



FULLY AUTOMATED SOLAR GRASS CUTTER

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ABSTRACT

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. 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. 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.

KEYWORDS : Motor , Ultrasonic Sensor , Solar Panel Battery

1. INTRODUCTION

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. 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. 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.

2. Existing system

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 will run the AC motor. 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.

3. BLOCK DIAGRAM:

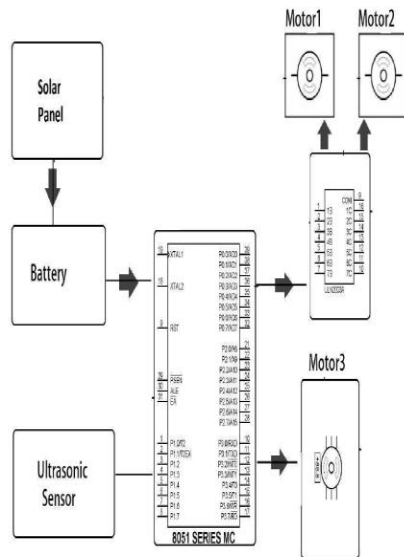


Fig 3.1: block diagram fully automated solar grass cutter

SOLAR PANEL: A solar panel, or photovoltaic module, is an assembly of photovoltaic cells mounted. Solar panels use sunlight as a source of energy to generate direct current electricity

BATTERY: A battery is a source of electric power consisting of one or more electrochemical cells with external connections for powering electrical devices

ULTRASONIC SENSOR: An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal.

DC MOTOR: A DC motor is an electrical machine that converts electrical energy into mechanical. In a DC motor, the input electrical energy is the direct current which is transformed into the mechanical rotation.

3.1 PROPOSED SYSTEM :

Shown the block diagram of the “Fully Automated Solar Grass Cutter”. As shown in block diagram there are many components are connected with each other. The solar panel is charged through the sun radiations and it generates the power. The power is stored in the battery. This power is given to the micro-controller which is controlled the whole device and operate automatically. The ultrasonic sensor which sense or detect the object . It is controlled by the micro-controller. The blade is used for cutting the grass.

4. PROBLEM STATEMENT:

We usually see the grass cutter machine was used at the housing park and residence bungalow the commercial are like industry area, we usually see the manually and conventional method was used grass cutter machine was used the fuel as source of power. The cost of fuels which are being used for cutters are also increasing. Thus our aim is to study alternative source of power like solar energy. In addition to this modification will be done to the blade to use different material and non hazardous to the operator. Thus providing user friendly and pollutionfree lawn mowers.

APPLICATIONS :

- For cricket ground.
- The football ground.
- All garden

- All Playground For colleges
- For small farms.
- for nurseries

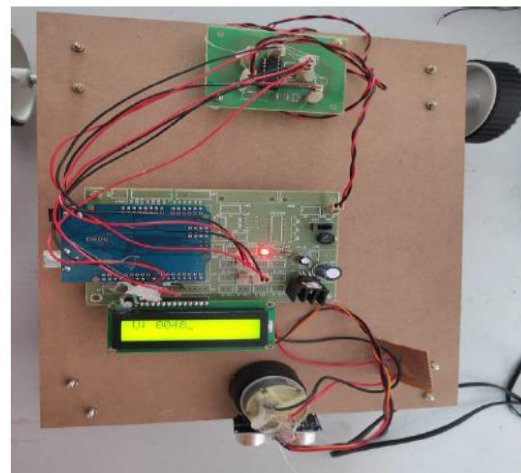
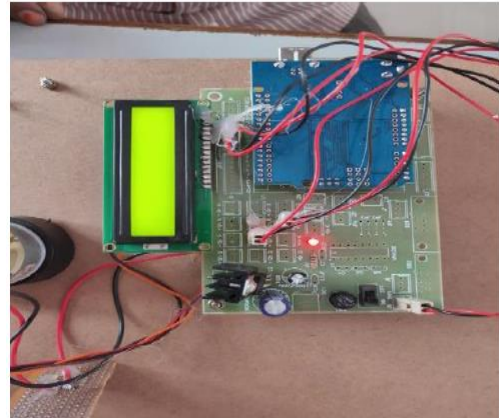
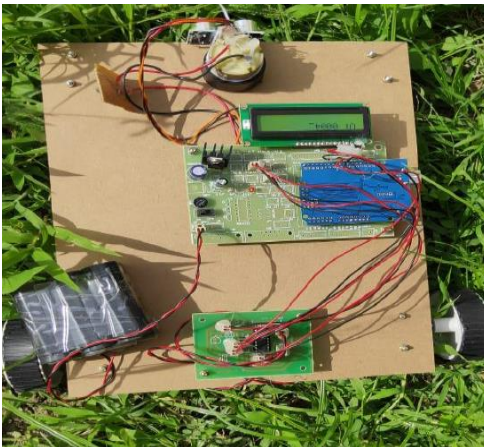
ADVANTAGES :

- 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.

DISADVANTAGES :

- Difficult to operate in rainy seasons.
- Failure of blade can occur.
- Time required for removing the grass is higher than the conventional one.

5. Results:



EXCUTION STEPS:

- In this block diagram in place of solar panel we are using 4v batteries are three.
- Three batteries will be 12 volts.
- Batteries will be connected in series $I=I_1+I_2+I_3$
- Ultrasonic sensor is used to detect the target.
- This system runs without any human intermission.
- In any obstacles by using an ultrasonic sensor will be detected.
- Grass cutter motor is used to cutting the grass and this is powered by batteries.
- It will be detect the corner of a particular lawn.



- Aurdino which is attached to the second extension of the motor the powered by the battery and this is a glass cutter motor.
- Fully automated solar grass cutter will be used in gardens, play grounds etc.

WORKING:

Coming to the working of solar powered grass cutter, it has panels mounted in a particular arrangement 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 as studied earlier. Now this electrical energy is stored in batteries by using a solar charger. The main function of the solar charger is to increase the current from the panels while batteries are charging, it also disconnects the solar panels from the batteries when they are fully charged and also connects to the panels when the charging in batteries is low. The motor is connected to the batteries through connecting wires Between these a two motor 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

6. 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.

7. 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 usingsome 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 surely 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.

REFERENCES:

- i. Prof. Ma [1] Srishti Jain, Amar Khalore, Shashikant Patil. Self-Efficient and Sustainable Solar Powered Robotic**



Lawn Mower in International Journal of Trendin Research and Development(IJTRD). Vol.2(6), December 2015.

ii. Ms. Rutuja A. Yadav, Ms. Nayana V. Chavan, Ms. Monika B. Patil, Prof. V

iii. .A. Mane. Automated Solar Grass Cutter in International Journal of Scientific Development and Research(IJSDR). Vol.2, February 2017.

iv. Bidgar Pravin Dilip, Nikhil Bapu Pagar, Vickey S. Ugale, Sandip Wani, Prof. Sharmila M. Design and Implementation of Automatic Solar Grass Cutter in International Journal of Advanced Research in Electrical(IJARE). Vol.6, April 2017.

v. Ms. Bhagyashri R. Patil, Mr. Sagar S. Patil. Solar Based Grass Cutting in International Journal of Electrical and Electronics Engineers (IJEED). January-June 2017.

vi. Microcontroller and embedded system-Muhammad Ali Mazid
vii. Tao Liu, Bin Zhang, Jixing Jia,Electromagnetic navigation system design of thegreen house spraying robot, IEEE(2014).

viii. Gholap Dipak Dattatraya1, More Vaibhav Mhatarde, Lokhande Manojku-mar Shrihari, Prof. Joshi S.G Robotic Agriculture Machine, International Journal of Innovative Research in Science, Engineering and Technology, Volume 3, Special Issue 4, April 2014.

ix. Sajjad Yaghoubi, Negar Ali Akbarzadeh, Shadi Sadeghi Bazargani, Sama Sadeghi Bazargani, Marjan Bamizan, Maryan Irani AS1 , Autonomous Robots for Agricultural tasks and farm assignment and future trends in Agro Robots, IJMMEIJENS Vol.13 No.03(2013).

x. K. Prema, N.Senthil Kumar, S.S.Dash ,Sudhakar Chowdary, Online control of remote operated agricultural Robot using Fuzzy Processor and Virtual Instrumentation, IEEE(2012).

xi. John Billingsley, Agricultural Robotics , IEEE Robotics Automation Mag-azine (2009).