

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES **DESIGN and FABRICATION of SOLAR OPERATED WATER SPRAYER**

S. T. Bhugawankar¹, M. P. Sathe², Dr. S. M. Mowade³

1,2 (Asst. Prof. Mechanical Engineering, Smt. Radhikatai Pandav College Of Engineering Nagpur, India.)

3.(Prof. & Head, Mechanical engineering, Smt. Radhikatai Pandav college of Engineering Nagpur)

ABSTRACT

As we know 70% of population of our County lives in villages & their main occupation is agriculture. Similarly more than 40% of these area do not get regular electricity supply. Most of the farmers uses motor operated spray pump or electrically chargeable spray pumps, which costs comparatively high.

Our prominent aim of this project is to fulfill the tasks like hand spraying using non-conventional energy sources. Thus solar operated spray pump will help the farmers of those remote areas of country where electricity and fuels like diesel or petrol is not regular. They can perform their regular work as well as saves electricity and fuel upto large extent. Thus saving revenue of government & also most demanded electricity.

In this project we have used the technique of operating the motor used for spraying using solar panels.

It would not be wrong to say that the sun was supplying all the energy need's of man either directly or indirectly and that man was suing only renewable sources of energy.

I. INTRODUCTION

In ancient time when heat energy was acquired in the form of fire, man utilized it for burning woods and other biomass for cooking and other purposes mainly for safety from dangerous wild animals. After improvement in their knowledge, man utilized heat energy and other energies at an increasing rate as per his requirement using wind for sailing ships, driving wind mills and using force of falling water to run water wheels.

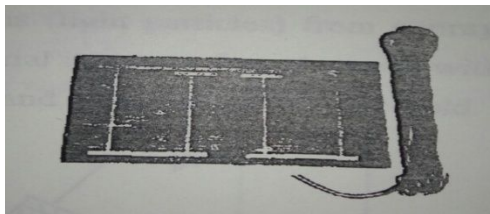
With the dawn of industrial revolution the need of energy has been increased and man started using steam engines, I. C. engines and some other equipment for this purpose. Man started utilizing coal, material gas etc. other fuls were also discovered. All those, above described energies are nonrenewable sources of energy. It is become clearer that our fossil fuels of none-renewable sources are gradually coming to an end.

There are many types of energy sources viz.

1. Heat energy
2. Nuclear energy
3. Wind energy
4. Electrical energy
5. Solar energy

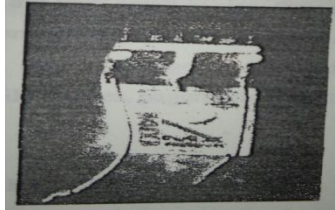
II. COMPONANT OF THE SOLAR SPRAY PUMP

1. Solar Panel



Solar energy the energy of photons which has an unlimited life can be utilized for various source of application. Photovoltaic system is one of the most important systems of solar energy. The first silicon semiconductor used P-V module was discovered in U.S.A. in 1954.

2. Storage Batteries



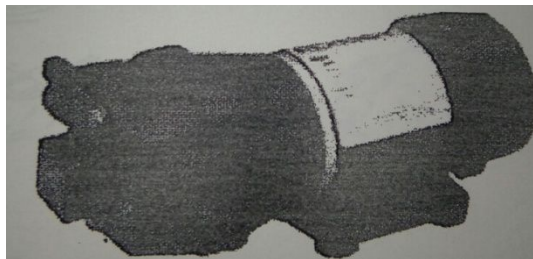
The battery is an essential part of the system. It is use for smooth & efficient operation of unit. It overcomes the following reasons.

- The solar radiation intensity varies from season to season as per the atmospheric condition.
- The solar energy radiation changes form time of day.
- It protects the spray pump from over voltage by providing const. Voltage of 12v.

Types of Battery

- a. Non rechargeable
- b. Rechargeable

3. Centrifugal Pump



The principle of operation of centrifugal pump can be explained by the phenomenon of a bucket of water whirling round in a circular path as shown in Fig. When the bucket of water is whirled round with high speed, no water will spill, even when the bucket is in the vertically downward position because of centrifugal force acting on the surface of water and holding water against the bottom of the bucket. If hole is made in the bottom of bucket, the centrifugal force of rotation throws the water through the hole. If the water in the bucket is connected to a continuous supply of water, water is sucked from the supply and is continuously thrown out through the hole.

4. Tank

The tank is made of plastic having a capacity of 1621 its. It is fitted on the tank frame by means of iron strips the tank consists of a nipple for connecting the rubber pipe to supply the solution to the sprayer reservoir tank.

The tank is placed over the pump and battery assembly. The outlet of the tank is given to the inlet of the pump. A vent is provided to the tan for maintaining atmospheric pressure over the liquid surface.

5. Nozzle

It is a small thin cylindrical section, in which orifice is placed. The main function of nozzle is to increase the velocity of flow of liquid.

6. Handle



7. Filter



III. SCOPE FOR FUTURE WORK

- Can be used for spray painting
- Can be used as drier in the agricultural purpose
- Can be used for lighting the lamp incase problem of load shading.

- We can also reduce the used of tank by using future modification project.
- Can be used as a water sprinkler in a garden.

IV. CONCLUSION

Solar energy is the non-conventional source of energy, it is available at free of cost all over the world. It is non hazardous and lion harmful to human beings as well as for environment. It is more convenient in tropical region. The solar sprayer is more economical than other conventional sprayers. There is no noise pollution vibration and hid consumption, it is very comfortable the maintenance cost is less. There is no wastage of pesticide. This model is light in weight as compared to other machines. In this we can vary the quantity of pesticide a required. It can also be used as a water sprinkler on herbs in gardens. Due to use of small hole on nozzle and high pressure by pump spraying is uniform throughout and more are a is covered.

V. ADVANTAGE

- Free from pollution.
- No manual effort is required for operating pump
- Negligible running cost
- Less maintenance is required
- Easy to handle
- No wastage of pesticide
- Light in weight
- Compact in size.

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