

# Fully Automated Solar Grass Cutter

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## ABSTRACT

*In today's world, Automation is a very important part of invention. Presently, manually handled devices are commonly used for cutting the grass over the lawn. Because of this, there is pollution and loss of energy. The old grass cutters need to be replaced by automated one where system will work for guidance and obstacle detection using battery as a power source. A solar panel will be attached on the top of the robot this will reduce the problem of more power consumption.*

*These days we are facing the problems like pollutions, power cut problem etc. In order to overcome these problems, we have thought about the device, which can be performing its functions without causing any of these problems. So we have thought of doing the project on cutting grass, this uses the renewable source of energy for its operation like solar energy. This project aims at developing a portable solar operated grass cutting device, as there is power shortage. So we have decided to make a solar energy operated device. Solar panel is connected to the battery. Then by connecting inverter to battery DC current is converted to AC current. This motor is connected to blade shaft by the help of belt drive. This will rotate the blade in high speed, cut the grass. This device will help in building of eco-friendly system. Current technology commonly used for cutting the grass is by the manually handled device. In this paper used novel technology. So in this paper we are trying to make a daily purpose robot which is able to cut the grasses in Lawn. The system will have some automation work for guidance and other obstacle detection and the power source that is battery and a solar panel will be attached on the top of the robot because of this reduces the power problem. This paper describes the different features and technologies present in Automated Solar Grass Cutter and different technologies able to cut the grass in lawn using IR sensors for obstacle detection.*

**Keywords:-** Solar panel, DC motor, Battery, Control unit, Cutter, Robote

## 1. INTRODUCTION

Nowadays, pollution is the major issue in the universe. In case of Gas powered lawn mowers due to emission of gases it is responsible for pollution. From time immemorial, the sun has been the major source of energy for life on earth. We can use the solar energy for giving power to the new high tech robotic grass cutters. Traditionally, lawn mowers are often clunky pieces of machinery that involves a lot of strength and energy to use. Man power is also required to look after them. As technology is improving day by day these traditional grass cutters should be replaced by the efficient, power saving and smart ones.

Automated Solar Grass Cutter is a fully automated grass cutting robotic vehicle powered by solar energy that also avoids obstacles and is capable of cutting grass without the need of any human interaction. So the traditional grass cutters are to be replaced by daily purpose robot which will be capable of cutting the grass in lawn without human intervention. The system will have some automation work for assistance and other obstacle recognition. The system will have a power source that is battery and a solar panel will be attached on the top of the robot. Cutting grass cannot be effortlessly accomplished by elderly, younger, grass cutter moving with engine which creates noise pollution due to the loud engine, and local air pollution due to the combustion in the engine. Along with motor

powered grass cutter, electric grass cutters are also risky and cannot be easily used by all. Also, if the electric grass cutter is corded, moving could demonstrate to be challenging and unsafe.

So it is more efficient to use a solar power grass cutter which will be smart and which consumes less power. The trial product will be charged from sun by using solar panels. The design of solar powered agricultural equipment (e.g. grass cutter) will include direct current (D.C) motor, a rechargeable battery, solar panel, a stainless steel blade and control switch. The automatic grass cutting machine is going to perform the grass cutting operation by its own which means no manpower is mandatory. This will be better because man power is not essential in managing cutter on those hot summer days, where you will prefer not to be out in the sun. The remote will permit the user to control the speed and direction of the grass cutter.

## 2. METHODOLOGY

The methodology for this project is similar to the prototype analysis process. In this project we are fabricating a prototype of the solar powered grass cutter. The methodologies of these attachments are explained in few sub-headings.

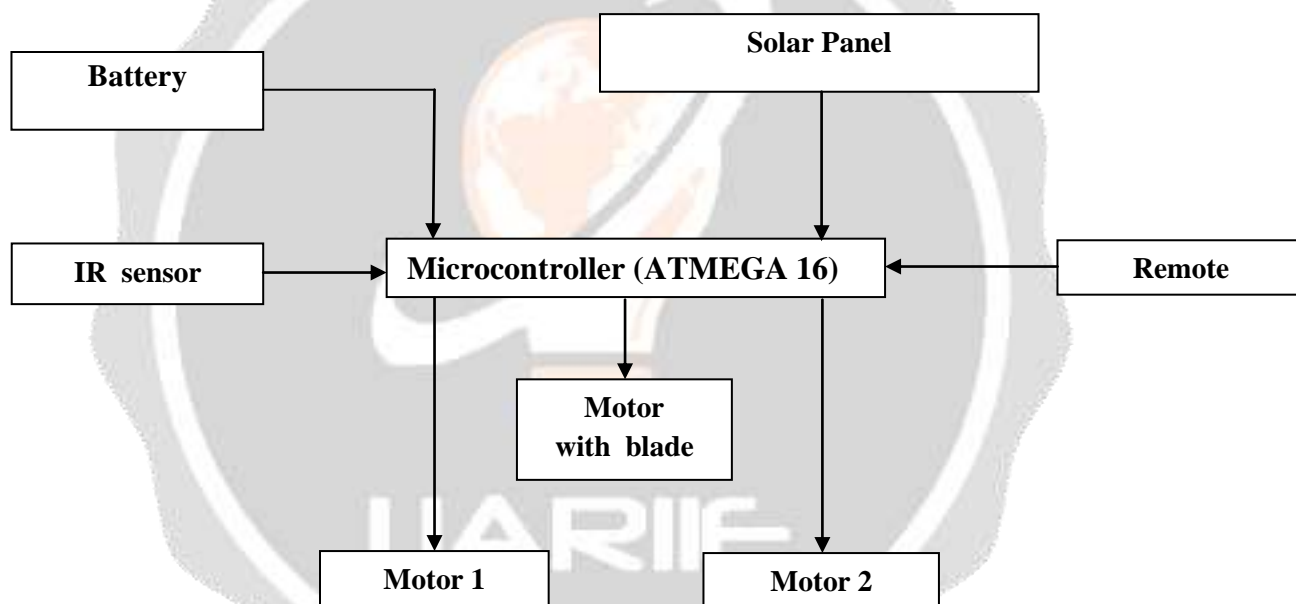


Fig.2.1 Methodology using Block Diagram



## 6. FUTURE SCOPE

- We completed our project successfully with the available sources. But the results and modifications are not up to the expectations.
- The mechanisms which we used scotch yoke mechanism does not given excepted efficiency.
- This efficiency can be increased by using some other mechanism and speed of motor is reduce because we have used heavy material and this material can be replaced by using light weight material .and design of blades should be done based on types of grass is used to cut.
- The project which we have done surly reaches the average families because the grass can be trimmed with minimum cost and with minimum time finally this project may give an inspiration to the people who can modify and can obtain better results.

## 7. APPLICATION

- For cricket ground.
- The football ground.
- All garden
- All Playground For colleges
- For small farms.
- for nurseries

## 8. ADVANTAGES

- Non skilled person can also operate.
- It is pollution free.
- No required any external supply.
- It is economical.
- Compact in size and portable.
- No any fuel cost.
- Easy to move from one place to another place.
- Freedom from long extension wires.

## 9. RESULTS

- The work done on lawn mower will meet the challenge of environmental production and low cost of operation since there is no cost for fueling.
- This lawn mower has been developed for the use of residences and establishments that have lawns where tractor driven mowers could not be used.
- The machine's capacity is adequate for its purpose. The machine has proved to be a possible replacement for the gasoline powered lawn mowers.
- The IR Sensors used in the grass cutter sense the objects and it will protect it from the obstacles.

## 10. CONCLUSION

Our project entitled Manufacturing of solar powered grass cutter 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 more physical exercise to the people and can be easily handled. This system is having 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. The mechanism which we used ie scotch yoke mechanism does not given excepted efficiency. This efficiency can be increased by using some other mechanism. and speed of motor is reduce because we have used heavy material and this material can be replaced by using light weight material .and design of blades should be done based on types of grass is used to cut. The project which we have done surly reaches the average families because the grass can be trimmed with minimum cost and with minimum time Finally this project may give an inspiration to the people who can modify and can obtain better result.

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