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SOLAR GRASS CUTTER WITH AUTOMATIC TRACKING

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ABSTRACT

A Solar grass cutter is a machine that uses revolving 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, college‟s part etc.We have made some changes in the existing machine to make its application easier at reduced cost. Our main aim in pollution control is attained through this. Unskilled operation can operate easily and maintain the lawn very fine and uniform surfacelook.This device will help in building of eco-friendly system. Current technology commonly used for cutting the grass is by the manually handled device. In this paper used novel technologyThe aim of our project is to make the grass cutter which operates on solar energy hence save the electricity and reduces manpower. In our project we use microcontroller for Controlling various operation of grass cutter.LDR (Light dependent Resistor): This opto electronic device is mostly used in light varying sensor circuit,and light and dark activated switching circuits.

INTRODUCTION

In large size of lawn in the park, schools, college, are maintained manually. The gardener used hand scissors used to cut and maintain lawn uniformly. It is not easy and also very difficult to maintain uniform size. Hence we design to make a solar grass cutter with any power source due to reduce the power consumption. The unskilled gardener is enough to operate the solar grasscutter.

SOLAR ENERGY:

Solar energy is very large, inexhaustible source of energy. The power from the sun interrupted by earth is approximately 1.8/10MW, which are many thousands of times larger than the present consumption rate on the earth of all energy sources. The quantum of energy India‟s land area receive from sun is equivalent to 15,000 time sits consumption requirement (500 billion kWh)

as projected for 2004. In addition to its size, solar energy has two other factors in its favor. Firstly, unlike fossil fuels and nuclear power, it is an environmentally clean source of energy. Secondly, it is free and available in adequate quantities in almost all parts of the world people live. But there are some problems associated with its. The real challenge in utilizing solar energy is of and economic concern. One has to strive for the development of cheaper methods of collection and storage so that large initial

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investments required at preset in most applications are reduced, solar energy inIndia:10 K w h/year potential to meet basic energy needs of teeming millions who live inA large amount of solar radiation fall on India and for most of the country very few days are without sunshine. India lies within the latitude of 7 N to and 37 N with annual average intensity of solar radiation as500 to 600 Cal/cm/day with more such insulations available in arid and semi-arid regions. Average solar radiation falling on India in arid and semiarid regions is 7.5 K w h/m/day. Solar energy 5×10 rural India. Solar energy is an important, clean, cheap and abundantly available renewable energy. The sun radiates heat and light. Theheat, light received from the sun supports the en vironment on the earth through the following well known natural effects.

- Temperature balance on theearth
- Photo-synthesis by biological plants production of oxygen and organic materials, production of organic chemicals andbio-mass.
- Wind due to unequal heating of water, landsurfaces.
- Heating of ocean water: ocean thermal energy(OTEC)
- Waves in ocean: ocean waveenergy
- Tides in ocean: ocean tidal energy (due to gravitationalforces)

The sun produces enormous amount of energy of heat and light through sustained nuclear fusion reactions. The solar energy received on the earth in the form of radiation is used for heating and producing an electrical energy.

LITERATURE REVIEW

Husqvarna, a Swedish manufacturer, this year is also introducing its automated grass cutertotheU. S. market (it's been sold in Europe for about three years). It works much the same as the Robomow with a boundary wire implanted at the border of your lawn. The Husqvarna model, however, takes care of itself. Whereas the Robomow has to be taken out and set up and watched by the owner, the Husqvarna Automated grass cutter lives outside, mows when it's programmed to mow and automatically returns to its base for recharging. The Husqvarna model is also significantly lighter than the Robomow (15 pounds vs. the Robomow‟s 42 pounds). Accordingto Husqvarna, this not only makes it safer, but it leaves no tracks on the lawn. This complete freedomfromeventhethoughtofmowing,however,doeshaveitsprice--$1,995plus$200to$300 for installation. It's available in limited quantities this year from select dealers. The company also plans next year to release a solar-powered model to the U.S. market. Husqvarna Auto Mower and Solar Mower work independently. A boundary loop wire holds the automated grass cutter to the lawn and a search loop ensures that it returns to the docking station for battery recharging. The solar Powered version does not need a charging station and will be in production next year. Both mowers share similar features, the only difference is the power source. Almost silent

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and environmentally friendly. The boundary loop wire (red) defines the Auto Mower's cutting area whilst the search loop wire (yellow) directs the mower to the charging station. The boundary loop is also laid out around trees and surfaces of the lawn which will not be cut. The lawn mower changes direction if it touches garden furniture, a tree or other solid objects, yet is able to cut under bushes andhedgerows. You can program the cutting height between 30 and 95 mm to achieve a lawn just the way you want it. Dimensions: (L) 71 cm, (W) 60 cm, (H) 26 cm

COMPONENTS AND DESCRIPTION

The components that are used in the project are as follows,

- Motor
- Solar Panel With LDRSensor
- Handle
- Battery
- CuttingBlade
- SpurGear
- Wheelarrangement
- IRsensor
- Switch
- Ballbearing

MATERIAL AND DESCRIPTION

D.C MOTOR

- VOLT: 12VD.C
- WATTS:90W
- RPM: 60RPM

BATTERY

- Material:Lead-Acid Free maintenanceBattery
- OutputVoltage:12 VD.C
- OutputPower:40Ampere-Hour

BEARING

- SIZE : 20 X 45 X 12MM
- MATERIAL:STEEL

WORKING PRINCIPAL

Solar powered grass cutter, it has panel mounted in a particular arrangement in such a way that it can receive solar radiation with high intensity easily from the sun. The solar panel arrangement consists of the DC motor which can be used for the translation of the solar panel. The LDR sensor is used to sense the light radiations from the sun and then according to the movement of the sun the control unit supplies power to the DC motor. The DC motor makes the solar panel to rotate in the direction along the path of the sun. The fixed blades is fitted in the frame of the body and the moving blade is rotated when the vehicle in moving condition. Solar panel, battery, moving wheel, blade, switch, dc motor and IR sensor are used. Solar energy is converted to electric energy with help of sun rays and electric energy stored by battery. Switch Button is on the electric power is run the dc motor and blade is rotate. The vehicle moving grass willcutting.

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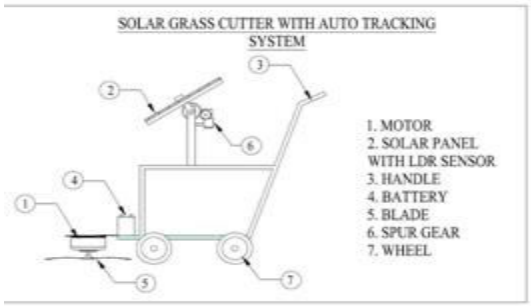
FABRICATION PROCESS



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ADVANTAGES

- Compact size andportable.
- Easy to move from one place to anotherplace.
- Operating principle issimple.
- Non-skilled person also operate thismachine
- No fuelconsumption.
- No. of reciprocating parts areless.

LIMITATIONS

- Large time required to remove thegrass
- Manuallyoperated

APPLICATIONS

- For cricketground.
- The footballground.
- Allgarden.
- AllPlayground
- Fornurseries.
- For smallfarms.

CONCLUSION

This project is more suitable for a common man as it is having much more advantages i.e,no fuel cost, no pollution and no fuel residue, less wear and tear because of less number of moving components and this can be operated by using solar energy. This will give much more physical exercise to the people and can be easily handled. This system is having facility of charging the batteries while the solar powered grass cutter is in motion. So it is much more suitable for grass cutting also. The same thing can be operated in night time also, as there is a facility to charge these batteries in day light.

Our project entitled solar based grass cutter is successfully completed. It will be easier for the people who are going to use project for further modification. This grass cutter occupy less space and light in weight and as it uses nonconventional source of energy hence running cost is zero. It has facility of charging battery while grass cutter is in the working condition. The cost of solar based grass cutter is less than the market grass cutter. Grass cutter is used to keep the lawn clean and uniform in schools, gardens andplaygrounds.

The Government of India is offering subsidy for the solar equipments. The industries are producing these components in mass productions, so the cost of the system may come down. So in future it is expected to run all equipments by using solar energy. This system is having facilityof charging the batteries while the solar powered grass cutter is in motion. So it is much more suitable for grass cuttingcontinuously.

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