

The Introduction To Automatic Seed Sowing Machine / Robot

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Abstract- In the farming process, often used conventional seeding operation takes more time and more labor. The seed feed rate is more but the time required for the total operation is more and the cost is increased due to labor, hiring of equipment. Today's era is marching towards the rapid growth of all sectors including the agricultural sector. This machine reduces the efforts and total cost of sowing the seeds. Robust construction, also it should be reliable this is basic requirement of sowing machine. Thus we made sowing machine which is operated manually but reduces the efforts of farmers thus increasing the efficiency of problem encountered in manual planting. For this we can plant different types and different size seeds also we can vary the space between two seeds while planting. We made it from raw materials thus it was so cheap and very usable for small scale farmers. For effective handling of the machine by any farmers or untrained worker we simplified its design.

Keywords- Sensor, Agricultural Robot, PIC, Servo Seeding Assembly

I. INTRODUCTION

The main requirement of automation is to reduce man power in our country; The buzzword in all industrial firms generally involves electrical component as well as mechanical part. Automation saves a lot of tedious manual work and speeds up the production processes. In India there are 70% people dependent on agriculture. 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. The robotic system is an electromechanical which is steered by DC Motor which has four wheels. The farm is cultivated by the machine, depending on the crop considering particular Rows & Columns. The infrared sensor detects the number of revolution of wheel to calculate seeding distance and it also senses turning position of vehicle at end of land. The seed block can be detected and solved using mechanical Drilling Mechanism. The machine can be controlled by remotely with the help of Bluetooth. C-Language is used in programming the PIC microcontrollers. This robot operated machine to fully autonomous robots in both greenhouse and open filed application. Robots are available on all development levels from experimental to market-ready in

several agricultural applications but most of them are in research, where institutes have made progress to extend the existing agricultural machines to robotic systems.

II. MERHOLOGY

The Automated seed sowing technology is a method design in order to reduce the human efforts as it requires less amount of manmade labor & can be handle efficiently without a skilled operator. Seeding manually requires lots of time, therefore this technology develops which eradicated much amount of time with proper efficiency, less time consuming, accuracy in sowing seed at specific distance. It works on simple mechanism, a battery operated DC motor is used transmits the rotary motion to the shaft with the help of chain drive, and there is another connection of sprocket and chain to the rotary motion. When the farmer puts seeds into the hopper. As the seed rotates, seed drops in the seed pipe, which is connected to the servo driven opener for the seeding; there is end plate for covering the seeds soil.

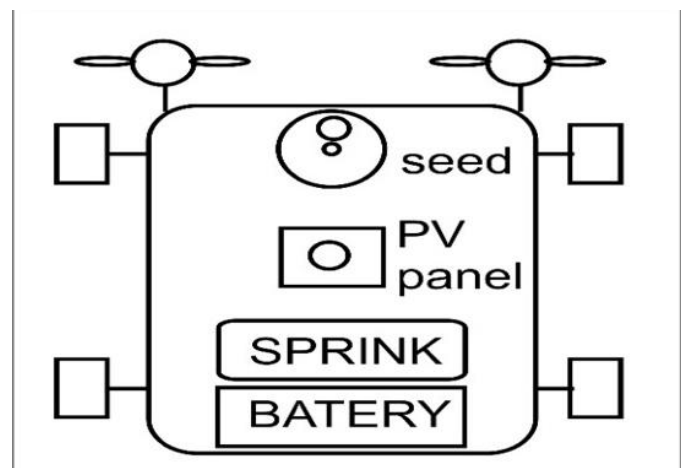


Fig.1- Basic Design Of Battery Operated Wheel

III. HARDWARE IMPLEMENTATION

Now The fig.2 show the circuit of PCB of the seed sowing system. The PIC16F886-8Bit microcontroller placed with top of the PCB. Also, near the LCD placed. The left corner is a power supply section. As well as the relay is connected across the 12V to 1000uF capacitor, and also a 10uF

capacitor across the ultrasonic sensor. The ultrasonic sensor pin trigger and echo pin connected to across PIC16F886-8 bit microcontroller circuit is connected to seed sowing machine. When an obstacle comes in front of the machine the ultrasonic sensor distinguishes that obstacle and indicates a buzzer. This Circuit Is Design In Dip Trace Software.

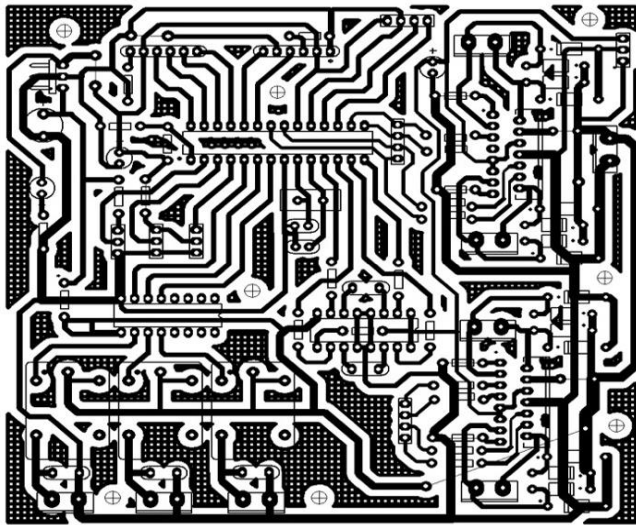


Fig.2- Circuit Of PCB

IV. BLOCK DIAGRAM

Here 12V battery is connected with the PIC Microcontroller. The battery will provide 5V power, if the battery then it will be charged directly from supply. ADC is analog to digital converter, It is used to convert the variable signal. Ultrasonic sensors are used here, which will sense the seed to seed spacing and depth of seed placement. In each rotation seed falls from the seed drum and seed plantation process takes place LCD will show the seed level and the remaining seed present in the container. At least the microcontroller gives the signal to the driver, further it will amplified motor.

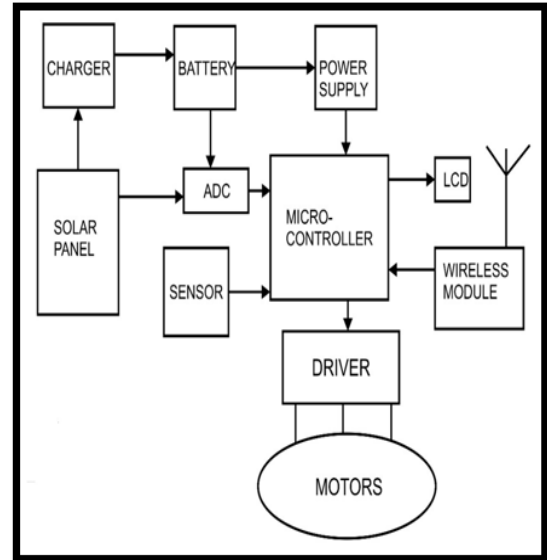


Fig.3- Block Diagram Of Proposed System

V. DESIGN

This circuit diagram drawn in software which is proteus design suite software. The Proteus Design Suite is a proprietary software tool used primarily for electronic design Automation.

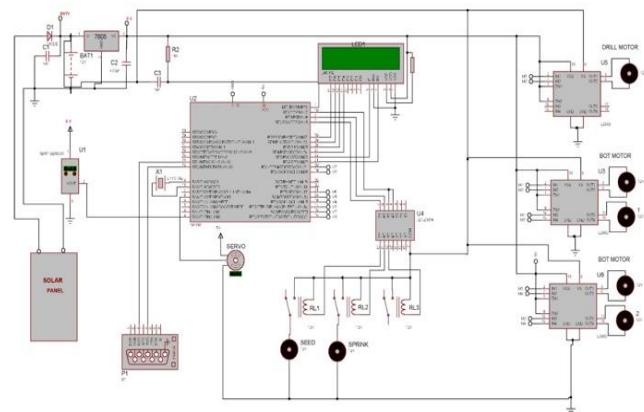


Fig.4- Circuit Diagram Of Automatic Seed Sowing Robot/ Machine

SELECTION OF MOTOR

Given:-

Size of wheel= 100 diameter

Total weight of machine = 8 kg

The effort requires to pull the machine is assumed = 100N

So maximum torque on drive shaft $T= 100 * 50$

T= 5000N-mm.

VI. ADVANTAGES

- These machines are adequately designed with auto seed feeding system planting channel for optimal growing conditions.
- Adjustable seeding rate.
- Seeding monitor and hectare counter.
- Spring loaded plunger for seed dropping.
- No extra manpower required.
- It is compact in size.

VII. APPLICATION

- Farming the design of furrow openers of seed drills varies to suit the soil condition of particular region.
- Most of the seed cum fertilizer drills are provided with pointed tool to form a narrow slit in the soil for seed deposition. Gardening seeds are broadcasted on the soil which results in the loss and damage of the seeds.
- As the cost of seeds is more and cannot be affordable for the soil farmers so there is the need for the proper placement

VIII. CONCLUSION

This seed plantation machine has great potential for increasing the productivity of the planting. Till now tractor was the main traction unit for nourishment in farming. With the adaptation if this seed planting machine its purpose will be done. Hence there is need to promote this technology and made available to even small scale farmers with affordable prices. This machine can be made by raw material also which saves the cost of whole project and is easily manufactured in available workshops. The only cost is of metering device and sensors. Hence by using this machine we can achieve flexibility of distance and control depth variation for different seeds, hence usable to all seeds.

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