

Invention And Design of Watercooler Cum Air Conditioner

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Abstract

The purpose of water cooler is to make two in one equipments at constant temperature irrespective of ambient temperature.They are meant to produce cold water at 5°C to 10°C for quenching the thirst of the people working in hot environment and by using the water cooler cum Air conditioner they feel comfort during summer seasons.This can be use in house.It is a multipurpose unit and portable one.It works under normal VCR system.The temperature of the cold water is controlled with the help of thermostatic switch.The evaporator with the fan are placed on the top of water cooler.The capacity of the tank is 10litre.The room air are sucked and cooled air are sent out.This type can be used as home appliances.The current consumption is less due to two in one and reduce the space.

Keywords: Water cooler cum Air conditioner,VCRsystem,Thermostaticswitch,Reduce

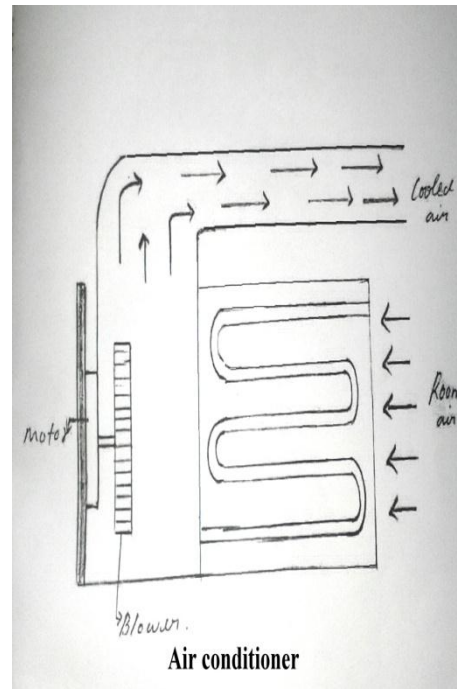
INTRODUCTION

It is a novel idea to control air and water temperature around us by the incorporation of cooling system in single unit. Human comfort is that condition of mind which express itself with the thermal environment . The cost is also lowered considerably. Here the refrigerant R12 is used in the system. The compressor, condenser, drier, capillary tube, evaporator, fan and chilled water pumping are connected on this proper method. The vapour compression cycle is utilized. When it works, the water is cooled at particular temperature, the cool water is pumped into finned evaporator. The air is blown through the fan on the evaporator. It is get cooled and spread over the room . This system is noiseless in operation .It is portable , so it can be transferred easily from one place to another place. They are meant to produce cold water at 7°C to 13°C for quenching the thirst of people working in hot temperature. Where atmosphere remains dry-hot during major period of the summer season. Air conditioner has become a luxury.

WORKING PRINCIPLES

AIR CONDITIONER

Construction



Air conditioner are mostly used in modern days for comfort. Here the cold water from the water cooler are moved to the air conditioner and the cold water joined evaporator and the air from the room are sucked and the cooled air sent to the room[1-5].The outlet water are sent back through the back side of water cooler .So

the cooled air is sent and makes the human to feel comfort[6-10].

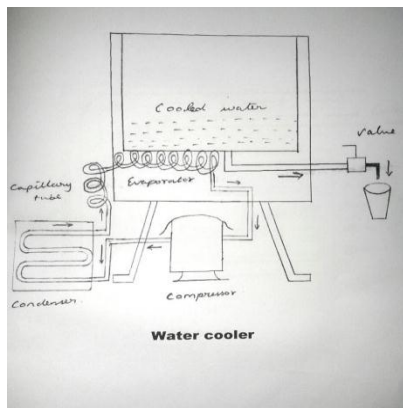
Working

In the cooled water from the water cooler are passed through the inlet to the evaporator and there pump is placed to suck at some pressure so the water can be fully speeded to the evaporator[11-13]. The axial fan is placed and the connected with motor when the switch is on the water are sucked and moved to the evaporator and then room air are sucked through the evaporator and cooled water get vaporize and the blower sent the cold air to the room. The latent heat is observed the cool water.

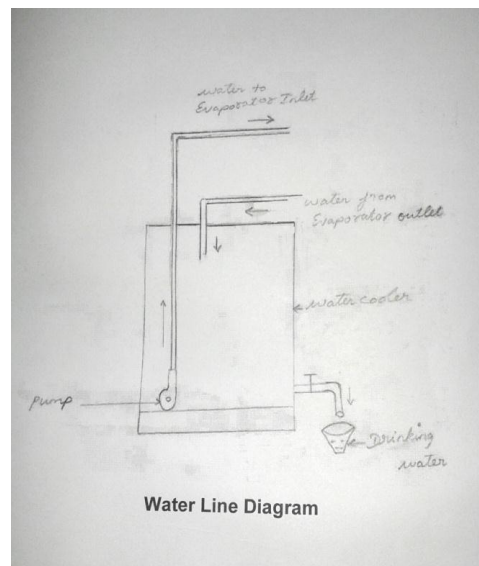
WATER COOLER

Construction

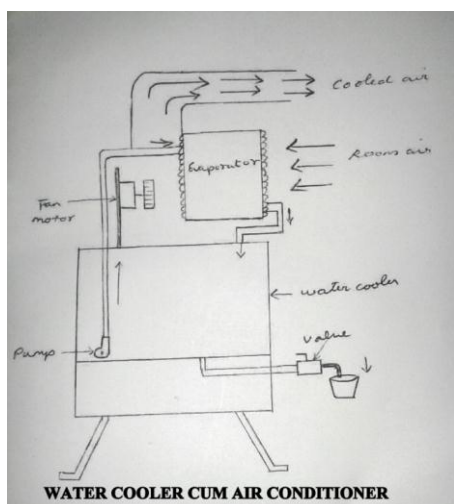
Water cooler is made up of VCR system and it consists of compressor, condenser, drier, capillary tube and evaporator. Here the water cooler switched on thermostatic controller is used for keep in constant temperature of water[14-16]. These water are stored in the evaporator tank and these water cooler are covered with insulating materials. and so that the temperature are constant. It is portable and compact one. The cooled Water is collected through a tap of drinking purpose. The type of water cooler is pressure tube



Working -Water cooler is used to cool the water at certain temperature of 5°C to 10°C used as also a drinking water. Here the water are supplied into the evaporator tank. The refrigerant are charged inside the system. The heat are removed from water and water gets cools and its makes to drinking purpose. For hot summer season. This wet vapour around the water storage chambers boils and evaporates into cold low pressure refrigerant. This evaporation of liquid contacts the heat from the water in the cooling chamber and cools the water. This cycle is repeated again and again, then the water becomes 12°C. Low pressure refrigerant (R12) was used. Thermostat control was used to stop the flow of current to the compressor when it reaches the certain temperature of 12°C



DESIGN AND ANALYSIS



Data

Capacity-10litres/hr

Storage-30litres

Refrigerant-R12 300±7gms

Power-275watts

Current-2Amps

Voltage-230V±10% 50HZ,PH

Water cooler cum Air conditioner

Velocity=2.8m/sec

Air Temperature=19°C (WET)

Room Temperature=20°C (DBT)

Atmospheric temperature=33°C

Water temperature=5°C, 6°C

Area=0.09 * 0.09

$A = 8.1 \times 10^{-3} \text{m}^2$

Volume of air= Area x velocity

$= 8.1 \times 10^{-3} * 2.8$

$V = 0.023 \text{m}^3$

Specific volume(v_s)=0.85 m^3

Mass of air= $\frac{v}{v_s} = 0.023/0.85$

$M_a = 0.027 \text{kg/sec}$

COST ANALYSIS

S.NO	NAME OF THE PARTS	SPECIFICATION	QTY	AMOUNT RS.
1	Water cooler(used one)	10liter/hr	1	4000
2	Fan	200 watts	1	300
3	Blade	1' dia	1	300
4	Evaporator(Bottle cooler)	Finned Type 1' x 1'	1	600
5	Pump	100 watts	1	250
6	Copper pipe	3/8"	4	240
	Total			5690

CONCLUSION

This project refrigerant is used only in water cooler not in air conditioner by using water as a refrigerant the cool has been achieved. Here main aim of the project is to reduce cost and more economical it is simple process for manufacturing this type of air conditioner. It is safer while comparing to other type of air conditioner current consumption is less comparing to both water cooler and air conditioner. This type of air conditioner will not affect the atmosphere because water is used as a refrigerant and eco friendly one and this air conditioner achieves the temperature nearer to the ordinary air conditioner. It has two rival properties of cool water and cool

air obtained in the system continuously. There is no need of giving separate water cooler and air conditioner as both purpose are solved in a single unit

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