RESEARCH ARTICLE OPEN ACCESS

"Electricity Generation by Universal Neodymium Permanent Magnetic Rotor by Reducing Magnetic Core Losses"

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ABSTRACT
In this paper construction of universal neodymium permanent magnetic rotor without any electromagnetic core, due to this we will reduce 38% of core losses and increase the stability of the system efficiency. Now a day's electricity generation from various sources like hydro, steam, solar, nuclear etc. but these sources have some merits & demerits. By these sources have more demerits as well as its have more losses, so we not fulfill the costumer/industrial requirements. For alternate arrangement we have been innovated this system.

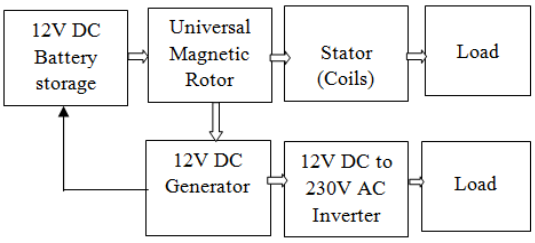
Keywords: 24 gauge copper wire, universal rotor (armature), Neodymium Permanent Magnets, 12V DC Generator, 12/20 cm wooden disk or plastic/non magnetic disk.

I. INTRODUCTION

Electricity generation is the process of generating electric power from other sources of primary energy. For electric utilities, it is the first process in the delivery of electricity to consumers. Electricity is generated by the movement of a loop of wire, or disc of copper between the poles of a magnet. There are seven fundamental methods of directly transforming other forms of energy into electrical energy 1. Static electricity 2. Electromagnetic induction 3. Turbines 4. Electrochemistry 5. Photovoltaic effect 6. Thermoelectric effect 7. Piezoelectric effect. The selection of electricity production modes and their economic viability varies in accordance with demand and region. The economics vary considerably around the world, resulting in widespread selling prices and power theft. By all above selection considerable we are design and generating electricity at low cost and flexible.

We are generating electricity by this system there is no any limitations. By this system we will step-up voltage as per our requirements. And we made feedback supply to the prime mover once feedback system connected there no need to external supply to the system (we can say this system become fee energy electricity generation).

II. BLOCK DIAGRAM



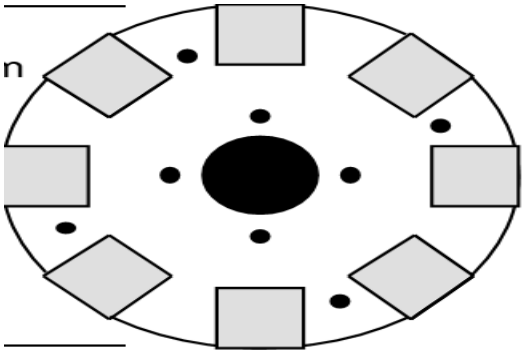
Working Principle of Block Diagram:

Design of universal magnetic rotor in this block we are used universal rotor (armature). Universal armature used in mixer, grinder its have very high speed. In this project we are used armature as a rotor and on the shaft of this rotor we are fixed neodymium permanent magnet disk, when rotor rotates magnetic disk also rotated. Stator coils are placed near to magnetic rotor so stator conductors cuts the magnetic field emf (Electricity generation) induced in coil. That generated emf can fed it to electrical load. Universal rotor have high speed so on the same shaft we coupled 12V DC generator. Generated 12V Dc supply we are stored through storage battery, and 12vdc supply used as input to armature. Then we designed 12V dc to 230VAC inverter circuit and more electrical load can be drawn. Initially from storage battery 12V dc supply will fed to armature, once armature start to rotates at the same time 12v Dc generator can also rotates and it generates electricity, as well as stator winding will cut the magnetic fields from rotating magnetic disk electricity generates on stator coils, generated electricity can be transmitted to electrical load for this way both side electricity generation will takes place.

III. DESIGN OF UNIVERSAL MAGNETIC ROTOR

Permanent magnets have been used industrially since the invention of the first carbon steel permanent magnet materials in the beginning of the 20th century. Permanent magnet motors are a well-known class of rotating and linear electric machines used in both motoring and generating modes. Permanent magnet machines have been used for decades in applications where simplicity of structure and a low initial cost were of primary importance. More recently, permanent magnet machines have been applied to more demanding applications, primarily as the result of the availability of low-cost power electronic control devices and the improvement of permanent magnet characteristics. In general, modern permanent magnet machines are competitive both in performance and cost with many types of machines.

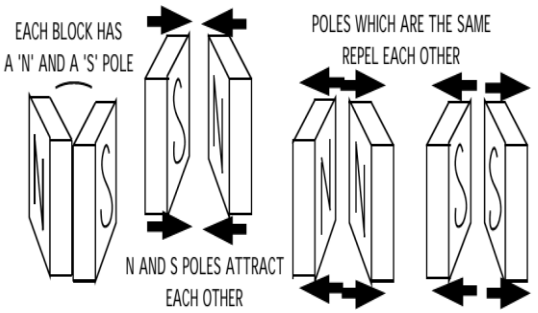
The magnet rotors are mounted on bearings, which turn on the shaft. The rear rotor is behind the stator, and enclosed within it they will turn the magnet rotors, and move the magnets past the coils. Magnetic flux passes from one rotor to the other through the stator. This moving magnetic flux is what produces the electric power [1].

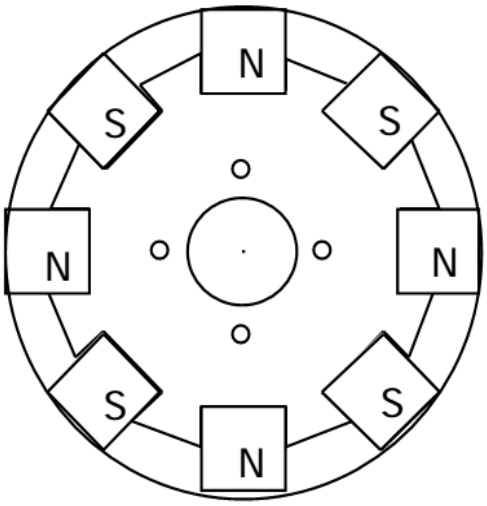


Each magnet rotor is built on a wooden or hard plastic disk, 12cm thick. Do not use aluminum or stainless steel for this disk! The disks have to be made of magnetic material. The disk has holes to mount it to them. At the center of the disk is a 2mm diameter hole. The magnet plates must be flat, not warped. It is not easy to cut the outer circle without warping the plate. The magnets will be placed on the round disk [6].

3.1 Poles On The Magnet Blocks:

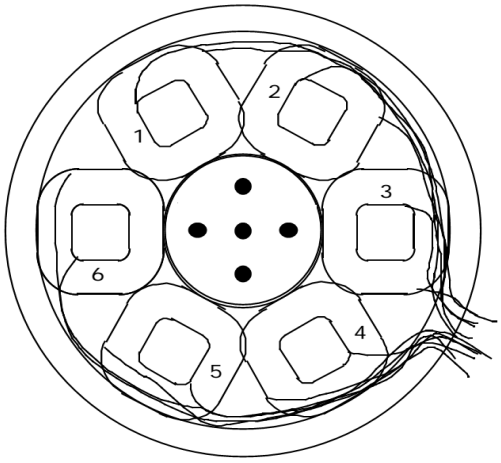
Take care when handling the magnets. Magnets can damage floppy discs, music tapes, credit cards and other magnetic media. Separate them from each other by sliding them sideways. They attract each other with strong forces. Take care not to let them fly together - they may break. Never use a hammer to assemble the PM rotor. You may break a magnet or break the resin holding it [

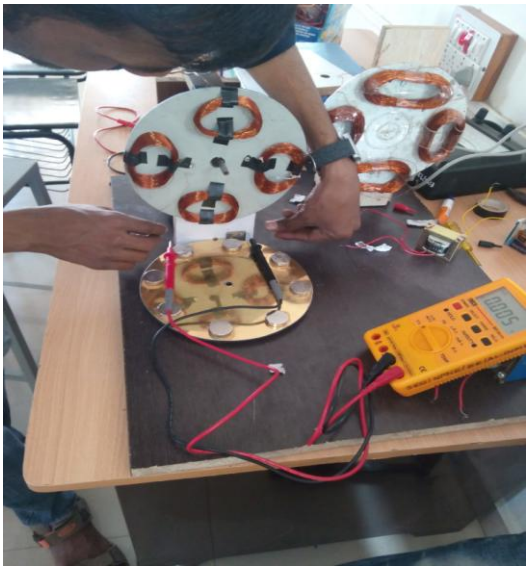




IV. CONSTRUCTION OF STATOR COILS

This section tells how to make a stator, using the jigs and moulds. It is a good idea to wind a coil before making the stator moulds, so that the mould can be checked for correct fit. Mount the reel of winding wire on an axle behind you, in line with the coil former. The wire should form an 'S' bend as it winds onto the coil. When the coil is complete, pass a piece of sticky tape under the coil on both sides and bind it tightly. Do not cut off the winding wire until this is done, or the coil will spring out, and loosen. Remove the coil from the former, and wind five more coils in exactly the same way. And Place the coils on a stator [6].

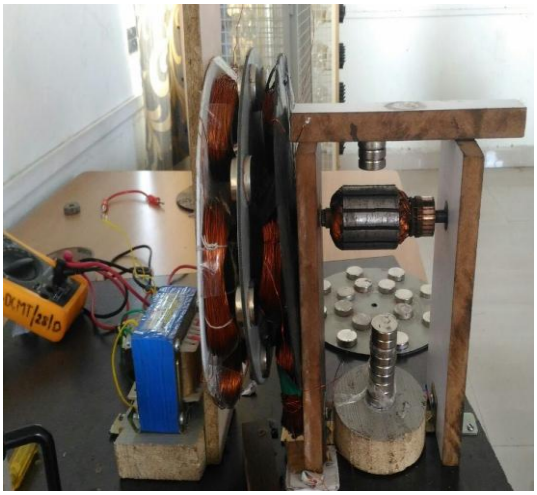


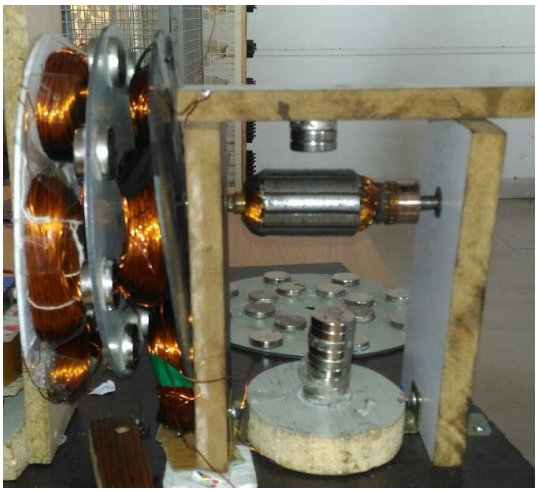


The total assembly of the stator which has shown above diagram. After completion of fixing copper coils on stator, remove the insulation on copper coil, then make a connection of all coils either as a series or parallel but you should take care about connection the coils should be same direction i.e. all coils should be clockwise, not one coil clockwise and another is counterclockwise.

V. EXPERIMENTAL RESULTS

Sr. No	Coil Turns	RPM	Voltage Generation
1	500	0	0V AC
2	500	50	10.03V AC
3	500	100	18.39V AC
4	500	250	21.23V AC
5	500	300	33.48V AC
6	500	500	50.39V AC
7	500	750	71.23V AC
8	500	1000	105.48V AC





VI. CONCLUSION

By using universal Permanent magnetic rotor electricity generation is have been used for many years in applications where simplicity of structure and a low initial cost have been of primary importance. Demanding applications, primarily as the result of the availability of low-cost In general, modern permanent magnet machines are competitive both in performance and cost with many types of machines. A modular construction, which makes the assembly easier, is considered.

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