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BATTERY OPERATED TILLING MACHINE

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ABSTRACT: Traditional farming methods, because they reduce labor, use automated farming methods for the lowest cost. The electric tiller has a new portable design that helps to reduce the time and costs of farming, thereby increasing the productivity and profitability of agriculture. This machine uses wheels with welded corners to keep it on the ground. The wheels are designed to keep the soil firmly in place during cultivation, and are strong enough to pull the fork of the tiller. The machine is driven by an electric motor that moves the wheel using a sprocket and chain arrangement.

I. INTRODUCTION

In India, farmers are currently reluctant to invest in agriculture due to the rise in oil prices. To solve this problem, we developed an electric mower and mower that uses a battery to drive an electric motor. The battery is environmentally friendly and easy to charge. Electric cultivators are mostly used in agriculture to prepare surface fertilizers. country level. Compared to other machines, the portable electric machine is not only more powerful, but also has a good

ability to cut grass. There are many types of electric motors available in the market that are powered by an internal combustion engine. These run on machines and need gasoline or diesel, which is a big problem because these farmers pollute the environment, which is dangerous for human health. To solve this problem, we created this portable power converter. It is economical and pollution free. There is no reason to doubt the new technology in agriculture, and today the electric plows with a working capacity of 8 to 10 hours and a weight of 30 to 40 kg are the cultivators. This program includes an electronic converter. The program includes mechanical design and development of chains and sprockets, bearings, electric motors, bicycle wheels, wheel hubs, batteries, electrics and cables, mounting and connections, frames supports, screws and fittings. The electric tillage we present in this report is ideal for row farming. This machine has a minimum planting distance of 3 hours at a distance of 100 meters and uses a 12 volt battery that can be replaced and charged in 3 to 4 hours and so on. the motor is used on the machine. This machine is easy to operate, small, easy to carry, simple in structure, easy to maintain, and takes up little space. Electric cultivators are mainly used for growing seeds in small farms and mountain farms, and can also be used for spraying horticulture and food crops. A smaller proportion of farmers use power poles for farming than tractors. The first successful example of electric power was the electric power, electric tractor. Agriculture is the backbone of the Indian economy, providing direct employment to 69% of the working population. As the largest source of employment and income for millions of people, there is a waste market for our industrial products. Production of food grains in the country tripled from 55 million tonnes in 1970-71

to 1930 kg/ha in 2010-11, largely due to the spread of irrigation facilities, hybrid seeds and agriculture. (Mandal et al., 2016). Growing agricultural labor and rising wages are not the only reasons for the rapid growth of agriculture. Factors such as time saving, efficient facilities, transportation of agricultural inputs and agricultural products, and reduction in tedious work are driving the demand for agricultural machinery. The development and manufacture of various mechanized equipment on a large scale to meet the needs of farmers is important to the growth of mechanization in India.

II. LITERATURE SURVEY :

1. Professor Prashant Rahat et al (2021) Published in the International Journal of Advanced Research in Science, Communication and Technology (IJARSCT). Design—Portable Energy Storage—In this paper the researcher researches a portable energy storage that can be filled with batteries. Agricultural methods used in agriculture. To provide the ability to hold the ground, the machine uses wheels with welded corners. The wheels are designed to grip the soil strongly and pull the tiller tines during tillage. An electric motor drives the wheel through a chain of gears. By using a motorized tillage system, labor is reduced for the lowest possible costs. The electric cultivator adopts a special transport design to reduce the time and costs of farming and increase the agricultural yield and efficiency.

2. Mr. Mahesh Gavali et al (April 2014) Published in International Journal of Science, Engineering and Technology Innovation Research (ISO 3297: 2007 Certified Organization) Design. A comparison is made between portable and electric generators in India. In this study, the author has compared the portable metallurgical machines and power plants in the Indian market in this article. There are also many methods of pruning plants. Examining the various tools used for mechanical weeding is the main focus of this project. According to research, most Indian farmers, most of whom are small farmers, can only afford portable machinery. Therefore, these smallholder farmers do not use mechanical weed control. These small farmers use both chemical and manual methods. According to a literature review, portable machines have lower operating and maintenance costs, but are less adaptable. Electric motors are more expensive but more efficient.

3. Zakariya et al (June 2021) published in the Journal of Engineering Research and Reports modified a portable electric plow for small-scale weeding. After the first studies, it was found that it is possible to use electric plants to get rid of weeds. Therefore, this study aims to improve its performance by changing some important parts such as grass knife and deep knife. Three sets of four, six and eight blades are made from 3 mm steel. Construction work was conducted at the Department of Agriculture and Biotechnology, Ahmadu Bello University, Zaria. The new machine was tested on grass productivity, field water efficiency, crop damage and fuel consumption on maize fields at the IAR Agricultural Institute and the University's Zaria Research Farm. of Ahmadu Bello during the 2017/2018 irrigation season. There are four levels for surface type "B" and three levels for grass depth "D". After two (2) weeks, the site used a 43 randomized block design.

4. Sabbath J. Hajratwala et al (March 2018) published the designs and fabrications of farmers and microbes in the Open Access International Journal of Science and Engineering. In this paper, the researchers looked at how farmers used traditional farming methods, which were time-consuming, labor-intensive, and expensive, so they introduced new technologies. In India, machinery is used for agricultural purposes with high standards. They created this model to overcome this challenge. This article is about machines that are used to cultivate one and a half hectares of land. With this new technology, the plow is able to move forward continuously, with the base wheels rotating through the blades that provide traction.

III.Existing system: In order for farmers to be successful in agriculture, earlier farmers used old farming methods that cost time, effort and money, so we introduced new technology. Generally, this

machine is used for high level agricultural projects in India. All the machines used in agriculture are very expensive and not practical for the farmers, so to avoid this problem we created this model.

IV. PROPOSED SYSTEM:

Electric cultivators are mainly designed for small farms and hill farms. Farmers use electric tillage machines for farming, which are cheaper than tractors. Electric cultivators are walk-behind tractors that are tested on the operator's back. A power tiller has two handles, and the power tiller is also known as a one-man walk-behind tractor. The operation of the electric tiller should be carried out behind the engine. The machine consists of an electric motor, battery, angle, wheel angle, bearings, power and wire, mounts and connections, screws and gears, bicycle wheel The machine is driven by the motor electric that uses a sprocket chain device to drive the pedal. wheel. The battery is used to drive the motor that pushes the fork to the ground. Cultivation forks can carry out narrow field cultivation according to the needs of the agricultural support frame.

V. Hardware requirements:

1. Battery

Fig 1:Battery

The cutter uses a 12 volt, 7 amp rechargeable lead acid battery. Lead-acid batteries were used to reduce prototype production costs, which are relatively cheap, but can be used for a long time with lithium-ion batteries. The lifespan of the 12V 7Ah battery may vary depending on usage and load. To determine battery life, we need to consider the discharge rate and battery capacity. Battery capacity is measured in Ah, which stands for Ampere hours. For a 12V 7Ah battery, that means it can produce 7 amps for 1 hour, or 1 amp for 7 hours.

2. Motor:

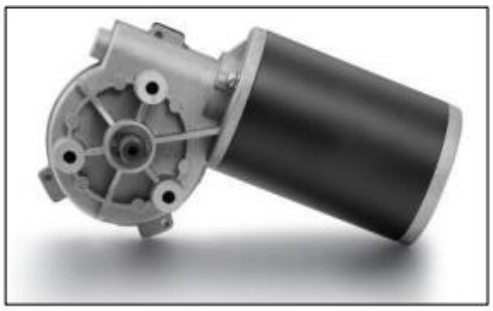

Fig 2:Motor

This project uses a 12V, 90W motor running at 60rpm. Since high torque is the main requirement, low speed is not a problem. Electric motors (DC motors) work on the principle that an electric current is produced in the conductor, placed in a magnetic field, when a current is applied to the conductor, the conductor starts to move and receive mechanical energy.

3. Welded wheel:

Fig 3:Welded wheel

The basic function of the rim is to provide a structure and a solid base for mounting the helmet. Good rims can reduce friction, handling and fuel consumption. Tires provide better support, noise reduction, and control than normal rims.

4. Belt Pulley mechanism :

Pulleys are used in drive systems to transmit power from one source to another. The signs and tools used for towing are used in mechanical vehicles such as cars, trucks and buses. Pulleys vary in speed, strength and distance between the shafts. For example, a V wheel is used when the wheel base is 2 meters. The advantage of the V-pulley is its wide speed range, but the cost of this type of pulley is more expensive than other pulleys. According to strength and speed, there are four types of pulleys: round belt, flat belt, V belt and synchronous pulley.

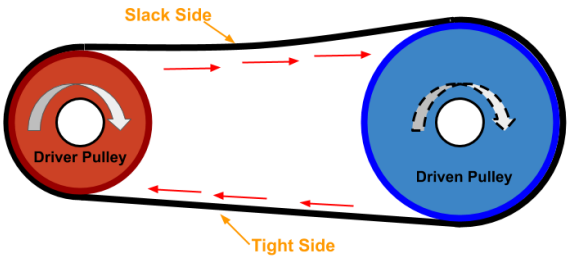

Fig 4:Belt Pulley mechanism

VI:RESULTS:

Fig 5:Frame

Fig 6:Battery and Motor

Fig 7:Fabrication of tiller machine

V. CONCLUSION :

Oil prices and environmental pollution are increasing day by day in today's world. Therefore, this project is designed to control environmental pollution and save oil and bio-products. Because this model requires less investment at the beginning, but it produces more energy and lower maintenance costs. We have developed a new battery-operated tool that reduces the risk of manual cultivators. In our project, we decided that by using this machine we can reduce agricultural costs, animal use, air pollution and labor. Our priority is to help farmers. The labor force was reduced, and after deep research and solutions, an electric cultivator was successfully designed.

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