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Design and Fabrication of Pesticide Sprayer Attachment in Two Wheeler

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Abstract - *The project's main goal is to design and build a multi-spraying vehicle that can be used in agriculture. It consists of a bike-mounted pump, reservoir, nozzle, sprinkler, and battery. The four nozzles are mounted on the bike's front and rear sides. This is where the pesticide is sprayed and stored in the tank. The vehicle can spray agriculture land within a short span of time. This project is used to reduce time and farmers' effort and save money.*

Key Words: **Pesticide Sprayer, Two Wheeler, Agriculture, Reduce Time**

1. INTRODUCTION

Agriculture plays an important role in day-to-day life. To help the farmers we had designed and developed a pesticide sprayer that is attached in a two-wheeler. Two-wheelers are attached so it has to make the spraying easy to the farmer and to reduce the human effort. The pesticide sprayer is usually large in size, so we had developed a pesticide sprayer which is compact in size. It consists of sprayer that is attached in the front, and rear side of the two-wheeler and the tank is placed in the rear side of the two wheeler. The sprayer sprays the pesticide at a very high-speed it makes spraying easy and at less time.

2. METHODOLOGY

2.1 Part description

- Two wheeler
- Diaphragm pump
- Nozzle turning mechanism attachment
- Hose
- Tank
- Suction hose
- T-pipe
- Rope
- Wire
- Diode
- Switch

2.1.1 Two Wheeler

FIGURE NO: 1

The TVS 50 XL motorcycle was chosen as the winning machine. It has a 50cc two-stroke engine, a centrifugal clutch, a belt transmission that connects the clutch output to a pulley, and a sprocket that drives the rear wheel via a chain drive in a 4:1 ratio. As a result, the two-wheeler drive mechanism in this motorcycle is simple to integrate.

Specification:

1. **Curb weight = 60 kg**
2. **Turning radius = 2.0 m**
3. **Gear ratio = 4:1**

2.2.2 Diaphragm pump

A diaphragm pump could be a positive displacement pump that pumps a fluid by combining the reciprocatory action of a rubber, thermoplastic, or Teflon diaphragm with acceptable valves on either aspect.

FIGURE NO: 2

2.2.3 Nozzle turning mechanism attachment

- **DC motor**
- **Aluminum plate**
- **Screw**
- **L clamp**
- **Steady clamp**
- **Nut and bold**

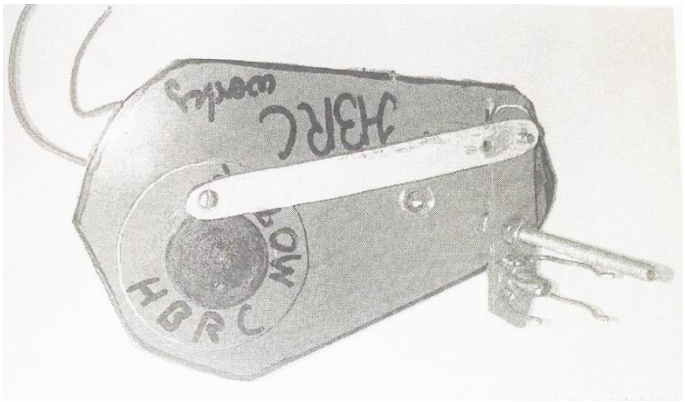

FIGURE NO: 3

2.2.4 Suction Hose

The pesticide is sucked with the aid of a suction hose and a compressor. Suction hoses are normally made of extruded synthetic rubber or soft plastic, and they're also lined with a fiber web on the inside.

2.2.5 Diode

The diode transforms AC current to DC current, which is then supplied to the motor to make it work. 1W-IN5405 is the diode's value.

2.2.6 Tank

The pesticide is stored in a tank. The tank has a storage capacity of 10 liters on both sides. Polyester plastic is used to make the reservoir**.**

2.2.7 Wire

Current is supplied to the pump and motor through wire. The most popular materials used to render the wire are copper and aluminum. These are not the finest conductors, but they are plentiful and inexpensive. The size of the wire is 3 mm

2.2.8 Switch

Switches are used to switch on and off the power to the pump and motor. The sort of switch is a toggle switch.

2.2.9 T-pipe

The tube from the tank is linked with a T-pipe. The T-pipe is made of mild steel and has an 8 mm port.

3. DESIGN OF PROTOTYPE

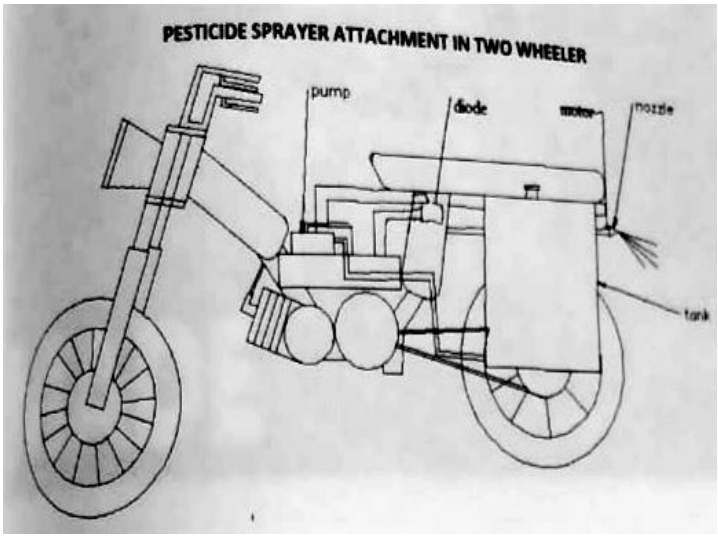

FIGURE NO: 4

4. ASSEMBLING PROCEDURE

- The tank is first mounted in the vehicle's rear end.
- Second, in the reservoir, add the hose pipe.
- The suction hose pipe is then attached to the T-pipe.
- The other end of the suction hose is attached to the pump's suction outlet.
- The nozzle turning mechanism is then attached to the two-back wheeler's end.
- The main line is connected to the diode DC outlet line, and the pump and motor wires are connected to the diode DC outlet line**.**
- Then, connect the dynamo with the diode.
- Fill the pesticide in the tank and start the two-wheeler.
- ON the toggle switch to power the pump and motor.

5. WORKING PRINCIPLE

The diaphragm pump, diode, pipe line, tubing, and spraying nozzle are all included in this project. Start the vehicle first, and then switch on the pump's power supply. The pesticide is sucked from the tank by the compressor, which then flows along the pipeline. The pesticide is then sprayed with less effort in the farm field by the spraying nozzle.

6. FABRICATION WORK

- **CUTTING WORK**

  The cutting process is used to cut the aluminum plastic material to the required shape and dimension.

- **BENDING WORK**

  The bending process is used to bend the mild steel plate 90 degrees to make it as a L-clamp to a required dimension.

- **DRILLING WORK**

  Drilling is used to make a hole in the L-clamp
  This is used to insert bolt and nut.

- **SOLDERING WORK**

  Soldering is used to join the wire in the required place to make a perfect circuit connection.

7. ADVANTAGES

- Reduced time
- Reduced human effort
- Simple method
- Easy spraying
- High efficiency

8. CONCLUSION AND FUTURE SCOPE

- The proposed model reduces back pressure by removing the need to hold the tank on the backbone and solder.
- More nozzles are needed to cover the largest possible area of spray in the shortest amount of time and at the highest possible rate.
- Having a proper field modification facility in the model tends to prevent overuse of pesticides, resulting in less runoff. It's an improved version of a manually controlled sprayer that will help small-scale growers.
- Spraying takes less time in comparison, allowing one to spray more fields every day.
- It is less costly than the latest spraying pumps on the market.
- It's an improved version of a manually controlled sprayer that will help small-scale growers.

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