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DESIGN AND DEVELOPMENT OF AUTOMATED WASTE SEGREGATOR

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Abstract: ***The waste generated disposed without proper management leads to climatic changes and unfavorable lifestyle of the living in recent days. Most of the waste is disposed by unplanned and uncontrolled ways. Usually the landfill sites are located in the outskirts which are the breeding grounds for diseases. The economic value of waste will increase when the complete re cycling process is finished. Several technologies have been used in order to manage and segregate waste into basic streams, namely: wet, dry and metallic. The segregation of waste at the source recovers back more benefits and value. The wet waste is converted to either methane gas or compost which can be used as various energy sources and the metallic waste can be recycled or reused again.***

Keywords: *Waste Separator, Easy Handling, Transportable*

I INTRODUCTION

The waste generated disposed without proper management leads to climatic changes and unfavorable lifestyle of the living in recent days. Most of the waste is disposed by unplanned and uncontrolled ways. Usually the landfill sites are located in the outskirts which are the breeding grounds for diseases. The economic value of waste will increase when the complete re cycling process is finished. Several technologies have been used in order to manage and segregate waste into basic streams, namely: wet, dry and metallic. The segregation of waste at the source recovers back more benefits and value. The wet waste is converted to either methane gas or compost which can be used as various energy sources and the metallic waste can be recycled or reused again. Even though large scale industries are present to segregate waste, it is always better to segregate primarily. At present there are very few but expensive segregation system for segregation of wet, dry and metallic waste at household level. So it is necessary to develop waste management system with effective segregation. The purpose of this project is to design a system with low cost and user- friendly which segregates wet, dry and metallic waste using suitable sensors and it can also monitor the levels of bins using IOT-ThingSpeak for better waste management process.

II PURPOSE OF MAKING

The model is developed to segregate the plastic bottles and tin cans automatically. So, this system will detect the waste by the sound resonant frequency produced when the material hits the platform. After the identification of the waste, it will be segregated into the trash bin. Hence, we are designing a system that will sort all types of waste in a single system which are dry, wet and metal wastes using their dielectric values.

The segregation model is designed to segregate dry, wet, plastic and waste water into their respective bins. It is an efficient and hygienic waste segregation and disposal system which will help in optimization of waste but an expensive system and consumes more space for household level.

III OBJECTIVE

The objective of this system is segregation of metal, plastic and biodegradable wastes. In our project, we use ESP 32 microcontroller for the operations to be performed and indicate it to the user through a message instead of using alarms. Since it is for household use, the design requirements are reduced in our system. We also use IOT called Thing Speak for analyzing the levels of the bins.

IV EXPERIMENTAL SETUP

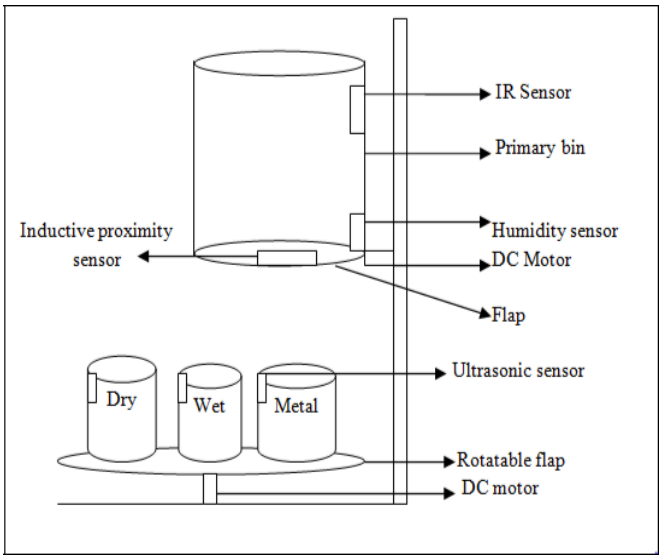

Fig.1. Design of automated waste segregator

V ALGORITHM

Step 1: When the waste falls into the primary dustbin, the IR sensor senses the waste the whole system gets activated. If no waste is present in the bin the system goes to the low power mode.

Step 2: The inductive proximity sensor first detects the metal in the waste, if the metal is present then it does as Step 4, if not present the humidity sensor activates.

Step 3: Humidity sensor acts on the waste and detects the waste as either wet or dry depending upon the moisture content in the waste and differentiates between wet waste and dry waste.

Step 4: The rotatable flap rotates clockwise with the help of DC motor according to the waste detected and respective waste bin comes under the primary bin.

Step 5: The closed flap of the primary bin opens by DC motor and lets the waste to fall into the bin below it.

Step 6: Ultrasonic sensors in each bin will continuously monitor the level of respective bin, when the bin becomes full the message is sent and displayed on LCD as particular bin is full and sends the message to the connected email using Wi-Fi. If bins are not full the system will reset the previous values and gets ready to accept other waste into the primary bin.

VI CONCLUSION

The present paper discloses the system designed to segregate dry, wet and metallic waste. The waste in the primary bin undergoes the inductive sensing module and senses the metallic waste and moves to its respective bin otherwise it activates the moisture sensing module. The moisture sensing module detects the waste as wet or dry waste and drops it into the bin accordingly.

By the observation we can dump each kind of waste in its respective bin, the following table shows us the segregation of certain waste at household level

Tins	Metal
Vegetable scrap	Wet
Paper	Dry
Banana peel	Wet
Plastic Pens	Dry
Metal cased pens	Metal
Plastic	Dry
Cloth	Dry
Food Waste	Wet

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