

# Solar Powered Waste Compaction Bin

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**Abstract**— Trash compaction is a process of compacting waste. The various process of trash decomposition produces air pollution and water pollution. In India many garbage dust or waste is left by creating pollution problem as well as environment problem, So we brought up this idea to save the time for compaction dust, recycling and to keep the earth green. This present study contains the waste management solar power trash compactor use renewable energy to turn public space clean and eco-friendly. Powered by the sun encourages recycling and reduce both greenhouse gas emission and trash collection expenses. The objective of this project is to compact the trash without producing any pollution. With the help of microcontroller and compaction mechanism the size of trash is reduced so that in the so that in small space more trash can be stored. It is estimated that between one-third and half of the waste generated in most cities in low and middle-income countries respectively are not collected and again this compacted trash can be compact again and the space used to store the trash can be made free. It will also reduce the diseases wise main cause is trash Main technical considerations included providing a compaction pressure comparable to the 15 psi.

**Keywords:** Solar Power, Waste Compaction Bin

## I. INTRODUCTION

The problem of trash control and disposal reveals itself in many facets of our society, from carnivals and city fairs in the summer time to overflowing garbage cans in a fast food restaurant. People often attempt to cram their waste into a trash receptacle already struggling to balance the trash piled on top of it. To solve this problem, we propose an automatic trash compactor that manages the trash levels and notifies when the receptacle needs to be emptied all by itself. Utilizing a trash compactor instead of a normal trash can increases the amount of trash that can fit inside the same sized receptacle. Therefore, the trash needs to be collected less frequently. To add further convenience, the compactor will sense when the container is full, and will automatically compact the trash as needed. When the trash cannot longer be compacted, it will lock itself and signal that it needs to be emptied. Several considerations were taken into account when determining this design including compression ratio of compaction, force of compaction, ease of use, sanitary considerations, and aesthetics. Main technical considerations included providing a compaction pressure comparable to the 15 psi seen in automatic trash compactors, as well as a container robust enough to handle pressure forces due to compaction. The method chosen as a means of compaction was a scissor lift system actuated by pressing down on a fixed bin. The system then elevates the refuse bin. This motion compresses the contents of the refuse bin against a stationary compaction plate, ultimately compressing the trash. The objective of this project is to compact the trash without producing any pollution. With the help of microcontroller and compaction mechanism the size of trash is reduced so that in the so that

in small space more trash can be stored. Again this compacted trash can be compact again and the space used to store the trash can be made free. It will also reduce the diseases wise main cause is trash. With the help of microcontroller and compaction mechanism the size of trash is reduced so that in the so that in small space more trash can be stored. Again this compacted trash can be compact again and the space used to store the trash can be made free. It will also reduce the diseases wise main cause is trash. Therefore, the trash needs to be collected less frequently. To add further convenience, the compactor will sense when the container is full, and will automatically compact the trash as needed. When the trash cannot longer be compacted, it will lock itself and signal that it needs to be emptied. Several considerations were taken into account when determining this design including compression ratio of compaction, force of compaction, ease of use, sanitary considerations, and aesthetics. Main technical considerations included providing a compaction pressure comparable to the 15 psi seen in automatic trash compactors, as well as a container robust enough to handle pressure forces due to compaction. The method chosen as a means of compaction was a scissor lift system actuated by pressing down on a fixed bin. In the present era, to protect the environment is our first priority. Nowadays due to global warming, there are abrupt changes in the atmosphere. There is a sudden increase in temperature which extremely affects the animals & their habitat. In this paper, the smart bin is built on a microcontroller-based platform Arduino Uno board which is interfaced with GSM modem and Ultrasonic sensor. One ultrasonic sensor is used for the position sensing of the human for opening the lid of the dustbin and another ultrasonic sensor is used to sense the height of the garbage in the dustbin and compare it with the garbage bin depth. The system makes use of Arduino, GSM module for sending a message, servomotor to open the lid, buzzer, LED as an indicator and Solar panel of the street light. The system is powered by a 12V battery which gets charged by a solar panel. When the level of garbage crosses the set limit, the system puts on the buzzer.

## II. LITERATURE SURVEY

### A. S. Fisher et al

A half scale version of a device called the plastic melt waste compactor prototype has been developed at NASA Ames Research Centre to deal with plastic based wastes that are expected to be encountered in the future of human space exploration scenarios such as lunar or martin missions. The plastic melt waste compactor design was based on the types of waste produced on the international space station, space shuttle, MIR and Skylab mission. The half scale prototype unit will lead to the development of a full scale plastic melt waste compactor prototype that is representative of flight hardware that hardware that would be used on near and far term space.

*B. W. John et almission.*

A half scale Plastic Melt Waste Compactor prototype has been developed at NASA Ames Research Centre. The half scale prototype unit will lead to the development of a full scale Plastic Melt Waste Compactor prototype that is representative of flight hardware that would be used on near and far term space missions. This report details the testing being done on the prototype Plastic Melt Waste Compactor by the Solid Waste Management group at NASA Ames Research Centre. The tests are designed to determine the prototype's functionality, simplicity of operation, ability to contain and control noxious off-gassing, biological stability of the processed waste, and water recovery potential using a waste composite that is representative of the types of wastes produced on the International Space Station, Space Shuttle, MIR and Skylab missions.

*C. Roberts et al*

The ongoing purpose of the project efforts was to characterize and determine the fate of microorganisms in space-generated solid wastes before and after processing by candidate solid waste processing. For FY 11, the candidate technology that was assessed was the Heat Melt Compactor (HMC). The scope included five HMC. Product disks produced at ARC from either simulated space-generated trash or from actual space trash, Volume F compartment wet waste, returned on STS 130. This project used conventional microbiological methods to detect and enumerate microorganisms in heat melt compaction (HMC) product disks as well as surface swab samples of the HMC hardware before and after operation. In addition, biological indicators were added to the STS trash prior to compaction in order to determine if these spore-forming bacteria could survive the HMC processing conditions, i.e., high temperature (160 C) over a long duration (3 hrs).

*D. S Michael et al*

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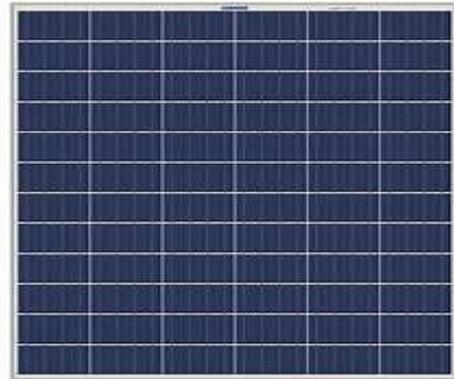
III. OBJECTIVES OF THE RESEARCH WORK

- 1) To study the available techniques of recycling systems.
- 2) To fabricate the designed system by procuring required materials.
- 3) To suggest the simplified and easiest method for waste compacting bin system in order to utilize the available space.
- 4) To reduce the frequency of waste collection

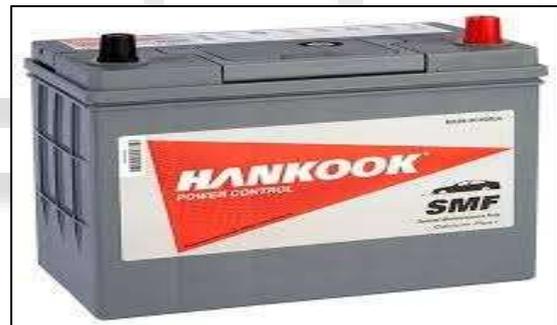
IV. MATERIALS AND METHODOLOGY

A. Materials Used

1) SOLAR PANEL:



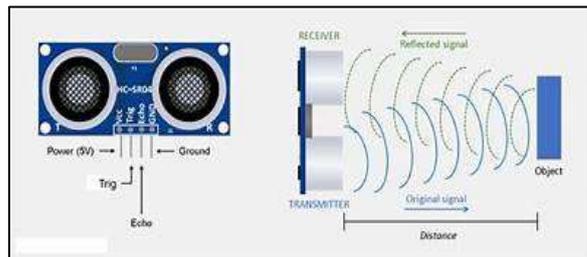
2) BATTERY:



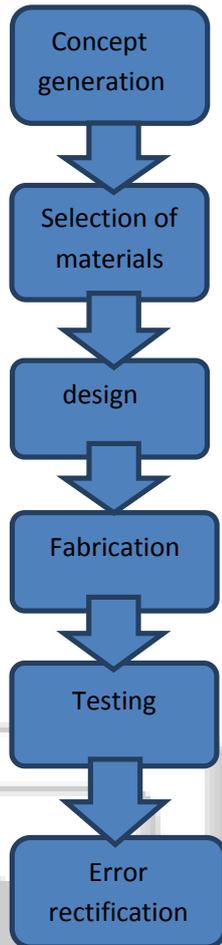
3) LEAD SCREW:



4) ULTRASONIC SENSOR:



## B. Methodology Followed



## V. CONCLUSION

- 1) We successfully Fabricated Solar Powered Waste Compacting Bin.
- 2) The implementation of Solar Compacting Bin leads to reduce Electricity and Time.
- 3) The trash bin is used batteries for power, the batteries also need to be safe, efficient, and have a long lifetime.
- 4) Use solar power as source of energy.
- 5) It is used in beaches, public area nearer to road.

Therefore, the goal of this project is to make a solar trash bin. As it is intended for commercial use, the price is an important factor. To account for that, each component that is not expensive as well as efficient is used. Also, since the trash basket is used batteries for power, the batteries also need to be safe, efficient, and have a long lifetime. Using a standby time when the trash basket is not in use, batteries last longer than just keep on it all day.

Second, to improve the understanding of technology, its appropriate application, potential consequences should be considered. This project utilizes several complex parts, which will require rigorous testing to successfully implement. The design combines electrical and mechanical parts to accomplish a task that could not be done as easily by only using one or the other.

Third, to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to

credit properly the contributions of others, we fulfill this paper deals with the steps involved in trash compaction systems and an attempt to speed up the process.

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