A Planter Robot

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ABSTRACT: Agriculture is the major sector in the world that plays a vital role in developing the economy of nation. This paper deals with the use of automation robot in the field of agriculture. The use of robot can be performs an alternative operation to improve the efficiency of the agriculture related works. So the farmers can focus on decision making perspective rather than the labor intensive works. The moving vehicle which can implement the array of plantation one at a time over a specified distance. There is a greater need for multiple cropping in the farms and gardening which requires efficient and less time. This robotic technology is especially formed and developed to help the people in reducing their back-breaking efforts while doing the agricultural and planting activities. In the farming process, often used conventional planting operation takes more time and more labor. This machine reduces the efforts and total cost of sowing the plants and fertilizer placement. We have trying to make it cheap by using different process method so that it becomes affordable to one and all. We have made its control very easy so that it does not get difficult for the users.
Keyword: Planting, Agriculture, Robot, Automation, Gardening.

I. INTRODUCTION

Agriculture is the back bone of India which is primary source of income and employment of many people. India economics base on agricultural field development in agriculture lead rise the economic status of country. In India formers are facing problem to unavailability of labor also traditional way of farming equipment which takes lots of time and it also increase the labor cost. The idea of applying robotic technology in agricultural activities helps to enhance the productivity of planting samplings. The robot is a moving vehicle that is capable of performing planting task without human intervention. The robot works based on command given by the controller. The automation in agriculture field could be effective efficient. It works on daily working hour's free stress and fatigue from human life. An automated robot that would plant trees in order to restore the ecosystem this is the solution that can help to maintain sustainability Of the environment, but this work is very tedious and tiring so mankind/human beings should turn to tree of planting robots. The robotics technologies especially design to reduce the time consumption of planting. 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. Plant has been an important agricultural commodity since the first crop plant was domesticated by pre-historic man. In this model plant sowing process is automated to reduce the human effort and increase the yield. The plantation is automatically done by using DC motor. As agriculture is extensively supported by technical means like planting, it is widely considered to be a field with a high potential for robotic application as it is a small step from these semi automatically operated machines to fully autonomous robots in both greenhouse and open field applications.

II. LITERATURE SURVEY

[1] The paper titled "Agribot" authored by Ankit Singh and Abhishek Gupta in the year 2019.

This paper has set out a vision of how aspects of crop production could be automated one. Although existing manned operations can be efficient over large areas there is a potential for reducing the scale of treatments with autonomous machines that may result in even higher efficiencies. The development process may be incremental but the overall concept requires a paradigm shift in the way we think about mechanization for crop production that is based more on plant needs and novel ways of meeting them rather than modifying existing techniques.

[2]The paper titled "Multipurpose agricultural robot" authored by Nithin P V and Shivaprakash S in the year 2017.

The paper aims on the design, development and the fabrication of the robot which can dig the soil, put the seeds, leveler to close the mud and sprayer to spray water, these whole systems of the robot works with the battery and the solar power.

[3] The paper titled "ROBOTIC AGRICULTURE – THE FUTURE OF AGRICULTURAL MECHANISATION " in the year 2009 authored by Simon Blackmore, Bill stout, Mahout Wang, Boris rumor Developed agriculture needs to find new ways to improve efficiency.

One approach is to utilize available information technologies in the form of more intelligent machines to reduce and target energy inputs in more effective ways than in the past. Precision Farming has shown benefits of this approach but we can now move towards a new generation of equipment. The advent of autonomous system architectures gives us the opportunity to develop a complete new range of agricultural equipment based on small smart machines that can do the right thing, in the right place, at the right time in the right Way.

[4] The paper titled "Automatic Seed Plantation Robot" in the year [2017] written by Deekshita K.P, P. Prassanna.
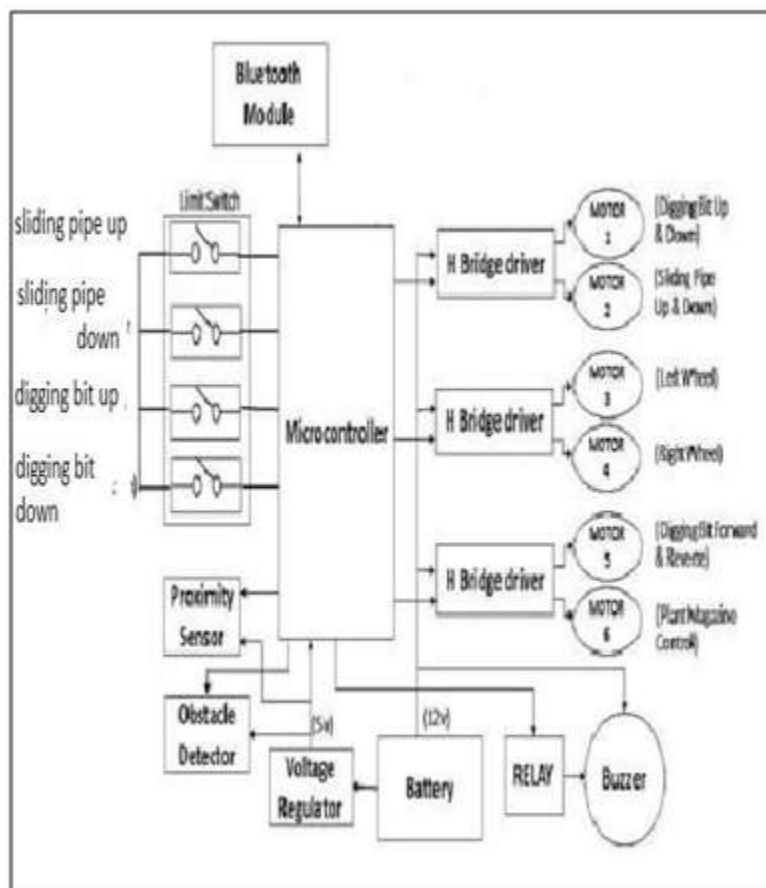
This paper presents an Automatic Seed Plantation Robot which is based on electronic and mechanical platform that performs advance agriculture process. We have developed an electromechanical vehicle which is steered by DC motors to drive wheels. The farm is cultivated by the automated system, depending on the crop considering particular rows & specific columns. The spacing between two seeds in a column has to be entered manually. Proximity sensor is used to measure the rotation of wheels. To detect the obstacle in the path of the vehicle IR LED with TSOP receiver is used and turning position is also depend on this sensor. To check whether seed container is empty or not LDR sensor is used. All the operations are monitored and control by PIC microcontroller using sensors. The programming of this microcontroller is done in assembly language. LCD display is used to show seed.

III. PROPOSED SYSTEM:

The robot waits for the starting command from the operator via. Bluetooth & performs a check if everything is ok. After the starting command is given digging bit come at position by dc gear motor, then the digging bit comes down by the help of limit switch & the motor for digging is turned on. The digging bit comes up by the help of limit switch after digging the ground. Sliding pipe come at position by dc gear motor & plant magazine move one position & then it checks if the sampling is available or not. If the magazine is empty the robot stops. If sampling is there then sliding pipe move down by the help of limit switch, after the sampling is planted the sliding pipe move upward by the help of limit switch & soil press mechanism done.

Finally the robot moves to next position (as per set revolution). If obstacle arrives it stops and alerts.

IV. COMPONENTS DESCRIPTION

Hardware Components:

H-Bridge Driver L293D- A H-Bridge is an electronic circuit that allows a voltage to be applied across a load in any direction. H-bridge circuits are frequently used in robotics and many other applications to allow DC motors to run forward & backward. These motor control circuits are mostly used in different converters like DC-DC, DC-AC, AC-AC converters and many other types of power electronic converters. In specific, a bipolar stepper motor is always driven by a motor controller having two H-bridges.

DC Motors- DC motors were the first form of motor widely used, as they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances.

Relay Module- A power relay module is an electrical switch that is operated by an electromagnet. The electromagnet is activated by a separate low-power signal from a micro controller. When activated, the electromagnet pulls to either open or close an electrical circuit.

Arduino- Arduino is open-source hardware. The hardware reference designs are distributed under a Creative Commons Attribution Share-Alike 2.5 license and are available on the Arduino website. Layout and production files for some versions of the hardware are also available. Arduino microcontrollers are pre-programmed with a boot loader that simplifies uploading of programs to the on-chip flash memory. The default boot loader of the Arduino Uno is the Optiboot bootloader. Boards are loaded with program code via a serial connection to another computer.

Battery 12V- A battery is a rechargeable battery that is used to start a motor vehicle. Its main purpose is to provide an electric current to the electricity-powered starting motor, which in turn starts the chemically-powered internal combustion engine that actually propels the vehicle. Once the engine is running, power for the car's electrical systems is still supplied by the battery, with the alternator charging the battery as demands increase or decrease.

IR Proximity Sensor- Proximity sensors can have a high reliability and long functional life because of the absence of mechanical parts and lack of physical contact between the sensor and the sensed object. Proximity sensors are also used in machine vibration monitoring to measure the variation in distance between a shaft and its support bearing. This is common in large steam turbines, compressors, and motors that use sleeve-type bearings. A proximity sensor adjusted to a very short range is often used as a touch switch.

Limiting Switches- Limit switches are used to automatically detect or sense the presence of an object or to monitor and indicate whether the movement limits of that object have been exceeded. The original use for limit switches, as implied by their name, was to define the limit or endpoint over which an object could travel before being stopped. It was at this point that the switch was engaged to control the limit of travel.

Buzzer- A buzzer will generate a tone using an internal oscillator, so all that needed is a DC voltage. A passive buzzer requires an AC signal to make a sound. It is like an electromagnetic speaker, where a changing input signal produces the sound rather than producing a tone automatically.

PCB- A printed circuit board mechanically supports and electrically. Connects electrical or electronic components using conductive tracks, pads and other features etched from one or more sheet layers of copper laminated onto and/or between sheet layers of a non-conductive substrate. Components are generally soldered onto the PCB to both electrically connect and mechanically fasten them to it.

Software Components:

ARDUINO IDE Programming- The Arduino integrated development environment (IDE) is a cross-platform application (for

Windows, macOS, Linux) that is written in the programming language Java. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main () into an executable cyclic executive program with the GNU tool chain, also included with the IDE distribution. The Arduino IDE employs the program argued to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firm ware.

Physical Components:
Drilling Bit
Frame/Chassis
Sliding Pipe
Sampling Holder

IV. APPLICATIONS

Agricultural robots automate slow, repetitive and dull tasks for farmers, allowing them to focus more on improving overall production yields. Some of the most common robots in agriculture are used for:
Farming
Gardening
Plantation
Forests
Agriculture Universities

Nursery Planting - Nurseries are where seeds are grown into young plants, which are later planted outside. Nursery plants are often sold direct to consumers and landscape gardeners, but they are also the start of the food journey for some crops.

VI. CONCLUTION

This project will help to overcome some problems in an agriculture and forest department. This could be a very useful device to work easily, efficiently and effortlessly and it will also help to the save the time. The operation of this Robot is very simple and easy. It does not require any skilled person for this Robotic operation. It can be less time waste compared to manual operation and also requires less energy compare to man power. Therefore this project will be better option for the people indulged in agricultural and forestry activities.

So this project is a boon to the modern world and we think it is good to do something to serve and it should be taken into consideration. We hope this device this project will help in reducing the difficulties shortage of labor.

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