PLASTIC SHREDDER MACHINE

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ABSTRACT

A cutting machine is designed to reduce large solid material objects into a smaller volume or small pieces. In this project there describes about the experimentation of plastic bottle cutting machine and analysis of mechanism used in machine. Plastic bottle cutter is a machine used for cutting the plastic in small pieces to make waste management easier. We are making this project model for recycling of plastic wastage in domestic area; industries as well as it can be useful to the scrap collectors. This machine is solution on the problem of space.

Keyword - Commingled (Mixed) Waste Plastics, Recycling, Plastic Shredder, Waste Plastics Cleaning)

I. INTRODUCTION.

Plastic is one of the most popular building materials of modern human culture, but its widespread use brought us many problems and caused environmental dangers of unprecedented scale. Since its mass adoption in the 1950s, discarded plastic products have filled landfills and contained seas and earth with materials that will not break down for centuries and centuries. To combat this problem, governments of many countries around the world formed rules for recycling plastic, established industrial processes for transforming discarded plastic into useful materials, and educated communities to the benefits of recycling all around the world.

One of the largest recycling efforts of the 20th century happened of course during wars when governments demanded of their people to donate their unused metals, tire Sand even nylon, but the notion of recycling plastic came only after the environmental revolutions of 1960s. During those years people really started noticing the impact of plastic waste on environment, and started laying groundwork for future recycling efforts. First plastic waste recycling mill in the world was created in Conshohocken, Pennsylvania in1972, marking the beginning for all future recycling plants. As years went by, government programs and eco-friendly communities slowly started to educate regular people into habit of recycling and forcing manufacturers to start producing easier to recycle plastic. Their efforts came to life during 1980s and 1990s with the adoption of PETE and HDPE plastic, which were designed with recycling in mind. These recyclable plastic products were introduced by Plastic Bottle Institute of the Society of the Plastics Industry and clearly marked on their containers by logo of triangle made of arrows.

II. NEED OF PROJECT

A. Plastics are used to manufacture an incredible number of products we use every day, such as beverage and food containers, trash bags and grocery bags, plastic cups and utensils, children's toys and diapers, and bottles for everything from mouthwash and shampoo to glass cleaner and dishwashing liquid.

B. And that's not even counting all the plastic that goes into furniture, appliances, computers and automobiles. The Need for Plastics Recycling is Growing.

C. As the use of plastics has increased over the years, they have become a larger part of the municipal solid waste (MSW) stream—growing from less than 1 percent in 1960 to approximately 12 percent in 2008.

III. PROBLEM DEFINITION

Since the garbage collection system is not well managed, people dispose the garbage wherever possible mostly in the drainages or the river banks. This has led to huge environmental pollution deteriorating the health of mankind and the other living beings. Due to the lack of knowledge of disposing the wastages, people trash the garbage in a way they want. We can see garbage all around city including in the roads, play grounds, parks and even in hospitals. People throw the garbage without realizing that it is affecting their own health and will deteriorate the future generation's living standard.

IV. OBJECTIVES

- To achieve economic and environment friendly recycled plastic from the waste.
- To Innovate use of scrap machinery.
- To reduce solid plastic waste
- To create awareness about plastic- uses and harms
- To make our environment friendly zone.

V. METHODOLOGY

- Various steps in plastic recycling machine include
- Cleaning of plastic.
- Sorting of cleaned plastic.
- Feed the plastic into the hopper.
- Plastic passed through pneumatic valve
- Melting of plastic
- Formation of granuals

VI. MATERIAL DESIGN

MACHINE TYPE	--------	SINGLE SHAFT SHREDDER
CUTTING ZONE	Approx mm	150 150
KNIFE LENGTH	Mm	127
DIMENSIONS	$\frac{L \times W \times H}{mm}$	180 80
WEIGHT	Kg	450
SHAFT LENGTH	Mm	445
BEARING	Serial No.	6207ZZ

VII. CALCULATION OF SPUR GEAR TERMINOLOGY

• Now, if you will buy gear in market, you can buy it telling diametrical pitch Dp & no of teeth to shopkeeper, with same Dp the teeth will match with each other no matter the size of gear.

• For small gear teeth (fitted to pump impeller shaft)

• T = 100

• B = 25 mm (Take minimum value)

• Dp = 10

• Dp x m =25.4

• M =25.4 ÷ 10 = 2.5mm

• (Where Dp = 10 inches)

• Circular pitch = Pc = πD÷T = 7.853 mm

• Addendum = A = 1÷Pd = 0.1

• Thickness of tooth = t = Pd x sin90÷N =

• Dedendum (B) = 10157÷Pd

• OD =T+2÷Pd

• Root dia = (R D) = T-2÷Pd

• Base circle = BC = D x cos (Pd x A)

• Circular pitch (CP) = 3.1416D ÷ N

• Circular thickness (T) = 3.1414D ÷ 2N = 1.57 ÷ Pd

• Working depth = 2 x m

• Whole depth = 2.157 x m

• Clearance = 0.2 ÷ Dp or 0.0637 x Cp

• For big teeth Teeth t = 100

• B = 10 mm

• Dp = 10

• Dp x m =25.4

• M =25.4 ÷ 10 = 205mm

• (Where Dp = 10 inches)

• Module = m = D÷T

• D = M XT

• Circular pitch = Pc = πD÷T =

- Addendum = A = 1÷Pd
- Thickness of tooth = t = Pd x sin90÷N
- Dedendum (B) = 10157÷Pd
- OD =T+2÷Pd
- Root dia = (R D) = T-2÷Pd
- Base circle = BC = D x cos (Pd x A)
- Circular pitch (CP) = 3.1416D ÷ N
- Circular thickness (T) = 3.1414D ÷ 2N = 1.57 ÷ Pd
- Working depth = 2 x m
- Whole depth = 2.157 x m
- Clearance = 0.2 ÷ Do or 0.0637 x Cp Bore diameter of bearing.

VIII. REFERENCES

1. Aireza Akbarzadeh and Mohammad Sadeghi Parameter Study in Plastic Injection Molding Process using Statistical Methods and IWO Algorithm" International Journal of Modeling and Optimization, Vol. 1, No. 2, June 2011 pp-141.
2. Prof. S. B. Khedkar1, Prof. R. D. Thakre2, Prof. Y. V. Mahantare3, Mr. Ravi Gondne4
3. "Study of Implementing 5S Techniques in Plastic Moulding" International Journal of Modern Engineering Research (IJMER) Vol.2, Issue.5, Sep.-Oct. 2012 pp-3653-3656
4. Poonam G. Shukla, Gaurav P. Shukla "Design& Fabrication of Pneumatically Operated
5. Plastic Injection Molding Machine" International Journal of Engineering and Innovative Technology (IJEIT) Volume 2, Issue 7, January 2013 pp-98.
6. Madan Mohan and Bhavani .R "Melt-Densified Post Consumer Recycled Plastic Bags
7. Used As Light Weight Aggregate In Concrete" Madan Mohan Reddy .K, Ajitha .B, Bhavani .R / International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622 www.ijera.com Vol. 2, Issue4, July-August 2012, pp.1097-1101.
8. Prof. Kusekar S.K, Design & Development of Plastic Recycling Machine by Using FEA. International Research Journal of Engineering and Technology (IRJET) e-ISSN: 23950056.