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"LPG Refrigeration System"

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ABSTRACT
We were make this project for the refrigeration purpose. Because of the worldwide demand of electricity, we were think to recover of the energy that is already being utilized, that's why we solved this crisis with less investment and making of an LPG refrigeration system. And the major reason for the depletion of the ozone layer is refrigerants from to refrigeration system, instead of that to hydrocarbons like liquefied petroleum gas as working fluid in refrigeration system. When we used Hydrocarbons as a refrigerant it will helpful in such way:- very low cost, nontoxic, zero ozone layer depletion , strong compact ability. To protect the depletion of ozone layer we use LPG as option. LPG refrigeration system works by the expansion of LPG form its resulting in decrease of pressure and increase in volume of the LPG. By this the temperature drops and we will get refrigeration. This cooling effect can be utilized for refrigeration work while burning of the same LPG gas same gas will be again use after the cooling.

KEYWORDS*: Hydrocarbon, Refrigeration System, Cooling, Ozone Layer, Electricity, Burning.*

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I. INTRODUCTION-

As we know that there is much demand of electricity for the electric appliances. In this appliances the most common thing is refrigeration system. That's why we made the refrigeration system which will not need any kind of electricity, it will run with the help of burning LPG gas. It is specially made for the ruler area for the ruler people. It will work and will being play a big role in the flood condition, due to which they can preserve their food for a while time.it can also use in the resturant where the uses of LPG in high level and all the time while cooking. Beside this it can be used with in the factory where the uses of the LPG is much more.

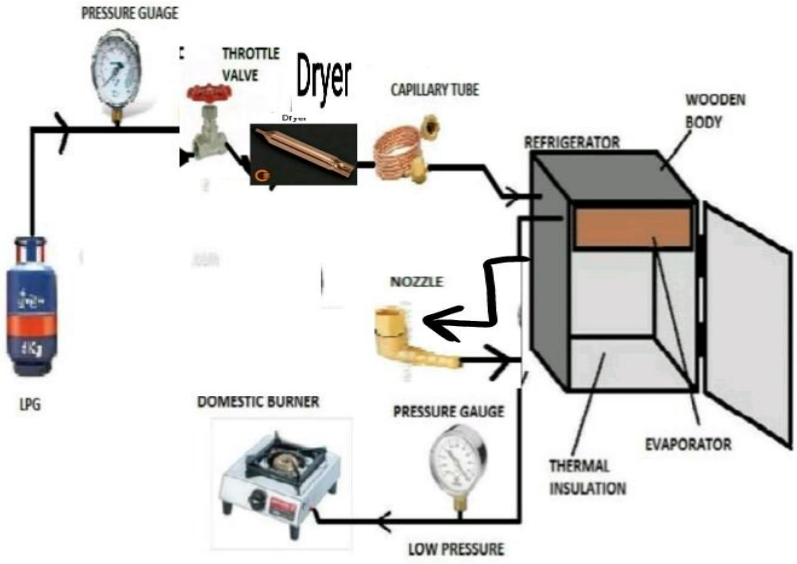

Fig-1: Diagram of lpg refrigeration system

II. PARTS OF THIS REFRIGERATION

There are many parts used in this system which is described below.

2.1-LPG cylinder:-First of all we need the cylinder which containing the LPG. The pressure of LPG is high in cylinder.

Fig-2 Cylinder

2.2-Regulator:- We need the regulator which will regulate the flowing of LPG.

Fig -3 Regulator

2.3-Pressure Gauge- Need of pressure guage which detect the amount of pressure and gives us a desired pressure.

Fig-4(i): Low pressure Guage.

Fig-4(ii): High pressure Gauge

2.4-High pressure pipe- Through which high pressure LPG will flow.

Fig-5 High Pressure Pipe

2.5- Dryer- Which is used to remove the moisture within the LPG due to present the silica gel in it.

Fig-6 Dryer

2.6-Throttle valve- Which decreases volume and increases pressure which cause temperature drop.

Fig-7 Throttle Valve

2.7-Capillary Tube- It Will again increase pressure which cause temperature drop.

Fig-8 Cappilary Tube

2.8-Evaporator or Copper Tube- It will remove the latent heat and generate the effective cooling effect. Here we used the Copper tube which reduces the making cost.

Fig-9 copper tube

2.9-Nozzle- A nozzle is a variable section, that can be used to direct or adjust a flow of fluid (gas or liquid). Also, nozzles are used to control the flow rate, velocity, distance, density, form and/or the pressure of the stream that comes out of them.

Fig-10 Nozzle

2.10-Burner- Burner where the LPG will burn due to which the coocking will be held easly after giving the cooling effect.

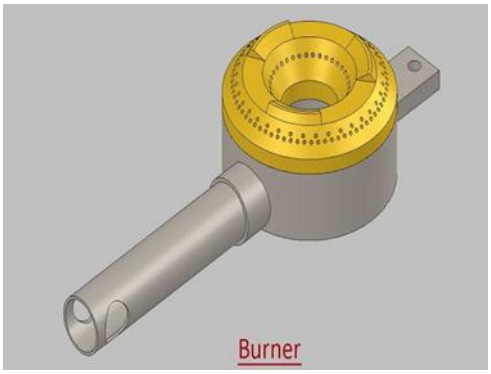

Fig-11 Burner

III. METHODLOGY

LPG refrigeration system is a modification of Vapour compression cycle.When we will study about vapour compression cycle we will able to understand about LPG Refrigeration cycle.

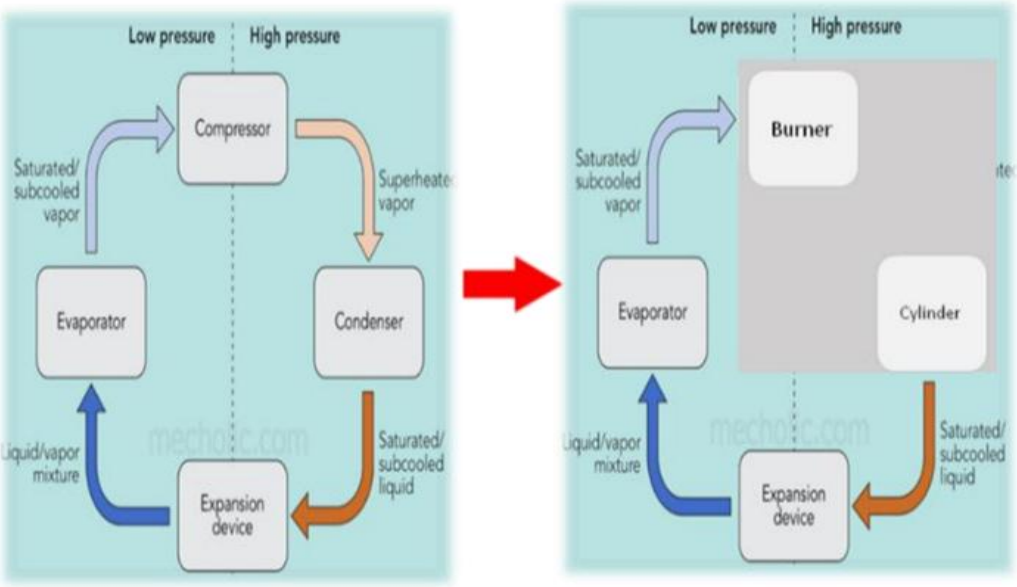

Fig-12 Vapour Compression cycle(vcc) Modified

IV. WORKING PROCESS

1-LPG will fill up into the cylinder in the liquified form.
2-Then LPG will come into the high presure pipe throuh the regulator which will also work as throttle valve.
3-Then LPG will come in the another throttle valve through the pressure guage where the pressure will increase and volume will decrease due to which we will get the temprature drop.
4-Then after LPG will goes into the dryer where the moisture will remove through the sillica gel in it.
5- After it LPG goes into the capillary tube which have tight passage due this passage pressure will increase which cause temprature decreases.
NOTE- Whithin the cappilary we will see the effective cooling effect.
6-After this it will goes into the evaporator(copper tube coiling) where the cooling effect heavily generated. This unit is the refrigeration unit.
NOTE- here if the copper tube coiling is more the cooling will be more**. Here in our project we were decreases the temprature is about 2^0 C from 36^0 C within 6 min.**
8-After the cooling the same LPG will goes to the burner and burn out.

Fig-11 Working model of LPG Refrigeration system

V. DESIGN

We have made the wooden box which having solid three side, and one front side is made as a door as like a refrigerator door, which has tendency to avoid the leakage of the cooling while it closed, and we can put something in it which we want to refrigerate while opening this door.

It is in rectangle shape and we insulate the in side of the box with the thermacoal due to it can avoid the thermal transmission of the atmospheric temprature and maintain the inside cooling in it. This unit contains the evaporator.

VI. MAKING OPERATIONS

- Carpentary shop
- Oxy Welding
- Lathe machining
- Marketing on shop
- drilling

VII. OBJECTIVE

We made this project specially for the ruler people and then after this it is used in the vehicle which is running with the LPG to carrying insulins and vaccines which have to keep in cool places. Thus it can help in the transportation of these medicines.

VIII. ADVANTAGES

- It is compact in size
- Easly portable
- It is giving heat and cooling both at same time with the same fuel
- Ozone deplitoin will not occure and it is nontoxic
- Electricity is not recured
- Making coast is low
- Light in weight
- Ruler people can able to use
- Electricity will save in much amount
- It can be used during flood in ruler area

IX. APPLICATIONS

- The system can further be improve and implement in air conditioning of vehicles where LPG is used as a fuel.
- The project can be implemented in restaurant and community program hall, mobile canteen, mid-day meal of school so to preserve food products like vegetables, milk etc.
- It is most useful in restaurants where continuously cooling and heating is required for many purpose.
- It can be used in ruler area where electricity is not available yet.

X. LIMMITATIONS

- One important thing is that always off the LPG cylinder first then of the burner through the regulators of those.
- Through which we can avoid the back flow of the LPG**.**
- Alwayse take care of leakage near the joints.
- Some times you have to shake the cylinder for the proper cooling**.**

XI. CONCLUSION

- We make this project and analysis it. Its really working, the cooling effect we can feel and see within the refrigerator due to the copper tube which is working as the evaporator.
- Also the LPG is burning through the burner and the refrigeration effect is also occurring.
- One important thing is that always off the LPG cylinder first then of the burner through the regulators of those.
- Through which we can avoid the back flow of the LPG.

Economical

1-We use lpg as refrigerant as well as for burning purpose hence cost for cooling is fully negligeble.

2-In this refrigeration system use of electricity is fully ignored because we iliminate compressure and condenser.

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