

SOLAR GRASS CUTTER

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ABSTRACT

From time immemorial, the sun has been the major source of energy for life on earth. The solar energy was being used directly for purposes like drying clothes, curing agricultural produce, preserving food articles, etc. Even today, the energy we originate from fuel-wood, petroleum, paraffin, hydroelectricity and even our food originates obliquely from sun. Solar energy is almost unbounded. The total energy we obtain from the sun far exceeds our energy demands. Ever since the industrial revolutions human have been dependent on fuels, electricity and wind energy. For human enlargement in many countries there is study and trials are going on the Solar energy and the wind energy, so we make our new concept solar powered grass cutting machine. Nowadays grass cutter machines are becoming very popular today. Pollution is manmade, which we can be seen 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 costlier. Maintenance of such conventional machine is more. To avoid these drawbacks, we plan to build new type of grass cutter which runs on solar energy and this model is also economical. The aim of our project is to make the grass cutter which operates on solar energy hence save the electricity and reduces manpower. This will reduce the effort required for cutting grass in the lawns and solar power used will help to contribute in lowering pollution. The machine is equipped with a grass cutter blade that allows for grass cutting at 2000 RPM. The machine is 50 watts, 2000 rpm and is powered by 6-watt solar panel and 12 v DC battery.

Keywords: solar, grass, cutting, energy, pollution

1. INTRODUCTION

Moving the lawn knives with a standard motor- powered lawn knives is an vexation, and no one takes pleasure in it. Cutting lawn cannot be fluently fulfilled by senior, youngish, lawn knife moving with machine produce noise pollution due to the loud machine, and original air pollution due to the combustion in the machine. Also, a motor- powered machine requires periodic conservation similar as changing the machine oil painting. Indeed though electric solar lawn is environmentally friendly, they too can be an vexation. Along with motor powered lawn knife, electric lawn knives are also dangerous and can not be fluently used by all. Also, if the electric lawn knife is corded, mowing could prove to be problematic and dangerous. The prototype will also be will be charged from sun by using solar panels

Earlier most of the activities are done by manually. Gradually so many big and small equipment's are developed to ease human activities, thus to reduce the human efforts to do the things. Now a day's most of the activities which included human efforts are either replaced or automated by the use of machines or other kinds of equipment's. Skilled persons are required for conventional grass cutter. why because here we use animals like bulls. now a day the technology is developed in other hands skilled persons with convention grass cutter were decreased. Now we have a need to depend on the technology. Due to the risk involved in a conventional grass cutter, now days very few peoples coming forward to grass cutting by conventional grass cutter. moreover, educational background of Indian youth is improving. So most of people hesitate to use conventional grass cutter.

A Solar energy is veritably large, indefatigable source of energy. The power from the sun intruded by earth is roughly 1.8/ 10MW, which are numerous thousands of times larger than the present consumption rate on the earth of all energy sources. The amount of energy India's land area admit from sun is original to 15,000 time sits consumption demand (500 billion kWh) as projected for 2004. In addition to its size, solar energy has two other factors in its favor. originally, unlike fossil energies and nuclear power, it's an environmentally clean source of energy. Secondly, it's free and available in acceptable amounts in nearly all corridor of the world people live. But

there are some problems associated with its. The real challenge in exercising solar energy is of and profitable concern. One has to strive for the development of cheaper styles of collection and storehouse so that large original investments needed at preset in utmost operations are reduced, solar energy in India A large quantum of solar radiation falls on India and for utmost of the country veritably many days are without sun. India lies within the latitude of 7 N to and 37 N with periodic average intensity of solar radiation as 500 to 600 cal/ cm/ day with further similar aloneness available in thirsty and semi-arid regions. Average solar radiation falling on India in thirsty and semiarid regions is 7.5 K w h/ m/ day. Solar energy 5×10 K w h/ time eventuality to meet introductory energy requirements of bulging millions who live in pastoral India. Solar energy is an important, clean, cheap and abundantly available renewable energy. The sun radiates heat and light. The heat, light entered from the sun supports the terrain on the earth through the following well given natural goods. • Temperature balance on the earth • print- conflation by natural shops product of oxygen and organic accoutrements, product of organic chemicals and bio-mass. • Wind due to unstable heating of water, land shells. • Heating of ocean water ocean thermal energy (OTEC) • swells in ocean ocean surge energy • runs in ocean ocean tidal energy (due to gravitational forces) The sun produces enormous quantum of energy of heat and light through sustained nuclear emulsion responses. The solar energy entered on the earth in the form of radiation is used for heating and producing an electrical energy. Among thenon-conventional sources of energy solar energy is the most promising. Hence our design is grounded on the solar energy conversion to mechanical energy to run a normal lawn knife. The study of the spending characteristics and copping

2. LITERATURE SURVEY

V Sivarao, T.J.S.Anand, Hambali, Minhat, Faizul presented a review of researches done on the subject of automated tractor. An autonomous tractor is a vehicle that can operate without or with minimal human control, self-propelled and guided automatically along a desired path. The benefits from such a system are useful for agriculture industry by reducing labour cost and time, as well as improving output efficiency by eliminating human errors. Many researches and inventions have been made, with the results ranging from successful, encouraging to some that are impractical for commercial implementation for certain reasons. These implements include sensor, global navigation satellite system, machine vision, laser triangulation, ultrasonic transmitter and geomagnetic controller, as well as actuator and servo motor.

Pratik Patil, Ashwini Bhosale, Prof. Sheetal Jagtap described about an automatic lawn cutter that will help the user to cut the grass in their lawn with less efforts. The different sensors are used it will detect and avoid objects and humans while mowing. The main objective of this automatic lawn cutter is that the user can specify the area that is to be mown and also the height of grass as per there requirement by using the keypad. This design contains a microcontroller like ATmega 16 multiple sensors, LCD Display, Keypad.

Ernest L. Hall another example of an autonomous lawn cutting system is called the Weed Eater developed by the Weed Eater Corporation. The system is a solar powered emission free mower that harnesses enough power to operate itself. The robot is equipped with 34 iridescent solar cells embedded on top of the systems platform and has the capability of handling properties up to 13,500 sq-ft. The system operates on the same principle as the Lawn Ranger except it uses a cable beneath the surface of a person's lawn. The mower uses this wire along with its sensors to allow the robot to maneuver around while keeping the system on track. The mower will continue to operate as long as the mower has energy, from the sun. The robot is equipped with a flexible bumper that when activated backs the mower up and continues the robot on a different path. It has the advantage of cutting grass in the form of a mulch so that the use of a grass catcher or raking is not required.

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Approximately 1.8/10MW amount of power from the sun has been interrupted by the planet Earth, which is thousands of times larger than the present global consumption rate of the energy. This has motivated the governments, researchers and power industries to increase their investments in the renewable energy industry aiming

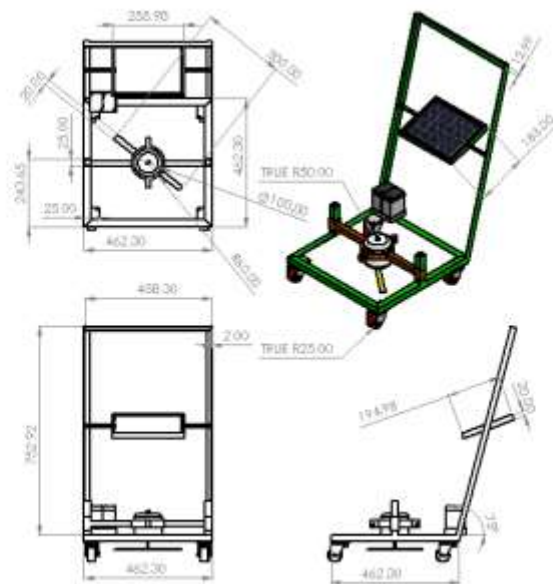
to utilize more this clean energy and relief the global warming. Many researchers have proposed new designs of autonomous and non-autonomous solar grass cutters [3, 4] Moreover, a few fully automated designs using sensors to detect obstacles and avoid any harm or injuries have been also proposed.

Patil S.M. et al. proposed a solar grass cutter called Smart Solar Grass Cutter with Lawn Coverage. The proposed design aimed to develop an automatic grass cutting machine that could be remotely controlled, and able to charge the used batteries while the solar powered grass cutter is operating during daytime.

Dilip B.P. et al. used several sensors in their prototype design providing the proposed solar grass cutter the capability to avoid the unnecessary objects and/or obstacles in the field during operation.

3. PROPOSED SYSTEM

The ideal of our design is to design and automatic field mower which operates on solar energy and avoids the debit of old field mowers. The purpose is to avoid energy extremity in India and reduces the mortal sweats, operating cost and conservation cost Also solar grounded lawn knife keeps the terrain clean and healthy. It's used for cutting different types of meadows for colorful operations. The whole machine operates on the solar energy stored in battery. The prototype is charged from sun by using solar panel. The ideal of the design are as follows • To make up pupil's mind, not only to work collectively but also to work item. • To get the knowledge of each pupil in colorful subjects which he has studied before? • To prepare a platoon, not only to make design but, also to decide design, cost of raw material and advantages and limitations of them. • The scholars can know that which and what kind of difficulties and constrains they've to face and find the right decision delicate it.



4. COMPONENTS USED FOR IMPLEMENTATION OF THE SYSTEM

The main components of the solar powered grass cutter are,

1. Frame
2. Solar panels
3. Batteries
4. DC motor
5. Castor wheel
6. Blades
7. Paint

5. DESIGN AND ANALYSIS

No methodology is available for material and method selection except decision making in multi attribute environment. Material selection is vital and crucial activity in any industry nowadays. This substantially reduces the risk of wrong material or method selection.

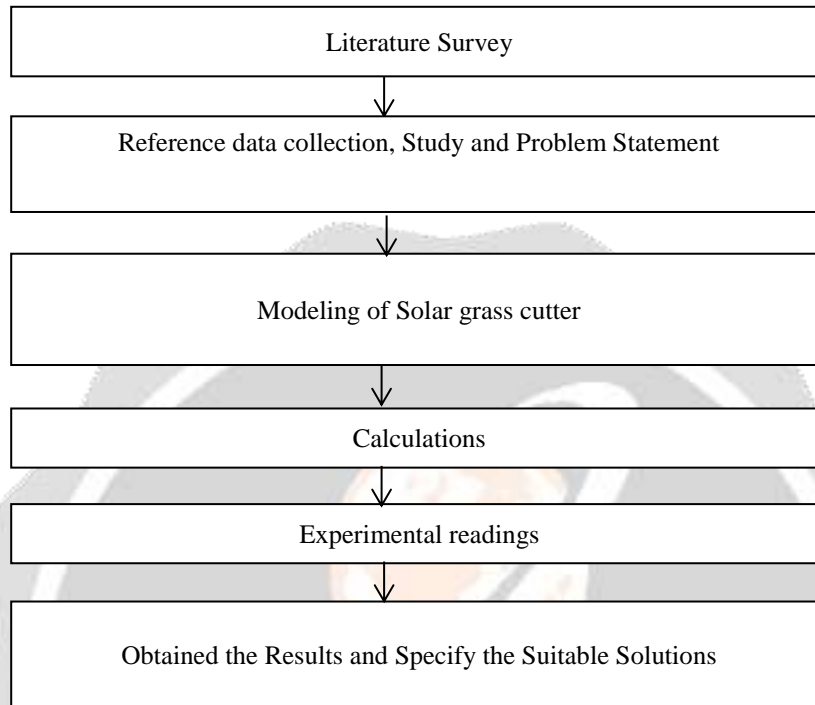


Fig -1 view of solar grass cutter

6. CONCLUSIONS

Our design entitled Fabrication of solar powered lawn knife is successfully completed and the results attained are satisfactory. It'll be easier for the people who are going to take the design for the farther variations. This design is more suitable for a common man as it's having much further advantages i.e., no energy cost, no pollution and no energy residue, lower wear and tear and gash because of lower number of moving factors and this can be operated by using solar energy. This will give much further physical exercise to the people and can be fluently handled. As we're nearer to Equator, the solar energy (non-conventional energy) is extensively available, so it's easy to charge the battery and is also pollution free. But the original investments of the solar powered lawn knife are high. At present in order to dock global warming and ozone reduction, the Government of India is offering subvention for the solar outfit's. The diligence are producing these factors in mass products, so the cost of the system may come down. So in future it's anticipated to run all outfit's by using solar energy. This system is having installation of charging the batteries while the solar powered lawn knife is in stir. So it's much further suitable for lawn slice also. The same thing can be operated in night time also, as there's a installation to charge these batteries in day light.

7. REFERENCES

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