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Co-Generation of Electrical Energy by any Rotating Machine (Cooler Motor)

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Abstract: ***The study of this paper deals with the production free energy by using the co-generation system. The energy which generates at the terminal of DC generator is an extra amount of free energy which is generated using Induction motor. The energy which is co-generated is further used to run household appliances and any other electrical devices. The main objective is to conserve the energy. It consists of A.C. motor of 2000 rpm is used to drive a series of belt and pulley drive which from a gear train and produces over double rpm at the shaft of a D.C. generator. This energy is getting free of cost.***
Keywords: Cooler motor, D.C. generator, Inverter, Battery, LED lights.

I. INTRODUCTION

In today's day to day life, consumption of energy is much higher than its production or generation. So we should conserve electrical energy as much as we can. Because the sources are vanishing very rapidly. By keeping above point in mind we are making a project which can co-generate electricity. We are doing our project on an electric motor of duct cooler. By doing a belt pulley arrangement on the motor shaft and the dynamo. This helps in conservation of electrical energy and co-generation of it. The rotating machine such as induction motor, D.C. motor runs at rated speed and converts the electrical energy into the mechanical energy. So, using this mechanical energy to rotate another machine like Alternator or dynamo to reproduce the electrical energy.And using the co-generated energy for the household purpose. In this way, we can conserve some amount of electrical energy.

II. EXPERIMENTS AND DISCUSSION

A. Block Diagram

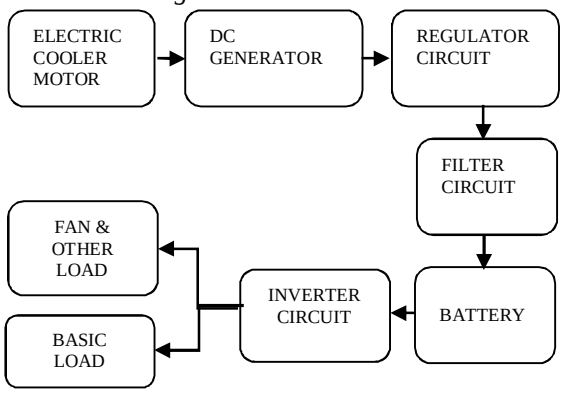

Fig. 1 Block diagram of basic the model

This is the basic block diagram of the model. As we are seeing, block diagram consisting of various components such as electric cooler motor, dc generator, regulator circuit, an inverter circuit, battery etc.
The functions of this blocks are explained below.

B. Electric Cooler Motor

An electric motor is an electric machine which converts electrical energy into mechanical energy. The electric motor runs on the basic principle of Faraday's law of electromagnetic induction. Whenever the current carrying conductor is placed between fields then it experiences a force. An electrical motor consists of a rotor, stator, windings, commutator, etc. The motor construction is given below.

C. DC Generator

A DC generator is an electrical machine which converts mechanical energy into electrical energy without change in frequency. This energy conversion is depending on the principle of production of dynamically induced emf. This article basic construction and working of a DC generator.

1) *Construction of A DC Machine:* A DC generator will be used as a DC motor with none constructional changes and the other way around is additionally attainable. Thus, a DC generator or a DC motor can be commonly termed as a DC machine.

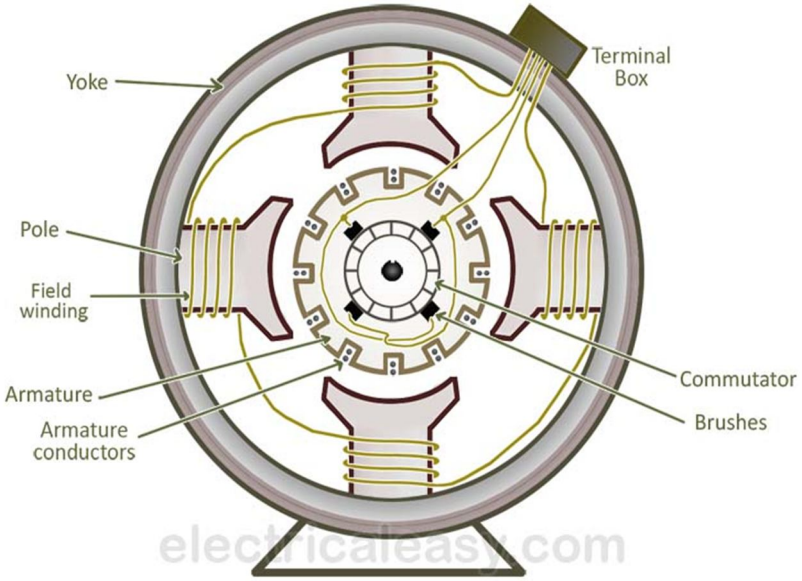

Fig. 2 Construction of DC Machine

2) *Working Principle of A DC Generator:* According to Faraday's laws of magnetic force induction, whenever a conductor is placed in an exceedingly magnetic flux (OR a conductor is stirred in an exceedingly magnetic field), associate degree electrical phenomenon (electromotive force) gets evoked within the conductor. From the emf equation of dc generator, we can calculate the magnitude of induced emf. If the conductor is given the closed path, the elicited current can flow into among the trail. In a DC generator, electromagnetic field is produce by field coils and the armature conductors are rotated into the field. Thus, an electromagnetically induced emf is generated in the armature conductors. The direction of induced current is given by Fleming's right-hand rule.

D. Regulator Circuit

Fig. 3 Regulator IC7818

The Regulator circuit is provided to regulate the output voltage which is obtained at the terminal of the DC generator. The output depends on the rotation of the DC Generator. And it varies from 13V-15V. The battery chargeable voltage is approximately about 12V.

E. Inverter Circuit

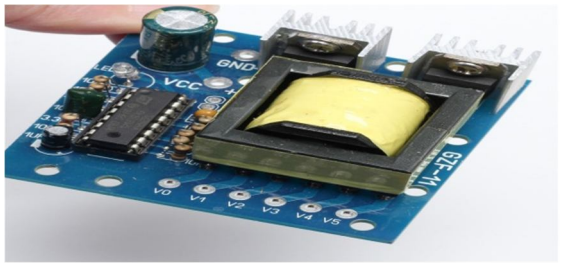

Fig. 4 Inverter Circuit Panel

The output power from the dc generator is DC which is then is stored directly in the battery. Also, the output at the terminal of a battery is in DC form. As shown in the block diagram the, Inverting Circuit is provided which converts the DC output power to the AC output power.

F. Battery

A battery is a electric device consisting of one or more electrochemical cells that convert stored chemical energy into electrical energy. Each cell contains a positive terminal, or cathode, and a negative terminal, or anode. Electrolytes ar allows maneuvering between the electrodes and terminals, which permits current to emanate of the battery to perform work.

G. Circuit Diagram

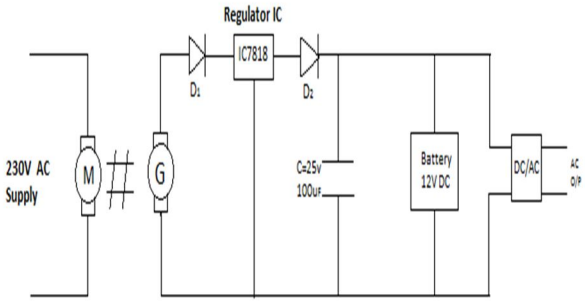

Fig. 5 Circuit Diagram of the Model

This is the basic circuit diagram of the model. The electric cooler motor is connected parallelly to the DC generator with the help of pulley arrangement. Then the regulated IC7818 is provided to keep the output in the range of 12V-18V which is sufficient to charge the Battery. The charges stored in the Battery is in a DC form i.e. DC Power. Hence then it passes to the Inverting Circuit where the DC form of Power is then converted into AC form. This AC power is sufficient to use it for household purpose.

III. WORKING PRINCIPLE

As we all know that electric motors run on the basic principle of Faraday's law of electromagnetic induction. Here we had done the pulley belt arrangement with the motor shaft and DC generator. When we give the supply to the cooler motor as per requirement of supply is 230 volt. The dc generator which is coupled to the motor with the help of belt pulley arrangement. When supply is given to the motor, the motor runs and dc generator is connected to the motor shaft, hence dc generator will rotate and to generates electricity. This generated electricity is stored in a battery with the help of inverter circuit. With the help of above arrangement, we can co-generate the electricity above 15volt. This generated electricity is nearly 48.7volt and it stored in the dc battery. The charge stored in the battery can use for the various purpose. As per design we are also connected inverting circuit for the emergency lighting purpose. The circuit is also used to convert DC to AC output supply. In an arrangement, a LED bulb is placed for a purpose for proper illumination. To control the speed of the motor, we use a speed control regulator. The regulator is used to vary the speed of the motor as per requirement.

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IV. CALCULATION AND MEASUREMENT

On load = 3W

Sr.no	MOTOR	
	Current (mA)	Voltage (V)
1.	0.35	150
2.	0.35	160
3.	0.3	170
4.	0.3	180
5.	0.3	190
6.	0.31	200
7.	0.32	210
8.	0.33	220
9.	0.35	230

Table 1: Readings at the motor side on load 3W

On load = 3 W

Sr.no	GENERATOR	
	Current (mA)	Voltage (V)
1.	0.5	12.5
2.	0.8	12.5
3.	1.3	12.6
4.	1.4	12.6
5.	1.5	12.6
6.	1.5	12.6
7.	1.5	12.6
8.	1.5	12.6
9.	1.6	12.6

Table 2: Readings at the Generator side on load 3W

On NO load

Sr.no	MOTOR	
	Current (mA)	Voltage (V)
1.	0.33	150
2.	0.35	160
3.	0.32	170
4.	0.3	180
5.	0.31	190
6.	0.31	200
7.	0.32	210
8.	0.33	220
9.	0.35	230

Table 3: Readings at the motor side on No load
On NO Load

Sr.no	GENERATOR	
	Current (mA)	Voltage (V)
1.	0.6	12.6
2.	0.8	12.6
3.	1.4	12.7
4.	1.7	12.7
5.	2	12.7
6.	2.1	12.7
7.	1.9	12.7
8.	2.1	12.7
9.	2.2	12.7

Table 4: Readings at the motor side on No load

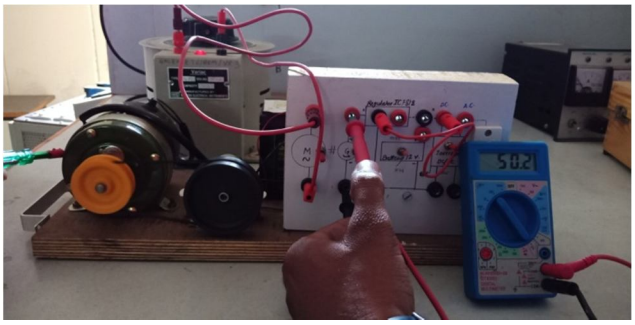

Fig. 6 Output voltage of generator

V. CONCLUSION

This project is applicable to all rotating devices and has a bright future scope. If the project is adopted by all residential and commercial consumers then it will very helpful in conserving the energy. By doing this we can conserve a lot much amount of energy. We have obtained a more electrical output which is our free energy. This free energy generation is non-hazardous and eco-friendly.

VI. ACKNOWLEDMENT

It is a proud privilege to voice the completion has been a more experience providing us with great insight into learning various design concepts, hardware, and engineering concepts & benefits of team-work. First and foremost we would like to thank our guide. For his constant encouragement, valuable help, immaculate guidance and assisting in every possible way for the successful completion of this project.

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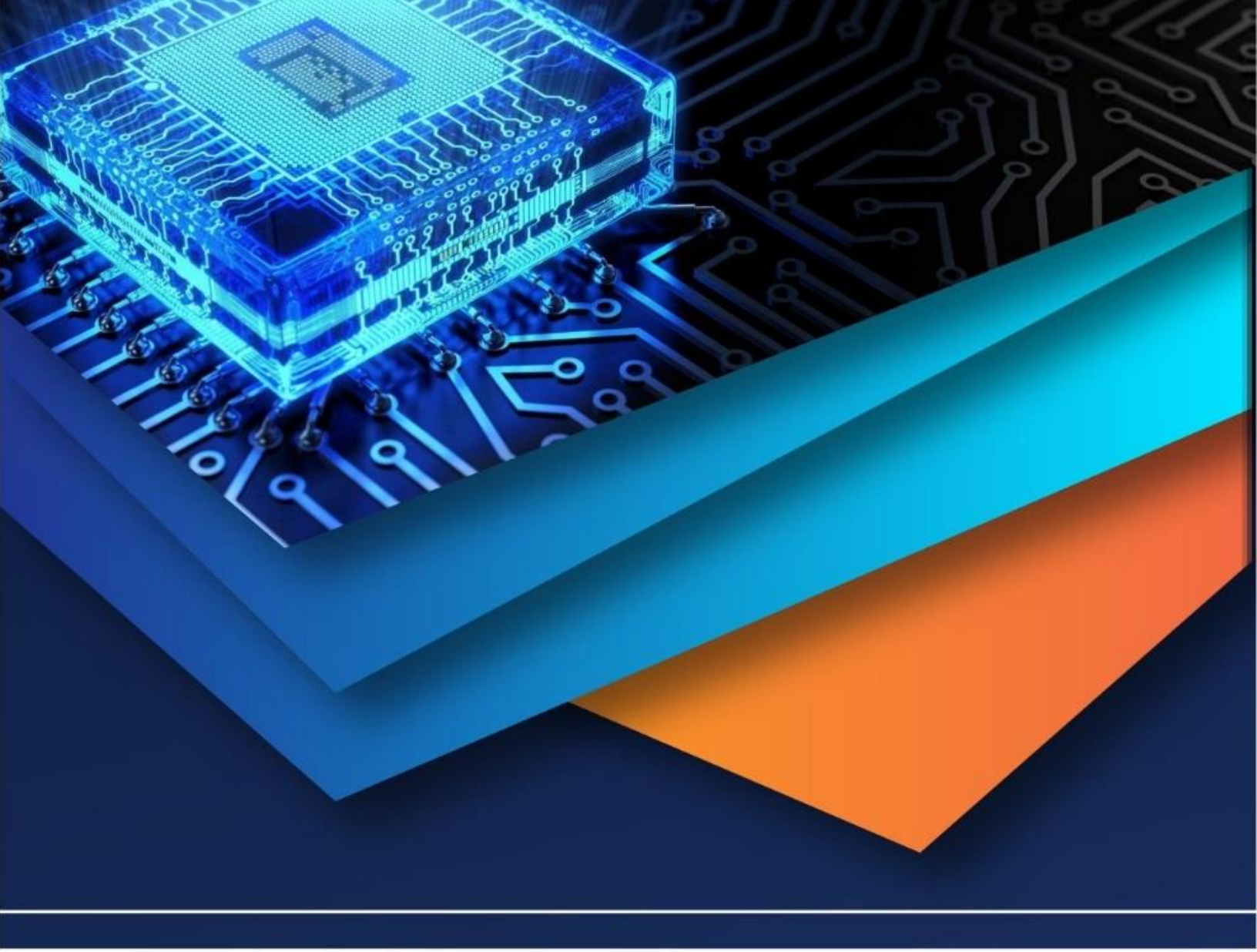

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