

Theoretical Study of the Biodegradable and Non-Biodegradable Segregator

Mr. R. Vinothkumar¹, K. Tamilazahan², M. Vivek Anand³, S. Sivaprakash⁴, V. Ajjith⁵

¹Associate Professor, Department of Civil Engineering, Panimalar Engineering College, Chennai

^{2,3,4,5}UG Student, Department of Civil Engineering, Panimalar Engineering College, Chennai

Abstract- Solid waste management has become one of the main issues in both urban and rural areas all over the world. With the progress of civilization, the waste generated become more complicated in nature. Now-a-days the wastes are dumped as landfill, in some cases some chemicals are added to it to decompose the waste and the major problem in solid waste disposal is plastic separation and they are separated manually and recycled. At present there is not a proper scientific waste treatment plant as well as suitable land for the disposal of wastes. In our project "Inspection Conveyor" beings with an introduction to waste material Inspection, it's various applications. The sensors are used to measure the material dimensions and this signal is given to control Unit. This is a very efficient instrument for checking the dimensions like length, breadth, height etc., to be used in modern engineering industries. The manual efforts can be completely avoided by using this modern equipment. It separates the plastic waste and reduces the manpower.

Keywords- Solid Waste, Waste Disposal, Solid Waste Management, Municipal Solid Waste

1. INTRODUCTION

This is an era of automation where it is broadly defined as replacement of manual effort by mechanical power in all degrees of automation. The operation remains an essential part of the system although with changing demands on physical input as the degree of mechanization is increased. Still the social and cultural response and the techno-economic considerations of the issue have not received the required importance in appropriate planning and application of waste management systems in our country. As the civilian people are unaware of the dangers of this situation and participation, silly-minded approach of the local/state/central governments have resulted in a dangerous and pathetic situation that most of the beautiful terrains are slowly turning into litter zones. Thus sincere efforts to handle an upcoming disaster are to be coordinated for reducing waste generation, and also its effective disposal, involving primary collection, segregation, recycling to the extent possible and treatment through appropriate technology to reduce their harmful effects to a reasonably acceptable level. Installing a good solid waste management system will aid in achieving good environmental sanitation around urban habitat. There has been development of new technologies for improving the waste management system.

2. SOLID WASTE

Solid waste substances are those materials which become useless after a short period of their use such as newspapers, different types of cans, bottles, broken glass wares, plastic containers, polythene bags, ashes, domestic garbage etc. These discarded solid substance after their uses are variously called as refuse, garbage, rubbish solid waste etc. These solid wastes require proper and sample space for their dumping and disposal. Solid wastes are classified into two categories, such as Bio degradable and Non-biodegradable waste.

2.1 BIO DEGRADABLE WASTE

Biodegradable waste includes any organic matter in waste which can be broken down into carbon dioxide, water, methane or simple organic molecules by micro-organisms and other living things by composting, aerobic digestion, anaerobic digestion or similar processes. In waste management, it also includes some inorganic materials which can be decomposed by bacteria. Such materials include gypsum and its products such as plasterboard and other simple organic sulfates which can decompose to yield hydrogen sulphide in anaerobic land-fill conditions.

2.2 NON-BIO DEGRADABLE WASTE

A Non-Biodegradable material can be defined as a kind of substance which cannot be broken down by natural organisms and acts as a source of pollution. Unlike biodegradable wastes, non-biodegradable cannot be easily handled. Non-biodegradable wastes are those who cannot be decomposed or dissolved by natural agents.

3. SOURCES OF WASTE

Generally waste from household. Waste from industry as hazardous. Bio medical waste and hospital waste. Hotel and restaurant waste as food, Agricultural waste. Animal waste.

3.1 SOURCES OF COLLECTION

The waste is collected from the apartment Newry Towers located in Padi, Chennai. The no. of floors in the apartment is 19. Waste per capita(kg/day) is 0.27. The no of persons in the apartment is 850. The total amount of waste generated is 230 kg/day.

4. NEED FOR AUTOMATION:

Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources, pneumatics form an attractive medium for low cost automation. The main advantages of all pneumatic systems are economy and simplicity. Automation plays an important role in mass production. For mass production of the product, the machining operations decide the sequence of machining. The machines designed for producing a particular product are called transfer machines. The components must be moved automatically from the bins to various machines sequentially and the final component can be placed separately for packaging. Materials can also be repeatedly transferred from the moving conveyors to the work place and vice versa.

4.1 ADVANTAGES:

The Waste separation Conveyor is more efficient in the technical field. Quick response is achieved. Simple in construction. Easy to maintain and repair. Cost of the unit is less when compared to other. No fire hazard problem due to over loading. Comparatively the operation cost is less.

4.2 DISADVANTAGES:

The wastes are disposed in open area; it will affect the soil condition. The burning of wastes creates air pollution. The formation leachate is due to pollute the ground water. This project conveyor setup cost is high.

5. COMPONENTS

5.1 COLLECTING TANK:

The collecting tank is made up of reinforced concrete. It is provided at the bottom of the APSM. The tank is made of size 2m×1m×2m. The MSW after separating the metallic waste is dumped into the collecting tank. One side of the collecting tank is connected to the lower portion of the conveyor belt.

5.2 CONVEYOR BELT:

The conveyor belt is connected to the APS module provided at a height of 12m. It is attached with a number of buckets at fixed intervals. These buckets carry the mixed municipal solid waste to the APSM. The belt is operated at the required speed so that each bucket carries the definite amount of solid waste.

5.3 METAL SEPERATOR:

The metal separator is a magnetized moving belt with sufficient width. Its function is to separate the solid waste from the mixed MSW. The speed of the belt can be controlled as per the requirements. After separating the bio and non- bio degradable waste, the remaining waste is lead to the rectangular collecting tank at the bottom.

6. MODULES OF PROJECT

6.1 RASPBERRY PI

The Raspberrry Pi 3 Model B+ is the latest product in the Raspberrry Pi 3 range, boasting a 64-bit quad core processor running at 1.4GHz, dual-band 2.4GHz and 5GHz wireless LAN, Bluetooth 4.2/BLE, faster Ethernet, and PoE capability via a separate PoE HAT The dual-band wireless LAN comes with modular compliance certification, allowing the board to be designed into end products with significantly reduced wireless LAN compliance testing, improving both cost and time to market. The Raspberrry Pi 3 Model B+ maintains the same mechanical footprint as both the Raspberrry Pi 2 Model B and the Raspberrry Pi 3 Model

6.2 PROCESSOR:-

The Broadcom BCM2835 SoC used in the first generation Raspberrry Pi[20] includes a 700 MHz ARM1176JZF-S processor, VideoCore IV graphics processing unit (GPU), [21] and RAM. It has a level 1 (L1) cache of 16 KB and a level 2 (L2) cache of 128 KB. The level 2 cache is used primarily by the GPU. The SoC is stacked underneath the RAM chip, so only its edge is visible. The 1176JZF-S is the same CPU used in the original iPhone, [22] although at a higher clock rate, and mated with a much faster GPU. The earlier V1.1 model of the Raspberrry Pi 2 used a Broadcom BCM2836 SoC with a 900 MHz 32-bit, quad-core ARM Cortex-A7 processor, with 256 KB shared L2 cache.[23] The Raspberrry Pi 2 V1.2 was upgraded to a Broadcom BCM2837 SoC with a 1.2 GHz 64-bit quad-core ARM Cortex-A53 processor,[24] the same SoC which is used on the

7. DISCHARGE OF WORK PIECE:-

The Conveyor Feed has a wide application in low cost automation industries. It can be used in automated assembly lines to carry up the finished product from workstation and place them in bins. It can also be used to pick raw material and place them on the conveyor belts.

8. IMPROPER MATERIAL REMOVING OPERATION

Raspberrry Pi 3, but underclocked (by default) to the same 900 MHz CPU clock speed as the V1.1. The BCM2836 SoC is no longer in production as of late 2016. The Raspberrry Pi 3+ uses a Broadcom BCM2837B0 SoC with a 1.4 GHz 64-bit quad-core ARM Cortex-A53 processor, with 512 KB shared L2 cache.[1]

9. CONVEYOR SYSTEM

A conveyor system is a common piece of mechanical handling equipment that moves materials from one location to another. Conveyors are especially useful in applications involving the transportation of heavy or bulky materials. Conveyor systems allow quick and efficient transportation for a wide variety of materials, which make them very popular in the material handling and packaging industries. They also have popular consumer applications, as they are often found in supermarkets and airports, constituting the final leg of item/ bag delivery to customers. Many kinds of conveying systems are available and are used according to the various needs of different industries. There are chain conveyors (floor and overhead) as well. Chain conveyors consist of enclosed tracks, I-Beam, topline, power & free, and hand pushed trolleys. Conveyor systems are used widespread across a range of industries due to the numerous benefits they provide.

10. PROPOSED SYSTEM

Proposed system, the robot detect the object by the ultrasonic sensor can collect the garbage automatically by sensing using web camera by the image processing technique using mat lab, the robot can be able to separate the garbage into degradable and non-degradable waste. Embedded c programming used for the arm and gripper movement by the raspberry pi and the separation of garbage is done by the image processing technique of size, color and texture.

This unit can also be used in improper material collected in a collecting box. The solenoid operated pneumatic cylinder is used for this mechanism.

11. CONCLUSION

By using this automatic waste segregation device, manpower is reduced and efficiency of sorting is increased. After separating the biodegradable and non-biodegradable waste the collection can be done by using separate vehicle for biodegradable and non-biodegradable wastes.

12. REFERENCES

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