APPLICATION OF SOLAR SYSTEM IN THE FIELD OF AGRICULTURE

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Abstract

In India agricultural field plays a very important role, so advancement in the agricultural field is necessary Seed sowing is the basic operations needed to get better revenue from agriculture. Manual sowing should not give adequate spacing between row to row. Manual sowing is very time consuming process and costly. To overcome this problem we here give the brief idea about design and fabrication of a automatic solar based smart seed sowing machine for Indian farmers.

Index Terms: Seed Sowing, Agricultural Sector, Microcontroller, Bluetooth model, sensors, Solar panel.

I. INTRODUCTION

The major occupation of the Indian rural people is agriculture which is the backbone of Indian economy. Traditional methods uses manual tools and labor work yielding less as compared to the growing population. To overcome such problems many automatic machines are available now a days creating a boom for the robotic or machines advancement in the field of agriculture. Automation can lead to high yield, less production cost and can reduce man power. In this project we are developing an automatic seeding and sowing machine which depends on feedback control mechanism so that it can be controlled manually too. Moreover it is mainly concentrating for the process of digging and sowing seeds such as cotton. The processes are supervised by self-guided by giving commands in mobile and sending through a Bluetooth module.

II. DESIGN OF SEED SOWING MACHINE

A. Block diagram consist of main components
1. Battery
2. Solar panel
3. PCB
4. Driller
5. Stepper Motor
6. Transformer
7. Microcontroller
8. Motor driver
9. Bluetooth
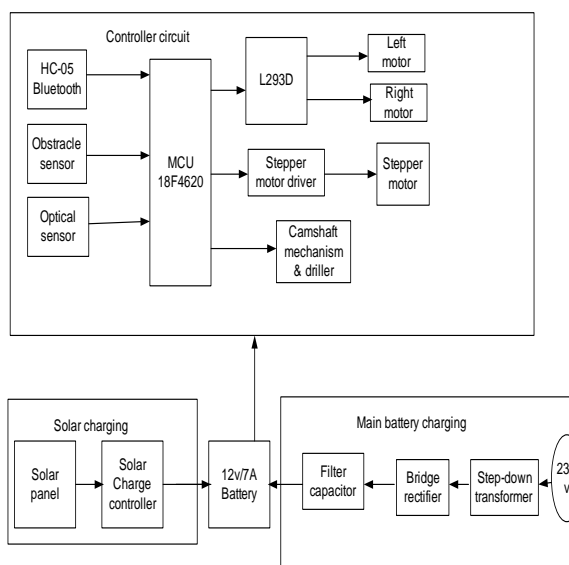10. Sensor
11. Voltage regulator
12. Diode

Fig. 1 Block diagram
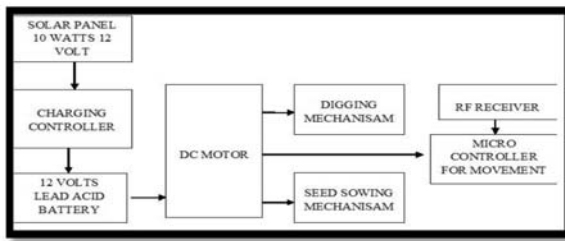
B. *EXPERIMENTAL SETUP*

Fig. 2 Experimental Setup

The experimental setup for proposed work is shown in Fig.2 which depicts the flow of controlling mechanism of machine and total operation.
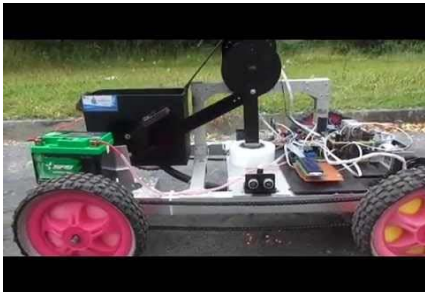
III. MODEL

Fig.3 Seed Sowing machine model

Seed sowing machine model is shown in Fig.3, in this machine a 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 stepper motor. This power is then transmitted to the rear wheel through chain drives. Consequently, in this project an attempt is made to make the electric and mechanical systems share their powers in an efficient way. The basic objective of sowing operation is to put the seed at desired depth and seed to seed spacing, cover the seeds with soil . 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 cotton seed. A solar panel is a device that collects and converts solar energy into electricity or heat or mechanical work. Solar energy is first used to charge a storage battery.

An electric battery is a device consisting of one or more electrochemical cells that convert stored chemical energy into electrical energy. The solar energy stored in the battery is utilized to operate DC motor. A DC motor is a device that converts direct current (electrical energy) into mechanical energy. By using the bevel gear and Chain drive with sprockets power is transferred to the wheels for their movement. 18F4620 Microcontroller is used to automatically control the machine. Hall, optical and obstacle Sensors are fitted to the machine for automatic counting of seed and to sense the obstacle in the moving path.

IV.CONCLUSION

By using this innovative project of seed sowing equipment we can save more time required for sowing process and also it reduces lot of laborer cost. It is very helpful for small scale formers.

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