

PESTISIDE SPRAYING ROBOT

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Abstract: In India, near about 70% people are dependent upon agriculture. So the agriculture system in India should be advanced to reduce the efforts of farmers. Many farmers have suffered from a toxic chemical exposure after spraying pesticide on the crop. It is necessary to protect a plant. We must avoid a pest from plant Compared to spraying pesticides manually outdoors, the environment is more closed, and has a high temperature, humidity and so on for operating the spray work in the green-house. In order to protect laborer and reduce labor intensity, we develop a prototype of pesticide spraying robot specially used in the greenhouse. Robot is controlled with a PIC16F877A microcontroller. Designing of the latest inverted ROBOT which can be controlling using an APP for android mobile. We are developing the remote buttons in the android app by which we can control the robot motion with them. And in which we use Bluetooth communication to interface controller and android. Controller can be interfaced to the Bluetooth module though UART protocol. According to commands received from android the robot motion can be controlled.

Keywords:-*Pesticide, Robot, Agriculture, Android Smartphone, Bluetooth Module, Robot, Single Microcontroller Chip.*

I INTRODUCTION

The agriculture is the backbone of the world. Agriculture is only the field which is providing the very basic needs of human beings. Today the prices of food items raising day to day, this is because the production in the agriculture field is going down. This is because today agriculture field facing many problems, lack of laborers, new diseases to the crop, insects destroying the crop etc. The most challenging work in the agriculture is controlling insects using pesticides. The spraying of pesticides by human is very harmful to their health. There are many cases in which peoples are died after spraying such a poisonous pesticides.

So our present model is an attempt to do such a difficult work by machines (Robot) to help the farmers. In this project, the robot is controlled by a mobile phone that makes a call to the mobile phone attached to the robot. And this robot is not only for Pesticide or Fertilizer Spraying, This robot can be used for other Agriculture works.. This project is designed to offer advanced technologies to the people facing various degrees of paralysis. One such Is Hemiplegic, which is the paralysis of arm, leg and trunk of the same side of the body. In this half portion of the Body is paralyzed and only half portion of the body works properly. This restricts their movement to a great extent. In Higher degree paralysis,

the movement gets restricted to only that of fingers and wrists purpose. In this system android mobile phone is used to control the motion of the wheelchair, to send the message to the Helper and to control the home appliances. The smart phone has been made smarter by using its inbuilt Accelerometer to control the movement of the wheelchair. The person can send message to the helper for help Regarding washroom, tea, food etc.

The mobile's Bluetooth is linked to an external Bluetooth which is further connected to the relays via Adriano which control the home appliances like fan, lights etc. The wheelchair powered with two brushless DC motors operating at 12 volts can also be monitored by a battery level indicator circuit up to 10

II LITERATURE SURVEY

Literature review is nothing but the work done before the present time on the same topic. So, we know that people doing farming from ancient time for food and other purpose. For better grown of crop they spray pesticides on them. There are many types of pesticides spraying technique available now that we can find as we move from east to west and also from north to south. It is difficult to mention all those techniques here. But we tried to mention main techniques used and best known to us. People in India use backpack type sprayer which is carry on back of the person with 15 lit maximum capacities and

AND ENGINEERING TRENDS

one nozzle in one hand while other hand is used to pump the machine to create pressure.

Another machine which is developed and supplied in England was manufactured and patented by Holme Farm Supplies Ltd. This machine is consisting of water tank on tractor. This water tank contains liquid pesticides. On back side of it a long rod is attached on which nozzles are attached. This is used to spray pesticides. Also many such machines are manufactured by this company for large scale farming and large size crops.

One another machine is made in India by Mansukhbhai Jagani. He attached spraying and cultivating equipment to his bike. So his bike was able to furrow opening, sowing, cultivate and spray pesticides on plants. This was proved as cost effective for small size farms.

Automation is the need for agriculture operations because of the reduction in the labor and increasing cost. There are numerous research investigations are reported in literature in the area of robotic application in agriculture.

III HARDWARE IMPLEMENTATION AND SOLUTION



Fig. 1. Hardware of pesticide spraying robot

This robot can go any direction as we desired, like forward, reverse, left or right. Also control the flow of pesticide and prevent the flow of pesticide to human and atmosphere. This robot takes action immediately without standing, as we desire.

The aim of this research activity is to develop a modular, fully customizable and remotely operable

sprayer. It is a robot made for agricultural purposes. It reduces the effort of farmers in addition to increasing the speed and accuracy of the work. It does the function of pesticide spraying. And they increases agricultural production to increase product and increases accuracy in application and enhance working safety. We developed a robot system to monitoring of crops diseases & pesticides.

IV BLOCK DIAGRAM

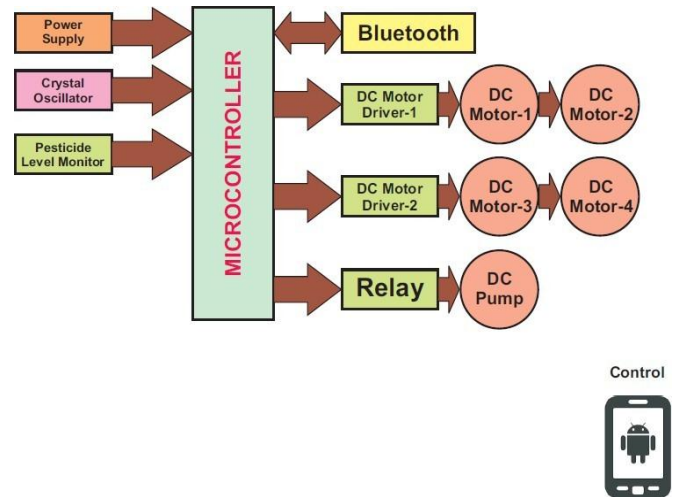


Fig 2 . Block Dia. Of the Project

□ The robotic part of the system consists of a microcontroller which is the brain of the system. This whole system is designed around this microcontroller, to control the operation of the system. In this work we have used a PIC microcontroller.

□ The hardware of the system consists of a DC pump used to spray the pesticide in the farm. This DC pump will also be controlled by the microcontroller. To interface this DC pump with the microcontroller we have used a separate relay. This relay also connected with the controller through the driver IC.

□ To control the robot from the remote we have designed an android application which will be installed in the android cell phone. And to send commands to the robot Bluetooth is used as a wireless transmission medium in the system. To receive these commands from the android application a Bluetooth module HC-05 is interfaced with the microcontroller in the system.

□ This robot will be operated through an android application installed in the android phone of the system user. As seen in the following figure 5 switches are designed in this application.

V IMPLIMENTATION AND DESIGN

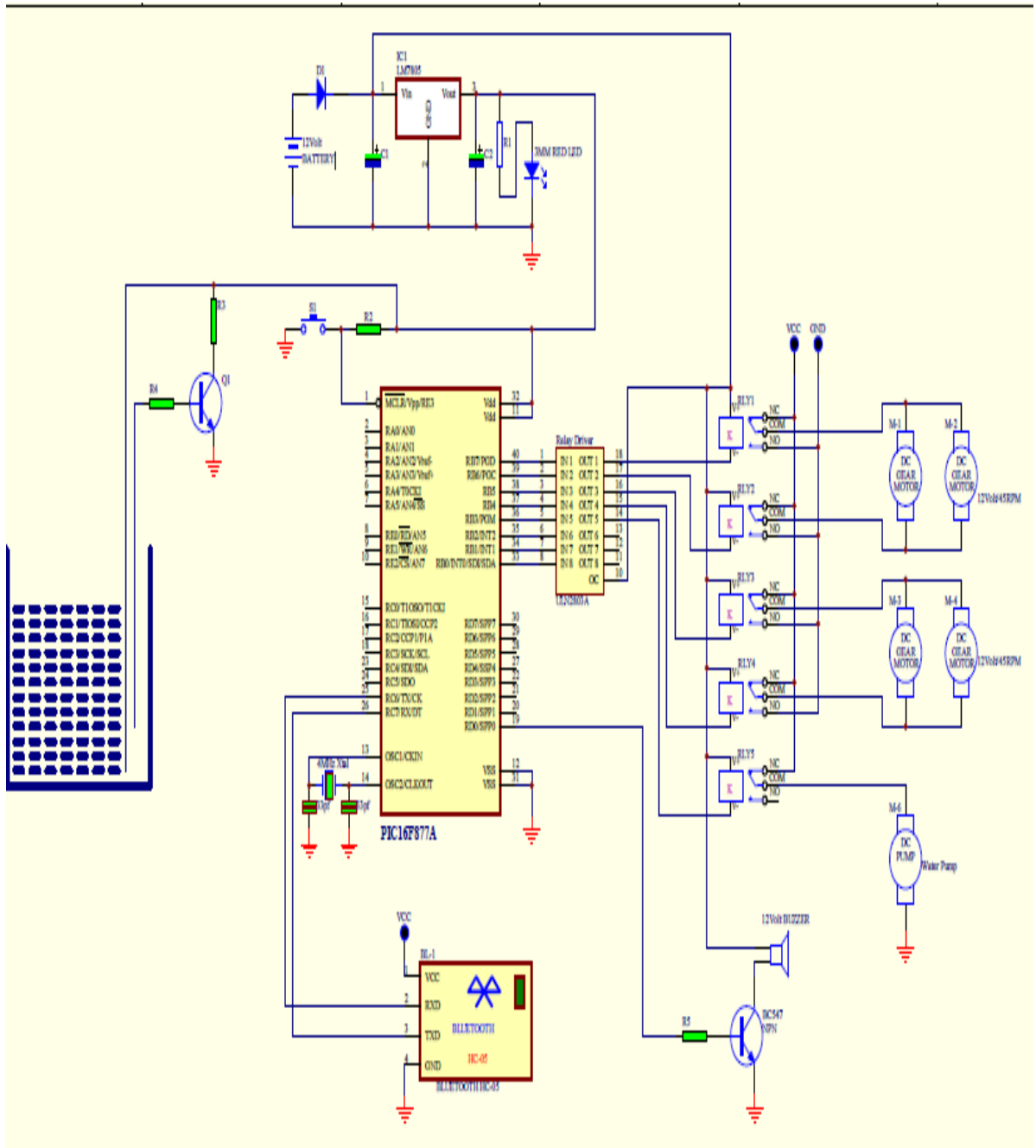


Fig 3 Android Mobile Control Pesticide Spraying Robot

Algorithm Steps :

- 1) Start
- 2) Pair of device
- 3) Send the command from android mobile
- 4) Send A character to pin no 26 .
- 5) Spray the pesticide.
- 6) Send B character to pin no. 26.
- 7) Move he robot forward direction.
- 8) Send C character to pin no. 26.
- 9) Move the robot reverse direction.
- 10) Send D character to pin no.26.
- 11) Move the robot left side.
- 12) Send E character to pin no.26.
- 13) Move the robot right side.
- 14) Repeat procedure.
- 15) End.

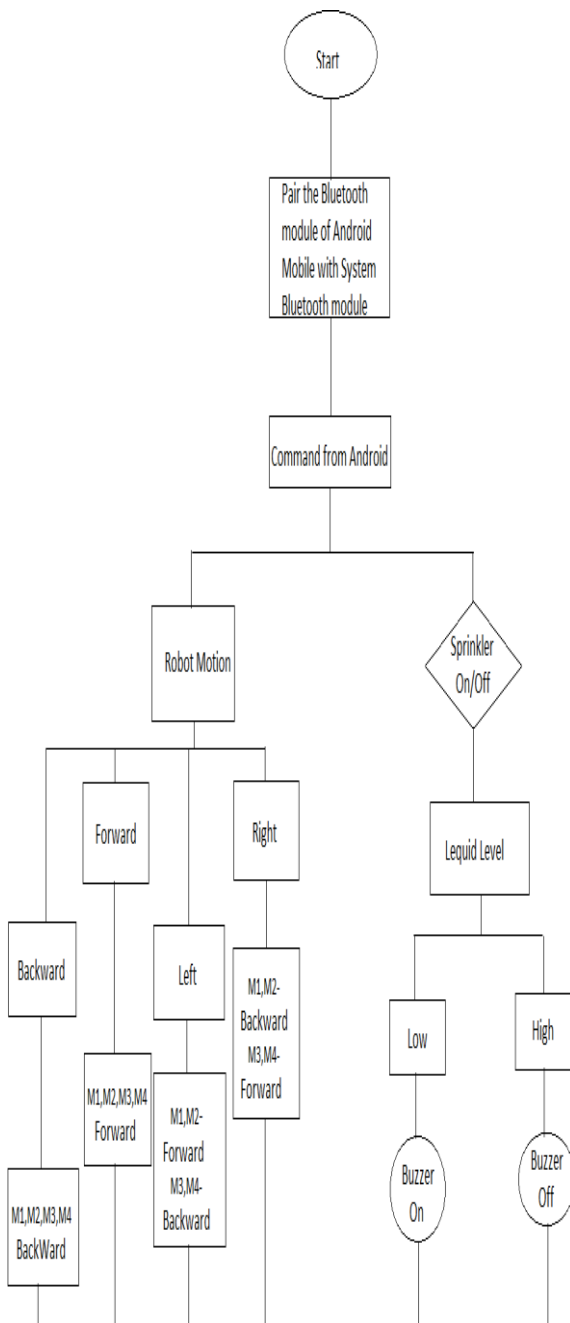


Fig 4 Flow Chart of Motoin of Robot

PCB LAYOUT

A printed circuit board (PCB) mechanically supports and electrically connects electronic components using conductive tracks, pads and other features etched from copper sheets laminated onto a non-conductive substrate. PCBs can be single sided (one copper layer), double sided (two copper layers) or multi-layer. Conductors on different layers are connected with plated-through holes called vias. Advanced PCBs may contain

components - capacitors, resistors or active devices - embedded in the substrate.

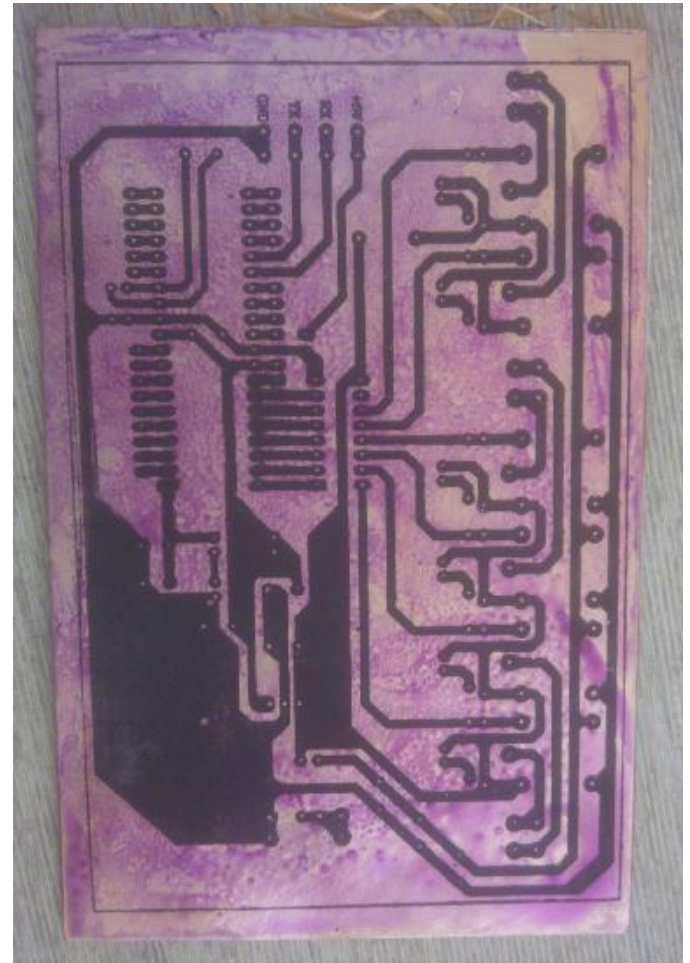


Fig 5. PCB Layout of Android Mobile Control Pesticides Spraying Robot

VI RESULT

This type of system is very helpful for agriculture purpose where need to spray the pesticide to different crops. Currently we use a system that increases the human effort and it also not comfortable. This pesticide sprayer robot move in fields and sprays the pesticide as per the requirement and command from the user. In this system we use small tank for pesticides and motor. By making some modification we can use this system for other type of application.

Forward direction - all motors rotates clockwise direction

Reverse direction – all rotates move anticlockwise direction

Left side – left side motors rotates anticlockwise direction & right side motors rotates clockwise direction

Right side – right side motors rotates anticlockwise direction & left side motors rotates clockwise direction

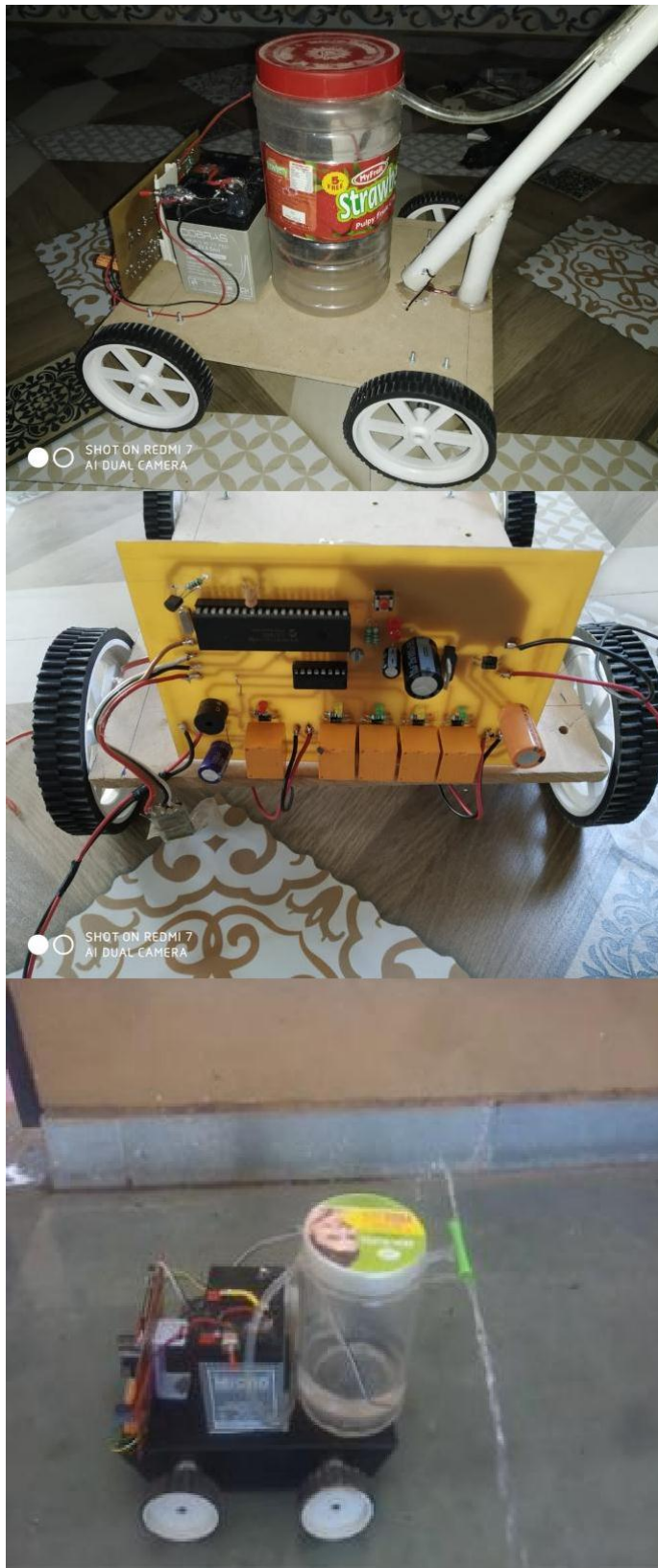


Figure 6 : PESTISIDE SPRAYING ROBOT

VII ADVANTAGES:

- Avoid the former being exposed to toxic pesticide vapors produced during spraying.
- Reduce the workload on the farmer and as it is easier to operate.
- The former need not spray in the hot sun, he can operate the device while standing in a cooler place.
- By the development of these agrobots lot of manual labor will also be decreased and the farmer life will save from chemicals.

VIII APPLICATION:

- Pesticides spraying robot used in greenhouse.
- Pesticides spraying robot used in agriculture.
- Pesticides spraying robot used in polyhouse.

IX CONCLUSION:

The robot for agricultural purpose is a concept for the near the performance and cost of the product once optimized, will prove to be work through in the agricultural spraying operations. We have been successful in developing a robot whose construction is enough to withstand the challenges of the field. We are sure that once this concept is presented in a manner suitable to Indian market, it will definitely help in bringing down the 15% molality rate found in the Indian formers associated with the agricultural spraying operation.

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