

Design and Fabrication of Fertilizer Crushing Machine

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Abstract: Crushers may be used to reduce the size, or change the form, of waste materials so they can be more easily disposed of or recycled. Organic waste crusher machine is the key fertilizer granulation machine widely used in crushing organic compost fertilizer, city organic waste, industrial organic waste, animal manure.

In before days people use to make the manure manually by using their own limbs, so that it was inconvenient for them and it was a delayed process of work. All these leads to unhealthy and unhygienic factors for the people. So, we have introduced the form of machining process to get the output product of the fertilizer in a simple way. In the formation of the manure we use organic waste materials like cow dung, solid waste predominantly, is any garbage, refuse or rubbish that we make in our homes and other places.

The outcome product size gets varies from 4-12cm in granulometry of structuring waste. The maximum quantity can be loaded in the Hopper is up to 4kg, the output of the mixture will take about 6.3min of time

Keywords: Blade design, Catia software, fabrication, Eco friendly, Power consumption, Cost Saving.

I. INTRODUCTION

As we are in 21st century we people do not have any knowledge about the source of food products how they are being cultivated and the way of path how they reach us to our daily routine life. All we humans are making fool of our own. We don't have any idea of how their being cropped and how much difficulties the farmers are facing.

According to a well-educated fellows knowledge, a farmer will be in a higher position, he knows the each and every minute tricks, terms and conditions that should have to be followed based on the natures season. As if we follow such an education which does not leads to an agricultural source of adopting situational mind cannot be obtained.

Hence, so for thinking all about such problems, we have chosen such an experimental, mechanical device which enriches and gives a major contribution to the farmers which helps them to sustain and follow our ancient types of cultivation process what they had adopted from their ancestors, to give a healthy resulting cultivation.

II. METHODOLOGY

Our main aim of our project outcome is to make a good proportion of a harmless mixture of fertilizers from the natural waste. Here we dump all the natural waste of animals, plants, humans and all other decomposable organic waste .as after the dumping the organic waste in to our fabricated crushing machine, it helps the farmers to get mix and give a paste like textured manure fertilizer. As these fertilizers are well crushed and made them in to good composite material based on the watery substance we are loaded.

The blade of shaft helps in mixing the dumped goods and the blade is made to rotate through a powered dc motor, the blade which has been designed in such a way, which can bring out the crushed materials and can be drawn get stored.

This is the main working concept which we have tried to bring out of our knowledge based on the farmers point of difficulties.

III. PROBLEM IDENTIFICATION

- A. Time consumption process
- B. Cost spending for binding and cutting the organic waste is high
- C. Also it creates health issues for the workers
- D. By the manual process less output of crushed manure is obtained
- E. Large amount of organic wastes cannot be treated by workers
- F. Required grain sizes of manures can't be obtained

IV. DESIGN OF PROTOTYPE

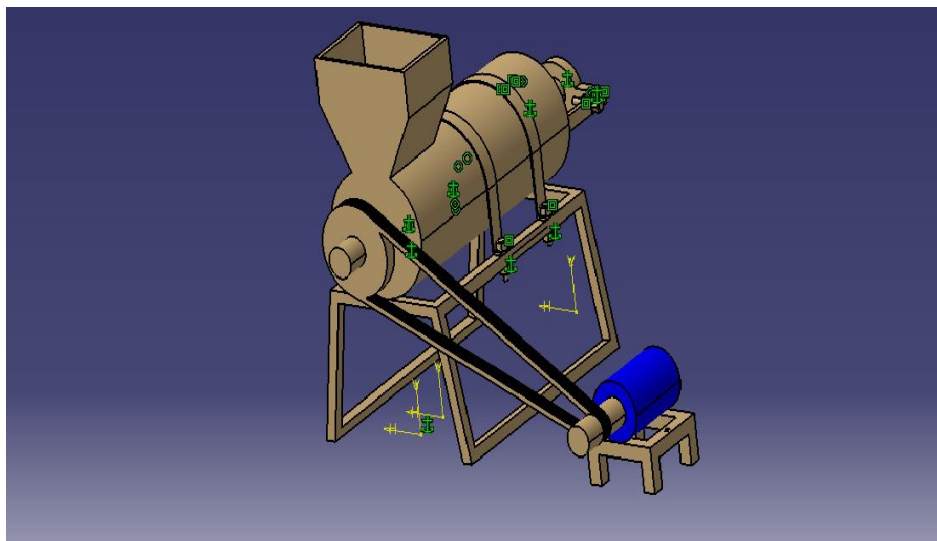


TABLE I
FONT SIZES FOR PAPERS

S.N	COMPONENTS		
O	MATERIAL	SPECIFICATION	QUANTITY
1	motor	1440rpm	1
2	Screw conveyor	-	1
3	mixer	-	1
4	Hooper feeder, rotary valve	-	1
5	Pulley	-	2

A. Screw Conveyor Specification

- 1) External diameter= (spindle screw + extra attachment)=140mm +24mm= 164mm
- 2) Internal diameter= 27mm
- 3) Depth = (external diameter+ internal diameter)/2=(164-27)/2= 68.5mm
- 4) Thickness of blade =5mm
- 5) Pitch area=150mm
- 6) Thread angle= 30 degree

B. Project Diagram





REFERENCES

- [1] International Journal of Engineering Trends and Technology (IJETT) –
- [2] Volume 4 Issue 9- September 2013
- [3] INTERNATIONAL JOURNAL OF RESEARCH IN AERONAUTICAL
- [4] AND MECHANICAL ENGINEERING
- [5] AN AUTOMATIC APPROACH FOR CRUSHER MACHINE Vishal N.
- [6] Kshirsagar1, Dr.S.K. Choudhary2, Prof.31
- [7] Parametric Modelling of Straight Bevel Gearing system and Analyse the Forces and Stresses by Analytical Approach
- [8] A.V. Ramana Rao1, CH. Bhanu Prakash2, M.N.V.S.A. Sivaram.K3
- [9] IJISSET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 10, October 2015.