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A Review Paper on Plastic Shredder Machine

S.M..Mowade[1], Guneshwar N. Hajare[2], Amol S, Pradhan[3], Nikhil G Dafare [4], Dewanand Deshmukh.[5]

[1]*Head of Department Department of Mechanical Engineering Smt.Radhikatai Pandav college of Engineering Nagpur, Maharashtra, India*

[2]*Department of Mechanical Engineering Smt. Radhikatai Pandav college of Engineering Nagpur, Maharashtra, India*

Abstract: *This paper assign with detailed study of plastic shredder machine. Plastic is most commonly used material in the whole world. But, plastic wastage increasing environmental pollution. For control to environmental pollution, plastic recycling is needs of time. Our project on plastic shredder machine convert large volume of plastics in micro size and this micro size plastic use for tar making and remoulding. This machine is used in recycling plants and industries. Plastic waste management is one of the greatest challenge to all countries. Averagely 5.6 million tonnes of waste plastic produced per year in India i.e. 15,342 tonnes per day. At current time only 5 to 25% of plastic scraps is recycle.*

Keywords: *Plastic waste, plastic recycling, plastic shredder machine.*

I. Introduction

The consumption of thin material plastic in present days production industry due to user demand. Plastic are synthetic material having high molecular weight polymer can moulded in any shapes. A big molecule made by repeating a small unit called monomer over and over again. Polymer is simply many monomers. Plastic have two types i.e. thermoplastic and thermosetting. Thermoplastic soften by melt and hardened by process of cooling thermosetting plastics can not change shape once melting. The plastic is composed element of hydrogen, nitrogen, oxygen, carbon, sulphur, chlorine. Rapidly pollution growth and urbanization and industrial growth increase waste generation in urban area. Very few countries actually recycle plastic .Impact of plastic on human health can not unnoticed.

II. Type of plastics

Polystyrene(PS): They have high clarity, hard rigid, glassy surface plastic. It is used for making electrical communication and electrical equipments, also used in toys, wall tiles, baskets etc.

Polypropylene(PP): They have high excellent chemical resistance, environmental stress resistance, high melting point, low density. It is used for making medical containers, furniture, sheet, luggage, pipes, bottles etc.

Low density polyethylene (LDPE): They have low density, low softening point, low]\melting range, easy process ability. It is used for manufacturing nursery bags, small bottles, milk packaging, wire insulation.etc

High density polyethylene(HDPE): They have good strength, good chemical strength, melting point (130◦c to135◦c), good process ability. It is used in manufacturing of films, fibres for clothing, transport, packaging, building, containers water bottles, etc.

Polyvinyl chloride (PVC): They have high durable, fire resistance, energy storing, versatility. It is used in wires, cables, furniture, appliances, sheets, films, bottles, footwear, etc.

Polyethylene terepthalate (PET): It is world's packaging choice for many foods. They have good chemical resistance, good gas barrier, highly crystalline, highly transparent, colourless. It is used in fibres, bottles, jars, containers, etc.

III. Working Principle

Plastic Shredder machine is composed by a two shaft shredder with rotary blades and spacer combs. Once the material is taken into the hopper and the machine is ON, the shredder catches the material and begins to cut it grossly. The high cutting torque and the different conformation of the cutters group it's possible to shred pieces made of different materials.

The plastic bottles have more volume compared than its weight. Therefore plastic bottles take more space than other scrape so the scrap collector avoids taking plastic bottles. If we crush or cut this plastic then it is suitable and cheap to scrap collector to transportation and the cut plastic can use for next processing. therefore we take decision for making motor operated plastic shredder machine inexpensive.

The bottle crusher cut parts from the bottles with moving cutting blade with a particular depth and the speed , then two parts separately or it will be shorten. The machine is powered by motor. The principle of operation is a follows :

- Feed the plastic bottle into the hopper.
- Blades will rotate by the shaft is rotated after starting of motor.
- Bottle will cut on contact with the cutting blades.
- The scroll will fall in the collector.

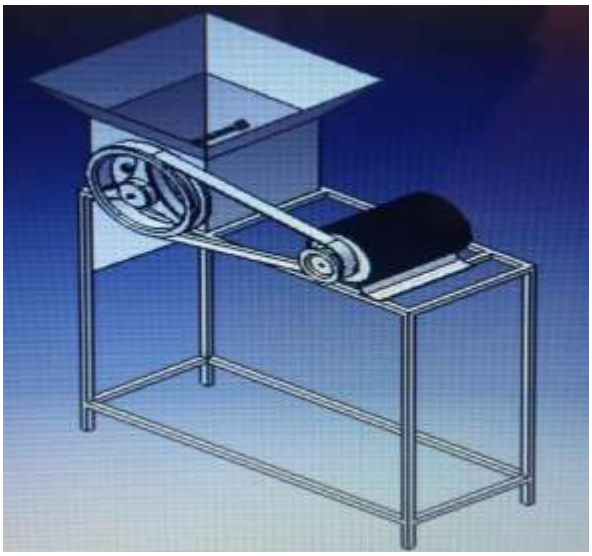

Fig. plastic shredder machine

IV. Literature Review

Joseph Y. Ko in 2000 conferred a machine with automatic feeding mechanism proper of shredding 20sheets with closed to 9 inches width. It had a 3 access switch i.e. Off, On and Auto. There blades were plastic strips cut by knife roller, but can be on occasion configured to had been confetti-cuts of plastics. Feeding mechanism accommodate a twin of roller to direct the plastic. The knife blades and rollers were driven by a belt drive and a single AC motor.

Ming- Hui Ho. in 2003 conferred the plastic shredder which had two rotary cutters apiece with multiple blades. Apiece blade have a first cutting blade with multiple first cutting edges and second cutting blade along with multiple cutting edges. Both the first and the second cutting blades were distributed in a non-angulate manner and each of the first cutting edges was offset to apiece one of the second cutting edges, in order that there was only one cutting edge that engaged with the plastic to be shredding. When the amount of shredded plastic increments, the plastic shredder do not work commonly because multiple cutting edges at the same time engaged with the plastic to be shredded plastic stuck in the shredder. This difficulty was grouped out by using rotary cutter with multiple blades with numbers cutting edges with the arrangement identified here, the sound of the shredding was also outstandingly decreased.

Frank Chang in 2000 conferred the blade assembly for plastic shredder is in a correlated manner. Conventional building comprises of long and short partition rings. The disadvantage was that even if one part malfunctioned, the whole assembly gets loosened. Instead of having partition rings it possesses long and short plates casted with the blade ring. The blades were staged on the rotary shaft to form a bladed shaft such a way that long and short projecting adjoin the long and short projecting plates of adjacent blades. This arrangement abrogated use of partition rings, cost and enhancing assembly efficiency.

Anderson, Terry & Donald Leal (1991) depicted on study "Marketing Garbage: The Solution for Pollution" the system of tradable pollution permits allow quality than recent pollution control authority do. At detail, polluters would be allow to increase pollution at some location where water quality is high in return to decrease

pollution in an area is low. It also increases efficiency. It allow by a firm is capable of decrease pollution at low cost than that other firms, a more cost firm would purchase right pollute from the low cost firm. The low cost firm could then reduce the pollution level it had Earlier allow to release and still make a profit from the sale of other permit. Another value of this scheme is that the cost of achieving a given level of air and water capacity is low in the scheme than in other scheme.

Dr. Muhammad MaqboolSadiq, Muhammad Rafique Khattak and et al., Plastic unwanted is silent danger for environment and their disposal is an important purpose for waste management. Now a day society does not have any alternative to plastic products like plastic
bottles, plastic bags etc. In all efforts made to limit its use but bad luck there is become increases now a days. To perform this issue many efforts were made in the past to reuse the plastic waste but no important result were gain.

Vishal N. Kshirsagar
This paper describes about the experimentation of can or plastic bottles crusher machine and analysis of mechanism used in machine. Hence in this the knowledge of analysis is necessary, and by analysis of various parts of quality and life of machine can be increased and improved.. Overall, for experimentation this machine involves process like design, fabrication, analysis and assembling of different components etc. will get increase but most important the knowledge of analysis ,the use of ansys-workbench software is increasing day by day to determine the parameters like stress, strain, deflection etc. for safe design and long durability.

Narayan, priya (2001) analyse plastic waste management in India, its recycling process and technology use in it and report the kind of recycle practice in India is quite different from other countries. The whole process of recycling is on the experience. The starting on the sorting of plastic waste. This is on the of colour, transparency, hardness, density and opacity of the scrap. Then sorted scrap is then sent to the granulator. The technology employ is mechanical with the traditional grinding to obtain granule. The last process is reprocessing. The reprocessing region divide in the granulator and the convertor. The granulators makes granules from the plastic waste and send these granules to the convertor. The region use these to make plastic product. A major unit in the information area granulators which use their storage shed in house to carry out the grinding. These units are placed in slum, function with stolen power and single machine release units.
Youcef Ghernouti et al. The study present the partial replacement of fine aggregate in concrete by using plastic fine aggregate obtained from the crushing of waste plastic bags. Plastic bags waste was heated then cooling of liquid waste followed by cooling and crushed to obtained plastic sand having finesse modulus of 4.7

Gaurav Madhukar M et al. , study on the process of convert waste plastic into profitable power source is explain by plastic recycling. The two global problems are fuel shortage and waste plastic are solved simultaneously. Plastic wastes (low density polyethylene) use by pyrolysis to make same physical specifications fuel which are same as diesel and petrol. Kerosene, petrol, diesel are obtained by depolymerization, pyrolysis, thermal cracking, distillation by waste plastics. economic the environmental and economic structure are safe by converting waste plastic in fuel. Making of fuel from plastic is chance making wealth and overcome problem of waste. Specifications of fuel from plastic are similar to petrol and further study for better results in this field.

V. Methodology

In plastic shredding machine plastic feed in to machine vertically through hopper. Blades mounted on shaft supported by bearing which is mounted on machine frame. One shaft is driven by motor and another shaft driven by gear both rotated in opposite direction. The motor is rotated at certain speed and waste come in contact with rotating cutter or blades large size waste converted into small micro-size.

VI. Objective

Main objective of that project is a waste management of plastic is needs of time. Also convert large volume of plastics material in a small size. Shredded plastics easy for transportation and easy for recycling.

VII. Conclusion

The aims of constructing a machine that may shred plastic waste in fine adequate shred to be useful in upcoming machine machines for producing new producing new products were met. The material costs of constructing the machine was controlling to be kept to a reducing, through at a cost of highly grow construction time.

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