ARDUINO BASED SOLAR GRASS CUTTER

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Abstract

Because of the nonstop expansion in the expense of fuel and the impact of emanation of gases from the consumed fuel into the air, this required the utilization of the bountiful sun oriented energy from the sun as a wellspring of ability to drive a grass cutter. A sunlight based fueled yard trimmer was planned and created, in view of the overall standard of cutting. The planned sun based fueled lawn mower includes direct current (D.C) motor, a battery-powered battery, sun oriented board, a treated steel edge and control switch. Cutting is accomplished by the D.C motor which gives the necessary force expected to drive the tempered steel sharp edge which is straightforwardly coupled to the shaft of the D.C motor. The framework will have a power source that is battery and a sunlight based board will be joined on the highest point of the robot. Moving the grass cutters with a standard motor fueled grass cutters is a bother, and nobody enjoys it. Cutting grass can't be handily cultivated by old, more youthful, grass cutter moving with motor make clamor contamination because of the boisterous motor, and neighborhood air contamination because of the ignition in the motor.

Keywords: *Lawn, Automation, Solar Grass Cutter, Microcontroller, Motor, Solar Panel, Battery.*

1. INTRODUCTION

Nowadays contamination is a significant issue for entire world. Contamination is synthetic and can be found in own homes. Additionally the expense of fuel is expanding thus it isn't effective. So the Solar fueled grass cutters are presented. Sun oriented fueled yard cutter can be portrayed as the use of sun based energy to control an electric motor which thus turns a sharp edge which does the trimming of a grass.

Be that as it may, the expense of those grass cutters is high. In any case, our programmed grass cutter comprises of battery-powered battery.

This plan is elective for naturally unsafe gas controlled grass cutter. So programmed grass cutter utilizing battery-powered battery is monetarily useful for client. By utilizing this grass cutter client can the cut the grass of the necessary zone by giving contribution by utilizing keypad. Additionally the tallness of grass can be indicated by changing the stature of sharp edges.

The principle objective of this grass cutter is that the grass in the yard should be mown with less exertion. Additionally, to cut the grass of specific zone according to client requirement. The sensors are the eyes of this grass cutter.

It will assist the client to cut the grass in their grass with less endeavors. The various sensors are utilized it will distinguish and evade articles and people while cutting.

The fundamental goal of this programmed yard cutter is that the client can indicate the territory that will be mown and furthermore the stature of grass according to there prerequisite by utilizing the keypad.

This plan contains a microcontroller like Arduino UNO, different sensors, Solar Panel, Battery, Inverter and so on this undertaking gives a plan strategy for a mechanized yard trimmer, whose assignment is to cut grass while following a predefined design with no need of client collaboration.

This assignment is required to be made conceivable by utilizing sensors to give a microcontroller estimation of distance.

2.   OBJECTIVES

There are a couple of benefits of using this structure, for instance, –

a) To get familiar with the working of programmed sunlight based force grass cutter.
b) To lessen the human endeavors, wounds and diminish utilization of electrical power.
c) To advance horticulture computerization.
d) To diminish grass reducing expense.
e) To lessen human mistakes.

3.   METHODOLOGY

In this proposed framework we have utilized the Arduino UNO microcontroller, DC motor and driver circuits. In this task the framework is been completely worked by solar powered energy. The fundamental point of sunlight based grass cutter is to cut the grass in which rancher take an excess of persevering so we can diminish all that. As shown in fig 3.1, there is one ultrasonic sensor which we have utilized for hindrance detecting when impediment is identified the robot is stop and the other way around. Microcontroller constantly check the yield of ultrasonic sensor and offers sign to the motor driver circuit which drives the motors.
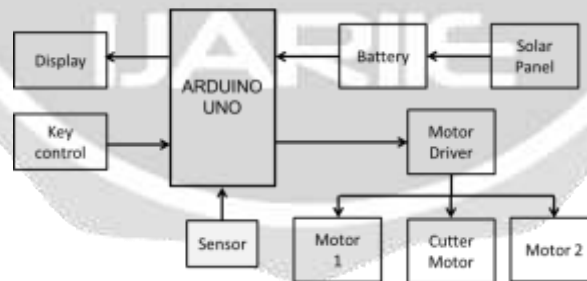

Fig.3.1. Block diagram

3.1 Arduino Uno

The suggested input voltage for this gadget lies between 7 to 12 voltage and cutoff is 6 to 20 voltage.

The capacity of Arduino UNO in are machines to get signals from Bluetooth module and to control the things dependent on the

coding which are stacked onto you from the Arduino PC programs which can be worked without any problem. It has 20 advanced

information and yield pins for legitimate association with different gadgets like l293d motor driver and IR sensor and so forth

3.2 LCD Display

LCD display module as shown in Fig.3.2 works on input voltage range of 4.5 to 5.5V.

It consists of total 16 pins. We are using LCD display to take inputs from the user. It consists of two registers- command register and data register [7].

It requires 1 mA current for its operation.

Fig.3.2. LCD Display

3.3 DC Motor

Usually the current required by dc motor is more than what is available at the microcontroller pins. Therefore when we need to control dc motor through microcroller, motor driver ICs are required to boost the current level.

Pretty much every mechanical development that we see around us is cultivated by an electric motor. Electric machines are methods for changing over energy. Motors take electrical energy and produce mechanical energy.

Fig.3.3 DC Motor

Electric motor is utilized to control many gadgets we use in regular daily existence. An illustration of little motor applications incorporates motors utilized in cars, robot, hand power devices and food blenders. Miniature machines are electric machines with parts the size of red platelets and find numerous applications in medication.

3.4 Rechargeable Battery

Solar panel produces electricity in the daylight only.
So, it is required to store the electricity produced by solar panel [6].

3.5 Solar Panel

A solar panel is nothing but solar photovoltaic cells used to convert solar energy into electricity [5].

Fig.3.3 Solar Panel

The solar panel is connected to the battery through charge controller which controls the charging voltage and current for the batteries[4].

3.6 Key control

Keypad is used to to change the speed of the the motor as well as to switch ON & OFF purpose.

3.7 Ultrasonic Sensor

An ultrasonic sensor is an electronic gadget that actions the distance of an objective article by radiating ultrasonic sound waves, and converts the reflected sound into an electrical sign.

Ultrasonic waves travel quicker than the speed of perceptible sound (for example the sound that people can hear).

Fig.3.4 Ultrasonic sensor

Ultrasonic sensors have two primary segments: the transmitter (which emanates the sound utilizing piezoelectric gems) and the collector (which experiences the sound after it has gone to and from the objective).

4. ADVANTAGES

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5. CONCLUSION

This paper provides a design method of an automated grass cutter operated on solar power, whose task is to cut grass with no need of user interaction. This task is expected to be made possible by using sensors to provide an Arduino with controlling.

The obstacle is automatically avoided, here for obstacle avoidance the ultrasonic sensor is used. The system also provides power backup by using inverter. The proposed system will be cost efficient with higher reliability.

REFERENCES

1. "Design and Development of a Solar Powered Lawn Mower": International Journal of Scientific & Engineering Research, Volume 5, Issue 6, June-2014.

2. E. Naresh, Boss Babu and G. Rahul, Grass Cutting Machine By Solar Power, International Journal and Magazine of Engineering, Technology,Management andResearch, Vol.3, 2016,2348-4845.

4. Swapnil Bendre P. Titarmare, Komal Choudhary, Harshada Kawale, Sagar Navghare, DUAL AXIS SUN TRACKING FOR SOLAR PV MODULES WITH AN AUTOMATED CLEANING SYSTEM, Journal of Emerging Technologies and Innovative Research, Volume7, Issue 5, Pages 25-28

5. P. P. Titarmare Komal Choudhary, Harshada Kawale, Sagar Navghare, Swapnil Bendre, Dual Axis Sun Tracking with an Automated Cleaning System for Pv Modules, IOSR Journal of Engineering (IOSRJEN), Volume 6, Issue Dec 2019, Pages 25-28.

6. Chandrakant Sharma, P. Titarmare, Abhay Halmare, Sandeep Mude, Devendra Holey, Electric Vehicles-Drive the Future, International Journal of Engineering Research in Electrical and Electronic Engineering, Volume 4, Issue 3, March 2018, Pages 9-12.

7. Vyawahare Nikita, P. Titarmare, Bhajikhaye Darshana, MICROPROCESSOR BASED SLIP POWER RECOVERY IN INDUCTION MOTOR, International Journal of Advance Research and Innovative Ideas in Education, Volume 3, Issue 2, 2017.

[8] Rahul Dekate '"Smart Fuel Flow Measuring System for Vehicles by using Dynamo Power Generation" IOSR Journal of Engineering (IOSRJEN) ISSN (e): 2250-3021, ISSN (p): 2278-8719 Special Issue || Dec. 2019 || PP 35-37

[9] Rahul Dekate, "Adaptive PI controller using STATCOM for voltage Regulation." E-Journal volume 4, issue 2,2018

[10] Prof. Rahul. Dekate, Kamesh Turkar, Rahul Mengre, Supriya Chandankhede, Minakshi Katare "Wireless Power Monitoring System for Electrical Protection & Power Quality Analysis" International Conference on Tech Trends in Science & Engineering" organized by Suryodaya College of Engineering, Nagpur on 7th & 8th March 2019