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Solar Operated Automatic Grass Cutting Machine

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Abstract: ***The grass cutting machine are very popular technology.***

- ***A. The past technology models of grass cutter are used I.C engine and also used scissor for grass cutting.***
- ***B. As the past technology of grass cutting machine was operated by manually, hence man power required is more. Also the time fuel required for accomplishing the work is more.***
- ***C. To overcome such problems we used the solar power for drive the motors. And for reduce the manpower we control it by mobile and sensor.***
- ***D. This proper purpose of solar operated automatic grass cutting machine is it will avoid the air and noise pollution and higher maintenance by the I.C engine.***

Keywords: Solar panel, DC motor, Battery, Ultra sonic sensor, Arduino circuit, Nylon tag Cutter.

I. INTRODUCTION

Nowadays grass cutter machines are getting very popular. Pollution is manmade, which we see in our everyday life. In vintage version of grass cutter IC engine turned into used and therefore due to its environmental effect pollutants degree rises. IC engine pushed cutter is extra costly. Maintenance of such traditional device is extra. To keep away from those downside we plan to constructed new kind of grass cutter which runs on sun electricity and this version is likewise economical. The goal of our task is to make the grass cutter which operates on sun electricity therefore shop the energy and decreases manpower. Grass cutter operates mechanically therefore it does now no longer require talent individual to operate.

II. OBJECTIVE

A. To reduce the time and human effort.
B. To provide easy assembly and dismantling of machine.
C. To reduce an air and noise pollution.

III. LITERATURE REVIEW

Srishti Jain et.al This paper describe manually treaded tool is usually used for reducing the provide as over the sector which creates pollutants and lack of energy. Automatic solar grass cutter so that it will lessen the attempt required for cutting grass in the lawns. Also solar power can be used to the driving force for the cutter and different sensors can be used to find and avoid the undesired objects in the field during operation. It includes microcontroller arduino ATmega328p, IR sensors, LCD display for better feedback and knowledge to the user. This paper will examine the operation and working principle of the Automatic Grass Cutter

Prof. V .A. Mane etc : In this paper they may be seeking to make a day by day cause robotic that's capable of reduce the grasses in lawn. The gadget may have a few automation paintings for steerage and different impediment detection and the energy supply this is battery and a sun panel might be connected at the pinnacle of the robotic due to this reduces the energy problem. Automated sun grass cutter are more and more more sophisticated, are self – docking and a few incorporate rain sensors if necessary, almost putting off human interaction. It works a great deal similar to the Robomow with a boundary cord implanted on the border of your lawn.

Ashish Kumar et al. discusses an experimental look at of Solar Power Grass Cutter Robot. In this paper, the writer defined how the sun plate located above the grass cutter generates sun strength and makes use of the acquired strength for the functioning of the grass cutter. For stopping the battery from overcharging and over discharging, a voltage regulator or a rate controller is located into the gadget which should be located in a series.

T. Karthik, S et al. in his paper fabricated grass reducing device with rotary blades via way of means of the use of sun power. The photovoltaic power primarily based totally machine makes use of linear or rotary blades that slide linearly to reduce the grass. The stage at which the grass need to be reduce may be adjusted via way of means of thinking about floor clearance. The fabricated device is extra orientated closer to imparting a low fee and environment-pleasant answer that may be used even via way of means of unskilled operators. It does now no longer recommend automation and units up a operated by hand machine.

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A. Literature Review Summary

- We are studies in this all research paper are the past technology of grass cutting was operated by IC engine. In old model of grass cutter IC engine was used and hence because of its environmental impact pollution level rise. IC engine driven cutter is more costly as well as maintenance of such machine is more.
- The grass cutting was manually oprated by the use of hand devices like scissor; thes results into more human effort and more time required to accomplishing the work due to which their was a lack of reaming grasses.

IV. PROBLEM DEFINATION

A. The past technology of grass cutting was manually operated by the use of hand devices like scissor, these results into more human effort and more time required to accomplishing the work. Due to which there was a lack of remaining grasses.

B. Also there was use of engine powered machines that increased the air and noise pollution with higher maintenance.

C. Due to this problems we have selected this project which reduces human efforts an does not harm the environment.

V. GRASS CUTTER MACHINE

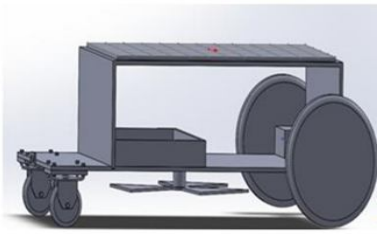

Fig.1 Actual model

VI. METHODOLOGY

The technique for this assignment is much like the prototype evaluation process. In this assignment we're fabricating a prototype of the solar powered grass cutter. The methodologies of those attachments are defined in few sub- headings.

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VII. CALCULATION

P = 2πNT/60 watts
Where,
P = power
N = Speed of motor
T = Torque
Then P=V*I
V=voltage
I=current

A. Torque And Power of a Motor with no Load Conditions

P=V*I
=12*25
=300W
N= 800 RPM
Then
P = 2πNT/60
300=2∗π∗800∗T/60
18000=2*π*800*T
T=3.58N-m

B. Torque and Power of a Motor with Load Conditions

P=V*I
=12*29
=348W
N=600 RPM
Then
P = 2πNT/60
348=2∗π∗600∗T/60
20880=2*π*600*T
T=5.53 N-m

VIII. CONSTRUCTION

A. Solar Panel

The solar panel is charged via the sun radiations and it generates the power. There are broadly three type of solar panels are available in market like, monocrystalline, polycrystalline and very small film. This solar panel is connected with the 12V battery through the solar battery charger

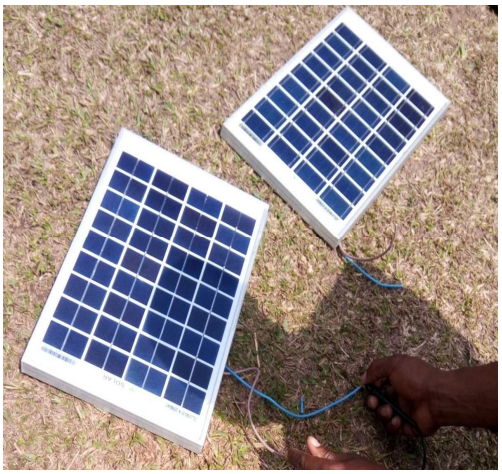

Fig.2 solar panel

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B. DC Motor

A DC motor is any of a category of rotary electrical motors that converts direct current electrical energy into mechanical energy. The maximum not unusual place sort rely upon the forces produced via way of means of magnetic fields. Nearly all types of DC motors have few inner mechanism, both electromechanical and electronic, to periodically alternate the path of current in part of the motor.

Fig.3 D C motor.

C. Arduino Nano Unit

The Arduino Nano is a small, complete, and breadboard-friendly board primarily based totally at the ATmega328P launched in 2008. It gives the equal connectivity and specs of the Arduino Uno board in a smaller shape factor.

In 2019, Arduino launched the Arduino Nano Every, an pin-equal evolution of the Nano. It capabilities a greater effective ATmega4809 processor, and two times the RAM.

Fig.4 Arduino nano unit

IX. RESULT AND CONCLUSION

Table no. 2 Result and conclusion

Sr No	Points considered	IC engine grass cutter	Developed Machine
1	Pollution	Pollution is major factor	No
2	Maintenance cost	High	Low
3	Fuel required	High	Not required
4	Size	Large in size	Compact in size
5	Weight	Heavy in weight	Light in weight

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X. CONCLUSIONS

A. It consumes non-renewable reasserts of electricity so overall electricity obtained from solar a ways exceeds our electricity demand. It intended to be an trade inexperienced choice to the famous and surroundings unsafe fueloline powered garden mower and decreases human effort.

B. Non professional character additionally cope with it without difficulty. By the use of easy switches or via way of means of predetermine programming it is able to be without difficulty cope with and manage inside much less time span.

C. It is especially green and correct as it detects the impediment and adjustments the path or prevent functioning as according to the coaching given. Therefore system need to be covered from harm and decreases danger on human.

XI.FUTURE SCOPE

The sun panel may be constant with mild sensors. Thus relying upon the association of the solar, the panel might be slanting, such that the solar rays are incident normally (at 90deg) to the sun panel. With this the tool might be steady able to trapping the sun power at instances while the electricity of the solar mild is less. If panel used of excessive watt, then the device may be used all through night time time for lawn lighting fixtures or room lighting fixtures, due to the fact we will acquire extra strength. And at night time time but you hold it apart. So the strength within side the battery may be used for this intention. By the usage of one valve within side the pipe we also can use it for gardening i.e. pouring water for plants. By connecting one field kind transporter we will use it to move file books or different stuffs from one location to different in workplace or another location. Grass cutter may be made extra proficiently used after editing for small rice harvesting.

XII. ACKNOWLEDGMENT

We take this opportunity to express our gratitude towards those how directly or indirectly helped us in completion of this project. I thank my guide Rupesh fonde, Professor of Nanasaheb Mahadik College of Engineering and all employees.

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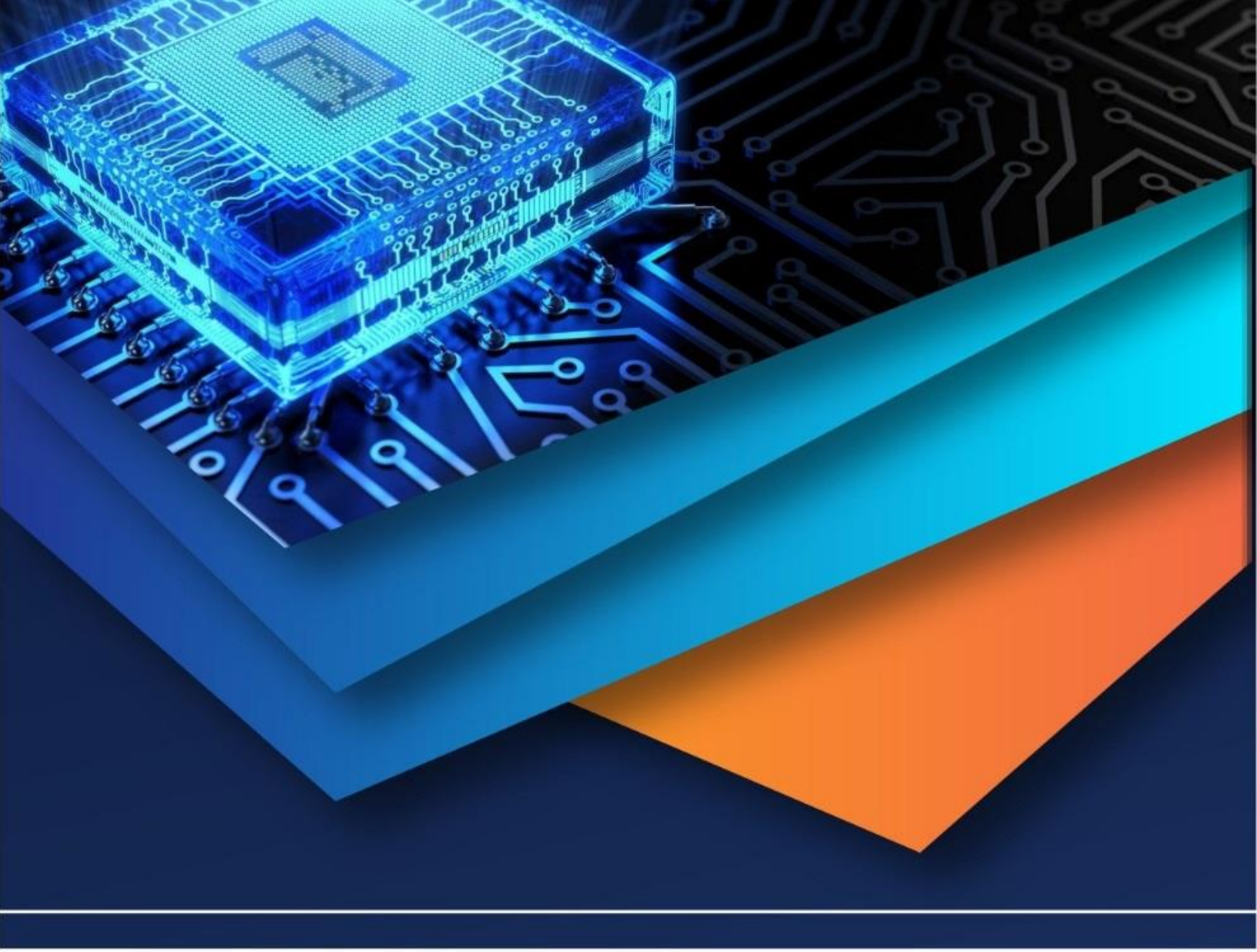

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