

A REVIEW ON THE IMPACT OF PLASTIC ON THE ENVIRONMENT AND A METHOD TO REUSE

V K NITHIN¹

1(Mechanical Engineering, Universal Engineering College, and Thrissur
Email: vknithmen@gmail.com)

Abstract:

Advances in technology and systems for collecting, sorting and reprocessing recyclable plastics are creating new opportunities for recycling. Coordinated public, industry and government action could divert large amounts of plastic waste from landfills for recycling, in the next few decades. This project introduces a new way to recycle the plastic bottles that normally come from households and provides a new way to make rope from plastic bottles. The machine includes a cutting unit, a temporary plastic strip storage unit, You have the following options such as a rope swing unit. Plastic bottles such as cold drink bottles and mineral water bottles are actually packaging waste from the growing food processing industry. The traditional plastic rope processing industry is not environmentally friendly. Rope processing releases many emissions into the atmosphere, including harmful levels of dioxins, nitric oxide, and a group of highly toxic chemicals. The aim of this project is to introduce environmentally friendly rope production technology. It builds on previous research and previous projects done by others.

Keywords — : reprocessing, plastic rope, rope swing unit

I. INTRODUCTION

Plastics are widely used in our daily life and are ubiquitous in our homes, offices and environments in the form of various products. It is a non-biodegradable product, and the improper disposal of such plastic products in the environment will undoubtedly have a major impact on the environment and also affect the lives of living things on earth. As a result, the amount of waste processed is increasing day by day. In order to live a pollution-free life on earth, it is necessary to recycle and use plastic effectively. Plastic is a polymeric material that can be easily molded or shaped. It is derived from polymers found in natural sources such as plants, minerals, petroleum, coal and natural gas. Polymers are large groups of monomers joined together by a chemical process called polymerization.

Synthetic and natural are two types of polymers used to make plastics. Natural polymers are derived from silk, wool and cellulose, substances found in trees and plants. Plastics are also made from synthetic polymers derived from gasoline, coal, oil and natural gas. Plastic is an inexpensive, lightweight, and durable material that can be easily molded into a variety of products used in a variety of applications. As a result, plastic production has increased significantly over the last 60 years. However, their current level of use and disposal poses several environmental concerns. About 4% of the world's production of oil and gas, a non-renewable resource, is used as a raw material for plastics, and the remaining 3-4% is used as energy for the production

of plastics. Much of the plastic produced each year is used to make single-use packaging and other short-lived products that are discarded within a year of production. These two observations alone show that current plastic use is unsustainable. Additionally, due to the durability of the polymers it contains, significant amounts of discarded post-consumer plastic accumulate as waste in landfills and natural habitats around the world.

Recycling is one of the most important means currently available to mitigate this impact and is one of the most dynamic sectors in the plastics industry today. Recycling presents an opportunity to reduce oil consumption and carbon emissions. We will provide and the amount of waste to be disposed of. Here recycling is referred to as other waste reduction strategies, namely reducing material consumption by reducing thickness or reusing products, using alternative biodegradable materials, and using energy for fuel. will be briefly explained in relation to retrieving. Packaging recycling has expanded rapidly in many countries over the last decades. Coordinated public, industry and government action could divert large amounts of plastic waste from landfills for recycling. in the next few decades.

Today, plastics are derived almost entirely from petrochemicals made from petroleum and gas. About 4% of annual oil production is converted directly from petrochemical feedstocks into plastics. Since the production of plastic also requires energy, its production consumes the same amount of fossil fuels. However, it can also be argued that using lightweight plastics can reduce fossil fuel consumption. For

example, in transportation applications where plastic replaces traditional heavy materials such as steel.

II. CAUSES OF PLASTIC POLLUTION

Plastic pollution is mainly caused by human activities. Because they produce plastic and use it extensively in their daily life. Without knowing how to properly recycle or dispose of plastics, people just dump plastics into the environment, polluting the environment in many ways. Some of the causes of plastic pollution in the environment are:

- Excessive use of plastic bags when shopping
- Disposal of plastic products in landfills or underground
- Incineration of plastic products;
- Increase use of plastic toys
- Using plastic cups, bottles, knives, forks, spoons, containers, etc.;
- failure to recycle and reuse plastic products;

III. IMPACT OF PLASTICS ON THE ENVIRONMENT

Plastic has many negative effects on life on earth. Some of the environmental impacts of plastic waste are listed below.

- Land degradation
- Contamination of groundwater
- Air pollution
- animal health risks;
- Effects on marine life
- Effects on human health

IV. PROBLEMS DEFINITION

Recently, plastic pollution has become a serious problem. Plastics are a major toxic pollutant and can cause significant environmental damage in the form of air, water and soil pollution. So our project aims to turn PET bottles into plastic ropes and reuse them.

V. OBJECTIVES

The main goals of the study are:

- resource protection

It does not use commonly used components such as molds, sources for melting plastics, etc., as it does not require a molding process. This process thus avoids the cost of molding and saves energy.

- Reusability

Since the raw material is PET bottles, rope production with excellent cost performance is possible. PET bottles are available from scrap collectors at a very low cost, emphasizing plastic recycling.

- Plastic-free environment

This process recycles the bottle crumbs, creating a crumb-free environment.

VI. MATERIALS AND METHODS

The purpose of the rope making machine is to make plastic rope out of plastic bottles. This will cut off the bottom of the plastic bottle with a stainless steel blade. Then place the bottle on the bottle holder and the strip removes the strip from the bottle. To do this, hold the threaded rod in the hand drill, rotate the chuck, then rotate the rod to pull the strip out of the bottle. The strip is then placed on the twisting unit

and the strip is twisted together with the other strips and gradually heated using a heat gun. Heating is absolutely necessary to avoid the tendency of the plastic to roll off.

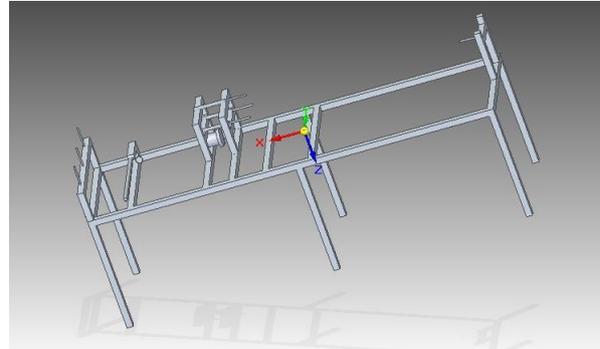


Fig. 1. Conceptual design

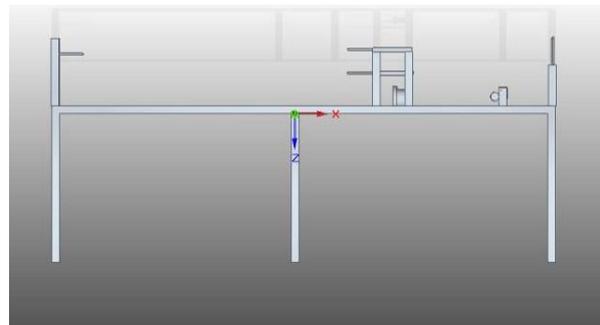


Fig. 2. Front view of frame

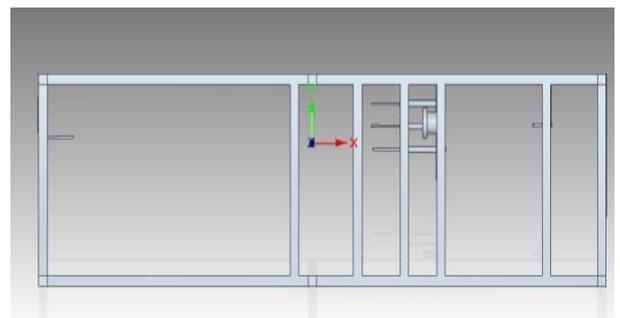


Fig. 3. Top view of frame

VII. RESULTS AND DISCUSSION

Produced a design model for a plastic rope manufacturer. A synthetic rope of the expected size is completed Cut out the bottom of the plastic bottle with a stainless steel blade. Then place the bottle on the bottle holder and the strip removes the strip from the bottle. The strips are assembled on threaded rods. Then the other strips and twisted strips come out of the bundle and are gradually heated with a heat gun.

Advantages

- Easy to set up.
- Easy maintenance and repair.
- This technology does not use molds
- Reduced maintenance costs
- Can be used to make rope from scrap.

Disadvantages

- High acquisition cost
- Can take up a lot of space
- Vibration occurs

Applications

- Used for decorative purposes

VIII. CONCLUSIONS

Population growth and rapid urbanization present us with several ecological challenges. One of the challenges is specifically waste management and plastic waste management. Environmental problems related to plastic waste, especially PET, are mainly caused by slow lifestyle changes, plastic-enhanced disposable culture, and lack of efficient waste management systems. PET bottles imported over the past five years (2013-2018) are estimated to reach 30,000 tons by the end of 2018, driven by high demand for soft drinks and bottled water. This

project discusses effective methods of recycling PET bottles to produce plastic ropes. We must recognize the need to recycle plastic waste. Sustainable action to address plastic waste is essential. Our project aims to raise people's awareness about the need to recycle PET bottles. Recycling bottles into rope is a viable option as rope is used in many different ways in our daily lives. Having achieved the expected results, we successfully completed the project.

REFERENCES

1. Hardesty, Britta Denise; Chris Wilcox (13 February 2015). "8 million tons of plastic are going into the ocean each year". *The Conversation*. Retrieved 21 February 2015.
2. Jambeck, Jenna, *Science* 13 February 2015: Vol. 347 no. 6223; et al. (2015). "Plastic waste inputs from land into the ocean". *Science*. 347(6223): 768771. doi:10.1126/science.1260352. PMID 25678662. Retrieved 21 February 2015.
3. Creton C (February 24, 2017). "Molecular stitches for enhanced recycling of packaging". *Science*. 355 (6327): 797–798. doi:10.1126/science.aam5803. PMID 28232538.
4. Eagan JM; et al. (February 24, 2017). "Combining polyethylene and polypropylene: Enhanced performance with PE/PP multiblock polymers". *Science*. 355 (6327): 81816. doi:10.1126/science.aah5744. PMID 28232574.
5. Fleischman T. "Polymer additive could revolutionize plastics recycling". *cornell.edu*. Cornell University. Retrieved 23 February 2017.
6. "PET_APR_Design_Guide.pdf" (PDF). *PlasticsRecycling.org*. Retrieved 13 July 2017
7. *Plastics Europe: Association of Plastics Manufacturers. Waste Pre -Treatment and Sorting*. Retrieved 8 July 2015
8. "ScienceDirect". www.sciencedirect.com. Retrieved 2019-03-20