

Design and Fabrication of Low Cost Plastic Shredder

Sunil Mahule^{1*}, Vishwas Nagpure², Shivprakash Bhojar³, Dipali Bhojar⁴

^{1,2,3,4}Department of Mechanical Engineering, Abha Gaikwad Patil College of engineering, Nagpur, India

Abstract: The Use of plastic is increasing day to day life in present scenario which causes a serious environmental issue, for this purpose we need to make eco-friendly environment by recycling possible waste plastic. To solve this issue already exist highly operated machines but they are too costly. So, the main purpose of our study is to design and fabrication of cost effective plastic shredder machine, the use of power supply and single shaft mechanism which can be useful for Micro, Small and Medium Enterprises. To implement this concept plastic shredder machine implemented which consists some mechanical and electrical components like Frame, hopper, electric motor, V-belt drive System, shredder setup. This machine is used for cutting the plastic in to small pieces, which are in irregular shaped flakes which can be processed further Recycle recovers the raw material, which helps to make new plastic product. Recycled plastic pieces are fed in to extrusion machine where it can form wire like plastic called filament and further used in 3D printing machine.

Keywords: Reduced plastic wasted, Reused plastic waste.

1. Introduction

Nowadays, the world is facing a critical issue of plastic waste management. The available plastic shredding machines are so costly and the setup is high. On the other hand, packing these waste and proving them to these waste processing plants is also costly.

Hence, to overcome this problem we have developed a low-cost Plastic Shredding Machine that will shred the plastic on a small basis and reduce the cost of transportation to processing plants.

A plastic shredder is a mechanical device used to cut objects into smaller pieces. A plastic shredder machine is a machine that cuts the plastics into smaller pieces in order to make waste management easier.

2. Problem Identification

In domestic area, industries etc. areas the plastic waste is present in large quantity, but the available machines used to recycle this waste are very costly. They pack this waste and give them to the local processing plants. So the process of packaging and transporting is much costly.

3. Solution of the Problem

Due to the above problem we try to find solution. So the main

intention behind this project is to process the plastic waste as cheap as possible by shredding where it is made for reducing cost of processing and transportation.

4. Objectives

1. To design the machine as per aesthetics and ergonomics.
2. To design the machine as possible as in compact size.
3. To identify different parts of plastic shredding machine.
4. To produce a low cost machine.
5. Easy to operate unskilled operator
6. Can be used at local recycling area.
7. Highly Durable.

5. Methodology

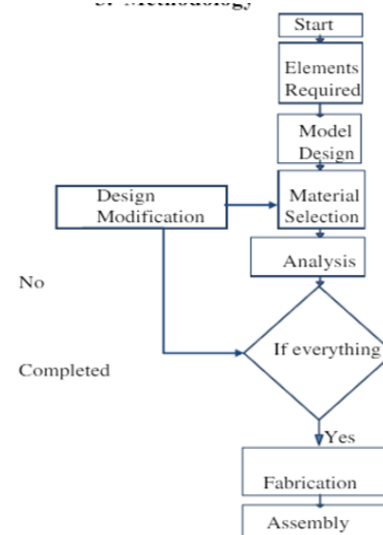


Fig. 1. Methodology

6. Conclusion

In this project we conclude that many parameters are dependent on each other to manufacture the shredder machine which is able to cut the plastic in small sizes.. Before starting the actual fabrication, load calculations are made to get positive result. We select 'C' section bars to reduce vibration. Finally, the machine is manufactured with low cost, less noise and less vibrations. We can conclude that plastic is shredded with the help of plastic shedding machine hence we also design and

*Corresponding author: sunilmahule20@gmail.com

manufacture plastic shredding machine. Plastic is essential part of our day to day life. But there is a big disadvantage of plastic that is plastic is difficult to decompose. So we have to recycle the plastic and there are various methods for plastic recycling. From above various papers we selected one method for plastic recycling and we will make a machine which is used for plastic recycling. We studied how to design the machine from literature review and we got many technical details about this machine this is very helpful to us.

7. Future Scope

This machine is run by electricity but in future this machine can be run by solar energy and reduce the production cost and also reduced the sound noise by minimize the friction of the mechanical parts.

References

- [1] Mulla Irfana Falyyaj, Bhosale Jaydeep, "Design and development of plastic shredding machine", Volume 4, Issue 10, October 2017.
- [2] Olalekan Hammed, "Development of polythene chipping machine for recycling purposes". Volume 6, Issue 7, July 2015.
- [3] Atadious David and Oyejide Oluwayomi Joel, "Design and construction of plastic shredder machine for recycling and management of plastic wastes".
- [4] Kamesh B. Vaidya, Mayank N. Kosurkar, "Recycling of Thermoplastic to reduce solid plastic waste", Volume 3, Issue 2 2017.
- [5] P. K. Farayibi, "Finite Element Analysis of Plastic recycling machine design for production of thin filament coil", Volume 36, No 2 April 2017.
- [6] Jassim M. Abdulkarim Jaff, Darewan A. Abdulrahman, "Design and Fabrication Recycling of plastic system", Volume 7, Issue 5, May 2016.
- [7] Karolina Glogowska, Jakub Rozpedowski, "Examination of Shredding Process Parameter and the properties of Recyclate", Volume 10, No 29, March 2016.
- [8] Ankit B. Raut, Mr. Vinayak D. Wagh, "Design and Fabrication of Paper Shredder machine", Volume 6, Issue 4 April 2018.
- [9] Fauzia Siddiqui, "Design and Fabrication of Paper shredder machine", Volume 8, Issue 3 2017.
- [10] Mulla Irfan Faiyyaj, Mete Rushabh Pradip, "Design and development of plastic shredding machine". Volume 4, Issue 10, October 2017.