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Fully Automatic Solar Grass Cutter

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***Abstract*: This project explains the solar-powered automatic grass cutter that lets the grass cutter run by solar energy. The proposed design of the device removes human effort in the process of grass cutting like lawn. The solar grass cutting system is a solar-powered vehicle capable of automatic grass cutting. The system consists of 12-volt battery to power the machine movement motor as well as the grass cutter motor. A solar panel is used to charge the battery so that there is no need of charging it externally. The movement of machine is totally controlled by automatic mode. 'Bluetooth controller 'play store application runs this machine movement and direction through an android application. The main target of this machine is to reduce human efforts.**

***Keywords*: Arduino Uno, Atmega16, Bluetooth model, Buzzer, Photovoltaics, Lawn mower, Design, Fabrication.**

1. Introduction

This project explains the solar-powered automatic grass cutter that lets the grass cutter run by solar energy. The proposed design of the device removes human resources in the process of grass cutting like lawn. The solar grass cutting system is a solar-powered machine capable of automatic grass cutting. When a grass cutter is being moved by human effort and using of fossil fuels is getting outdated method in these days, while people are getting aware about the solar energy. Cutting grass cannot be easily accomplished by elder, younger. Grass cutter moving with engine creates noise pollution due to engine and local air pollution due to the combustion of fuel. Also a motor power engine requires a periodic maintenance such as changing the engine oil, even though electric solar grass cutter is friendly to environment.

2. Problem definition

Normally we see the grass cutter machine was used in the housing park and the residence bungalow the commercial area is like the industrial area, we normally see the grass cutter machine used manually and conventional method used the fuel as a source of power. The cost of the fuel used for cutters is also rising. Our goal is therefore to research alternative energy sources such as solar energy.

3. Proposed system

The proposed design of the device removes human effort in the process of grass cutting like lawn. The solar grass cutting system is a solar-powered robotic vehicle capable of automatic and manual grass cutting. The methodology for this project is similar to the prototype analysis process. In this project we are fabricating prototype of the solar powered grass cutter. The methodologies of these attachments are explained in few subheadings.

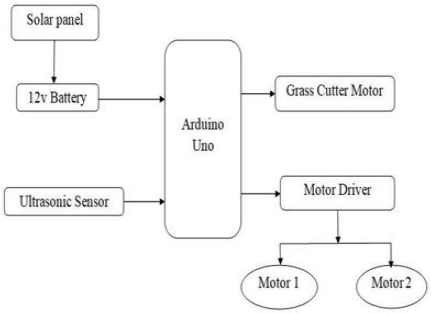

Fig. 1. Block diagram

4. Working

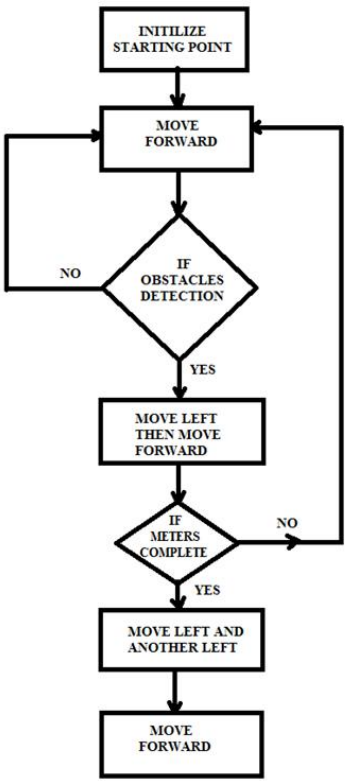

Fig. 2. Flowchart

It has panels mounted at an angle of 45 degrees in such a way that it can receive solar radiation with high intensity easily from the sun. These solar panels convert solar energy into electrical energy. Now this electrical energy is stored in batteries by using a solar charger. The motor is connected to the batteries through connecting wires. Between these a two motors, driver is provided. It starts and stops the working of the motor. From this motor, the power transmits to the mechanism and this makes the blade to rotate with high speed and this makes to cut the grass. To avoid and protect the device from any human interaction or any large or small obstacles the IR sensor is used.

5. Hardware

A. Arduino Uno-Atmega 328p

Block diagram of Solar powered automated grass cutter machine. This block diagram consists of Atmega328 at the center and controlling all the operation in this Solar powered automated grass cutter machine. The Atmega 328 also has an ADC converter on its chip, which lets us transform continuous analog quantities into digital domains. The ADC has six channels to allow us to take samples from eight terminals.

Fig. 3. Arduino Uno

B. Ultrasonic sensor

The ultrasonic sensor used here performs the role of continuous ambient monitoring to detect an obstacle such as humans, animals, etc.

In fact, the ultrasonic sensor operates on SONAR's principle.

Fig. 4. Ultrasonic sensor

C. Solar panel

Packaged interconnected array of solar cells, also known as photovoltaic cells, is a solar panel (photovoltaic panel). Such solar panels are used as a device that can be used in commercial and residential use to generate electricity and supply for use. Because only a limited amount of power can be produced by a single solar panel, many installations have several panels. The photovoltaic devices.

Fig. 5. Solar panel

D. Voltage regulator

The three-terminal positive regulator series LM78XX / LM78XXA is available in the TO-220/D-PAK kit with several fixed output voltages, making them useful for a wide range of applications. It can be used as a fixed regulator of output, current regulator, dual supply regulated.

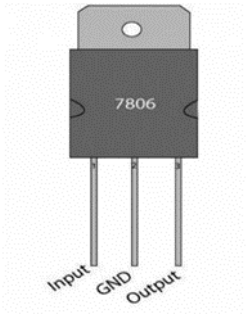

Fig. 6. Voltage regulator

E. Bluetooth Module HC-05

Fig. 7. Bluetooth Module

Bluetooth Module is an easy-to-use Bluetooth SPP (Serial Port Protocol) module that is designed for transparent serial wireless connection. Its communication is via serial communication which makes it easy for the controller or PC to interface it.

6. Conclusion

Our project, Solar Powered Grass Cutter Manufacturing, is

completed successfully and the results obtained are satisfactory. It will be better for the people who will be taking the initiative for the further changes. The project is more appropriate for a common man as it has far more benefits, i.e. no fuel costs, no emissions and no fuel residue, less wear and tear due to fewer moving parts and this can be powered using solar power. That will give the people a lot more physical activity and can be done easily. This machine has the battery charging facility while the grass cutter is in motion with solar power. So it's also much better suited for grass cutting. The same thing can also be done at night time, as these batteries can be charged in daylight by a battery. The system we used, i.e. scotch yokes, does not offer exceptional efficiency. By using some other method this efficiency may be improved. So motor speed is decreased because we used heavy material and this material can be replaced by using light weight material. The specification of blades should be based on the varieties of grass used for cutting. The project that we have done surely reaches the average families because the grass can be trimmed with a minimum cost and with a minimum amount of time. Finally, this project can inspire the people who can change and get better results.

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