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Fabrication of Agricultural Motorized Paddy Weeder

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Abstract: ***In Indian agriculture, it's a completely hard project to weed out undesirable flowers manually in addition to the use of bullock operated equipments which may also similarly result in harm of primary crops. More than 25 percentage of the fee incurred in cultivation is diverted to weeding operations there through lowering the income percentage of farmers. This evaluation paper is a small painting in the direction of studying weeding-cum-earthingup gadget elements for reasonably priced cultivation on the way to assist to decrease the operating fatigue and to lessen labour fee.***
Keywords: DC motor, battery, pulley, blade, v belt,wheels.

I. INTRODUCTION

Agriculture is the spine of India, and weed elimination being one of the number one system withinside the field, there's a need for weed to be eliminated in all of the fields to growth the excellent of vegetation and to lower the impact of weeds on vegetation. A weed can be described as any plant or flowers that interferes with the goals of farming or forestry, which includes developing vegetation, grazing animals or cultivating wooded area plantations. A weed will also be described as any plant developing wherein it isn't always wanted. For example, a plant can be precious or beneficial in a garden, or on a farm or plantation – however if the equal plant is developing wherein, it reduces the cost of agricultural produce or spoils aesthetic or environmental values, then it's miles taken into consideration a weed. However, a few florae are weeds no matter wherein they grow.

A. Objective

1) To reduce the time and manpower.
2) To reduce the number of workers.
3) To reduce an air and noise pollution.

II. LITERATURE REVIEW

A. Dr. B. Paulchamy, et al. this paper represents three in 1 prototype layout primarily based totally on computerized weed detection and sprayer machine and automated irrigation machine with GSM protocol. This machine particularly works at the reason to put in force a machine that does the 3 given functions extra efficiently.

B. K. Sripriyan, et al. this paper carried to analyze the have an impact on of weeder gadget with various paddy field. Mainly consciousness on put off the tiny flora which develop in conjunction with paddy for weeding the agriculture land with out adverse the crop is achieved. It additionally check out the optimized layout parameter to maximise the overall performance of gadget.

C. Mr. Mahesh Gavali, et al. the paper speak approximately layout expand and optimize blades used for those an efforts is made to lessen electricity required to pressure those machines and to boom the existence of those blades the use of the blades with lowest pressure profiles. By growing the existence and decreasing the electricity required the effectiveness of the mechanical weeders may be increased.

D. Mr. Vivek Raut, et al. this paper is paintings toward reading weeding gadget elements for most cost-efficient cultivation in order to assist to reduce the running fatigue and to lessen labour cost. The most important intention of this evaluate paper is to have a right know-how of various elements or constraints of weeders.

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III. PROBLEM DEFINATION

Weed elimination is one of the important sports in agriculture. chemical approach of weed manipulate is greater distinguished than guide and mechanical techniques. however, its negative outcomes at the surroundings are making farmers to remember and be given mechanical techniques of weed manipulate. chemical weeding is the maximum notably used approach of weed elimination however those chemical substances used for weeding are dangerous to residing organisms and poisonous in nature. studies has been accomplished to apply a few aggregate numerous techniques of weeding. the want of update using herbicides with greater sustainable weed manipulate strategies recommended the definition of revolutionary bodily weed manipulate strategies. mechanical and thermal manner have been used to manipulate weeds and elimination with the aid of using mechanical approach is one the techniques often used those to take away weeds from the rural fields.

IV. AGRICULTURAL MOTORISED PADDY WEEDER

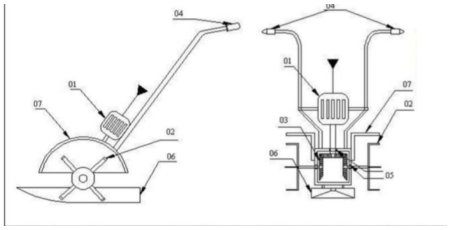

Fig.1 Actual model

V. METHODOLOGY

Indian farmers use conventional approach, there's huge scope for improvement in agricultural sector. In conventional approach weeding procedure are executed with the aid of using the bull which grow to be high-priced for farmers having small farming land its time ingesting and calls for separate setup. Therefore to triumph over above problems, we've got layout and increase the bendy system with the intention to be useful to the medium and small scale farmer for the weeding operations

VI. CALCULATION

Theoretical issues Soil resistance has a full-size impact upon the energy requirement of weeder. Also, intensity of reduce, width of reduce and pace of operation affects energy requirement of weeder. For calculating energy requirement of the weeder, most soil resistance changed into taken as 0.7 kgf/cm2 . The pace of operation of the weeder changed into taken into consideration as 0.five m/s. Total width of insurance of slicing blades changed into eight cm. The intensity of operation changed into taken into consideration as five cm, transmission performance is 50%. The energy required to reduce the soil „Pd‟ is, Pd = SR*d*w*v / 75

Where,

Pd - Power required to reduce the soil

SR - Soil resistance, N/mm2

d - Depth of reduce, cm

w - Effective width of reduce, cm

v - Speed of operation, ms-1

Hence, energy requirement is anticipated as,

= 0.069 * eight * five * 0.five / 75

= 0.0184 HP

Total energy required

The general energy required „Pt‟ is,

Pt = Pd / η

Where,

Pt - Total energy required

Pd - Power required to reduce the soil

Ŋ - Transmission performance.

Pt = 0.0096 kW

Torque transmitted through the shaft

The torque „T" transmitted thru the shaft is labored out the use of the subsequent equation

$T = P * 60 * 1000 / 2 * \pi * N$

Where,

T - Torque transmitted through the shaft, Nm

P - Power, kW

N - Revolutions of the top mover in step with minute

Considering motor minimal pace as 3000 rpm and engine energy 0.81kW we get torque as,

$T = 0.81 * 60 * 1000 / 2 * \pi * 3000$

$T = 2.577$ Nm.

Thus the most torque of 2.58 Nm changed into generated at Motor.

VII. CONSTRUCTION

A. Pulley

The pulley transmits the rotatory movement among rotating ends. Pulley rotates approximately its very own axis. Two pulleys are hired withinside the process. One. pulley is constant to the motor shaft and the alternative pulley is constant to the gearbox shaft. The pulley's are related to every different with the belt. It is made for the aluminum and this pulley. The pulley is connected to stepper motor via way of means of the usage of belt pressure. When the Spur equipment rotates then the pulley is circled and transfers the movement to belt pressure via motor.

Fig.1 pulley.

B. DC Motor

The motor presents the power vital for the displacement of the device. Motor is hooked up at the the front of the device that is positioned at the mainframe. The motor used is a "Brushless DC motor", at the side of a controller for particular movement and pace manipulate. The rated pace of the motor is 3000rpm at no load condition, and has a rated capability of 1.5kw, with a rated cutting-edge of 30-forty five amps. A brushless DC electric powered motor (BLDC motor or BL motor), additionally called electronically commutated motor (ECM or EC motor) and synchronous DC automobiles, are synchronous automobiles powered with the aid of using direct cutting-edge (DC) energy through an inverter or switching strength deliver which produces energy withinside the shape of alternating cutting-edge (AC) to power every section of the motor through a closed loop controller. The controller presents pulses of cutting-edge to the motor windings that manipulate the rate and torque of the motor.

Fig.2 D C motor.

C. Drive Shaft

The force shaft connects the wheels with the gearbox. Drive shaft is made from slight steel. There are 2 connecting rods. One is positioned in touch with the gearbox and paired to the wheels. The different shaft is positioned in reference to the gearbox that is linked to the rotavator shaft. The gearbox whilst given force, splits the force into 2 paths. One is to force the wheels and the alternative is to force the rotavator.

Fig.4 Drive Shaft

D. Battery

The battery used is lead acid battery. It presents the vital electricity to pressure the motor, and the battery acts because the electricity supply for the machine. Lead acid batteries are greater less expensive and has a higher performance of approximately 80-85%. Amount of warmth generated is likewise much less and the capacities of the batteries to be had also are wide. The battery is of steady 12V. The amps score decided on is 50AH. A general of four batteries are used for electricity supply. Batteries are set up at the tray, that's located at the mainframe with the assist of welding. The batteries are related in collection to construct a voltage of 48V this is appropriate to pressure the motor with greater electricity and torque.

Fig.5. Lead Acid Battery

VIII. ADVANTAGES AND APPLICATION

A. Advantages

1) It calls for much less time for weeding.
2) Labour wages are absolutely neglected.
3) It additionally reduces human and animal efforts.
4) More land may be weeded than traditional method.
5) Less noise and vibration. No pollutants problem.
6) It is fine appropriate alternative withinside the absence of animal for weeding.
7) Weeding maintained the yield through casting off the undesirable grass from the yield.

B. Application

1) is used to eliminate the trash.
2) It is used as opportunity weeder over animal drawn weeder.
3) Large Agricultural Fields. Fields with Huge Quantity Of Weeds.
4) Labour Deficient Regions motor with greater electricity and torque.

IX. CONCLUSIONS

Comparing the manner among electric energy weeder and regular weeding gadget , after trying out withinside the subject for approximately 5 times, primarily based totally at the exams the performance is calculated to be 80% which is nearly same to the regular present weeder, that's an awful lot green even as a unmarried man or woman operates the gadget. Deeper operating intensity and a sluggish tour pace can obtain a very good weed control. Weed casting off gadget upload the modernization and improvements withinside the agricultural subject. This gadget will make the farmer unbiased and now no longer depend upon the labourers for casting off weed. As the take a look at is carried out in exclusive soil situations and with exclusive weeds, it is easy and greater powerful for the ordinary utilization whilst as compared to regular weeding gadget, with the assist of electrical energy weeder 0 emission is ensured, that's the number one purpose to expand this gadget.

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X. FEUTURE SCOPE

The product synthetic is appropriate for weeding of row vegetation, which has a row width of two feet. The price worried withinside the operation is the unit modern ate up throughout charging. While different fees protected are solid and has an extended life. The price of operation is likewise decreased with the aid of using decreasing the labour requirements. Usage of the electric weeder is absolutely non-polluting and eco-friendly. The running price as of contrast with energy could be very much less. 1litre of petrol or diesel fees round 70-seventy five Rs.Where as unit modern is round 2.50- 6Rs, primarily based totally at the locality. The charging manner on absolutely draining takes upto 6 hours. And the whole running price is set 340Rs. Which runs for two hours and covers 3/4th of an acre. While on the opposite hand, the fuel engine covers much less than an acre for a litre of fuel. The technique of treating crop and soil selectively in keeping with their desires with the aid of using small self sufficient machines is the herbal subsequent step withinside the improvement of precision farming. By taking a gadget technique, we are able to increase a brand new mechanization gadget that together offers with all vegetation agronomic desires in a higher way.

XI. 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 Javeed tamboli, Professor of Nanasaheb Mahadik College of Engineering and all employees.

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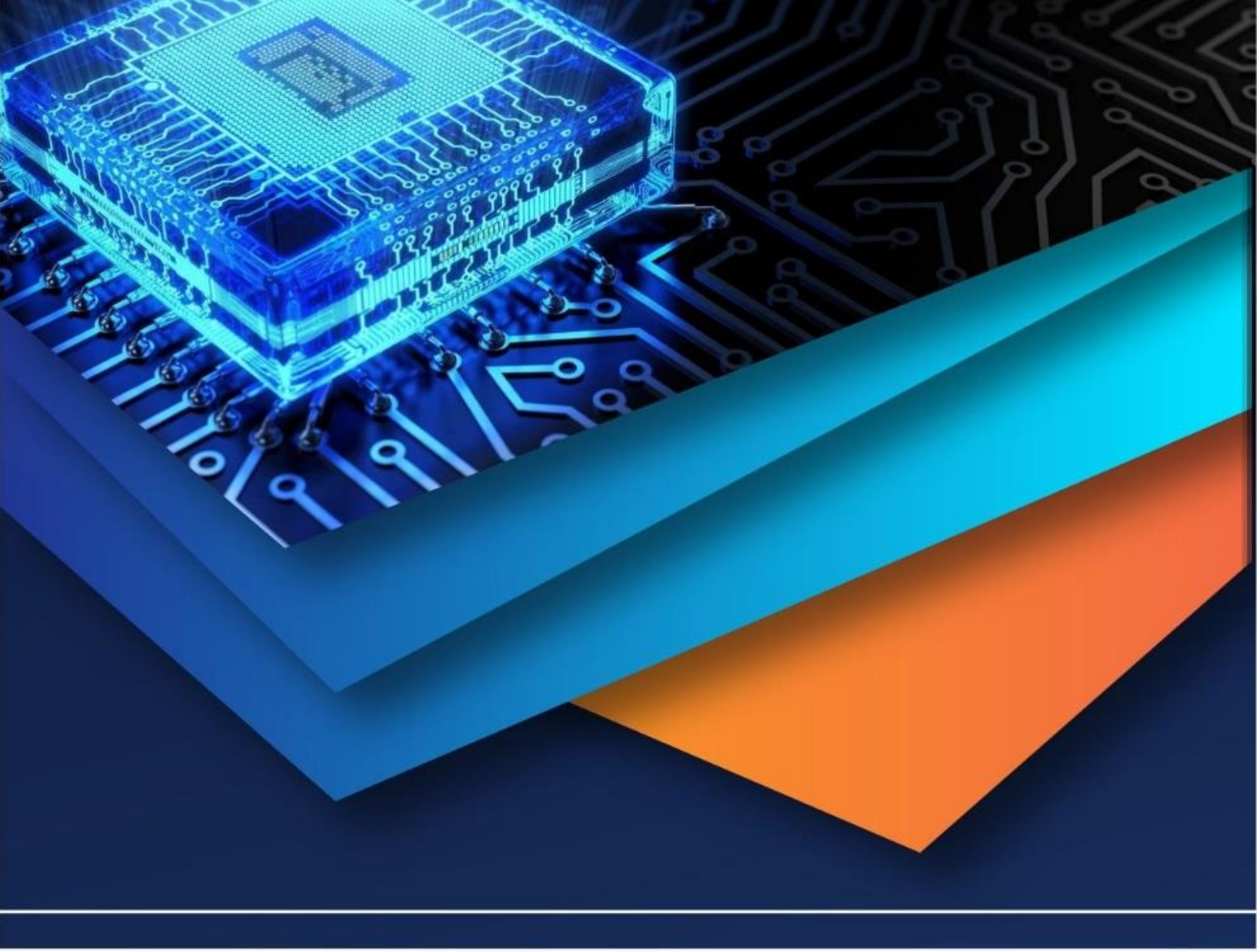

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