Solar Grass Cutter

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Abstract - This paper describes the different features

And technologies present in Solar Grass Cutter. The sun has been the major source of energy for life on the earth. The solar energy was being used directly for purposes like preserving food articles, drying clothes, curing agricultural produce, etc. Nowadays manually handled devices are commonly used for cutting the grass for domestic purposes. This uses results in the loss of energy and pollution. To reduce pollution, an old vehicle needs to be replaced by robots using battery as a power source. These days' pollution and power cut being major problem we have thought of developing a device which will overcome these problems. This project aims at developing a solar operated grass cutting device. A grass cutter is a device that uses blades to cut a grass at an even length. The construction of this device is very simple. Solar plate delivers the power in this device. Battery is used for storage of solar energy. There is no need of charging the battery externally as solar panel is connected to the battery. This device is the prime example of how technology can be used to reduce human efforts as well as to efficiently utilize renewable sources of Energy.

Key Words: Solar panel, Battery, Pollution,Robot

1. INTRODUCTION

In today's world, pollution is the major issue around the globe. Sun has been the major source of energy for life on the earth. Technological developments are mostly designed to reduce manual labor, operating time and manpower. But sometimes it may cause pollution and may lead to human distraction by pollution of noise. So to overcome this problem solar grass cutter is useful.

The different types of grass cutter are available in the market like electrical grass cutter and gasoline grass cutter. In gasoline grass cutter there is required a fuel for running a cutter and due to the engine it produce gases so it increases pollution and it has a noisy operation. An electrical grass cutter is working on electricity through electrical motor. It uses single phase induction motor so it requires AC power. Due to single phase induction motor the weight of the device is more so it is more difficult to operate.

To solve this entire problem we try to design a remote control solar power based solar grass cutter.

Remote control solar grass cutting device is a device which is cutting the grass by its own through. This device reduces both environment and noisy pollution. It can be made with help of solar panel, battery, DC motor, sensors, blade, and ATmega328 microcontroller. This system uses 12 V batteries to power the robot. A solar panel is used to charge a battery.

An Atmega328 controller is used as the brain of the system. The grass cutter motors and the wheel motors are interfaced to the Atmega328 microcontroller that controls the working of all the motors. Detection of objects or obstacles is a very important factor for safety of the machine as well as human safety. On detection of object or obstacle a pre- programmed action is taken by the controller as per the condition sensed by the sensor. There is no need any fuel and any extension wires for run the cutter. So there is no pollution to environment. So it is pollution free or Eco- Friendly.

2. LITERATURE SURVEY

1) **Sachin Prabha1, Dattatray G. Biradar2, Sachin Panshette3, Veerbhadrappa.T4 1, 2, 3 M. Tech student, 4 Assistant Professor, "SOLAR GRASS CUTTER MACHINE", Volume 3, Issue 10, pp- 2702, June-2016**

In this paper they are using the handle or frame which is depend on the size of the lawnmower. They are also using a bearing which is machine part, which support a moving element and confines its motion. DC motors are used for movement of wheels.

2) **"Grass Cutting Machine by Solar Energy Power". May 2017(International Journal & magazine of engineering, technology, management & research)**

They are focused on force which is required to cut the grass force is require for moving should be greater than 10 Newton's. Precise torque and speed control without sophisticated electronics.

3) **"A Review on Smart Solar Grass cutter with Lawn Coverage" (2017) Imperial Journal of Interdisciplinary Research (IJIR)-**

Moisture based sensors used for measure humidity. Ultrasonic sensor for obstacle detection from (2-400) cm. Due to ultrasonic sensor give high accuracy & stable

Reading. It operates at night time also because of facilities to charge the batteries.

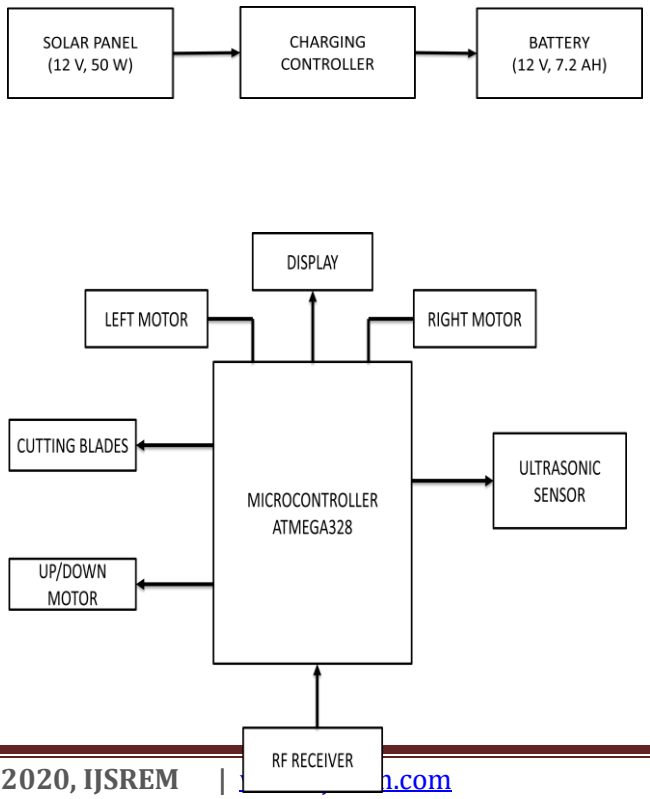
4) "A Portable and Automatic Weed Cutter Device". (IOSR Journal of Electrical and Electronics Engineering (IOSR-JEEE))

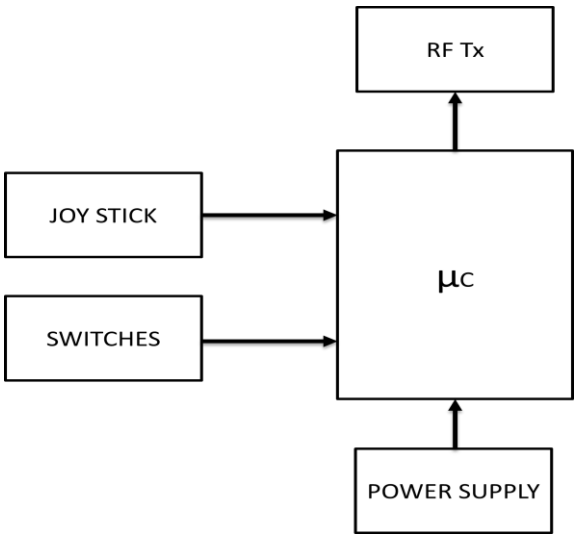
They have used GSM module. This vehicle is easy to operate, pollution free and automatic. As this cutter vehicle design is automatic, reduce the manual efforts. This system leads to improve the agricultural production.

5) Bincy Abhraham1, Darsana P S2, Isabella Sebastian3, Sisy N Joseph4 Prof. George John P5, "Solar Powered Fully Automated Grass Cutting Machine", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 6, Issue 4, pp-2520, April 2017

In this paper grass cutter and vehicle motors are interfaced to pic microcontroller that controls the working of all the motors. It is also interfaced to an ultrasonic sensor for obstacle detection. The microcontroller moves the vehicle motors in forward direction in case no obstacle is detected. On obstacle detection the ultrasonic sensor monitors it and the microcontroller thus stops the grass cutter motor to avoid any damage to the object/human/animal whatever it is and it also provides an alarm. Microcontroller then turns the vehicle as long as it gets clear of the object and then moves the grass cutter in forward direction again otherwise it changes the direction.

3. BLOCK DIAGRAM





4. MAIN COMPONENTS

Solar panels and ATmega328 microcontroller are the two main components of this robot.

A. Solar panel

The solar panel is charged through the sun radiations and it generates the power. There are mainly three type of solar panels are available in market like, monocrystalline, polycrystalline and thin film. Monocrystalline panel is more efficient than other so here this type of solar panel used. Monocrystalline panels are generally constructed from high quality silicon cell. In this device used solar panel in between ration of 12V and 240mA. This solar panel is connected with the 12V battery through the solar battery charger.

B. ATmega328 Microcontroller

ATmega-328 is basically an Advanced Virtual RISC (AVR) micro-controller. It supports the data up to eight (8) bits. ATmega-328 has 32KB internal built in memory.

5. ADVANTAGES

- Reduces both Environmental and Noisy pollution i.e. it is pollution free.
- It is economical.
- Vehicle is light weighted.
- Easy to move from any place to another place.
- Compact in size and portable.
- Non skilled person can also operate.

6. CONCLUSION

This paper has presented the design and development of solar grass cutter. It will be easier for the people who will take this project for modification. This project is developed in such a way that it is easier for common man to use and is very advantageous i.e. it uses renewable energy source, no fuel cost. This vehicle has having the facility of charging the battery while grass cutter is inmotion.

7. REFERENCES

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