

Design and Development of Automatic Seed Sowing Machine

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Abstract: Agriculture plays an important role in the life of economy. It is the backbone of our economy system. In this project work focused on seed sowing processes and tried to solve the problem. In seed sowing machine system they are used battery powered wheels and dc motor inbuilt in these wheels. When the seeds are empty it detects the level of storage seed and indicates the alarm. When any obstacle comes in the in-front of machine or divert path the seed sowing machine can detect this obstacle very easily. In each complete rotation of rotating wheel there is seeds falls from this seed drum and the seed plantation process can take place smoothly as well as without wastage of seeds. The end of system machine reached and it create alarm. This system provides all the facility which can work efficiently.

Keywords: Atmega328, ultrasonic sensor, battery operated wheels, Relay, Buzzer, LCD

I. INTRODUCTION

The Automatic seed sowing machine are developed. In this proposed work they have focused on seed sowing process. In this seed sowing process to avoid the drawbacks. The seed sowing machine is developed which has very less cost. Also the unskilled farmer can be easily operated automatic seed sowing system.

Researchers have presented a better speed of operation and good Seed Sowing capacity for new advanced agriculture process which includes robotic based cultivation. An agriculture robotic system is used. They has used DC motor which has four

wheels. An agricultural farm is cultivated by the Plow machine, depending on the crop considering particular rows specific columns. Ultrasonic sensor detects the blocks in the path with measure the distance between both robot and block. Also senses turning position of our vehicle at end of the each column. The seed block can be detected and solved using water pressure. This machine can be controlled on remotely. A sensor guided robot rover for digging, precise seed positioning and sowing has been proposed to reduce the human effort. [1]

Researchers have presented a multi-class image segmentation to automate fruit segmentation. The proposed algorithm is applied to fruit segmentation. This problem for a robotic agriculture observation mission. The aim to provide yield estimation with high correctness as well as robustness against fruit variance. [2]

Researchers have presented a system in which a robot machine. The different sensors are used to control different parameters of robot for sowing the seeds by using microcontroller. At the end of field using remote switch and the position of wheels changed. Seeds are empty alarm is detected. [3]

Researchers have presented a system which is solar based automatic seed sowing. In village the farmers mainly income depends on the agricultural source. Automatic seed sowing machine is fulfill the digging, seed sowing, water pouring and fertilizing by using solar energy. This automatic seed sowing machine is help to the farmer. And also they can perform their regular cultivation activity as well as saves fuel up to larger extent. At the same time by

using solar energy environment pollution can be reduced. [4]

Researchers have developed seed planter machine. It should be easily for simple farm, design and technology. The manually operated template row planter is designed and developed to improve planting efficiency and reduce drudgery involved in manual planting method. Seed planting is also possible for different size of seed at variable depth and space between two seed. Also it increased seed planting, seed fertilizer placement accuracies. The system can very simple for unskilled farmers and easily handled. By using of this machine, achievement of flexibility distance and depth variation for different seed plantation is possible. [5]

Agriculture is main occupation in India.70% population to live in village. There are different type of traditional method are used. In Traditional method of sowing seeds is very bulky. The farmer has to sow the seeds are manually.This is very time to spend this process and also the wastage of seeds.

In this design, the drive shaft directly controls the seed metering mechanism which eliminates completely attachments such as pulleys, belts system, thereby eliminating complexities which increase the cost, and increasing efficiency at a highly reduced cost which is the focus of this project work. This system is very much beneficial to all farmers because the wastage of seeds and more man power are avoided for that system. Also the time to be saves. All facilities to be provided in automatic seed sowing machine. In seed sowing machine system they are used battery powered wheels and dc motor inbuilt in these wheels. In this system seed storage tank are used .when the seeds are empty it detect the level of storage seed and indicate the alarm. When any obstacle comes in the in-front of machine or divert path the seed sowing machine can detect this obstacle very easily. The end of system machine reached and it create alarm.This system provides to all the facility which can work efficiently. Also the farmer can sow the seed very much easily. As well as time will be save. This system is very useable to farmer .seed can be sow automatically.

II. PROPOSED SYSTEM

The fig.1 shows that the blocks diagram of proposed system. In agricultural system the more facilities to provides the farmer and accurate work .This system has 4 wheel robot system.The seed sowing machine is developed which has very less cost. Also the unskilled farmer can be easily operated automatic seed sowing system. The design and fabrication of a manually operated single-row Seed planter that is cheap, easily affordable by the rural farmers. The single-row Seed planter is very simple to use the various adjustments are made with ease, and it is maintenance free. In seed sowing machine system they are used battery powered wheels and dc motor inbuilt in these wheels.

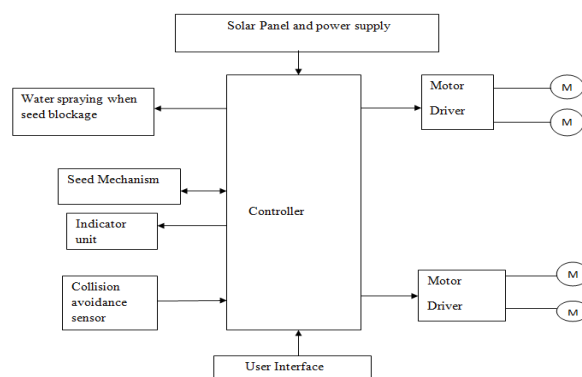


Fig 1: Block diagram of the proposed system

In this system the seed storage tank are used .when the seeds are empty it detect the level of storage seed and indicate the alarm. When any obstacle comes in the in-front of machine or divert path the seed sowing machine can detect this obstacle very easily. In each complete rotation of rotating wheel there is seeds falls from this seed drum and the seed plantation process can taken place smoothly as well as without wastage of seeds. The end of system machine reached and it create an alarm.This system provides the entire facility and farmer sow the seeds very easily.

III. DESIGN OF SEED SOWING MACHINE

The fig.2.shows the detailed drawing of seed sowing design mechanism. It is designed as per farm condition also it is as per the requirement so that it can dig the required size of rows for seed sowing.

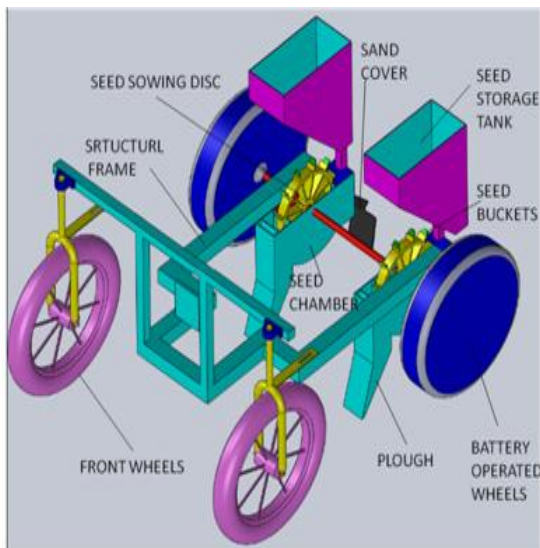


Fig.2: Design of seed sowing machine

1. Battery powered rotating Wheels:-

The rotating wheels are designed also it has fabricated rib parts so it helps to give grip during the seed planting, so that user can easily pull the whole assembly as per required direction. The both wheels are powered by battery and DC motor is inbuilt fitted in these wheels. The motor specifications are 1100watt, DC power, 12V, 7amp current.

2. Seed storage Tank:-

This is one of the stationary components which are mounted on the main frame. Inside this drum we can pour the seed for planting / sowing operation. Bottom of this seed tank there is seed sowing disc arrangement.

3. Seed sowing disc and seed bucket:-

In each complete rotation of rotating wheel there is seeds falls from this seed drum and seed plantation process taken place smoothly and without wastage of seeds. These seed buckets are fitted on the seed sowing disc with the help of screws. The buckets are designed in such a way that they can select the size of bucket as per seed type, size and shape. Also these buckets fit on the seed sowing disc in such a way that the distance between two seed during the plantation we can adjust and set according to requirement.

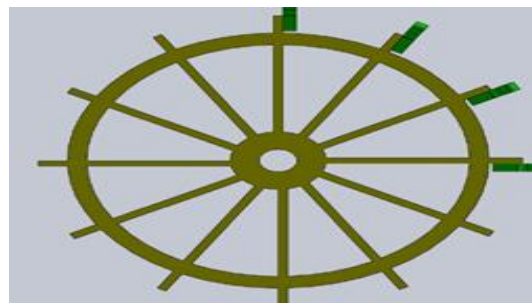


Fig.3: Seed Sowing Disc

4. Seed chamber, Plough and sand cover arrangement:-

In the drawing the seed chamber, Plough and sand cover arrangement is shown. The seed sowing disc is rotate in the seed chamber. The seeds are falls in the seed chamber through seed storage tank and the seed buckets are collect the seeds from the chamber and it sows in the ground as required depth with the help of plough. The distance between two rows we can adjust with the help of ploughs. After seed fallen in the ground the sand cover will pull the sand on the seed.

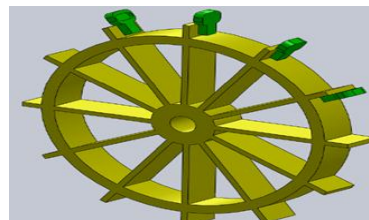


Fig.4: Seed chamber, Plough

IV. 3D MODEL PICTURE OF SEED SOWING MACHANISM

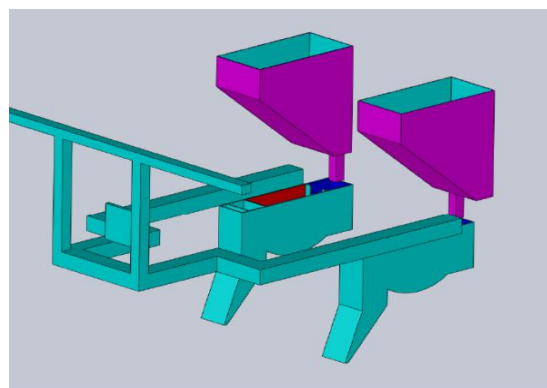


Fig.5: Seed Tank

This is one of the stationary components which is mounted on the main frame. Inside this drum it can pour the seed for planting / sowing operation. Bottom of this seed tank there is seed sowing disc arrangement.

V. PHOTOGRAPHS OF SEED SOWING MACHINE MODEL



Fig.6: Battery operated wheel

Size of wheel = 600mm diameter

Total Weight of machine = 56kg

Selection of motor-

The effort required to pull the machine manually is assumed = 100N

So Maximum Torque $T = \text{Effort} \times \text{Radius of wheel}$

Torque on drive shaft $T = 100 \times 100$

= 10000 N-mm



Fig.7: Two Sided seed sowing arrangement

VI. HARDWARE IMPLEMENTATION

Ultrasonic sensor interface with Atmega 328:

The fig.8 shows the ultrasonic sensor interface with Atmega 328 of seed sowing system. The Atmega 328 is placed at the top of the PCB. Also near the LCD is placed. The left corner is made for power supply. In power supply, the bridge rectifier is across the transformer connection. As well as the Relay is connected across 12V to 1000µF capacitor. Also the 10µF capacitor is across the ultrasonic sensor. The ultrasonic sensor pin trigger and echo pin are connected across Arduino pin 15 and 16. So this circuit is connected to the seed sowing machine. When an obstacle comes in front of the machine, the ultrasonic sensor detects that obstacle and indicates the buzzer.

Obstacle detection range < 20cm



Fig.8 Ultrasonic sensor interface with Atmega 32

VII. RESULTS

1. Developed for seed sowing mechanism:



Fig.9: Developed for seed sowing mechanism

The distance between two crops of different seeds:

Table 1. Different seeds and Distance

Seeds	Distance
Soyabean	18cm
Groundnuts	15cm
Jowar	12cm

VIII. CONCLUSION

In each complete rotation of rotating Wheel there is seeds falls from this seed drum and seed plantation process taken place smoothly and without wastage of seeds. The sowing disc is rotate in the seed chamber, the seeds are falls in the seed chamber through seed storage tank .The seed buckets are collect the seeds from the chamber and it sow in the ground as required depth with the help of plough. Also the any obstacle comes in front of seed sowing machine the ultrasonic sensor are detect that obstacle and indicate the buzzer.

IX. REFERENCES

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