

Portable Solar Washing Machine

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Abstract-Washing machine quickly washes the clothes but consumes a lot of electrical energy. The proposed portable solar washing machine is a light weight machine that can efficiently wash the clothes by the use of solar energy. The cost of this washing machine is low and requires less maintenance. It is expected that by using this portable solar washing machine both the water and the electrical energy consumption can be reduced easily. The Washing Machine IoT. Using a nodemcu esp8266 development board and several super tiny led sensors this system will monitor a washing machine front panel led output. Then connect to the network and send notifications to push bullet client. This can be a phone or a computer.

KEYWORDS:SOLAR, PORTABLE WASHING MACHINE, IOT, ARDUINO.

I.INTRODUCTION

Washing machine is a machine that quickly washes clothes, linens and other item. Before the invention of the washing machine, people spent hours doing their laundry by hand. Some people soaked their clothes in stream and then beat them on rocks to get out of dirt. The rapid advancement in technology has been given rise to the washing machine which is widely used in present day's society. Portable washing machine is a very light weight machine operated with dc motor which is connected to battery which is charged by the solar cell so portable DC washing machine uses nonconventional energy source.

This machine is very simple to convey. In India, many spots square measure still no power implies there's no lightweight thus by utilizing this newest innovation we tend to consummate our general public's

requirements. This compact garment washer isn't tough to cripple thus each individual handles it effectively at every spot.

II.MOTIVATION TOWARDS THE WORK

The main motive is to provide 24 hours of medical facility, person less service, high efficient machine, cost effective machine to people at rural areas, railway stations, bus stands, hill stations, medical stores, hospitals etc. Diagnosis is always a concern for the people who are travelling long distances in trains or buses. At the same time medicine availability also has a major impact excluding the factor about a complete cure. The aim of this project is to give preliminary relief so that we can give people a better chance of resisting the health from before they are able to reach the doctor.

III. LITERATURE REVIEW

Azimuth et al. (2020) developed a portable solar washing machine in their paper titled "Design and Implementation of a Portable Solar-Powered Washing Machine for Rural Areas."

In their design, the washing machine is powered by a solar panel that charges a battery, which in turn powers the washing machine's motor. The washing machine also includes a water inlet and outlet, a drum for washing clothes, and a drain.

The authors designed the washing machine to be lightweight and portable, with a handle for easy transportation. They tested their design in a rural community in Togo and found that the washing machine was effective at washing clothes, with a washing capacity of up to 3 kg. The authors also found that the washing machine was energy-efficient, with a power consumption of only 60 watts.

IV.OBJECTIVE OF THE PROJECT

- To provide a convenient and eco-friendly way for individuals or households to clean their clothes, especially in areas where access to electricity or clean water is limited. The washing machine should be designed to be lightweight, compact, and easy to transport, making it suitable for camping, traveling, or emergency situations.
- Additionally, the washing machine should be powered by solar energy, allowing it to operate off-grid without the need for electricity. This not only reduces the environmental impact of the washing machine but also provides a sustainable solution for individuals or households in areas where electricity is unreliable or unavailable.
- The washing machine should be designed to be user-friendly, with simple controls and a quick and efficient cleaning process. It should also be durable and long-lasting, able to withstand outdoor conditions and frequent use.

V. PROPOSED SYSTEM

The aim of the project is to build a software that can be embedded in the washing machine. The software is made with the purpose that it can learn from its experience making it an intelligent machine which can analyze the patterns followed by the user during washes and then could replicate the same patterns from its experience. Also the system supports manual functioning and semi-auto Functioning as well. Through this paper, theoretical explanation of a working of the machine is given with the help of which the automation of washing machine is made easier.

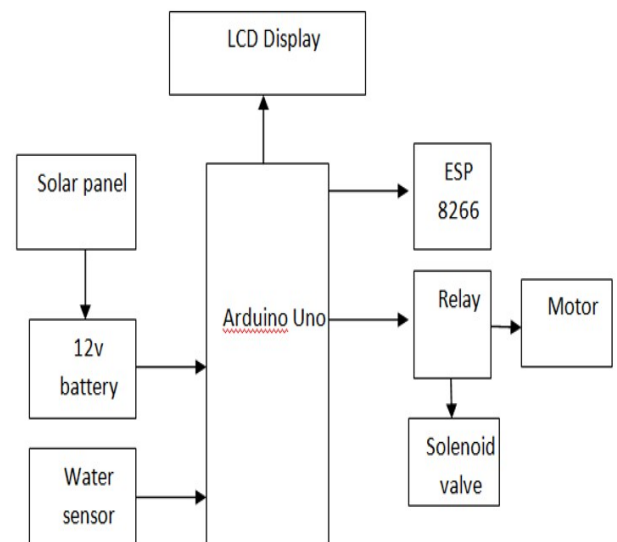
Fig. 1 Block diagram of the proposed system

VI.COMPONENTSDESCRIPTION

WATER LEVEL SENSOR

The operation of the water level sensor is fairly simple. The power and sense traces form a variable resistor (much like a potentiometer) whose resistance varies based on how much they are exposed to water.

This resistance varies inversely with the depth of immersion of the sensor in water: The more water the sensor is immersed in, the better the conductivity and the lower the resistance. The less water the sensor is immersed in, the poorer the conductivity and the higher the resistance. The sensor generates an output voltage



proportional to the resistance; by measuring this voltage, the water level can be determined.



Fig. 2 Water Level Sensor

12V DC Solenoid Water Air Valve Switch (Normally Closed) 1/2 controls the flow of fluid (liquid or air) and acts as a valve between high-pressure fluid! This liquid valve would make a great addition to your robotic gardening project. There are two (Nominal NPT) outlets. Normally, the valve is closed. When a 12V DC supply is applied to the two terminals, the valve opens and water can push through.

The valve works with the solenoid coil which operates electronically with DC 12 volt supply. As it is a normally closed assembly, it opens the flow of fluids as soon as it is powered ON and stops/blocks the flow when the supply voltage removed.



Fig. 3 Solenoid Valve

12V 1.3AH SEALED LEAD ACID BATTERY

The 'Online' range of sealed lead acid batteries are maintenance free, valve regulated and leak proof ideally suited to all 'standby applications' There will be no loss in power output over the battery life. Low self-discharge of about 2-3% per month compared with 20-30% for more common battery systems. Quality construction with no compromise on materials to ensure a long service life. Low internal resistance means a high discharge rate. Wide operating temperature range operating between -15° C to +50 ° C when fully charged.



Fig.4Lead Acid Battery

12V DC Motor

A DC motor is the motor within a class of electrical machines which converts direct current electrical power to mechanical power. These motors rely on forces that magnetic fields produce. Regardless of the type, DC motors have some kind of internal mechanism, which is electronic or electromechanical. In both cases, the direction of current flow in part of the motor is changed periodically. A 12V DC motor is small and inexpensive, yet powerful enough to be used for many applications. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances.



Fig.5 DC Motor

SOLAR

Photovoltaic cells are used in solar panels to turn sunlight into electrical energy. Electrons migrate when sunlight strikes the cells, creating an electric current. Batteries are used to store the generated electricity, which may then be used to power a variety of appliances. Solar panels are a great option for powering the sophisticated greenhouse system because they are a sustainable and ecologically beneficial source of energy.



Fig.6Solar Panel

VII.RESULT

Portable solar washing machines are compact and lightweight washing machines that use solar panels to power the washing cycle. They are environmentally-friendly and cost-effective, but have a small laundry capacity. It's important to consider factors such as durability, ease of use etc.,

VIII.CONCLUSION AND FUTURE SCOPE

The washing machine has greatly influenced people's life styles by providing easy means of washing clothes and drying them out to a considerable extent. It not only saves time and amount of water used but also helps

the user to wash and dry clothes with a lot of ease due to its fully automatic nature. Most of the raw materials used in the manufacturing process of the portable DC washing machine have unacceptable social and environmental impacts in their life cycle. Therefore, it is quite important to mitigate these effects and look at other possible alternative materials while achieving the functionality of the product. Due to the many drawbacks in various stages of washing machine manufacture, alternative options of washing need to be looked at portable dc washing machine which is solar operated. A service can be provided where dirty laundry will be located on a weekly basis, washed, dried, ironed and then returned to users amidst some feasibility problems. It is believed that by providing such a central service, material use and water and energy consumption patterns could be minimized to a great extent by using the portable dc washing machine. Hence we can say that the portable dc washing machine has wider scope in the future. In the future, Hybrid model can also prepared, which may base on non-conventional sources (solar energy, wind energy) as well as by main supply.

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