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Solar Power Tiller

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ABSTRACT: Agriculture has been an integral part of the human ecosystem. Now a days it is very important part in human life, because population is growing day by day as it feed us and thereby it runs the farming techniques are very intensive. However, traditional farming methods require a lot of human effort and are very time-consuming. So, by using tilling machine in farming helps to reduce time and cost involved in tilling. So automated tiller machine is used to reduce labor problems and also it is eco-friendly to the environment.

KEY WORDS: Agriculture, Farming, Tilling Machine, Environment ECO-Friendly.

I. INTRODUCTION

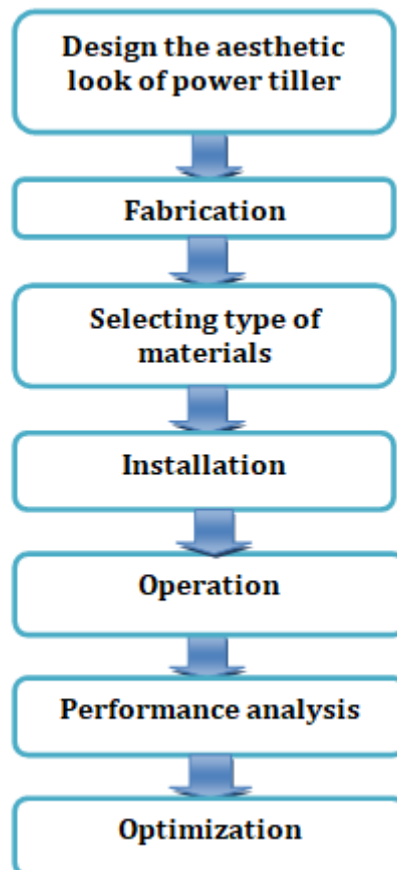
Power tiller helps in preparing the soil sowing seeds, planting seeds & spraying the fertilizers, herbicides & water. In addition to it also helps in pumping water, harvesting, threshing & transporting crops. Power tiller can be used in almost all agricultural operations. It improves quality of work and products, frees up the time of farmers for other farm operations.

II. LITERATURE SURVEY

- [1]Prof. Patil digvijaypandurang “Mechanical Power Weeder Design and Development” They found that the plants growing when not required will affect the life of the other plans as a result turns in to the failure of the farmer. In India, major percentages of people are dependent on the farming for even their day to day expenses. Every stage of the farming has several reasons for failure and must be completed in the specified time for effective cultivation. The complete design stages of the machine have been discusses in this paper. The machine will found useful for the farmers due to cost effectiveness.
- [2]Prof. Shabbir. J et al “Design,Devellopment and fabrication of mini cultivator and tiller” Form this research paper we find that main advantage of this technology was that any farmer in India can easily handle this mini cultivator. As increasing the traction and torque for tilling process achieving by depth of 4-7 inch. The transportation of tiller can be replaceable to bladed wheel with normal tyre. This machine was affordable to farmers and capable of performing multifunction like Plowing, Differential Cultivation, Wrapper, and Pudding etc.
- [3]Prof Aravind Rajetal. “ Design and Fabrication of Rotary Tiller Blade” In this paper they found that working width and optimal diameter of rotary tiller proportionate to the power tiller. They are tried to achieved the maximum field efficiency for the rotary tiller and to reduced the consumed materials in the manufacturing of this machine.
- [4]Prof Abhijit garjeetal. “Design, Development and Operation of 3.5HP Power Tiller ” In this paper they studied that machine chain and sprocket are used for power transmission whereas in other machines gears are used for cost reduction. As machine was simple in construction, accurate manufacturing and standard components are used, so

machine required less maintenance. It was designed on the basis of optimum material consideration.

III. METHODOLOGY



IV. EXISTING MACHINE

- In earlier days the machine runs by the electrical charged battery.
- Power consumption is required to charge the battery.
- In earlier method work has to be taking more time, because of battery charging

V. UPDATED MACHINE

- Now a days power saving is important ,so we are going to using solar energy.
- Here the battery is going to be automatically charged with the help of solar energy
- In this updated machine time taking for work is less and also there is no need of additional charging to the battery.

VI. COMPONENTS OF SOLAR POWER TILLER

- Solar panel (12v,64W)
- DC motor (12V,300rpm)
- Lithium Ion Battery (12.8V,7.5 Ah)



- Supporting Frame
- Chain and Sprocket
- Switch
- Rim
- Cultivator Teeth
- L-Shape Angle

Solar Panel: A solar cell panel, solar electric panel, or solar panel, also known as a photo-voltaic (PV) module or PV panel, is an assembly of photovoltaic solar cells mounted in a (usually rectangular) frame. Solar panels capture sunlight as a source of radiant energy, which is converted into electric energy in the form of direct current (DC) electricity.

DC motor: A brushless DC electric motor, also known as an electronically commutated motor, is a synchronous motor using a direct current (DC) electric power supply. It uses an electronic controller to switch DC currents to the motor windings producing magnetic fields which effectively rotate in space and which the permanent magnet rotor follows. The controller adjusts the phase and amplitude of the DC current pulses to control the speed and torque of the motor. This control system is an alternative to the mechanical commutator (brushes) used in many conventional electric motors.

Lithium Ion Battery: A lithium-ion or Li-ion battery is a type of rechargeable battery which uses the reversible reduction of lithium ions to store energy. The anode (positive electrode) of a conventional lithium-ion cell is typically graphite made from carbon. The cathode (negative electrode) is typically a metal oxide. The electrolyte is typically a lithium salt in an organic solvent.

Two Wheeler Back Wheel Rim: The rim is the "outer edge of a wheel, holding the tire". It makes up the outer circular design of the wheel on which the inside edge of the tire is mounted on vehicles such as automobiles. For example, on a bicycle wheel the rim is a large hoop attached to the outer ends of the spokes of the wheel that holds the tire and tube. In cross-section, the rim is deep in the center and shallow at the outer edges, thus forming a "U" shape that supports the bead of the tire casing.

Chain and Sprocket: Chain drive is a way of transmitting mechanical power from one place to another. It is often used to convey power to the wheels of a vehicle, particularly bicycles and motorcycles. It is also used in a wide variety of machines besides vehicles.

Wheel Angles: A MS angle or mild steel angle is a L-shaped cross-section used in the construction of buildings and structures. The most commonly used MS steel angles are the ones forming a 90-degree angle with two sides of equal length and width. The angles with uniform sides are called equal angles and the ones with one side bigger than the other are called unequal angles.

VII. OVERVIEW OF THE PROJECT PROTOTYPE



FIG:- SOLAR POWER TILLER

VIII. ADVANTAGES

- Automatic Operation.
- Battery Powered no fuel needed.
- Easy to operate.
- Cost- effective as compared to a tractor.
- Replacement for animal power and human effort.
- Simple in design.
- Easy to maintain.
- Cheap in cost.
- Pollution free.
- Eco-friendly
- User friendly
- It has low running cost



IX. DISADVANTAGES

- It needs charging when battery runs out.
- Clean after every use.

X. FUTURE SCOPE

Scope of The Work:

In future the tiller machine can be update as much as now:

- 1) In future the BLDC motor can be replaced with E-Bike hub motor, some parts can be added like accelerator and brake to make the work easy.
- 2) Various processes along with Ploughing could be done such as seeding and spraying by adding more attachments.
- 3) More operations can be included to the machine like pesticide sprayer, tiller and many other machines for various operations.
- 4) By making modification same machine with able to changing the different rotary tool for different purpose example rotary tool for cutting purpose, digging purpose.

XI. CONCLUSION

Today in the world fuel prices and environmental pollution increases day by day. So control environmental pollution, to save fuel and bio product this project is design. For this model requires low investment at the starting stage but its gives more energy output with low maintenance. Our new project developed battery powered is minimizing the harmful effort of manual tiller. Here in our project we conclude that by using this machine we reduce the farming cost, animal use, and air pollution and manpower. Our main objective is to help the farmers.

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