Final Year Project

Report on

"Synergy Exemplar"

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Dedication

Cardinally, we are very thankful to Allah Almighty who has bestowed upon us to complete this task. Besides, it is collaterally dedicated to our kind teachers **Sir Haris & Sir Farhan Iqbal and Our Parents** who nourished our soul and body to find our modes and future perspectives. It is due to the kind care of them that we seem to have been turned out to be competent Engineers with courage to resolution.

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We express our heartiest gratitude to all, who physically and metaphysically helped us out to accomplish our research project to its completion.

ABSTRACT

This project generates energy from inclined plates placed on roads by using electronic gadgets and gear arrangement. It's a novel idea to generate large amount of electricity, with least expenditure. And if the implementation of the design occurs, it will benefit for the government in terms of the power and energy. Various forms of energies are produced during vehicle motion like heat energy is produced due to the rough surface, as the vehicle is travelling at a very high speed. There are various systems to generate power, from which one consist of conversion of kinetic energy into electrical energy. It is an electro-mechanical system. The vehicular motion pushes the plates or inclined plates in downward direction. This movement forces the recoiling springs, which on further rotates a mechanical system of gears, ball bearings and shaft rod etc. The output gained from this whole mechanical movement is applied on the shaft of dynamo, connected to this whole mechanism.

Chapter # 1

Introduction

The famous scientist Michael faraday in his early 1830's was the first ever person who discovered the principle of generating electricity. According to faraday principle of generating electricity, when a disc or a loop of wire or a circular disc is allowed to move between the magnetic poles volts or electricity is generated.

It was the first ever process to deliver electricity to consumers as well home consumers. There are also other methods for generating electric power for the purpose of electric transmission and distribution and also electric power storage.

On industrial scale electromechanical generators are the main source of energy, which are driven by heat engines. These heat engines are fueled by chemical combustion or nuclear fission or coal or petroleum or by kinetic energy of flowing materials like water etc. this kinetic energy forces the rotor of the alternator to rotate

Electrical generation at commercial level is done using electromagnetic induction. In this method mechanical energy forces an electrical generator to rotate. There are many methods of producing mechanical energy, hydro power, tidal power and heat engines.

We have been trying from ages to find new means of power sources and to find easiest/smartest way to generate electricity, by reducing its generating cost.

Electricity can be generated by many methods like by coal , natural gas and by hydral power plants . Nuclear fuel is also used for the generation of electricity in some countries. And all of these methods have their own advantages and disadvantages.

There are many methods by which electricity can be generated like by coal or natural gas or by hydral power plants. Even in some countries electricity is generated by nuclear fuel. All of these methods have their own pros and cons.

Pakistan is facing an inevitable challenge in restructuring its system for the electric current supply. Pakistan's demand and supply for electricity has not gained a balanced position since the invention of Pakistan. Pakistan's electricity producers his are now seeking parity in returns for both domestic and foreign investors which indicate it to be one of the key unresolved issues in overseeing a surge in electricity generation when the country faces growing shortages. From recent years electricity generation in Pakistan has shrunk by up to 50% due to over reliance on fossil fuels. The total installed electricity capacity in Pakistan is 21,000 MW.

"Thinking of these crises we worked on a design which aims the objective of electricity by reducing the cost to generate it. We had generated electricity by an AC alternator."

The main **objective** of our project is to connect a generator motor to a system of gears; shafts etc. by stepping down the RPM and by reducing the gear losses. This system of generation includes both mechanical and electrical concepts.

We made an electro mechanical design "**Synergy Exemplar**" in which energies are transformed from one to the other. We had made a set of inclined plates about 4" to 5" above from ground level. These plates are connected to a set of recoiling springs. The purpose of these springs is to bring back the plates in their original position.

A mechanical setup has been design to get better output. This setup includes circular gears differs in size and teeth ratio. The springs are attached to shaft rod. The shaft rod rotates in only one direction by the "one way clutch bearing" placed on the shaft rod.

A circular gear of diameter 6" is placed on the shaft. This gear is further connected to a larger gear of "Gear box". We have used the gear box to achieve greater number of rotations just by a small pressure/force exerted on the inclined plates. The gear box has 1:40 gear rotation ratio.

We had minimized the gear losses. This whole arrangement of gears and inclined plates is connected with an AC alternator having rotations of 1500 rpm. The alternator we used is AC with carbon brushes. It has 4 poles. We had step down its rpm by gears combinations.

In direct form when a vehicle moves over the inclined plates, the tires of the vehicle pushes the plate in downward direction which forces the shaft rod to rotate which results in the rotation of alternator rotor and as a result we get output in the form of A.C volts like 20 V AC to 85 V AC.

Now we have stepped down this to 12 VAC by using a center tapped transformer. We also did voltage regulation to get a constant voltage of 12VAC. In the end we got an output of 12 V DC (after rectification). This 12 V DC is used to charge the battery like 40 ampere battery.

Block Diagram