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Advanced Manufacturing Air Conditioning cum Wall Refrigerator

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ABSTRACT: The manufacturers of refrigerants and refrigeration, air conditioning equipment, governmental agencies, and environmental groups continue working together toward the goal of reduced environmental impact via reduced emissions and improved energy efficiency. Examples of progress are presented for several sectors of refrigeration and air conditioning, followed by projections for further significant reductions. Although this project will emphasize environmental impact for power reduction. Looking forward refrigeration has adverse effect on environment. Further cooler uses water so as to give cool air outside, for this application much more quantity of water has been used every year. To restrict all these, an attempt is made to have an optimized unit of refrigeration cum air conditioning which will overcome the problem of electricity required for running both the application so far and again help to save water and wood, also maintain an ecological balance between people and surrounding. Both the system will run on single cost of refrigerator so that the normal person can afford the system and will have pleasure to take a pleasant comfort.

KEYWORDS:- Air conditioning, Refrigeration, VCRS system.

I. INTRODUCTION

Vapor-compression refrigeration system(VCRS), in which the refrigerant undergoes phase changes, is one of the many refrigeration cycles and is the most widely used method for air conditioning of buildings and automobiles. It is also used in domestic and commercial refrigerators, large-scale warehouses for chilled or frozen storage of foods and meats, refrigerated trucks and railroad cars, and a host of other commercial and industrial services. Oil refineries, petrochemical and chemical processing plants, and natural gas processing plants are among the many types of industrial plants that often utilize large vapor-compression refrigeration systems. Refrigeration may be defined as lowering the temperature of an enclosed space by removing heat from that space and transferring it elsewhere. A device that performs this function may also be called an air conditioner, refrigerator, air source heat pump, geothermal heat pump, or chiller (heat pump). Cooling systems air conditioning and Refrigeration systems are high electric power consumption's; these systems also have huge impacts on the ecosystem. A proper use or choice with an energy saving plan should be considered in order to make the development of ecosystem sustainable so that a harmony between people and environment could be formed.

II. LITERATURE REVIEW

S.K.GUPTA had study on these project i.e. air conditioner cum refrigeration. they suggest that two different unit like that refrigerator and air conditioner are two different unit convert in one unit that unit is air conditioner cum wall refrigerator.

He studied a lot on this project and wanted do something like this. They wanted to create a separate cabinet by putting VCRS system to fan through that cool air.

We observed this research paper and further studies on that and we wanted to developed and modify advance air conditioner with refrigerator. In these we create the same refrigerator, one is the refrigerator and other is air conditioner.

We constructed a circuit in which we joint compressor to force drop condenser to filter to two-way connection, one joined of the evaporator of refrigerator and second is joined to evaporators of air conditioner and the joint in one suction line and return goes to compressor.



This system work one VCRS system which provide high efficiency. In refrigerator air conditioner unit to maintain the room temperature 21 degree to 22 degree so the wall refrigerator is connected to the air conditioning. And in below side compartment provide the chilling in cabinet temperature 4 degree. This save 50% energy as both unit works on single compressor.

In 21st century the world facing problem of electricity, to overcome this problem worldwide many researches going on. Many of the world's largest growing industries as well as electricity producers' companies said that around 30% of electricity is consumption worldwide for the application of refrigeration and air conditioning.

The manufacturers of refrigerants and refrigeration, air conditioning equipment, governmental agencies, and environmental groups continue working together toward the goal of reduced environmental impact via reduced emissions and improved energy efficiency. Examples of progress are presented for several sectors of refrigeration and air conditioning.

Although this project will emphasize environmental impact for power reduction. Looking forward refrigeration and air conditioning has adverse effect on environment. Further equipment so as to give cool air inside and with refrigeration.

III. METHODOLOGY

1. Collection of Research Papers

Collecting research paper from the internet on the prefabricated machine or system for carry to air conditioning with refrigerator Collecting research paper on fabrication of AC with wall refrigerator collecting research paper on design and automate the AC cum wall refrigerator.

2. Project Proposal

Making project proposal for the selection of project and of experiencing our ideals with project in charge and getting suggestions and implementing those suggestions and submitting the project proposal to the project in charge.

3. Selecting Area of Work

After project finalization we have to decide and area of work for fabrication of AC with wall refrigerator with respect to the residence of group member as the suitable area of work is our group member house collage workshop and other workshop for fabrication of AC cum wall refrigerator.

4. Cad Modal and Animation of Machine

Making cad model of machine for swiving all the concept related to the machine making the animation of machine for explaining the working of machine.

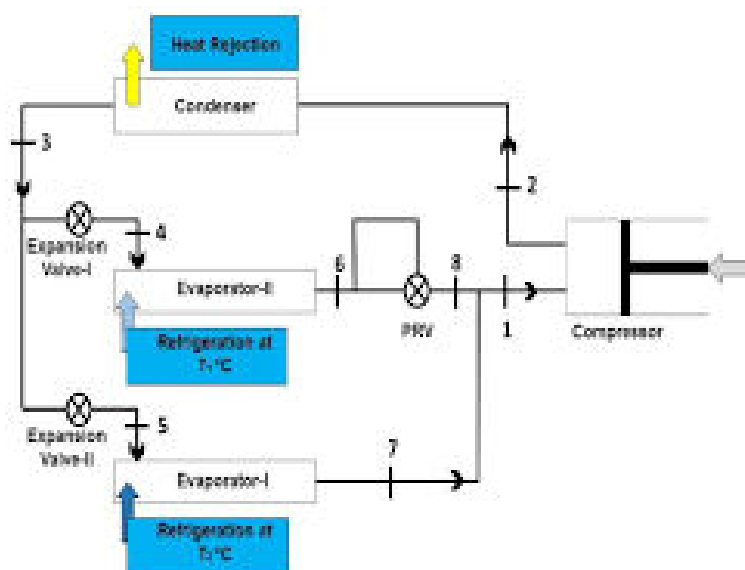
5. Finding Resources

Resource should be fined for fabrication of machine it requires some pre-fabricated parts which are readily available in market also the complex part such as compressor and window AC should be fabricated from various workshop finding the parts of vcrs system and assemble those parts.

6. Collecting Different Components

After fabrication and purchase of all the components all the components should be collected from various locations at the workplace.

IV. BLOCK DIAGRAM



V. COMPONENTS

1. Compressor

There are two outcomes from compressor one is for suction and other is for discharge. The compressor sucks the vapor refrigerant from evaporator and discharge to condenser. The compressor is simple V type reciprocating, single stage, single acting and hermetic sealed type compressor. Function Compresses and circulates refrigerant throughout the cooling system and increase the temperature and pressure at condense level.



Figure: Compressor

2. Condenser

Condenser is one of the essential components of refrigeration system. It is the heat rejection component in refrigeration cycle. The function of condenser in refrigeration system is to de-superheat and condense the vapours discharged by compressor and frequently to sub cool the liquid with minimum pressure drop.



Figure: Condenser

Classification of Condensers

1. Air cooled condenser:

- (a) Natural circulation air cooled condenser.
- (b) Force circulation air cooled condenser.

2. Water cooled condenser:

- (a) Double tube type condenser.
- (b) Shell and tube condenser.
- (c) Shell and condenser.

3. Evaporative condenser

3. Evaporator

Evaporator is a component of refrigeration system in which liquid refrigeration is vapourised low pressure and temperature to produce refrigeration effect. Function of evaporator is to absorb the heat from the space medium which is cooled by means of refrigeration.



Figure: Evaporator

4. Blower

A centrifugal fan is a mechanical device for moving air or other gases. The terms. "blower" and "squirrel cage fan" are frequently used as synonyms. These fans increase the speed and volume of an air stream with the rotating impellers. Centrifugal fans use the kinetic energy of the impellers to increase the volume of the air stream, which in turn moves them against the resistance caused by ducts, dampers and other components. Centrifugal fans display air radially, changing the direction of the airflow. They are sturdy, quiet, reliable, and capable of operating over a wide range of condition.



Figure: Blower

5. Expansion Device

After condenser the liquid refrigerant is stored in the liquid receiver needed. From the receiver it passed through an expansion valve where the pressure is reduced sufficient to allow the vaporization of liquid at a low temperature of 10 degree centigrade.



Figure: Expansion valve

6. Pressure Gauge

The outlet pressure is a discharge pressure of compressor and for it discharge pressure gauge is used. The inlet pressure is a suction pressure of the compressor so pressure gauge used for it suction pressure gauge. The pressure gauge is used for measuring the pressure at inlet and outlet of compressor.



Figure: Pressure Gauge



VI. RESULT

After making this model, we conclude that the C.O.P of individual refrigerator is larger than the combine system of refrigeration and air conditioner. This model is more preferable in areas where there is possibility of electricity cutoff during more time of day.

VII. APPLICATION

1. Food processing preservation and distribution.
2. Chemical and process industries.
3. Comfort air conditioner.
4. Providing thermal comfort to human and other living being.
5. Providing condition required for various product and process in industries

VIII. CONCLUSIONS

As per experimental study to reduce electricity consumption for refrigeration cum air conditioner, also save water and forest which are affected a great impact to maintain an ecological balance and to make it cost effective, so normal person can offer this product. Environmental groups and governmental agencies. have cooperated over the last two decades to bring about reductions in refrigeration and air conditioning systems energy consumption and refrigerant emissions. The reductions have been possible through a combination of factors: Increased environmental impact awareness, commitment of industry personnel, improved systems technology and operating/service procedures, and governmental regulations. These successes give us great confidence in continuing efforts for reduction of climate change impact of refrigeration and air conditioning system. HFC refrigerants have high societal value in providing safe and reliable refrigeration and air conditioning. At equivalent costs of other options, climate change impact from minimal refrigerant emissions can be more than offset by improved energy efficiency.

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