SOLAR AIR HEATER WITH AIR PURIFIER

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ABSTRACT

A review on solar air heater with air purifier is presented. The review covers the over view of solar air heater technology, detail description of various types of solar air heaters, solar air heaters with different absorber plate surface geometry to enhance the rate of heat transfer. Different designs of solar air heater with and without heat storage materials especially phase change materials are reported. Use of fins on the absorber plate and different surface geometry of absorber plate enhances the rate of heat transfer during the sunshine hours and use of PCM (thermal energy storage medium) supply heat energy during off sunshine hours. As a result, solar air heaters gain popularity in a wide range of its applications.

This paper describe the heating through the sun light

Keyword:- *Solar Air Heater, Air purifying, Phase change materials.*

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1. INTRODUCTION

Solar air heater is a simple device which captures the solar energy. It is pollution free device and very much environment friendly. Solar air heater is unique type of heat interchange that absorbs and converts solar radiant energy into heat. It provides a healthy environment with low cost air heating. Solar air heating is a solar thermal technology in which the energy from the sun, isolation, is captured by an absorbing medium and used to heat air and air exit out from the duct pipe is purely fresh due to pass throughout the air filter.

1.2 PROBLEM DESCRIPTION

The modern Solar Air Heater work basically on a solar energy which is a form of a renewable source of energy. This model curbs the use of electricity and hence act as a major problem solving to minimal use of electric energy. A air purifier with affordable cost, it also used to purify the air. This model can be cheap alternative compared to electric source model and the abundant solar energy can be used to its maximum potential.

So, to overcome from this problem there was an effort to make environment friendly and less maintenance required air heater called Solar Air Heater with Air purifier.

2. LITERATURE REVIEW

Jurinak and Abdel-Khalik have done a study to determine the optimum physical properties of phase-change energy storage materials for solar air-heating systems.

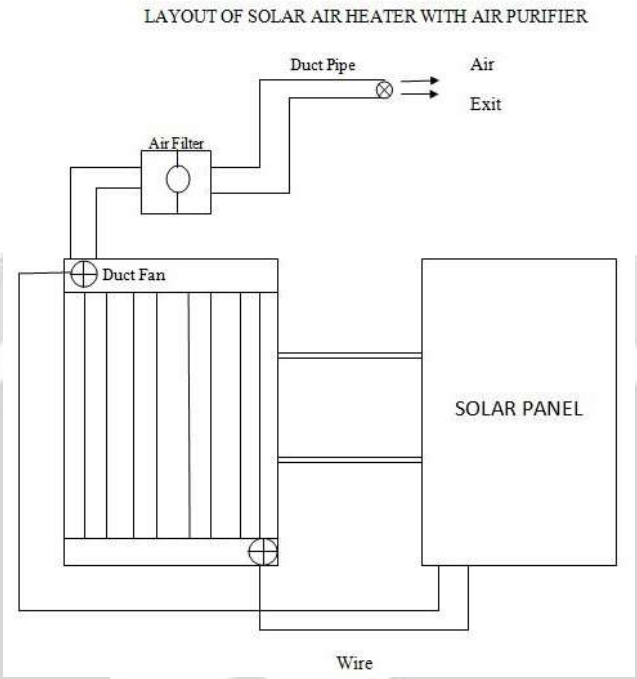
Saman et al. have done a study on the thermal performance of a phase change thermal storage unit. The storage unit consists of several layers of phase change material (PCM) slabs with a based solar roof integrated heating

system. The storage unit was a component of a roof integrated solar heating system being developed for space heating of a home as shown in melting temperature of 29 ◦C.

3. EXPERIMENTAL SETUP

Solar Air Heater with Air purifier consists of following important apparatus:-

i.)Solar Panel ii.) Air Purifier iii.) Temperature Measure Device iv.) Duct Fan



i.) Solar Panel:- Solar energy is clean ,cheap and abundantly available. Here we are using polycrystalline types of solar panel. The solar panel we are using is 10W.

ii.) Air Purifier:- Air filter is used to filter the dust particles present in air and gives out fresh air through then. It has finy porous filter which allows only clean air pass through it without any impurities.

iii.) Temperature Measurement Device:- It is use to measure the temperature of exhaust air.

iv.) Duct Fan:- When use in conjunction with heating and cooling system, a duct fan is intended to propel the hot or cold air a room or space, when use in conjunction with heating and cooling system.

3.1 WORKING PRINCIPLE

The working principle of Solar Air Heater with Air Purifier is describe in following manner:-

In a winter season the cool air enters in a pipe which was in the wood box and covered with glass. Pipe is heated by sun light when the air pass through the pipes the air temperature will increase. At the top of the wood box there was some storage where hot air will stored and with the help of duct fan the air will pass into duct pipe which was connected inside the room. At the end of the duct pipe there is one Air filter attached which filter the hot air before passing inside the room.

3.2 RESULT AND CONCLUSION

As a result the temperature of exhaust air is 40-45°C.

Controlling of output temperature according to user choice. Variations in output temperatures due to changing environmental conditions are not desirable for temperature-specific applications.

Thus, it can be concluded that, modular designs of Solar Air Heater (SAH) in standard variants in terms of efficiency or maximum output energy are necessary for catering the need of users from different economic levels or regions.

4. APPLICATION

- Solar air heater provides ventilation and process air heating.
- Efficiency and cost are the biggest barriers for any solar products.
- Solar heated fresh air can reduce the heating load during sunny operation.
- Location throughout the world have solar energy available without any cost.

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