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## Enhanced Non-Biodegradable Solid Waste Disposal using Incinerator

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### ABSTRACT

The system is implemented using sensors which are being controlled by controller, and ultrasonic sensor detects the level of the waste in the bin and sends the SMS accordingly through telegram. The collected waste is made to fall on the conveyor belt which is driven by the DC motor, when metal is sensed by the metal sensor it will be segregated (rock and pinion motion), In the same way when wet wastes are sensed by the wet sensor it is also segregated, other than any of these (metal and wet waste), plastic and paper waste moved to incinerator box. The main purpose of the Incinerator box is to burn the waste materials, where it contains heating coil which produces sparks and burns the waste inside the box and turn them into ash. The fan is added for cooling purpose.

### INTRODUCTION

Waste management refers to the collection, transportation, treatment, and disposal of waste. It is the process of handling all types of waste, including solid waste from their point of origin to their final destination. Waste management systems are designed to ensure the safe and efficient handling of waste while minimizing its impact on the environment and public health. There are several types of waste management systems, including landfilling, incineration, recycling, composting, and waste-to-energy conversion. Each system has its advantages and disadvantages, and the appropriate system depends on the type and amount of waste generated, as well as the local regulatory environment. Waste reduction, reuse, and recycling are essential components of a sustainable waste management system, and can help to conserve resources, reduce greenhouse gas emissions, and minimize the need for new landfills and incinerators.

### OBJECTIVE OF PROPOSED SYSTEM

- To design the system for waste management.
- To segregate the metal, wet and plastic waste.
- To monitor the dustbin by SMS and location information.
- To burn the plastic and paper waste in incinerator box.

### MOTIVATION OF PROPOSED SYSTEM

Waste management is one of the major environmental problems of Indian cities. The problem is overflowing of waste on the roads. This, in turn, leads to various hazards such as bad odor & ugliness to that place which may be the root cause for the spread of various diseases. Several efforts have been invested in tackling. Waste is an important issue, which needs to be tackled smartly. We got inspired from "Swatch Bharat Abhiyan" which is a national campaign by the Government of India, to clean the streets, roads, and infrastructure of the country.

### METHODOLOGY

In proposed model, Smart waste Dustbins are located in several areas of city are connected to Internet wirelessly, they equipped with ultra-sonic sensors which collects the data about level of collected waste in waste Dustbin. Then waste Dustbin sends this information through software application (Telegram). If the Smart waste Dustbin is filled up to its certain value, then the message is displayed and the responsible authorities take proper action. Once all waste is collected then segregation of metal and non-biodegradable wet waste gets segregated through conveyor belt, which further moved to incinerator compartment where it burns the waste and converted into ash and cooling fan is implemented to minimize the excess heat as shown in fig 1.

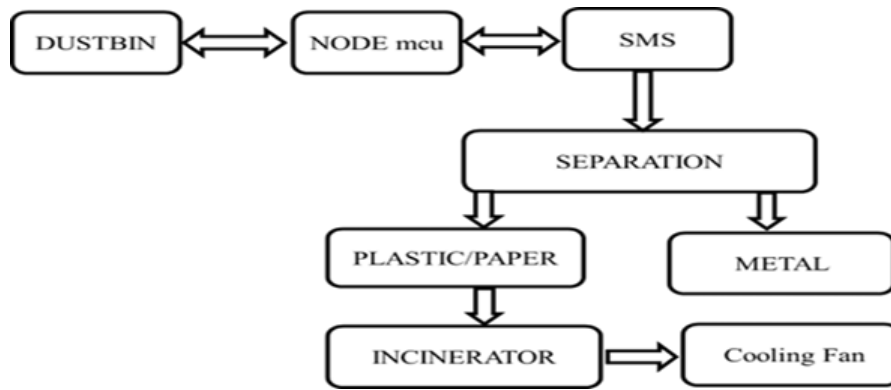


Fig 1:- Methodology

**Block diagram: -**

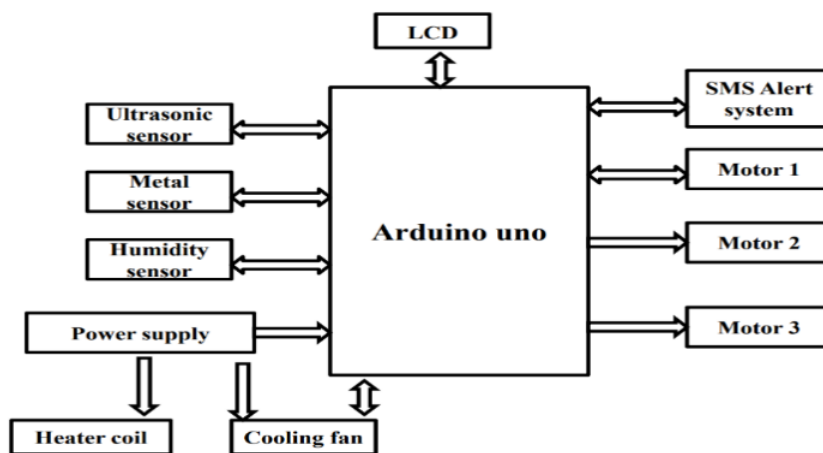


Fig 2:- Block Diagram

**CIRCUIT DIAGRAM: -**

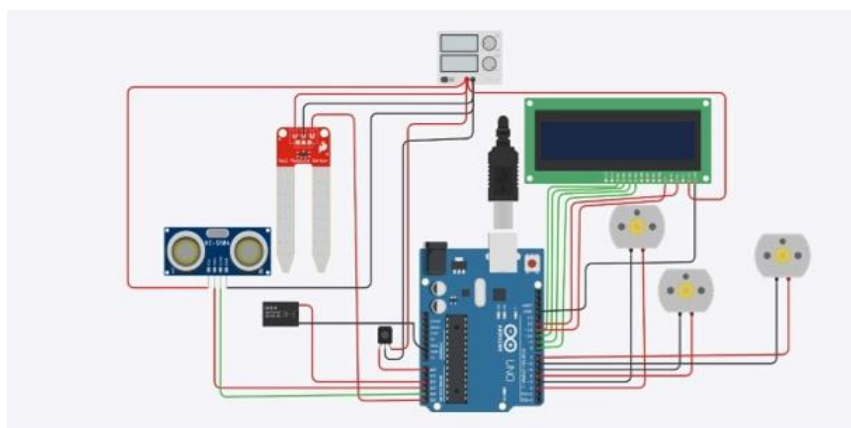


Fig 3:- Circuit diagram of waste segregation

The garbage containers transmit signals to indicate that they are over 90% full and should be emptied. Via the mobile communications network, the signals are sent to a Web based software application through Telegram.

An ultrasonic sensor is installed in the garbage container and detects the fill level regardless of what has been deposited inside. The whole system contains ULTRASONIC SENSOR, ARDUINO UNO BOARD, ESP8266 (WIFI MODULE), H BRIDGE DRIVES, POWER SUPPLY, INCINERATOR COMPARTMENT, COOLING FAN.

The sensor is fixed on to the board. the connection between the Arduino board and sensor is made with the help of connecting wires. The working program is fed into the Arduino board. The ESP8266 module is also connected to the same Arduino board with the help of wires. The power supply to the system is given with the help of a battery This can be best used by municipal corporation for their betterment of management regarding collection of wastes. With the help of proper technology. we can guide the trucks to choose the shortest path. It also favors the “SMART CITY” project and “DIGITAL INDIA”.

The collected waste is made to fall on the hopper and then it falls on conveyor belt, in conveyor belt IR sensor detects the waste present and turn's on conveyor belt DC motor, when metal is sensed by the metal sensor it will be segregated (rack and pinion mechanism), In the same way when wet wastes are sensed by the wet sensor it is also segregated, other than any of these (metal and wet waste), plastic and paper waste moved to incinerator box. The main purpose of the Incinerator box is to burns the waste materials, where it contains heating coil which produces sparks and burns the waste inside the box and turn them into ash. The fan is added for cooling purpose.

## DESIGN DETAILS

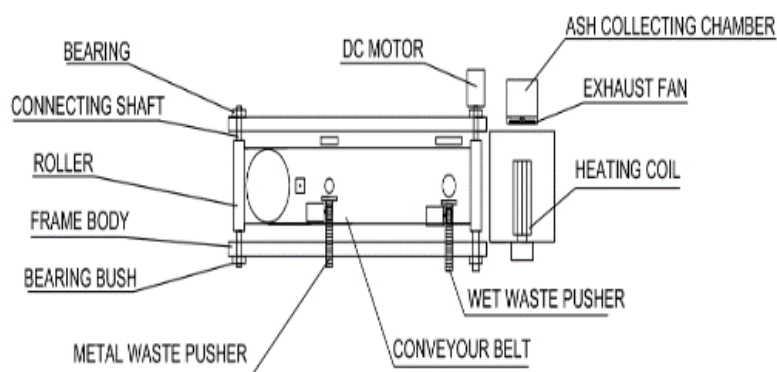


Fig 4:- Top view segregation system

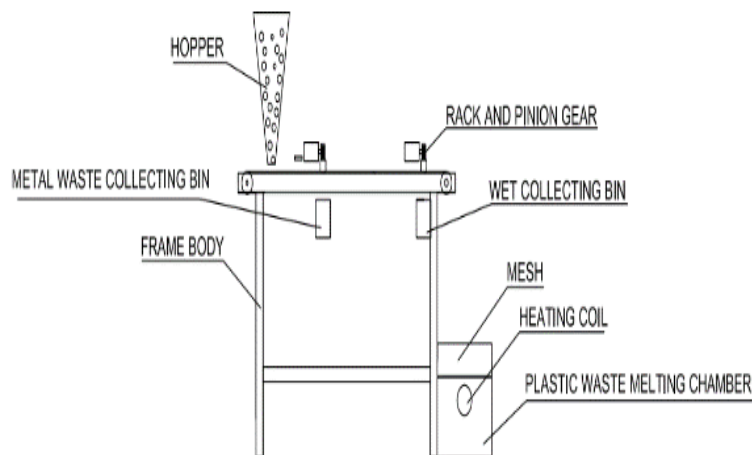
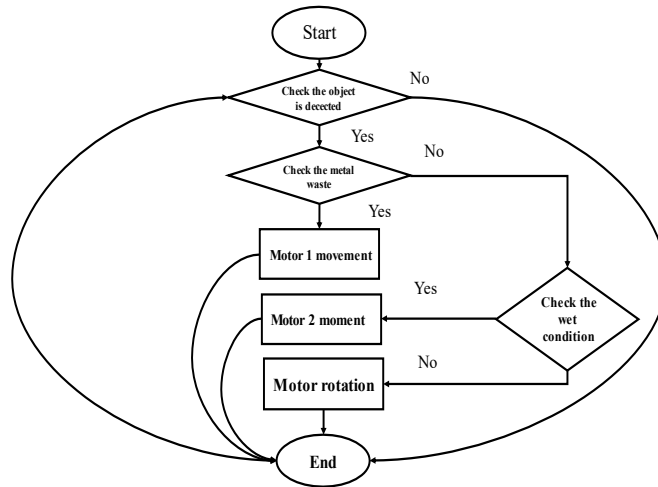


Fig 5 :- Layout of segregation system (side view)

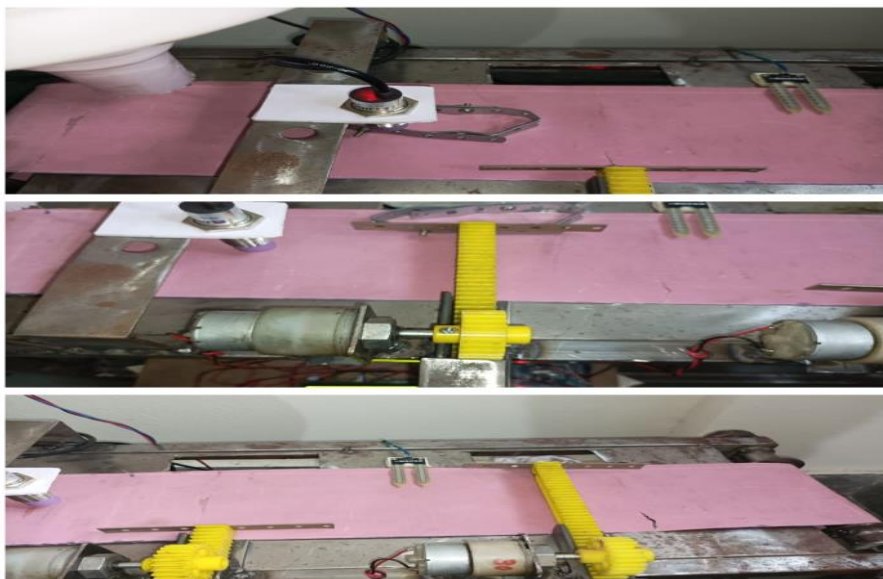
**FLOW CHART**



**VII. RESULT**



**Fig 6:- Front view of the working model**



**Fig 7:- Segregation process**

The dustbin tracking can be easier with the help of location information through telegram The proposed system able to segregates the non-biodegradable waste such as paper and metal.

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## ADVATAGES

- Automated waste segregation.
- Integration of mobile devices.
- Proper disposal of waste.
- System scalability and easy extension.

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## CONCLUSION

The use of updated literature review and continuous research which was a major source to understand the issues related to disposal of solid waste. The proposed system able to segregates metal and wet waste when they allowed to move on the conveyor belt, and the non-biodegradable waste such as paper and plastics are burnt in the incinerator box, and also able to optimize resource allocation, reduce running cost, and increases the sustainability of the waste services.

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## FUTURE SCOPE

In future the project can be used in automated vacuum collection system with some external attachment fixed to it. It requires some modification in design and in working of the system. That ensures the transportation of waste with the help of pneumatic tubes located under the ground. Thus, an effective way of automated vacuum collection system can be achieved And by including the robotic arms for segregation system. Also adding a sensors for the incinerator box for the automatic on and off of the heating coils.

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