International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 06 | Jun 2022 www.irjet.net p-ISSN: 2395-0072

AUTOMATED SOLAR GRASS CUTTER

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Abstract – *In the past grass cutting is done by manually, the cutting of grass is repetitive and boring work. The researchers found out a grass cutting machine which uses petrol or diesel causes air pollution. In order to avoid pollution the grass cutters are to be replaced by the cutters which uses renewable energy like solar. Also to avoid man power the solar cutter is to be fully automated which uses solar and battery as a power source. Arduino UNO is the heart of the system, a blade is used for cutting grass and a motor driver for controlling the wheels of the system.*

Key Words: DC Motors, Arduino UNO, Bluetooth Module, Solar panel, Blade, Motor Driver, IR Sensor.

1. INTRODUCTION

Pollution has been one of the major problems in this world causing living on earth a havoc. Any lawn mower that uses fuel such as petrol, diesel or gas as a source of power to run the engine will cause lots of air and noise pollution. This causes damage to the environment which leads to health problems to the persons near lawn mower. And hence, it is necessary to use eco-friendly lawn mower that is driven electrically using a renewable source of energy. With an advanced technological science now, automated lawn mower can also be developed easily using microcontrollers and sensors. That is, the work of cutting of the grass can be done with minimal or no effort. So, we can say that an automated solar powered grass cutter can be developed. The solar grass cutter uses solar energy as a primary source, it gives power to the two motors for moving the grass cutter and to one motor for cutting the grass cutter. To avoid the obstacles while moving, IR sensor is used.

2. LITERATURE SURVEY

Vicky Jain shows a preparation of wireless grass cutter that involves transmitter and receiver that reduces man power[1].Ashish Kumar Chaudhari manufactured a grass cutting machine that uses blades .The grass cutter can be manually operated and simultaneously works automatically with the use of equipment embedded in the system[2].G. Rahul shows the use of solar energy used to power the electric motors and to turn the blades[3]. Lanka Priyanka describes about automatic grass cutter that helps the users to cut grass in their garden with minimum or no effort. There are different sensors that are used in this system that helps in the detection of any obstacle on the way of the machine during the process of cutting the grass[4]. Bhagyashri R patil has proposed a design of solar powered grass cutting machine includes DC motors, Blade, and Solar panel. Solar and battery can be used as power source[5].Mrs. Melba noted that solar panel was placed above grass cutter which takes energy from the sun, use it as power for working of the grass cutter[6].

3. EXPERIMENTATION

3.1 Block Diagram

The block diagram consists of

1. Solar Panel
2. Battery
3. Bluetooth Module
4. IR Sensor
5. Microcontroller
6. D.C. Motors
7. Blade Motor

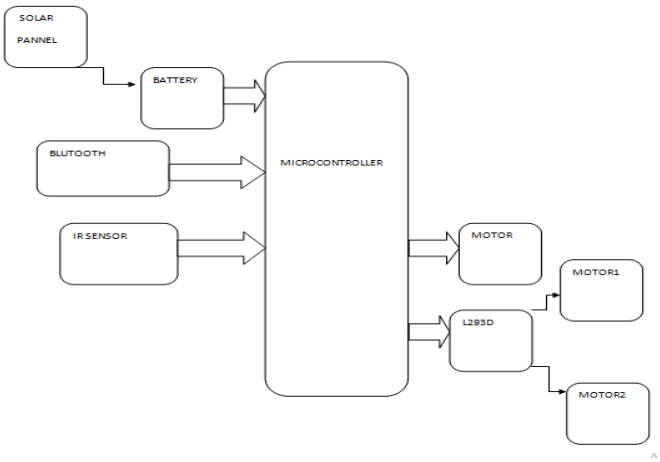

Figure 1- Layout of an Automated Solar Grass Cutter

3.2 Block Diagram Description

1. **Solar Panel**

Solar Panel receives energy from the sun and then converts into the electrical energy. Solar Panel is combination of many photovoltaic cells.

Figure 2-Solar Panel

2. **Battery**

Battery, a energy storing device which is made up of one or more electrochemical cells, used to store energy in the chemical form and then converts into electrical energy.

Figure 3-Battery

3. **Bluetooth Module**

Bluetooth module, a device used for communicating with the system within the short range.

Figure 4-Bluetooth Module

4. **IR Sensor**

Infrared Sensor is used to detect the obstacles by emitting the light. It detects the obstacle after the emitted light gets reflected back.

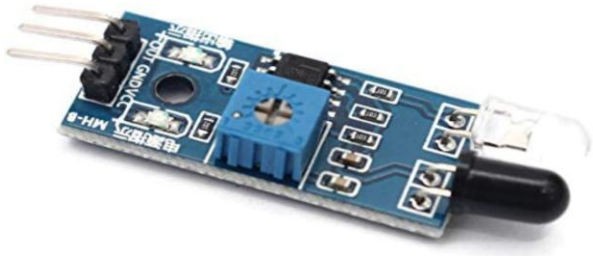

Figure 5-IR Sensor

5. **Microcontroller**

Microcontroller is a integrated circuit which is designed to govern a specific operation. Microcontroller can also called as small computer. A microcontroller consists of CPU, fixed amount of RAM, ROM, Input and output ports in a single chip.

Figure 6-Microcontroller

6. D.C Motors

There are 3 motors in the grass cutter system. Two motors are used for movement of system and one motor is used for blade to cut the grass. These motors are driven by motor driver ICL293D.

Figure 7-DC Motor

5. WORKING

The Solar Panel is kept above the grass cutter to take energy from sun and it is connected to the battery. Both can be used as a power source. The Arduino UNO is connected to the motor driver which in turn connected to the motors for the movement of the vehicle. Another motor is connected to blade for grass cutting. Bluetooth module is connected to the Arduino to make the system automated. When the user enters the commands, based on the commands the arduino uno will send instructions to the motors to drive forward or backward.

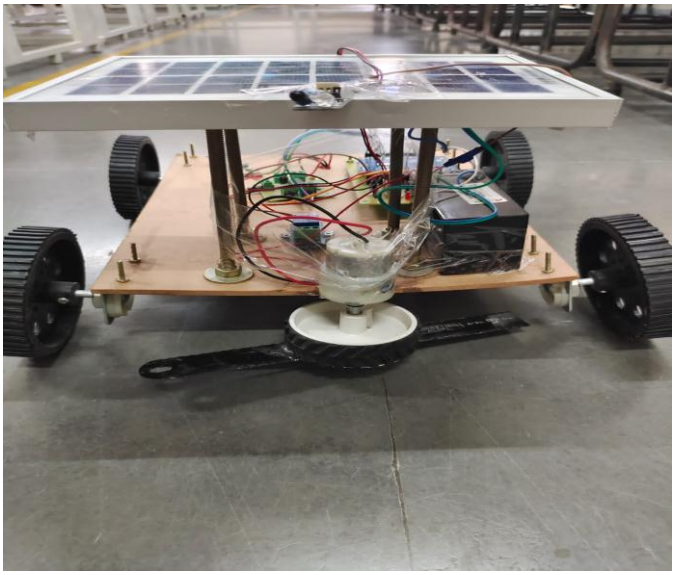

Figure 8- Solar Grass Cutter

4. CONCLUSIONS

Analyzed and fabricated a automatic solar based grass cutter which is environmentally friendly due to the usage of renewable energy; solar energy .A diesel or petrol alternative and environmentally friendly automatic solar based grass cutter device prototype is developed and established a Bluetooth connection between an application in the mobile phone called Bluetooth terminal and the grass cutting device.

REFERENCES

[1] Vicky Jain ,"Solar based wireless grass cutter",", International Journal of Science, Technology and Engineering, Volume 2, 2016, 576-580.

[2] Ashish Kumar Chaudhari "Solar Powered Fully Automated Grass Cutting Machine", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, pp 2520-2524.

[3] G. Rahul, "Grass cutting machine by solar energy power", ISSN no:2348-4845,international journal and magazine of engineering, technology management and research.

[4] Ms. Lanka Priyanka," Fabrication of Grass Cutting Machine," International Journal and Magazine of Engineering, Technology, Management and Research, Vol. 2, 2015, 386-390.

[5] Ms. Bhagyashri R. Patil, Mr. Sagar S. Patil, "Solar Based Grass Cutter: A Review", International Journal of Electrical and Electronics Engineers, pp 134-138, Volume: 09, Issue: 01, Jun-2017.

[6] Mrs.Melba D' Souza Ms. Vaidhavi B.Naik Ms. Rucha V Bicholkar, "Automatic Solar Grass Cutter", IJSTE – international Journal of Science Technology & Engineering | Volume 3 | Issue 09 | March 201.

BIOGRAPHIES

Devana Sai Krishna, A mechanical Engineering Student.

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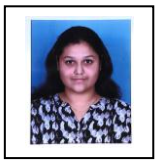
Kota Shanmukha Rao, Mechanical Engineering Student.



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