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MULTI-PURPOSE FARMING MACHINE USING SOLAR ENERGY

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Abstract: In India almost 75% of people are depending on agriculture. This project is an eco-friendly and pollution free operation & are performed in the agricultural field like inter cultivation, seed sowing, good carrying and pesticides spraying etc.by using this machine we can reduce the most of the man power and the time. In agriculture it is very important to fill the gap between the farmers and the implementation of Technology.Energy demand is one of the major thread for our Country. Finding solutions, to meet the energy- demand is the great challenges for social scientist, engineers, entrepreneurs and industrials of our country according to them, applications of non-convectional energy is the only alternate solutions for Convectional energy demand. Now a day the concept and technology employing this non- conventional energy becomes very popular for all kinds of development activities. One of the major area, which finds number applications are in agricultural sector, here we are fabricating the agriculture multi-purpose machine is a new innovation model which is mainly used for cultivation, seeds sowing and water spraying.

Keywords: Cultivation, seed sowing, goods carrying, pesticides spraying.

- **INTRODUCTION**

Agriculture has been the backbone of the Indian economy and it will continue so for a long time. A man without food for three days will quarrel, for a week will fight and for a month or so will die. Agriculture is a branch of applied science . Agriculture is the science and art of farming including cultivating the soil, producing crops and raising livestock. It is the most important enterprise in the world. Over the years, agricultural practices have been carried out by small-holders cultivating between 2 to 3 hectare, using human labor and traditional tools such as wooden plough, yoke, leveler, harrow, mallot, spade, big sikle etc.

These tools are used in land preparation, for sowing of seeds, weeding and harvesting. Modern agricultural techniques and equipment are not used by small land holders because these equipment are too expensive and difficult to acquire. By adopting scientific farming methods we can get maximum yield and quality crops which can save a farming from going bankrupt but majority of farmers still uses primitive method of farming techniques due to lack of knowledge or lack of investment for utilizing modern equipment.

- **LITERATURE SURVEY**

1. D.A.Mada and Sunday Mahai, have come up with the idea and methodology to develop mechanization in such a way to meet the demands of poor farmers in Nigeria. They emphasized on versatility of the farming equipment for using in different farm operations.

2. Dr.C.N.Sakhale, S.N.Wahmare and Rashmi S. Chimote, have developed a working model of a multipurpose farm vehicle, which powered by 24cc engine, their model also does fertilizer spraying and cultivation, digging and seed sowing operations.

3. Prof. M.V.Achutha, Sharath Chandra and Nataraj G.K. have done design analysis of an agricultural vehicle to optimise the amount of materials used for it .

4. KshirsagarPrashant, Kuldip Ghotane,have done design analysis to develop an agricultural vehicle by Considering various loads acted upon it when various auxiliaries are mounted on it.

5. Yogesh Sunil Wamborikar, Abhay Sinha, “Solar Powered Vehicle” in their design of solar powered vehicle, sun is the main source of energy for the vehicle. Energy from sun is captured by the solar panels and then this energy is converted to electrical energy. The electrical energy thus formed is being fed to the batteries that get charged and is used to run high torques DC series motor. The shaft of the motor is connected to the rear wheel of the vehicle by using chain sprocket.

- **PROBLEM STATEMENT**
  - Lack of mechanization in farming.

    1. Mechanization is a crucial input for agricultural crop production and one that historically has been neglected in the content of developing countries. Factors that reduce the availability of farm power compromise the ability to cultivate sufficient land and have long been recognized as a source of poverty.
  - Required excess efforts for different process.

    1. Soil preparation: The soil is plowed, leveled and manured before sowing the seeds.

    2. Sowing: Seeds of good quality are sowed or dispersed in the soil.

    3. Manuring: The nutrients are provided to the seeds at regular intervals. Manure is the decomposition product of plant and animal wastes.

    4. Weeding: Weeds or unwanted plants are removed using we dicides or removing them Manually.
  - Excess time consumption for performing individual process.

    1. By introducing Machine power, mechanised farming etc we can reduce manpower in farming and direct them to small agriculture land to remove their poverty.

- METHODOLOGY

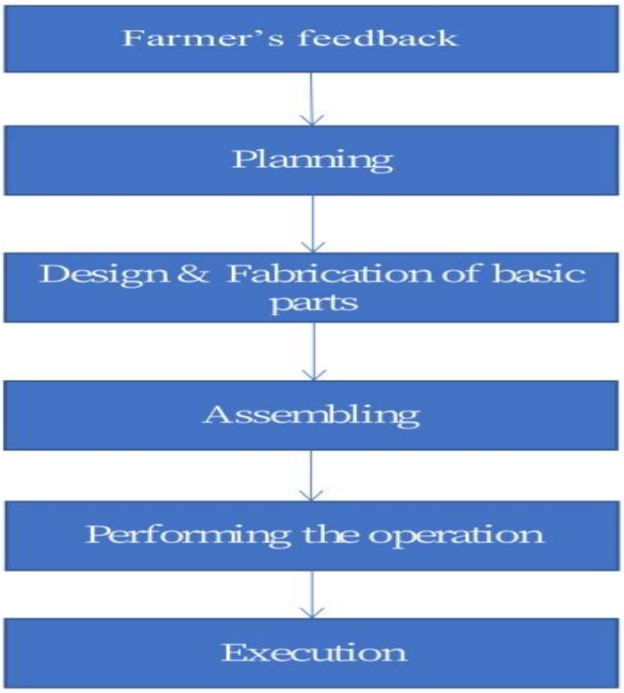

Fig1: Methodology

Below Fig shows the operation of Solar based multipurpose purpose farming machine. The solar panels which are observed the solar radiation in the form of heat energy or DC. This DC is stored in battery charged circuit. There is steady static blade is used at rear side of machine with shaver blade. But in this machine we modified the tooling system is steady into rotary which is driven by Electric dc motor with producing the torque. This consist of a solar panel and it generates energy to run this machine the solar radiations are immerse on Solar panel by this process the solar energy is converted into electrical energy is stored in a battery then the battery passes electric energy to controller kit, when controller kit is energized we can minimize or maximize motor speed as per our need. After controller kit gets it supply to run motor, when the motor runs and finally work is done by rotor where there is turn machine we can turn it easily.

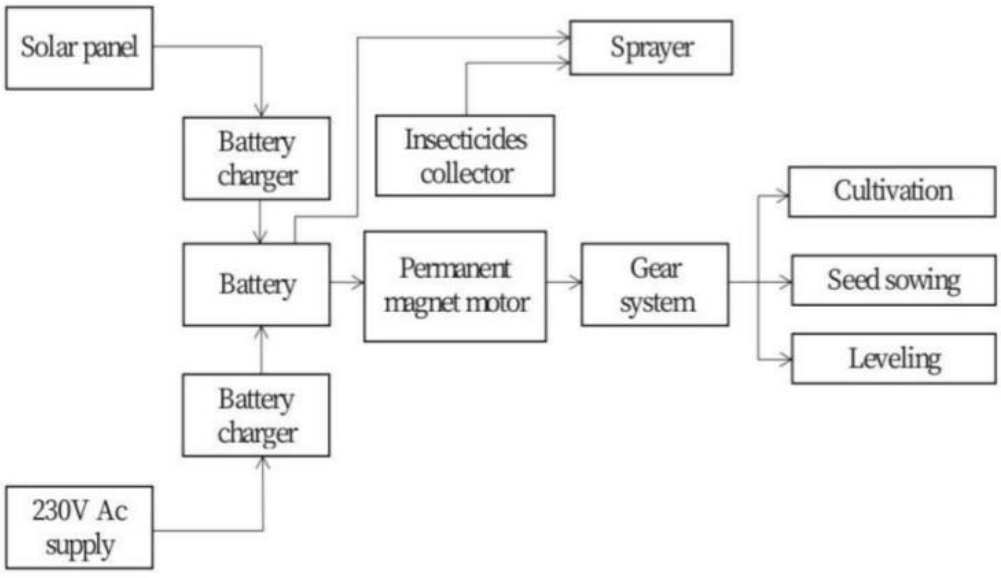

Fig 2: Block Diagram

can be charged from solar panel or alternatively by direct electrical source. Here we are using PMDC (Permanent magnet DC) motor which is having the features like, it is a type of motor that uses permanent magnet to create the magnetic field.

To run the PMDC motor, the supply is taken from the battery. Energy required for spraying purpose will be supplied from battery. Motor shaft is arranged to place vertically, gear system makes conversion of vertical rotation into wheel movement in forward direction. The required energy will be drawn from battery. Seed container is used to store the seeds. Lever is fitted to close the seeds after the seed sowing. The blade is rotated in clockwise direction but the shaft rotates in anti-clockwise direction to develop a torque. The whole machine requires the 12V battery to operate the system. In the absence of solar energy we can use alternative source of supply.

- **Components**:

1.solar panel:A solar cell (also known as a photovoltaic cell or PV cell) is defined as an electrical device that converts light energy electrical energy through the photovoltaic effect.

Fig 3: solar panel

2.battery

, we used two batteries with the voltage of 12V and current of 7.5A each, producing a fully charged output voltage of 24volts, 15Amps. A battery cell consists of two lead plates a positiveplate covered with a paste of lead dioxide and a negative made of sponge lead, with an insulating material(separator) in between.

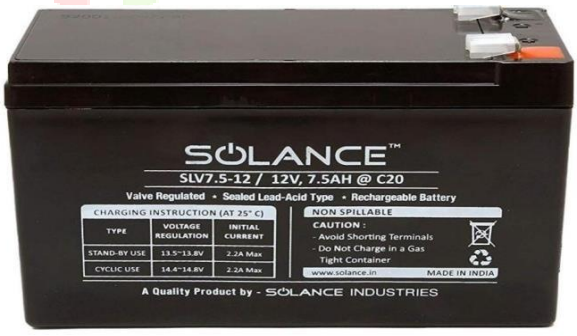

Fig 4: battery

3.permanent magnet DC motor (PMDC): PMDC motor, stator field is generated by permanent magnet and hence the field remains constant. Due to constant stator field, linear torque/speed characteristics can be obtained. PMDC motor provides high torques; it is widely used in the application where accurate position control is required. In this project the motor need starting torque as to be high that's why this project use permanent magnet DC motor of following rating

Fig 5: PMDC

- **Result and discussion**

Fig 6: multi-purpose forming machine

Based on the overall performance of the machine we can definitely say that the project will satisfy the need of small scale farmers, because of their requirements is fulfilled.The machine requires less man power and less time the unit cost of the product can greatly reduce by man production and we hope this will satisfy the partial trust of India agriculture. Today's major labour problem in farming can be solved.

- **Advantages**

1. Simple in design: The farming machine design is very easy compare to the other machine like diesel or petrol using machines.

2. Easy to operate : The farming machine is operate using solar energy and motor that's why the operation is easy.

3. Easy to maintain: The farming machine is operate using renewable energy sources so the maintenance is easy.

4. Cheap cost: Cost of the renewable energy source that is solar energy is freely available in nature so the cost is less.

5. Pollution free: The solar energy source is not producing any pollution from its operation.

6. Eco friendly: The solar energy is renewable and freely available and non-pollution source in the environment.

- **Disadvantages**

1.difficult to cultivate large area.

- **Applications**

- A forming machine in agricultural implement fitted with rotary tillers which gives a smooth resistance to all farm activities.
- In the form machine which is mainly used to cultivating, seed sowing, spraying and leveling the land.
- Although it is mainly used for seedbed preparation in low land paddy field. It is also used as a power source or other .
- Sowing and fertilizer application in agriculture field.

CONCLUSION

The "Multipurpose farming machine" aims to perform various operation of the agricultural, which are accomplished by using various components like solar panel, D.C. motor and motion transmission mechanisms. The various component required for building the multipurpose agricultural equipment has been designed as planned. Multipurpose agricultural vehicle is single system which can perform multi operations like sowing, water sprayer, cultivating, leveling. It can also be used for local transportation purpose for material handling Multipurpose agricultural vehicle will reduce external changes like fuels; electricity etc. and his will be helpful for poor farmers. Multipurpose agricultural vehicle is a single system which contains multi attachment. The equipment weight is around 8 to 10 kg thus it can be carried easily in farmland. The equipment can do the work of 4 labors a day which reduces the labor cost of the farmer.

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