

## MULTI-PURPOSE FARMER AGRIROBOT

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**Abstract:** The paper aims on the design ,development and fabrication of this robot which can put the seeds, leveller to close the mud and sprayer to spray fertilizer or water in field, these whole system of the robot works with the battery or fuel engine .More than 40% of population in the world chooses agriculture as primary occupation in recent year the development of the autonomous vehicles in the agriculture has experienced increased interest. The vehicle is controlled by Relay switch through IR sensor input. The language input allows a user to interact with the robot which is familiar to most of the people. The advantage of these robots are free and fast data input operations.

### 1. INTRODUCTION:

The robotics technology in agriculture is very new this time. In agriculture, the opportunities for the robot-enhanced productivity are immense and the robots are appearing on farms in various guises and in increasing numbers. We “can take operations from this agrirobot for sowing seeds, levelling mud, soil moisturing sensor, irrigation, spraying water and fertilizers. Watching the farms day and night for an effective report, allowing farmers to reduce the environmental impact , increase precision and efficiency and manage individual plants in novel ways . The application of instrumental robotics are spreading everyday to cover further domains ,as the opportunity of replacing human operators provides effective solutions with return on investment .This is specially important when the duties, that need be performed are potentially harmful for the safety or the health of the workers, or when more conservative issues are granted by robotics heavy chemicals or drugs dispensers , manure or fertilizer spreaders,etc.

### 2. LITERATURE REVIEW:

Seed sowing, Ploughing the farm, Spraying water or fertilizer, Mud leveller, Moisture sensor.

### 3. MATERIALS:

In this paper used of differrnt equipment for make this robot. When we assemble the all equipments as plough for ploughing, sprayer for spraying, sensor for sensing the soil, leveller for levelling the mud, seed for sowing during the ploughing.

### 4. METHOD:

#### 4.1 PROCESS OF SEED SOWING:-

In the process of seed sowing here we use principle of PIC & PLACE robot. Which will pic the seeds and put in the soil.

**Step-1:** In the first step , on the mid base of robot a 360 degree moving motor is connected and with this motor a 180 degree moving motor is connected.

**Step-2:** After connecting both motors we connected a arm having two or four fingers. This arm can be of aluminium ,iron or wood.

**Step-3:** This arm is so long as it can reach to the soil easily.

**Step-4:** In the other side , there will be a cavity on mid base, which can store the seeds or fertiliser

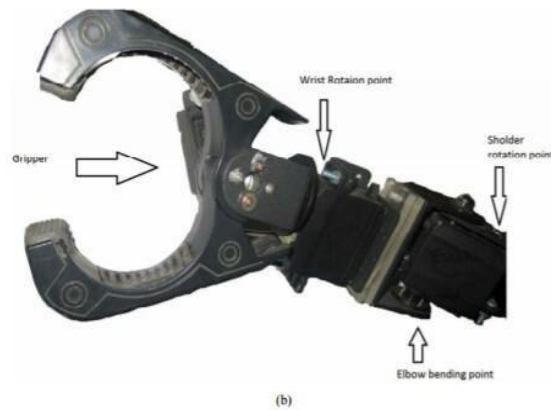


Figure 1. (a) Type-1 and (b) Type-2 custom made mechanical arm gripper.

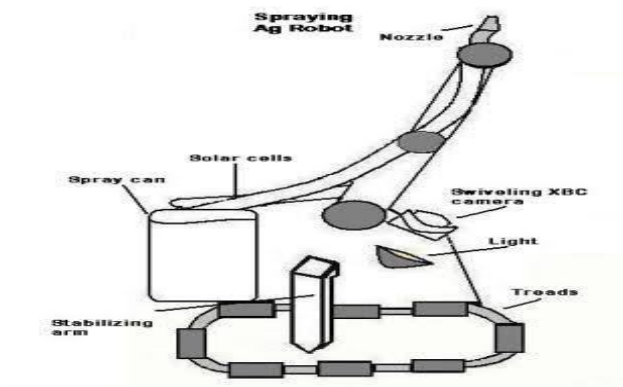
#### 4.2 PROCESS OF PLOUGHING:-

In the process of ploughing we can use teethe like ----- . Which can easily plough the farm. Various steps for this process are as follows-

**Step-1:** In plough, we connect two or three tooth with mid base.

**Step-2:** With moters we can give it up- down movement when requires.

**Step-3:** When robot moves in forward direction, we make it down and continue the process of ploughing.



#### 4.3 PROCESS OF SPRAYING:-

In the process of spraying we can use the principle of viscosity . In this principle when an outward pressure is applied on the pipe, then the liquid start to come out from the pipe. And this process continues until the liquid did not finish from container.

**Step-1:** A pipe is connected to the container or to the cavity , we generate on the mid base. This cavity can store fertiliser, water and seeds.

**Step-2:** This pipe is hold by pic & place arm, on the mouth of pipe a shower type structure is formed which can spread the liquid in the farm.

For starting water flow we have to create outward pressure in the pipe.

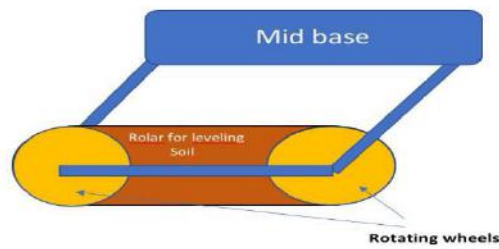
#### PROCESS OF MUD LEVELER:-

In the process of mud leveler we use it for leveling the soil in the farm. And it is worked by using roller.

**Step-1:** In the mud leveler process we use a simple cylindrical shaped roller of wood , iron, or aluminium .

**Step-2:** This roller is connected with motor to mid base.

**Step-3:** The motor rotates it in up & down direction as requires.



#### 4.4 PROCESS OF MOISTURE SENSOR:-

In the moisture sensing process simply a moisture sensing sensor is connected to AVR board.

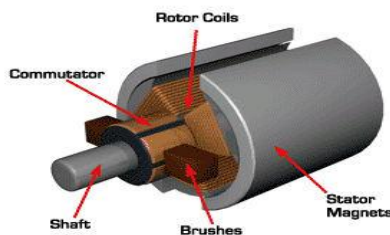
**Step-1:** Moisture sensor is fitted down on the robot which will be bounded by a motor to move up- down.

**Step-2:** When it will need to sense the moisture it goes down under the soil and result will be shown in the display.

#### TECHNICAL DETAILS:-

##### MOTOR:-

This motor contains brushes, rotor coils, commutator, shaft, stator magnets. When shaft rotate the commutator also rotate with shaft. And create a magnetic field around it. We use Gear motor, for four wheels of robot, for rotating it. Because it gives low speed and high torque. So it will be good for it. In this robot we use 9 volt battery for providing power to motors. We can also use 12 volt battery for providing power to motors.



In this robot the main part of whole robot is microcontroller board. And here we use AVR microcontroller ATMEGA16 in it.

##### MOISTURE SENSOR:-

In this robot we use moisture sensor for sensing the moisture of soil. This component finds the moisture level by going inside the soil, and represents its reading on the display of LCD.

**SPRAYER FOR FERTILIZER OR WATERING:-** Here we use a shower type sprayer with a pipe. In this we use a cooler pipe for pumping the water.

##### BLUETOOTH FOR CONTROLLING:-

We need here a wireless controlling device for controlling the robot within a range. The range is limited. Here we can use remote control also for controlling.



## 5. DISCUSSION:

In our daily life we see that the farmers are doing their farming in hot sunlight in the field. So, for their farmers we make AGRIROBOT that are help for farming in the field and it is operate by the mobile phones and Bluetooth system for the performing the different operations by their farmers.

## 6. ANALYSIS:

We observe that the farmers of their country are lose more time in field for farming but when the robot are doing work they doing work more fast than farmers. When robot is work there only less number of worker are required for operate its.

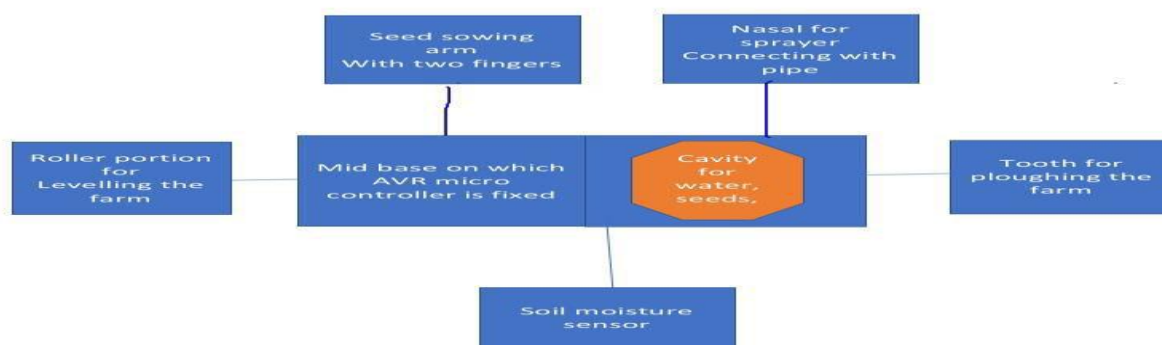
## 7. FINDINGS:

It is find that there have less number of workers are needed for operate it and the work are complete very easy within very less time for the farmer. It is new technology robot which is very helpful for the farmer of their country.

## 8. RESULT:

At last we clarified it is very versatile device for farmers of our country. It perform multiple work at a time and very easy way. It is verified by the farmers.

## 9. RECOMMENDATIONS:



Eg: 1



Eg: 1.1

## 10. CONCLUSION:

The conclusion of this paper is to present the status of current trends an implementation of agricultural and autonomous systems and outline the potential for future application. Different applications of autonomous vehicle in agriculture have been examined and compared with conventional system, where three main groups of field operations have been identified to be the first potential practical applications, crop establishment, plant care and selective harvesting. Fabricate a prototype multipurpose agricultural robot which can perform the following function. It reduce human effort in the agricultural field with the use of small roboIt perform all four operations at single time, hence increase the production and saves the time. It complete large amount of work in less of time. The farmer can operate this robot through remot or mobile by sitting at one side and he can operate easily.

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