

Design & Fabrication of Solar Operated Agro Spayer

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Abstract—“Energy and its uses” is an of the important factor for any country. Finding solutions, to get the “Energy demand” is the tough challenge for Scientist, Engineers, Industrialist Entrepreneurs and of our Country. According to them, Applications of Non conventional energy is the only a tern for solution for conventional energy demand. Nowadays the Concept and Technology employing this Non-conventional energy becomes very famous for all types of development activities. One of the major area, which finds many applications are in Agriculture Department. Solar energy plays an vital role in drying agriculture products and for irrigation purpose for pumping the well water in remote villages without electricity. This Technology work on solar energy can be extended for spraying pesticides, Fertilizers Fungicides etc., using Solar Sprayers. This paper deals how a ‘Power Sprayer’ which is already in use and works with fossil fuel any fossil fuel. Can be converted into solar sprayer’s works without

Key words: Spray Pump, Agriculture Spraying Equipment

I. INTRODUCTION

Most of the increase in the area of land irrigated in the world has been through the increasing use of driven engine pumps. However, the increasing price of oil-based fuel has reduced the profit to be gained by farmers from irrigation, since food cost have generally been control from rising in line with energy costs. Despite present short-term changes in oil prices, conventional based oil engine driven power sources and mains electricity are expected to continue to increase in the longer term. If we are to decrease our dependence on imported oil, we have to find methods for energizing irrigation pumps that are independent of outside imported oil or centralized electricity.

Solar radiation as a source of energy is Of course. Sustainable energy technology except for waste possibly arising out of the manufacture of solar component (e.g. semiconductors), solar technology have very less environmental side effects. The environmental impacts of solar system in operation are very low and the source is, for us inexhaustible.



Fig. 1: Solar Operated Agro Sprayer

II. CONSTRUCTION

A. Solar Panel:

A solar panel (also solar module, photovoltaic panel) is a packaged, connected assembly of photovoltaic cells. The solar panel can be used as a component of a larger photovoltaic system to produce and supply electricity in commercial and residential applications. Each panel is rated by its DC output power under standard test conditions, and includes a number of solar panels, an inverter, and sometimes a battery and or solar tracker and interconnection wiring. Typically ranges from 100 to 310 watts. The efficiency of a panel determines the area of a panel given the same rated output - a 10% efficient 230 watt panel will have twice the area of a 20% efficient 230 watt panel. Because a single solar panel can produce only a small amount of power, most installations contain multiple panels. A photovoltaic system typically



Fig. 2: Solar Panel

B. DC Water Pump:

For people living in remote areas, solar operating water pumps are usually the only solution as there is no access or less access to fuel. If there is diesel, Solar Water Pumps are the only or best alternative for fuel as the cost of running power lines or fuel pumping may be too great.



Fig. 3: DC Water Pump

A solar powered water pump different from a regular water pump only in that it uses the sun's energy is used to produce electricity for the pump. The solar panels absorb the sun's energy and convert it to electrical energy for the

pump to run. All the pumped water is stored in a water tank so that there is constant supply even in rainy weather conditions and during non-sunny days where there is no power to generate the solar water pumps. Solar powered water pumps represent a higher initial cost, however, over a period of 5 years they represent a cost benefit due to minimal maintenance costs compared to AC pumps run with a generator.

III. SPECIFICATION

A. According to Spraying Capacity & Discharge Capacity Of Spray Motor Is Selected:

- Weight of the motor : 1kg (approx)
- Current : 3A mp
- Operating power required : 84 watt
- Operating Voltage : 12 V
- Motor Speed : 1, 600 rpm.
- Discharge Capacity : 1 Lit/min
- Flow rate : >560ml / 10 seconds
- Fluid pressure : 1.6kgf/cm²

B. According To Motor Operating Power Battery Is Selected:

- Weight of the battery : 2 kg.
- Cost of the battery : Rs.1200-1500
- Output power : 144 watt.
- Operating voltage : 12v
- current : 9 amp

C. According to Battery Output Power Solar Panel Is Selected:

- Power : 18 watt
- Dimension : 397*278*25mm
- Weight : 1.6 kg
- Open Circuit Voltage : 12 volt
- Short Circuit Current : 0.65A mp
- Operating Current : 12 Amp.

IV. WORKING

The solar pump consist of solar panel, DC motor, Battery, micro control sensor, emergency LED, spray nozzle, pesticide tank. DC mobile charger etc. It uses solar energy to operate. First the solar panel collects solar energy from sun and converts it into electrical energy by photovoltaic conversion process. Battery uses this electricity to charge itself. The stored electricity used to run the motor and other devices. When the switch is turn ON the operated spray pump requires fuel which is costly and availability of fuel is not an easy at rural places. At the same time carbon dioxide is exhaust as pollutant which is harmful to our environment. In such cases we should think to move towards some non-conventional energy. Considering it, solar energy would be one of the solutions. Solar energy plays a vital role in drying agriculture products and for irrigation purpose for pumping the well water in remote villages without electricity. This technology on solar energy can be extended for spraying pesticides, Fertilizers and Fungicides etc., using Solar Sprayers. the power that power is dc power its positive and negative charges are connected to a battery in order to save the power Here we prepared a low price solar operated pump

with devices such as dc mobile charger, which can work without any fuel. This solar pump can be use at various places such as farm, garden and also to kill mosquitoes. We hope our new invention make the farmer modern and smarter. In this project, we emphasized on the spraying of pesticides using solar power as energy.

V. CONCLUSION

As we know 60% of population of our country lives in villages & their main occupation is agriculture. The prominent aim of this project is to fulfill the tasks like hand spraying, IC engine spraying, and le g pump spraying etc. using non-conventional energy sources. Thus solar operated spray pump will help the farmers of those remote areas of country where fuel is not available easily. They can perform their regular work as well as saves fuel up to large extent. At the same time they reduces environment pollution. Thus saving revenue of government & also most demanded fuel.

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