Electric Operated Weed Remover

Dhanesh Kailas Bhor[1] Suraj Sunil Pabale[2] Prashant Namdev Padwal[3] Shivam Sanjay Wagh[4] Prof.Khatode.A.L[5]

[1,2,3,4,5]Department of Mechanical Engineering

[1,2,3,4,5]Samarth Group of Institutions, India

Abstract— this project work is done for properly manage weeds. Weeds affect crop yield due to competition to acquire plant nutrients and resources (Slaughter etal. 2008; Weide et al., 2008). Weeds have very fast growth rates compared to crops, and if not treated and managed, they may dominate the field. There are various methods for controlling weed infestation in crop production .Some farmers adopt agronomic practices that improve crop competitiveness such as planting vigorous crop seeds at relatively shallow depths and planting right after a weed control operation. This method is used to prevent the weed seeds from germinating before the crop is planted and to ensure that crop plants emerge before the weed plants. This practice will not only ensure a maximized crop yield and reduce weed infestation, but also minimize any economic losses (Maxwell and O'Donovan, 2007). The above practice should be applied for controlling weeds if the canopy closes and does not allow much light onto the ground surface where weeds will germinate and grow. However, weed control is still required during the crop production cycle.

Keywords: Weed, Weed Control Technique

I. INTRODUCTION

The earliest and the simplest weed control method is manual weed control. This method was and is accomplished by a person bending down and using their hands to pull weeds out of the soil. This method then advanced to hand tools, from using a stick to using a hand-hoe. The labor required for weeding is expensive, time consuming and difficult to organize (Weide et al., 2008). Gianessi and Reigner (2007) reported that manual labor costs have increased from $0.10/hour in 1940s to $1.00/hour in 1960s. As of 2005, the rate had further increased to $10/hour. Furthermore, problems such as back pain due to frequent repetitive bending caused manual weed control to be avoided. In such as California, hoe weeding and hand weeding was banned due to permanent back damage in workers. Before the existence of chemical weed control, mechanical weed control was the best option to solve issues related to manual weeding. In mechanized agriculture, there were times where weeding tools were pulled by draft animals such as buffaloes and horses, which now in the developed world have generally been replaced by tractors. There are various types of mechanical weeding implements in the market that use three main techniques: burying weeds, cutting weeds and uprooting weeds.

II. LITERATURE SURVEY

Sawpnil V. Ghinmine, et. al., (2019) [1], Weed management is one of the tedious operations in vegetable production. Because of exertions costs, time and tedium, manual weeding is unfavourable. A mechanical weeding actuation system was designed, and a prototype turned into constructed. This actuator be-came advanced to mechanically manipulate intra-row weed plants. The mechanical weeding actuator consisted of a belt drive machine powered by using an integrated engine and a rotating tine weeding mechanism powered by way of engine energy. Weed manage is one of the most difficult duties on an agricultural farm. Three methods of weed control are commonly known in agriculture. These are mechanical, chemical and biological control. Mechanical weed manipulate is without problems adopted via farmers once they get convened of its advantages. Mechanical weed control not handiest uproots the weeds between the crop rows however also keeps the soil surface loose, ensuring better soil aeration and water intake capacity. Various forms of mechanical weeders have been evolved. In human operated weeders, muscle energy is required and so it can't be operated for long time. The traditional approach of hand weeding is time consuming. In order to assess the opportunity of mechanization of the weeding operation, the energy operated single row energetic weeder is to be designed and developed.

Anurag Dwivedi1, et. al., (2018) [2], This paper focuses on the various Strategies used for weeding purpose for agricultural implants that have a scope to be utilized in future. The implants used in conventional techniques have some facet effects. The powerful properties of sun powered weeding machine is appropriate for weeding reason and don't have any facet effects. It avoids the use of any chemical substances and as a result prevents the vegetation from chemical substances

Jeetkumar Gupta1, et. al., (2018) [3], In agricultural area there are one of a kind tasks like sowing, ploughing, weeding, harvesting, etc. Weeding is a tedious and frustrating method so we are able to make the use of robotics to clear up the issues related to weeding. In this study, we evolved a gadget that could paintings autonomously using pc generated code and algorithms in conjunction with sensors which might be integrated in it. The mobile robot will wander within the farm or garden and save you weeds from developing further. Using precise design factors and quite a few sensors, the mobile robotic patrols the lawn daily, avoiding useful flowers and limitations while

Khandare Suresh Vasudev, et. al., (2018) [4], Comparative observe for portable weeders and strength tillers in the Indian market is discussed. Various techniques used for weed elimination in crops are also discussed. Main recognition of that is to take a look at numerous equipment's used for mechanical weed removal. This study found out that most of the Indian farmers, majority of that are small scale farmers can afford simplest portable weeders. These small scale farmers as such don't use mechanical weed control methods. Chemical and manual weeding is predominantly used by those small scale farmers. The literature survey indicated that portable weeders are relatively much less highly-priced in operation and maintenance however also are much less versatile. Power tillers are appreciably greater steeply-priced however are also very much greater versatile

and may perform in variable soil conditions. Due to those constraints maximum smaller farmers hotel to chemical and guide weeding. These techniques are labour in depth and as the sort of predominant constraint in crop production. Research has been finished in many countries to involve technologies such as photograph analysis, GPS navigation, etc. In mechanical weeding machines. But most of these efforts are yet to leave a lasting impact in marketplace place. Hence it's miles vital to develop more green and cost effective strategies of mechanical weeding for you to lessen using chemical and manual weed removal techniques.

III. CONSTRUCTION

The machine is constructed using the following components:-

1) Main Frame - Mild Steel is used for frame of the equipment of 1inch dia.
2) Ploughs- ploughs are made up of mild steel.
3) Cycle wheel- wheel diameter of 28-700" of aluminum.

IV. WORKING

This equipment used for ploughing the land by using the electric energy and as well as it can remove the weeds which grow in different crops so that the machine can be used for multipurpose and reliable this device has a gear motor which will work on battery supply and serve the farmers in better way. As the gear motor operates it drives the wheel by using sprocket & chain mechanism, as this device moves in forward direction the wheel rotates and move in forward direction the motor is mounted on the frame and right-hand side of the equipment is flexible to adopt different tools for different agriculture operations.

Due to this, a huge amount of labour effort can be reduced and within less time more weeds can be removed with less cost and easy operation. Then finally one labour is required to remove the weeds which are not removed by powered weeder around the plants. Depending on the requirement of the farmer, tools can be designed & fabricated & can be mounted on the tool holder.

Fig. 6.1: Actual working

V. COMPONENTS AND DESCRIPTION

A. Gear motor:

Fig. 7.1: gear motor

We understand the inventive mind and the thrill of creating something all your own. That is why we are proud to present the Ebike MY1016Z3 24V 350W 324 Geared DC Motor complete with a 9 tooth 1/8″ bicycle chain sprocket. This motor is great for those wanting to make their own custom electric vehicle, whether it's a scooter, electric bicycle or something the world isn't even ready for. This electric motor with gear reduction produces more low-end torque than your standard motor. Motor direction can be changed to Left or right rotation by just reversing wires Note: This motor is capable of rotation in either the clockwise or counterclockwise direction by reversing the motor's power wires.

B. Controller:

Fig. 7.2: controller

- Speed controller for DC Motor, up to 500w, 24Volts. This controller may be used for replacement of most Electric tricycle and other kinds of electric scooters, E-bikes, or E-advs. Check that voltage is compatible, motor is of same or less watts and for similarity in size, shape and color.
- Voltage: 24Volts Rated power: 500 watts
- Operating Conditions: -25-45 centigrade Match motor: dc brushed motor Brake handle: mechanical normally open Speed Regulator 1-4 V (Throttle)

C. Batteries:

Fig. 7.3: battery

- Volts: Used to describe how fast electrons move, more voltage = more speed!
- Amps: How wide the road is, more lanes, more cars can pass at the same time side by side... Watts: The combination of Volts and Amps (Volts X Amps = Watts)
- Amp Hours: Should always be listed, typically 10 to 20 Amp Hours (abbreviated " Ah ") a measure of how many fixed number of Amps a battery can sustain for 1 hour.. (C rate). Or, double the amps for half the time. Or half the amps for two hours. Etc.
- Watt Hours: This is a far more accurate way to know how much usable energy is in a given battery pack (abbreviated Wh) when available, this is the number to look for! Also, you can translate it into how many watts, continuous, for 1 hour! A 500wh battery can deliver 500 watts for 1 hour or 1000w for 30 minutes.... Or 250w for 2 hours. Etc. Most ebikes do not use power at an exact level, continuously, so this does not directly translate into ride time, but you can quickly see how a larger battery with more energy (capacity) can deliver lower power levels for longer periods of time, and go further on a charge.

D. Bicycle wheel:

Fig. 7.4: wheel

We are a renowned company engaged in offering high quality Cycle Wheel Rim. The wheel rims manufactured by us are available to clients at leading market prices in various specifications. These wheel rims are priced economically and are available to clients at highly reasonable market prices. These are easy to install and maintain. These wheel rims are installed in frame. Being rust-resistant and abrasion-proof, these wheel rims last for long periods of time.

E. Battery level indicator:

Fig. 7.5: battery level indicator Generic 12V 24V LED Lead Acid Storage Battery Indicator

F. Accelerator:

Fig. 7.6: accelerator

Accelerator 2" Colour: Black Grips with Silver Ends Includes: 1 Throttle Grip, 1 Normal Grip (Matching Pair) Throttle Control Set Three Pin Blue: Signal Wire Black: Negative Pole Red: Positive Pole Electric Throttle, Motorcycle, Scooter Suitable for Most 12V,24V,36V,48V Bike, Scooter with Hall Controller Package Included: 1X Throttle Grip 1X Normal Grip

VI. DESIGN CALCULATIONS

A. DESIGN CALCULATION

1) DESIGN OF FRAME

Material selected for frame is mild steel of grade 15
Grade of mild steel =15
Tensile strength (N/) = 130
Tensile stress

1) Area: - A= (0.2×0.2) mm
2) Load: = F/A
3) Bending Shear Strength: - = F/A

2) Design of Wheel

1) Torque = F × perpendicular distance

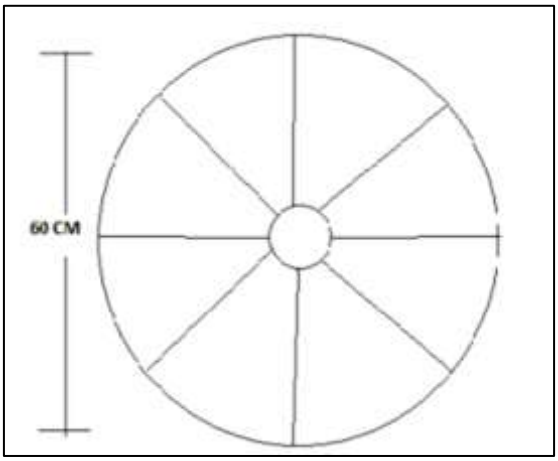

Fig. 3.2.: Wheel

2) Bending strength :- = M/Z

3) Design of Bracket

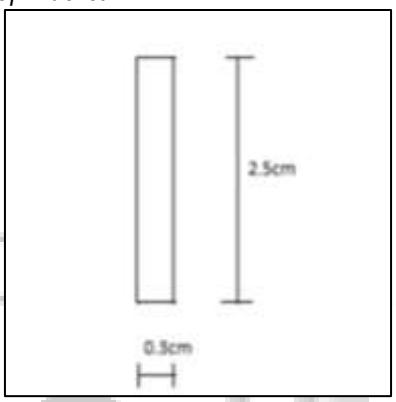

Fig. 3.3: Bracket

1) Bending Strength: - = M/Z
2) Tensile Strength: - τ = F/A
3) Crushing strength: - = 2π × R × l

4) Design of Rotor

1) Bending Strength = M*Y/I

VII. Cost Estimation

A. MANUFACTURING COST

Sr.No	Name of Parts	Materials	Quantity	Amount in Rs.
1	Gear motor 24v,250w	M.S	1	3700/-
2	controller	AL	1	999/-
3	Batteries	LEAD	2	1400/-
4	Wheel	S.S	1	800/-
5	Battery level indicator	PLASTIC	1	200/-
6	Accelaretor	RUBBER	1	275/-
7	Brakes	S.S	1	150/-
8	1inch pipe	M.S	12ft	300/-
9	20*5 plate	M.S	8ft	200/-
10	10 mm Square Rod	M.S	3ft	50/-
11	Nut-Bolt	M.S	10	70/-
12	LED Light	AL	1	75/-
13	Wire	CU	10ft	95/-
14	Oil Paint	-	100ml	70/-
15	Chain	M.S	1ft	40/-
16	Fabrication	-	-	500/-
			Total	8805/-

VIII. Conclusion

The device is cost effective, feasible & sustainable. It effectively reduces labour work & save the time. It accelerates the farm work, affordable by farmer & is farmer friendly. Proper designing in accordance with the farmer requirements surely popularizes these tool & implements in near future. Applying the innovative ideas & advanced technology to the farms is necessary to revolutionize the Indian agriculture there by erasing the old manual methods, By using the modern wisdom, theses traditional implements needed to be standardized keeping in the mind economy of the rural people.

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