Smart Multifunctional Seed Sowing Machine

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ABSTRACT-

Most countries in the current generation lack sufficient skilled manpower in the agriculture sector, which has a negative impact on developing countries' growth. As a result, it is the time to automate the agriculture industry in order to solve this problem by utilizing advanced technology in the growing process. The basic function of a sowing machine is to saw the seed in a row at the desired depth and keep it in place. The separation between two seeds we use a keypad to enter the distance between two seeds. We made sowing machine which is operated manually but reduces the efforts of farmers thus increasing the efficiency of planting also reduces the problem encountered in manual planting. For this machine we can plant different types and different sizes of seeds also we can vary the space between two seeds while planting them.

Index Terms- Seed, Sowing, Planting, agriculture, efficiency

INTRODUCTION

In certain regions of rural areas, seed sowing is done conventionally by hand and ploughers. This process is really hectic and time consuming. It is a simple statement, but one that resonates with every farmer. To make this necessary task easier for farmers, the concept of automatic seed sowing system came into existence. Automatic Seed sowing System is a system which consists of a telescopic plow and automatic seed disperser. The feed is manually loaded in the feeder and it follows the path of the disc mounted on the shaft where it can only pass when the hole is in front of the opening. To ensure the precise, timely and proper sowing, this project is applicable in an agricultural country like Nepal where the lack of manpower in farming has an adverse effect on crop production. The main objective is to design an automatic sowing system that moves around the farm land to distribute the feed uniformly. Remarkable changes can be brought to this field. In this we are using an Arduino circuit for controlling the motor for moving after certain time space.

PROPOSED WORK

This machine has very less cost. This planter is very simple to use hence, unskilled farmer is also able to handle this machine. We simplified the design also made it cheaper and affordable to every rural farmer. We made various adjustments and simplified it from controlling and maintaining point of view. In this design we connected drive shaft to metering mechanism which eliminates the attachments such as pulleys and belts system. DC motor drives the shaft of motor which is coupled with battery bank. As motor starts it moves this robot as well as operates the metering mechanism. Seed storage tank is connected at the top of the robot near rear wheels. The sensor is fitted to it which senses the level of seed in it and gives the alarm when the tank is empty. Front sensor serves the function of guiding the robot. As any obstacle comes in front of robot it gives the signal to the robot and diverts the path of robot. For every rotation of the wheel according to the adjustment it allows the definite seed to fall into the hoper so that there is no wastage of the seeds also the sowing process does smoothly. When the robot reaches at other end and when it completes task it creates an alarm so that we can provide required facility

LITERATURE SURVEY

1] "AUTOMATIC SEED SOWING MACHINE USING MICROCONTROLLER" by V.SAI ROHITH, P. SIVA PRASAD, Mr. C. LEELA MOHAN

The goal of this project is to automate the seeding procedure. The created system can carry out seeding operations in the agricultural field. The seeding pattern was discovered to be the fundamental flaw in prior methods. Only one type of seed can be utilized because the seeding pattern is rigid. In the

current system, this constraint is overcome. The system is capable of completing the seeding operation based on the results of the trials. The seed implantation depths were uniform, as was the distance between the two consecutive seeds. The designed robot is capable of doing its task without the need for human involvement, reducing the amount of time that humans are involved in the process. Creating a robot capable of doing a wide range of agricultural tasks is a challenging process.

2] "AUTOMATED ROBOT FOR SEED SOWING AND FERTILIZER SPRAYING ALONG WITH WEED REMOVER BASED ON MSP430 CONTROLLER" by MR. AMIT KUMAR K, MR. ROHIT D KUMARE ,MR. SUYOG DESHAPANDE, MR. VINAYAK SHINTRE,MR. VISHAL PARIT

Seed plantations are carried out automatically in this study utilising a DC motor.

Microcontroller is used to control and vary the distance between the two seeds. Additionally, it is possible to grow several types of seeds at various distances The project also includes sprinklers, which will be used. for decreasing fertiliser waste by spraying the proper amount of fertiliser required for the crop

a certain crop The sprinkler would splatter on the senses as the wheel turned and the sprinkler was turned on and off. Microcontroller would be in charge. We can change the orientation of the Robot when it reaches the end of the field. Remote switches are used to do this. The microcontroller is in charge of the entire procedure.

3] "DESIGN AND IMPLEMENTATION OF SEEDING AGRICULTURAL ROBOT" by P.Usha, V.Maheswari, Dr.V.Nandagopal

The aim of the paper is to reduce the man power, time and increase the productivity rate. All the basic automation robot works like weeding, harvesting and so on. Here the designing systems like plough the land, sowing the seed, watering the plant or spraying the fertilizer and navigating the vehicle motion are preferred by this autonomous robot using a microcontroller. Based on movement of this robot in the land, the ultrasonic sensor helps in obstacle detection, thereby performing turning the position of the robot either in left or right or forward direction. The navigation part has been done in simulation with the help of proteus.

4] "Automatic Seed Plantation Robot" by Prashant G. Salunkhe, Sahil Y. Shaikh, Mayur S. Dhable

This study describes an Automatic Seed Plantation Robot that executes advanced agriculture processes and is built on an electronic and mechanical platform. We created an electromechanical car that uses DC motors to steer and drive wheels. The farm is cultivated by an automated system that considers specific rows and columns based on the crop. The distance between two seeds in a column must be manually specified.

The rotation of wheels is measured using a proximity sensor. An IR LED with a TSOP receiver is utilised to identify obstacles in the vehicle's path, and the turning position is also determined by this sensor. LDR sensor is used to determine whether or not the seed container is empty. The PIC microcontroller monitors and controls all operations.

5] "Multipurpose agricultural robot" by Nithin P V , Shivaprakash S

The study focuses on the design, development, and manufacturing of a robot that can dig the soil, plant seeds, close the mud, and spray water. The robot's entire system is powered by a battery and a motor. Solar energy In recent years, more than 40% of the world's population has chosen agriculture as their major vocation. The development of autonomous cars in agriculture has sparked significant interest in recent years. The automobile is controlled by an IR sensor input and a relay switch. A person can engage with the robot through language input.This is well-known to the majority of people. Hands-free and quick data input activities are two advantages of these robots.

DESIGN OF SEED SOWING MACHINE

Following figure shows the complete drawing of the sowing machine. While designing the mechanism physical conditions as well as the requirements both are considered. Hence this machine is able to plant the seeds in the required way.
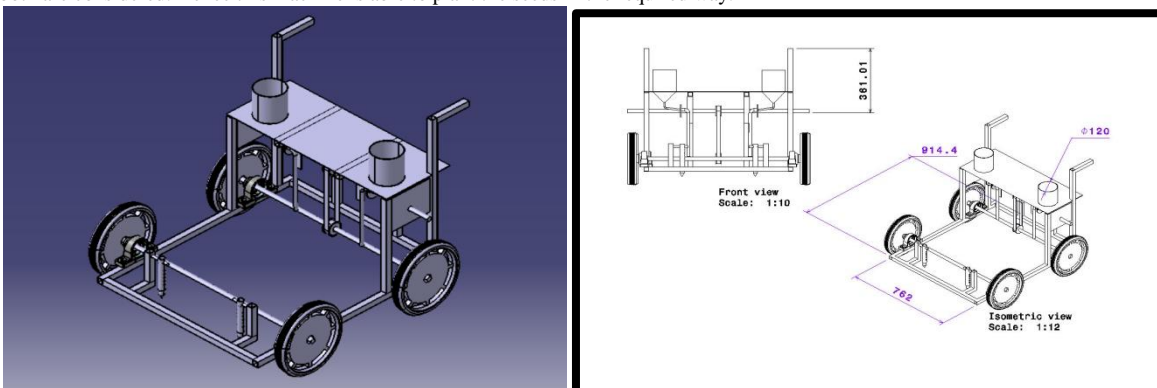
CAD: -

Computer-aided design (CAD) is the use of computer systems (or workstations) to aid in the creation, modification, analysis, or optimization of a design. CAD software is used to increase the productivity of the designer, improve the quality of design, improve communications through documentation, and to create a database for manufacturing. CAD output is often in the form of electronic files for print, machining, or other manufacturing operations. The term CADD (for *Computer Aided Design and Drafting*) is also used.

Its use in designing electronic systems is known as electronic design automatic(EDA). In mechanical designit is known as mechanical design automation (MDA) or computer-aided drafting (CAD), which includes the process of creating a technical drawing with the use of computersoftware.

USES:

Computer-aided design is one of the many tools used by engineers and designers and is used in many ways depending on the profession of the user and the type of software in question.

CAD is one part of the whole Digital Product Development (DPD) activity within the Product Lifecycle Management (PLM) processes, and as such is used together with other tools, which are either integrated modules or stand-alone products, such as:

- Computer Aided Engineering(CAE) and Finite element analysis (FEA)
- Computer-aided manufacturing (CAM) including instructions to Computer Numerical Control (CNC) machines
- Photorealistic rendering and Motion Simulation.
- Document management and revision control using Product Data Management (PDM).

CAD is also used for the accurate creation of photo simulations that are often required in the preparation of Environmental Impact Reports, in which computer-aided designs of intended buildings are superimposed into photographs of existing environments to represent what that locale will be like, where the proposed facilities are allowed to be built. Potential blockage of view corridors and shadow studies are also frequently analysed through the use of CAD.

CAD has been proven to be useful to engineers as well. Using four properties which are history, features, parameterization, and high-level constraints.

MAIN COMPONENTS

Following are the major parts which are used in this machine.

- Arduino
- Viper motor
- Chain and sprocket
- Funnel
- Pillow block bearing

MANUFACTURED WORKING MODEL

APPLICATIONS:

1) Farming the design of furrow openers of seed drills varies to suit the soil conditions 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.

2) Gardening Seeds are broadcasted on the soil which results in the loss and damageof the seeds. As the cost of seeds is more and cannot be affordable for the farmers so there is the need for the proper placement of seeds in the soil.

3) Sport's Stadium The fluted roller seed cup is having the arrangement of seed cut-off and controlling flap to control the amount of seeds and fertilizers.

4) AgricultureUniversities The Harrow is one of the important agricultural equipment which is used in the fields of agriculture for seed bed preparation and weed control. This is used before the seeds are sown in the field. This helps in the levelling of the soil and seeds can be sown in the prepare bed easily Polyhouse 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 farmers so there is the need for the proper placement of seeds in the soil.

Advantages:

1. Adjustable seeding rate.
2. No extra man power required.
3. It is compact in size.
4. Low maintenance cost.
5. Low initial cost.

FUTURE SCOPE:

1) Introduction of Cutter in place of drill can be used as grass cutter equipment.

2) Using remote control machine can be made automatic.

3) Addition of multi-hopper can be attached side by side for sowing of large farm.

4) Water dripping unit could be included in seed sowing machine.

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 of 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 materials 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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