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Pre-Programmed Mulch Maker

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ABSTRACT

Organic waste is a global issue that costs money to dispose of and provides no benefit. It also results in the release of hazardous gases such as methane. The goal of this paper is to create a Mulch Maker that is pre-programmed with process time criteria, easy to operate, odourless, and energy efficient. This machine has been built to compost quickly. Depending on the capacity of the machine, it can be utilised by households, restaurants, hotels, schools, apartment buildings, communities, offices, and cafeterias. The system uses microorganisms and a moderate temperature to digest garbage and organic substances.This prototype would digest organic waste in 38 to 50 hours with no toxic gas emissions and odours, and it is a plug-and-play machine that uses standard power.

Keywords: Compost Machine, Organic waste, Stirrer

I. INTRODUCTION

Solid waste is a term that refers to a wide range of garbage materials generated by human activities that are abandoned as worthless or commercial operations in a given area and can be treated in a variety of ways. Controlling the generation, storage, collection, transport or transfer, processing, and disposal of solid waste materials in a way that best addresses a range of public health, conservation, economic, aesthetic, and other environmental factors is known as solid waste management. The major goal is to decrease and eliminate the negative effects of waste materials on human health and the environment in order to promote economic growth and a higher quality of life.This must be done in the most effective manner feasible in order to keep expenses low and waste from accumulating.

II. LITERATURE SURVEY

Manish Kumar,Akhilesh Chaudhary and Sandeep Jhamb (2021),gave a thorough and detailed analysis of the work done on the Automatic Compost Machine's method and functioning principle. Inside the machine, there are humidity and temperature sensors that help measure the temperature and humidity, providing a precise

temperature and moisture, and then unique microorganisms begin decomposing the waste into compost. This is completely automated; first, food waste is fed in, then an internal shredder divides the large trash into smaller pieces. The waste then enters a chamber with an inbuilt heater, whose job it is to dry our compost in order to generate excellent compost.Normally, waste contains 80 percent moisture, which is not ideal for composting, so a sensor is used to detect the amount of moisture in the waste, and the heater begins automatically. After this process, the waste is handled by a mixing blade, which thoroughly mixes all of the waste. We can collect our compost after 22 to 24 hours and use it in farming to boost soil fertility.

Monika Shinde, Sandeep Walunj, Suraj Mane, SufiyanVande, N.V. Dhumal(2019),demonstrated the design and fabrication of an organic waste composting equipment for the production of organic fertiliser. The machine comes with appropriate warning labels for optimal operation and is also recyclable. It is simple to use and produces odourless fertiliser, and the entire process can be completed in less than a day. Sanitreat powder and Bioculum are used to slow down the putrefaction of organic waste and speed up the aerobic composting of biodegradable organic waste.

YogieFajarPratama, EndroAriyanto, SitiAmatullahKarimah (2019),suggested that the automatic fertiliser maker uses the Internet of Things to detect temperature and humidity during the composting process, and that the data is analysed by fuzzy logic, which also serves as the main controller for the actuator (heater and water pump). Water sprinkler, heater, and mixing motor make up the actuator. Temperature, humidity, and pH monitoring are all handled via a web server. The prototype was designed to manufacture fertiliser in the shortest amount of time possible (14 days).

Sengottaian K, Mohanrajhu N, Palani S, Jayabalan C (2019), presented that Organic manure is an environmentally beneficial bio fertiliser that is employed in today's more polluted world. The proper application of manure for landing is essential for avoiding land contamination, water surface pollution, and the loss of ammonia and other nutrients through manure. Organic farming practises are suitable and adaptable to a wide range of land types in India. Because of the high cost of labour, using manpower to apply organic ingredients is uneconomical. As a result, it receives a lot of attention from all over the world. This not only saves money, but it also preserves the environment and farmers' health.The manure spreader's design and fabrication assist farmers who cannot afford expensive manure spreading equipment. Farmers' health and safety are ensured by using the manure spreader, which prevents infection and other diseases. It boosts the agricultural sector's economy by improving crop cultivation in various agricultural fields.

JayantNikaju, VivekBorkar ,AtishPise and Prof. S. S. Pawar(2018),shows how an organic compost machine works to quickly breakdown organic waste like food and garden waste into nitrogen-rich organic manure or compost. The temperature and moisture required for microbial waste breakdown are around 66°C and 60%, respectively. The volume of organic waste in this machine is reduced thanks to a shredder that pulverises it. The time it takes to compost is reduced when the temperature and moisture content are properly managed. As a result, segregation and improper landfilling are prohibited. Composting improves soil fertility, stabilises the

climate, reduces global warming, and improves waste management, among other things. Composting minimises the volume of organic waste while also killing germs.

Saleh Ali Tweib, RakmiAbd Rahman and MohdSahaidKalil (2011),presented that to improve soil structure and fertility, organic matter is recycled back into the soil. Because of pollution concerns and the hunt for environmentally sound waste treatment solutions, the composting process has gotten a lot of attention in recent years. Waste quantities are continuing to rise, resulting in resource depletion and increased environmental dangers. Composting, rather than being put directly into the ground, is an environmentally responsible method for converting organic waste into valuable items that would otherwise be landfilled. It decreases landfill space, contamination of surface and groundwater, methane emissions, transportation costs, air pollution from burning garbage, enables more flexible total waste management, improves material recycling, and may be done with minimum capital and operating costs.

III. CONVENTIONAL METHOD

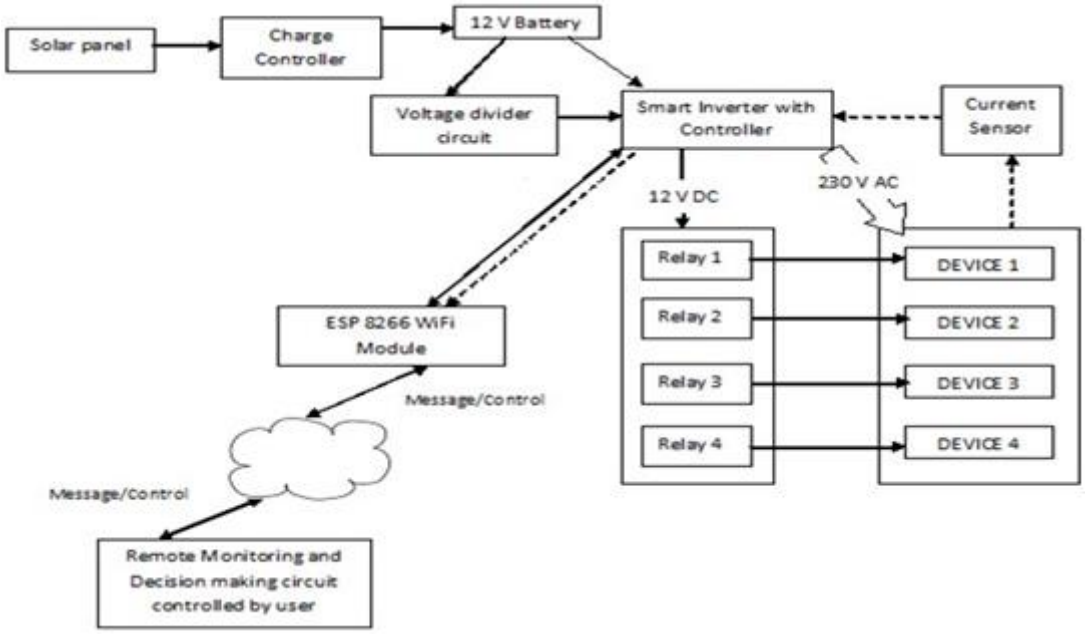

Fig.1.Conventional Method

The PV panel converts solar energy into electrical energy. The solar energy will be stored in the battery via the charge controller in the inverter. The inverter transforms DC to AC, which is then distributed to the numerous loads linked with it. The current sensor continuously senses the load current, which it then delivers to the user via the Wi-Fi module. If the load current level exceeds the threshold, the user can utilise the Android app to disconnect the loads, allowing them to be controlled. When the load current level surpasses the threshold, the complete or required loads are reconnected via Wi-Fi ON-OFF control via the Android app or mobile URL site.

IV. PROPOSED METHOD

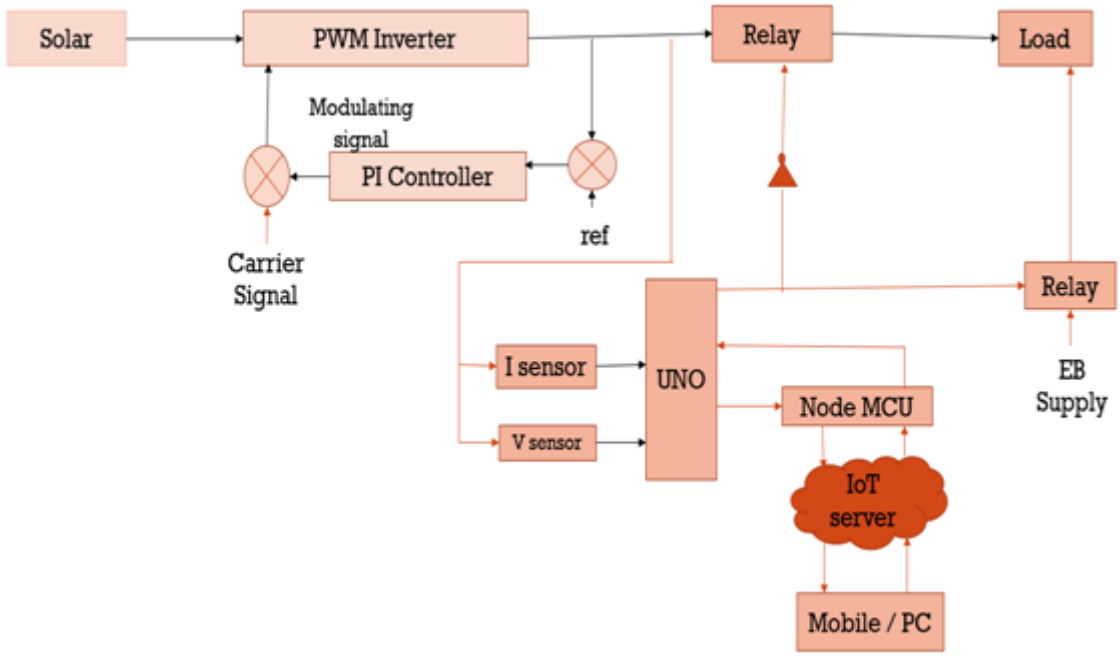

Fig.2.Proposed Method

The output of the inverter is monitored in this article, and the loads are managed accordingly, i.e. by using the IoT and Wi-Fi module to turn on and off the load (apps or mobile URL). When the inverter output falls below the threshold value, the unnecessary loads are disconnected, either automatically or manually, using the IoT and Wi-Fi module. If a detachable load is required in an emergency, an IoT or Wi-Fi module can be used to link it to an alternative energy source. As an alternative energy source, EB or batteries could be employed.

V. CONCLUSION

This paper allows for continuous monitoring of the inverter and the loads linked to it. When the loads are connected and disconnected according to the inverter output, overvoltage damage to the loads is reduced, and the life span of the loads is extended. Both manually and automatically, the inverter and loads can be monitored and regulated. The user's preferences define which loads should be connected and disconnected, making it more user-friendly.

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