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LAWN MOWER BASED ON INTERNET OF THINGS WITH ROBOTICS ARM

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ABSTRACT

operating it from long range .Special feature of this lawn mower is that, it can be operated from any part of world where there is available of internet .it can be control by using our cell phone which is easy to use and is easily available to all. We have use ARDUINO IDE for programming the device for all the operation which can be done by it. Different types of sensors are used to detect the location of obstacle and to inform the arm to respond. We also focused about the energy used in this device. We have used a BATTERY which is continuously powered by SOLAR PANELS which is ENVIRONMENT FRIENDLY and renewable source of energy

1. INTRODUCTION

Many technical gadgets are introduced to do job of cutting grass. Our research **(LAWN MOWER)** is introduced to do the same job for cutting purpose in a technical style by use of our cell phone which is very compact and in daily use. Colour green is symbol of nature of beauty . as grasses has the colour green which is enhanced the beauty by proper cutting and resizing with the easy modes of gadgets. we can decorate grass in lawn by using this device without any manual effort and without any movement of the human body . This device is installed with many features such as robotic arm to remove obstacle in its path, ultrasonic sensors to sense obstacle, solar panels to charge battery and many more. Movement in any direction is controlled easily and height of cutter can be controlled by the simple use of the button given in the blynk dashboard. **ARDUINO IDE** software is used to do all the programming used to do all the programming and to control all the movement of the device such as up- down movement of cutter, rotation of cutter and the rest. Battery is used to store the power collected by sun and to be used in cloudy days. . Working of this is as easy and smart. We can move it by inputs given in software. This device is cheaper than many grass cutter available in market these days.

2. WORKING

We have used server of Blynk application for controlling purpose of the motors. The are all based on the internet of things. We have used virtual pin of the Blynk app for controlling the digital GPIO pins of NODEMCU (esp8266) and this pins are controlling the pins of the ARDUINO UNO through the serial communication. We have target to make the lawn mower fully automated and IOT based .We have used geared dc motor for controlling cutter movement . Operating voltage needed for the motor used in cutter is of 3-12V range battery of approx.120 rpm. We used NODEMCU board for the controlling purpose of the motors which are used for different movement parts. We have used voltage distributer for distributing of the voltage from the battery according to our need. We have used relay for controlling of the supply of the from the battery which also controlled by our smart phone.

We have used three 3D dc motor driver (L298 H-bridge driver) which is used for the controlling of the motors.

We have used IR sensors for obstacles detecting so that it cannot get damage or hit any things for protecting the lawn mover grass cutter. All the connection according to our lawn has shown below. we have used solar panel which is programmed by using ARDUINO IDE as panel is also fully automated. Solar panel is sun tracking which will help to increase the efficiency of the solar panel in any condition and increase the overall efficiency of the grass cutter. We have used eight virtual pin in BLYNK application for all the controlling function the grass cutter.

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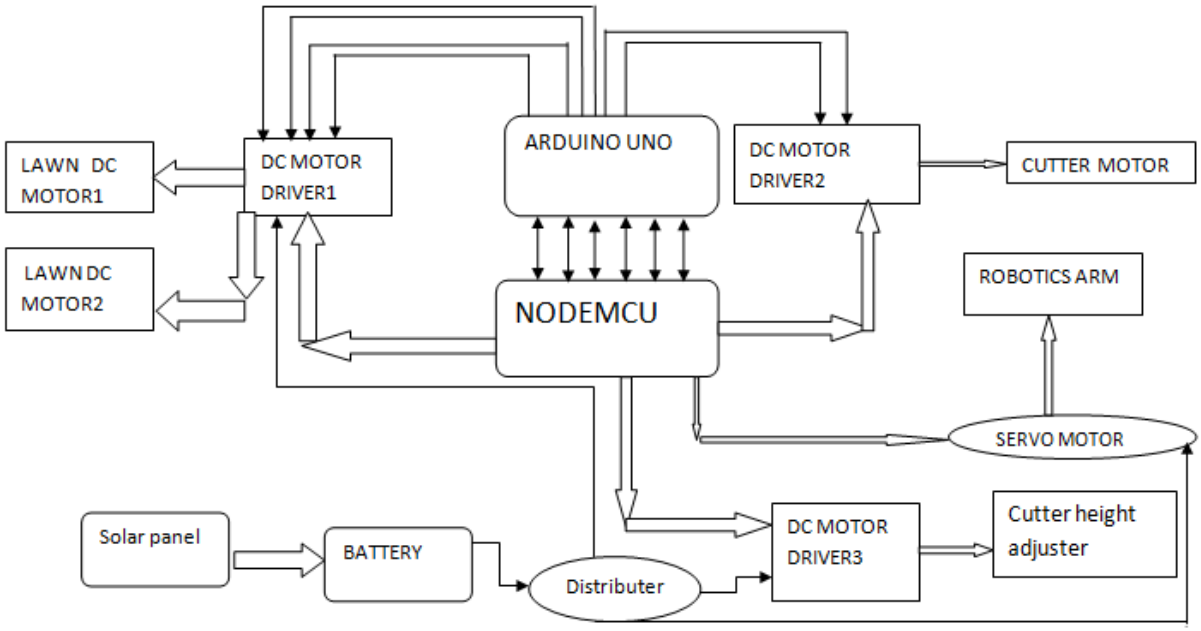

Fig: block diagram

3. COMPONENT USED

A. DC motor driver (L293D)

It consist of two H-bridge which is the simplest circuit for controlling a low current rated motor .It is a small current Amplifier which takes a low current control signal and then turns it into a higher current signal that can drive a motor.

IC receives signals from the microprocessor and transmits the One is used for controlling the motors for two tyres for grass cutter.

B. NODEMCU (ESP8266)

It is the open source IOT platform which helps us to interact with the sever and hardware for making things automated . We have used (D1, D2, D3, D4) pins for tyres motors(D5,D6) for cutter & (D7,D8) pin are used for adjusting the height of the cutter.

C. IR ,Ultrasonic sensor ,camera

IR sensor are used for obstacle detecting which will not allow the grass cutter to hit it and according to the coding it will change the direction. Also there is use of ultrasonic sensor which provide us information about the length of the grass being cut.

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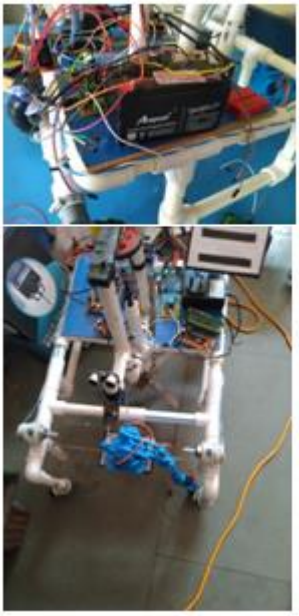
D. Solar pannel and battery



We have used battery of 12V which is charged by using solar panel which is fully automated. Initial current of the battery is less than 0.39A and is rechargeable .Solar panel provide the charging system for the battery.

E. ARDUINO UNO

We have use ARDUINO UNO for the controlling the height of the cutter according to the response of the IR sensor whenever there is any obstacle in the path of cutter which may harm the blade then UNO is programmed to take the cutter u.

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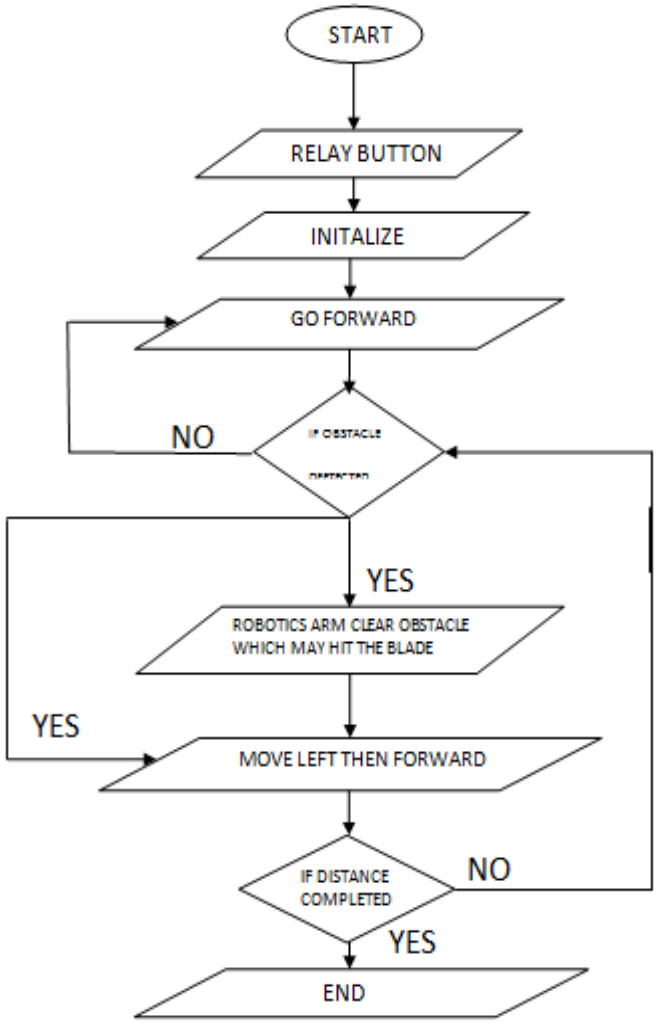
Flow chart:



F. Robotics ARM

Robotics arm ha four degree of freedom as there is used of four servo motor. It is used for the clearing the obstacles which may hits the blades of the grass cutter of lawn mower .it act according to the response of the sensors which installed for the sensing of the obstacles .

4. CONCLUSION

This paper has presented the advance use of the new technology in the fully automated grass cutter. Solar panel is environment friendly which is one of the best part of research paper for providing the power source to the battery and IOT is used for automation of the grass cutter. Also the main feature we have given is that we can trim the grass at different level according to our choice by using mobile phone .

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