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A Novel Design of Automatic Grass Cutter Machine

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***Abstract*—**At present we are having grass cutter machines that controls manually by humans and after cutting grasses, again they have to give their efforts to collect the grasses from the field. The machines which are used to cut grasses are operated on diesel, which is a wastage of natural resources. So we make a machine that cut the grasses and at the same time it collects all the grasses by vacuum cleaner. The machine is operated on battery which is charged by using solar cell. The main features of the machine are, it is control by mobile phone and if there is any obstacle in front of the machine while cutting grasses then the machine automatically create a beep sound. From time immemorial, the sun has been the major source of energy for life on earth. The solar energy was being used directly for purposes like drying clothes, curing agricultural produce, preserving food articles, etc. Even today, the energy we originate from fuel-wood, petroleum, paraffin, hydroelectricity and even our food originates obliquely from sun. Solar energy is almost unbounded. So here in our machine we used a energy source which never ends.

***Keywords*—**Blade, Vacuum cleaner, Battery, Solar cell, Arduino, Bluetooth module, Ultrasonic sensor, Buzzer, Dc motors, Wheels, Wiper motors.

I. INTRODUCTION

So basically we make a wireless bot using Arduino, Motor driver, Bluetooth module, dc motors and wheels, and the bot is controlled by our phone. In front of our bot we placed a grass cutting blade that cut grasses [1-3]. The blade is connected with a wiper motor and the motor is connected with a switch, which is connected with battery. In the back of our bot we placed a vacuum cleaner which collect the grasses from the field. We make the vacuum cleaner using wiper motor and a fan blade. Here also the motor is connected with a switch, which connected with battery [4.5]. The battery is connected with a solar cell. So the machine runs on the solar power. In front of our bot we placed an ultrasonic sensor which detects that if there is any obstacle in front of our bot. If there is any obstacle then a beep sound generates. We use an ultrasonic sensor, bread board, buzzer and Arduino to make this. 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 and this can be operated by using solar energy[6-8].

II. EXPERIMENTAL SETUP

A. BLOCK DIAGRAM &CIRCUIT DIAGRAM

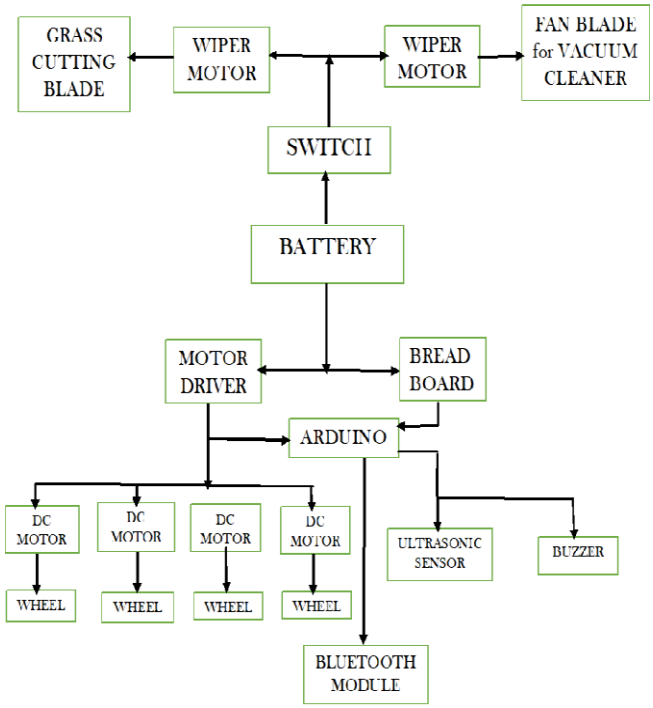


Figure 1. Block diagram of Automatic grass cutter machine

When the switch is on, two wiper motors starts working. So the blade which is connected to the wiper motor starts moving and cut the grasses and on the other hand vacuum cleaner starts working. Now when we connect motor driver and bread board to the battery, the arduino starts working. So now the ultrasonic sensor and the buzzer is on. Now if any obstacle comes before the machine, the buzzer gives a response and on the other hand we connect our phone to the Bluetooth module which is used in our device. Now we can fully control our machine.

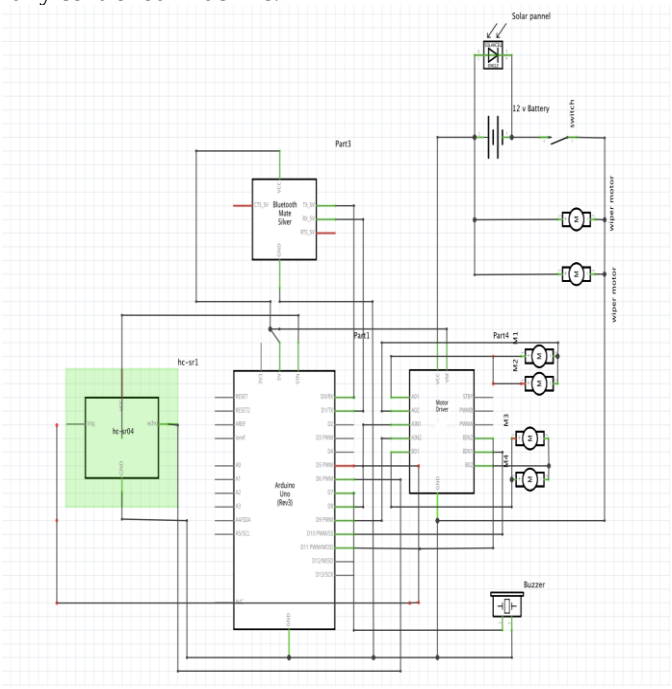
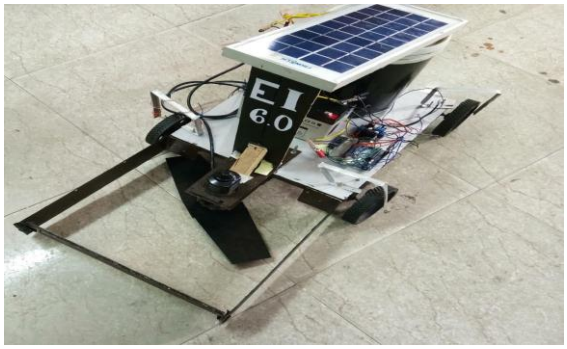


Figure 2.Circuit diagram of Automatic grass cutter machine

Here arduino is connected to motor drivers, bread board, ultrasonic sensor, buzzer and Bluetooth module and motor driver is connected to 4 dc motors which are connected to wheels.

B. REAL PHOTOGRAPHS:-



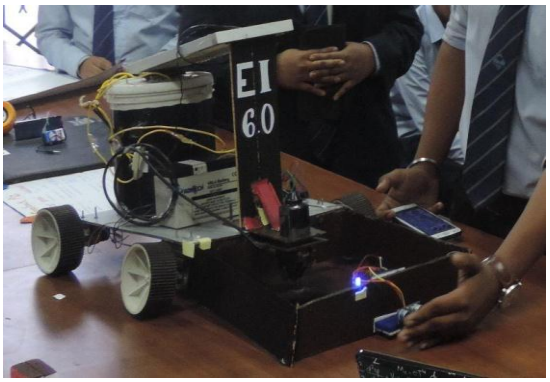


Figure 3.Real photographs of Automatic grass cutter machine

C. CODING OF THE ARDUINO SETUP:-

```
const int trigPin =5;
const int echoPin =6;
const int buzzer = 7;
long duration;
int distance;
char incomingByte;

void setup() {
  pinMode(trigPin,OUTPUT);
  pinMode(echoPin,INPUT);
  Serial.begin(9600);
  Serial.begin(9600);
  pinMode(8,OUTPUT);
  pinMode(9,OUTPUT);
  pinMode(10,OUTPUT);
  pinMode(11,OUTPUT);
}

void loop() {
  digitalWrite(trigPin,LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin,HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin,LOW);
  duration = pulseIn(echoPin,HIGH);
  distance = (duration*0.034)/2;
  Serial.print("distance:");
  Serial.println(distance);

  if(distance<=20)
  digitalWrite(7,HIGH);
  else
  digitalWrite(7,LOW);

  { if (Serial.available()>0)
    { incomingByte = Serial.read();
    switch(incomingByte)
      {
      case 'F' :  Serial.println("Forward");
```



```
        digitalWrite(8,HIGH);
        digitalWrite(9,LOW);
        digitalWrite(10,HIGH);
        digitalWrite(11,LOW);
        break;
case 'B' :  Serial.println("Backward");
        digitalWrite(8,LOW);
        digitalWrite(9,HIGH);
        digitalWrite(10,LOW);
        digitalWrite(11,HIGH);
        break;
case 'R' :  Serial.println("Right");
        digitalWrite(8,HIGH);
        digitalWrite(9,LOW);
        digitalWrite(10,LOW);
        digitalWrite(11,LOW);
        break;
case 'L' :  Serial.println("Left");
        digitalWrite(8,LOW);
        digitalWrite(9,LOW);
        digitalWrite(10,HIGH);
        digitalWrite(11,LOW);
        break;
case 'S' :  Serial.println("Stable");
        digitalWrite(8,LOW);
        digitalWrite(9,LOW);
        digitalWrite(10,LOW);
        digitalWrite(11,LOW);
        break;
default  :  break;
  }
 }
}
}
```

III. COMPARISON BETWEEN SIMPLE GRASS CUTTER MACHINE AND AUTOMATIC GRASS CUTTER MACHINE

Table 1

FACTORS	SIMPLE GRASS CUTTER MACHINE	AUTOMATIC GRASS CUTTER MACHINE
NATURAL RESOURCES	It is operated on diesel. So wastage of natural resources	It is operated using solar energy. So no wastage of natural resources.
EFFORT	More effort	Less effort.
CONTROLLING SYSTEM	Manually	Automatically
VACUUM CLEANER	Don't have	It contains vacuum cleaner
EFFICIENT	Less	More
OBSTACLE DETECTOR	Don't have	It has

IV. CONCLUSION & FUTURE SCOPE

Our project entitled Automatic Grass Cutter Machine is successfully completed and the results obtained are satisfactory. 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 and this can be operated by using solar energy. So we can say that it's one time investment and lifetime return. This system is operated by using mobile phone so it can be control by anyone. This project which we have done surly reaches the average families 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 result. We can use this machine in cricket ground, football ground, small farms, all type gardens etc. This machine has many advantages with compare to simple grass cutting machine. The advantages are:-1) Non skilled person can also operate because it is simply operated by mobile phones. 2) It is pollution free. 3) It collects all the grasses from the field after cutting. 4) It is economically cheap with compare to the simple grass cutter machines. 5) Compact in size and portable. 6) No fuel cost because it operates in solar power. 7) Easy to move from one place to another place. We successfully made our machine and the machine worked properly and in future we have a plan to add a new concept of WHEEL ENCODER by which we just have to give the length and breadth of the field in a keypad and the machine cut and collect all the grasses from the field.

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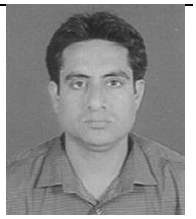
Authors Profile



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