

Design and Fabrication of Mini Compost Machine

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ABSTRACT: Worldwide, increase in population density along with the population migration from rural to urban areas and industrial expansion lead to great amount of waste generation. Organic waste especially food waste is a threat to our society. It takes cost to dispose the waste generated and cause the emission of harmful gases like methane. Composting has proved to be the key solution to this problem. The objective of this project is to produce compost at the highest level through a machine that efficiently manage space and time. This can be used in household, restaurants, hotels, apartments depending on the waste generation. Apart from the elimination of waste generated we can also make sure that the plants are getting enough amount of nutrients, also the soil should be properly conditioned without any chemical treatment.

KEYWORDS: Compost Machine, Waste Treatment, Recycling

I. INTRODUCTION

Waste management has become a serious issue as most of the countries still suffers to dispose the waste properly. Composting turns to be one of the promising treatments of bio-waste which in turn converts into useful products. This project is about a mini compost machine which converts the

organic waste particles into compost. Its mainly aims to develop a solution for the time-consuming process of traditional way of compost making.

II. METHODOLOGY

Mini compost machine mainly consists of a drum to which the waste particles are deposited. A mixer is provided in order to reduce the waste into small particles before entering the drum. The shaft which is connected across the drum consists of mashers which can stir the waste particles and a DC motor is provided at one end of the shaft to make stirring possible. Heating coils are placed on the drum in order to reduce the moisture content and to provide a temperature sufficient for microorganisms to survive. The proper management of temperature and moisture content decreases the time period required for composting. After turning the waste into compost, it is taken outside through the opening provided on the drum. The main parts used in the Mini Compost Machine are the following:

2.1 COMPOSTING DRUM

Composting drum is a small sized cylindrical-shaped hollow solid made of mild steel pipe. It is the major container of waste materials, and houses the masher with its shaft.



Figure -1 Composting Drum

2.2 SHAFT

Shaft is a rotating machine element, usually

circular in cross section, which is used to transmit power from one part to another.

2.3 HEATING COIL

Heating coil is used to heat the inner cylindrical drum where composting takes place which require a temperature of 70°C .

2.4 MACHINE FRAME

The machine frame consists of the composting

drum with heating coil and shredder. It is the supporting element for the composting machine.

2.5 DC MOTOR

DC Motor converts direct current electrical energy into mechanical energy. It helps to run the shaft for mixing of waste in the composting drum.



Figure -2 DC Motor

2.6 BEARING

Ball bearing are used to provide smooth, low friction motion in rotation of shaft inside composting drum.

2.7 SHREDDER

It is the component used to break the raw materials into tiny chunks before entering into the composting drum. The broken raw materials

provide better results.

2.8 MASHER

The component mixes all the ingredients inside the cylinder and helps to dry the ingredients evenly.

2.9 THERMOSTAT

This is an electronic device used to maintain the water temperature at 70°C .

III. MODELLING



Figure -3 Fusion 360 Modelling of Compost Machine

IV. FABRICATION



Figure - 4 Fabrication of Mini Compost Machine

V. CONCLUSION

Composting is an eco-friendly method of treating waste and converting them into useful products. Organic compost machine can minimize the cost required for degradation, segregation and also the transportation of waste. These kinds of machine are more flexible, efficient and it saves time to a great extent. The concept of converting useless products will give much significance in the present and the future.

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