



INTERNATIONAL JOURNAL FOR ENGINEERING APPLICATIONS AND TECHNOLOGY

Automatic Solar Grass Cutter

Prof. Anuprita Linge,,Pranali Eklare, Madhuri Khadse Ashvini Kumare, Mangesh Milmile,Lokesh lamsonge.

Professor,ETRX,SSPACE,Maharashtra,India(anupritalinge@rediffmail.com)
 Student, ETRX ,SSPACE ,Maharashtra,India (Madhurikhadse1994@gmail.com)
 Student,ETRX,SSPACE,Maharashtra,India (Pranalieklare14@gmail.com)
 Student,ETRX,SSPACE,Maharashtra,India (Ashukumare93@gmail.com)
 Student,ETRX,SSPACE,Maharashtra,India (mangesh.milmile77@gmail.com)
 Student,ETRX,SSPACE,Maharashtra,India (lamsongelokesh@gmail.com)

Abstract

A Solar grass cutter is a machine that uses sliding blades to cut a lawn at an even length. Even more sophisticated devices are there in every field. Power consumption becomes essential for future. Solar grass cutter is a very useful device which is very simple in construction. It is used to maintain and upkeep lawns in gardens, schools, college's etc. We have made some changes in the existing machine to make its application easier at reduced cost. Our main aim in pollution control is attained through this. Unskilled operation can operate easily and maintain the lawn very fine and uniform surface look. In our project, —Solar grass cutter is used to cut the different grasses for the different application.

KETWORD :Arduino Mega, DC Motor, LM7805 , Grass Cutter and Solar Energy

I. Introduction

The first lawn mower was invented by Edwin Budding in 1830 in Thrupp, just outside Stroud, in Gloucestershire, England. Budding's mower was designed primarily to cut the grass on sports grounds and extensive gardens, as a superior alternative to the scythe, and was granted a British patent on August 31, 1830. [1]in 1995, the first fully solar powered robotic mower became available. The mower can find its charging station via radio frequency emissions, by following a boundary wire, or by detection sensor. It detects any obstacle present in that particular range.

The Accelerometer sensor is a lifting detection sensor. It following an optional guide wire. The system uses an Arduino Mega microcontroller, Battery, DC motors, Ultrasonic sensor, Accelerometer, sensor and Solar panel. The main source of power is the solar panel which is used to charge the lithium ion battery. The battery provides the power supply to the Arduino. The DC motors and the sensors are interfaced with the Arduino. The Ultrasonic

II.HARDWARE REQUIREMENTS

A. Arduino Mega:-

The brain of the system is Arduino Mega. The Fig. 1 shows Arduino Mega. Arduino Mega is a microcontroller board based on

ATmega 2560. It has 54 digital input/output pins of which 14 can be used as PWM outputs, 16 analog input pins, a 16 MHZ crystal

oscillator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the

microcontroller, simply connect it to a computer with a USB cable or power it with a AC to DC adaptor or battery to get started.

The Mega 2650 board is compatible with more shields designed for the Uno and the former boards Duemilanove or Diecimil.



Fig. 1: Arduino Mega

B. DC Motor:-

Dc motor is a device that converts direct current (electrical energy) into mechanical energy. In the presented idea for grass cutter

model we have used two different type of DC motor one is low torque and the other one is high torque.

The low torque DC motor

is interfaced with the rotating blade for cutting the grass and the high torque DC motor is interfaced with the wheels for moving the grass.



Fig 2(a): Low Torque Fig.2(b): High Torque Motor

III. TECHNICAL SOLUTIONS:-

Another example is called the Lawn Ranger described by Rafaels and developed by Technical Solutions of Frederick, Md. The design uses an onboard computer to control the mower and interact

with sensors that guide the robot. The robot has two modes operation :remote mode in which an individual guides the mower around the outer perimeter of a person's yard and around any obstacles in its path. The system is switched to automatic mode in which the robot's infrared sensors make a comparison between cut and uncut grass. The mower continues this process until completes the job. The inventor was seeking to manufacture the prototype at a cost of \$900 with the intension of creating larger models for the future

IV.OBJECTIVE :- 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 ultrasonic sensor for object detection. The microcontroller moves the vehicle motors in forward direction in case no obstacl is detected. On obstacle detection, ultrasonic 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 offuntil it gets clear of the object and then moves the grass cutter in forward direction again

V.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 donesurly 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

the people who can modify and can obtain better results

VI.FUTURE SCOPE:-

We completed our project successfully with the available sources. But the results and modifications are not up to the expectations. This can be further improved by incorporating the following modifications to obtain better results. 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 familes because the grass can be trimmed with minimum cost and with minimum time Finally this project may give an **inspiration to**

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. REFERENCES :-

- [1] <http://nevonprojects.com/fully-automated-solar-grass-cutter/>
- [2]http://www.kscst.iisc.ernet.in/spp/39_series/SPP39/S/02_Exhibition_Projects/169_39S_BE_1251.pdf
- [3]<http://www.slideshare.net/kamerakranthikumar1/solar-grass-cutter>
- [4]http://www.ijera.com/papers/Vol4_issue9/Version%203/C49031021.pdf
- [5] www.adfruit.com
- [6] www.instructables.com
- [7] **Introduction to Robotics : Analysis, Control, Application 2nd Edition by Saeed B. Niku**
- [8] **Robotic Technology and flexible Automation by S. R. Deb**
- [9] **Sujendra.S and Vanita.P Smart Lawn Mover for Grass Trimming, International Journal of Science and Research, Volume 3, Issue 3, March 2014**
- [10] **Vipul Patel,Tanvi Patil,Pratik Sarvankar,Kashif Shah, Arduino Control awn Mover, International Journal of Scientific Research and Development, Volume 3, Issue 11, 2016**

