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Plastic Bottle Strip Cutting Machine - An Approach

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Abstract: ***Plastic is severe pollutant to the environment so we must recycle it. The excessive garbage waste of plastic is the major problem of our country and plastic bottle is one of them. The available machine used to recycle this waste are very costly. Our abstract is about the design of plastic recycling which would help to Convert the plastic bottle into plastic strips and their by help in waste management .The strips are cut with the help of Blade and send further with the help of motors. It can generate various sizes of strips of the multiple size of bottles. The strips having various applications in households and industrial use. This project is similar to the plastic Bottle recycling machine, where we convert a plastic bottle into plastic strips. It would also help in reducing the volume of waste generated and will thus help in effective waste management.***
Therefore this project will prove to be a useful asset in many ways.
Keywords: plastic bottle, cutter blade, plastic strip, recycling, household use.

I. INTRODUCTION

Bottles have a significant impact on the environment. 89 billion bottles of plastic water are sold each year worldwide. The United States is the largest consumer of bottled water. The French are major exporters of bottled water. India and China have tripled and doubled their consumption between 2000 and 2005.

For the example, according to the World watch institute, which is an independent body, nearly 2 million tons of polyethylene terephthalate (PET) bottles end up in discharge each year in the United States. In many countries of the world, channels of collection and recycling of these bottles have been set up.

In many countries of the world, channels of collection and recycling of these bottles have been set up. For example, Valorplast in France organizes the collection and recycling of these bottles, which are given a second life as pillows, duvets, cushions, pens. Unfortunately many of them, especially in countries that do not have collection and recycling channels are still in circulation and pile up in open dumps or end up in the oceans. PET, PVC, HDPE ... The types of plastic are numerous, almost all reusable or recyclable, but too few are.

A possible reuse of PET water bottles is the transformation into strips. The approach paper is related to cutting the PET bottles into strip. PET bottle are used and disposed on a large Scale and may be industrially recycled. The approach design enable bottle to be cut up and immediately used as prime material for a variety of uses in the form of strips. The Strip thus obtained helps to solve domestic problems, replacing prime materials for use as wires, Strings or chords, or industrial problems such as straps for packaging.

The strip is useful for manual work usually carried out with threads and may be applied to processes for making baskets, mats and knitting with needles or weaving with a loom. Other processes may be carried out after the cutting process such as heat-forming for erasing the plastic memory of its former shape, giving it new shapes and technical features and broadening its potential as prime material for new uses and articles. This approach design helps to dispose bottles since the volume is drastically reduced when processed and useful in many assets.

II. LITERATURE SURVEY

A. *T.M Coelho, J.A.Gobbo Jr.(2011)."PET containers in Brazil: Opportunities and challenges of a logistics model for post---consumer waste recycling." Resources, Conservation and Recycling.*

This paper describes the opportunities and challenges of the logistics model for post-consumer PET bottle recycling in Brazil, while providing knowledge of its practices along the recycling chain. The Results describe the need to educate those directly and indirectly involved in the process; to reduce consumption in order to reduce the amount of waste generated; to structure the post-consumer reverse chain and engage industrial sectors and government, through public policies, to support cleaner technologies along the PET Bottle production chain.

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B. Miguel Friedenbach, Buenos Aires (AR) May 13, 2004, Tool for cutting Used Containers of Recyclable Plastic Material into Ribbons.

A tool for cutting PET bottles and the like into ribbons. The tool includes a tool head having an opening, a cutting blade housed inside the opening and a slot open above and extending perpendicular to the plane of the blade, downwards through the tool head a short distance past the blade. The blade has a sharp edge across the slot. The slot receives the edge of the bottle
Obtained by cutting off the bottle bottom or the funnel and spout thereof. The edge is inserted in the slot and the bottle turned so that the blade cuts through the bottle following a spiral path and producing a ribbon of PET material at an outlet side of the slot.

C. Foolmaun RK, Ramjeawon T. Life cycle assessment (LCA) of PET bottles and comparative LCA of three disposal options in Mauritius. Journal Environment and Waste Management 2008;2(1/2):125–38

Disposal of the increasing volume of used Polyethylene Terephthalate (PET) bottles has been a cause for concern for the Mauritian Government.
To assist Government in decision-making, a study on PET bottles and its disposal was undertaken using the Life Cycle Assessment (LCA) tool.
Three disposal scenarios, namely (100%) landfilling; (100%) incineration; and 50% landfilling and 50% incineration were compared. Sima Pro 5.1 software was used to analyse data and Eco-indicator 99 method was used for the impact assessment. The results showed that about 90% of the total environmental impact happened during the assembly and use phase of PET bottles. 100% incineration was found to be the most preferred option.

D. Kazisemon, Mohammad milad Dec 2019 developing a model for a recycling plastic bottle into synthetic fiber, international university of business agriculture and technology.

Synthetic fiber PET bottle is a thermoplastic resin so it can be melted and reshaped repeatedly. With plastic extrusion process we can melt PET bottle flakes and then air is blown using air compressor turning that molten plastic into synthetic fiber. In recent years the consumption and disposal of polyethylene terephthalate (PET) has increased.
After use, PET bottles can be disposed of in mixed waste or in selective waste collection to be recycled and reinserted in the production chain.
We have found out with the abundance in plastic bottle waste we can make synthetic fiber in a very cheap price. Comparing with the imported fiber or felt, flock our synthetic fiber costs less than half of the price. This fiber can be used as the packaging material or stuffing material.
It can also be processed at a spinning mill to turn it into polyester yarn. As recycling PET bottle has commercial value, employment and income can be generated.

E. "Matatas". "PET String cutter (string from plastic bottles)." Instructables. Retrieved 4/29/2015, 2015.

This is an intractable website for a PET Bottle Strip Cutter Design. It consists of a cutting blade secured in place by two stacks of washers around a threaded rod held in place by a wing nut. A Bottle of various sized is pre-cut and placed between the two threaded rods, which support its weight. Once In place the pre-cedge is pulled out as string, turning the bottle so that the blade continuously cuts through the bottle. Strings Of varying width can be made by adjusting the height of the blade from the wood platform.

F. Mullah Irfan Faiyyaj, Mete Rushabh Pradip, Adarsh Institute of Technology, Vita. Shivaji University, Kolhapur Design and Development of Plastic Shredding Machine, International Journal of Engineering Technology Science and Research. Volume 4, Issue 10 October 2017.

Now days the plastic is one of the most used material in world wide. There are advantages and disadvantages of plastic, but the disadvantages are more than advantages. The most serious disadvantages of plastic are, it takes too many years to decompose more than 400 years and this is too much. So there is need of recycle the plastic to reuse and to decrease the Use of plastic. This product is used for cutting and crushing plastic in small pieces to make waste management easier. We are making this project model for recycling of plastic wastage in domestic area, industries etc. in these areas the plastic waste is present in large quantity. But the available machines used to recycle this waste are very costly. So our intension behind this project is to process the plastic waste as cheap as possible by shredding. Benefits of this machine are the reduction of labour work which results in cost reduction. So we are going to design this for shred the plastic waste, with the help of blades.

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G. A Khoironi1, S Anggoro.2019Community behaviour and single-use plastic bottle consumption. Doctoral Program of Environmental Sciences, Diponegoro University.

Since plastic is considered as environmentally hazardous material, various programs aimed at educating the community on the impact of plastics pollution and consumption have been continuously conducted. Furthermore, the relationship between culture and community behaviour regarding single-use plastic bottle consumption is important to be investigated for mitigating plastics pollution. The purpose of the current research was to investigate the quantity of single-use polyethylene terephthalate (PET)-based plastic bottles are used daily and how communities are managing them in the waste stream. The data was collected from the family members of 100 households of various educational, social, economic, age, and lifestyle backgrounds. About seven local companies that work in plastic waste collection were also important participants in the data collection regarding plastics consumption. The study showed that almost 80 % of households reported one to four single-use plastic bottles consumed each day while the remaining 20 % used more than four single-use plastics bottles daily. From 88 respondents, only 10 % separated

plastic bottles in their trash disposal. The result also showed that the increasing use of single-use plastic bottles is highly influenced by the behaviour of the local community in plastics consumption and waste management.

III. RESEARCH METHODOLOGY

A. Study and Principle of Working

Trash of plastic and waste management is the two main challenges. The PET bottle is one of them. Various machines are developed for the recycling trash of plastic bottles. Plastic bottle crusher machine, shredding machine, etc. hence they have limited functionality, i.e. to crush the water bottle into small volume and use it for recycling process. This is not the proper solution for the management of plastic bottle. We need to reuse the plastic bottle before them going for the recycling process. Our approach is about to design of plastic recycling which would help to convert the plastic bottle into plastic strip and their by helps in waste management. A plastic bottle strip cutter is makes the use of plastic bottle waste while also producing raw material for users to create new products for income generation.

B. Need of Project

There are many wastes in environment increasing day by Day which need to be reduced that are causing harm to human life. PET bottle are used and disposed on a large scale and may be industrially recycled. The current project enable plastic bottle to be cut into strip and immediately used as a prime material for verity of uses. The strips thus obtained helps to solve domestic problem. We are developing the machine within this social economic context to provide alternative response to this problem. The need is to give suitable technological response that will add value to activities concerning collection and sell of domestic trash and /or to the needs of other socially vulnerable sector (unemployed, disables, base community undertaking etc.)By generating economically sustainable micro businesses.

C. Problem Identification

We have studied various plastic bottle recycling machine. From most of the machine are not completely solve the plastic bottle waste management. The existing plastic bottle strip cutter machine have limited functionality, such as making the strip of same size bottle diameter and extracting same width of strip. The problem with the existing bottle strip cutter used design will not allow for adjustments to be made in the size of them plastic strip created and is not set up for different sized plastic bottles. the currently various companies of plastic water bottles are available and they have unique designs .the existing design not achieved the removing of strips form this bottle. Cutting bottles into strands of plastic is important because the strips can then be woven to make items such as chairs, green houses, fencing, and more. These products can generate income to improve the lives of people living in poverty. Additionally, in improving this design we can decrease the amount of plastic Trash accumulation by repurposing it to create desirable goods.

IV. PROPOSED IDEA

The plastic bottle strip cutter machine is the advance version of existing strip cutter machine that overcome the entire problem raised in that design. It is made of the vertical shaft in which the bottle is inserted with deadweight which gives pressure on bottle to remove strip while rotating. At the bottom of shaft having a horizontal cutter blade fixed by nut and bolt. The distance of the blade from bottom of fixed point of blade is adjust by tightening the nut and has spring inside it. The cutter blade is slightly making an angle to horizontal this will ease to cut strip from bottle. The user required to cut the bottom of the bottle and insert in the vertical shaft and put the deadweight over it. Rotates the bottle to pull the piece of strip from cutter blade.

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The start end of strip pull and tight to other end where the pulley and motor arrangement in which all bottle strips is wound. As the motor start rotating the pulley wound all strip remove from bottle. This design allows producing different size of bottle that are shaped with varying diameter. The currently bottles available in the market are having varying diameter with complex shape can be easily cut by this bottle strip cutter machine. The width of strip can be change from 5mm to 15mm by just tightening and screw up the nut on the blade. Hence the results are consistent, the design allows different plastic strip sizes, accommodates different bottle sizes with varying diameter, ability to replace the cutter blade, simple to handle, less man work involvement and most importantly, it is safe to use.

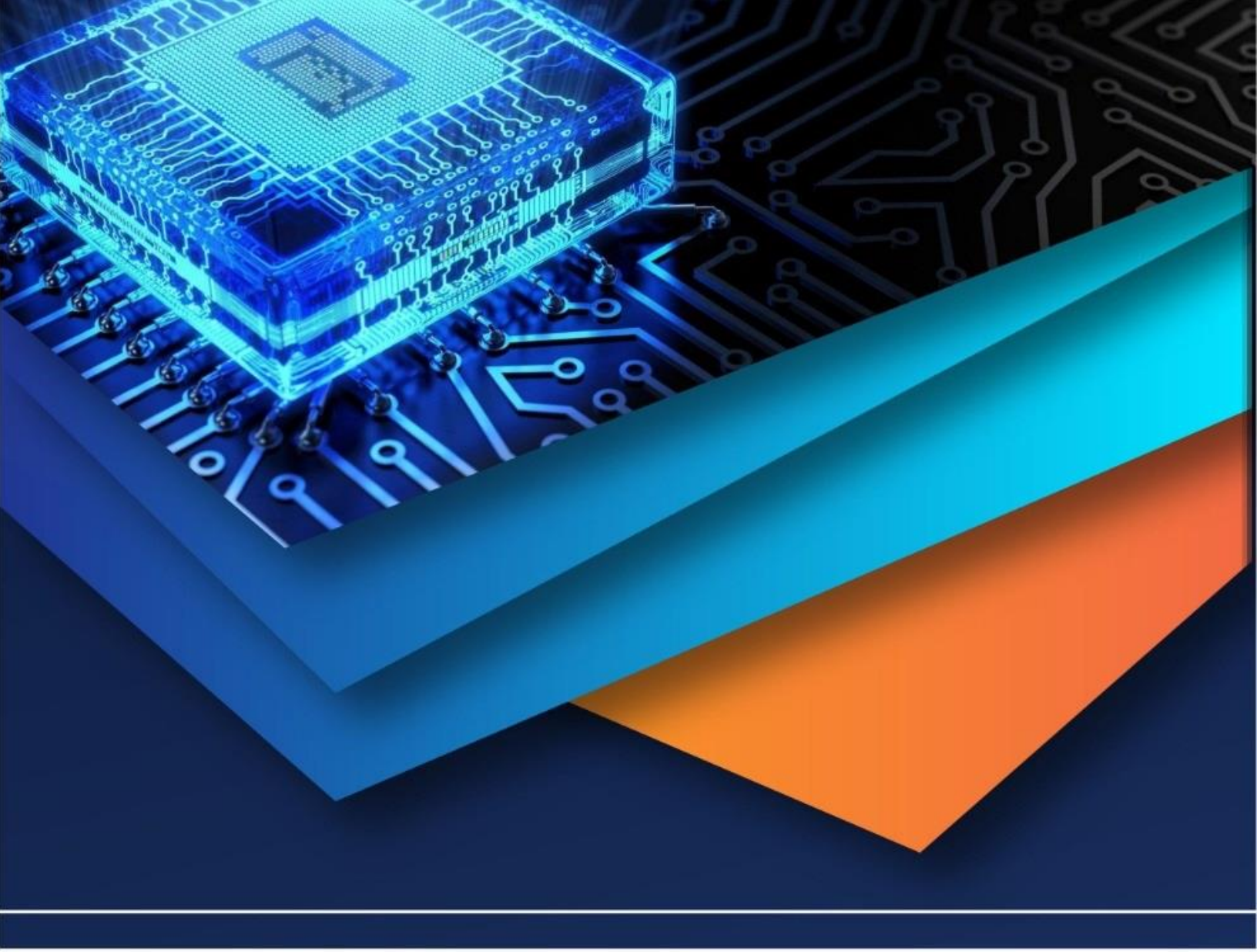
V. RESULT AND CONCLUSION

Our result is simple easy to construct bottle strip cutter that meets all the target parameters. New design improves all the problem faced in existing design. They include parameters on perceived ease of construction perceived ease of use, percent frequency of continuous and complete bottle strip. And recycled material. The only one there remaining indicators to be measured that we do not expect to meet is target of 80% recycled material. Ultimately, our design prioritized an effective tool over the use of recycled material and we believe that some of relatively inexpensive materials required building; the final design is still accessible to those with limited incomes. The new design of plastic bottle strip cutter is determined to make use of plastic waste and continue experimenting with commercial products made from PET Plastic strips. We believe that the final result of this project
will be of great benefit to the centre and their goals. Overall, we are very pleased with the final new design created for the bottle cutter and the design process in general. The new design is simple, easy to construct and use, durable, cheap, and most of all fun to use.

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