iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** III **Month of publication:** March 2022

DOI: https://doi.org/10.22214/ijraset.2022.41074

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue III Mar 2022- Available at www.ijraset.com

Review Paper on Agricultural Solar Grass Cutter

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Abstract: ***Currently, manually handled devices work on non-renewable sources of energy. Solar grass cutter focuses on the use of a renewable source of energy which will help to reduce the emission of harmful gases which are emitted by the conventional grass cutter. Solar grass cutter requires low maintenance and less human interface as compared to conventional grass cutter. Recently we are facing problems like air pollution, noise pollution, power cut problems, etc. To overcome these problems conventional grasscutter can be replaced by a Solar grass cutter which is environmentally friendly. In the market there are lots of grass cutters are available but at a higher cost, which is mostly unaffordable for farmers, but this machine is very cost-effective and affordable. Power consumption in this machine is less as compared to conventional grass cutters. In this project, two blades are used to cover more area for grass cutting. The main target of the machine is to reduce human efforts.***
Keywords: Solar panel, Battery, Blade, DC motor.

I. INTRODUCTION

There is a lot of progress work has been pending but there is still some labor-power which requires lots of income allocation for a small work. So, this is required that some exertion should have some other substitute so that the labor power surplus can be avoided. So, in our project we are trying to make a daily purpose machine which is capable to cut the grasses in farms and lawns. The project work will be done according to the appropriate application-based production. The system will have a power source that is battery as well as solar panel will be attached on the top of the machine. Nowadays IC engine based traditional manual grass cutters are used. Over the field traditional grass cutting machine can create pollution and causes loss of energy. Solar power which is available naturally will be used to provide the force to drive the cutter. Usually for adjusting the height of grass cutter according to lawns & farms, it requires two types of grass cutting machines, to avoid this use of two respective machines this individual machine has been designed with ability to adjust the height of blades according to its use on lawns/farms.

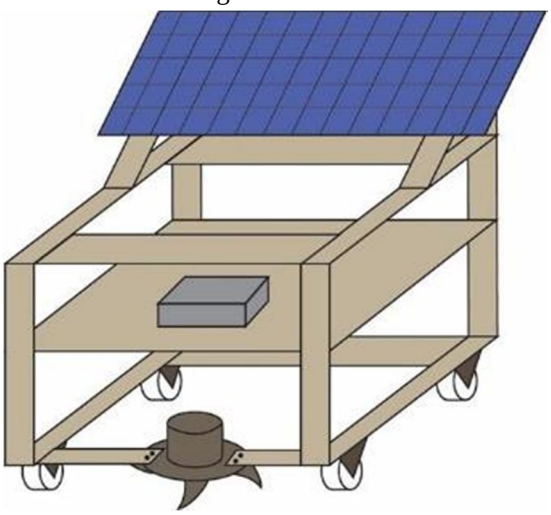


Figure 1. Agriculture Grass Cutting Machine [10]

Also, this machine has two blades to cover more area by which work will be done in less time with less effort. This project's main objective is of fabricating a grass cutting machine system that makes use of solar energy which is available without any cost. As there is a continuous increase in the cost of fuel and the effect of emission of gases from the burnt fuel in the atmosphere, we decided to make an environmentally friendly grass cutting system which uses solar energy as well as Safety is the major priority while designing the grass cutter.

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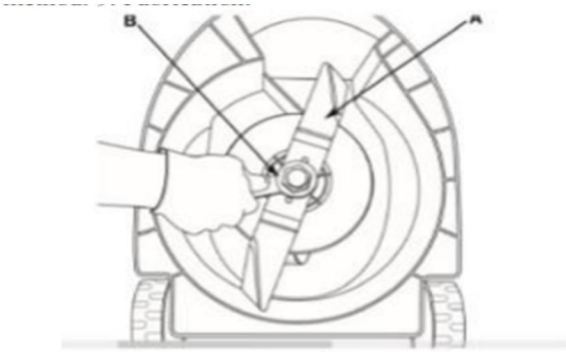


Figure 2. Assembling the Blade With the Electric Motors Shaft [9]

II. LITERATURE REVIEW

A. Fabrication of Solar Grass Cutter

Pankaj Malviya et. al. Author prepared manually handle the device. The battery can be charged by using a solar panel as well as an external power supply and a DC motor which is controllable is used for changing the direction of the grasscutter as per need are used. The most modern regulator is used for preventing overcharging and discharging of battery which saves span of the battery. Due to industrialization, more electricity is required for various industrial applications and electrical gadgets so solar energy is the best alternative for electricity. Solar panel, battery, DC motor, solar charger these components are used for fabrication of grass cutter. They have used less number of moving components so there is less maintenance. This grass cutter will give much more physical exercise to the operator and it will easily handle.[1]

B. Grass Cutting Machine Using Solar Energy

T. Karthick et. al. 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. A solar panel is placed such that to absorb high intensity from the sun and it will incline at 45^0. The main function of a solar charger is to increase current during batteries are charging and also disconnect when they are fully charged. Circuit breakers are used to start or stop the motor. By considering ground clearance they can adjust the height of the grass.[2]

C. Modification of Solar Grass Cutting Machine

Praful P. Ulhe et. al. In this paper they have prepared a manually operated grass cutter with spiral rollerblades due to spiral blades increasing the efficiency of cutting. For adjusting the height reel cutter is a component placed on a grass cutter. This grass cutter is used to cut the grass uniformly and also it can cut the different types of grasses. The battery can be charged during working conditions and it also has AC charging. For a collection of cutting grass cutting box is placed over the grass cutter so the cut grass is put outside the lawn. It is having light in weight and compact in design.[3]

D. Fabrication of Solar powered Grass Cutting Machine

Ms. Lanka Priyanka et. al. In this paper they have fabricated a 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.[4]

E. Solar Grass Cutter Machine

Sachin Prabha et. al. The writer fabricated a solar grass cutter machine for reducing human work and also consuming non-renewable sources of energy on the earth's surface. By using solar panels the energy is acquired from the sun and stored in batteries and uses this energy as per the requirement. All these functions are proceeding according to prescribed time by proper monitoring. A specific mechanism provides for the protection of batteries from extra charging which increases the life span of batteries. It can also be used on small scale for gardening.[5]

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F. Smart Solar Grass Cutter Robot for Grass Trimming

Ashish Kumar Chaudhari et. al. In this paper author explained that the solar plate which is placed above the grass cutter generates solar energy and uses this energy for working the grass cutter. Also, using a driver circuit for controlling the speed of the motor as per the requirement. Solar panels, batteries, DC motor, solar charger, circuitry, and blades these components are used for preparing grass cutter.

For preventing the battery from overcharging and the over-discharging regulator is placed into the system and it should be placed in series. They have provided an LCD display unit that displays voltage generated during solar ray trapping. Due to seasonal conditions if the battery is not charged they can provide the power bank to charge the battery instantly.[6]

G. Solar Based Grass Cutter : A Review

Ms. Bhagyashri R. Patil et. al. In this paper author explained that For human enlargement in many countries there is study and trials are going on the Solar energy and the wind energy, So they make there new concept solar powered grass cutting machine in these concept they cut grass s on the agricultural products or on small plants in lawns and gardens. Remote controlled grass cutter can be described as the application of Radio frequency to power a machine on which electric motor rotates which in turn rotates a blade which does the mowing of a grass. [7]

H. Sensor Based Multipurpose Agricultural Cutter

Prof. J.P. Wagh, Aishwarya Chaudhari et. al. in the paper titled " Sensor Based Multipurpose Agricultural Cutter "author states that, the rotary mower can rotate about a vertical axis with the blade spinning at high speed and this tends to result in a rougher cut and shreds the grass leaf easily.[8]

I. Fabrication of automated Solar grass Cutting Machine

Prof. Mohd Attalique Rabbani et. al. in the paper author states that, the machine which was designed such that the solar plate generates solar energy and utilizing this energy for running the grass cutter motor. Integrating features of all the hardware components used have been developed in it. The generated torque will be transferred to the cutting head mechanism for efficient grass cutting. The entire configuration set up was mounted on a wooden base which attached together with a bicycle frame and a set of wheel arrangement. This portable lawn mower can be used to maintain and trim grass in gardens, home, schools or yards. [9]

J. Environmental Friendly Solar Grass Cutter

Prof. Sheetal Jagtap et. al. in the paper author states that, the DC motor in low power with high efficiency. This project eliminates the physical power required in pushing without sacrificing safety. In this project IR Proximity sensor are used to detect and avoid object/animal/human while operating.

This machine consist of battery which charges simultaneously while operating. If the climatic conditions are not suitable for the solar panel to generate power and if the user wants to operate the machine at that time, then there is an alternative source of power through battery. Power consumption in this machine is less as compared to conventional grass cutter. The movement of the machine is totally controlled by automatic mode and manual mode [10]

III. CONCLUSION

Due to power demand, we choose solar energy which is a renewable source of energy, and hence there is no running cost. This project is more suitable as it is having much more advantages i.e. no fuel cost, no pollution, and no fuel residue. There are facilities of adjusting blade's height as per requirement and arrangements of two blades which covers more area as compare to the other machines.

The DC motor is low power with high efficiency. As compared to the other high technology-based grass cutters, this machine is very cost-effective, especially for farmers.

IV. ACKNOWLEDGMENT

We take this opportunity to express our regards and sincere thanks to our advisor and guide Prof. Tushar Mohod. His constant encouragement and moral support gave us the motivation to carry out the project successfully.

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REFERENCES

[1] Pankaj Malviya, Nukul Patil, Raja Prajapat, Vaibhav Mandloi, Dr. Pradeep Kumar Patil, Prof. Prabodh Bhise, Fabrication of Solar Grass Cutter, Internatinal Journal of Scientific Research in Science, Engineering and Technology, Vol. 2, 2016, 892-898.

[2] T. Karthick, S. Lingadurai, K. Muthuselvan, M. Muthuvanesh, C. Pravin Tamilselvan, Grass Cutting Machine Using Solar Energy, International Journal of Research in Mechanical, Mechatronics and Automobile Engineering, Vol. 2, 2016, 1-5.

[3] Praful P. Ulhe, Manish D. Inwate, Fried D. Wankhede, Krushnkumar S. Dhakte, Modification of Solar Grass Cutting Machine, International Journal for Innovative Research in Science & Technology, Vol. 2,2016, 711-714.

[4] Ms. Lanka Priyanka, Mr. Prof. J. Nagaraju, Mr. Vinod Kumar Reddy, Fabrication of Solar Powered Grass Cutting Machine, International Journal and Magazine of Engineering, Technology, Management and Research, Vol. 2, 2015, 386-390.

[5] Sachin Prabha,Dattatray G. Biradar, Sachin Panshette,Veernhadrappa, Solar Grass Cutter Machine, International Journal For Technological Research In Engineering, Vol. 3,2016, 2702-2706.

[6] Ashish Kumar Chaudhari, Yuvraj Sahu, Prabhat Kumar Dwivedi, Harsh Jain, Experimental Study of Solar Power Grass Cutter Robot, , International Journal of Advance Research and Innovative Ideas in Education, Vol. 2, 2016, 68-73.

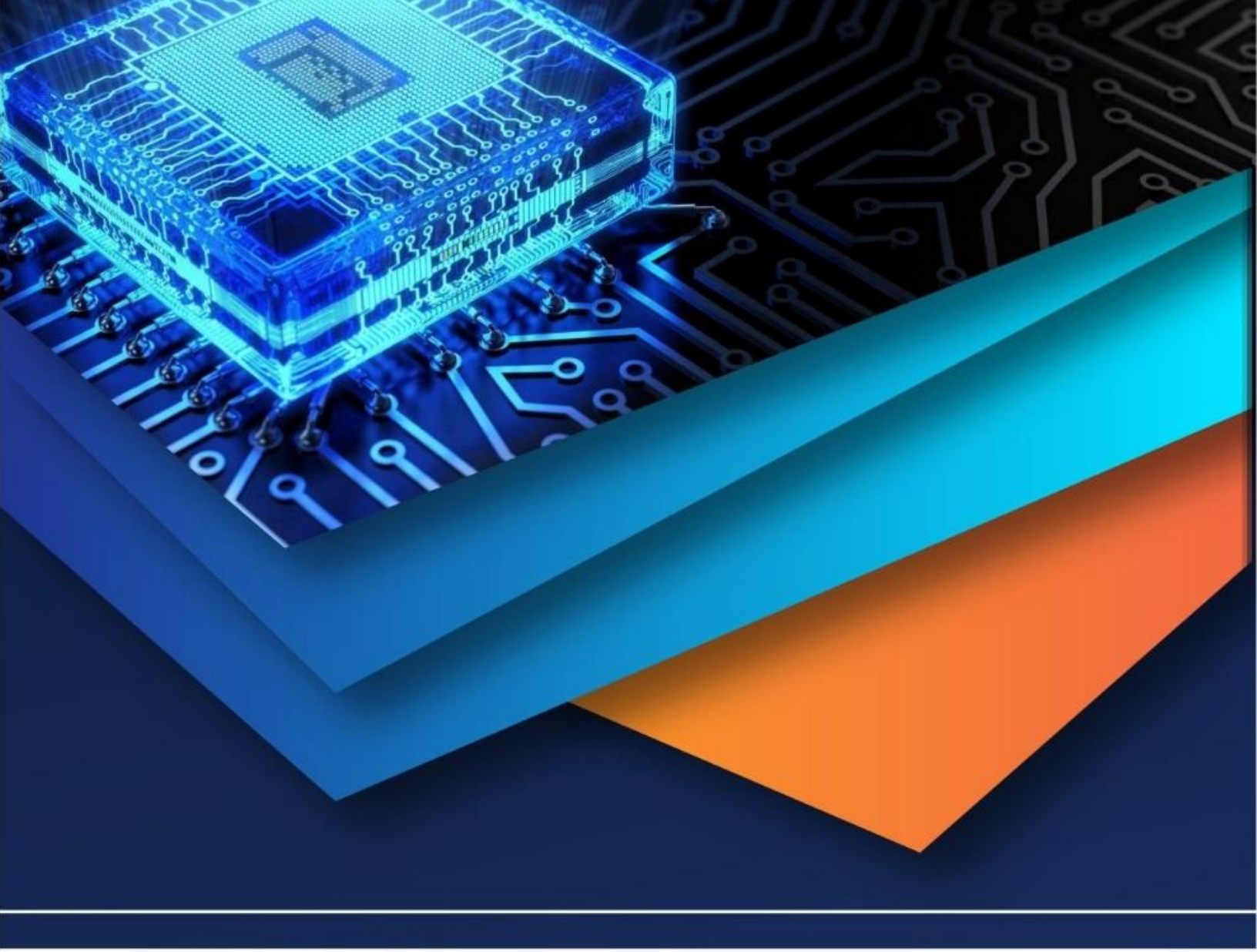
[7] Ms. Bhagyashri R. Patil, Mr. Sagar S. Patil ,"Solar Based Grass Cutter : A Review", IOSR journal of mechanical engineer, ISSN-2278-1684,Vol.No.9,Issue No.01,January-June 2017.

[8] Prof.J.P.Wagh, Aishwarya Chaudhari, " Sensor Based Multipurpose Agricultural Cutter ", IOSR journal of mechanical engineer, ISSN-6103,Vol.No.03,Issue No.05,May 2016.

[9] Prof. Mohd Attalique Rabbani, Mohammed Afan, Ashraf Muzzammil Hussain, Mohammed Muzaffar Abdullah, Fabrication of automated Solar grass Cutting Machine, International Journal of Scientific Research & Engineering Trends, Vol. 6, 2020, ISSN-2581-5792.

[10] Tanmay Bhalodi, Nikhil Bhujbal, Karan Doshi, Rahul Goregaonkar, Prof. Sheetal Jagtap, Environmental Friendly Solar Grass Cutter, International Journal of Research in Engineering, Science and Management, Vol. 3, 2020, 2581-5792

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