



Automatic Seed Sowing and Spraying Agriculture Robot

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ABSTRACT

An automatic seed sowing and spraying robot is an agricultural model used for ploughing and dropping seeds into the ploughed land and also used for moisten the fields. This robot is controlled via wi-fi module and helps an interconnection between the user and the robot. This robot also allowing him to control over very large distances using IoT enabled devices and wireless smart automation of sensors. In this recent scenario of Smart Agriculture use of robot plays a very important role. There are so many skilled laborers but the scarcity of skilled laborers and environmental changes have made man to replace with the technology. There are so many tools that are used for automation. The automation is a very powerful process that are mainly used for time saving and also for energy saving. This is a forming process is also used for energy efficiency of repeated work in agriculture fields for farmers. This also increase productivity of crop and market trends. The main requirements for a good crop yielding is its seeding and spraying procedure. Actuators and Rotors in the agricultural field as is the only solution to overcome the scarcity of labor in the agriculture sector as mentioned using IoT (Internet of Things). The required accuracy of the solar tracker depends on the application. Concentrators, especially in solar cell applications, require a high degree of accuracy to ensure that the concentrated sunlight is directed precisely to the powered device, which is at (or near) the focal point of the reflector or lens. Typically concentrator systems will not work at all without tracking, so at least single-axis tracking is mandatory. Non concentrating applications require less accuracy, and many work without any tracking at all.

Keywords: Solar tracker, reflector, concentrators, heliostat etc.

INTRODUCTION

In the current generation most of the countries do not have sufficient skilled person power especially in agricultural sector and it affects the growth of developing countries. The main requirement of Automation is to reduce man power in our country; the buzzword in all industrial firms generally involves electrical, electronic component as well as mechanical part. Automation saves a lot of tedious manual work and speeds up the production processes. So it is a time to automate the sector to overcome this problem. In India there are 70% people dependent on agriculture. Seed has been an important agricultural commodity since the first crop plant was domesticated by pre-historic man. In this model seed sowing process is automated to reduce the human effort and increase the yield. The plantation of seeds is automatically done by using DC motor. Cropping is important and tedious activity for any farmer, and for large scale this activity is so lengthy also it needs more workers. Thus agriculture machines were developed to simplify the human efforts. In manual method of seed planting, we get results such as low seed placement, less spacing efficiencies and serious back ache for the farmer.

This also limited the size of field that can be planted. Hence for achieving best performance from a seed planter, the above limits should be optimized. Thus, we need to make proper design of the agriculture machine and also selection of the components also required on the machine to suit the needs of crops. The agriculture is the backbone of India. And for sustainable growth of India development of agriculture plays vital role. The India has huge population and day by day it is growing thus demand of food is also increasing. In agriculture we saw various machines. Also, there traditional methods are there. Since long ago in India traditional method is used. Also, India has huge man power. This manual planting is popular in villages of India. But for large scale this method is very troublesome. The farmer has to spend his more time in planting. But time available is less for him. Thus it requires more man power to complete the task within stipulated time which is costlier. Also more wastage happens during manually planting. Hence there is need of developing such a machine which will help the farmer to reduce his efforts while planting. This process of using machines is called as mechanization. Along with mechanization automation also helps to increase the efficiency of the process. The robotic system is an electromechanical (conveys a sense that it has agency of its own) and artificial agent which is steered by DC motor which has four wheels. The farm is cultivated by the machine, depending on the crop considering particular rows & specific columns. The infrared sensor detects the obstacles in the path and it also senses turning position of vehicle at end of land. The seed block can be detected and solved using water pressure. The machine can be controlled remotely.

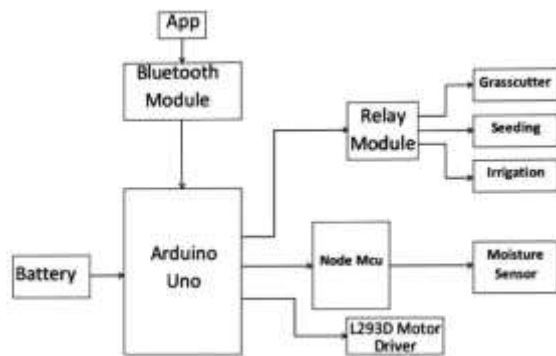
THEORY

In addition with seed sowing, multipurpose operations such as Leveling are also needed. But many problems are faced by farmers during seed sowing operation, like proper adjustment of distance between two crops, distance between two rows. Seed sowing is very basic and paramount operation in the agricultural field. Now a days seed sowing is done either manually or by tractors. Manual method includes broadcasting the seeds by hand. Sometimes method of dibbling i.e. making holes and dropping seeds by hand is used. Another method of

seed sowing is to use tractor in farms. The heavy equipment of seed storage and dropping mechanism are attached to the tractor to drop the seeds. A ground wheel is attached at the base of the seed sowing machine. The power transmission system is used to transmit the motion of the rotation to the metering mechanism. The metering mechanism contains number of scoops to drop out the seeds from the hopper. These seeds are then transmitted in the seed distributor pipes. Flexible and compatible pipes can be used to distribute seeds. With the help of tiller we can make the land smooth for sowing the seeds.

The metering mechanism arrangement can be changed depending upon the nature and the type of seed. Thus we can perform sowing of the different kind of seeds. But these methods of seed sowing require more time & the man power. Using the present techniques problems of misalignment of distance between seeds and the rows of the seeds occurs solar.

BLOCK DIAGRAM



WORKING PRINCIPLE

Initially, various dimensions of the smart seed sowing robot are assumed based on the different dimensional constraints of the robots. After considering various design aspects of the robot, then different parts of the seed sowing robot are designed using CAD package PTC CREO 3.0.1. The appearance of the fabricated smart seed sowing machine was given more importance for more convincing and attractive. Various geometrical models of the fabricated smart seed sowing machine are listed in Fig. The design of this smart seed sowing robot is based on the different modules which include sensing device, actuator, seed handling unit, microprocessor, stepper motors, servomotors, communication, and data processing unit. The block diagram of the various components of the robot is presented. The circuit diagram of the main control unit is presented and the mobile interface is presented. The specification automatic way of ion of the smart seed sowing robot is presented.

CONCLUSION

After taking the complete testing with various types of seed, the yielding rate of seed sowing was higher as compared to the conventional seed sowing machine. During testing of the robot, different types of seeds have been sowed in a proper sequence according to different rows and columns marked in the field which results in proper germination of seeds. The rate of seed sowing with different types of seed is mentioned the rate of seeding for different types of seed in the field during the primary of the robot. It is concluded that the sowing of the sesame takes the highest time as compared to other types of the seed. This is due to the difficulty in gripping the sesame seed owing to the shape and size of these seeds.

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REFERENCES

- [1] M.R. Pundkar, A.K. Mahalle, A seed sowing machine: A review, *Int. J. Eng. Soc.Sci.* 3 (3) (2015).
- [2] J. Khosravi, M.A. Asoodar, M.R. Alizadeh, M.H. Peyman, Application of multi decision making system compensatory (TOPSIS) in selecting of rice milling system, *World Appl. Sci. J.* 13 (11) (2011) 2306–2311.
- [3] P.P. Shelke, Frontline demonstration on bullock- drawn planter enhances yield of soybean crop, *Int. J. Farm Sci.* 1 (2) (2011) 123–128.
- [4] B. Ramesh, T.C.N.A.M. Sara, A.V. Satyam. Automated Agricultural System for Multipurpose Activities of Farmers. *Int. J. Recent Innovation. Trends Computer. Communication.* 5(12), 171-175.
- [5] S. Umkar, A. Karwankar (2016, April). Automated seed sowing agriculture robot using arduino. In 2016 International Conference on Communication and Signal Processing (ICCSP) (pp. 1379-1383). IEEE.
- [6] M.V. Gowrishankar, K. Venkatachalam, IoT based precision agriculture using Agriculture robot, *GRD J.* 3(5) (2018).

- [7] K. Karthikeyam, S.S. Sundar, C.S. Subramaniam, P.S. Sivakumar, (2017, April). Design and development of a multi-utility agricultural vehicle. In 2017 IEEEET echnological Innovations in ICT for Agriculture and Rural Development (TIAR) (pp. 109-111). IEEE.
- [8] P.V. Bute, S. Deshmukh, G. Rai, C. Patil, V. Deshmukh, (2018). Design and Fabrication of Multipurpose Agriculture robot System.

