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Indoor Compactor – "Say No To Food Wastage!"

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ABSTRACT: The concept is straightforward and motivated by the fact that dustbins need to be cleaned frequently, which is not always feasible. As a result, diseases spread and the environment becomes unhealthy. The objective is to provide greater space and use alert services to promptly clear the trash can. Municipal trash cans are frequently overflowing and not being cleaned on schedule. The repercussions are severe as a result. It contains rubbish overflow that pollutes the environment, spreads disease, makes the area unsightly, and makes people unclean. The term "waste management" typically refers to all types of waste, including waste produced during municipal, agricultural, and social activities like health care, as well as waste produced during the extraction of raw materials, the processing of raw materials into finished products, and consumption of finished products. A mechanism that notifies the municipality in advance of the trash being filled is necessary so that they can promptly clean the bin and protects the environment. We want to present a Smart Garbage Bin as a solution to this issue, which will alert the designated person when the garbage bin is close to fill and will send the message, in order to prevent all such occurrences.

KEYWORDS: Pico, Smart Bin, Controllers, Motor, Sensors, Relay, Compactor, Waste

I. INTRODUCTION

There is one issue since the world is going through an upgrade. We have waste to deal with. We frequently see images of overflowing trash cans with surplus waste spilling out. Due to the enormous number of insects and mosquitoes that breed there, this causes a lot of ailments. Solid waste management is a major issue in urban areas. Therefore, a system that can eliminate this issue or at the very least scale it back to the absolute minimum must be developed. The primary cause of pollution nowadays is garbage overflow. It leads to unclean conditions for the populace and foul odours in the neighbourhood, which spreads some deadly diseases & human ailment. We will put into practise a project called Self navigated Smart dustbin to prevent all of these occurrences. Here, we employ an ultrasonic sensor to determine whether or not the trash can is full of trash. Here, an ultrasonic sensor is mounted on top of the trash can to gauge how far the trash is from the container's top.

II. RELATED WORK

In [1] the motor begins when a single phase of AC electricity is passed. The motor's speed is increased to 2880 rpm by rotating the motor shaft, which is fixed with a 4-inch pulley, and the shaft with the blades, which is fixed with a 2-inch pulley. This machine doesn't use torque; it operates entirely on the basis of pure rotational force. Therefore, a gear box is not required. The blades rotate at the same rate as the shaft while it is rotating quickly. Materials placed into the hopper are hammered by the blades. The gap between the size and blade is only half an inch, so as the blades rotate quickly, they produce centrifugal force, which raises the uncut pieces and hammers them until they fit through the size hole. In [2] the paper describes how to build a machine that will directly grind up organic waste generated in a typical kitchen, completing the first step required by the majority of composting processes. To begin the procedure, all of the generated kitchen trash must be sorted to determine the organic waste. The water from the organic kitchen trash must then be drained. Numerous methods, such as heating, compression, vacuum dehydration, etc., can be used to accomplish this. The procedure utilized in this project to eliminate the water content is squeezing. The method of pressing is based on a type of juicer called a "masticating juicer," which squeezes fruit to extract juice. A 300W, 80 rpm motor rotates the squeezing mechanism for this project. In [3] the compressed wastes are then ground into pulverised form as the next phase. This can be done using either a crushing mechanism, like in a typical juicer, or a grinding mechanism, like in a grinder. In this project, two grinding stones are employed; one is kept fixed, while the other is rotated with the help of a secondary motor that essentially shares all the characteristics of the primary motor. The waste material is allowed to cool at room temperature for a while after the grinding process. In [4] this paper is contained in a plastic container. A few holes have been drilled into the cover of the container to allow air into the compost. As was already said, bacteria need oxygen to continue the respiration process that occurs in aerobic

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environments. It's also a good idea to place the compost in a closed container. The bin will shield the compost from the elements and maintain a constant internal temperature. Closed containers are also used to prevent odour and to stop other animals from interfering with the procedure. The container will be mounted horizontally on a four-wheel base, allowing it to be spun like a tumbler. As it slides down the length of the drum, the waste mixture progressively breaks down and is thoroughly mixed with oxygen and water. The following increase in biological activity and granularity leads to a well-established breakdown process. The composter enables a healthy composting procedure. As a result, many factors are considered when designing it.

III. METHODOLOGY

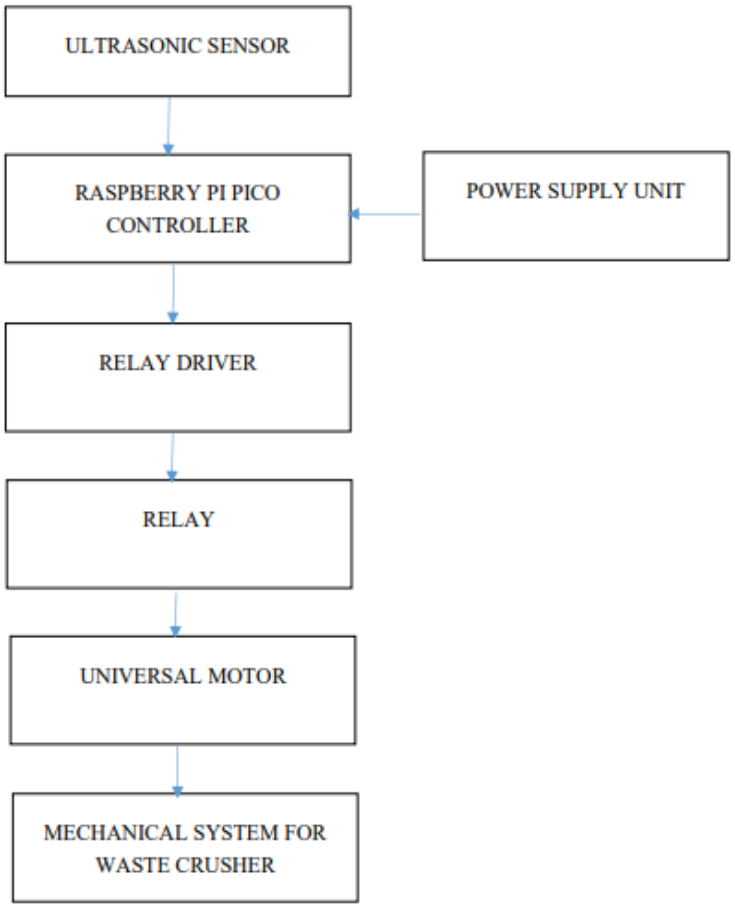

Fig 1. Block Diagram

A Compactor is a machine or a mechanism used to reduce the size of food waste from kitchen or soil through compaction. Here we came up with the portable indoor compactor using ultrasonic sensor, universal motor and raspberry pi Pico controller using sensor technology for operating the system. Our project consists of blades, power supply unit, Pico controller and fabricated dustbin model. The universal motor is connected in the rotating mechanism for the rotational movement of the blades. Different direction blades are provided in the supporting rod for control of the motor's movement. When the waste materials like kitchen food waste was put in garbage box it cuts transmitter and receiver signal receives of ultrasonic sensor. It is employed to determine when the bin, which is situated on the top of the compactor, has reached its volume-based filling capacity. Eco signals are gathered back at the eco terminal where a constant signal is emitted. To determine the bin's distance, the total lap time is employed. Due to this it sends signal to the raspberry pi Pico and the control unit switch ON the universal motor. Motor rotates the blades due to this the blades moves rotation which is connected on the shaft. After complete crush the motor automatically switch OFF. To obtain the required DC voltage needed to power the other circuits, we employ a power supply for the system. Although the other parts of our circuit require 5 volts DC, the voltage we receive from the main line is 230V AC. Consequently, a step-down transformer is required to generate 12V AC, which is then rectified into 12V DC. This capacitor is used to remove some residual repellence from the rectifier's output. The positive voltage allows the 12V DC to be rated down

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to 5V. The result is a fixed DC voltage of 5V. Thus, we can use this compactor at each house where we can generate our own natural compost instead of artificial or chemical compost. Additionally, we have a second container where moist waste is dried. Here, we've utilised a moisture sensor to identify any moisture in the garbage, and once it does, the fan immediately kicks on to finish drying it. The fan will turn off automatically if the moisture content is no longer present. The IR sensor, which is also employed, is used to determine whether the container is full. When it is filled, a buzzer alerts the user.

IV. RESULT AND CONCLUSION

The project's goal of using pneumatic force to create a hole has been accomplished. We did a great job and enjoyed ourselves while doing it. Punching is a straightforward activity that we may perform and is highly beneficial for carrying out modest tasks at our college. We settled on a straightforward, space-saving c-frame machine that anyone can operate. We punched the sheet metal to test our design. As our idea is based on the production of pneumatic punching, more modifications and expansion of its applications are possible. We consider adding the following features to this project in the future. 1) Pneumatic punching machine automation 2) Adding LDR sensors to accident-avoidance systems 3) Adding timers, silencers, and other components to pneumatic machines to improve their performance.

Fig 2. Final Outcome

V. FUTURE WORK

Improvement sensors, which are utilised to increase sensitivity and transmitting speed, are the focus of current and future studies. IOT module should be efficiently constructed with an Android app that includes sensor values. Future market field that is emerging is IOT. Added features include filters that keep dangerous air inside the industrial setting and send it outside. The internet should be used to upload these data. The webpage will display the message "Basket is Full" if the distance is less than this threshold value, and "Basket is Empty" if it is greater. If the distance is greater than this threshold value, the trash can is empty. Here, we've set the programme code's Threshold value to 5 cm. The dustbin will autonomously navigate to the disposal location once the threshold is reached, and after disposal, it will return to the source point. There will be a few updates to this project.

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