

HYBRID LAWN-MOWER MACHINE

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ABSTRACT

The continuous rise in the cost of fuel and the effect of various harmful gasses from the burnt fuel into the environment, this necessarily stated the use of the hybrid grass cutter machine which works on both solar energy sources and DC power supply source also. Solar power lawn mowers were designed and developed based on the general principle of moving. The defined solar powered lawn mower also has a direct current DC motor, a rechargeable battery for solar panel, stainless Steel Blade and controls switch. Moving is achieved by the motor which provides the required cut needed to drive the stainless steel blade which is directly coupled to the shaft of the DC motor. Solar powered lawn mower is operated by the switch on the board which closes the circuit and allows the flow of current to the motor which in turn drives the blade used for moving. The battery charges through the polar charging power adapter also, which converts the DC supply to AC supply to the battery of the machine. Performance of the developed lawn mower machine was taken out with the different types of graphics.

Keywords: Solar, Grass cutting machine, Hybrid power supply, D.C motor

1. INTRODUCTION

Solar energy provides power to an electric motor which makes the blade rotate and therefore used for cutting the grass of the lawn to a specific size required. It uses the photovoltaic cells on the solar panel to generate energy which is needed to provide power to the motor.

The hybrid operating grass cutter will help to curb the levels of air pollution and noise pollution to much extent. Rotating the blades of the mowers are based on the small but powerful engine that provides enough torque to rotate the very sharp horizontal blades that cut the grass on contact.

An induction motor, a battery and alternator, three foldable blades, and a power adapter to convert DC supply source to AC supply source to charge the mower machine's batteries are all included in the lawn mower machine. This technology is powered by an electrical switch that runs the hybrid running lawn cutter machine on and off.

2. OBJECTIVE

The main objective of making this project is to make a hybrid powered grass cutter which will operate on both solar energy and DC power supply to avoid disadvantages of traditional grass cutters. The main aims behind this project are to overcome fuel consumption, reduce human resources and efforts, operating, maintenance and development cost. One of the best parts of the solar based grass cutters is that they are environmentally friendly.

2.1 The major objectives of the project can be summarized as:

- To replace the traditionally operating grass cutters with more effective hybrid based grass cutters.
- To make a more efficient and effective grass cutter machine at less cost.
- To reduce cost and maintenance charges of the grass cutters.
- To make an efficient grass cutter on simple mechanisms which can be operated by unskilled man force too.
- To make such a grass cutter which will be eco friendly.

3.METHODOLOGY

A rectangle shaped framing section handle,DC gear motor, metal sheet,tyres, solar panels and an adapter to convert DC power supply to AC power supply to charge the machine's battery make up the hybrid grass cutter machine.

When the solar panels are turned on, the solar energy is detected and stored in the battery. As soon as the motor is turned on, the cutting motion begins,and the blades attached to the motor's shaft mesh with the grass, eventually cutting it.

4.LITERATURE SURVEY

Praful.P.Ulhe

In this paper they have prepared a traditional solar operating grass cutter machine through which the solar energy sources charge the battery and is connected to the blade via a motor for cutting the grass [1].

T karthicker

This paper author fabricated a grass cutter cutting machine with rotary blades by using a DC power supply source [2].

Thomas Green Son

He invented a Silence mower that transmits power through the rear roller to the cutting cylinder .This machine was quite silent and lighter than the driven machines[5].

E Naresh and Boss Babu

He used DC power generated from photovoltaic cells to drive any load within its capability[7].

5. PROBLEM DEFINITION

The traditional technology of grass cutting is operated manually by hand devices which results in more human effort and time. These methods lack uniformity in the process. Due to the use of fuel source machines they create more air and noise pollution. Also they are very costly as per maintenance and operating charge.

6.WORKING PRINCIPLE

It Will feature a panel angled on top of the machine in a manner similar to the angle of inclination where the sun's rays fall the most. The photovoltaic cells in the solar panels store the solar radiation ,which is subsequently converted into electrical energy by connecting the solar power converter to the battery. Wires will be used to connect the motor to the battery. The cutting blade gets power from both the DC power supply and the solar energy source, which causes the blades to activate and cut the grass.

The panel is angled in such a way that it receives the maximum amount of solar radiation with a high intensity fall from the Sun. This is accomplished by the solar panels, which transform polar energy into electrical energy.

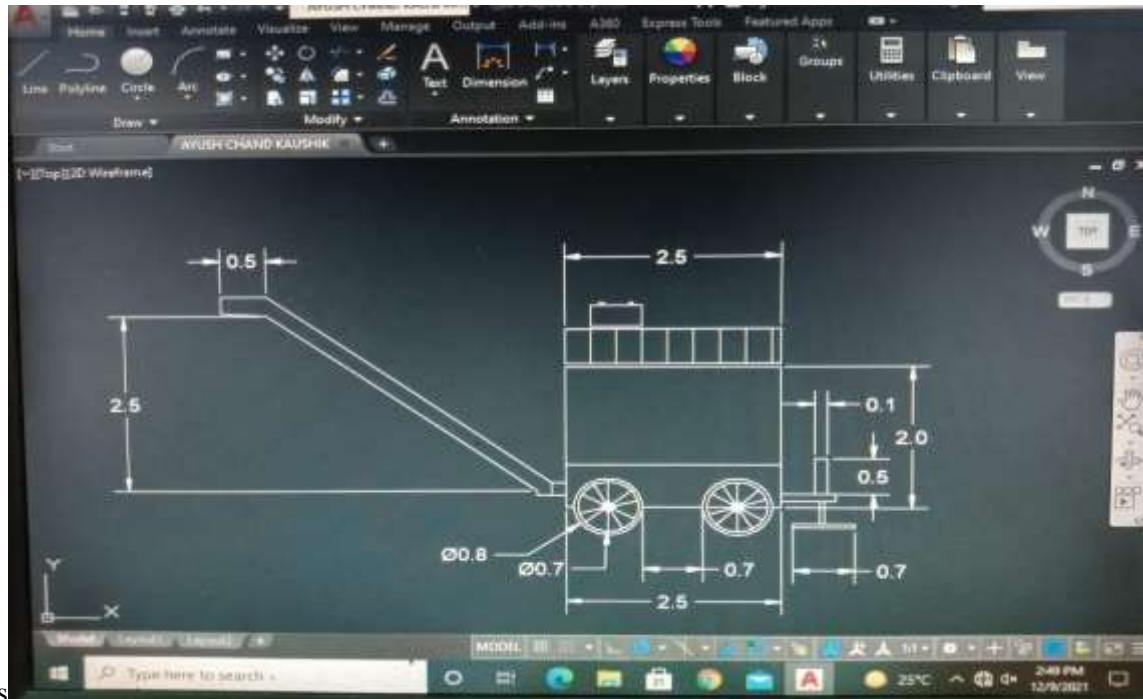


Fig:-2D CAD Model of Hybrid Lawn-Mower Machine.

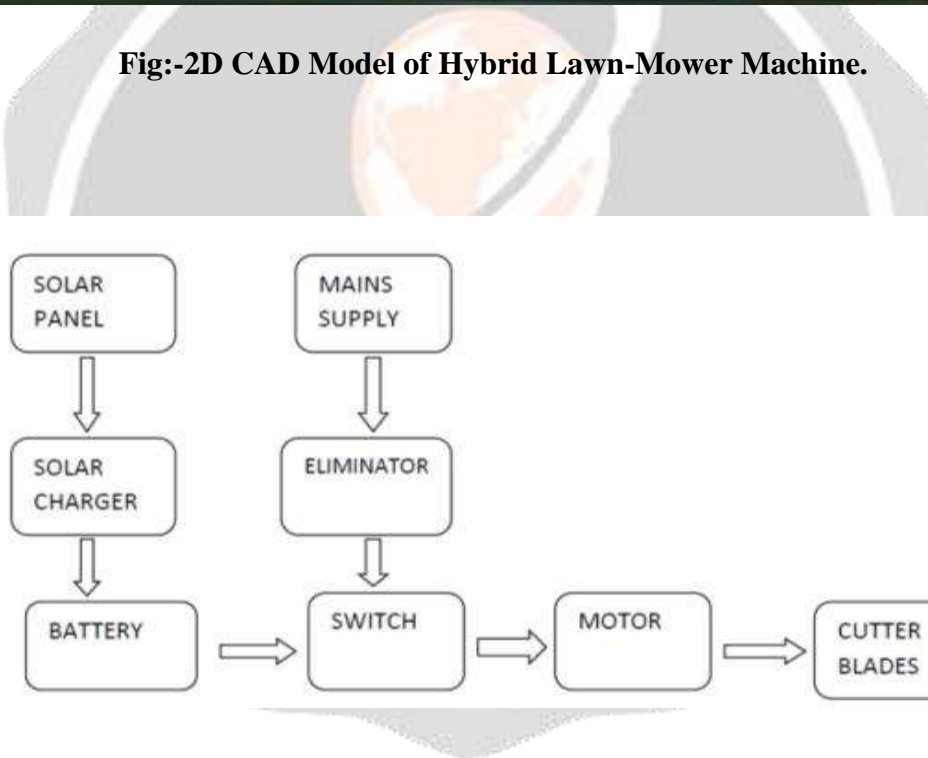


Fig:- Flowchart of Hybrid Lawn mower machine

7. COMPONENTS USED

S.No.	Part Name	Material	Quantity
1	Square Rod	Mild Steel	20 feet
2	Nut & Bold	Mild Steel	4
3	Electric Cable	Copper	5m
4	Wheel	Rubber	4
5	Switch	Plastic	1
6	Eliminator		1
7	Solar Panel	Silicon	1(12V,20W)
8	Battery	Lithium Ion	12V
9	Motor	Magnetic Steel	800RPM
10	Blade	Steel	1

8. RESULT AND CONCLUSION

The hybrid grass cutter machine combined two different energy sources which make it more efficient and effective. This machine consists of no fuel cost and eco-friendly environment which make it more superior over the traditional grass cutter machines.

9. FUTURE SCOPE

1. The device is completely Eco-friendly.
2. The device incorporates the mower and trimmer together in a single device for better performance and reducing efforts and costs.
3. The device can trim as well as mow simultaneously.
4. It can operate both on solar and electric energy.
5. The device can be used by unskilled human forces.

10. REFERENCES

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