

Thermoelectric Freezer Using Inverter Technology

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Abstract- As increasing population the number of freezer used is also increased. Due to large number freezer the environmental loss takes place as the compressor is used in the freezer to overcome it we are using the peltier module to cooling the particular area. The user can set the by using the change in programming and their cooling starts. After required cooling takes place then Inverter technology tries to maintain that temperature. For cooling power required to the system is 100% but after cooling to maintain it requires only 50 % of power due to implementation of the Inverter technology

Keywords- Peltier Module, Temperature Sensor, Inverter Technology, Ecofriendly.

I. INTRODUCTION

Now a Day in every house there is a use of Freeze. If we calculate it then it will be 99% peoples uses freeze and only 1% use some another method for cooling or storing the food. As well In medical field such like in hospitals to store some medicines below the 0°C then we can store that medicine in this freezer as it having range (-50°C to 70°C). For store the chemical we can use this freeze. Early 19th century scientists, Thomas see beck and jean peltier, first discovered the phenomena that are the basis for found that if you placed a Temperature gradient across the junctions of two dissimilar conductors, electrical current would flow. Peltier, on the other hand, learned that passing current through two dissimilar electrical conductors, caused heat to be either emitted or absorbed at the junction of the materials.

It was only after mid-20th century advancements in Semiconductor technology, however, those practical applications for thermoelectric devices became feasible. With modern techniques, we can now produce thermos electric efficient solid state heat-pumping for both cooling and heating; many of these units can also be used to generate dc power at reduced efficiency. New and often elegant uses for Thermo-electrics continue to be developed each day. In the polio box, the ice is used for cooling. But after some times that ice will be melt &there is need to add new ice for cooling.

This process takes place continuously & also required large amount of ice & time also. To overcome this drawback

we are designing the thermoelectric freezer which is portable & no need to add ice again & again for cooling purpose. For cooling there is use of peltier module which is totally eco-friendly.

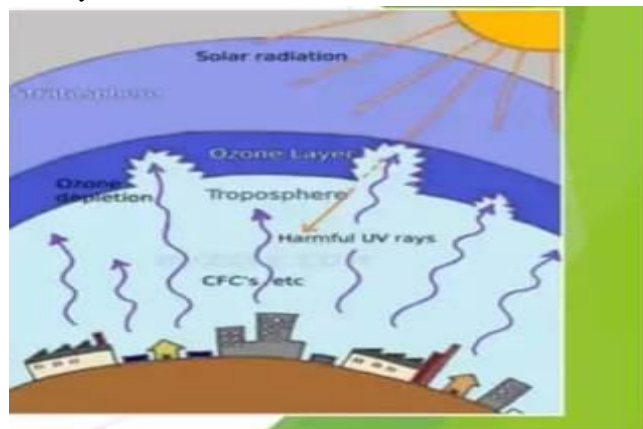


Fig1.1: CFC gases decreases the ozone layer

In this project the peltier module is used for cooling particular area or device. Cooling of freezer is done by using peltier. In this project without use of any gases cooling takes place. Due to gases ozone layer will be decreases to protect environment in these project use of peltier.

In this project Inverter Technology is also introduced to the freezer by using that inverter technology power consumption takes place. Also the manual change in temperature takes place as per user required.

II. OBJECTIVE

- In normal freezer gas is present due to that ozone layer will decreased & by using peltier this drawback will overcome.
- To consume power inverter technology is used.
- As per user required temperature change is available.

III. PROBLEM STATEMENT

1. To reduce the pollution this happens due to Freezers & save the environment.
2. To make it battery operated so user can use it while travelling.

PELTIER EFFECT-

It States That When An Electric Current Flows Across Two Dissimilar Conductors, The Junction Of The Conductors Will Either Absorb Or Emit Heat Depending On The Flow Of The Electric Current. The Heat Absorbed or Released at the Junction Is Proportional to the Input electric Current. The Constant Of Proportionality Is Called The Peltier Coefficient.

IV. MATERIALS AND METHODS

Inverter Freezer Design:

The proposed system can help the environment to control the reduction of Ozone layer. Peltier Module is used for cooling the particular area. And Inverter technology is used for saves the power and increase the battery capacity. The controller is programmed by using embedded c language.

The primary design considerations for an Inverter Freezer are as follows:

- 1) It must be stable and reliable, that is it must be able to detect falls in the Temperature and then manage it.
- 2) It must protect the Environment as well as humans and animals.
- 3) It must be small, light weight.
- 4) It must be activated when suddenly Temperature Changed.
- 5) It should be cost effective.

V. SYSTEM DEVELOPMENT

Block Diagram:

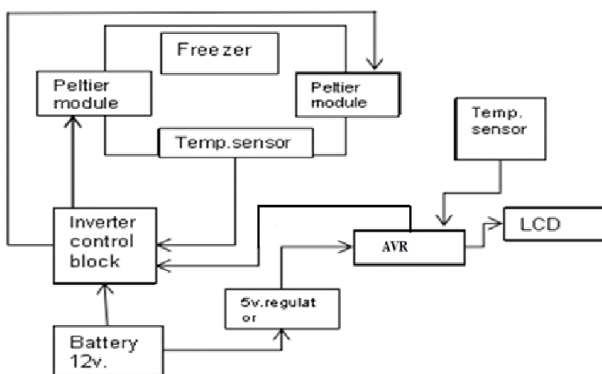


Fig.1.2: Block diagram of the Freezer Using Inverter technology

In this Freezer we set the Temperature as User wants. It is totally depends on how much coldness required for the product? Which the help of the programming we can change

the temperature. Then power is provided to reach towards the required temperature. And then after reached to the required temperature Inverter technology starts working and saves power and increased the battery life.

BATTERY:

Battery is required to control all system. 12v supply given to control relay. Then the regulator IC 7805 & regulated 5v supply is given to Controller. As System is Portable so it should work for longer time for that the battery capacity is large.

TEMPERATURE SENSOR:

Temperature sensor used in the system is Lm35 which senses the temperature of the system & output is given to the Controller. Its temperature range is -70 c to 150 c. Two temperature sensors are used in this system. One for internal temperature and another for environmental temperature

CONTROLLER:

At mega 328p is an AVR family controller. This gives high performance and required low power. It has 32 pin. It is having flash memory 32k byte, EEPROM 1k byte, RAM 2k byte.

LCD DISPLAY:

Display used is 16 x 2. Display is used for indication purpose. The temperature contain in the freezer is displayed on the display also the outer environmental temperature is also displayed on these LCD display.

INVERTER TECHNOLOGY:

It these technology power consumption takes places. The temperature is manually set by the user and when peltier tried to reaches that temperature when it rehearses up to that temperature it starts to consume power and used less power.

DIMENSIONS OF FREZZER-

FREEZER BOX:

- Dimensions - 45x25x25 Cm.

RADIATOR:

- Dimension -9.4x7.9x9.4 cm

EVAPORATOR:

- Dimensions-85.4x85.4x41.5mm

FUTURE WORK

Although the proposed system can help to prevent Ozone Layer reduction because if ozone layer is decreased it is very harmful for human as well as animals.

If system will continuously on then power requirement is also more for that purpose we introduced Inverter Technology.

In Future we try to implement IOT technology in it.

CONCLUSION

We developed a Freezer, in that all mechanical parts we replaced into Electronics. As well it is totally Ecofriendly due to no use of any gas (Freon R-22) and those effects on our Environment. Ozone Layer Reduction is eliminated. Also Inverter technology is introduced to Save the Power. And this freezer is portable so we can travel it anywhere.

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