

Design and Fabrication of Air Cooler System

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Abstract- Cooling process is very important to maintain the foods, fish and many items at constant temperature to avoid the effect of viruses. Cooling process employs the different methods to cool the air. But considering the lower application and cost effective the water cooling system is considered for our project. The main aim of our project is to supply the cooled air with the help of wet cloth circulation. It consists of Pump, Battery, Fan and Water tank. The air conditioner and air cooler are widely used in the world. These electrical devices consumed more electrical power and it is not benefit for the poor people. In practice power shortage is also occurred. These problems are rectified by modification of ordinary radiator fan. In summer season, the ordinary radiator fan gives small amount of cold air in the room. So the radiator fan is modified by using copper tube and special design Cooling Chamber. The cooling of air by using cold water which is circulated in the copper tube for the purpose of reducing the heat in the surrounding environment, where it is of great importance in widely distributed villages with little or no rural electrification and also in the urban areas where power shortage is often in practice.

Index Terms- Pump, Fan, Battery, Water tank.

I. INTRODUCTION

The world always trying to invent new one. Somebody tries to find new one and tries to modify an ordinary one to implement a technology. Energy plays an important role in the material, social and cultural life of mankind. This is the result of population growth and increase in the standard of living which is directly proportional to energy consumption. In practice air conditioner and air cooler are widely used in the world. These electrical devices consumed more electrical power and it is not benefit for the poor people.

In practice power shortage is also occurred. These problems are rectified by modification of ordinary radiator fan.

In summer season, the ordinary radiator fan gives small amount of cold air in the room. So the radiator fan is modified by using copper tube and Special design Cooling Chamber.

In this project the ice cooler chamber for storing the cold water or cold ice bars or ice cubes which whose temperature decrease as time passes. This cold water or refrigerant is circulated through the copper tube with help aquarium pump which kept water cold for long times. The fan blowing against the copper tube which gives more cooling effect of air in the surroundings.

A. Air Cooling

Air cooling is a method of dissipating heat. It works by expanding the surface area or increasing the flow of air over the object to be cooled, or both.

Air cooling is a standard of system cooling it dissipates heat. The objects been cooled from the external devices like fans and other heat sinks to cool the total area surfaces of the object. It takes very less time and it is a quick process. It is more advantages than liquid cooling.

Benefits of Air Cooling:

- Less equipment involved.
- Easy mechanism.
- No extra power required.
- Implementation is easy.
- Less Maintenance and Cost.

II.LITERATURE SURVEY

[1] Venkateshan. S.P., "HEAT TRANSFER ", Ane Books, New Delhi, 2004

- The heat transfer had taken in three areas conduction. convection and radiation.
- He explain the heat transfer takes place in solid mean by its conduction.
- And the heat transfer through fluids is convection .
- And the heat transfer takes place at atmosphere is radiation.
- These are all the heat transfer will takes place through it.

[2] Holman, J.P., "HEAT AND MASS TRANSFER", Tata McGraw Hill, 2000

- In all the objects both the heat and mass transfer has happened.
- By the application of heat and mass only the objects can be run throughout the areas .
- The air conditioning system also run under the process of both heat and mass transfer.

[3] Kothandaraman, C.P., "FUNDAMENTALS OF HEAT AND MASS TRANSFER", New Age International, new delhi 1998.

- The heat and mass transfer can takes place in air cooling system.
- It takes convection process for the air cooling system to be performed.
- The proposed system operated only by the process of heat and mass transfer.

[4] Bad giri et al was invented in thousands of years ago in the form of wind shafts on the roof.

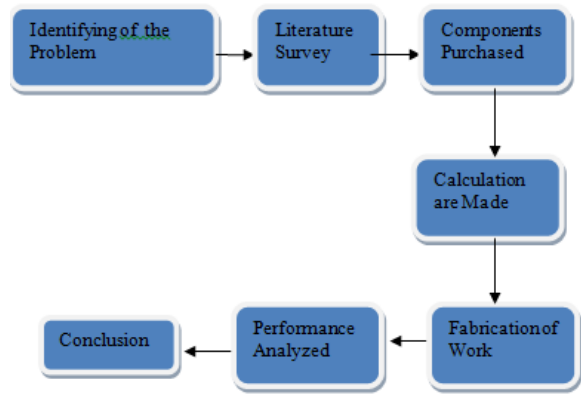
- Which caught the wind passed it over subterranean water and discharged the cooled air into the building.
- In US only they invented the first air cooling system with a big machine. It's blade and casing is big the speed also less in olden days.

[5] Dr . S. Senthil, “ HEAT AND MASS TRANSFER” A.R.S.publishers

- The air cooling system can be varying the data with different level of water.
- It is calculated by the data book of heat and mass transfer to solve it.

And the correct value to be taken. Then the flow of water from tank to pump will be in good condition

III. METHODOLOGY



IV DESCRIPTION OF EQUIPMENT

The DESIGN AND FABRICATION OF AIR COOLING SYSTEM consists of the following components to full fill the requirements of complete operation of the machine.

1. Fan
2. DC Pump
3. Battery

4.1 FAN

A radiator fan is used for the rotating of air cooler system. By outside of fan the copper coils are rotated to give a chillness air.

Mechanically, a fan can be any revolving vane or vanes used for producing currents of air The radiator fan will give more efficiency comparing to a normal fans.

The copper coils are fixed to the fan by passing the water inside of the copper coils. The chillness air can be get from the fan.



Radiator Fan Fixed with the copper tubes

4.2 PUMP

A pump is a device that moves fluids (liquids or gases), or sometimes slurries, by mechanical action. The pump are of three types they are direct, lift and displacement pumps.

The pump will convert hydraulic energy into mechanical energy. The pump will takes the fluid from tank and convert into mechanical energy at the outlet to discharge at high and low pressure. In this air cooling system the lift pump is used to lift the water from the water tank.

The pump suck the water from water tank and send to the outlet of copper tubes. The pump has their capacity to lift the water from the water tank by the pipe.



PUMP

4.3 BATTERY

The battery will be a rechargeable and the voltage is 12volts and 9ampere hours been used in the air cooling system. The two switches be connected with the battery one for operating of fan and other for operating of pump.

Battery be connected the positive terminal of pump and negative terminal to the fan. Then clicking the switch of the battery the chillness air can be coming out from the fan. The Battery supply the power to the pump and the fan with two different switches. The two batteries are connected and joined with different volts.



BATTERY

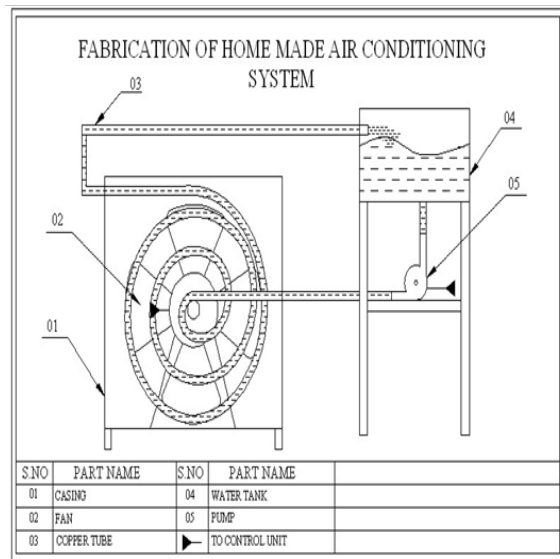
V DESIGN AND DEVELOPMENT OF AIR COOLER SYSTEM

The design of air cooler system be done by AutoCAD. The simulation will be done by the ANSYS software.

The fabrication of homemade air conditioner is the other name of the air cooling system. The air cooling system will be done on a home itself.

It is a product oriented type the air cooling system will be design and developed under the product oriented. And it is very useful for the society.

The peoples can be use this air cooling system where ever they need they can use it.



DESIGN OF AIR COOLING SYSTEM

VI FABRICATION OF WORK

The Fabrication of Working Model of Air Cooler System to be chosen by the properties of materials and the quality of materials be checked with the market place. The cost of labour and overhead charges to be checked then the total cost of working be calculated and the fabrication of work will be started by stepwise.

Initially the tank is filled with the water. The pump is used to pump the water from collecting tank and then after cyclic process the water will reach the collecting tank .The copper tubes arranged in a spiral manner to the front side of the fan guard. The control unit is used to control the fan (ON/OFF). The water is allowed to pass inside the copper tube. Behind the copper tube arrangement a fan is fixed so that the air

outcome will contain moisture in it. The water tank and pump and the radiator fan with copper tubes are be fixed horizontally to give a correct flow direction of water from the water tank.

Then the water will be recycled through the tank by the cyclic process. In summer time the cold water will be used from the water tank to get the chillness air from fan. And in the winter time the hot water is used from the water tank to get the hot air from the fan.

The adjustment of temperature is not possible in this air cooling system. And it is applicable in homes, restaurants, companies and also in hotels etc.

The connections will be given to the battery to pump and fan with an wires. And the pipe will be fitted to the water tank to the pump and pipe will be fitted to the copper tubes.

By switching ON the switch the battery will be ON. The two switches of the Fan and Pump will be running on it. The cold water will be added to the water tank. The pump will suck the water to run on it and the fan will be rotated then the copper coils will flows the water inside on it. At last, finally the chillness air can be comes outside of the fan.



FABRICATION OF AIR COOLING SYSTEM

VII CONCLUSION

The project carried out by us made an impressive task in the field of air conditioning. This project has also reduced the cost involved in the concern. project has been designed to perform the entire requirement task which has also been provided.

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