

ROBOTIC GRASS-CUTTING MACHINE

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Abstract- This paper summarizes and reviews different technological developments for making efficient and cost-effective lawnmowers. A lawn mower is a device that is used to mow/ cut i.e., cut the grass of a lawn to an even height. It can be operated manually or by some energy conversions such as solar power battery power etc. Generally, these are powered by electric motors or internal combustion engines and dc motors. In this paper, effort has been made to modify the old mower to improve its usability. the cutting height is the robotic grass-cutting machine.

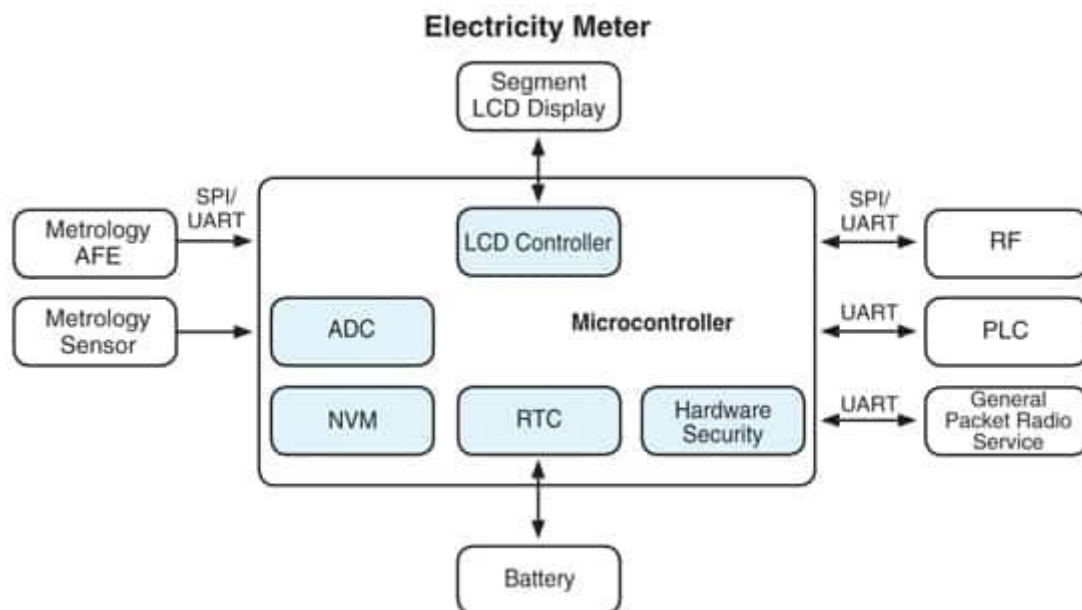
Keywords: High mower, DC motor, wireless, cutting motor height. Robotic grass-cutting machine.

1. INTRODUCTION

A high mower is a machine that is used to cut grass. The blades of the High mower are powered by pushing the mower forward This can eliminate wear patterns in the lawn caused by the mower only being able to follow one wire back to the station. A robotic lawn mower is an autonomous robot used to cut lawn grass. A typical robotic lawn mower requires the user to set up a border wire around the lawn that defines the area to be mowed. The robot uses this wire to locate the boundary of the area to be trimmed and in some cases to locate a recharging dock. Robotic mowers are capable of maintaining up to 20,000 m² (220,000 sqft) of grass 15 times going power motor and the environmentally high motor grass cutting machine.

2. METHODOLOGY

The steps followed for the design of the lawn mower is represented in the form of a flowchart as depicted in the figure below.



3. SYSTEM DESIGN IMPLEMENTATION

To trim the grass, modern technology frequently requires manually operated tools, resulting in pollution and energy loss. We introduce the automatic lawn cutter in this project to cut grass. In addition, the operational power is provided by the rechargeable battery that is mounted to the cutter, sensors, and crane mechanism may be used to detect undesired objects and move around during operation. Automatic grass cutters can reduce the workload of cutting grass in the field. The Arduino mega2560 will be used to handle all of the motors in the vehicle, including the grass cutter. To identify the object, the vehicle will be in close proximity to the ultrasonic sensor. The ultrasonic sensor detects obstacles, and the Arduino then stops the grass cutter motor to avoid any damage to the item, person, or animal, as the case may be. It has an adjustable grass-cutter level, an Android application, a gear wire blade, and obstacle avoidance features. This study also discusses the design criteria. The goal of this research is to create an automated lawn-mowing robot with built-in obstacle avoidance and grass level changes.

A. Gear motor

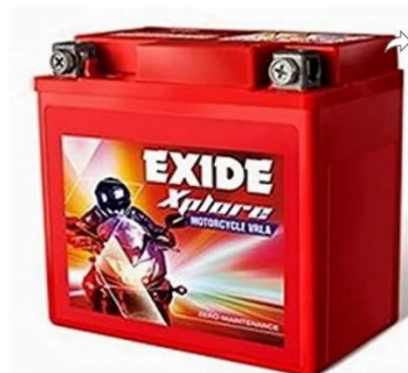
A side shaft DC gear motor, model number Rhino GB37 12V. This engine is small and made entirely of metal. It may be utilized continuously in consumer electronics and industrial machines due to its low current consumption. A D-type output shaft and a 37mm

diameter are also features of the small spur gearbox that enable the excellent connection. The Rhino GB37 motor is available with several gearbox ratios, giving it an output rpm range of 20 to 1600 that is appropriate for a variety of applications.



B. Battery

Twelve-volt batteries are normally utilized in RV, boat, and other auto frameworks. According to a specialized viewpoint, a battery utilizes at least one cell to permit a synthetic response making the progression of electrons in a circuit. Batteries don't make energy or power all alone.



C. Cutting Blade

Cutting edges are razor-sharp. Handle carefully. Put on safety glasses. When using a cutter or knife, stay focused and alert at all times. Spend some time learning how to operate any cutter properly and understanding its limits.

Never take for granted that you are skilled with a knife. Always keep blades and knives in a secure location. Keep out of children's reach!



D. Wheel

A high-capacity industrial laundry cart that is composed of eco-friendly polyester canvas, waterproof on the inside, and simple to clean with a damp towel. enables you to clean...



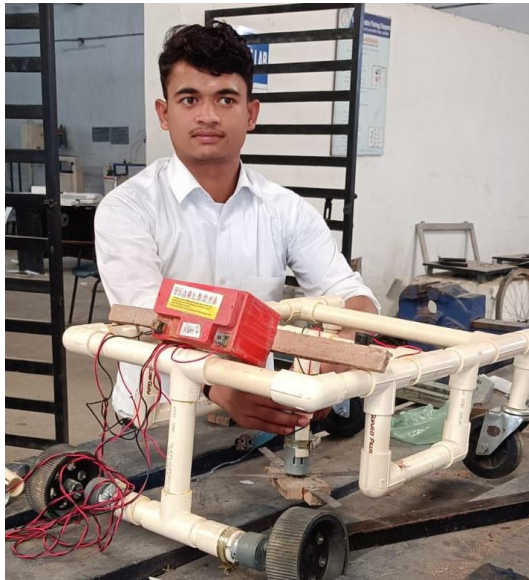
4. COST ESTIMATION

S.NO	NAME OF COMPONENT USED	QUANTITY	COST OF THE COMPONENT
1	PVC PIPE	12foot	350 Rs
2	PVC TEE	11 PIECES	418 Rs
3	PVC COUPLING	3	60 Rs
4	12 DC MOTOR GENERATOR	2 PIECES(RPM30)	900 Rs
5	12 V HIGH TORQUE DC MOTOR	1 PIECES RPM (3500)	150Rs
6	Robot wheel with Hex Brass Coupling	1 PIECES	70 Rs
7	12 V DC battery and 3.7 V Li-ion battery	1 PIECES	1200 Rs
8	Stationary cutter blade	4 PIECES	100 Rs

Total Cost = 3248 Rs

5. WORKING

A two-engine driver is given. It starts and stops the working of the engine. Keen data machine is the primary course of advancement in the apparatus control at water system fields. We planned an expansive and estimable scope of Sun-powered Grass Shaper alongside sunlight-based chargers. As the energy discussion is vital in the ongoing situation and ought to be finished to the most extreme degree in any place it is conceivable. In any case, these trimmers grass cutting hardware all need exactly the same things to work right - - an engine, a turning edge, a method for getting around, and a method for disposing of the grass clippings. The controlling gadget of. The fundamental capability of the sun-powered charger is to build the current from the boards while the batteries are charging, it likewise detaches the sunlight-powered chargers from the batteries when they are completely energized and furthermore associates with the boards while the charging in batteries is low. The engine is associated with the batteries through interfacing wires Between the entire framework given utilizing a switch ON the DC engine communicated with grass cutting edges. The whole model comprises two segments one controlling area and one more planning part of the model. The controlling segment comprises Battery-powered batteries, transfer switches, and Sunlight based chargers. The framework relies upon the charging circuit the engine can be controlled utilizing a transfer switch. The sun-oriented power stores the energy in a battery and afterward runs the engine through the hand-off switch.



6. RESULT

The design and fabrication of the wireless lawn mower have been done as per the specification mentioned above. This model is tested for grass cutting and gives the efficiency of cutting 100 sq. ft. of lawn in 10 minutes using 180 watts of power with 2000 rpm using a 12-volt electric motor

7. APPLICATIONS

1. For cricket ground.
2. The football ground.
3. All gardens All Playground

8. ADVANTAGES

1. Compact size and portable.
2. Easy to move from one place to another place
3. Operating principle is simple.
4. Non-skilled persons also operate this machine

9. CONCLUSION

It has been observed that literature pertaining to lawn mower design and development is comparatively lesser. In the present studies, different aspects of solar-powered, plug-in electric, and wireless lawnmowers have been presented. With this background, the present studies direct the design and development of a low-cost manual / electric lawn mower. It has also been observed that technological variations. It lawn mowers are powered by gasoline engines and the operating cost for such lawnmowers is around Rs.500-600/- per day excluding labor charges.



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BIOGRAPHIES

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