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SOLAR GRASS CUTTER USING ULTRASONIC SENSOR

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Abstract - These days grass cutter machines are becoming popular in our surroundings. The main motive behind making this project is to save electricity by using solar energy and reducing manpower. In this project we are using microcontroller for controlling various operation of grass cutter. Grass cutter operates automatically by the help of sensor which helps to detect the obstacle and avoiding collision.

Key Words: **Detection, Solar**

1. INTRODUCTION

A Solar grass cutter is a machine which uses sliding blades to cut the grass at the small farms, play grounds, etc. Solar grass cutter is very useful grass cutting machine. It operates automatically by the help of sensor which help in sensing the obstacle and turns to different direction if any obstacle get detected. It is a machine which saves energy, reduces manpower, saves time, etc.

2. Solar Grass Cutter

A Solar grass cutter is a machine that uses sliding blades to cut the grass .It consist of photovoltaic cell for containing energy from solar panel. It's an automatic solar grass cutting machine which is having ultrasonic sensors for detecting the obstacle. DC to DC Converter helps to step up the DC voltage from the photovoltaic panel and store the DC voltage in a storage system.

2.1 Working of Automatic Solar Grass Cutter

The automatic solar grass cutter is a automatic grass cutting robotic machine powered by solar energy that avoids obstacle and saves the vehicle from colliding. This robotic vehicle is capable of cutting the grass automatically. In this vehicle we uses 6V battery for generating the power to the motors for the movement of the robotic vehicle. We use solar paneel to charge the battery. We use 8051 microcontroller for making this robotic vehicle that controls the working of all the motors. We are also using here a ultrasonic sensor for object detection. The microcontroller moves the motors in forward direction in case no obstacle detected in front of the vehicle. When obstacle is get detected then the ultrasonic sensor monitors it and microcontroller stops the grass cutter motor for safety of the vehicle. Then microcontroller turns to the different direction to the clear area and then moves the grass cutter again in forward direction.

2.2 Block Diagram of Solar Grass Cutter

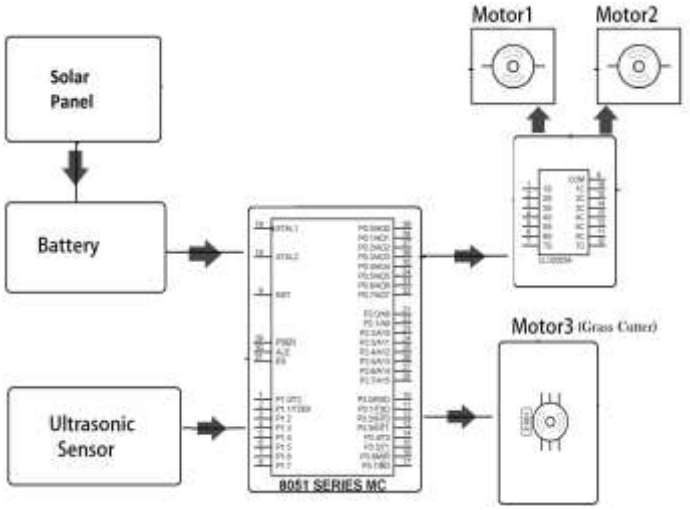

Fig - 1: Block Diagram of Automatic Solar Grass Cutter

2.3 Hardware Specifications

- 8051Microcontroller
- Solar Panel
- Motor Driver IC
- DC Motors
- Batteries
- Ultrasonic Sensor
- Robotic Body

2.4 Software Specifications

- Programming Language: Embedded C
- Kiel µVision IDE

3. Ultrasonic Sensor

Ultrasonic sensor is an electronic device which measures the distance of a object by emitting ultrasonic sound waves, and converts the reflected

sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound.

Ultrasonic sensors is similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves. Sensors generate high frequency sound waves and evaluate the echo. Sensors checks the time interval between sending the signal and receiving the echo to determine the distance to an object.

4. APPLICATIONS

- Used in small farms for cutting grass
- Used in playgrounds
- Used in small farms

5. ADVANTAGES

- Portable
- Simple operating process
- Moves from one place to another easily
- Anyone can operate this machine
- Number of reciprocating parts are less
- No requirements of fuel because it runs by solar energy

6. CONCLUSION

This machine will meet the challenge of environmental production and operation cost is low because there is no cost for fueling. A solar grass cutter has been developed for the use of residences and establishments. It's capacity is high. This machine saves the time. Manpower is reduced. This type of machine can helps to make a developed surroundings.

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