

Bin Dozer

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Abstract:- In this paper, the idea of separating Biodegradable and non- biodegradable waste have been suggested and the technique to use Biodegradable waste for producing Biogas for cooking, to produce Electricity and the soil left after decomposing Bio wastes can be used as fertilizers in the field of Agriculture. This methodology can be used for both small scale and large scale waste separation and also to produce products. This idea will provide way for manufacturing of large number of organic fertilizers, which will promote Agriculture in a good way to grow Healthy crops and also provide way to healthy nation. Because of this Artificial fertilizers can be completely dumped.

INTRODUCTION

THE Smart bin system which works with smart technology. The IOT (Internet of Things) which plays a major role in making the full Autonomous system, which is mainly involved in separating the Biodegradable and Non-Biodegradable waste. Where the Non-Biodegradable wastes such as Low density plastics and High density plastics can also be separated from the common waste by boiling those wastes in water at a certain temperature. Then the remaining Biodegradable wastes can be moved to the next smart bins which have been placed under the ground as it produces methane (Biogas) while boiling those wastes in sand with few amount of water at certain temperature. The obtained methane gas can be used as Bio fuel for cooking and to produce electricity. After the decomposition process of the Biodegradable wastes into the soil, it will obtain the unique properties which can be used as a Fertilizer in the field of Agriculture.

PROBLEM STATEMENT

In this paper, the idea of separating Biodegradable and non-biodegradable waste have been suggested and the technique to use Biodegradable waste for producing Biogas for cooking, to produce Electricity and the soil left after decomposing Bio wastes can be used as fertilizers in the field of Agriculture. This methodology can be used for both small scale and large scale waste separation and also to produce products. This idea will provide way for manufacturing of large number of organic fertilizers, which will promote Agriculture in a good way to grow Healthy crops and also provide way to healthy nation. Because of this Artificial fertilizers can be completely dumped.

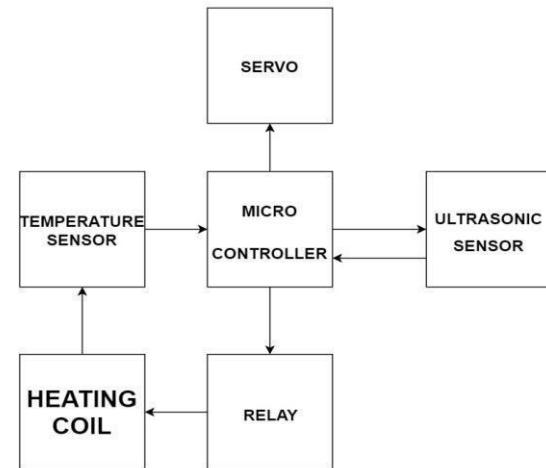
I. OBJECTIVE

To separate Biodegradable and Non-Biodegradable waste separately. To make use of Methane gas obtained by decomposing the Biodegradable wastes in the form of Bio fuel for cooking, for producing electricity. To make fertilizers at the end of the process by decomposing the Biodegradable wastes in the soil. To produce unlimited Fertilizers for Farmers in order to grow the healthy Crops and also to avoid artificial Fertilizers.

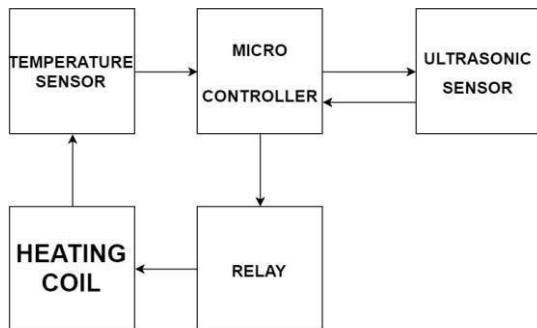
II. PROPOSED CONCEPT

This design has been proposed in such a way that the concept and product development concept is simple and Low cost.

PROCESS 1:



PROCESS 2:



III. COMPONENTS

The components used are simple it's been for different process for all detection methods.

a) MICROCONTROLLER

A microcontroller is a small computer on a single integrated circuit. In modern terminology, it is similar to, but less sophisticated than, a system on a chip.

Microcontrollers are designed for embedded applications, in contrast to the microprocessors used in personal computers or other general purpose applications consisting of various discrete chips.



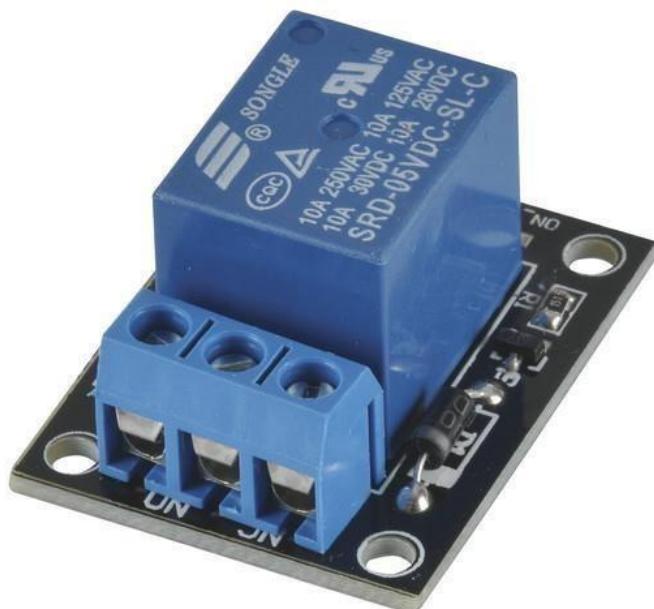
b) ULTRASONIC SENSOR

Ultrasonic sensors measure distance by using ultrasonic waves. The sensor head emits an ultrasonic wave and receives the wave reflected back from the target. Ultrasonic Sensors measure the distance to the target by measuring the time between the emission and reception.



c) RELAY

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.



TEMPERATURE SENSOR

A temperature sensor is a device that detects and measures hotness and coolness and converts it into an electrical signal.



d) SERVO

In control engineering a servomechanism, sometimes shortened to servo, is an automatic device that uses error-sensing negative feedback to correct the action of a mechanism. It usually includes a built-in encoder or other position feedback mechanism to ensure the output is achieving the desired effect.



e) HEATING ELEMENT

A heating element converts electrical energy into heat through the process of resistive or Joule heating. Electric current passing through the element encounters resistance, resulting in heating of the element.

IV. WORKING

There are two bins used in this technique. In the first bin, the main process is to separate Non-Biodegradable from the Biodegradable waste. At first, the Micro controller will give command to Ultrasonic sensor to sense the height of the waste. After getting desired height which is

sensed by the Ultrasonic sensor, the Microcontroller will start the relay. The relay will make the heating coil to work which intern heat the wastes with the water. The relay will make the heating coil to work which intern heat the wastes with the water. After reaching 30 to 40 degree, which is the optimal temperature to make even high density plastics to float. The temperature sensor will sense and maintain the obtained temperature. In between the sensor will be working per minute, in order to remove the floating plastics.

V. APPLICATION

- This method is being used to separate Biodegradable and non-biodegradable waste.
- The bio gas produced can be used for cooking
- The bio gas can be used to produce electricity
- The decomposed biodegradable waste can be used as fertilizers for Agricultural.

VI. ADVANTAGES

- The wastes can be categorized and segregated separately.
- Almost every Non-Biodegradable wastes can be separated and can be sent to another recycling process.
- The Biodegradable wastes can be converted into organic Fertilizers. The source for Electricity can be provided by the emitted Methane gas.
- There will be promotion of organic Fertilizers among artificial Fertilizers.
- More efficient.
- Reasonable cost.

VII. CONCLUSION

The wastes have been converted into useful things to the society. By segregating plastics separately, it will enable rain water penetrate into soil.

REFERENCES

- [1] Ayman A. Aly, Zeidan E. B., Hamed A. M., Ali W. Y., "Effect of Heat Treatment On The Abrasion Resistance Of Thermoplastic Polymers", EGTRIB Journal Of The Egyptian Society of Tribology Volume 7, No. 4, 52 -64, October 2010
- [2] Hongyu Wang, Dongmei Zhua, Wancheng Zhoua and Fa Luoa, "Influence of heat treatment on electromagnetic properties of polyimide/carbon black composites", Polym. Adv. Technol. 2014, 25 1616-1621
- [3] Fouad H., Mourad A.-H. I., Barton D. C., "Effect of pre-heat treatment on the static and dynamic thermo-mechanical properties of ultra-high molecular weight polyethylene Polymer Testing 24, pp. 549 – 556, (2005).
- [4] S. J. Gencur, C. M. Rimmac, S. M. Kurtz, Failure micromechanics during uniaxial tensile fracture of conventional and highly cross-linked ultra-high molecular weight polyethylenes used in total joint replacements, Biomaterials 24 (2003) 3947.
- [5] Ayman A. Aly , M.M. Mahmoud, A. A. Omer, "Enhancement in Mechanical Properties of Polystyrene Filled with Carbon Nano Particulates (CNPS)", World Journal of Nano Science and Engineering (WJNSE) , Vol. 2 No.2, 103-109, 2012.

[6] J. Tong, Y. Ma, M. Jiang, Effects of the wollastonite fibre modification on the sliding wear behaviour of the UHMWPE composites, *Wear* 225 (2003) 734.

[7] M. Es-saheb, A. A. Elzatahry, E. M. Sherif, A. S. Alkaraki, and E. kenawy, "A novel electrospinning application for polyvinyl chloride nanofiber coating deposition as a corrosion inhibitor for aluminum, steel, and brass in chloride solutions," *International Journal of Electrochemical Science*, vol. 7, no. 7, pp. 5962–5976, 2012.

[8] S. Agarwal, A. Greiner, and J. H. Wendorff, "Functional materials by electrospinning of polymers," *Progress in Polymer Science*, vol. 38, no. 6, pp. 963–991, 2013.

[9] M. P. Laurent, T. S. Johnson, J. Q. Yao, C.R. Blanchard, R.D. Crowninshield, In vitro lateral versus medial wear of knee prosthesis, *Wear* 255 (2003) 1101.

[10] J. S. Bergstrom, C. M. Rinnac, S. M. Kurtz, Prediction of multiaxial mechanical behaviour for conventional and highly crosslinked UHMWPE using a hybrid constitutive model, *Biomaterials* 24 (2003) 1365.

[11] S. H. Teoh, W. H. Chan, R. Thampuran, An elasto- plastic finite element model for polyethylene wear in total hip arthroplasty, *Journal of Biomechanics* 35 (2003) 323.

[12] A. Gomoll, T. Wanich, A. Bellare, J-integral fracture toughness and tearing modulus measurement of radiation cross-linked UHMWPE, *Journal of Orthopaedic Research* 20 (2003) 1152.