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## Mini Flour Mill And Dough Maker

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**Abstract :** The Flour milling facilities has been the cornerstone of agricultural processing for the centuries. The Like most agri-industrial production facilities, flour milling facilities have a number of the unique design for the requirements. The machine is used for the milling of flour(dough)to a higher degree for food manufacturing without damaging the nutrients. In the construction of the design, It is expected to use for indigenous technology and to increase the efficiency for minimise cost and maximise benefit. The machine design to use the main drive shaft as means of speed reduction. It is very cheap to maintain. There is still the need for improvement on design of dough mixers despite the availability of a number of them in the market. It is required that for the constituents be mixed efficiently at a shorter time. The dough mixer has been designed for this purpose. Flour kneading is the time-consuming task for most of the people in home and in many small industries or bakeries.

**Keywords** – Flour Kneading, Dough Maker, Mini Flour Mills, Stone Mil, Whole Wheat

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### I. INTRODUCTION

Flour is used in the daily process for making chapattis, roti naan any more. Flour is the essential raw material for many of them which consist of more amount of 90% wheat flour is the predominantly used in the food items on the daily basis as it is most essential product for daily consumption in India.

The flour mill machine is another product on our product range. Our company has supplied the flour milling machine to several countries across the world. The flour mill machine processes wheat to produce fine flour mills for roti, chapati and a wide range of other wheat products.

Our flour mill machine is made by combining the latest technology, highly specialized engineers and top of the range production material. The flour milling machine like all of our other machines has been tried and tested all around the world and our clients are satisfied with its performance and durability. The flour milling machine complete line is made up of the cleaning section, milling section and the packaging section.

the Dough is typically is made by mixing flour with a small amount of aqua or other liquid and sometimes includes yeast or other leavening agents, as well as ingredients such as fats or flavorings. Dough can be made from a wide variety of flour, commonly wheat and also rice, and other cereals or crops.

This machine design evaluates the manual, tiresome old traditional is method of mixing dough. It is simpler and more convenient way of mixing dough from its components of water, flow and little oil to the final product which is the dough to make the chapattis.

The machine is designed for small scale production, when a large amount of chapattis are needed this may include restaurants, hotels, home, bakeries, and even and can be hired for making chapattis in ceremonies and events.

The machine is a solution to economizing production in the various areas stated above and also caters increases the production of chapattis indirectly per unit time. There are already many dough making machines, but they have the problems like cleaning, high cost and time consuming.

## II. PROBLEM DEFINITION

### 2.1 Problem Statement

- A dough maker is use for household as well as industrial purpose. now, the desire of floor mixing increases because demanding hotel, bakeries, etc.
- Now we are basically targeting situation where we need instant floor and dough making like in some Indian villages there is no flour mill near home. Hence, they walk through such a long distance. So, the machine we have designed can do both jobs of flour and dough making.

### 2.2 Objectives:

- For grinding small amount of grains is possible, as per requirement.
- At same time it is convert in dough.
- Rusting of parts is left.
- Everyone can afford.(Comparatively others).

## III. METHODOLOGY

### 3.1 Part List and Components:

#### 1. Parts to be purchased

Table 3.1.1 Parts to be purchased

Sr.no.	Parts	Specification
1.	Motor for dough making	751-1000watt single phase mixer grinder motor, 240 V.
2.	Motor for grains grinding	Permanent magnet DC motor 24volt 250watt
3.	Hopper	Use to store grains Dimensions: 100mm dia.
4.	Grinding stonesx2	Use to make flour Dimensions: 100mm dia.
5.	Water container	To store water Dimensions: 40mm dia.- 200mm length

#### 2. Parts to be manufacture

Table 3.1.2 Parts to be manufacture

Sr. No.	Parts	Specification
1.	Casing of flour grinder	These part is use to cover flour making stones and also use for to suggest way to the flour. Material use is sheet metal. Dimensions: approx. 130mm in dia. 30mm width
2.	Dough making container	It is steel pot we use to mix flour and water/oil and making dough. Dimensions: 200mm dia. ,200mm height.
3.	Outer body	It is outer structure of our machine made up of by wood Dimensions: approx.600x300x300 mm.
4.	Inside support systems	Use some M.S. square rods to support required components Dimensions: 30x30mm.

### 3.2 Description of Part List and its components:

#### 1. Motor for dough making



Fig 3.2.1 Dough Motor

This motor is use for dough making, we connect these motor below the dough making container and use like mixer and the dough. Specification: 751-1000watt single phase mixer grinder motor, 240 V. core size 32mm of copper.

#### 2. Motor for grains grinding



Fig 3.2.2 flour making motor

This motor is for making flour from grains, it is connects to the one grinding stone and another stone is fixed  
Specification: Permanent Magnet Dc Motor 24 Volt 250-Watt Output, This Electric Motor with Gear Reduction Produces More Low-End Torque Than Your Standard Motor.

#### 3. Hopper



Fig 3.2.3 Hopper

Its like a larger funnel. A Hopper is the top and narrow at the bottom, used for wheat, rice into a big opening. The term "hopper" may refer to the chimney or smokestack on a steam locomotive and commonly refers to the same on a ship. Specification:-Diameter 100 mm, length 100 mm. Material:-Stainless Steel.

#### 4. Grinding stone



Fig 3.2.4 Grinding Stone

Stone grinder or Industrial atta chakki is used for grinding of wheat, rice to make whole flour. the Stone grinders has been two circular grinding stones in a closed body. One stone turns against to a stationary stone and with this is action grinding of grains takes place. Specification:-Diameter - 140 mm. Material:-stone.

## 5. Water container



Fig 3.2.5 water container

The water bottle is a container that is used to hold water, liquids or other beverages for making dough. This water bottle is placed vertically and a small hole is made at the bottom of the bottle, from which water is dropped to the dough-making container. Diameter:- 40 mm Diameter. Length:-200 mm. Material use:- metallic, Plastic.

### 3.3 Construction of Machine:

In construction solution we add some manufacturing processes for fabricating our mini flour mill and dough-making machine, then some processes are explained further.

We are manufacturing some parts are:

- Outer body made by wood or acrylic sheets
- Casing for grinding stone
- Some support systems

#### 3.3.1 Outer body made by wood or acrylic sheets

For making the outer casing of wood, first we cut the plywood as per requirement, then after that we join the plywood's which are cut, these are joined with the help of nails / small screws. We are making the outer casing like shown in fig.



Fig 3.3.1 wood casing

#### 3.3.2 Casing for grinding stone

Casing of these is made by the metal sheets for that first we cut all sheets part as per dimensions, after that we join them with the help of welding or by rivet joint, the actual shape of our outer casing is shown in fig.



Fig 3.3.2 grinding stone casing

### 3.3.3 Support system

Support systems are mainly use for to carry grinding systems there are motor. Grinding casing and grinding stones. For carry these all parts we use to fabricate hollow square rods of 30x30mm. These rods are stand by using wood body and join by nut and bolts are showing in main assembly.

### 3.4 Working of the Machine:

We build a machine for making dough and only making flour. It is small machine we are making it is use full for daily purpose making to make dough for rotis and breads these machines is making this dough. So actual working of these machine is,

1. First, we are to cast grins in hopper and same time we cast water and oil mixer to the water bottle.
2. After that start machine than from hopper grains are entered between two grinding stones and grains are turns into the small particles to the flour.
3. We adjust the one stone to adjust the practical size of flour.
4. If flour is done flour is go to the dough making container there is a rotating blade is already rotating and from water bottle water droplets are continuously drop and mixing in the flour particles.
5. This process is continuously doing if grains are in Hooper.
6. Hopper size is maximum as machines capacity.
7. If we don't have dough than of the motor of dough making and supply of water.
8. If we only have dough then off the motor of flour making but, then you already put flour in dough making container.
9. If dough and flour is ready than remove the dough making container.

## IV. COST ANALYSIS, 3D CAD MODEL AND RESULT AND CALCULATION

### 4.1 Cost Analysis:

Table 4.1 Cost Analysis

Parts	Cost (Rs)
Motor	
Motor for dough making	500/-
Motor for grains grinding:	700/-
Hopper and bottle	300/-
Grinding stones	600/-
Wood / acrylic sheets	1000/-
Metal sheet	500/-
Supporting system	500/-
Electronic components	200/-
Other	500/-
Total	4800/-

\*Maximum budget is. Rs.6000/-

### 4.2 3D Cad Model:

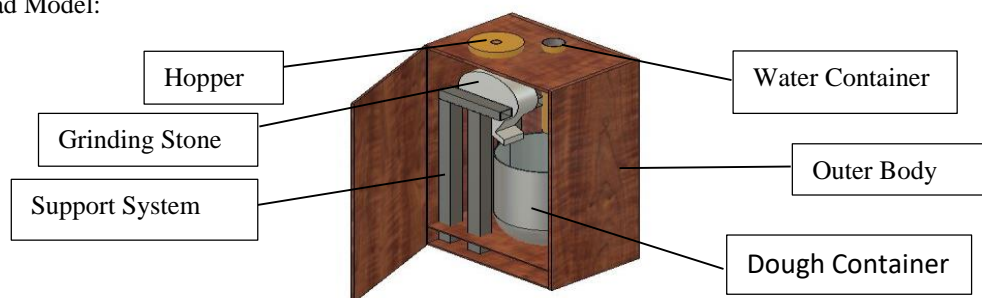


Fig 4.2 3D CAD Model Using Autodesk Fusion 360

#### 4.3 Result and Calculation:

Our working model is not ready yet but with the help of components and our cad model we visualized all points in. We are use two types of motor one for dough making and one for flour making for both motor we required more torque as compare to speed then we calculate the below different torques in different rpm, but use two motors with different power.

$$\text{Power in (kw)} = \text{Torque (Nm)} \times \text{Speed (RPM)} / 9.5488$$

From these formula we calculated following values:

\* For motor 1 (use for dough making) power = 750–1000-watt use 1kw

Table 4.3.1 For motor 1 Torque and Speed

Torque (Nm)	Speed (RPM)
14.24	500
7.12	1000
4.75	1500
3.56	2000
2.37	3000

\*For motor 2 (use for flour making) = 250 watt use 0.250 kw

Table 4.3.2 For motor 2 Torque and Speed

Torque (Nm)	Speed (RPM)
7.12	250
3.56	500
1.78	100
0.89	2000
0.59	3000

## 5. CONCLUSION

Flour mills, which are sometimes referred to as grain mills, break down the grain into smaller parts and separate them. These machines can range in size from a small version that will fit in the kitchen, to a large commercial version made for manufacturing space. The one fact we cannot ignore is that such machines can make a life easier for us. Dough makers and mini flour mill are no more a luxury. Both flour mill & dough makers in a same assembly can save a lot of time and energy. We can fabricate them in different shapes, varieties, and sizes as per requirement Domestic, Industrial etc. We are make our 30% of project in that we select our parts and components and also understand how to build our project so we now start the making of actual model from December and probably we complete at the end of March.

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