

All Time 360 Degree Cooler Cum Heater System

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Abstract

To develop the energy efficient, environment friendly direct evaporative air conditioning and forced heating system having low operating cost suitable for hot and dry regions and climates .The objective of this paper is to develop an advanced 360 degree rotating air cooler& heater which provides air cooling and heating in all directions. Simple 360 degree evaporative cooling is achieved by direct contact of water particles & a moving air stream. When a hot and dry air is allowed to pass through a wet cooling pad, the temperature of incoming air is reduced with an increase in specific humidity as some water from the pad is evaporated taking the latent heat of vaporization from the incoming air.360 degree heater, is forced convective heater that has an electric fan to speed up the air flow. In a convection heater, the heating element heats the air in contact with it by thermal conduction. Hot air is less dense than cool air, so it rises due to buoyancy, allowing more cool air to flow in to take its place. To achieve comfortable temperature either as heater or cooler.

Keywords: Evaporative Cooling, Specific Humidity

I. INTRODUCTION

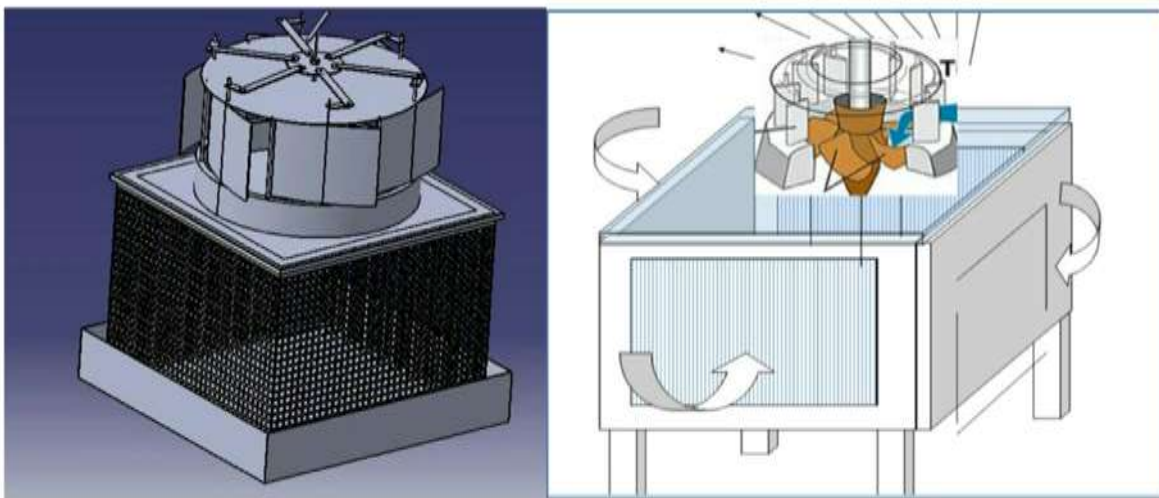
The EVAPORATIVE cooling is one of the earliest methods employed by men for conditioning their houses. Only in recent years, it has been put on sound footing thermodynamically. It is a process of adiabatic saturation of air when a spray of water is made to 360 EVAPORATIVE into it without transfer of heat from or to the surroundings. The initial investment cost of such a system is low & the operation is simple & cheap.

Simple 360 EVAPORATIVE cooling is achieved by direct contact of water particles & a moving air stream. If the water is circulated without a source of heat & cooling, dry air will become more humid & will drop in temperature. In a complete contact process, the air would become saturated at WBT of the entering air.

The comfort given by the 360 EVAPORATIVE cooling always depends upon the outdoor temperature & R.H. High D.B.T & low W.B.T. always gives more comfort with 360 EVAPORATIVE cooling. Although the 360 EVAPORATIVE cooling does not perform all the function of true air conditioning but it provides comfort by filtering & circulating the cooled air. This system does not dehumidify the air but on the contrary, further humidify air.

II. WORKING PRINCIPLE

Figure shows the construction details of the evaporative cooling cum heating system.



By starting the pump it sucks water from bottom tank which was already filled with water. Water goes on stationary pad which are placed on backside of two side door, through delivery pipe. After circulation of water the pads become wet.

Later the exhaust fan starts & sucks the atmospheric air, which is passed through wet pad. In this process cooling is achieved by direct contact of water particles & moving air stream.

In complete contact process the air would become saturated at WBT of entering air. In other words sensible heat of air is carried by water in the form of latent heat, when it is brought intimate contact with water.

Due to this air may be sufficiently cooled by 360 EVAPORATIVE process, which results in considerable increase of humidity. In order to get better effect ice cube or chilled water may be added in bottom tank.

Similarly for heating system nichrome heating coil of 10 inch dia is installed into the system which gives hot air and it can give a high heating effect. Surrounding to the exhaust fan specially fabricated cellulose pads are arranged which will open automatically during operation 360 degree air cooler and heater will allow person to sit in any direction during winter for heater and cooler for summer. The comfort given by the 360 EVAPORATIVE cooling always depends upon the outdoor temperature & R.H. High D.B.T & low W.B.T. always gives more comfort with 360 EVAPORATIVE cooling. Although the 360 EVAPORATIVE cooling does not perform all the function of true air conditioning but it provides comfort by filtering & circulating the cooled air. This system does not dehumidify the air but on the contrary, further humidify air.

III. ADVANTAGES

- Easy to operate
- Easy to clean
- Less power consumption
- Maintenance cost is nearly negligible.
- Easy installation process
- Air coolers and heater do not have expensive components and hence are cheaper in cost.

IV. CONCLUSION

The result indicates a considerable saving in power consumption and at the same time the cooling effectiveness can be enhanced. The procedure detailed in the present study can be used to develop and designing 360 degree cooler cum heater of larger capacity to economically cool bigger endusers, because the various parameters can be changed with ease the approach can be employed to analyze any piece of equipment and improve its performance.

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