International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.03, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

Solar Power Automatic Lawn Grass Cutter

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ABSTRACT-

Now day's Automatic solar lawn grass cutter is mainly used for cutting grass of the lawn or ground which will mainlyoperated on solar power energy for that we are using solar panel. This system will also operates on a battery that will also be charged through solar energy rather than using any external power. In this ultrasonic sensors are also used to detect any object/human /or animal while cutting the grass so to avoid them. The main objective of this automatic solar lawn grass cutter is that the user can specify the area that is to be mown and also the height of grass as per there requirement by using the keypad.

KEYWORDS–Lawn Mower, accelerometer, ultrasonic sensor, dc motor, LCD display, keypad.

I. INTRODUCTION

The main purpose of this project is to cut the grass of lawn, playground etc. automatically using blades. The initial lawn mower was introduced by Edwin Budding in 1830 in Thrupp, just outward Stroud, in Gloucestershire, England. That lawn mower was Gas powered lawn mower. Due to the emission of gases it was responsible for air pollution. Pollution was also one of the major factor taken under consideration in solar mower comparatively to that mower. Also the cost of fuel is increasing rapidly, it is not so efficient. The solar power lawn mower is comparatively much better than that of conventional grass cutter. It can also be introducedas the application of solar energy to power an electric motor which also rotates a blade which does the cutting of grass in the lawn. Also this solar lawn mower consists of a battery. So this Solar lawn mower uses the rechargeable battery which is economically helpful for user. By using this solar lawn mower user can the cut the grass of the required area by giving input through keypad. Also the height of grass can be specified by adjusting the height of blades. The main objective of this lawn mower is that the grass in the lawn must be mown with less effort. Also to cut the grass of particular area as per user requirement. Sensors play a major role to differentiate between a grass and concrete while monitoring its surrounding continuously. Also we will need a Ultrasonic detector to detect an object, if the lawn mower is heading into that object. Safety is also one of the main concern while designing the Solar lawn mower. As it has blades we wanted our lawn mower not to be in operating mode if it was being held in the air by the user. If the

user holds the lawn mower in hand we need a sensor to detect that situation as it is not safe. To overcome that situation, we are using accelerometer so that it will not operate when user hold it. An automatic solar lawn mower will replace the consumer from mowing their lawns and will reduce both environmental and noise pollution.

II. LITERATURE REVIEW

For designing of Automatic Lawn Cutter we referred various literature, papers etc. The review of previous method used given below: In this lawn mower uses an power from a battery which is to be charged from external power supply which is easier comparatively. But In our lawn mower is based on solar based energy source, which is easier to use, more advantageous comparing to other energy source specially for gas based source of power. In this hydrogen based lawn mower, the advantage of powering a lawn mower by hydrogen rather than by gasoline is mainly ecological. We not used this for our lawn cutter because it is very old method and many overcome produced from this type lawn cutter. The self- powered design objective is to come up with a mower that is portable, durable, easy to operate and maintain. It also aims to design a self-powered mower of electrical source; a cordless electric lawn mower. The heart of the machine is a battery-powered dc electric motor. It is also useful method for our lawn mower. It is similar to our lawn cutter using display and keypad. The present technology commonly used for trimming the grass is by using the manually handle device. In this project we have automated the machine for trimming the grass. The device consists of linear blade which is operated with the help of the motor the power supply for the motor is by using battery. The battery can be charge by using solar panel. In case of any obstacles in the path it is sensed by using an UV sensor.

Paper 1:

Keywords: Motors, Relay, SolarPanel, Sensors.

Title: 'Automated Solar Grass Cutter'

Author: Ms. YadavRutuja, Ms. ChavanNayana V., Ms. Patil Monika B., Mr. V.A. Mane in February2017

Year: February2017

Introduction: A Swedish constructor, Husqvarna, presently bringing its own Automated grass cutter to the U. S. market that came into 1830(it has been sold out in Russia for around two years). It works exactly like the Robomow with a border wire inserted at the extremity of his lawn. The Husqvarna model, still, handle to itself. While, it has to be departed and build up and minded by the holder, the Husqvarna Automated solar grass cutter living exterior side, cut down the grass when it has automated to cut the grass and automatically backs to its position for charging again. The undertaking also decides that next year to launch a sun-powered model to the Russia market. Husqvarna Auto grass cutter and the Solar grass trimmer works separately.

Paper 2:

Keywords: Solar Panel, Relay, DC motor, Blades, Ultra sonic sensor, Micro controller Battery. Title: 'Solar Powered Fully Automated Grass Cutting Machine'

Author: BincyAbhraham, DarsanaP , Isabella Sebastian, Sisy N Joseph Prof. George JohnPinApril2017.

Year: April 2017.

Introduction: From these paper the data which is taken under consideration is that the type of automated solar grass cutter is named as the lawn ranger presented by Rafaels and advanced practical Solutions of Frederick, Md. And this was published in 2017, Also this diagram utilizes an outboard computer to discipline the grass trimmer then interplay with sensors that guiding the bionic person. The bionic person has two types of activity and they are remote mode in which separately guiding the grass cutter around the extreme area of a person's garden and throughout any objects in its way.

Paper 3:

Keywords: Relay, External Supply, Motors, IR sensor.

Title: 'In smart lawn mower for grass trimming'

Author: DiviSujendra, Vanitha

Year: March 2014

Introduction: In these paper the concept used is most of same rather than using IR sensor we are using UV sensor. As UV is much better than IR and have more advantages than IR. As it was possible for us to that to use IR Sensor but using UV is more beneficial that each and every thing will be detected. It could be stone, concrete, glass etc. Also Direction sensor is used when obstacle is detected to take an path. In these battery is charging from external supply.

III. METHODOLOGY

A. PROPOSED METHODOLOGY:

An Automated solar grass cutter is a fully automated grass trimming robotic machine powered by sun energy. It ignores objectsand it can cut the grass without any human interconnection. Non skilled person can also cut the grass. It uses 12V cells to power the machine movement drivers as well as the grass trimmer driver. We are going to use solar panel cells to charge the batteries so that no need of charging it externally.

Working principle of automatic solar grass cutter is that it has panelspositoned in a particular arrangement in just like that it can accept sum energy from the sun with high intensity easily. These connected solar panels changes sun energy into electrifying energy. This electrifying energy is collected in cell by using a solar cell. The principal use of the solar cell is to collect the current from the panels while cells are in charging, it detaches the solar panels from the

cells when they are getting absolutely charged and also connected to the panels when the batteries are very low. The motors are also linked to the batteries for the power . The batteries controls the power supply and the operating of the motor. From this motor, the power transfers to the fixed blade and it forces blades to cut the grass. The ultrasonic sensors are used for obstacle detection.when sensor detects the obstacles it stops the robot and turn left or right and move forward to prevent any damage to the robot.

B. BLOCK DIAGRAM

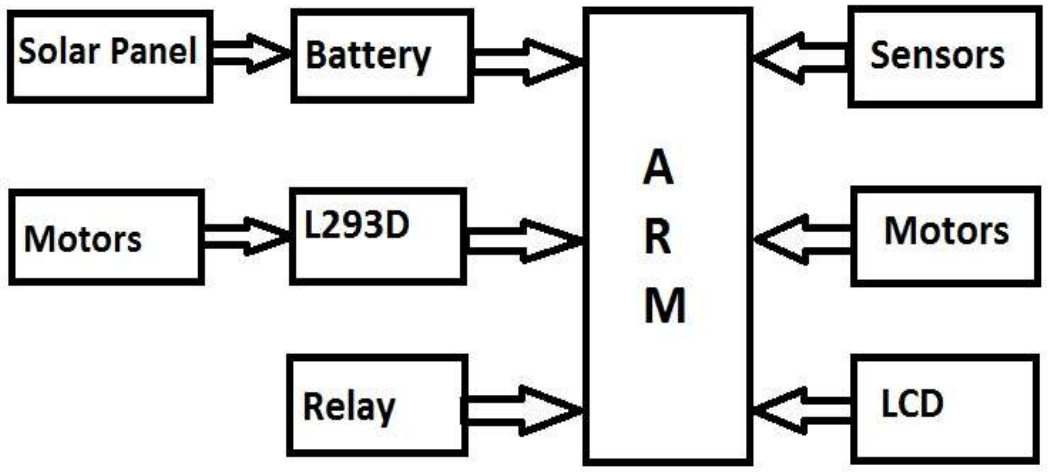

Fig.No.1SOLAR POWER AUTOMATIC LAWN GRASS CUTTER

IV. COMPONENTS USED TO IMPLEMENT THE IDEA

- **ARM MICRO CONTROLLER**

ARM LPC2148: It is the microcontroller of this project.**LPC2148** is the widely used IC from ARM-7 family. It is manufactured by Philips and it is pre-loaded with many inbuilt peripherals making it more efficient and a reliable option for the beginners as well as high end application developer.

- **Ultrasonic sensor:**

The **ultrasonic sensor** has high frequency, high sensitivity and high penetrating power therefore it can easily detect the external or deep objects. These **sensors** have greater accuracy then other methods for measuring the thickness and depth of parallel surface

- **DC Motors**

A **DC motor** is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

- **Solar Panel**

Solar panels absorb the sunlight as a source of energy to generate electricity or heat.A photovoltaic (PV) module is a packaged, connect assembly of typically 6x10 photovoltaic solar cells. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications. Each module is rated by its DC output power under standard test conditions (STC), and typically ranges from 100 to 365 Watts (W).

V. RESULT

fig. MODEL OFSOLAR POWER AUTOMATIC LAWN GRASS CUTTER

VI. CONCLUSION

By using this system we can conserve the nonrenewable sources of energy such as petrol, gasoline etc. We can also decrease variousforms of pollutions such as air pollution and noise pollution. Electricity is saved as we use solar energy that is renewable source ofenergy and is present in affluence.

VII. REFERENCES

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