ISSN 2395-1621

Design and Manufacturing of Solar and IOT Base Seed Sowing Machine Robot

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ABSTRACT

The real power required for machine equipment depends on the resistance to the movement of it. Even now, in our country 98% of the contemporary machines use the power by burning of fossil fuels to run IC engines or external combustion engines. This evident has led to widespread air, water and noise pollution and most importantly has led to a realistic energy crisis in the near future. Now the approach of this project is to develop the machine to minimize the working cost and to reduce the time for digging and seed sowing operation by utilizing solar energy to run the robotic machine. In this machine, solar panel is used to capture solar energy and then it is converted into electrical energy which in turn is used to charge 12V battery, which then gives the necessary power to a shunt wound DC motor. This power is then transmitted to the DC motor to drive the wheels.

Keywords: Seed Sowing, Robot, Battery, Motor.

ARTICLE INFO

Article History

Received: 28th April 2022

Received in revised form : 28th April 2022

Accepted : 1st May 2022

Published online : 2nd May 2022

I. INTRODUCTION

Today the environmental impact of agricultural production is very much in focus and the demands to the industry is increasing. In the present scenario most of the countries do not have sufficient skilled man power in agricultural sector and that affects the growth of developing countries. Therefore farmers have to use upgraded technology for cultivation activity (digging, seed sowing, fertilizing, spraying etc.). So it's a time to automate the sector to overcome this problem. In India there are 70% people dependent on agriculture. So we need to study on improving agricultural equipment. Innovative idea of our project is to automate the process of digging and seed sowing crops such as sunflower, baby corn, groundnut and vegetables like beans, lady's finger, pumpkin and pulses like black gram, green gram etc. and to reduce the human effort. Since we have lack of man power in our country, it is very difficult to do digging and sowing operation on time, Automation saves a lot of manual work and speed up the cultivation activity. The energy required for this robotic machine is less as compared with other machines like tractors or any agriculture instrument, also this energy is generated from the solar energy which is found abundantly in nature. Pollution is also a big problem which is eliminated by using solar plate 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. The paper discusses different aspects of seed sowing machine which will be helpful for the agriculture industry to move towards mechanization. The agricultural industry has always been the backbone of India's sustained growth. As the population of India continues to grow, the demand for produce grows as well. Hence, there is a greater need for multiple cropping on the farms and this in turn requires efficient and high-capacity machines. Mechanization of the Agricultural industry in India is still in a stage of infancy due to the lack of knowledge and the unavailability of advanced tools and machinery. In traditional methods seed sowing is done by

manually, opening furrows by a plough and dropping seeds by hand. The agricultural has always been the backbone of India‘s sustained growth. As the population of India continues to grow, the demand for produce grows as well. Hence, there is a greater need for multiple cropping in the farms and this in turn requires efficient and time saving machines.

II. BLOCK DIAGRAM

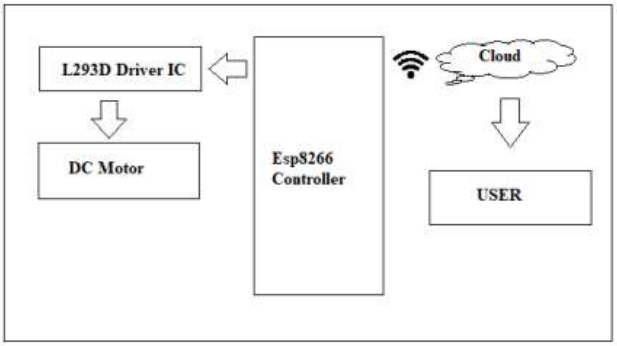

Fig 1. Block Diagram

We propose a machine, which can carry out various farming activities like seeding robot etc. Figure shows the block diagram of our experimental setup. This is a Mobile operated machine which is equipped with a four-wheel drive. The seed sowing machine is developed at a very low cost. It is cheap and easily affordable by rural farmers. It is maintenance free and various adjustments can be made with ease for continuous operation. This solar powered seed sowing machine basically works on vertical discontinue working principle refers to the vertical movement which can be followed by an individual body in an agricultural filed and implements its discontinuous action in relation to the Horizontal line of work. As per name indicate this machine is used for sowing seed.

This is run with the help of motor. This is connected to 12 V battery. This is directly connected to the solar panel through which it gets charged. A Microcontroller .with help of which it can be start and stop .and we can also control the Clockwise and anticlockwise motion of motor controls this motor. For dropping seed we are using a hopper, which is mounted behind motor show in figure above, and a lever arrangement is provided on handle when this lever is pressed seed will be dropped automatically from hopper travel into a pipe attached to and dropped in hole. In this way seed sowing is done with this machine.

III. EXPERIMENTAL SETUP

The purpose of this project is to provide farmer with multipurpose equipment which implements all the scientific farming specifications and technology to get maximum yield and good quality crops by reducing investment and number of labor.

1. The main objective of this project is to design and fabricate smart-seed sowing machine which can automatically sow seeds in the field based on variable pitch which is given as input by the farmers using the keypad present on the machine.
2. Make this smart machine economical and user friendly for Indian farmers to operate.
3. Design and selection of various components of robot.
4. Development of Seeding mechanism robot.

Fig 2. Experimental Setup

IV. FUTURE SCOPE

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. So considering these points related to spraying and seed sowing an attempt is made to design and fabricate such equipment which will able to perform both the operations more efficiently and also will results in low cost.

- Decrease the operational cost by using new mechanism.
- Work reliably under different working conditions.
- Decrease the cost of machine.
- Decrease labor cost by advancing the spraying method.
- Machine can be operated in small farming land (1 acre).
- Making such a machine which can be able to perform both the operation

V. ADVANTAGES

- It maintains the proper row spacing.
- The seeds can be placed at proper depth.
- Seed rate can be controlled.
- Many seeds can be sown by this machine.
- Mixed cropping can be easily done.
- Due to small size machine is portable. In addition, can be used in small area.
- Cost efficient.
- Less Man Power will be used.
- Decrease the disturbance of the agricultural soil by 98%

- Improve agricultural soil carbon sequestration
- Save energy, money and time of a farmer.

VI. ACKNOWLEDGEMENT

Presentation inspiration and motivation have always played a key role in the success of any venture. We express our sincere thanks to our BE Project Guide Prof. M.A.Mane for his encouragement and support throughout our project, especially for the useful suggestions We would like to thank Prof. P.V.Bute, Head of Mechanical Engineering Department for his unwavering support during the entire course of this final year project work.

VII.CONCLUSION

In India about 70% of the population lives in rural areas and their main source of income is dependent on agriculture sector. So, it is important to have special focus on agriculture sector and to apply

latest technologies and methods which are more advance and efficient. This will lead to better growth rate of the country. Our machine which operate on solar power when compared to different traditional seed sowing methods, it can be concluded that:

1) Sowing rate can be controlled
2) Seed spacing can be achieved
3) Less manual power is required
4) No pollution is caused
5) Economical
6) Variety of seeds can be sowed

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