



International Journal of Intellectual Advancements and Research in Engineering Computations

Smart tools for modern agriculture using embedded system

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ABSTRACT

This agriculture project is proposed to improve the technologies in agriculture with ego-green manner. Here we focused about environment, zero fuel, cost effective. It is basically an embedded tool for ploughing, seed sowing, mud leveller and pesticides sprayer. In traditional agriculture system ploughing machines are heavy fuel based which may results in air pollution and it produces greenhouse gases like co₂. It also purpose a simple operation mechanism for high efficiency. The entire agriculture system is controlled by mobile using RF communication. RF technology used for controlling multiple operations simultaneously. It can covers distance 20m. The multipurpose agriculture equipment is very simple to use and the various adjustments are made with ease.

Keywords -*Agro boat, Forming.*

INTRODUCTION

In agriculture the applying of robotics technology is very new. The robot can performing agriculture operations autonomous such as ploughing, seed sowing, mud leveler and pesticides sprayer. In olden days cattle are used for ploughing and mud leveler. Seed sowing process done by man power alone. After the evaluation in modern agriculture the ploughing, seed sowing, mud leveler and pesticides sprayer are in a separate manner. This type of mechanism requires heavy work load and it consumes more cost. After some years. That machine reduces the cost and man power requirements. Watching the farms days and night for an effective report, allowing farmers to reduce the environmental impact, increase precision and efficiency and manage Individual plants in novel ways [1-5].

The applications of instrumental robotics are spreading every day to cover further domains, as

the opportunity of replacing human operators provides effective solutions with return on investment. This is especially important when the duties, that need be performed, are potentially harmful for the safety or the health of workers, or when more conservative issues are granted by robotics. Heavy chemicals or drugs dispensers, manure or fertilizers spreads etc. are activities more concerned by the deployment of unmanned options [6-10].

SYSTEM ANALYSIS

Existing system

Existing system results heavy load on the agricultural land which increasing the density of the soil seed drill is a device that sows the seed for crops by metering out the individual seeds, positioning them to the soil, and covering them to certain average depth [11-15].

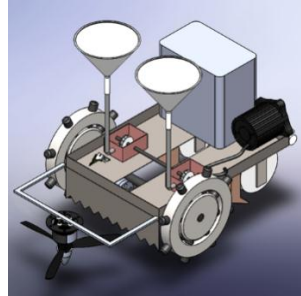


Fig. Existing system

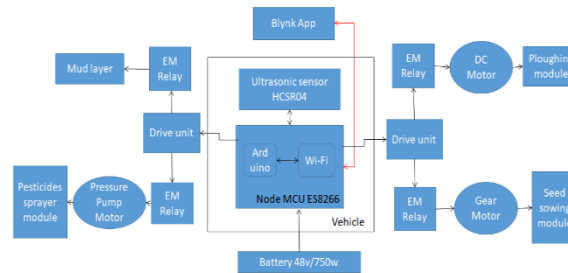
Disadvantages

- Major soil erosion
- Highest fuel and labour cost
- Destroy soil structure

Proposed system

Our proposed system aims to construct a robotic vehicle which can be controlled by wireless

node MCU8266. A DC motor operated at 12V battery for power supply. The power is transmitted at wheel through the gear drives. This project use both mechanical and electronic method to share their power efficiency. Our proposed device used for future farmers [16-20].



The agriculture robot contains four operations in single machine. There are plugging, seed sowing, mud leveler and pesticide's sprayer. While plugging the dc motor is used to digged the soil. In seed sowing operation the gear motor is used to sow the seeds with the help of funnel. The seed will be sown with equal gap of rows and columns. The mud leveler process to close the seeds into the soil and equalize the soil. The final process is pesticide's sprayer. If the sprayer used with pump motor to spray the pesticides to the crop.

Objectives

This paper present the objective of our system status of the current trends and important of agriculture and autonomous system and future applications. Different types of autonomous vehicles in agriculture have been examined. It in compare with conventional systems. Three main

operation have been identified by practical application.

- Crop establishment
- Plant core
- Selective harvesting

Our smart device machine or robot can perform the following the operations.

In this project to fabricate the robot vehicle which can plough the soil, and put the seed in to stander soil and close the mud and finally to spray the pesticides water. While these whole system of robot works with battery power only and it is controlled by node MCU ES8266

While the robot used to in agriculture field when human effect is too reduced. To complete large amount of works in very less time. Farmer can operate this robot through blink app.

METHODOLOGY

The system works under the battery and controlled by blink. The four wheels are connected in the base frame of the robot and driven the rear wheel is dc motor. Harrow is flitted to till the soil in the one end of the frame. For storing seeds and seed flow the funnel is used. It is made up of plastic. The drilled hole in the funnel is used for spread the seeds to the digged soil.

Another end level is used for close the seeds to the soil. The water pump is used to spray the [pesticides along with water. The whole system operate under the 12V battery. The working system of the robot is controlled by node MCU.

To implement the prototype model of drilling and seed sowing machine system with esteemed

source and economy. The subject of the system is further to developed using advanced technique. It may become a success if our project can be implemented throughout our country.

OPERATION

Our proposed system contains five operations.

Steering operation

The remote controller, controlled by the direction of the motor to steering the vehicle either left or right side direction motor is connected to node MCU. Thus the node MCU is responsible for the robot movement.

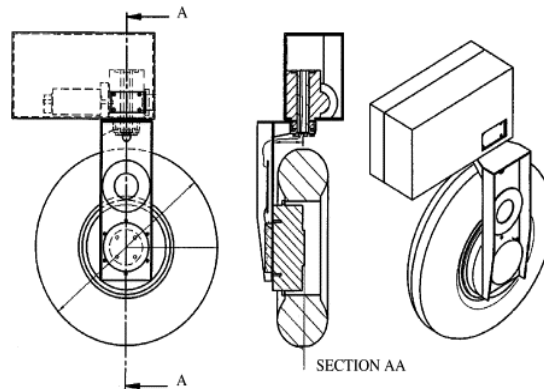


Fig. Steering operation

CULTIVATING OPERATION

The cultivator is like a teeth structure. It used to plough the soil in the order to sow the seeds.



Fig. Ploughing

Seed sowing operation

Seed drum consists of seeds and with the help of funnel like structure, the seeds are dropped in to the soil.

Mud leveler operation

The plate shape leveler is used to connect the end of the vehicle. It works of leveling and closing the mud.



Fig. Mud leveler

Pesticide spraying operation

A pesticide container contains with pesticides storage. A pump motor is used for pumping the pesticides and spray to the crops.



Fig. Sprayer

CONCLUSION

In agriculture the opportunities for robot enhanced productivity are immense and the robots are appearing on farms in various guises and in increasing numbers. The other problems associated with autonomous farm equipment may be in our future, but there are important reasons for thinking that may not be just replacing the human driver with a computer. It may mean a retaking of how crop production is done. The crop production may be done better and cheaper with a swarm of small machines than with a few large ones.

One of the advantages of the small machine is that they may be more acceptable to the non-farm

community. The jobs in agriculture are a drag, dangerous, require intelligence and quick, through highly repetitive decision hence robots can be rightly substitute with human operator. The higher quality products can be sensed by machines accurately. Robots can improve the quality of our lives but there are downsides. The present situation in our country all agricultural machine is working on manual operation otherwise by petrol engine or tractor is expensive, farmer can't work for long time manually to avoid this problem, we need to have some kind of power source system to operate the digging machine.

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