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Conversion of Electrical Energy Using Magnetic Repulsive Generator

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***Abstract*: Now-a-days motors which are used for different applications are powered by electricity, as the requirement of power or electricity is the basic commodity for today's world, we need a lot of electricity to power all our daily use machines. In this project we are producing free energy by using the magnetic repulsive energy method. By utilizing minimum amount of electrical energy is used to produce high electrical energy by using magnetic repulsion technique. The system uses permanent magnets to produce repulsion and this repulsive force produces a torque which drives a DC generator. The repulsive magnet disc which contains number of permanent magnets are arranged on a circumferential position of the disc at a regular intervals and same magnetic polarity of permanent magnets are located on the motor shaft. The rotating disc is couple with generator through a set of gears. While driving a load, the motor rotates the disc due to magnetic repulsion which drives a DC generator to produce electrical energy. The power output from the DC generator can be boosted by the voltage booster and it can be stored in batteries or used to drive any AC loads through an inverter.**

***Keywords*: Batteries, DC generator, Permanent magnet, Repulsive force.**

1. Introduction

In the present scenario power becomes the major need for human life. The availability and its per capital consumptions are regarded as the index of national standard of living in the present day civilization. Energy is an important input in all the sectors of any countries economy. Energy crisis is due to two reasons, firstly the population of the world has been increased rapidly and secondly standard of living of human beings has increased. India is the country, which majorly suffers with lack of sufficient power generation. The availability of regular conventional fossil fuels will be the main sources for power generation, but there is a fear that they will get exhausted eventually by the next few decades. Therefore, we have to investigate some approximate, alternative, new sources for the power generation, which is not depleted by the very few years. Another major problem, which is becoming the exiting topic for today is the pollution. It suffers all the living organisms of all kinds as on the land, in aqua and in air. Power stations and automobiles are the major pollution producing places.

Therefore, we have to investigate other types of renewable sources, which produce electricity without using any commercial fossil fuels, which is not producing any harmful products. There are already existing such systems using renewable energy such as solar wind), OTEC (ocean thermal energy conversions) etc…for power generation. This paper proposes a novel technology to convert the rotational free energy available from rotating machines to electrical energy using repulsion magnet technique.3 The repulsive-type magnetic system has been employed so far in bearing and levitation systems alone. Due to the scarcity of power generation, much modern technique must be employed for power production in this world. This proposed work states the new invention of producing energy from repulsive type magnetic system for power generation. The technique is very effective and cost enough. This paper proposes a technology to produces electrical energy using repulsion magnet technique. The proposed technology employs the theory of magnetic repulsion. The system uses permanent magnets to produce repulsion and this repulsive force produces a torque which drives a DC generator. The power output from the DC generator can be boosted by the voltage booster and to store in batteries or used to drive any AC loads through an inverter.

2. Literature Review

Saunders, R. M. et al. (1951) had shown the concern about several factor which are different from those encountered in the design of standard machines such as a consideration of the behavior of magnetic circuits employing permanent magnet material, the effect of demagnetizing forces, type of magnet stabilization to be utilized, method for reducing voltage regulation and method for reducing the transient and negative sequence reactance.

Strauss, F. (1952) discussed the rotating permanent magnet field in synchronous machines. The author pointed out the deviation from the standard design under steady state condition by analyzing pole leakage estimation, flux density, steady-state short-circuit and reactance's of the armature, etc.

Hershberger, D. D. (1953) studied the design of fractional horsepower size permanent magnet motor and generator. Ginsberg, D. et al. (1953) presented the calculation for the design of permanent magnet generator. The equation and curves permit the calculation of open-circuit voltage, transient performance, short-circuit current, synchronous impedance and voltage regulation for various power factors.

Hanrahan, D. J. et al. (1957) discussed the theory of permanent magnet generators and also shared the potential application such as mobile military applications like guide missiles, piloted aircraft and engine generator set for shipboards and field use where size, weight, and environmental requirements are severe.

Ellison, A.J. et al. (1968) described the acoustic noise and vibrations in rotating electric machines. The paper describes the noise is produced by mechanical, magnetic and aerodynamic sources.

Binns, K. J. et al. (1979) presented that performance of the generator can be predicted with reasonably good accuracy by a computer program presented in a flowchart for evaluation of flux path in rotor steel.

Turner, P. J. et al. (1981) presented a 2D modeling of turbine generator and analyzed the first order finite element formulated by the nodal method. The design information is used to calculate excitation current and load angle corresponding to any terminal voltage current and power factor. The method is simple and converges in a few iterations.

Ray, A. K. et al. (1981) presented finite element method for predicting the flux distribution, the no-load magnetization curve and the load excitation of saturated electrical machines. By applying the method to determine the flux-ampere-turn relationship for saturated stator teeth, it was shown how the method could be applied to improve the conventional methods of magnetic circuit design.

Cendes, Z. J. et al. (1983) presented a 2D finite element package which automatically generates finite element meshes for magnetic field problem. The system combines the concept of Delaunay triangularization with variational principle to provide a grid which adapts to the characteristics of the solution. In the procedure to the different appropriate solution to the magnetic field were derived, the difference between two approximate solutions providing an element by an element measure of the accuracy of the solution. By refining those elements having the largest error and recomputing the solution iteratively, finite element meshes having uniform error density are obtained.

Bryant, C. F. et al. (1984) presented a finite element modeling as a powerful tool for solving the enormous complex field problem. He emphasized the need for efficient data creation and handling which had stimulated investigation into what has become known as pre and post- processing.

Berkery, J. F. et al. (1984) developed an automatic grid generator for motor design analysis. The grid generator was developed to eliminate the drudgery of creating node point and elements for a used in a production design environment.

3. Conversion of Low Voltage to High Voltage

If you connect two gears together and the first one has more teeth than the second one (generally that means it's a bigger-sized wheel), the second one has to turn round much faster to keep up. So this arrangement means the second wheel turns faster than the first one but with less force. Looking at our diagram on the right (top), turning the red wheel (with 24 teeth) would make the blue wheel (with 12 teeth) go twice as fast but with half as much force.

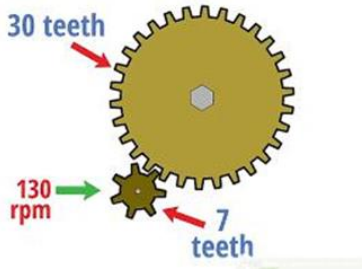

Fig. 1.

A. *Neodymium magnet*

A neodymium magnet (also known as NdFeB, NIB or Neo magnet) is the most widely used type of rare-earth magnet. It is a permanent magnet made from an alloy of neodymium, iron, and boron to form the Nd2Fe14B tetragonal crystalline structure. Developed independently in 1984 by General Motors and Sumitomo Special Metals, neodymium magnets are the strongest type of permanent magnet available commercially. Because of different manufacturing processes, they are divided into two subcategories, namely sintered NdFeB magnets and bonded NdFeB magnets. They have replaced other types of magnets in many applications in modern products that require strong permanent magnets, such as electric motors in cordless tools, hard disk drives and magnetic fasteners.

B. *Miller dynamo*

Dynamos are actually quite efficient at converting kinetic energy to electrical energy. It depends on the size and the precision of construction, but 80% is easily achievable, so if 100W is available from the bicycle it should be possible to get 80W from the dynamo. A dynamo is a device for converting mechanical energy into electrical energy. In a dynamo, the mechanical energy of rotation is converted into electrical energy in the form of a current in the armature.

C. *Spur gear*

Spur gears consist of parallel teeth to the axis and are utilized for transferring power between two parallel shafts. They are simple to manufacture and low cost. They need the most effective potency and smart accuracy rating. They are used in high speed and high load application altogether varieties of trains and an honest sort of velocity ratios. Hence, they perceive wide applications right from clocks, organization gadgets,

motorcycles, vehicles, and railways to aircrafts.

D. Voltage booster

A boost converter is one of the simplest types of switch mode converter. As the name suggests, it takes an input voltage and boosts or increases it. All it consists of is an inductor, a semiconductor switch (these days it's a MOSFET, since you can get really nice ones these days), a diode and a capacitor. Also needed is a source of a periodic square wave. This can be something as simple as a 555 timer or even a dedicated SMPS IC like the famous MC34063A IC.

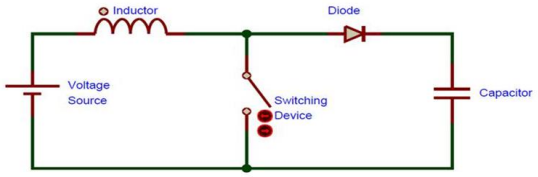

Fig. 2

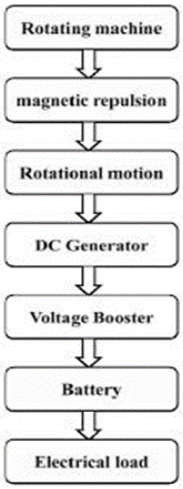

Fig. 3. Methodology

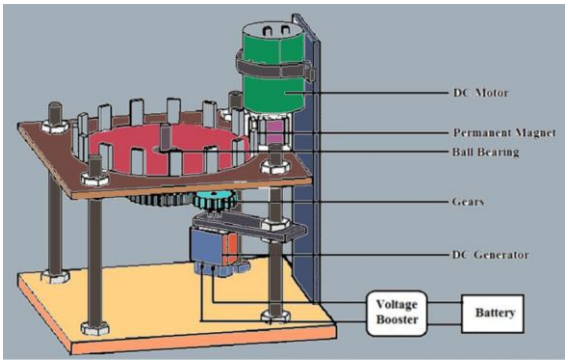

Fig. 4. Model development

4. Calculation

Magnetism is the force that moving charges exert on one another. This formal definition is based on this simple equation.

$$FB = qv \times B$$

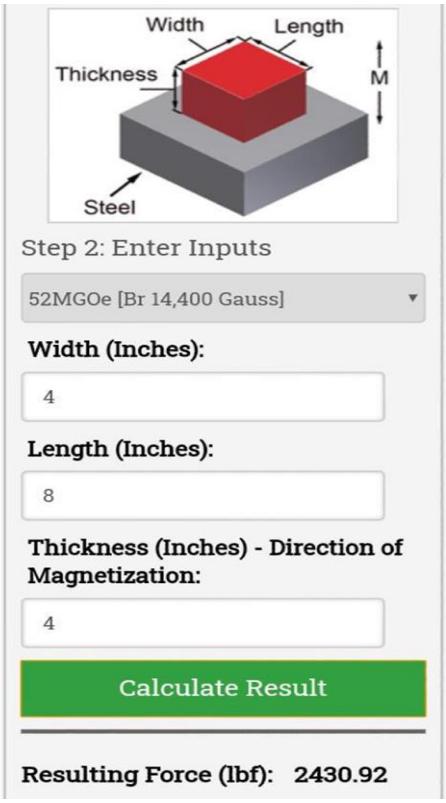

Fig. 5.

Recall that electricity is (in essence) the force that charges exert on one another. Since this force exists whether the charges are moving, it is sometimes called the electrostatic force. Magnetism could be said to be an electric dynamic force, but it rarely is. The combination of electric and magnetic forces on a charged object is known as the Lorentz force.

$$F = q(E + v \times B)$$

For large amounts of charge,

FB = q v × B FB = q dx × B = dq ℓ × B dt dt FB = Iℓ × B

Torque calculation:

Torque (T) = ½ (Ia / A) BDC Z Newton meters

Using the relation,
B = φ / a

= φ/(ΠD/P)ł

= φ x P / (Π Dł)

T = ½ x (Ia / A) x Z x φ x {P/ (ΠDł)} x Dł

= φ Z P Ia / (2ΠA) Newton meters

= 0.159 x φ x Z x Ia X (P/A) Newton meters

= 0.162 x φ x Z x Ia x (P/A) Kg-m

5. Conclusion

In this paper we have discussed about technology employs the theory of magnetic repulsion. The system uses permanent magnets to produce repulsion and this repulsive force produces a torque which drives a DC generator to produce electrical energy. It is a nonconventional type of producing the energy. The existing source of energy such as coal, oil etc. may not be adequate to meet the ever increasing energy demands. Since the model has only few modifications and more advantages. Future scope of this work is to implement in industry to generated electricity by the rotational free energy available from rotating machines to electrical energy using repulsion magnet technique. The significant conclusions that may be drawn based on the present work may be summarized as follows:

- Model study is done and it is found to give a satisfactory result.
- The mechanism proposed is much simpler and continuously produces the electrical power.
- The produced electrical energy is renewable energy which is pollution free.

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