



Drug Purchase and Medical Store Management

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ABSTRACT-

In the last decade and recently they have developed various cooling methods but fewer things are available in the compact manner. In general, the water coolers are available in a large manner and some tiny ones use huge power which is from an external source. Available in the compact manners are Conduction plates and heat pipes, Immersive cooling system and Chilled water-cooling system. Where the above functions of Heat are locked at the connecting place between the copper tubing and the components, heat is then sent to the connecting place between the copper tubing and a solid conduction plate placed on the side of the server. The computers are placed in a non-conductive liquid allowing the central processing unit, graphics processing unit, and the heat is dissipated directly to the liquid. The compacted refrigerant is worked with a condenser that rejects the power from the refrigerant to the environment or a liquid coolant or something to that effect. To make a solar water cooler compact size and to run on solar energy so that it can be portable to any place and runs on its own.

Keywords— Thermo electric effect, tec, heat sink, cooling fan, peltier modul.

I. INTRODUCTION

In the last decade they have developed various cooling methods but from that fewer things are available in the compact manner and where some of them function with the coolant [1]. The coolant is harmful to the environment which can cause air pollution, without these effects there are few methods regarding water cooling which are not harmful to the environment [2]. Where the above things are functioned by the high pressurized water is flow into the pipe with the thin diameter pipe and that leads to the transfer of water heat to the atmosphere where the transition of heat even takes place after water temperature which is lower than the atmosphere and this process result of production of water with lower in the temperature And in alter the pressurized stainless valve is then passed to the copper tube which in contact with the direct cold water that result of direct transfer of cold from the cold water to the copper valve , the copper places the vital role in the conduction of cold which is termed as the direct water method And in others the use of ammonia as the cooling agent. In this the ammonia have the low cooling point by the ammonia turns into lower temperature as vapour state and this effectively used to reduce the temperature of the water above discussed models are using large space for the accommodation[3-5], and the copper pipes to cool the liquids done by the high pump of water which are harmful and cost effective .In the refrigerator cooling techniques which the refrigerant are harmful to the environment by the side products of refrigerant after the cooling of liquid [6]. This paper comprises 5 sections:1) Functions of solar panel 2) Cooling system 3) Thermo electric assembly 3) Working of solar water cooler 4) Surface on the heatsink 5) Conclusion 6) Future work.

II.FUNCTIONS OF SOLAR PANEL

The basic working principle of a solar panel is converting the sun rays to electrical energy. And the device which is used in this conversion is known as a solar cell or a solar photovoltaic cell [9]. Also, there are many other devices are there to make this process but let us take the solar cell in this paper. A solar cell is driven by a flux of radiation also it is an electrical current source [7-9]. A solar panel is a collection of solar cells which works together to produce the desired electrical output. On concern with the today world solar panels are getting increase in demand because the solar like electrical productions are pollution free but the only disadvantage in the solar panel is less efficiency in production. This problem can be overcome only by the study of solar cells and this will definitely help in increasing efficiency and also makes pollution free electrical production in every house. In this solar water cooler, we have used a 12 volt solar panel because all other components which are used require 12voltage [10]. So, the supply is connected parallel across the components so that the voltage will be the same and all components get the same voltage of 12 volts. The solar cells contain pn junctions and which one will have depletion regions. If the rays make contact with the panel, the free electrons which are present in the one-layer transfers to another layer. In this process of making the movement of electrons will produce electricity.

III. COOLING SYSTEM

There are two sides of the Peltier module which produce cold at one side and hot at another side. The priority should be given equal to the both transferring processes. Because if the Peltier module overheats then it will start to malfunction and both the sides of the Peltier module will start to produce heat. So,

transferring heat in an effective way helps to increase the efficiency of the coolness of water. In this solar water cooler, we used to heatsink and central processing unit cooling fan to suck the heat produced by the Peltier module. Where the heat sink is attached with the Peltier module and it shares the heat produced by the Peltier module and the CPU cooling fan will suck out the heat present in the heat sink [11]. The structure of the heat sink is designed to easily transfer the heat from it to another medium. The cooling fan also requires 12 volts to work so that it is connected in parallel with the source. Also, there is battery backup storage of supply to store at day time and gives supply at the night time or at cloudy or rainy times [12].

IV. THERMOELECTRIC ASSEMBLY

A. HEAT SINK

Heat sink is a metallic component which is used to transfer the heat from one medium to another medium by enlarging its surface area. The structure of the heat sink plays a vital role in transferring the heat from the Peltier module to other mediums like air, coolant, etc. Heat sink is not only used in this solar water cooler also it is used in various equipment because every electrical and electronic component produces heat while it is in working condition. So many of the devices will have this metallic component which is a heat sink to transfer the heat to air or any coolant [13]. Figure 1 shows the structure of the heat sink helps in circulating air through it so that the heat is effectively transferred. The structure is made to reduce the surface area and make the total area into small areas and so that the heat passes through the areas and is easily transferred.

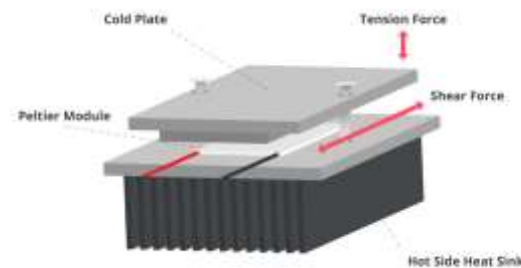


Fig.1.Heat sink

B. HEAT EXCHANGER

Heat exchange is a process of which the heat is transferred from one to another material. Here heat exchange is a most important thing which should be noticed carefully to make proper working of the Peltier module. Here a heat sink is used to transfer the heat produced from the Peltier module to the air using its structure [14].

TABLE 1. Components specification

Components name	Rating
Solar panel	12volts
Heat sink	10° c/w
Battery	7Ahr
DC Fan	12volts

In many electrical and electronic devices, a heat sink is used to transfer the heat. Because in electrical and electronics circuits the heat is one of the major drawbacks which will reduce the efficiency of the circuit or material. Also, thermal paste plays a vital role in heat exchanging because there will be no contact between the module and the heat sink and the thermal paste will make the contact and help in increasing the efficiency [15-18].

V. WORKING OF SOLAR WATER COOLER

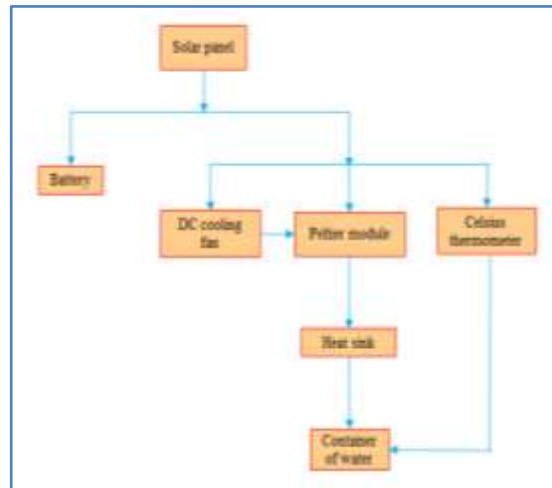


Fig.3.Block diagram of solar water cooler

From the solar panel by using photovoltaic effect the DC current passes through the rechargeable battery and then, the Peltier module uses the source from battery which runs on the function of heat liberate at the joined junction by applied voltage which is fixed with the heat sink by the thermally insulated paste. The Peltier module and CPU cooling fan are connected in a parallel manner. Table 1 shows the required rating of components, The Celsius meter is finally fixed in a parallel manner.

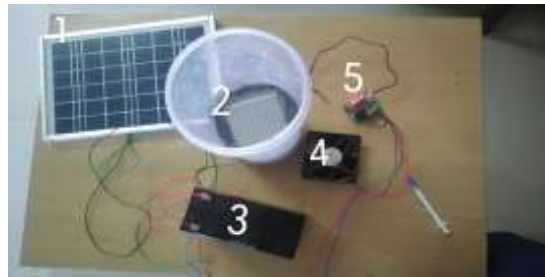


Fig.4.Prototype of solar water cooler

- 1- Solar panel
- 2-Heat sink
- 3-Battery
- 4-DC Fan
- 5-Digital thermometer

Heat absorbed (C) = mCpd. First the photovoltaic cell is used to produce electric energy from the absorbed solar rays. Figure 3 shows the flow of working, a solar panel is actually a collection of solar or photovoltaic cells, which can be used to generate electricity through photovoltaic effect. Then the energy is transferred to the battery to store that energy for the electric use for later. The next stage is to pass the current through the Peltier module, while the current passes through it, the heat is liberated on one side and the other side gets cooled. Figure 4 shows the working model of the solar water cooler. The heat sink is placed at one side of the Peltier module to transfer the cold and another heat sink is placed at another side to transfer the heat [15]. The side with the fangs in the heat sink is fixed in the water, so the water gets cold. Figure 5 shows the Graph of solar water cooler. As following the TABLE 2 shows the performance analysis of the graph with respective to temperature vs time. With in increase in time the temperature decreases.

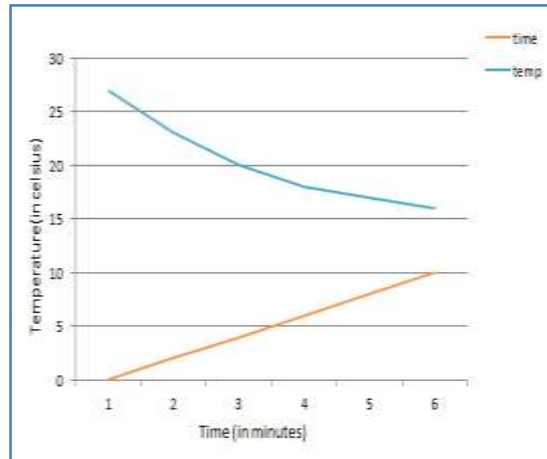


Fig.5.Graph of solar water cooler

TABLE 2. Performance analysis of the graph

Time(in mins)	Temperature(in celsius)
1	26
2	24
3	22
4	20
5	18
6	16

VI. SURFACE ON THE HEAT SINK

Heat sink is an aluminium or steel plate which is used to transfer the heat as well as cold from one substance to another substance. In this solar water cooler, a heat sink is used to transfer the cold to the water container and also to transfer the heat produced by the Peltier module away by using the dc CPU fan which helps to suck out the heat produced by the Peltier module through the heat sink material [19]. If the heat sink is not placed, then the heat produced by the Peltier module will overcome the cold production and let the Peltier module get damaged or let the module not work properly. So, placing a heat sink using thermal paste is one of the important things which should be followed to get more efficiency [20].

VI. CONCLUSION AND FUTURE SCOPE

In this paper we have made a compact and portable solar water cooler, so that we are able to carry this product to anywhere and we are able to afford cold water at any time, any place. As we have used solar energy, we can able to make use of this product even in places like forests, deserts, etc. Also, there is a heat liberation from the other side of the Peltier module which is not used in this project. By making use of the heat liberation, we can also able to make hot water at the same time. By using the other side of output (hot water) the optimum temperature of the water is to be obtained. The transfer of side product (heat) to water leads to the increase in the temperature of the water. Thus, the perfect combination of hot and cold-water results in obtaining the rated water temperature where the rated water temperature is obtained by the algorithmic activity. Code for the combination of hot and cold is stored in the microcontroller and the respective gear is fitted at the outlet of the water. In table 3 we clearly specified about the price for each components and the total price has been specified.

TABLE 3. Feasibility price for the model

Components name	price
Solar panel	840
Heatsink	350
Battery	1020
Peltier module	265
DC fan	145
Total price	2620

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