The point of making it portable was so that it could have the same mobility as a household appliance while making what is usually a daily activity an effortless task that doesn't require your attention. Another advantage is the drastic decrease in cost as compared to other machines with similar purposes available in the market. One such machine is currently sold for about 1.5 Lakhs which is a staggering amount. This machine will give people without "skilled labour" access to quick, tasty and convenient Dosas. It also saves time and requires practically no supervision. Dosa is an traditional food item commonly used in Indian homes. Dosa is stable dish and it is a typical assembly of the south Indian diet and trendy all over the Indian subcontinent. Its main ingredients are rice and black grams. It is easy to make in short time. It is a stable dish in South Indian states of Kerala, Tamil Nadu, Karnataka, Telangana, and Andhra Pradesh, and several countries like Nepal,SriLanka, Singapore, and Malaysia. To improve the commercial purpose of the food production feilds by introducing automotive machines in food industries. Retail shops are the major source of purchase of Instant Food Products like Dosa and idli. The heating assembly is very important in dosa making machine. One of our most important primary objectives is to have machine that makes heat on the dosa pan at the touch of a bottom. It also looks to reduce the cost of heating source such as fuel or electricity.

2. LITERATURE REVIEW:

History of Dosa and Dosa Making Pans

According to food historian K. T. Achaya, Dosa (as dosa) was already in use in ancient Tamil country around 1st century AD, it has been mentioned in Sangam literature.

According to P. Thankappan Nair a food historian, dosa originated in the Udupi town of present-day Karnataka. The basis of dosa is correlated to Udupi, because of the dish's association with the Udupi restaurants. The original Tamil dosa was softer and thicker compared to the dosa we know today. The thinner and crispier dosa was first made in Karnataka. And it became very popular all over India. [2]

Dosa is an inseparable part of South Indians life. Now a days, the same pattern of preparing dosa is used in all places. But instead of using cast iron or stainless steel pans, people use non-stick pans. A non stick pan is required oil before pouring the dough on to the pan

Market Study:

Around 95% consumers of Dosa/ Idli, prepare it at their own home. Rest of the people consumes it in hotels and restaurants. Retail shops are the major source of purchase of Instant Food Products like Dosa and idli. There are products available in the market, that are capable of preparing different types food items like roti, dosa etc

2. MATERIALS:

Pan material- stainless steel

In metallurgy , stainless steel, also known as inox steel are inox from French inoxydable, is a steel alloy with a minimum of 10.5% chromium content by mass. Stainless steels resistance to corrosion and staining, low maintance. It can be rolled into sheets, plates, bars, wires and tubing to b e used in cookware, surgical instruments, major applications.

Shaft:

Using stainless steel the shaft is manufactured. It is used to transmit power from gear box to pan.

Gas burner:

Gas burner is a mechanical device that burns a gas or liquid fuel into a flame in controlled manner.

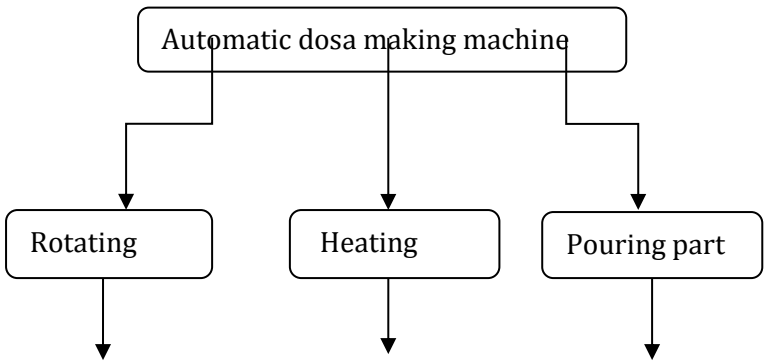
3. METHODOLOGY:

In dosa making process, the dosa is prepared automatically. The dosa making process consist of three main assemblys. They are,

1) Heating assembly.
2) Pouring assembly.
3) Rotating assembly.

In heating assembly, the rotating pan is heated by using gas power. The heat is distributed throughout the pan uniformly. Gas heating is convenient and easily controlled. While burning gas causes little local air pollution. The batter is poured on the rotating pan using pouring assembly. The pouring batter is heated by gas power and after this the dosa is removed from the rotating pan. The pan is mounted on the shaft. The shaft is connected to the gear box and it is rotated by using motor. The gear box contains worm and worm wheel. The rotating pan is made up of stainless steel. In that stainless steel coating is applied. Stainless steels are used because of their corrosion resistance in a wide variety of service environments, usually without additional coatings. In certain circumstances, however, stainless steel components or structures may require a coated (paint) finish. In stainless steel material Abrasion paint is used. Stainless steel should be coated in a galvanized metal-etching primer, using a paintbrush man-made for latex paints. After the primer cures for 4 to 6 hours, painting can begin.

In this dosa machine four dosa are prepared at one rotation. Gas heaters can run on either natural gas or LPG. Gas heaters come as gas space heaters and decorative gas fireplaces.



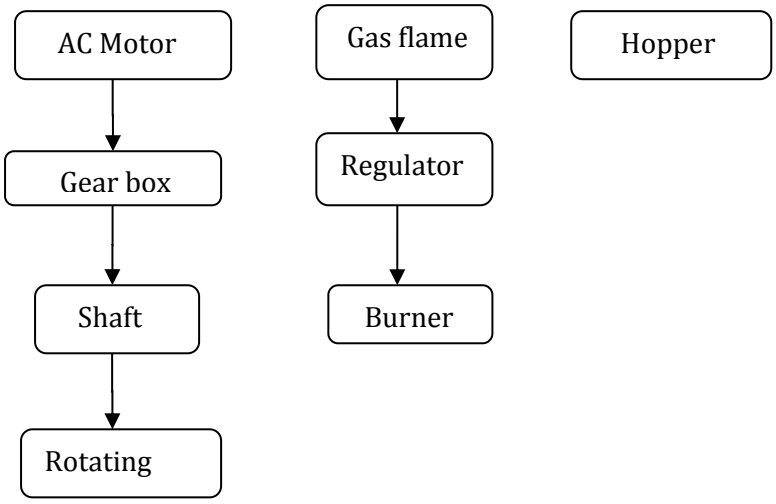


TABLE:

S.NO	COMPONENTS	MATERIAL USED	SPECIFICATION
1.	Pan	Stainless steel	900mm(diameter)
2.	Shaft	Mild steel	50mm (diameter)
3.	Frame	MS sheet	
4.	motor	AC Motor	1HP
5.	Worm and worm wheel	Brass	120mm &30mm
6	burner	brass	800 mm
7	Ball bearing	Ss steel	50mm
8	Pouring basin	steel	300mm dia *600mm height
9	Timing sensor	semiconductor	
10	weight		110 kg
11	Heating source	LPG	1
12	Power source	motor	220 volt 736 watts

4. ANALYSIS:

- The diameter of a burner is 685mm which is used for heating a pan, so the area of heat distribution is larger.
- More than 1000mm diameter of a pan material can be heated constantly.
- The large quantity of a dosa's are made with a less time consumption. In this project 350 dosa's per hour can be achieved.

5. DISCUSSION:

Requirements of this project are given below,

- Aesthetic
- Reduction of human efforts
- Energy consumption
- Hygienic
- Ergonomics

6. CONCLUSION:

The design and fabrication of heating assembly of the automatic dosa making is discussed in this paper. We use gas power energy for safety and for preserving high quantity with less time consumption. The automatic dosa making machine is used in hotel, restaurant, small scale industries and individual business related. The gas heating is more convenient and you can control the temperature with thermostat and using regulator. This project helped in understanding the research methods, material selection process, designing for manufacturing and manufacturing methods.

7. RECOMMENDATIONS:

- Suitable coating of material should be done to avoid corrosion.
- Maintenance of a motor under heavy voltage can give a life span .
- Proper oil usage in gear box can give efficient yield .
- Required coating to be applied for avoiding chemical reaction of pan material with food .

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