Plastic Recycling Vending Machine

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Abstract: *Plastic is one of the most versatile materials of our modern age and yet the popularity of plastic is the problem. By recycling plastic, the amount produced and wasted can be reduced but whereas the process has short-term advantages for the environment, the long-term results aren't so pretty .So the ECO BIN comes with more advantages in recycling process. A 360 degree solution for the PET [4]waste generated at the source of consumption like malls, multiplexes, Hotels & resorts, corporate offices, plants, airports etc. It's a compact automatic and soundproof plastic bottle crushing[2] machine for end user. It Ensures 100% recycling at source of generation of waste. We have proven that it reduces CO2 emission by 100% recycling & ensuring raw material for industry. The main problem found by us is difficulty in managing plastic pet bottles. The environment is littered by plastic wastes especially bottles it causes the pollution and health hazards .So we are here with a solution E-eco Bin. It is a device that accepts plastic pet bottles and rewards the user with a candy. The inserted bottle will be crushed into minute granules. The output of the E-eco Bin can be used for recycling, road making etc.*
Keywords: crushing machine, PET ,Plastic Recycler, Plastic Detector, PET Detector, Vending Machine.

I. Introduction

We all know that plastic is a good friend of human being as it can be moulded to any shapes as desired.The main problem found by us is difficulty in managing plastic pet bottles. The environment is littered by plastic wastes especially bottles and it causes pollution and health hazards.We hope to make a product that can recycle plastic bottles from public disposal systems. Either crushing or grinding the plastic for recycling.

Main problems caused by plastic pollution are waste and environmental problem in our contemporary society. Imagine that we only really started to use plastics 'big-time' as of the 1930s. That's just 85 years ago! In that time, we managed to create huge problems in terms of litter, for our water ways, waste disposal, animals and the environment generally. One of the big problems which are less obvious to the eye is micro plastics. Plastic that have decayed into rather small particles over a couple of decennia (i.e. the plastic consumed in 1950s and 1960s), or plastic particles that detach from synthetic clothing in the washing machine, but which cannot be easily filtered out of the environment anymore and release their plastic toxins into the environment apart from being consumed by marine life (which we also consume..).So what if there is a machine in which we can put the pet bottles and can easily be crushed into granules and can be further recycled.

II. Litterature Review

Today the plastic waste is one of the main problem of our society so waste management plays an important role. The littered plastic bottles cannot be collected effectively, so the dumping causes huge health problems. So we are here with a solution Plastic recycling vending machine. In market similar kind of products are available but it has no proper detection system to detect the input is either plastic bottle or other kind of wastes that damages the whole system. If a metal or glass material is put into the machine it will damage the crushing blades and makes the system a total failure.

III. Operation Of Plastic Recycling Vending Machine

The main components of the system is
1. Controller[1]
2. Vending Machine
3. Crushing system
4. Monitoring system
5. Advertisement Display
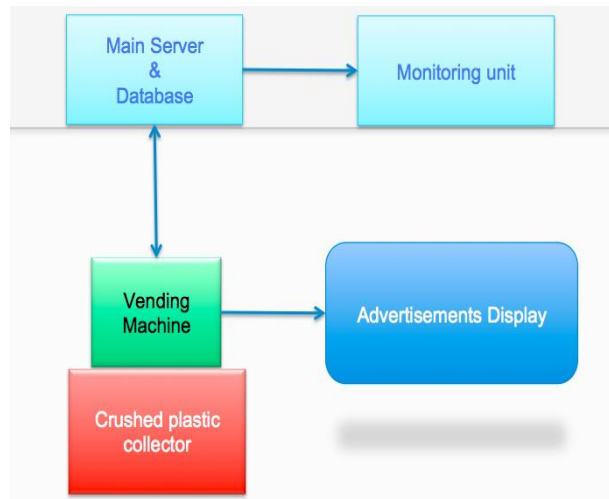
The input item will be sensed if it is desired plastic pet [4] bottle. The sensor type used are the industrial laser and detection system. When the item is in, the microcontroller will make the crusher motor to run for 3 sec and after crushing the output granules will be deposited in the collector. At the same time the vending system will be activated by the controller and a candy will be delivered to the user. The monitoring system will monitor the level of the crushed plastic in the collector. The advertisement display will display the advertisements of the benefactors.

IV. Algorithm Of State Machine Diagram

The Algorithmic State Machine Diagram consist two main states in which it receives returned item as an input. In the second step, Sensor checks that containers are received or not? In the third step, it detects if plastic or not. .If the sensor detects the plastic PET bottle then it gives a candy as an output.
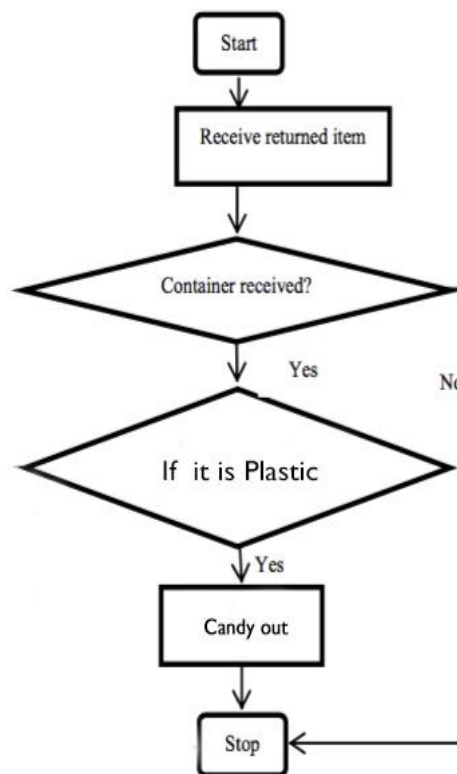
V. Concept Exploration

After deciding to create the Plastic recycling vending machine, we had to decide what electronics to use and which sensors we would incorporate into it. After a lot of searching, we found an idea about the electronic circuits, the working structure and software components suitable for making the Plastic recycling vending machine.

Motivated by the problems due to health issues, we believed that the Plastic recycling vending machine would be a good design and a good model to these problems. So the Plastic recycling vending machine would need sensors to detect the plastic bottles, motor, claw blades for crushing.

VI. Technical Specifications

Machine Features (outer)	
DIMENTIONS:	
• Overall Length (incl. Wheel)	1690 MM 700 MM
• Overall Width	1000 MM
• Overall Depth	
	110 KG
Weight	
	400 bottles per day or 100 bottles per hours
Capacity	
	MS Steel
BODY with Safety lock	
	Capacity of 400 KG
WHEEL: for free movement	
	To indicate machine is running
	PET/Plastics only
Size of Bottles for feeding	
Quality of bottle	
	300 MM X 300MM
WINDOW in bottom	

VII.   Conclusion

This project has set out the vision of making a clean environment free of littered plastic pet bottles. The existing system has no detection technologies so we are planning to include the detection system in our project. It will be soon beating the market which mainly can be introduced at public places such as shopping Malls, Airports, Railway stations etc. In future we are planning to in co-operate the plastic as well as metal and glass bottles can be inserted in Plastic recycling vending machine

Acknowledgements

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