FORM 2
THE PATENTS ACT 1970 (39 of 1970)
AND
The Patents Rules, 2003
COMPLETE SPECIFICATION
(See section 10 and rule13)

TITLE OF THE INVENTION

ENVIROGAS: AN INTELLIGENT BIOGAS-EXTRACTING WASTE BIN SYSTEM FOR SUSTAINABLE ORGANIC WASTE MANAGEMENT

APPLICANT

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the following specification particularly describes the invention and the manner in which it is to be performed.

FIELD OF INVENTION

The idea behind the current invention to create a system that will extract biogas from organic waste, and this will be reduce problems of health-related issues which is caused by organic waste, reduce pollution created by organic waste as well as clean the environment.

BACKGROUND OF THE INVENTION

The present invention provides a sensor-based garbage bin that reports its fullness and its physical condition. In this system, we mainly focus on producing biogas from the waste, colleting the byproduct after the gasification process, and sending an alert message to the service station that will provide an urgent service (e.g., cleaning) to collect the byproduct which will be used in cultivation. The garbage bin is fitted with a number of types of sensors and transmission devices, which is responsible for detecting garbage level, the presence of organic waste, and transmitting data to the signals. The model of the system is based only on extracting 'Bio Gas' from biodegradable garbage using IOT Technology and extracted gas can be used in various fields of life.

Software mistakes may result from inconsistent or unclear requirements, oversights or misinterpretations of those requirements, carelessness or neglect in the coding process, insufficient testing, unsuitable or unexpected uses of the software, or other unanticipated problems. Finding these software flaws at the proper time is crucial for lowering the significant cost of software development.

R. Sieg, R. white "Gasification of solid waste material to obtain high but product gas" Publication of US3817725. A related to a process for converting solid waste material to combustible gases which comprise.

Mullen F Mc "Waste materials processing system" Publication of US3769921A related to a waste materials processing system and method for combusting solid waste material on grates in combination with comminuted waste material being combusted in suspension within a combustion zone.

James N Vandergrift, Postel Carl “Apparatus for producing fuel” Publication of US2066082A, this invention relates to means for producing a new type of domestic fuel and more particularly to means for producing a smokeless domestic fuel from slack or Waste from screened bituminous coking coals.

A garbage-bin system can be adapted into a general garbage bin and it consists of the sensing devices like ultrasonic and I-R sensors, it also contains node MCU and SIM module for data transmission, and other components like wire, battery for starting and completing the whole process, solar plans for generating the power/electricity supply and gas pipe for transferring biogas. This system helps the local municipal administration in the waste management system. i.e., monitoring of domestic wastage clearance at the proper time to avoid damage to public health. A web server has also been set up through which the municipal authorities also get information about the bins in their area. It uses devices like SIM MODULE and Sensors for sensing information of Bins and sending them to a workstation, which is situated at the service center office for finding the shortest path. This project came in comfortable a worthy reporting for maintaining a Green environment. The proposed system is an attempt to improve the current waste collection system in India for the "Clean India Mission".

OBJECTS OF THE INVENTION

Some of the objects of the present disclosure, which at least one embodiment herein satisfies, are as follows.

It is an object of the present disclosure to ameliorate one or more problems of the prior art or to at least provide a useful alternative

Efficient Biogas Extraction: Developing a smart garbage can that maximizes the extraction of biogas from organic waste using creative and effective techniques would increase the overall output of renewable energy.

Real-time Monitoring: Design a system with real-time monitoring and sensors to precisely measure the levels of organic waste and biogas inside the bin, providing the best possible gas collection and trash management.

Automated Process: To create an automated system for sorting, processing, and digesting organic waste that requires little to no physical labour and produces biogas with consistency and dependability.

Remote Management: To allow users to remotely monitor and manage the smart garbage bin system, allowing them to monitor waste levels, biogas production, and system performance.

Sustainability and Waste Reduction: To promote a circular economy and eco-friendly waste management practises while reducing the amount of organic waste that is dumped in landfills, lowering methane emissions, and creating a clean energy source in the form of biogas..

Other objects and advantages of the present disclosure will be more apparent from the following description, which is not intended to limit the scope of the present disclosure.

SUMMARY OF THE INVENTION

The following presents a simplified summary of the invention in order to provide a basic understanding of some aspects of the invention. This summary is not an extensive overview of the present invention. It is not intended to identify the key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concept of the invention in a simplified form as a prelude to a more detailed description of the invention presented later.

The system aims to extract useful gases from organic waste using a bin that only takes organic waste. The bin detects the level of waste and starts gasification, which produces biogas within 9-12 days. The extracted gas is stored in a container and sent to workstations through pipes in the smart bin. A by-product is formed, which is used for cultivation. The I-R sensor detects the movement of the by-product and sends a signal to the Node MUC for collecting the by-product. The system is connected through wires and includes an ultrasonic sensor to monitor the garbage bin's level and an IR sensor to monitor the environment around the bin. The

transmission device is a Node MUC and a SIM module, with a solar panel for charging batteries and powering LED lights. The flow chart of the system consists of three phases: filling the bin with only 2/5ths of garbage, mixing cow dung with water, decomposing organic waste, and transferring the collected biogas to workstations. The by-product produced during the decomposition process is used for agriculture.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates working model.

FIG. 2 illustrates Flow of process.

DETAILED DESCRIPTION OF THE INVENTION

The following description is of exemplary embodiments only and is not intended to limit the scope, applicability or configuration of the invention in any way. Rather, the following description provides a convenient illustration for implementing exemplary embodiments of the invention. Various changes to the described embodiments may be made in the function and arrangement of the elements described without departing from the scope of the invention.

The model of this system works on extracting useful gases from organic waste only. In this Model, the Bin takes only organic waste and the level of that waste will be detected by the ultrasonic sensor. Once the process is starting and the level of garbage is FULL up to 2/5. We will mix some methane particles (preferred: cow dung) with water for further processing, and the gasification process is started. After a certain period of time, the mixture starts producing biogas (it will take 9 to 12 days). The extracted gas is stored in a container and the stored gas will be automatically sent from one place to another through pipes that were fitted in the smart bin.

Once the gasification process is completed a By-product is formed that will be used for cultivation as we say, here the I-R sensor is responsible for providing services

to switch on the LED light at night and detect the movement of the by-product and generate a signal to Node MUC for collecting the product that will be formed after the process of gasification. The Node MUC passes a signal that will be transmitted to a service center, for collecting the fertilizer (by-product) through SIM Module (that is used for data transmission) to create an alert message that will further use in agriculture.

The sensors are divided into two parts. The first part is an ultrasonic sensor to monitor the level of the garbage-bin. The other part is IR sensor to monitor the environment around the garbage bin to avoid waste disposal outside the container that waste will be a bulk of garbage or a byproduct. If products are disposed of improperly, the infrared sensor detects the garbage around the waste bin and generates the signals. The transmission device that is used is Node MUC and a SIM module. A solar panel for charging batteries and for supplying power in LED lights. The whole system is connected through wires.

In the last section of the patent, we are given a flow chart of our model, through which we are trying to give an overview of this model. The flow chart will divide into three phases, In the first phase once a process started only 2/5th of the garbage will be stored by the smart bin if not it will continue the filling after the completion of garbage as per the level we decided the flow will be going in the second phase, this phase we add or mix cow dung with a sorted amount of water as a main source of methane composition to produce a biogas yield with a 50% average as per the global research. The process of mixing this mixture will take at least 2 to 3 days.

A few days later the decomposition of organic waste is completed and converted into biogas. In the third phase, the collected biogas was transferred into the workstations through pipes and the byproduct (fertilizer) that will be produced in the process of decomposition will help in cultivation.

And the process will continue for the waste that was being dumped in the garbage bin during in the decomposition.

Advantages of the Invention

the present invention has the following advantages:

- Our system provides greater accessibility to the dustbin.
- It will save fuel and time using appropriate route planning.
- By implementing this proposed system. It will reduce cost, and manpower.
- Keeps the environment clean and fresh.
- Reduces environmental pollution.
- This system also keeps reducing health-related issues.
- The byproduct after producing biogas is used in agriculture because the product works as a fertilizer.

While considerable emphasis has been placed herein on the specific features of the preferred embodiment, it will be appreciated that many additional features can be added and that many changes can be made in the preferred embodiment. without departing from the principles of the disclosure. These and other changes in the preferred embodiment of the disclosure will be apparent to those skilled in the art from the disclosure herein, whereby it is to be distinctly understood that the foregoing descriptive matter is to be interpreted merely as illustrative of the disclosure and not as a limitation.

We Claim,

1. enhancing the methane content in the organic waste to facilitate efficient biogas production.
2. A method for methane enrichment of organic waste, comprising the steps of introducing methane particles into organic waste, promoting the interaction between methane particles and organic waste through mixing, and enhancing the methane content in the organic waste to facilitate efficient biogas production.
3. In the model the bin takes organic waste then it mixed cow dung then the waste start producing the biogas.
4. The sensor data is analyzed and utilized for system performance evaluation, process optimization, and decision-making to continuously improve the methane enrichment process, enhance biogas production efficiency, and achieve maximum environmental and economic benefits.
5. The system, further comprising a battery storage system that stores excess solar energy for use during periods of low solar irradiation or at night, ensuring a continuous and uninterrupted operation of the gas injection system, gas diffusion mechanism, and agitation or mixing mechanism.

Dated this 25-08-2023

Signature

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IN/PA 2959

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ABSTRACT

This invention helps in producing fertilizers which mainly help in clean environment. The model comprises of IOT technologies like sensors. In the model the bin takes organic waste then it mixed cow dung then the waste starts producing biogas. In the present invention, the gas will be sent through the pipe through the process of gasification. The remaining waste will be sent to the existing pipe; the leftover waste was used as a fertilizer. This project supports agriculture also by providing fertilizer and the environment. To detect the level of garbage, a label sensor is used. The idea behind the current invention to create a system that will extract biogas from organic waste, and this will reduce problems of health-related issues which is caused by organic waste, reduce pollution created by organic waste as well as clean the environment.