A SURVEY PAPER ON SOLAR BASED AUTOMATIC GRASS CUTTER

[1]Singh Suraj
[2]Salve Rahul Rajendra
[3]Bangar mamata Pandhari
[4] U.V.Patil

[1]Singh Suraj,[2]Salve Rahul Rajendra,[3]Bangar mamata Pandhari,[4] U.V.Patil
Electronics and Telecommunications,Sir Visvesvaraya institute of technology,Chicholi,Nashik,India

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. 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.

Keyword : - *Battery,Blades,DC Motor,Obstacle sensor,Solar panel.*

1.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 following an optional guide wire. This can eliminate wear patterns in the lawn caused by the mower only being able to follow one wire back to the station. A robotic lawn mower is an autonomous robot used to cut lawn grass. A typical robotic lawn mower requires the user to set up a border wire around the lawn that defines the area to be mowed. The robot uses this wire to locate the boundary of the area to be trimmed and in some cases to locate a recharging dock. Robotic mowers are capable of maintaining up to 20,000 m 2 (220,000 sqft) of grass. Automated solar grass cutter are increasingly sophisticated, are self-docking and some contain rain sensors if necessary, nearly eliminating human interaction. Robotic lawn mowers represented the second largest category of domestic robots used by the end of 200Possibly the first commercial robotic lawn mower was the MowBot, introduced and patented in 1969 and already showing many features of today's most popular products. In 2012, the growth of robotic lawn mower sales was 15 times that of the traditional styles. With the emergence of smart phones some robotic mowers have integrated features within custom apps to adjust settings or scheduled mowing times and frequency, as well as manually control the mower with a digital joystick

1.1 .OBJECTIVE AND AIM OF WORK

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

2. LITERATURE SURVEY

Husqvarna, a Swedish manufacturer, this year is also introducing its Automated grass cuterto the U. S. market (it's been sold in Europe for about three years). It works much the same as the Robomow with a boundary wire implanted at the border of your lawn. The Husqvarna model, however, takes care of itself. Whereas the Robomow has to be taken out and set up and watched by the owner, the Husqvarna Automated grass cutter lives outside, mows when it's programmed to mow and automatically returns to its base for recharging. The Husqvarna model is also significantly lighter than the Robomow (15 pounds vs. the Robomow's 42 pounds). According to Husqvarna, this not only makes it safer, but it leaves no tracks on the lawn. This complete freedom from even the thought of mowing, however, does have its price -- $1,995 plus $200 to $300 for installation. It's available in limited quantities this year from select dealers. The company also plans next year to release a solar-powered model to the U.S. market. Husqvarna Auto Mower and Solar Mower work independently. A boundary loop wire holds the automated grass cutter to the lawn and a search loop ensures that it returns to the docking station for battery recharging. The solar Powered version does not need a charging station and will be in production next year. Both mowers share similar features, the only difference is the power source. Almost silent and environmentally friendly. The boundary loop wire (red) defines the Auto Mower's cutting area whilst the search loop wire (yellow) directs the mower to the charging station. The boundary loop is also laid out around trees and surfaces of the lawn which will not be cut. The lawn mower changes direction if it touches garden furniture, a tree or other solid objects, yet is able to cut under bushes and hedgerows. You can program the cutting height between 30 and 95 mm to achieve a lawn just the way you want it. Dimensions: (L) 71 cm, (W) 60 cm, (H) 26 cm.

Chasis Implementation on Bread Board

3. APPLICATION

1. For cricket ground.
2. The football ground.
3. All garden All Playground

4. 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 the people who can modify and can obtain better results

5. CONCLUSIONS

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.

5. REFERENCES

[1] http://nevonprojects.com/fully-automated-solar-grass-cutter/

[2]http://www.kscst.iisc.ernet.in/spp/39_series/SPP39S/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