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SOLAR POWERED SEED SPRAYER MACHINE CONTROL BY MOBILE

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ABSTRACT: In India, where 70% of the population relies on agriculture, it's crucial to modernize farming procedures aimed at reducing farmers' manual labour load.These days, planting seeds requires lot of work and effort.We suggest creating a universal automated seed-sowing system as a solution to this problem.
With this invention, manual labour will be reduced as seeds are accurately dropped at predefined intervals and lines, streamlining the process of seed planting.The equipment mechanically seals the furrows after seeding use a control mechanism to guarantee precise seed placement.With the use of such technologies, we can drastically reduce the labour that farmers must do and save time, energy, and labor costs in agricultural operations. This project focuses on the development of a Solar Seed Sprayer Machine to address the growing need for efficient agricultural techniques. The machine utilizes solar power to spray seeds onto fields, eliminating the need for manual seeding. By streamlining the process, it reduces time, labor, and energy consumption while enhancing crop production.
Keywords: Seed Sprayer Machine, Relay, Bluetooth Module, Robot, Battery, Solar Panel, DC Motors

I. INTRODUCTION

For varying agricultural and climatic conditions, the ideal row-to-row spacing, seed rate, seed-to-seed spacing, and depth of seed planting vary depending the crop. An effective sowing machine should try to meet these needs.Using better machinery for these kinds of tasks also has the added benefit of reducing labour, energy, and time costs.The conventional seed-planting approach has numerous drawbacks.
This essay discusses the various approaches to planting seeds, adding fertiliser to the soil, and creating a --- multifunctional seed sowing machine which can perform simultaneous operations. For a long time, it has been thought that atomic energy would be a solution for the growing energy problem, but in recent times solar energy has proved to be an efficient, more secure and safe way of providing energy. Concepts related to the solar energy have constantly been under heavy research and development. The basic objective is to optimize the energy produced from photovoltaic cells, by making the overall systems more efficient and cost effective.

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Most solar panels are statically aligned; they have a fixed position at a certain angle towards the sky. Therefore, the time and intensity of direct sunlight falling upon the solar panel is greatly reduced, resulting in low power output from the photovoltaic (PV) cells. This requires constant tracking of the sun's apparent daytime motion, and hence develops an automated sun tracking system which carries the solar panel and position it in such a way that direct sunlight is always focused on PV cells. Seed sowing machine is a device which helps in the sowing of seeds in a desired position hence assisting the farmers in saving time and money. The basic objective of sowing operation is to put the seed and fertilizer in rows at desired depth and seed to seed spacing, cover the seeds with soil and provide proper compaction over the seed.

II. LITERATURE REVIEW

1) Suganya and Jayaranjani introduced a seed sprayer machine incorporating solar power and Bluetooth connectivity, offering potential advancements. However, the system's complexity may hinder its practicality in today's context.
2) Ravi, GobiGanesh, Gokulakannan, Kandeeswaran, and Kesavan presented a seed sprayer machine driven solely by fuel, indicating a notable disadvantage due to environmental concerns and operational costs.
3) Pawar, Gorane, Labhade, and Jadhav proposed a seed sprayer machine controlled by mobile devices, suitable for harsh environments but potentially limited by its complexity and higher cost.
4) Al-Talib, Xian, Atiqa, and Abdullah introduced a solar-powered seed sprayer machine, offering basic functionality but lacking adaptability to different environments and technological advancements.
5) Overall, while each study contributes valuable insights, there remains a need for a comprehensive solution that balances efficiency, environmental sustainability, and cost-effectiveness in modern agricultural practices.

III. PROBLEM IDENTIFICATION

The results of the literature analysis revealed that the methods used in previous research to plant several seed in rows that are evenly spaced apart and to cover the seeds with dirt after they have been sown were lacking .Thus, by creating an automated multiple seed sowing procedure and adding a soilclosing mechanism, this st udy seeks to close these gaps.The suggested remedy, known as the Universal Seed Sowing Machine, is inten ded to drastically save labour expenses and time related to with traditional methods. With the global population expected to increase rapidly, there is a pressing need for innovative technologies to enhance agricultural productivity. Achieving uniform seed spacing is crucial for optimal plant growth and yield. Additionally, heavy machinery poses challenges in muddy fields, potentially damaging the soil. Hence, the Universal Seed Sowing Machine is designed to be lightweight and cost-effective, ensuring efficient seed sowing while minimizing soil disturbance.

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IV METHODOLOGY

1)This device uses a solar panel to absorb solar radiation and transform it into electrical energy.
A 24 volt battery with a 7.5 amp hour capacity stores the electrical energy, which subsequently provides the required power to a DC motor.The belt and pulley system then transfers this power to the cutter.
2) The farm field will be ploughed to make a furrow for the unsown seeds because of the shear deformation caused by the cutter's teeth.
3) The friction between the hopper's surface and the earth causes the seed hopper to revolve.
Rotation torque is produced through ground contact.Because of their own weight, seeds will fall from the pe rforations onto the ground.
4) The basic objective of sowing operation is to put the seeds in rows at desired depth, to maintain seed to seed spacing and to cover the seeds with soil and provide proper compaction over the seed. The recommended row to row spacing, seed rate, seed to seed spacing and depth of seed placement can vary from crop to crop and for different agro-climatic conditions to achieve optimum yields. Typical application of seed sowing of Cereal's including ground nut, all types of dal's, oil seed crop's etc.
5) To put the soil back on the seeds, an adjuster is used which adjust the soil towards the furrow created by the cutter.
6) After adjusting the soil, water is sprayed from the pipe for cultivation. Water Tank- Tap arrangement is used for irrigation purpose

V PROPOSED SYSTEM

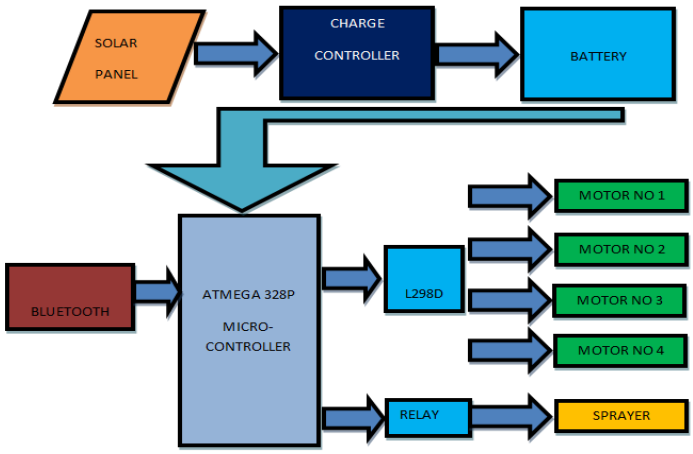

Fig.1 - Block diagram

The solar energy is collected by the solar panel, transformed into electrical energy, and then used to charge a 1 2-volt battery.
The purpose of the soil moisture sensor is to ascertain whether the soil has the necessary moisture content for t

he targeted crops, which include sunflower, wheat, and power.An HC SR04 ultrasonic sensor uses ultrasonic s ound waves to determine how far away an object is.To find out if there are any obstacles in the way, utilise HC -SR04.A drill bit is used to drill into the earth to a predetermined depth.
Here, the depth is 5 cm for the required crops.The instruction to drop the seeds into the drilled hole is then sent by the microcontroller. Therefore, consistency is attained in seeds are dropped in the hole created, ATmega328 sends a command to move further and this is fed to the motor driver IC L293D. The L293D IC receives signals from the Atmega328 and transmits the relative signal to the motors. We need motor driver for running motor using microcontroller. To interface between motor and microcontroller we will use L293D motor driver IC in our circuit. Four 60 rpm motors have been used which receive supply voltage from a motor driver L293D. Since the supply voltage of the motors been used is 12V, a motor driver is essential as a microcontroller can't provide such high voltage.

VI CONCLUSION

The suggested seed distributing device has shown to be remarkably successful in accomplishing the project's g oals.It uses only solar energy to run, which reduces dependency on nonrenewable resources and is in line with environmental ideals.The machine has demonstrated remarkable capabilities by spreading up to 1353 seeds per second, primarily small and medium-sized seeds and beans.
Additionally, its running route covers an area of 3.14 square metres due to its operational efficiency.

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