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Solar Operated Grass Cutter

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Abstract: Automated Solar Grass Cutter is a fully automated grass cutting robotic mover powered by solar energy with solar penal that also avoids obstacles and is capable of fully automated grass cutting without the need of any human interaction. The system uses 10V batteries to power the mover movement motors as well as the grass cutter motor. We also use a solar panel to charge the battery so that there is no need of charging it externally. The grass cutter motors are interfaced to an 8051 micro-controller that controls the working of all the motors. It is also interfaced to an ultrasonic sensor for object detection. The micro-controller moves the mover motors in forward direction in case no obstacle is detected. On obstacle detection the ultrasonic sensor monitors it and the micro-controller thus stops the grass cuter motor to avoid any damage to the object/human/animal whatever it is. Micro-controller then turns the robotic as long as it gets clear of the object and then moves the grass cutter in forward direction again

Keywords: Automated Solar Grass Cutter, Solar Penal, Mover Movement Motors, Grass Cutter Motor, Micro-controller & Ultrasonic Sensor

I. INTRODUCTION

An agricultural robot is a robot deployed for agricultural purposes. The main area of application of robots in agriculture today is at the harvesting stage. Emerging applications of robots or drones in agriculture include weed control, cloud seeding, planting seeds, harvesting, environmental monitoring and soil analysis. According to Market Research Engine, the agricultural robots market is expected to reach \$75 billion by 2025 .Fruit picking robots, driverless tractor / sprayers, and sheep shearing robots are designed to replace human labour. In most cases, a lot of factors have to be considered (e.g., the size and colour of the fruit to be picked) before the commencement of a task. Robots can be used for other horticultural tasks such as pruning, weeding, spraying and monitoring. Robots can also be used in livestock applications (livestock robotics) such as automatic milking, washing and castrating. Robots like these have many benefits for the agricultural industry, including a higher quality of fresh produce, lower production costs, and a decreased need for manual labour. They can also be used to automate manual tasks, such as weed or bracken spraying, where the use of tractors and other manned vehicles is too dangerous for the operators. The mechanical design consists of an end effector, manipulator, and gripper. Several factors must be considered in the design of the manipulator, including the task, economic efficiency, and required motions. The end effector influences the market value of the fruit and the gripper's design is based on the crop that is being harvested.

II. METHODOLOGY

Step 1: - We started the work of this project with literature survey. We gathered many research papers which are relevant to this topic. After going through these papers, we learnt about grass cutter and pesticide spray machine.

Step2: - After that the components which are required for my project are decided.

Step 3: - After deciding the components, the 3 D Model and drafting will be done with the help of CATIA software.

Step 4: - The components will be manufactured and then assembled together.

Step 5: - The testing will be carried out and then the result and conclusion will be drawn.Procedure manage the spinned words as you want.

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III. MODELING



IV. RESULTS

Solar grass cutters are environmentally friendly and costeffective alternatives to traditional gas-powered lawn mowers. They use solar energy to power their cutting blades, reducing the need for fossil fuels and lowering greenhouse gas emissions. Adding a fire sensor and obstacle detector to a solar grass cutter can improve its safety and efficiency. The fire sensor can detect potential fire hazards, such as dry grass, and alert the operator or automatically shut off the machine to prevent a fire. The obstacle detector can detect objects in the path of the grass cutter and help avoid collisions, reducing the risk of damage to the machine or injury to the operator.

The result of implementing these features in a solar grass cutter can be a safer and more efficient machine that helps protect the environment and the operator. However, the performance of the machine may depend on the specific design and implementation of the fire sensor and obstacle detector, as well as the overall quality of the solar grass cutter.

V. CONCLUSION

In this semester we have successfully designed the CAD model using CATIA V5 R20 software and selected the material required and also done all the required calculation for this.

By doing this project we conclude that ,we can reduce the human efforts and this will be helpful for farmer. As it is operated on solar energy so the it is best application that does not effects on environment.

This project work has presented progress towards achieving a future precision autonomous farming system. This system is designed to help farmers in reducing their time and energy spent for pesticide spraying and weed cutting. This system can be operated on +12V rechargeable battery.

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