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Design and Fabrication of Grass Cutter

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[1, 2, 3, 4]*Guided by: Prof. C. J. Shende mechanical Deparment, Amaravati university*

Abstract: ***In my seminar I design the grass cutting machine for the use of agricultural field, to cut the crops in the field. This is a new innovative concept mainly used in agricultural field. It is simple in construction and its working is easy. The components that are used are engine, gear, cam, chain and sprocket, lead screw, wheel, control unit. Below the gear arrangement cutting blade is fixed. When the engine starts running the shaft also rotates and that rotates the gear arrangement which is coupled with the motor. As the gear arrangement rotates the cam arrangement, it operates the sickle bar which tends to cut the grass or crops. The sickle bar has one is fixed cutter and another one is movable cutter which is placed on it. The whole set up is placed on a movable base which has a wheel arrangement.***
Keywords: Grass Cutting Machine, Components, Power Supply, Sickle Bar.

I. INTRODUCTION

Grass cutter machines have become very popular today. Most common machines are used for soft grass furnishing. In our project Grass cutter machine we are aimed to develop for operation and construction. Agriculture is the most important sector in the Indian economy. In India there is a great scope of grass cutter machine. In our country as well as other countries has also it is used in various fields for cutting the grass. The machine may consist of two, three or four blades depending upon the machine. The grass cutting machine is known as lawn mower. The grass cutting machine is available in the various types like reel (cylinder) mower, rotary and mulching mower, hover mower, riding mower, professional mower etc. but these are very costly and unaffordable also. Also, it requires a skilled person to operate it. Hence, it was found necessary to have a grass cutter with minimum initial cost and can be operated by unskilled labor [7].



Figure1.1: our Model of the grass cutter [7].

The machines required for manufacturing includes welding machine, grinding machine etc. Working principle of the grass cutter is providing a high speed rotation to the blade, which helps to cut the grass. The blade will get kinetic energy while increasing the rpm. The cutting edges are very smooth and accurate. Also Electric Grass Cutting Machines are much easier to be used in garden, lawn and grass fields. In order to enhance the beauty of home-lawns and gardens, Grass cutting machines are the best available option in the industry.

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With the help of a lawn mower which is a machine with revolving blades to help us cutting lawns at even length, people can eaily maintain and beautify their lawns and gardens without any hassle. Now-a-days, there are plenty of options starting from the simplest push along mower to the most advanced electric grass cutting machine [7].
A vertical mounted electrical motor operated grass cutter was found to be an alternative to common rotor mower (Chancellor, 1958). The grass cutters do the better job of cutting grass or lawn grass. The vertical rotor shaft has many pairs of swinging knives that cut the grass at equal height. If the blade cannot cut the grass by the first blade, then it can be cut by the other three remaining blades. The commercially available units for mowing or grass cutting are casting heavily. The grass was cut above the ground surface without damaging the blades when it strikes on immovable object such as rock, stone. The grass cutting takes place due to impact and shearing action also [7].

A. Parts Of Machine

Shaft : it is an rigid component which transfer power from one end to another
Bevel gear : it is an type of gear which is used as a differentional
Chain sprocket : it is used to supply power one flywheel to another
Blades : it is used to cut the grass

B. Studies And Findings

1) To study about design component of grass cutter.
2) To design field grass cutter machine that will use a less effort to cutting the grass.
3) To improve efficiency of grass cutter by using various component of grass cutter.
4) To study load carrying capability, strength of component of grass cutter
5) To improve cutting rate.
6) To improve the physical conditions of soil.
7) To destroy weeds and to prepare a suitable seedbed.
8) Its effect on productivity and motivation of employee.
9) To improve the performance and efficiency.
10) There are number of uses of grass cutting in college campus, garden etc.

II. RESEARCH ON PAPER

A. Ashish Kumar Chaudhari

In this paper they have prepared manually handle device which is capable to cut the grass. This device consists of linear blades and it does not affected by climatic conditions. The main objective of this paper is to move the grass cutter is different directions to prepare various designs as per requirements. By using link mechanism the height of the cut can be adjusted. The unskilled labor can easily operate this device [1].

B. Praful P. Ulhe

In this paper they have prepared manually operated grass cutter with spiral roller blades due to spiral blades increases the efficiency of cutting. For adjusting the height reel cutter is component placed on grass cutter. This grass cutter used to cut the grass uniformly and also it can cut the different types grasses [1].

C. Ms. Lanka Priyanka

In this paper they have fabricated 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 [1].

D. Edwin Beard Budding

Budding obtained the idea of the lawn mower after seeing a machine in a local cloth mill which used a cutting cylinder mounted on a bench to trim cloth to make a smooth finish after weaving. Budding realized that a similar concept would enable the cutting of grass if the mechanism could be mounted in a wheeled frame to make the blades rotate close to the lawn's surface [3].

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E. C. B. Mills

Today, new technology is bringing us improved mower versions. Low emission gasoline engines with catalytic converters are being manufactured to help reduce air pollution. Improved muffling devices are also being installed to reduce the noise pollution. Battery powered mowers are also becoming practical. Although slightly smaller with an average cutting swath of only 17-19", these new mowers will quietly cutting lawns without the common cloud of blue smoke hanging in the air, for about an hour per charge. Prices are comparable to a high-end gasoline powered mower [3].

F. P.Bulski

Bulski identify the sound created by the machine is making noise pollution. He research on sound created by the machine and giving the result how to remove the sound while cutting the grass of lawn or ground. As looking to the petrol engine it make air pollution to environment so from my recommendation it should be implement on electric operated lawn mower [3].

G. Thomas Green & Son

He introduced a mower called the Silens Messor (meaning silent cutter), which used a chain drive to transmit power from the rear roller to the cutting cylinder. These machines were lighter and quieter than the gear-driven machines that preceded them, although they were slightly more expensive. The rise in popularity of lawn sports helped prompt the spread of the invention. Lawn mowers became a more efficient alternative to the scythe and domesticated grazing animals [4].

H. Randsome

The first was produced by Ransom's in 1902. JP Engineering of Leicester, founded after World War I, produced a range of very popular chain-driven mowers. About this time, an operator could ride behind animals that pulled the large machines. These were the first riding mowers. In the United States, gasoline-powered lawn mowers were first manufactured in 1914 by Ideal Power mower [4].

I. Davidge E D

"I'm planning on moving my entire fleet to propane. Not only is it better for the environment, it also increases my productivity. I'm saving money on fuel, and labor costs as well, since my crew isn't spending time filling up at the pump. Propane has no additives and is a clean burning system. I save on maintenance since there is no carburetor or fuel filter to maintain"[4].

III. IDEAS FROM REASEARCH STUDY

A. Cutting grass of secondary primary and tertiary field thereby reducing human effort needed.
B. Great portion of farmland can easily cut or brushed with lawn mower in one day.
C. This project reduced number of personnel that needed in a particular farm operation.
D. To reduce manpower.
E. To improve the economy of the country.
F. Provisions of foreign exchange in the country.

IV. RESEARCH AND COLLECT IDEA

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V. CONCLUSIONS

A grass cutter which is simply called as lawn mower becomes very popular today. The main advantage of this developed protocol is, it does not affect farmer health by any means and also and now it is necessary for cleaning gardens. It is used for various applications.

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A. If the component having good material properties, load carrying capability then it certainly enhance the performance of the grass cutter.

B. The cutting effectiveness of the blade can be increased by improving slice to push and obtain good strength. Furthermore, there should be minimum welding joints in the design

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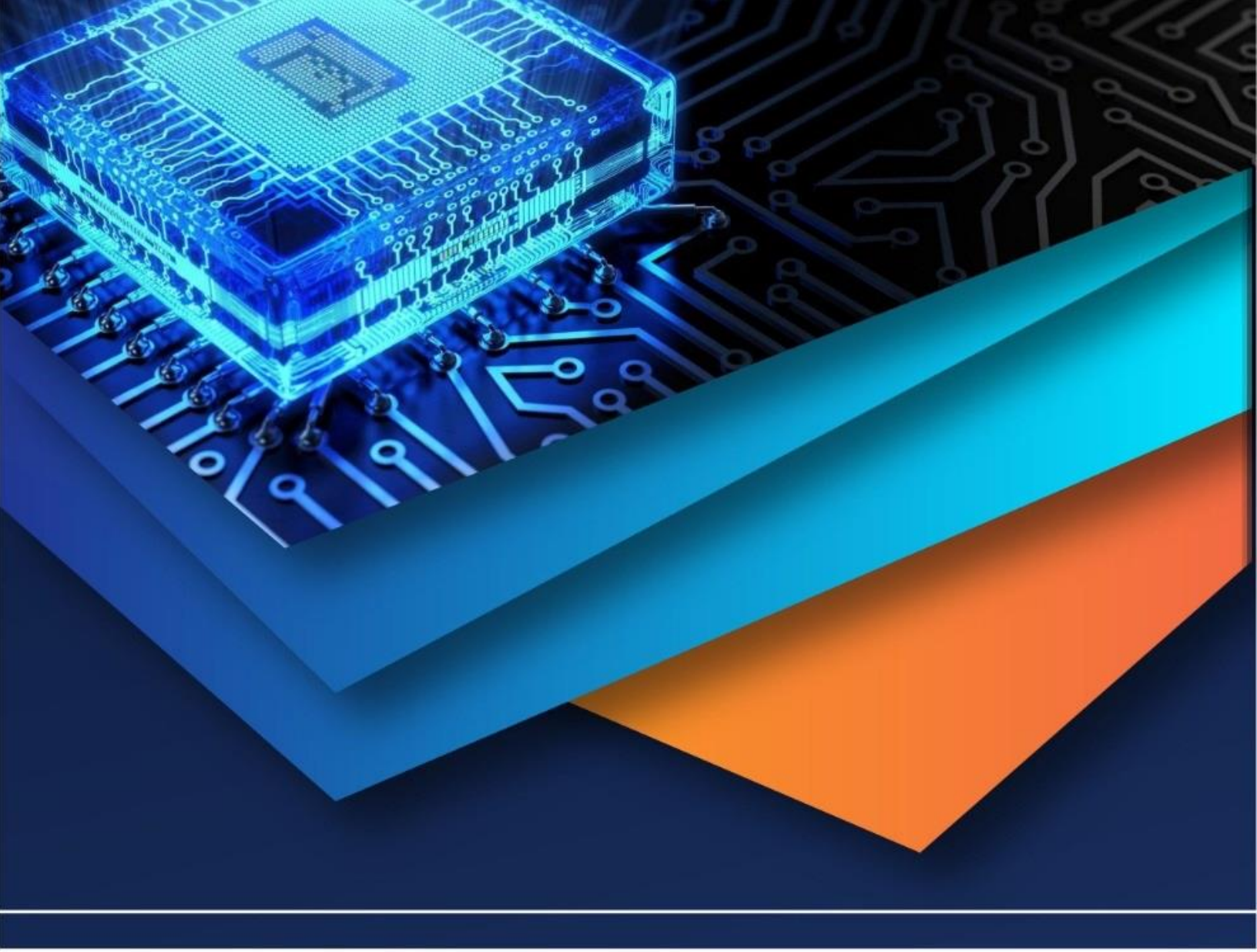
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