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A Review Paper on Grass Cutter Device Using Bluetooth

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Abstract

The grass cutter uses a solar based energy source, which is easier to use, more advantageous compared to other energy source especially for gas based source of power. But our solar grass cutter is based on solar power because this energy is a renewable source of energy and it is easy to work. So we made solar powered grass cutter.

Keywords: *Solar Power, Battery, Lawn Mower, DC Motor, Servomotor, Sprinkle.*

I. INTRODUCTION

In today's climate of growing energy needs and increasing environmental concern, alternatives to the use of non-renewable and polluting fossil fuels have to be investigated. One such energy is solar energy. In this solar based grass cutter, the advantage of powering a grass cutter by solar rather than by gasoline is mainly ecological. We manufactured this grass cutter because it is very easy method and many problems are overcome by this type of grass cutter.

The self- powered objective is to come up with a cutter that is portable, durable, easy to operate and maintain. It also aims to design a self- powered cutter of electrical source; a cordless electric grass mower. The heart of the machine is a battery powered DC electric motor. It is also useful method for our grass cutter.

The present technology commonly used for trimming the grass is by using the manually handle device. In this project we have

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automated the machine for trimming the grass. The device consists of blade which is operated with the help of the motor the power supply for the motor is by using battery. The battery can be charge by using power supply and solar panel.

II. Literature Review

In this paper they have prepared manually handle device which is capable to cut the grass. This device consists of linear blades and it does not affected by climatic conditions. They have used following components for preparing grass cutter.

If any obstacle comes in front of grass cutter then it sense by IR sensor and gives signal to the microcontroller to change the direction or stop the grass cutter until the obstacle is removed. The main objective of this paper is to move the grass cutter is different directions to prepare various designs as per requirements. By using link mechanism the height of the cut can be adjusted. The unskilled labor can easily operate this device.

Table No. 1- Component of Solar Grass Cutter

Sr. No.	Item	Quantity
1.	DC Motor	2
2.	DC Motor	1
3.	Wheel	4
4.	Battery	1
5.	Solar panel	1
6.	IR sensor	1
7.	Blade	3

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III. OBJECTIVES

Automated solar grass cutter is a fully automated grass cutting robotic vehicle powered by solar energy that also avoids obstacles and is capable of fully automated grass cutting, without the need of any human interaction. The system uses 12V batteries to power the vehicle movement motors as well as the grass cutter motor. We also use a solar panel to charge the battery so that there is no need of charging it externally. The grass cutter and vehicle motors are interfaced to an 8051 family microcontroller that controls the working of all the motors.

It is also interfaced to an IR sensor for object detection. The microcontroller moves the vehicle motors in forward direction in case no obstacle is detected. On obstacle detection, IR sensor monitors it and the microcontroller thus stops the grass cuter motor so as to avoid any damage to the object/human/animal. Microcontroller then turns the robotic vehicle off until it gets clear of the object and then moves the grass cutter in forward direction again.

IV. PROPOSED DIAGRAM AND DESCRIPTION

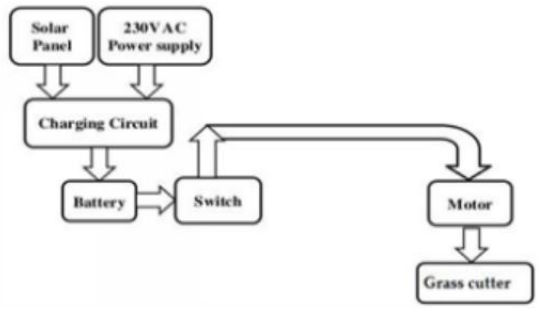


Fig. 1: Circuit Diagram Proposed

Solar Energy: Solar energy is radiant light and heat from the sun harnessed using a range of ever-evolving technologies such as solar heating, solar photo voltaic, solar thermal energy, solar architecture and artificial photosynthesis. Solar energy is very large, inexhaustible source of energy. The power from the sun interrupted by earth is approximately 1.8/10MW, which are many thousands of times larger than the present consumption rate on the earth of all energy sources.

Servomotor: A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration.

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It consists of a suitable motor coupled to a sensor for position feedback.

It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors.

Servomotors are not a specific class of motor although the term servomotor is often used to refer to a motor suitable for use in a closed-loop control system.

Servomotors are used in applications such as robotics, CNC machinery or automated manufacturing.

L293D IC: L293D is a dual H-bridge motor driver integrated circuit (IC).

Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal.

This higher current signal is used to drive the motors.

L293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction.

Block Diagram

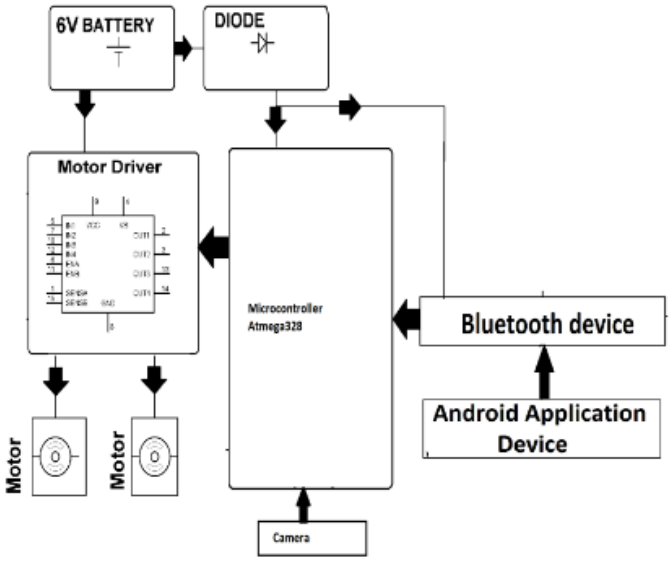


Fig. 2: Bock diagram of solar grass cutter

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Hardware Specification

- Atmega 328 Microcontroller
- DC Motor
- Ultrasonic Sensor
- 5V power supply
- Servomotor
- Relay
- Voltage regulator
- Bluetooth device
- Motor Driver IC
- Battery

Software Specifications

- MC Programming Language Embedded C

V. WORKING OF SOLAR POWERED GRASS CUTTER:

Our project proposes a robotic vehicle that can be handled remotely through an android based device. The control device is integrated with a Bluetooth device that allows capturing and reading the commands. The robotic vehicle may then be operated as desired as commanded through the android application.

The vehicle is integrated with a microcontroller of AVR family that is used to operate the vehicle as per android commands.

The controlling device may be any android based Smartphone/tab etc. having an android OS. The android controlling system provides a good interactive GUI that makes it easy for the user to control the vehicle. The transmitter uses an android application required for transmitting the data. The receiver end reads these commands and interprets them into controlling the robotic vehicle. The android device sends commands to move the vehicle in forward, backward, right and left directions.

After receiving the commands, the microcontroller then operates the motors I order to move the vehicle in four directions. The communication between android device and receiver is sent as serial communication data. The microcontroller program is designed to move the motor s through a motor driver IC as per the commands sent by android device.

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Fig.3: Working Model

VII. ADVANTAGES

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

VIII. DISADVANTAGES

1) The eventually disposal of batteries is problematic.

2) The motors in cordless cutter lend to be less powerful than gasoline motors of the same total weight.

IX. LIMITATION

- Large time required to remove the grass.
- Manually operated.
- Difficult to operate in rainy seasons.

FUTURE SCOPE

Size can be reduced to make it compact.

Efficiency can be improved by increasing the battery capacity.

More sensors can be incorporated for accurate results and improved automation.

Programming can be enhanced to make the device perform different operations.

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CONCLUSION

It consumes non-renewable sources of energy so total energy received from sun far exceeds our energy demand. It meant to be an alternate green option to the popular and environment hazardous gas powered lawn mower and reduces human effort.

Non skilled person also handle it easily. By using simple switches or by predetermine programming it can be easily handle and control within less time.

It is highly efficient and accurate because it detects the obstacle and changes the direction or stop functioning as per the instruction given. Therefore equipment should be protected from damage and reduces risk on human.

XII. RESULT

Our project entitled "Smart Solar Grass cutter with Lawn Coverage" is successfully completed and the results obtained are satisfactory. It will be easier for the people who are going to take the project for the further modifications. This project is more suitable for a common man as it is having much more advantages i.e. no fuel cost, no pollution and no fuel residue, less wear and tear because of less number of moving components and this can be operated by using solar energy. This will give much less physical exertion to the people and can be easily handled. This system has the facility of charging the batteries while the solar powered grass cutter is in motion. So it is much more suitable for grass cutting also. The same thing can be operated in night time also, as there is a facility to charge these batteries in day light.

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