

FABRICATION OF MOTORIZED AGRICULTURE WEEDER WITH GRASS COLLECTOR

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Abstract: In India, most of the people are farmers and agriculture is the backbone of India. Crores of rupees are spending in agriculture, but due to weeds, the yield of the crops was drastically falling down. Even though there are losses with insects, worms and from diseased crops. As compared to all these losses, loss due to weeds is high. Most commonly weeds are always grown at where they are not necessary. In our project work we design and constructed a motorized agriculture weeder with a grass collector to remove and collect the weeds and waste material present between crops. The compelling structure of the weed expelling machine is to limit the time taken for evacuating weed present between the developing plants. The agriculture weeding machines are accessible in the market at different kinds; however, those are expensive and exorbitant to farmers and to work those machines requires a talented individual. There are weeds and undesired plants on the field which devours the nutritious components which are planned for the harvest that will be developed in the field. Right now, we have planned a weeding vehicle to remove and clean the undesirable grass and weeds. This weeder works by a high torque dc motor that is controlled by a battery.

INDEX TERMS: Base Frame, Battery, Cutting, Drilling, Dual Axis Electrical Motor, Welding, Wheels Grass Collector.

I. INTRODUCTION

India is a developing country; it requires new inventions and techniques for efficient developments. The economic developments in the agricultural sector of India have quite more opportunities for research to develop effective machines for the betterment of the farmers. The weeds are one of the reasons for the failure of crop production and based on weeds should be controlled. There are various methods used in the process like chemical, mechanical biological, etc. every single method has its benefits and drawbacks, mechanical weeding is widely used because of its benefits. The demand for quality food is very huge in the market, now a day people are ready to pay an extra amount if the quality is assured. To achieve a high yield crop production new method is to be implemented for the removal of the unwanted weed in the crop. The major problem is the weed grow along with the crop; the nutrients are provided to the crop are taken by the weeds grown in between crops. weed takes advantage of the nutrients, the crop becomes weak and the weed becomes rich in nutrients and gets strength. To eradicate this problem, the weed is to be removed.

To solve this problem, we have fabricated a weed removing machine with Dc motor, we modified the machine by taking a single axis Dc wiper motor and we fabricated it to dual-axis motor. it works with a connection to the battery. a weed collector is arranged to collect the weeds grown in between the crop. we have converted the rotary motion of the motor into linear motion by using a second class of lever, and we also provided the sliders to the frame to adjust the horizontal and vertical height based on the comfort and height of the operator. The existing weeders are operated by using engine, even though they are efficient they are unaffordable and produce so much pollution to environment, for that reason we have improved the weeder to work with Dc motor and feeds power from battery and also we have arranged a grass collector at the bottom of the weeder which collects the grass and waste materials.

II. OBJECTIVES OF STUDY

- The main objective of our project is to construct and test the motorized agriculture weeder.
- Generally, humans and animal power are used to control the weeds but we have developed a mechanical weeder.
- To limit the time consumption for weeding, we introduced mechanical weeder.
- To understand the conditions under which the weed competition is high so that we can control the weeds.
- Providing the linear and vertical height adjusting slider to facilitate the operator to adjust the frame as per his height

III. COMPONENTS OF AGRICULTURE WEEDER

3.1 FRAME

In our motorized agricultural weeder, the frame is made up of hollow square pipes and these pipes are made up of mild steel. Other accessories like Dc motor, wheels, grass collector, the battery mounted on it. The motor is mounted at the front end of the body and the handle is connected at the rear end of the body. The cutting edge is connected to the motor at the front side.



Fig. 4.1(a) Frame of Agriculture Weeder

3.2 DC MOTOR

A 12 volts Dc motor is used to run the lever mechanism, it takes the power from a battery. One of the modifications we have done is, converted a single axis dc motor to dual-axis motor as shown in fig.4.2 (a)



Fig.4.2 (a) DC Motor

3.3 LEVERS

There should be a medium to transfer the forces, so we attached the second class of levers to the motor. And a bucket-shaped plates are welded at the end of levers to dig into the soil and remove the weeds.



Fig.4.3 (a) Levers

3.4 WHEELS

Two wheels are mounted at bottom of the frame, to support and move in required directions. In between these two wheels, a grass collector is welded to collect the weeds and waste materials.



Fig.4.4(a)Wheels

3.5 BATTERY:

12volts battery is used to supply the power to the motor. It is placed in between the handle and motor. By placing this at that particular place we can reduce the burden to the operator.



Fig.4.5(a)Battery

3.6 COLLECTOR:

A grass collector is attached at bottom of the weeder, it collects the weed and waste materials present in the field. These collectors are made of mild steel.



Fig.4.6(a)Grass Collector

IV. PARTS AND MATERIAL USED:

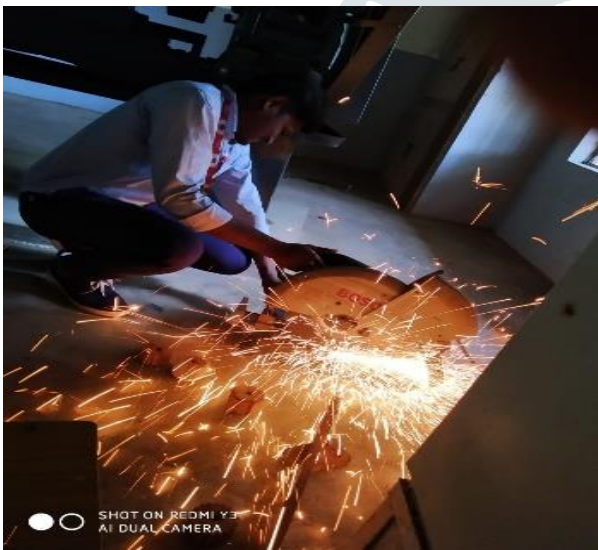
s.no	Components	Material	Quantity
1	Dc motor	-	1
2	Frame	Mild steel	-
3	Battery (12volts)	-	1
4	Wheels	plastic	2
5	Grass collector	Mild steel	-

V. IMPROVEMENTS OR MODIFICATIONS:

- a) We have modified the single-axis motor to dual-axis motor
- b) To collect the waste materials and weeds we introduce a collector at the bottom of the weeder
- c) To avoid pollution, we have developed an electrical weeder with a Dc motor

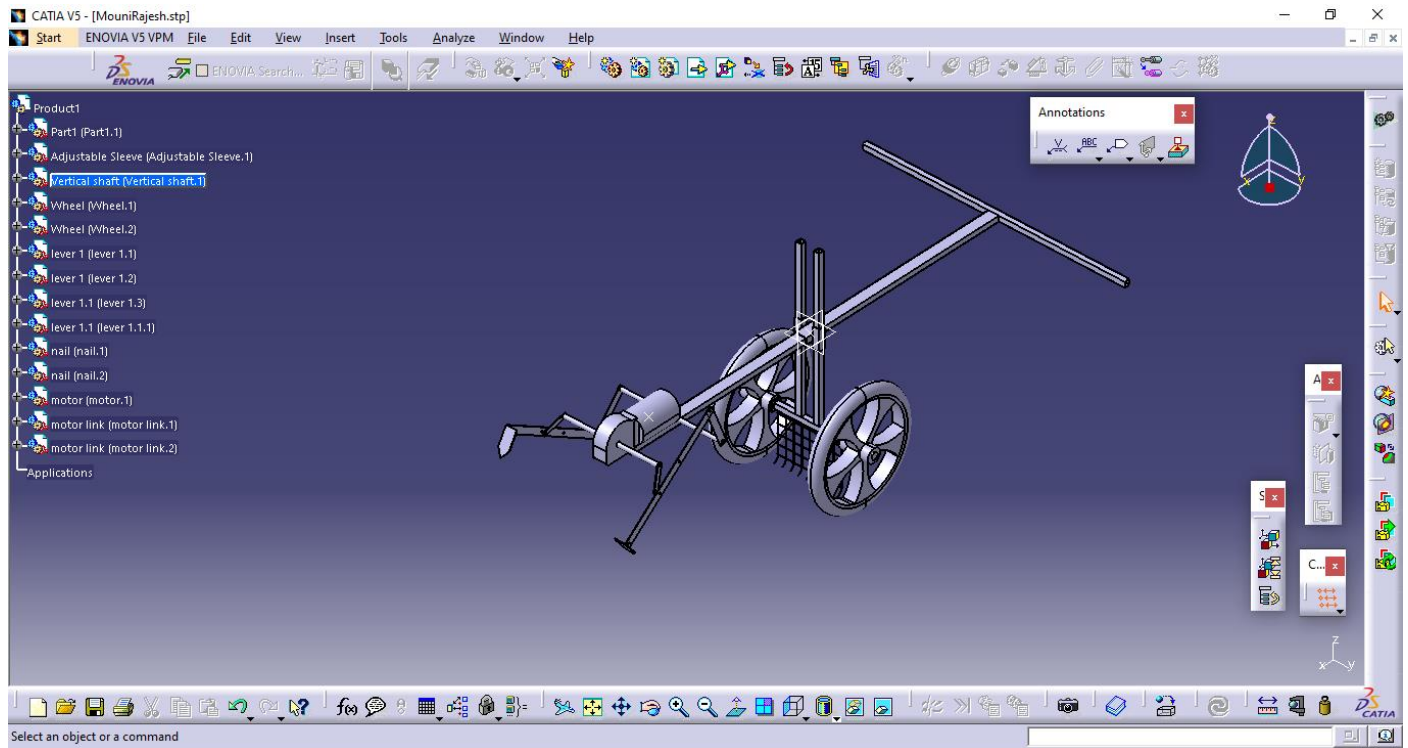
VI. METHODOLOGY:

- a) Initially, we constructed the frame by using mild steel hollow square pipes. By welding these square hollow pipes we bring a shape for agriculture welder.
- b) By using nuts and clamps Dc motor is mounted at the front end of the frame.
- c) For easy holding purposes, Square pipe is welded at the rear end of the frame, A switch is provided on the handle.
- d) To make this welder comfortable and friendly we constructed and introduced the sliders for easy height and length adjustments based on the height of the operator.
- e) Two wheels are attached to the frame for easy movement in a particular direction.
- f) The battery is mounted between the handle and motor to reduce the burden on the operator, Battery is mounted at the center or in between the handle and motor.
- g) Second class at levels are attached to the motor for easy removing of weed.
- h) A collector in constructed and welded at the bottom of the frame to collect the weeds and waste materials.

**Fig.(6a)Cutting****Fig(6b)Drilling****Fig.(6c)Grinding****Fig.6 (d)Welding**

6.1 DESIGN:

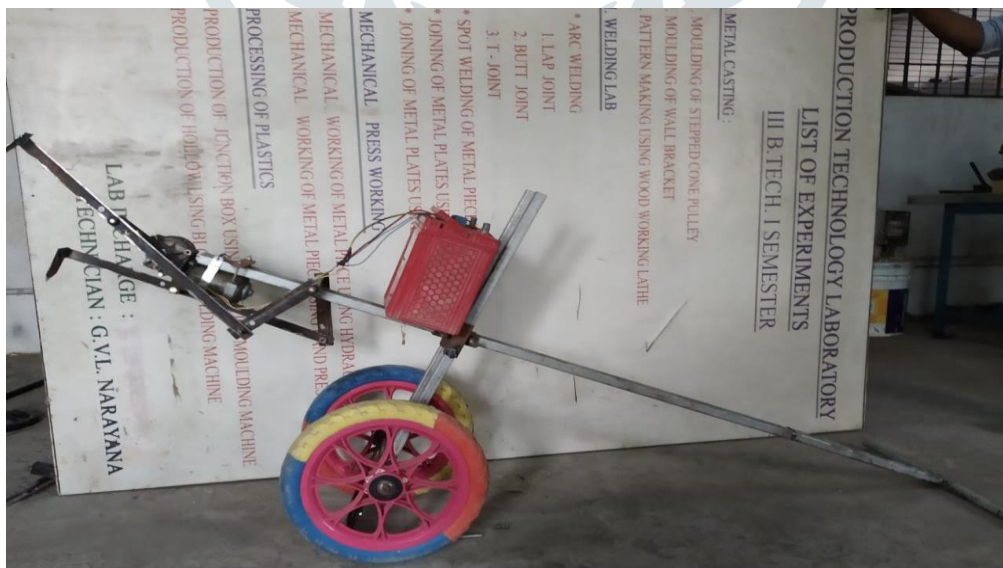
We have drawn a cad model using Catia software.

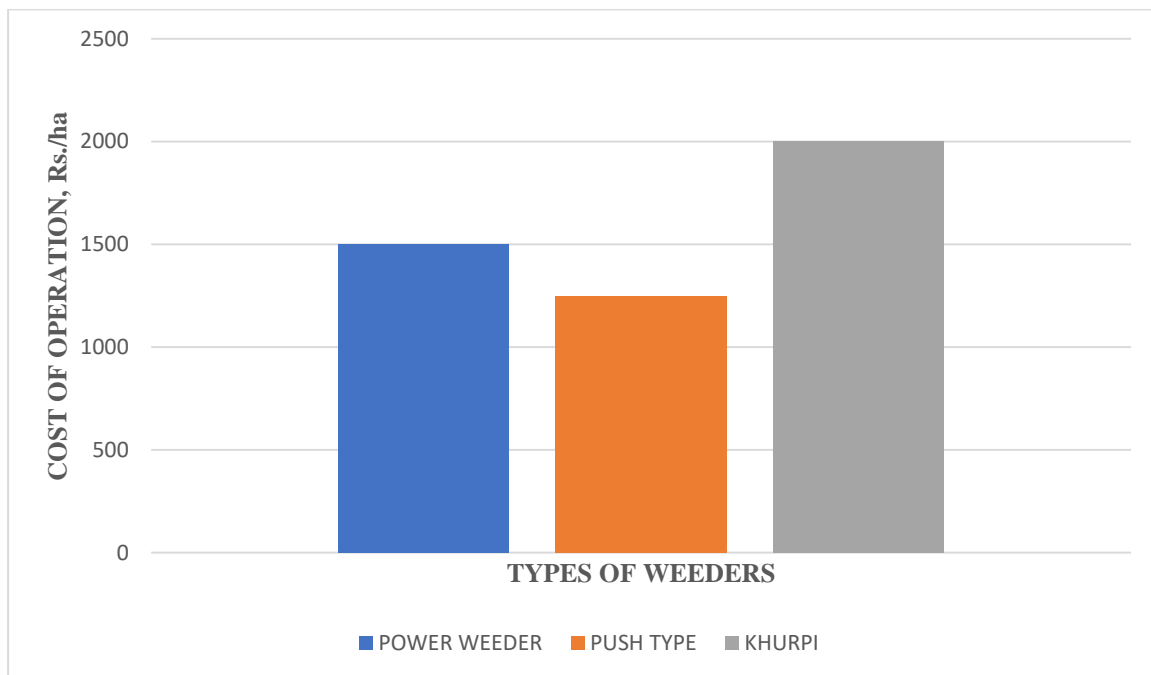


6.2 WORKING:

The main working principle of the weeder is to remove the unwanted weed from any type of cultivating crop region. It is powered mechanically and electrically by the group of linkages that were connected to the motor.

It works by converting the rotational motion of motor to the linear access to the linkages that were connected to the motor and grass collectors is attached at bottom of the weeder moves in forward direction along with weeder. The rotation of motor allows the linkage to remove the weed from the cultivating land and collect it in a specific region where the weeder moves and collects the grass. By operating the on/off switch at the handle, the equipment is controlled, and power transmitted to the motor there by levers are operated. Due to the movement of levers, the Machine moves in forward direction and removes weeds. Removed weeds are collected by the collector present at bottom of the weeder.



6.3 COST OF OPERATION UNDER DIFFERENT WEEDING TOOLS:**CHART 6.3 COST OF OPERATIONS****VII. CONCLUSION:**

- The main theme of our project is to use it as alternative for animal drawn weeder.
- The time and cash consumed in ordinary procedures will save.
- Comparatively machine is low cost.
- It is easy to change the direction of weeder.
- It can be easily handled by any person in filed while working on it because of its slider adjustments it is possible to adjust the machine as per the operator height.
- It is of less noise machine when compared to the other machines.

VIII. REFERENCES:

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