EMBEDDED BASED AUTOMATIC LAWN MOWER

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Introduction

In the past and even until now, cutting of grasses in the schools, sports tracks, fields, industries, hotels, public centre, etc. were done with a cutlass. This method of manual cutting is time consuming because human effort is needed for the cutting. Also inaccuracy in cutting level was observed using the manual cutting method. The aim of this work includes, but not limited to the following:

- To reduce labour input in the cutting of not only weeds or grass but also in the trimming of flowers and trees.
- To reduce cost, time of cutting and also to beautify the environment.

Issues and challenges:

IC engines require frequent maintenance and it is costly. A gasoline-powered lawn mower produces as much pollution in one hour as a new car does in thirty hours. To avoid these drawbacks, we plan to build new type of grass cutter which runs on solar energy and this model is economical, noiseless and free from pollution compared to the existing model.

Problem statement:

Construction of solar powered lawn mower which stays in specified boundary, finds distance and position of the obstacle to avoid collision. With help of new system noise and air pollution need to be avoided.

Objectives

(a) To optimally design and fabricate the unmanned solar powered lawn mower.

(b) To detect and avoid collision with obstacle and change its direction.

Methodology

The main components of the solar powered grass cutter are:

Hardware: 15w mono crystalline solar panel, 12 volt lithium ion battery, DC Series Motor, Ultrasonic sensor,4 wheels, Mowing blade, ATmega328P Microcontroller, Motor Driver L293D Software: Embedded C
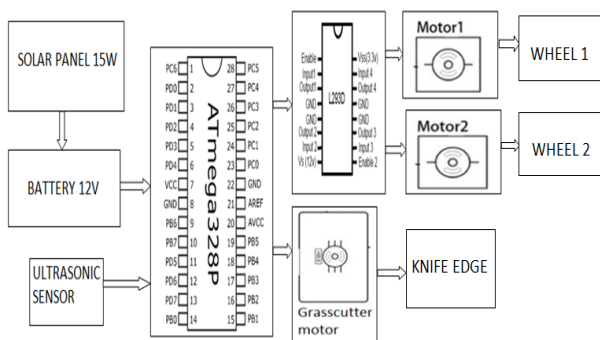
The completely automatic solar grass cutter is a fully automatic grass cutting robot car powered via sun strength that also avoids limitations and is capable of fully computerized grass reducing without the want of any human interplay. The machine uses 12V battery to provide energy for the vehicle motion automobiles as well as the grass cutter motor. We also use a solar panel to charge the battery in order that there is no need of charging it externally. The grass cutter and vehicle is interfaced to an ATMega328p microcontroller that controls the operating of the vehicle. It is likewise interfaced to an ultrasonic sensor for object detection. The microcontroller moves the automobile motors in forward course in case no impediment is detected. On impediment detection the ultrasonic sensor monitors it and the microcontroller consequently stops the grass cuter motor to avoid any damage to the object/human/animal something it's far. Microcontroller then turns the robotic as lengthy because it gets clear of the item and then moves the grass cutter in a head path again.

Results and Conclusion

(a) The machine trims the grass automatically without any external force or human intervention.

(b) The lawn mower detects obstacle and change it's direction as soon as it detects obstacles.

(c) When battery is fully charged with the help of solar panel it can mow grass continuously for 4 hours.

(d) Smooth working and easy handling

Future Scope

(a) The efficiency can be improved by increasing the battery capacity.

(b) More sensors can be incorporated for accurate results and improved automation.

(c) The programming can be enhanced to make the device perform different operations.