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SOLAR POWERED GRASS CUTTER WITH MOBILE REMOTE CONTROLFORLARGEOUTDOOR SPACE

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Abstract

Solar Grass Cutter can operate more than two hours when the battery is fully charged. Based upon the results, the Smart Solar Grass Cutters reliable From the time immemorial, the sun is the major source of energy for life on earth used for heat and lighting. Nowadays, solar energy has been known as a renewable energy source. It is an alternative energy to that of fossil fuel and it can be collected from the renewable resources such as sun, wind and hydro. This paper introduces a new development of grass cutter, named as Smart Solar Grass Cutter, by using solar irradiance as a primary energy source with the presence of a solar panel. This grass cutter prototype is developed to reduce air pollutant and improve the current design specifically the blade position based on the previous studies. With current technology ,this new prototype is designed as remotely controlled grass cutter using Arduino UNO. Smartphone is used as the remote controller. After developing an established prototype, the design analysis is carried out to be validate with the theoretical values to ensure that the prototype can be safely used. The Smart with high efficiency of the system compared to the previous studies. Therefore, it can be concluded that the prototype is reliable and environmentally friendly.

INTRODUCTION

The conventional grass cutters have been widely used recently by workers in the gardening and agricultural industries. However, the manual grass cutters are which can directly affect the workers' health. The conventional grass cutter are also creating a high level of noise and vibration which can cause serious health issues such as grip strength, decreased hand sensation and dexterity ,finger blanching or 'white fingers 'andcarpal tunnel. In order to address these issues, a new design of a grass cutter machine has been proposed. This device can be fuelled by solar energy and smartly controlled, which has

been named as a Smart Solar Grass Cutter that has three main systems which are smart control system, solar system, and the grass cutter.

OBJECTIVE

The objective of this project is that to use renewable energy sources like solar power and to operate at a cutter equipped with various accessories (tool) to cut grass. The DC motor, powered by a battery, a spiral shaped grass cutting blade connected to the DC motor directly.

LITERATURE SURVEY

[1] Udamale S.R., Band A.R., Mhaske M.B., Ghadge G.P., Thorat N.D. 2023, "Smart Solar Grass Cutter" The paper reports the development of a prototype grass cutter powered by solar energy, leveraging a solar panel as the primary energy source rather than fossil fuels, to reduce both air pollution and energy consumption .It improves on prior designs, particularly focusing on optimized blade positioning, and is implemented as a remotely controlled system using Arduino UNO, with smartphone-based control .

[2] Kupawat P., Mishra S., Gupta S. 2019, "Solar Based Smart Grass Cutter" This project aligns with the growing trend of integrating renewable energy and automation in gardening tools. Similar projects have been developed, focusing on solar-powered mowers with features like obstacle detection and remote control. However, this particular design emphasizes the combination of solar energy utilization and Bluetooth-based remote operation, setting it apart in terms of user convenience and energy efficiency.

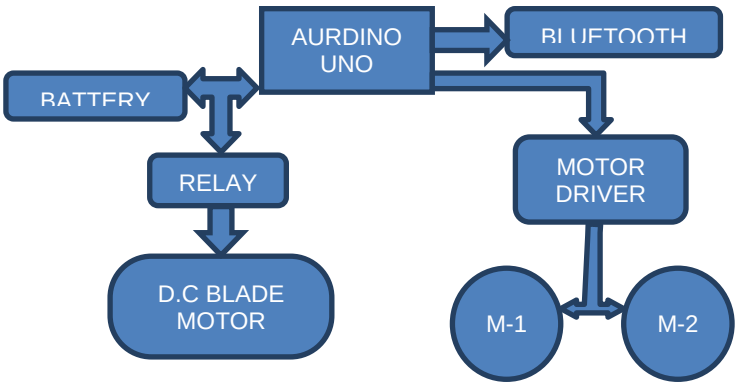
[3] Jagdale Snehal Popat and Rajput Priti. 2020, "Android Controlled Solar based Grass Cutter Robot" present an Android-controlled solar-powered grass cutter robot built around an Arduino microcontroller and Bluetooth-based Android interface (HC-06 module). Powered by a 12 V 7.5 Ah battery charged via a 10 W solar panel, the robot supports directional control and cutter activation. Key strengths include its affordability, portability, low maintenance, and effective uniform cutting though its performance is weather-dependent

[4] Ramesh Babu V., Elumalai S., Sharon V.M., Yogesh S., Jeremy I. Raj L. 2023, "Smart Grass Cutter Using Solar Power System" Ramesh Babu V. et al. (2023) introduce a smart, solar-powered, and autonomous grass-cutting system, enhancing safety through obstacle and flame sensors while employing an Android application for remote control and monitoring. This dual focus on autonomy and environmental performance differentiates it from earlier systems such as Udamale et al. (2023), which emphasize design validation and efficiency with smartphone control but do not integrate advanced sensor-based safeguards.

METHODOLOGY

The development of the solar-powered grass cutter with mobile remote control involved a structured and systematic approach. Initially, the problem was analyzed by identifying the need for an environmentally friendly, remotely operable grass cutting machine suitable for large outdoor spaces. The system was designed to harness solar energy as its primary power source, eliminating the need for fossil fuels and reducing operational costs. The key components selected for this project included a solar panel, rechargeable battery, DC motors for wheel and blade operation, a microcontroller (Arduino), a motor driver circuit, and a Bluetooth module for wireless control via a mobile device. A robust but lightweight chassis was fabricated to support all components and withstand outdoor conditions. The solar panel charges the battery through a charge controller, ensuring regulated power supply. The battery powers both the drive motors and the cutting motor, with all functions managed by the microcontroller, which receives commands wirelessly from a mobile application. The cutting blade, attached to a high-speed motor, was mounted securely beneath the frame. The drive system used geared DC motors connected to wheels to allow smooth and controlled movement across various terrains. The Arduino was programmed using Arduino IDE to interpret mobile commands for movement and blade activation. After assembling the hardware, the system was rigorously tested for motor function, remote control responsiveness, solar charging efficiency, and grass cutting effectiveness. Field trials were conducted in a large outdoor area to evaluate real-world performance, during which the system demonstrated effective cutting and maneuverability under solar power. Final adjustments were made to improve blade performance, solar panel alignment, and battery efficiency. The completed system meets the requirements for a sustainable, remote-controlled grass cutting solution ideal for large-scale applications.

BLOCK DIAGRAM



ADVANTAGES

1. No long wires required.
2. Compact Design and easily Moveable
3. No fossil Fuel required
4. It has Less maintenance &any one can operate
5. It has pollution free &it can Eco-friendly

APPLICATION

It is useful for cutting grasses in Farms, Gardens, Stadiums, College Grounds, Lawns and many more

CONCLUSION

The solar grass cutter with mobile remote control is an effective and environmentally friendly tool designed for large outdoor areas. It combines renewable solar energy with modern wireless technology to provide efficient, safe, and convenient grass cutting. This system reduces dependence on conventional fuels, lowers operating costs, and allows remote operation, which enhances user safety and comfort. Despite some limitations like weather dependency and battery life, it offers a sustainable and practical solution for large-scale lawn maintenance. Overall, it represents a significant advancement in green technology for outdoor landscaping.

REFERENCES

Udamale S.R., Band A.R., Mhaske M.B., Ghadge G.P., Thorat N.D. 2023, "Smart Solar Grass Cutter"

Kupawat P., Mishra S., Gupta S. 2019, "Solar Based Smart Grass Cutter"

Jagdale Snehal Popat and Rajput Priti. 2020, "Android Controlled Solar based Grass Cutter Robot"

Ramesh Babu V., Elumalai S., Sharon V.M., Yogesh S., Jeremy I. Raj L. 2023, "Smart Grass Cutter Using Solar Power System"