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# DESIGN AND FABRICATION OF A SOLAR GRASS CUTTER: A REVIEW

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## ABSTRACT

Nowadays grass cutter machines are becoming very popular today. Pollution is manmade, which we can be see in our daily life. In old model of grass cutter IC engine was used and hence because of its environmental impact pollution level rises IC engine driven cutter is more costly. Maintenance of such conventional machine is more. To avoid these drawbacks we plan to built new type of grass cutter which runs on solar energy and this model is also economical. This project is to make the grass cutter which operates on solar energy hence save the electricity and reduces manpower. These days we are facing the problems like pollutions, power cut problem etc. In order to overcome these problems, we have thought about the device, which can be performing its functions without causing any of these problems. So we have thought of doing the project on cutting grass, this uses the renewable source of energy for its operation like solar energy. This project aims at developing a portable solar operated grass cutting device, as there is power shortage. So it was decided to make a solar energy operated device. Solar panel is connected to the battery. Battery is in turn connected to a DC motor.

**Keywords**: (Solar Grass Cutter , DC Motor, Battery, Solar Panel).

## 1. INTRODUCTION

Solar grass cutter is also known by the name solar lawn mower. A lawn mower is a machine that uses one or more revolving blades to cut lawn to an even height. The blades may be powered either by hand pushing the mower forward to operate the mechanical blades or may have an electric motor or an internal combustion engine to spin their blades. Some mowers also include other abilities, like mulching or collecting their clippings. An electrical Lawn Mower is more suitable & easy to use than the lawn mower with an engine. A Solar grass cutter is a machine that uses sliding blades to cut a lawn at an even length. Even more sophisticated devices are there in every field. Power consumption becomes essential for future. Solar grass cutter is a very useful device which is very simple in construction. It is used to maintain and upkeep lawns in gardens, schools, colleges etc. Rapid growth of various high-tech tools and equipment makes our jobs done in comfortable and sophisticated manner. The project aims at fabricating a grass cutting machine system which makes the grass cutter working through motor that runs using solar energy. Power plays a great role wherever man lives and works. Grass cutter machines have become very popular today. Most common machines are used for soft grass furnishing.

| Sr. No. | Item | Quantity | Remark |
|---|---|---|---|
| 1 | DC Motor | 2 | Rotating the blade |
| 2 | Wheel | 4 | Moving the robot |
| 3 | Battery | 1 | Power supply for motors |
| 4 | Solar panel | 1 | Power supply for batteries |

The lawn mover is an aid in the mundane task of grass cutting and tending to lawns. Due to the revolution of green movement in the present scenario the industries with major campus areas are changing the percentage of greenery in the campuses and increased greenery causes increased effort and money to tend to.In such cases the lawn mover proves to be an god sent. Due to increased availability of system on chips, the lawn mover can be automated very easily and also the reduced size and cost of Dc motors causes the system to be independent of fossil fuels to be able to tap into renewable energies. The presence of Ultrasonic sensors and light dependent resistors in a smaller and cheaper packaging cause the bot to be more aware of its surroundings. Due to the presence of ardiuno oin the system causes and increase in the module that can be added. Traditional design of lawn movers had motored powered engines which required regular maintenance such as engine oil and greasing. They also created a lot of noise pollution and air pollution. In the cold and harsh environment the fossil fuel powered motors tend to freeze and not run. These problems

are solved by using electric motors . They are also much more greener because they use solar panel.The mover uses battery chorded system causes a range as alimitationn and damage to the chords.

## 2. LITERATURE REVIEW

"Reference [1]" designed a simple solar grass cutter that is portable and easy to operate. In his design, an alternator for recharging the D. C. battery that powers the electric motor was developed. The blades of the system are driven by multiple pulleys connected to the motor. Overall, it is a cordless solar power mower with 88.51% cutting efficiency

"Reference [2]" designed and constructed solar grass cutter. The mower transfers torque to the blade using an internal gear system. Performance evaluation of the machine was done .

"Reference [3]" developed a solar grass cutter. A direct current (D.C) motor connected to the battery powers the blades and a photovoltaic panel is used to generate the energy needed to power the mower. Performance evaluation of the design was done on a field capacity of 1.11x10-4 ha/hr nm and an efficiency of 93% was obtained. A rotary lawn mower was designed and analyses by reference [7]. A new product (simple lawn mower) that is cost effective and simple in design was put forward. The frame and adjustable module were analysed using ANSYS workbench. Results showed that under loading condition, the frame is found to be safe and reliable.

"Reference [4]" developed a simulation of an improved solar lawn mower machine. Focus was on improving solar powered lawnmowers by using locally available materials. The efficiency of the lawn mower was suggested to be dependent on the ability of the software to predict the circumstance under which failure is likely to occur.

"Reference [5]" reviewed and evaluated three (3) different types (solar, electric and gasoline) of lawnmower and concluded that solar powered lawnmower has over 90% cutting efficiency, and produces no air pollution or noise as compare to internal combustion engine lawnmowers. They also concluded that the direction of sunlight falling on the solar panel can vary how the system is charge.

"Reference [6]" In this paper author fabricated grass cutting machine with rotary blades by using solar energy. The solar energy is trapped in the photovoltaic cell to generate electricity. The cells may be grouped in the form of panels or arrays. Solar panel is placed such that to absorb high intensity from sun and it will incline at 450. The main function of solar charger is increased current during batteries are charging and also disconnect when they are fully charged. Circuit's breakers are used to start or stop the motor. By considering ground clearance they can adjust the height of grass.

"Reference [7]" In this paper they have fabricated solar powered grass cutting machine with tempered blades are attached to this grass cutter. This grass cutter is manually operated as well as automatic operated. The materials commonly used GI sheet, motor, wheel, Al sheet, switch, wire, square pipe and insulating material. The components used are comparator, rechargeable battery, relay, temperature sensor, DC motor. The voltage generated by using solar panel displayed on LCD display unit.

"Reference [8]" They prepared solar powered vision based robotic lawn mower which operated manually with less efforts. The predetermined program feed into the system and the robot moves as per predetermine pattern with the help of MATLAB programming as well as camera installed over the robot structure. Robots which is produced for reducing the human efforts also detects human and objects which is come in front of robot. Therefore it protects the equipment form damage and also reducing risk on human. The robot cut the grass in different direction for making different design patterns as specified by human.

"Reference [9]" The writer fabricate solar grass cutter machine for reducing human work and also consume non renewable sources of energy on the earth surface. By using solar panel the energy is acquire from sun and store it into batteries and uses this energy as per the requirement. All this functions are proceeding according to prescribed time by proper monitoring. A specific mechanism provide for protection of batteries from extra charging which increases life span of batteries. It can also be used for small scale for gardening.

## 3. CONCLUSION

The main aim of the project is to design and fabricate an eco-friendly device named as the solar grass cutter. There had been many attempts in the past too for making a device that cuts the grasses but were mainly focused on use of the muscle power either human or animals. Also development has led towards the utilization of electric power in order to move lawn mower. Now the world is facing energy crisis and people are more focused towards using renewable energy source for every activities that is being consuming the non-renewable resources. Likewise the power consumption of grass cutter has been modified towards the solar sector which is one of the renewable energy sources. Due to this technology, global problem of pollution has been reduced and a green technology has been introduced.

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