



## RESEARCH ARTICLE

### DESIGN AND DEVELOPMENT OF GINGER GARLIC PASTE MACHINE

\*<sup>1</sup>Roshan P. Ghodkhande, <sup>2</sup>Swapnl M. Naranje, <sup>2</sup>Pratik R. Madekar,  
<sup>2</sup>Rohit O. Thakur and <sup>2</sup>Shubham C. Vaidya

<sup>1</sup>Assistant Professor, DMIETR Wardha, Maharashtra, India

<sup>2</sup>BE Mechanical Engg Student, DMIETR Wardha, Maharashtra, India

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#### ABSTRACT

Ginger and Garlic Paste is mainly used as a condiment in various food preparation and also serves as a carminative and gastric stimulant in many medicine preparations. As a condiment, it is used for flavoring mayonnaise and Tomato Ketchup sauce, Salads, meat sausages, chutney, pickles, Biryani, Fried Rice etc. The project is about fabrication of mechanical crusher which would help to making a paste for full size ginger and garlic material. This project aims to design a crusher that could be installed anywhere and would aid crush of full size ginger and garlic. This project involves the process of designing the crusher considering forces required for crushing and ergonomic factor that an operator needs. The design of this machine is such that it would require optimum load to crush and will not strain the user or operator. The crusher is designed based in the simple principle or a mechanism which is Crank and Slotted Lever Mechanism where the rotary motion from the motor is connected to crushing plates that crushes materials. The Designed components were then assembled and analyzed using analysis software and the required dimensions of the crusher for the optimum performance have been found. These data's were then transformed into a real time model by manufacturing it. The designed crusher was then checked and the crusher effectively crushed all the components with ease and with reduced human effort.

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## INTRODUCTION

Spices are most important constituents of Indian food and cuisines, and are used not only for household purpose, but also in hotels, restaurants, eateries and food processing industries. In the regions where spicy food is consumed, Ginger-Garlic is an important part of most recipes. Ginger-Garlic is used in whole, grounded form-pure and also forms part of various blended special purpose spices, which are used to add flavors to various dishes throughout India and Asia. Turmeric finds application in oleoresin production also. Like Ginger-Garlic, used in pure and as a component in blended spices for various Indian dishes. In all the regions of the state, garlic and ginger are grown abundantly and consumed as such. It is consumed daily, in every house. In present days customers are more attracted towards instant foods, instant mixes, spices etc. The ginger and garlic paste has good market potential. If the product is manufactured and packed in small quantities such as 50 gms and 100 gms packets. The market is widespread specially in rural areas. It is ready to use item which is consumed in all households.

In urban centers the demand for ginger garlic paste is very good and can be supplied on commercial scale in bulk. The conventional technique of preparing ginger and garlic paste consists of removing the outer skin of ginger and garlic, peeling and mixing ginger and garlic in required proportions. The mixture of ginger and garlic is grinded in wet grinder with required quantity of water, salt, turmeric etc. and vacuum packed with hot sealing machine in 50 gms and 100 gms packets. In all the regions of the state, garlic and ginger are grown abundantly and consumed as such. It is consumed daily, in every house. In present days customers are more attracted towards instant foods, instant mixes, spices etc. The ginger and garlic paste has good market potential. If the product is manufactured and packed in small quantities such as 50 gms and 100 gms packets. The market is widespread specially in rural areas. It is ready to use item which is consumed in all households. In urban centres the demand for ginger garlic paste is very good and can be supplied on commercial scale in bulk.

#### Overview

Different types of machine used in hotels for the purpose of pasting but every machine having some limitation and disadvantages that's why we are try to overcome these

\*Corresponding author: Roshan P. Ghodkhande,  
Assistant Professor, DMIETR Wardha, Maharashtra, India

limitation and disadvantages for the hotel, society program. Overview gives little bit information about the various pasting machine which are used in various application.

### MIXER MACHINE



Fig. 1. Mixer Machine

Weed control can be achieved by cultivation, hand-hoeing or by applying registered herbicides. Deep cultivation close to the plants should be avoided as root damage with subsequent yield losses may occur. Each method of weed control may be effective but the best way is to integrate these methods to ensure a weed free garlic field. When I was child, it always fascinated me to watch a particular Indian lady at the wet market. A wet market is the open air place where fresh fruits vegetable, fish and meat were sold at cheaper price compare to the super market. In the old days method of grinding spices are different. Before electric blender the spices were painstakingly ground manually. Sometime a family hire a woman (usually an Indian lady) whose goes from house to house grind the spices manually enough supply for a week it is a drying practice even through I know some ladies refuse to cook if they where force to use pre-ground dry spices in the packet that we are so used to now a day.

### Battu Kisser

A mini version of stone mill was also used however this was mainly used turning rice grain in to rice powder. This are consider primitive tool because they have been used since the stone age! Needless to say, it is very rear to see such a spectacle.



Fig. 2. Battu Kisser

### Problem Formulation

- In the beginning the ginger garlic were cut by hand and sharp knife in small piece. The output got from this method, was very low and it does not fulfill this market demand because it was very time consuming process.
- It was also a boaring work for the the worker.
- Traditional method of ginger garlic cutting is by manually using hand and knife. This technique did a good job of cutting and grinding. But it is not a reliable method for pasting.
- The traditional method is not sufficient method for grinding and pasting due to manual process we should identify some major problem and to overcome from this problem different idea are generated.
- Large quantity of ginger and garlic are lost annually due to lack of storage facility and local method of processing ginger and garlic. In order to improve on various ways in which the cutting are done, there is need to develop simple machine to address this problem and this brought about the design and fabrication of cutting and pasting of ginger garlic paste machine.



Fig. 3. Working Mechanism of ginger garlic pasting machine

### Objectives

- Design & develop a low cost ginger, garlic paste machine which will helps caterers, hotel and society programs etc.
- Considering the above problems we are going to design and fabricate such a machine that will eliminate most of the problems from previous available manually paste machine, so human effort is reduced and getting more productivity, earn more profit to hotels and caterers.
- The bulk amount of paste made by machine.
- To minimize the manual efforts for handling the machine.

## Construction and Working

The grinding machine consists of a power driven grinding wheel spinning at the required speed and a bed with a fixture to guide and hold the solid material. The grinding head can be controlled to travel across a fixed solid material or the material can be moved whilst the grind head stays in a fixed position.

The machine has been constructed in such a way that it can be operated by both electrical and mechanical means. The drive unit consists of an electrical motor of 1Hp. The motor is fitted with a smaller pulley of 0.07m diameter. The power from it is transferred to the larger pulley of 0.21m diameter by means of a V-belt drive. The larger pulley drives the main shaft which houses the crank. The main shaft is supported on the machine frame by means of two ball bearings housed inside Plummer blocks to prevent vibrations. The presence of bearing also reduces friction over the shaft. The crank is rigidly fixed to the shaft. The connecting rod is fixed to the crank by means of temporary fasteners to provide rotational motion to it. The connecting rod is fastened to the spiral rod which is in turn connected to the spiral shaft. The spiral reciprocates inside a bin in which the wastes are placed it also acts as a guide way for the spiral. The power from motor in the form of rotation is converted to reciprocating motion by means of crank and slotted lever mechanism. Thus the cans and other wastes are crushed efficiently.

## Future Scope of Work

At present machine used the ginger garlic processing neither will establish nor popular among the processor. Most of the processing is still done manually in recent times, aware of ginger garlic is increasing do to popularity of health food and herbal products. Thus thrust is being given towards the developing of processing machine of ginger garlic with higher efficiency. The main machine, which need immediately attention are grading, packing and shredding machine. Currently small capacity machine are being used in the processing but this are the less efficient consume more power and susceptible to numerous breakdown.

This lead to the decrease in the total output of the processing unit. Traditionally, the cutting and pasting operation is done on individual food by hand which is tiresome and time consuming. Some time worker get injuring on hand during this operation. To overcome this problem, machine these type of manual process so as to reduce the fatigue to the worker and to increasing the productivity. Future may be carried out on effective continuous feed mechanism to increase the capacity of the machine.

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