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Arduino Based Grass Cutter

***Mr.N.S.Jadhav*[*1],*S.V.Chavan*[*2],*T.P.Kamble*[*3],*S.K.Shelake*[*4],*V.B.Ghure*[*5.]**

[1].Lecturer/Department of electrical engineering,Sanjay Ghodawat Polytechnic,Atigre/ India
[2].Student/Department of electrical engineering,Sanjay Ghodawat Polytechnic,Atigre/ India
[3]. Student/Department of electrical engineering,Sanjay Ghodawat Polytechnic,Atigre/ India
[4]. Student/Department of electrical engineering,Sanjay Ghodawat Polytechnic,Atigre/ India
[5]. Student/Department of electrical engineering,Sanjay Ghodawat Polytechnic,Atigre/ India
satej10chavanbandre@gmail.com*2

ABSTRACT

A Solar grass cutter is a machine that utilizations sliding edges to cut a yard, that assist human with cutting grass consequently. Significantly more refined gadgets are there in everyfield. Because of fast turn of events, numerous robots have transform into an independent robot. Power utilization becomes fundamental for future. The development or the way of the Solar grass cutter depends on a way arranging method. Sun powered grass cutter is an extremely valuable gadget which is exceptionally basic in development. It is utilized to keep up with and upkeep yards in gardens, schools, school's and so on.

In our venture, we are utilizing Arduino UNO, Bluetooth module, DC engine, sunlight powered charger. For this grass cutter, Arduino UNO microcontroller is used as the microcontroller. Sensors are utilized to give input from outside world. We have rolled out an improvements in the current machine to make its application more straightforward at diminished cost. Our fundamental point in contamination control is achieved through this. Untalented activity can work effectively and keep up with the grass exceptionally fine and uniform surface look. Each activity of the grass cutter is checked by the ARDUINO UNO with the assistance of the sensors and Bluetooth module. In our project,—Solar grass cutter is utilized to cut the various grasses for the different application.

INTRODUCTION

By not utilizing this sun based energy, we work s grass cutter. In the market there are a wide range of grass cutters are accessible, for example, gas based grass cutter, electrical energy-based grass cutter. The electrical grass shaper relies on power and the gas based grass cutter expects fuel to work. The consuming of fuel in gas grass cutter cause air contamination as well as commotion contamination. For the cutter machine enormous link wire is expected for cutting the grass of huge region and the heaviness of engine is additionally weighty. In this way, as the innovation is improving, we additionally need to supplant the customary ordinary grass cutter to the new robotized battery utilized grass cutter. Along these lines, from the above challenges, attempted to make a mechanized grass cutterwhich having battery of 12V. There are all out 5 DC engines are utilized in the gadget from which 4 are utilized for moving gadget starting with one spot then onto the next and one major engine is utilized for cutting of the grass. These engines are associated with the engine driver and took care of by Arduino UNO. For the deterrent recognition reason. There is on need of wire and fuel to work gadget. In this way, the gadget is contamination less and eco-accommodating. The gadget has given with two modes to work inside they are programmed and furthermore one can work the gadget with telephone by associating the gadget with Bluetooth as Bluetooth module is given in the gadget. This task gives the planning steps to computerized grass cutter, whose point is to cut the grass of the predefined region which is determined to the gadget with next to no human communication. The result is accomplished by utilizing the sensors and different parts. A definitive objective of this gadget is to make a comparative gadget as conventional grass cutter with better effectiveness and of minimal expense

These days the robotization assumes vital part in the field of developments and furthermore mechanization is becoming quickly. Along these lines, it assumes vital part in the existence of people. Previously, the grass cutter was taken care of physically that is by human contact and furthermore, they require fuel or energy for working, Due to this there is parcel of loss of fuel and energy and it causes contamination as fuel is utilized for running the gadget The prerequisite of electrical energy is developing at exceptionally quicker rate as the utilization of electrical gadgets is expanding and the enormous measure of businesses and the apparatuses. we are likewise running out of powers. The customary grass cutter is expensive and its upkeep cost is extremely high. Thus, we really want to supplant the customary grass cutter. This model is affordable as contrast with the ordinary one. The fundamental aphorism of this gadget is to make a grass cutter that sudden spikes in demand for battery , consequently to save the electrical energy and to decrease the human point of interaction. In this project we use Arduino UNO microcontroller for controlling the tasks of a grass cutter, the grass cutter has a sharp edge for cutting the grass, and DC engines for the wheels of the Robot. It is completely mechanized and environmentally friendly power based project. Grass shaper works naturally accordingly it requires no gifted individual to work the gadget.

LITERATURE REVIEW

Sun Based Grass Cutter : A Review " Ms.Bhagyashri R. Patil, Mr.Sagar S. Patil" , in the paper named "Sun Based Grass Cutter : A Review " states that , regular grass shaper consumes non-sustainable wellsprings of energy. So to be an other green grass shaper can be controlled by utilizing sun oriented energy.

B. Sensor Based Multipurpose Agricultural Cutter " Prof.J.P.Wagh, AishwaryaChaudhary", in the paper named " Sensor Based Multipurpose Agricultural Cutter " states that, the rotational trimmer can turn about an upward pivot with the edge turning at fast and this will in general bring about a more unpleasant cut and shreds the grass leaf without any problem.

C. Sun based Grass Cutter with MPPT Tracking Panel " Ms.GuravSayali, Ms. Desai Pritam ", in the paper named "Savvy Solar based Grass Cutter with MPPT Tracking Panel " states that, adding a communicating of programmed power bank to charge the battery in a flash can help the grass cutter run for long time.

G. Rahul depicts the utilization of sun based energy to run the electric engine utilized for cutting grass. Bhosale and Khadake have introduced the execution of shrewd sunlight based grass shaper. This framework is driven by the sun based energy by utilizing sunlight powered charger and battery. This grass cutting machine was programmable for motor speed control.

Golden and Ghate have planned a grass shaper which works on sun based energy. Henceforth it saves the power and lessens labor supply. Amrutesh et al. have proposed brilliant sun based grass shaper framework which utilizations of sliding cutting edges to cut a yard at an even length. The relative investigation of advantages and disadvantages of sunlight based controlled programmed grass shaper and ordinary grass shaper is introduced in

To plan a Smart Solar Grass Cutter, a few boundaries should be thought of as, for example, the parts to be utilized in the task, the place of the parts, the construction of the principle body, the benefits and disservices of the plan and the wellbeing factors.

The Smart Solar Grass Cutter can work independently or non-independently. Other than that, the significant element is the proficiency. The materials and parts choices including the positions are pivotal to accomplish a superior productivity. This Smart Solar Grass Cutter is a basic plan which is upgrading the use of materials. The general aspects are relying upon the size or the elements of the sunlight powered charger. Three engines are utilized for back tires and the cutting edge.

The tallness of the rooftop is relying upon the stature of the battery. The elastic pivoting wheel is utilized as the front tires as it will consequently alter the course contingent upon the back tires. One engine is executed for each back tire. The plan is savvy and viable to the fundamental targets. Beginning from the hand sketch, the prototypeis planned in multi-faceted utilizing SolidWorks programming. Aspects of the plan are vital and should be exact and exact to improve the security factor

PROBLEM STATEMENT

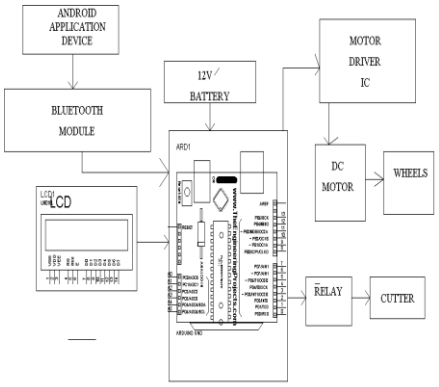
In the market there are a wide range of grass cutters are accessible, for example, gas based grass cutter, electrical energy-based grass cutter. The electrical grass shaper relies on power and the gas based grass cutter expects fuel to work. The consuming of fuel in gas grass cutter cause air contamination as well as commotion contamination. For the cutter machine enormous link wire is expected for cutting the grass of huge region and the heaviness of engine is likewise weighty. In this way, as the innovation is improving, we likewise need to supplant the customary traditional grass cutter to the new mechanized grass cutter.

OBJECTIVES AND SCOPE

To take into account more prominent adaptability in the plan, an exclusively fabricated stage will be utilized. Much experience has proactively been acquired with different sensors chipping away at the initial two ages of independent yard cutters. This is the key framework that will empower the trimmer to perceive objects, keep away from them, and can move likewise in an example.

METHODLOGY

BLOCK DIAGRAM GRASS CUTTER WITH ARDUINO



In the period of present day world, computerization is significant. For this, we have plan a framework which restricts the labor supply and utilize least energy with negligible work to cut the grass. Iot joins mechanical gadgets to the computerized machines. The gadget comprises of Arduino UNO microcontroller, Ultrasonic sensor, Bluetooth Module and a Solar controlled framework. Associating these components in required design we get our ideal framework structure. The Ultrasonic sensors fills in as the eyes of the gadget, To give the expected capacity to the gadget we utilize the battery .The battery supplies the energy to the parts and as indicated by the orders the engine moves. What's more, this machine will likewise eliminate the obstacles on its way. The framework requires no human cooperation for the activity of the framework. When the info is given it will all work without anyone else and as the area is covered it will come by its own.

Framework has four wheels, battery, Arduino, DC engine, Bluetooth module and the shaper, gathered into one place to cut the grass. It is worked by means of cell phone utilizing Bluetooth application according to the need.

Whenever a specific key is squeezed, the given guidance is communicated to the Bluetooth module from the telephone over bluetooth association. Then Arduino gets the sign and plays out the activity for example fitting guidance ships off the engine driver input pins. Battery is the power source and Arduino conveys the voltage prerequisite as the need might arise.

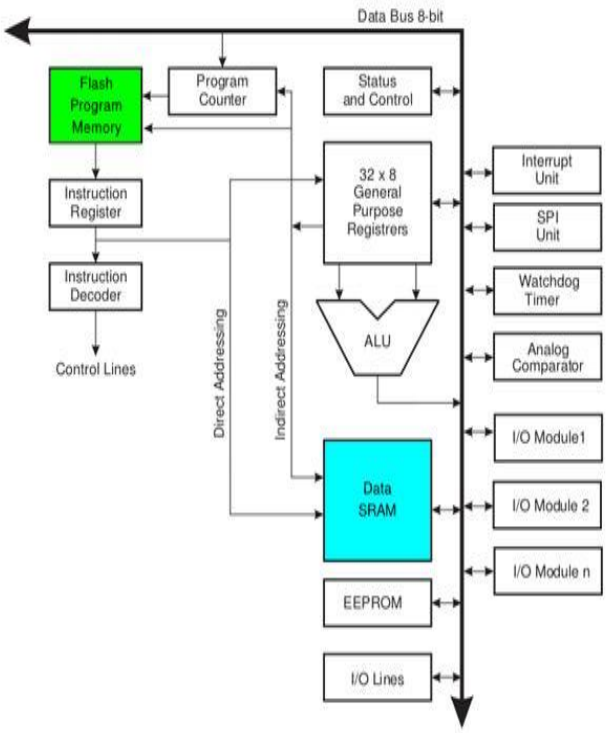
PROPOSED SYSTEM

The grass shaper machines are turns out to be extremely well known today. Contaminations is synthetic, which we can find in our own day to day existence. Old model of grass shaper IC motor are utilized and subsequently on account of its current circumstance sway contaminations level ascent IC motor driven shaper is costlier. Upkeep of such traditional machines is without a doubt. To keep away from the downsides, we intend to make new sorts of grass shaper,. Grass shaper work programmed consequently it doesn't need ability individual to work.

COMPONENTS

1. **Arduino Uno R3**: R3 is the most recent adaptation of Arduino UNO which we are utilizing in our shaper. Suggested input voltage for this gadget lies between 7 to 12 voltage and breaking point is 6 to 20 voltage.The capacity of Arduino UNO in are machines to get signals from Bluetooth module and to control the things in view of the coding which are stacked on to you from the Arduino PC programs which can be worked without any problem. It has 20 advanced information and result pins for legitimate association with different gadgets like l293d engine driver and IR sensor and so forth.
2 .**L293d DC motor driver**: This gadget is the connection between the microcontroller board and DC servo engines information being utilized in the shaper for different purposes. It Basically deals with the idea of H-Bridge which permits the voltage stream in clockwise and anticlockwise course and in this way turns the DC engines in one or the other bearing. It likewise controls the speed of engines. Working voltage of Arduino is by and large 5 V and engines require more than this for example 6-12 V, subsequently l293d additionally assumes a significant part you supply voltage/current from chip to servo engines.
3. **HC05 Bluetooth module**:The HC05 Bluetooth module helps in move signals from android application to the microcontroller over the bluetoothconnection.Main rationale of this Bluetooth module is to control servo engine being utilized in shaper with the assistance of Smartphone over Bluetooth association. The power supply for the module is +3.3 V and 50mA.
4. **DC motors**: Here in our machine, we are utilizing 5 servo engines. Four of them are for the four wheels smaller than normal engine is utilized for turning cutters with rough speed of 500 cycles each moment .It is the engine which is answerable for giving force to the wheels to smooth and quick pivot and interpretation of the shaper.
5. **Battery**: It stores the electrical energy changed over from sunlight based energy with the assistance of sun powered charger fitted into the gadget. The limit of the battery being utilized in the shaper is 12V/1.3AH.

ARDUINO ARCHITECTURE



ARDUINO INTERFACE

Steps to program an Arduino

- Programs written in Arduino are known as representations. A fundamental sketch comprises of 3 sections

1. Assertion of Variables
2. Instatement: It is written in the arrangement () work.
3. Control code: It is written insider savvy () work.

- The sketch is saved with .ino augmentation. Any tasks like confirming, opening a sketch, saving a sketch should be possible utilizing the buttons on the toolbar or utilizing the device menu.
- The sketch ought to be put away in the sketchbook catalog.
- Picked the appropriate board from the devices menu and the sequential port numbers.
- Click on the transfer button or picked transfer from the instruments menu. Consequently the code is transferred by the bootloader onto the microcontroller.

Few of basic Adruino functions are:

- **digitalRead**(pin): Reads the digital value at the given pin.
- **digitalWrite**(pin, value): Writes the digital value to the given pin
- **pinMode**(pin, mode): Sets the pin to input or output mode.
- **analogRead**(pin): Reads and returns the value.
- **analogWrite**(pin, value): Writes the value to that pin.

- **serial.begin**(baud rate): Sets the beginning of serial communication by setting the bit rate.

Advantages of Arduino based grass cutter:

- No lengthy wires required.
- Minimal Design and effectively Moveable
- No Fuel required
- Less support
- Extremely prudent
- Anybody can work
- Eco-accommodating
- Contamination free

Applications of Arduino based grass cutter:

- Farms
- Gardens
- Stadiums
- College grounds
- Lawns and many more.

CONCLUSION

It will be more straightforward for the understudies or others who will perform comparative task for additional upgrades to the venture. This machine is appropriate to anybody as it is exceptionally more straightforward to utilize and no ability is expected to deal with the machine. The machine is enjoying such a lot of benefits, for example, no fuel cost, no contamination, less upkeep cost and can be worked utilizing sunlight based energy so normal can get it without any problem. As Grass cutting requires such a lot of time; it is accepted that human ought not be squander their life on such undertakings or if nothing else decrease the chance to least. The expense adequacy and the straightforwardness in dealing with makes the robot to be a need rather than an extravagance lastly this undertaking might give motivation to individuals for any future improvement in this task.

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