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Solar Powered Digging and Seed Sowing Machine

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Abstract: A seed drill is a sowing gadget that definitely positions seeds in the dirt and afterward covers them. Prior to the presentation of the seed bore, the regular practice was to plant seeds by hand. Other than being inefficient, planting was extremely uncertain and prompted to a poor appropriation of seeds, prompting to low efficiency. The utilization of a seed bore can enhance the proportion of harvest yield by as much as nine circumstances. The genuine power required for machine hardware relies on upon the imperviousness to the development of it. Some of these resistances are the wind resistance, the moving resistance and the inclination resistance.

Keywords: Seed Sowing, Agricultural Sector, Solar Powered, Portable, Motor, Solar Panel, Battery, Microcontroller, Display, IC, Wheel, Hopper, Iron Plate, springs.

I. INTRODUCTION

The fundamental go for our venture has been to build up a solar powered digging and sand sowing machine, which is sunlight based fueled. In this machine utilized a sunlight based board to catch and change over solar energy into electrical energy which thus is utilized to charge four 12V batteries, which then gives the vital energy to a shunt wound DC engine. This power is then transmitted to the back wheel through belt drives. The speed control is done through a variable belt course of action.

Thus, in this venture an endeavor is made to make the electric and mechanical frameworks share their forces in a productive way. Therefore mulling over the steadily expanding contamination levels and the stringent contamination standards (EURO-II and onwards) set up by the POLLUTION CONTROL BOARDS, and since the fossil powers are exhausting, most likely may last inside the decades to come or before, and to decrease the running expense of the burrowing machine, we are trying to consolidate the previously mentioned highlights in our cutting machine.

II. MATERIALS AND METHODOLOGY

A. Chassis

A chassis comprises of an interior system that backings a man-made question in its development and utilize. It is comparable to a creature's skeleton. A case of an undercarriage is the under piece of an engine vehicle, comprising of the edge (on which the body is mounted). In the event that the running rigging, for example, wheels is incorporated then the gathering is portrayed as a moving case. Material Used In Chassis - Iron Size of Chassis – 22 inch x 8 inch x 36 inches.

B. PCB

A printed circuit board (PCB) mechanically underpins and electrically associates electronic parts utilizing conductive tracks, cushions and different components scratched from copper sheets covered onto a non-conductive substrate. PCBs can be single sided (one copper layer), twofold sided (two copper layers) or multi-layer. Conductors on various layers are associated with plated-through openings called vias. Progressed PCBs may contain parts - capacitors, resistors or dynamic gadgets - implanted in the substrate. Printed circuit sheets are utilized as a part of everything except the least difficult electronic items.

C. Drill Bits

Drill bits are slicing instruments used to make round and hollow openings, quite often of roundabout cross-area. Bores come in many sizes and have many employments. Bits are typically associated with a component, frequently basically alluded to as a penetrate, which turns them and gives torque and hub compel to make the opening. The shank is the piece of the boring tool got a handle on by the throw of a penetrate. The forefronts of the boring apparatus are toward one side, and the shank is at the other. 18000 RPM base engine 6mm Dia shaft with M3 string gap Length 63 mm without shaft length 30mm 12kgcm torque.

D. Battery

An electric battery is a gadget comprising of at least one electrochemical cell that change over stored chemical energy into electrical energy. Every cell contains a positive terminal, or cathode, and a negative terminal, or anode. Electrolytes permit particles to move

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between the cathodes and terminals, which permits current to stream out of the battery to perform work. Battery: 7.5 Amp Hour 12 Volts Sealed Lead Acid Battery.

E. Electric Motor

An electric motor is a gadget used to change over electrical vitality to mechanical vitality. Electric engines are critical in cutting edge life. The fundamental guideline on which engines work is Ampere's law. This law expresses that a wire conveying an electric current delivers an attractive field around itself.

Motor diameter 28.5 mm

300RPM base motor

No-Load current = 800 mA

Load Current = up to 7.5 A (max)

F. Solar Panel

Solar Panels are an incredible method for cutting your electric power. We as a whole need to live self-reasonably, or if nothing else lessen the carbon impression of our home, and solar panels make that fantasy conceivable. Solar panels are made of photovoltaic (PV) cells, which transform sunlight into power. This power can then be nourished into your home's mains power supply.

III. METHODOLOGY

In this machine a solar panel is utilized to catch solar energy and after that it is changed over into electrical energy which thusly is utilized to charge 12V battery, which then gives the important energy to a shunt wound DC engine. This power is then transmitted to the back wheel through chain drives. Thus, in this venture an endeavor is made to make the electric and mechanical frameworks share their forces in an effective way.

The essential target of sowing operation is to put the seed and manure in lines at fancied profundity and seed to seed dispersing, cover the seeds with soil and give legitimate compaction over the seed. The prescribed line to line dividing, seed rate, seed to seed separating and profundity of seed arrangement can shift from harvest to edit and for various agro-climatic conditions to accomplish ideal yields. Run of the mill utilization of seed sowing of Cereal's including ground nut, a wide range of dal's, oil seed harvest and so forth.

A solar panel is a gadget that gathers and changes over sun based vitality into power or warm or mechanical work. Sun based vitality is initially used to charge a capacity battery. An electric battery is a gadget comprising of at least one electrochemical cell that change over put away synthetic vitality into electrical vitality. The sun oriented vitality put away in the battery is used to work DC engine. A DC engine is a gadget that proselytes coordinate current (electrical vitality) into mechanical vitality. By utilizing the incline rigging and Chain drive with sprockets power is exchanged to the wheels for their development. AT89S52 Microcontroller is utilized to naturally control the machine. IR Sensors are fitted to the machine for programmed turning operation and to detect the hindrance in the moving way. An infrared sensor is an electronic instrument.

IV. DESIGN AND FABRICATION

A. Block Diagram of the Machine

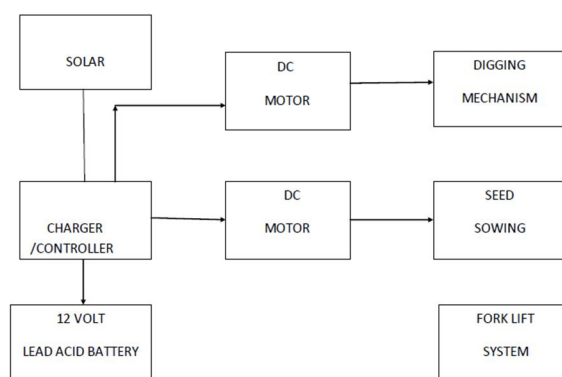


Fig 1: Block diagram of design of the machine

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B. Design of Seed Box and Bottom Frame

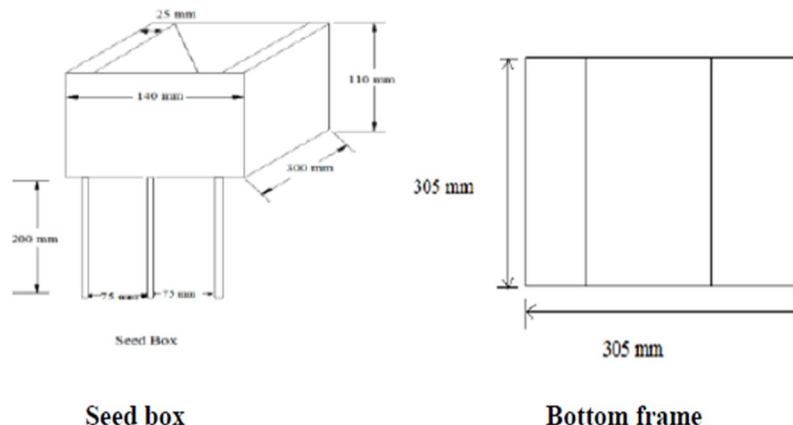


Fig 2: Design of seed box and bottom frame

C. Specification of Bottom Frame

Dimension: 760 x 520 mm

Material: MS Angle 50 x 50 x 6 mm

Weight/m: 4.5 kg/m

Total weight of base frame: 9.4 kg

Material: Mild steel 2mm thick

Dimension: 540 x 420 x 285 mm

Weight: 7.3 kg

V. EXPERIMENTAL SETUP



Fig 3: Model setup of a Solar powered digging and seed sowing machine

A. Working of a Digging and Seed Sowing Machine

Consider the get together appended to the tractor. Amid cotton planting the wheel of grower is put on ground, as the tractor moves grower wheel likewise turns. This movement of grower wheel is exchanged to pulley1 which is connected on a similar shaft. Movement of pulley1 is exchanged to pulley2 by methods for chain or belt drive. Attributable to this course of action gear1 pivots. When teeth on gear1 networks with gear2, it turns to some degree, then the gaps on plate harmonizes with the openings of chamber through moving strip so that seed from the tank get discharge according to prerequisite.

When gear1 separates with gear2, gear2 come back to its unique position by methods for spring strain (spring is joined to the pole of This cycle continues rehashing coming about into the required dispersing in seed sowing. The required dispersing can be balanced

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by giving gaps on circle at various edges, for example, 0, 45, and 90(for illustration we can plant the seed at 1, 2, and 4 feet by shutting and opening of gaps on plate).

Whenever seed dispersing is not required, gear1 can slide on shaft so that gear2 does not work with gear1. Hence plate won't pivot and opening on circle matches with the gaps on chamber guaranteeing consistent stream of seeds.

For various sizes of seeds we can conform the stream of seeds (from tank to plate) with the assistance of moving strip which can slide over the chamber with the assistance of lever.

Row separating can be balanced with help of the nut and fastener game plan gave on the base plate.

In the event that if tractor prevents the seed spill out of tank can be halted by giving key to the channel funnels. This key can be connected to the lifting lever gave close to the administrator.

VI. PERFORMANCE CHARACTERISTICS AND ADVANTAGES

A. Performance Characteristics

Model of the sunlight based worked programmed seed sowing machine created has the accompanying Performance qualities.

Working rate of the machine rely on the DC engine and vitality put away in the battery.

Prototype Machine can delvelop the dirt in three lines up to 5 crawl by pivoting the burrowing device by the assistance of DC engine.

Digging speed rely on upon the dampness content in the dirt and device tip.

At a similar moment from the seed dropper seed is put in all the three columns at a separation of 4 inch.

No. of seed setting at a moment can be fluctuated by changing the extent of openings in the dropper.

By the assistance of 4 post sensors, machine will detect the track length of the field and takes a programmed turning toward the finish of the limit.

Later on work this machine can likewise be further intended to identify obstruction exhibit in the way by utilizing IR sensor.

B. Advantages

The seeds can be placed at proper depth.

- 1) Seed rate can be controlled.
- 2) Many seeds can be sown by this machine.
- 3) Mixed cropping can be easily done.
- 4) Due to little size machine is compact. What's more, can likewise be used in small area.
- 5) Cost productive.
- 6) Less Man Power will be utilized.
- 7) Decrease the unsettling influence of the agricultural soil by 98%
- 8) Improve agricultural soil carbon sequestration
- 9) Save vitality, money and time of a rancher.
- 10) Required seed separating can be accomplished.
- 11) Variety of seed can be sown by this machine.
- 12) When contrasted with customary sowing strategies time required is less.
- 13) Seed stream can be controlled.

C. Applications

- 1) It is extremely appropriate for huge fields.
- 2) As this plays out numerous errands so it is exceptionally appropriate for the ranges where there is work deficiency.
- 3) Very valuable for little scale agriculturists.
- 4) Accuracy is high.
- 5) Speed of work is more.
- 6) No additional exertion is required.
- 7) Man prerequisite is low

VII. CONCLUSION

Innovative seed sowing equipment's has exceptional influence in agriculture. By using this innovative project of seed sowing gear

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we can spare more time required for sowing process and additionally it reduces lot of labor cost. It is very helpful for small scale farmers. After comparing the distinctive method of seed sowing and restrictions of the existing machine, it is concluded that this solar powered seed sowing machine can:

Maintain row dispersing and controls seed rate.

Control the seed depth and legitimate utilization of seeds can be done with less misfortune.

Perform the different simultaneous operations and hence saves work requirement so as labor cost, labor time and also save parts of energy.

Hence it is easily affordable by farmers. So we feel that this project serves something good to this world and we would like to present it before this prosperous world.

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