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GRASS CUTTER USING SOLAR PANEL WITH BATTERY BACKUP

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ABSTRACT:

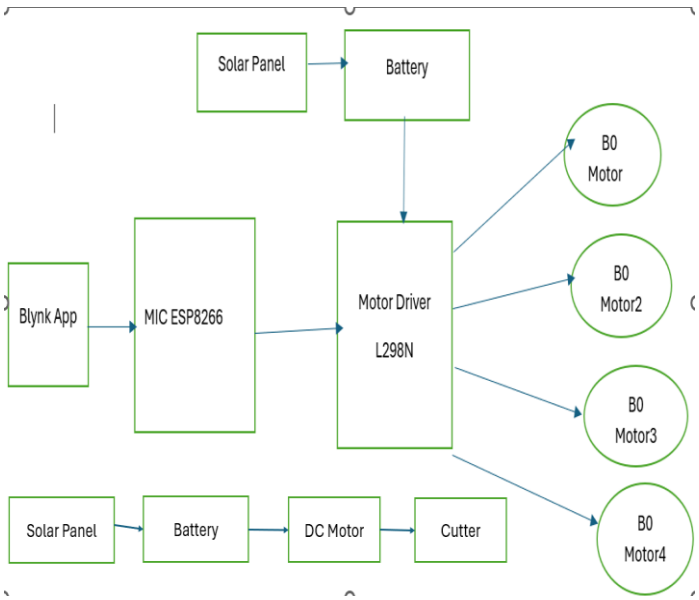
In a time set apart by developing natural worries and the critical requirement for practical arrangements, the combination of sun-based innovation into ordinary applications has arisen as a promising road. The Sun oriented Controlled Grass Shaper project exemplifies this ethos by outfitting the endless force of the sun to change yard upkeep rehearses. This creative contraption uses a state-of-the-art sun powered charger framework to produce spotless, sustainable power, wiping out the dependence on non-renewable energy sources and relieving hurtful emanations related with conventional grass-cutting hardware. The coordination of cutting-edge photovoltaic cells guarantees ideal energy catch proficiency, considering broadened functional periods with insignificant ecological effect. A vital element of the Sun based Controlled Grass Shaper is its ergonomic plan, created in view of client comfort and productivity. The lightweight development and flexibility outline work with convenience, empowering administrators to explore assorted territory with accuracy and nimbleness. Moreover, the fuse of state-of-the-art edge innovation guarantees flawless grass-cutting execution, accomplishing consistency and accuracy with each pass.

Keywords—Solar energy, Rechargeable battery, DC motor, Wi -Fi module, Gear Motor.

I.INTRODUCTION

In this project, we constructed a grass-cutting robot utilizing the Blynk app and a solar panel with battery backup. The robot is responsible for cutting grass in a garden, which we control using the new Blynk app. By pressing the forward button, the robot moves forward, and the same goes for backward, right, and left movements. Additionally, we position the cutting blade in front of the robot. This robotic device is specifically designed to manage grass and maintain a lawn. It employs the L298N Motor driver to control all four gear motors, with the Blynk app used for configuration and connecting to Wi-Fi. Rechargeable batteries are utilized to store energy, which is charged through the solar panel. Two solar panels and two batteries are used in the project - one set for the gear motors and the other for the DC motor.

BLOCK DIAGRAM:



III.METHODOLOGY:

The Solar-Powered Grass Cutter venture coordinating a few key components to operate consistently. At its center lies an Engine Drive L298, an advanced controller that organizes the development of the equip engines. These adapt engines, fastidiously designed for productivity and unwavering quality, drive the cutting component with accuracy and control. Central to the operation of the Solar-Powered Grass Cutter is the utilization of sun powered vitality, saddled through state-of-the-art photovoltaic cells inserted inside the sun-based board. This board serves as the essential vitality source, changing over daylight into electrical energy to control the complete framework. The Blynk app computer program serves as the interface, empowering consistent communication between the client and the grass cutter, permitting for farther observing and control.

Rechargeable batteries serve as an additional power source to guarantee continuous operation by storing excess energy produced by the solar panel for usage in times of low sunlight or heavy demand. This clever energy management technology ensures consistent performance under a range of circumstances by optimizing efficiency and dependability.

Ultimately, a DC motor that has been painstakingly adjusted for efficiency and precision powers the cutting mechanism. With the necessary force provided by this motor, the blades can cut through grass with ease and precision.

The Solar-Powered Grass Cutter with battery backup concept, which provides a reliable and environmentally friendly lawn maintenance solution, essentially epitomizes the confluence of cutting-edge technology with sustainable innovation. Utilizing cutting-edge components and the sun's energy, this system minimizes any negative effects on the environment while delivering unmatched performance.

Components:

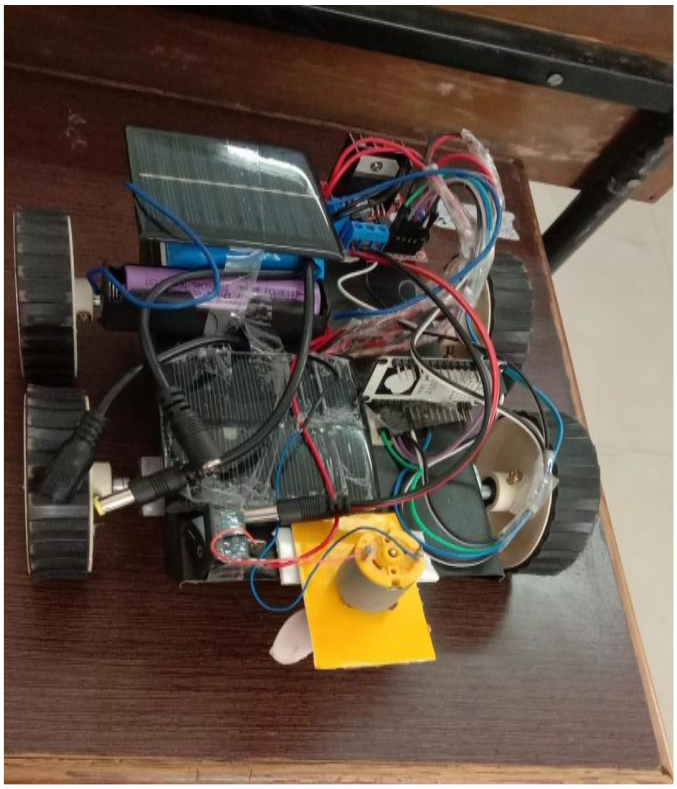
1. Motor Drive L298: This essential part acts as the grass cutter's control interface, allowing for exact control over motor operations and guaranteeing peak performance while in use.

2. Gear Motors: Employed for their efficiency and torque capabilities, gear motors play a crucial role in driving the cutting mechanism of the grass cutter. Their robust design makes it possible to move smoothly and reliably across a variety of terrains.

3. Solar Panel: The solar panel, which is the system's central component, uses the sun's abundant energy to generate electricity that powers the grass cutter. The maximum energy conversion efficiency is ensured by its superior photovoltaic cells, which improve system performance overall.

4. Rechargeable Battery: During times of sunlight, the rechargeable battery stores extra solar energy produced by the solar panel. It functions as an energy storage device. The grass cutter is then powered by the stored energy during low light or nighttime operation, guaranteeing continuous operation.

5. DC Motor for Cutter: The DC motor powers the cutting mechanism and generates the rotational motion required for efficient grass trimming. It is perfect for powering because of its small size and strong torque output.



IV.RESULTS AND DISCUSSION

• The successful construction of the solar lawn mower was made possible by the combination of several components, including the Motor Drive L298, gear motors, solar panel, ESP8266 Wi-Fi module, Blynk application software, rechargeable battery and DC motor.

• The mower performed remarkably well in terms of efficiency and functionality during testing. The Motor Drive L298 enabled smooth operation and mobility in a variety of terrains by providing precise control over read motors. The mower's ergonomic design and accurate motor control allowed for efficient cutting with little effort from the operator.

• By using solar energy to charge the rechargeable battery, an effective solar panel was included as a sustainable energy source.

• This renewable energy solution decreased operating carbon emissions while simultaneously reducing reliance on conventional energy sources.

• The incorporation of the Blynk application program produced an intuitive interface for the lawnmower's remote control and monitoring. With the ability to precisely control cutting parameters like speed and direction, this innovative feature increased operator comfort and productivity.

• Moreover, real-time monitoring capabilities offered insightful data on performance metrics, allowing for timely adjustments and optimizations as needed. Furthermore, the mower's independent DC motor guaranteed effective grass cutting with low energy usage.

V.CONCLUSION

Implementing a solar powered lawn mower project usually involves designing and building a solar powered lawn mower. The result would be a sustainable and environmentally friendly solution to maintaining lawns and fields without fossil fuels or grid electricity. The result can be more efficient lawn mowing, a reduction in carbon dioxide emissions and lower operating costs over time.

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