CMR Institute of Technology

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Institute Innovation cell

Developing Online Repository of Ideas Developed and Wayforward plan

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Idea Title: AGRO AIR BASED SPRAYER

Problem Statement:

Sprayers should be made cost efficient,user friendly,thus not harming the environment when used for agriculture purposes,and should be working more efficiently so that users can gain more yield.

PROBLEM DEFINITION:

Farmers cultivating larger areas require an air based sprayer at lower cost that can spray larger parts of the land in a shorter time so that they can improve yield with reduced investment.

OVERVIEW:

Electrostatic force field has been exploited in the design and development of an air-assisted electrostatic sprayer for agricultural applications to increase the mass transfer efficiency, pesticide bio-efficacy, uniform deposition, maximum canopy coverage and liquid pest to reach the hidden areas and underside of the target by reducing the drift of active ingredients of pesticides from the target microorganism.

Electrostatic force field application is the current trend in pesticides spraying to protect the crops, vineyards, orchards and trees from many dreadful diseases and insects.

GOALS/Objectives:

Sprayers should be of less cost which can be affordable by the user and shall have a simple design so that can be used easily by the user and sprayer should cover larger part land in a shorter time ,so farmers can improve the yield with less investment.

SPECIFICATIONS:

1. Researches have indicated electrostatic spraying achieves better coverage of difficult targets than conventional spraying.

2. Water consumption of that kind of sprayers is up to 10 times less than conventional spraying.

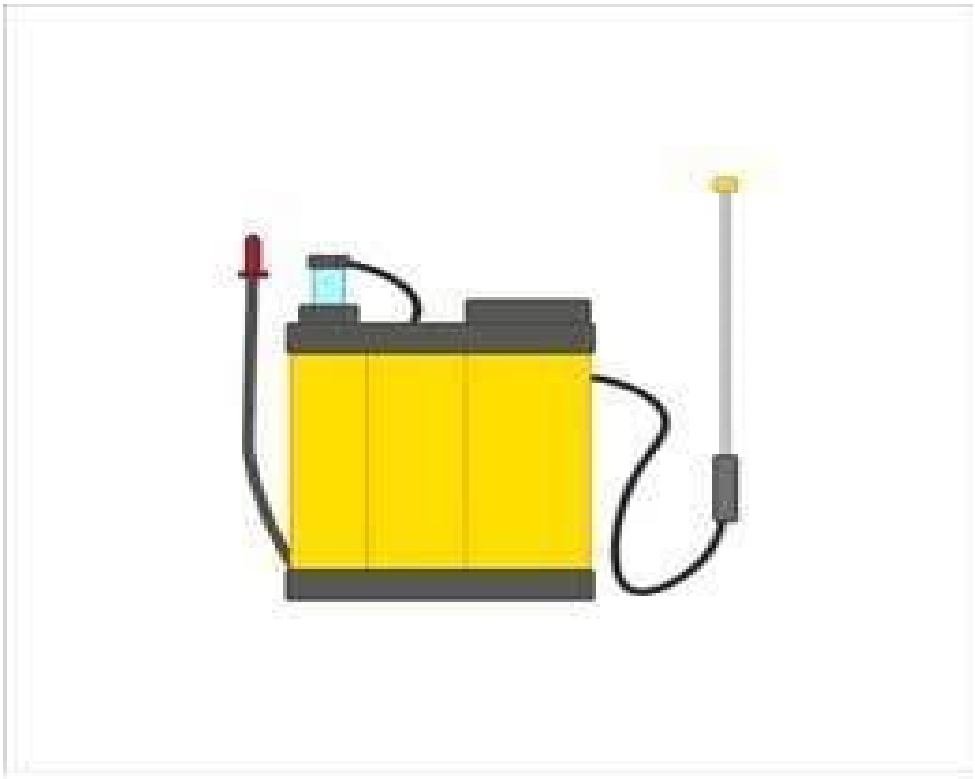
3. Electrostatic guns have very high transfer efficiency which means less money spent on

MILESTONES

1. Ideation/Data collection

Sprayers are generally used for spraying insecticides and pesticides on crops and plants so as to control diseases and pests. They are used in the agriculture sector. Also they are used to spray in herbicides so as to control the micronutrients and weed for the crop growth.

It provides a comprehensive analysis of all regional and key player segments providing closer insights into current market conditions and future market opportunities, along with drivers, trend segments, consumer behavior, price factors and market performance and estimates



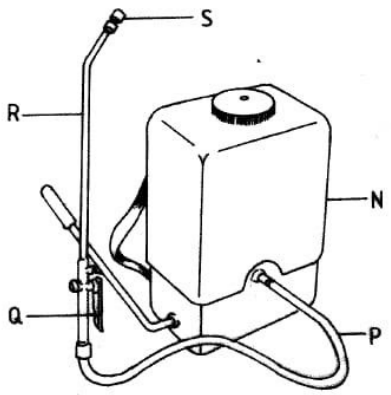
2. Model Building

Conceptual Design :

Sprayers are fully integrated, mechanical systems, meaning they are composed of various parts and components that work together to achieve the desired effect, in this case: the projection of the spray fluid. This can be as simple as a hand sprayer attached to a bottle that is pumped and primed by a spring-lever, tube, and vacuum-pressure; or as complex as a 150 foot reach boom sprayer with a list of system components that work together to deliver the spray fluid.

For more complex sprayers, such as agricultural sprayers, common system components include: the spray nozzle, sometimes with a spray gun, fluid tank, sprayer pump, pressure regulators, valves and gaskets, and fluid plumbing.[2] The sprayer pump can be just as important as the sprayer type itself as

there are many sprayer pump design types with various construction materials, inlet/outlet sizes, and performance specifications. Common sprayer pump types include diaphragm, centrifugal, and roller PUMP



3.Components/Tools Understanding and usage:

Requirement Analysis :

Hard and software components requires :

1.Motor pump

2. Pipe

3. Cane 5l

4. Wire

5. Arduino

6. Relay

7. Jumper wires

8. Floating level sensor

1.ARDUINO :

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board.

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

2.Floating level sensor :

A float switch is a type of level sensor, a device used to detect the level of liquid within a tank. The switch may be used to control a pump, as an indicator, an alarm, or to control other devices. One type of float switch uses a mercury switch inside a hinged float.

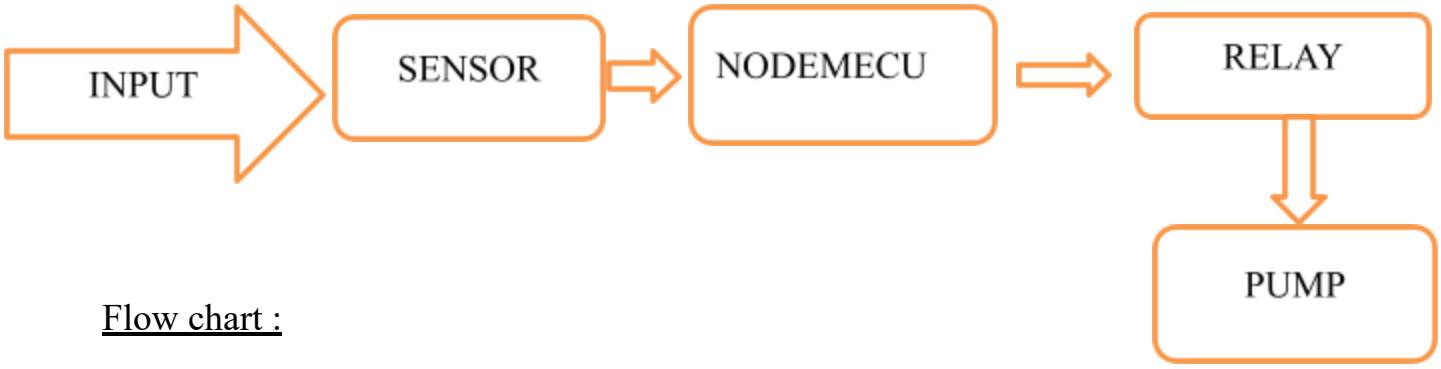
3.Motor pump :

Most RV water pumps run using the RV's 12-volt battery. ... This is a 12v RV water pressure pump that can also be adapted for marine, filtration, and solar water systems. It can flow water pressure ranging from 17 to 55 psi, thanks to internal bypass technology that reduces cycling controlled by a switch.

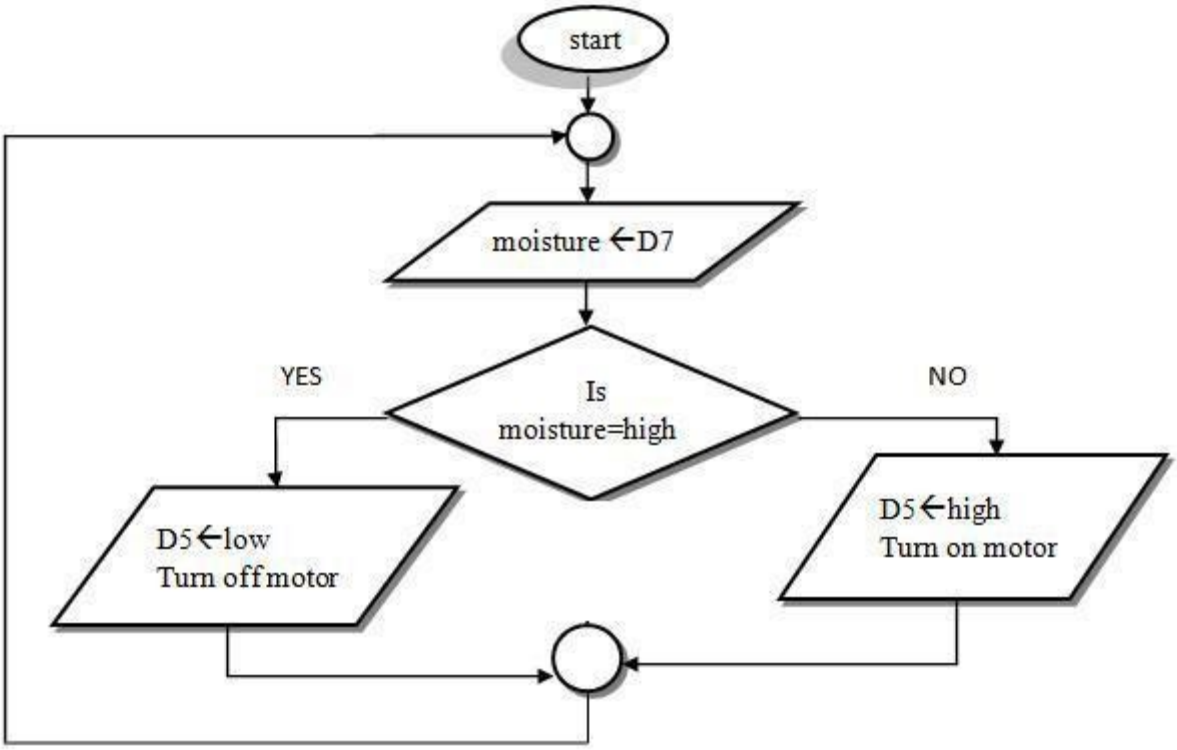
4.Relay :

A relay is an electrically operated or electromechanical switch composed of an electromagnet, an armature, a spring and a set of electrical contacts. The electromagnetic switch is operated by a small electric current that turns a larger current on or off by either releasing or retracting the armature contact, thereby cutting or completing the circuit. Relays are necessary when there must be electrical **isolation** between controlled and control circuits, or when multiple circuits need to be controlled by a single signal.

Block diagram :



Flow chart :



Source Code :

```
int FloatSensor = 2;
int led = 13;
int buttonState = 1; //reads pushbutton status
void setup() {
  Serial.begin(9600);
  pinMode(FloatSensor, INPUT_PULLUP);
  pinMode (led, OUTPUT);
}
void loop() {
  buttonState = digitalRead(FloatSensor);
```

```
if (buttonState == HIGH) {
    digitalWrite(led, LOW);
    Serial.println("WATER LEVEL - LOW");
  }
  else {
    digitalWrite(led, HIGH);
    Serial.println("WATER LEVEL - HIGH");  }
  delay(1000);
```

4. prototype

5. Testing