

SOLAR ELECTRIC CULTIVATOR

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ABSTRACT

Solar electric cultivator we can say in short form SOLECTOR. This is simple and easy word to say.

This paper presents the concept of solar electric cultivator which is mainly Design for small forming and used in the field of agriculture. The adoption of solar electric cultivator by the farmers for carrying out farming operation is low as compared to tractors.

This type of project works on renewable energy and it is also eco- friendly for atmosphere, because here no fuels are used.

It is one of the tillage tools i.e., best for preparing seedbeds. The blade is a crucial component of this equipment because it prepared the seedbed and mix the fertilizer. using this machine and boosting its fertility will raise agricultural output. It produces an atmosphere that is favorable for crop growth to continue. It simultaneously completes both tasks, such as grinding, and bed maintenance. Agriculture is the science that circulates all activities related to food production. Energy is one of the most important needs for human survival on earth. Energy will come from the food. This is perfect for that field, where the tractor cannot be reach like – Gardening.

Key words- Wiper Motor, Solar panel, Cultivator, Rim wheel, Wheel angles.

INTRODUCTION

Now a day, agriculture is a crucial component of the human eco-system. Using a manual solar-powered electric cultivator is a fairly simple activity compared to using a tractor, which is expensive and uses a lot of fuel. It improved the sector's productivity and effectiveness.

These types of machines are also useful for rural and urban areas and this with for small forming such as Onion, Coriander, Tomato, Garlic, Radish, Carrot etc. and other types of crops.

This low-cost portable battery charged solar electric power cultivator machine is one- stop to modern solution to enhance the conventional agriculture method of farming and reduce human effort as low price using motorized electric and solar panel mechanism.

In the present day, all industries, including agriculture, are expanding quickly. To meet future food demands, farmers must implement novel techniques that increase crop output overall without changing the texture of the soil. Its main goals are to cut back on the workforce, which is difficult to find in the current market, as well as working hours. Considering that it has the potential to be far better than the old- fashioned land cultivation techniques that rely on labour or a bull. One of the biggest barriers to increasing agricultural output is a lack of automation or mechanization.

OBJECTIVES

- ❖ There is no required of skilled person.
- ❖ There is no need of fuel because this machine is operated by solar and battery power.
- ❖ It is a pollution free and there is no produces smoke because there no use of fuel whereas Tractor produces large amount of smoke, which are very harmful for human health.
- ❖ The operation of this machine is too easy.
- ❖ Replacement in animal power and human effort.

USED COMPONENTS

Solar Panel-

It is a device which converts the solar energy into electrical energy. The battery charged by this solar energy. Solar energy is free since it is provided by nature. This solar energy is employed in areas where there is insufficient access to electric light or when the electric light fails while the task is being done, in which case solar energy is important.



Figure 01

BATTERY

This is a device which store electrical energy, it stores the 12-volt DC current and used in power transmission. The battery is connected to the motor by a switch which is helps in rotate to the motor. It is charged by the help of solar energy or the electrical energy.



Figure.02

CULTIVATOR

Cultivator is helps to make the pulverizing and mixed the soil of the field and also preparation the seedbed. It is increased the growth of the crop. It also helps us in cutting the weed and increases the fertilizer capacity of the soil.



Figure.03

WHEEL

It is a most commonly a wire wheel, designed for a bicycle. In this project the cycle wheel is used for move the solar electric cultivator. But in this project in place of tire, there is used of small size of wheels angle.



Rim Wheel

Free Wheel

L – Section iron sheet

Figure.04

FREE WHEELS

Free wheels are machine element which is used in the power transformation from one gear to another gear with the help of chain.



WIPER MOTOR

In this project, Wiper Motor is use to convert the electrical energy into mechanical energy and this energy is used to run the machine. Wiper motor is use to provide high torque. The speed of this motor is 65 to 70 rpm and the power of 30 watt and 12 volt.



Figure.06

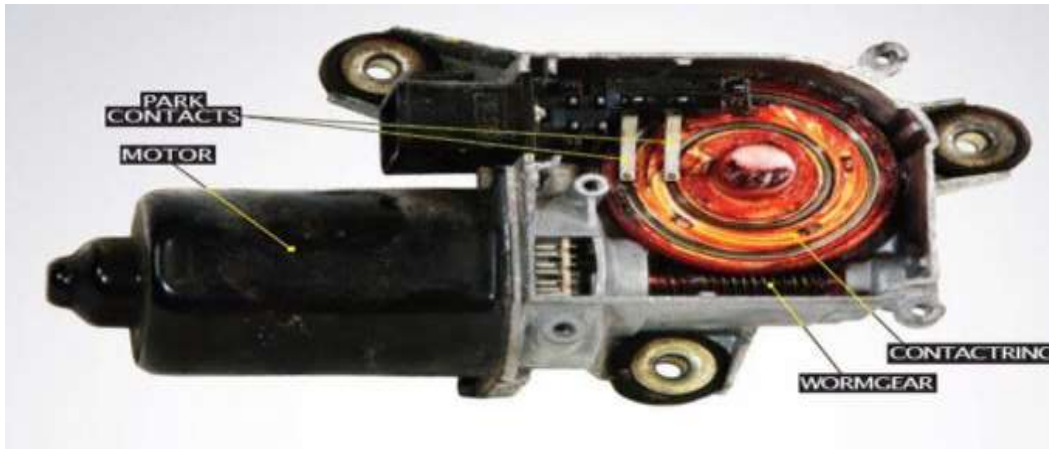


Figure.07

S.N.	USED COMPONENT	PRICE
1	Wiper Motor	1800
2	Battery	850
3	Solar Panel	1050
4	Iron Rod	700
5	Rim Wheel	300
6	Sprocket chain	50
7	Free Wheel	100
8	Cultivator Far	150
9	L – Section Angle	200
10	Switches & wire	100
11	Paints	150
12	Nut Bolts	100
13	Casting	300
	Total cost	5850

CONSTRUCTION

An electric motor powers the device and a chain drive setup is used to drive the pulling wheel . The device is built using an electric motor , battery, chain drive , L shapes angles , electric wire, supporting structures and bicycle wheels and among other components. A battery powers the motor that pushes the forks into the ground. The cultivator forks make it possible to till precisely and easily, as needed for forming. The device is portable and light in weight. The machine requires very little maintenance because it is so easy built.



Figure.08



Figure.09

WORKING

When the on the switch button then start the working of machine. The supporting frame is neatly and precisely modified for tiller machines to supply output voltage of fixed proposition. In this approach, the magnitude is maintained And the input voltage is unaffected by the voltage conditions. The primary wire, which is attached to the switch, has the regulator connected. Wire and a regulator attached to the motor to start the process.

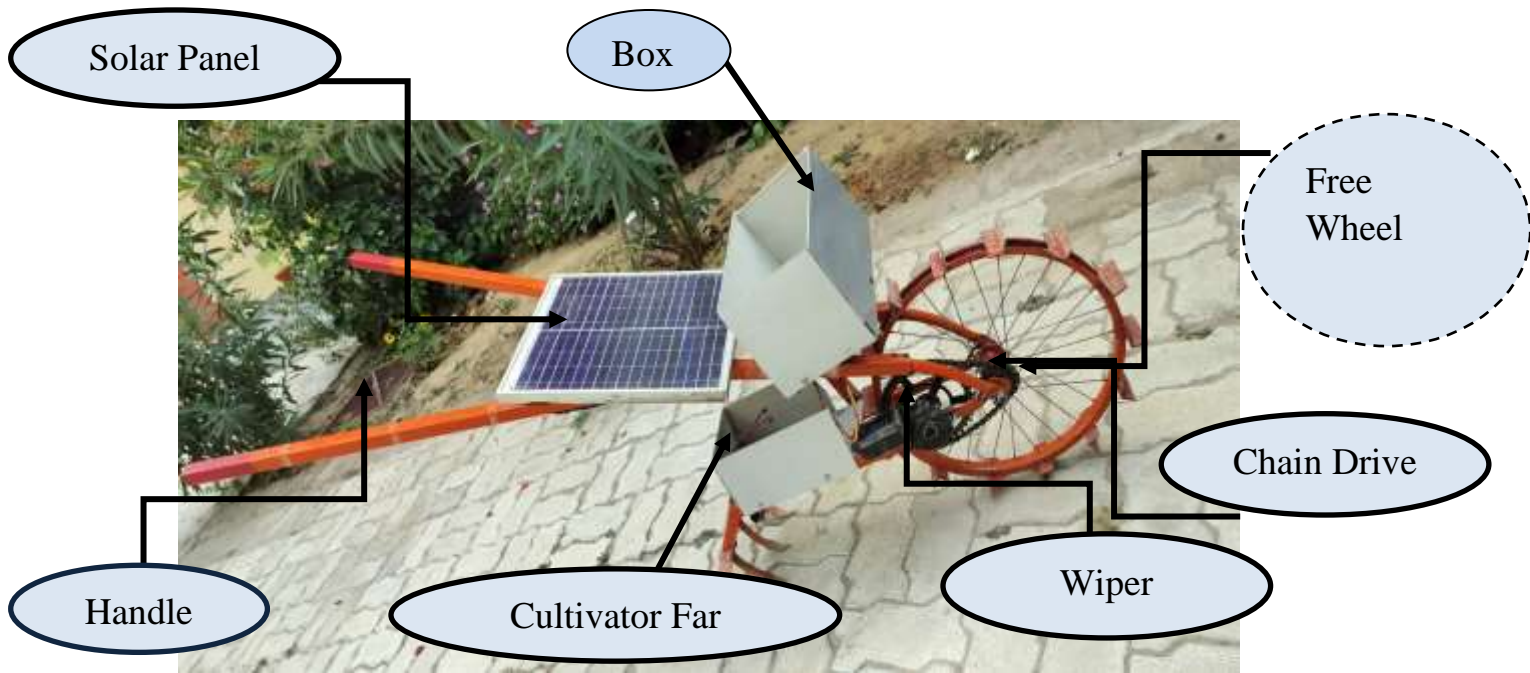


Figure.10



Figure.11

ADVANTAGE

- ❖ The operation of this machine is very easy.
- ❖ Less costly as compared to tractor.
- ❖ Environmentally friendly.
- ❖ It is battery powered, so there no fuels are used

Environmental aspects -

- This type of project works on renewable energy and it is also eco-friendly for atmosphere.
- It is pollution free and there is no produces smoke because there is no use of fuel whereas tractor produces smoke, which is very harmful for health.

Need of Solar Electric Cultivator -

- The Solar Electric Cultivator is also helping to reduce the cost as compared to the tractors.
- There is no need of skilled person because the operation of this machine is too easy.
- Manual Solar Electric cultivator machine of field is very easy task while tractors high capital along with heavy fuel consumption cost.

CONCLUSION

- In this project, we conclude that employing this equipment helps us save money,
- Risk and labor work will be reduced.
- Our primary goal is to assist the farmers.

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