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Portable Battery Powered Weed Cutting Machine For Small Scale Farming

Shubhlakshmi Tiwari[1*], Sharda Pratap Shrivas[2], Rahul Gedam[3], Devesh Shrivastava[4]

[1*]*Professor and Head, Department of Civil Engineering, Chouksey Engineering College, Bilaspur, E-mail: shubhut@gmail.com*
[2]*Assistant Professor, Department of Mechanical Engineering, Chouksey Engineering College, Bilaspur*
[3]*Assistant Professor, Department of Electronics and Telecommunication Engineering, LCIT Bilaspur*
[4]*Assistant Professor, Department of Mechanical Engineering, Bhilai Institute of Technology, Durg*

***Corresponding Author:** Shubhlakshmi Tiwari*
[*]*Professor and Head, Department of Civil Engineering, Chouksey Engineering College, Bilaspur, E-mail: shubhut@gmail.com*

Abstract

Weed growth is a huge challenge for farmers; it can usually be controlled with herbicides, but it is extremely hazardous to produce. This study proposes a chemical reaction-free veggie portable type weed cutting machine. This study looks into weed cutting machines and builds a prototype for small-scale production. The cutting equipment, which is usually rotating in motion, is used to cut along roadways, around plants, and along movement by hands. The motor in this portable power weed cutter is powered by a 12 volt battery.
Key Words:- Weed cutter, Farm equipment, Agriculture, Portable machine.

1. Introduction

The presence of weed is always harming to crop especially during the early growth stages when both weeds and crops can grow simultaneously**.** The problem of weeds is common in any vegetable crop, which is being prevented in today's modern era by the weed harvesting machine and by spraying the medicine. This machine is currently operated with petrol and diesel which is very expensive for small scale farmers, eradicated from the spray of weed pesticides has a bad effect on the plant.
There are many villages near Bilaspur Chhattisgarh that cultivate vegetables. Out of all these, in Sendri village, it will examine this machine and study the results of its use. Sendari village is situated on the banks of the Arpa river where weeds grow due to excess of water, for which people depend on laborer for condemnation.

2. Background Work

Amrutesh et al. presented their work on yoke mechanism for agriculture and attempted to decrease the weed by cutting performance while also providing comfort to the operator. In this study, they employed the crank slider mechanism and discovered that it is significantly superior than the mechanically powered [1]. Akene et al. work on a solar power portable mechanism of this effort is to create a new spraying technique that will spray at the highest rate in the shortest amount of time. This improves the quality of pesticide spraying. This technique is manual and does not rely on external pressures like electric motors, making it economical for small farms [2]. Baingane et al., projected on solar grass cutter with a manually controlled mechanism. This research proposes that a type of manually driven cutter would accomplish easy to cut grass which is unwanted grow nearby the crops [3]. More et al projected a model reduces environmental and noise pollution, automatic lawn cutters are modern tools that make life easier for their users by saving time,

protecting them from adverse weather, and giving an easy-to-use interface [4]. Magar et al. focused on Grass cutters operate on the sliding movement of blades. They suggest that this grasscutter works on electric energy, making it eco-friendly [5]. Palve et al., The Solar-Battery Operated Grass Cutter is a robotic body that includes a rechargeable battery, Direct Current (DC) motors, a solar panel, a blade, an on-off switch, and a button for area selection.A rechargeable battery is attached to a solar panel, and microcontrollers operate the remaining operations. This portable solar-powered grass cutter has five DC motors. A button for Area Selection is given to specify the area to cut the grass, and when the area is covered, the Portable Solar-Battery Operated Grass Cutter will stop [6].

3. Description of problem

Weed cutting machine is used for cutting weeds produce near plantation and agriculture field, usually this machine is run with petrol and diesel. We are trying to run this machine electrically in our project. The atmosphere will not be polluted by the use of unleashed batteries, which are caused by burning of petrol and diesel. Due to its portable size of machine can cut easily near the plantation. A lot of money is spent for condemnation of the farmer, if the battery powered machine is used then due to low budget small scale farmer can also purchase this machine. Weed cutting machine which is used recently have their axis is perpendicular to ground so it could not cut weed from its roots. But the novelty of this machine is that is can extirpate the weed from its roots due to its spike roller which is axis is parallel to ground. Extirpate will reduce the grow of weeds for long time which also reduce the weeding effort.

4. Brief description of innovative Solution

More labor is required to destroy the weed, instead of which a machine is more beneficial. Weed harvesting is very expensive for farmers because it takes a lot of money by labors and getting the machine working is also expensive due to its operating by petrol and diesel. Battery operated small machine is a good option for weed harvesting. The use of this machine will save fuel and the environment will not be polluted due to non-flammable use. The design of this machine is different from that of an ordinary machine for harvesting weeds. This equipment is very efficient and it can reach as near as possible to plant for harvesting grass and unwanted weed without harm any crop plant. There will be no need for any kind of medicine or pesticides for weed, so that the fertility of the soil does not make harm.
In this machine, the axis of the spike roller has been placed normal to the axis of rotating motor, so that by rolling spike dig the soil. By digging in this way the root of the weed will come up and the soil will become crumble which is very good for the plant. There is 50mm behind this spike roller, an iron comb has been placed perpendicular to ground which collects the grass that has come up and helps to separate it from the soil. This roller can be rolled by 12 Volt DC High Speed Motor which can easily run by battery up to 5hrs with full charge. Small size battery is fitted on the handle of machine and connected to motor. Rotation switch is place on the handle which can be operating by user when it required. Roller diameter is 60mm and length is 30mm on which 8 rolling spike is placed in its circular cylinder. Roller is supported by Handle which is 300mm long. This handle can be extended when as per requirement, the schematic prototype is shown in fig. 1 and design dimension is shown in fig 2.

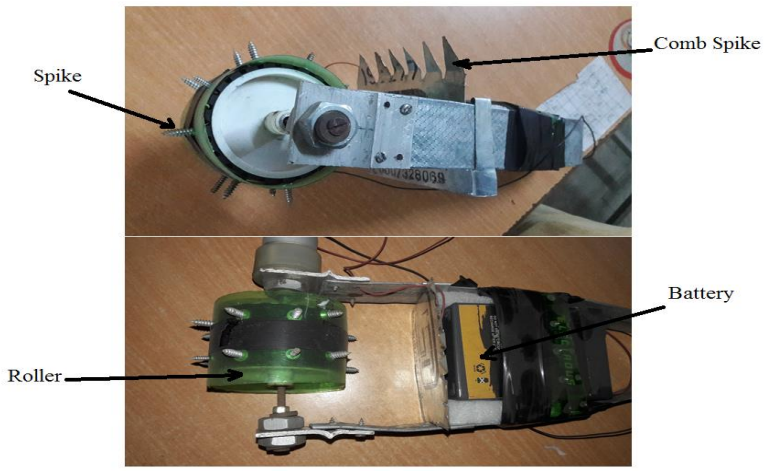

Fig 1 Side and Top view of Weed Cutting Machine

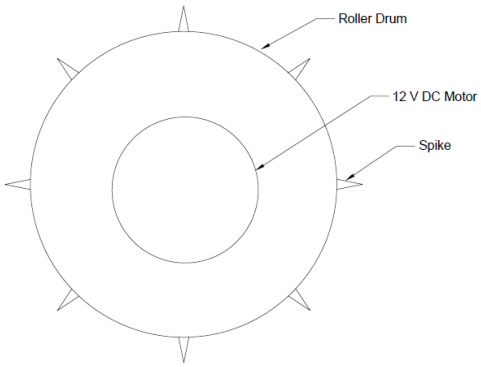

Fig 2 Dimension of working parts

There are many types of machines available in the market which is powered by non-renewable energy like petrol and diesel and these all machines have high consumption of petrol and diesel. If the machine is operated with a battery, then its price will be greatly reduced. If it is brought in the market with low price, it will solve the problems of the farmers and due to the reduction in the price, even small class farmers will be able to buy it easily.

5. Conclusion

It can reduce the labor effort, also decreasing the man power used in the agriculture field. Recharge battery give exemption of non-renewable fuel. Fertility of land and environment could be no harm with this machine. With this type of machine, any farmer can easily do his agricultural work with minimum workers and it can buy this machine without any loan due to its low price and maintenance. All Indian farmers can use this machine for small scale and high scale to increase its efforts with minimum expenditure. This machine will make a great business in between all categories farmers.

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