" MULTIPURPOSE AGRICULTURE MACHINE"

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ABSTRACT

Agriculture is the backbone of India since 70% to 75% of the country population has agriculture as their primary occupation. Therefore it is important to bring new implementation in the field of agriculture. Our multipurpose farming machine is performing three operations i.e. digging, seed sowing, and pesticides sprinkling.. For the loosening of soil, the iron plough tool is attached to the tool holder of machine . At a time only one row is ploughed. In the first operation i.e seed sowing the machine is attached to the main machine and the furrows will be placed back of plough tool. The seed is stored in vessel of seed sowing machine after storing seed into vessel the seed comes to the soil though a pipe. In the seed sowing operation at a time only two rows are sowed. The multipurpose farming machine will be available for the farmers at low and affordable price. By using this machine productivity of the crops will be increased.

PROBLEM STATEMENT

- In order to reduce human efforts of laborious work in agriculture it is important to design and develop an agricultural machine which can be able to perform three operations simultaneously seed sowing, digging and pesticide spraying in agriculture field.
- The seed sowing machine is not abundantly available in India. It has high cost and very complex design. Also it is large in size and in weight. Thus transportation of such heavy machines becomes difficult.

- Due to increased concentration in pesticides which causes serious health issues to farmer we have designed and developed a machine to spray pesticides automatically.

LITERATURE SURVEY

LITERATURE SURVEY

A REVIEW PAPER ON MULTIPURPOSE FARM MACHINE

The multipurpose agriculture machine is a solution for small scale farming to improve their
Farming techniques. In this project we are developing a machine which will satisfy all these needs of the farmer. In this equipment we used the iron plough for digging operation. And for spraying we used a vaccum pump. This machine mainly performs three farming operation (digging, sowing, pesticide spraying) which is used for small scale farming.

D.A. Mada, Sunday Mahai in 2013, made a research paper and mentioned the importance of smart agricultural system by giving examples. The conclusion from the paper was need of multipurpose machine which will be used before harvesting the crops. We took this into our cosideration for our research and further production of our multipurpose agricultural machine.

V.K. Tewari, A. Ashok Kumar, Satya Prakash Kumar, Brajesh Nare in 2012 made a research paper with a case study on farm automatization in west Bengal as being part of India it give clear statistics about availability and progress in agriculture made in India.

Three Basic Designs

It is a concept for designing a machine for small scale farmers. In one machine many functions are being performed with cheaper cost as compared to the other agricultural machines. Mechanism of the machine is not very complicated so a normal person can also use it easily. The machine mainly performs three main functions which are as follows:-

1) Sowing

2) Spraying

3) Digging

CONSTRUCTION DETAILS

Multipurpose agricultural machine consists of the following components
1)Chassis frame 2) DC motors 12 V 3) Sprayer 4) digging tool 5)Hopper 6) Switch 7) 12V Batteries 8) Fertilizer tank 11) Wheel

Chassis frame :

It consists of a framework on which the components are been placed . Chassis frame is the under part of a machine, which consists of the frame (on which everything is mounted).

The chassis is be one of the significant structures of a machine. It is the part which holds both the body of the machine. Parts like wheeles, motor, hopper, spraying mechanisms etc are fixed on the chasis frame.

12V Battery and Motor

Battery is mounted on the chassis near the handle shaft and four motors are connected to four corners of the frame. This provides a machine the movement it requires throughout the field.

Digging tool:

Digging tool device, or drill bit, that usually includes a rod placed with an inclined hook which digs the soil as the machine moves forward.
The mechanism consists of a drill tool with it is machine to in this project we are using the machine's forward push to plough the field .

Hopper

Hopper is placed on chassis' back for storing the seeds .
Shank is the shaft for the bowing seeds from the hopper.

Fertilizer tank

It is placed on the back of chassis between the battery and motors.
It is connected to the spraying mechanism for the machine and is used to store either water or pesicides.

Mechanism for movement

Requirements:

1. Arduino UNO
2. DC Motors
3. Battery
4. Wires
5. L293D motor driver IC

Using conditional statements are used to code for the movement. The forward movement is done by making both the wheels work at the same time and for right and left movement one motor runs. One motor running while the other idle will pull the bot in one direction and this results in left or right movement.

If we press 1 in the serial monitor, their would be a forward movement. Similarly, if we press 2 there would be a backward movement, press 3 for left movement and press 4 for right movement.

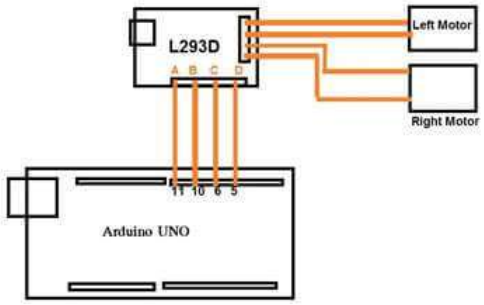


Figure 1:-Circuit for the movement of the machine

Mechanism for sprinkler

For sprinkling, there is a fertilizer tank in which the liquid is stored. It is connected to the vaccum pump which is then connected with the sprinkler. This all is mounted above the chassis frame below which the crops are present.

Mechanism for sowing

This is a mechanical part of the project. This mechanism consists of a hopper in which the seeds are there which is connected to the pipe which drops towards the ground. The hopper consist of holes through which only limited seeds will fall.

Mechanism for digging

This is a mechanical part of the project. In which there would be a lever connected to the back side of the chassis frame. The lever has to come down whenever the digging process is required. When it comes down, the machine moves forward while the digging goes on with the machine.

WORKING

Function of multipurpose farming machine is to sow the seed, wastage of seed and loosening of soil in the rows at required depth and is to maintain the distance between the seeds and provide a proper connection to the seed. A multipurpose farming machine is a device that is used sows the seeds, it digs a furrow in places as well as spray pesticides.

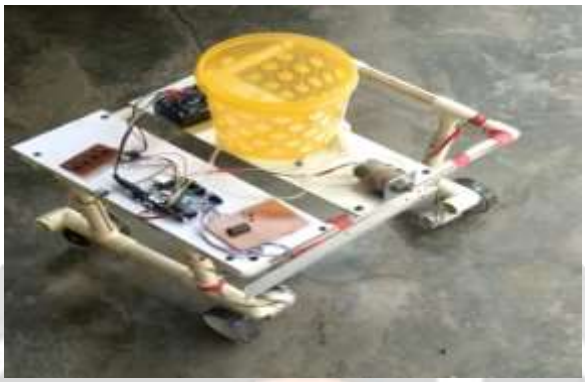
The method of ploughing and seed sowing in a traditional way a lot of labour and hence scarcity of labour. Thus the result in less crop yield and these difficulties needs some solution.

The multipurpose farming machine is doing three operations i.e. digging, seed sowing and pesticides sprinkling. The assembly is doing three operations i.e. ploughing, seed sowing and irrigation. And the assembly operator walks behind the machine during the working period of machine. For the loosening of soil, the iron plough tool is assembled. The gripper is providing a proper grip into soil . At a time only one row is ploughed. In seed sowing operation the seed sowing machine is assembled to machine and the furrows will be place back of plough tool. The seed is store in hopper of seed sowing machine after storing seed into hopper the seed comes into the soil.

For sprinkling, there is a fertilizer tank in which the liquid is stored. It is connected to the vaccum pump which is then connected with the sprinkler. In which there would be a lever connected to the back side of the chassis frame. The lever has to come down whenever the digging process is required. When it comes down, the machine moves forward while the digging goes on with the machine.

Results:

"Multipurpose Agricultural Machine" conclusion can be made on the basis of overall performance of the machine.We can thus say that this model will satisfy theneeds of small scale farmers, as theycannot affordhigh cost agricultural equipments.



FUTURE SCOPE

1. We can interface different sensors to this machine so that it can monitor some more parameters like moisture content in soil, air etc.
2. We can add Wireless Technology to control the machine.
3. We can add a different motorised drill for different crops.
4. We can install a water tank and a fertilizer tank in machine to minimize more efforts.
5. We canput a solar panel topower themachine.

6. we can add frequency radiator to keep the birds away.

CONCLUSION

After we have completed the "Multipurpose Agricultural Machine",we can concludethat,
As per the overall performance of themachine, this project will satisfy theneed of small scale farmer, because they cannot affordhigh cost agricultural equipments. The machinewill need less man to work with and will also save time as compared to the ancient and traditional methods. So if we make this available on a largescale,its costsignificantly reduce and we hope this will help our farmers and contribute to our Indian agriculture.

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