

Power Is Generated By Using Magnetic Rotor

P.Varalakshmi, DV.Madhuri

¹Mechanical Department, JNTU-H/ Christu Jyothi Institute of Technology & Science, Jangaon, Telangana, INDIA.

Abstract

Nowadays 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. Electrical energy is converted into different forms of mechanical energy. In our subject we are producing free energy by using the magnetic repulsive energy. The main objective is to use the repulsive force of magnets and produce rotary motion which can be used in different applications. Here we are rotating a simple cooler fan which is attached to a conventional bicycle rear wheel hub which consists of ball bearings and a shaft and is powered by magnetic repulsive force.

Keywords: Magnet, Repulsive, Rotary, Bearing, Shaft.

1. Introduction

Magnetism is a class of Mechanical phenomena that includes forces exerted by magnets on other magnets. It has its origin in electric currents and the fundamental magnetic moment of elementary particles. These give rise to a magnetic field that acts on other currents and movements. All materials are influenced to some extent by a magnetic field. The strongest effect is on permanent magnets which have persistent magnetic moments caused by ferromagnetism. Most materials do not have permanent moments. Some are attracted to a magnetic field (paramagnetism); others are repulsed by a magnetic field (diamagnetism); others have a much more complex relationship with an applied magnetic field and are known as non-magnetic substances. They include copper, aluminum, glass and plastic. Pure oxygen exhibits magnetic properties when cooled to a liquid state.

Attraction : When two magnets or magnetic objects are closed to each other, there is a force that attracts the poles together. Force attracts N to S. Magnets also strongly attract ferromagnetic materials such as iron, nickel and cobalt.

Repulsion: When two magnetic objects have like poles facing each other, the magnetic force pushes them apart. Force pushes magnetic objects apart. Magnetic can also weakly repel diamagnetic material.

2. PARTS

The main parts those are used for power generation by using magnetic rotor.

1.Rotor, 2.Neodymium Magnet, 3.Shaft, 4.Hub, 5.Bearings, 6.Washer, 7.Nuts, 8.Fan, 9.Wooden Stand.

2.1 Rotor:

The rotor consists is made up of aluminum material with a diameter of 100mm and thickness of 20mm with a hole in the center of the disc for the alignment of a shaft of 10mm diameter. The rotor will be rotating with a certain rpm under the action of magnetic repulsive energy. The rotor rotates freely with the help of bearings. The rotor consists of four magnets are placed inside the disc by making grooves inside them. The weight of the rotor is about 450gms, it is 100mm in diameter and 20mm in thickness. Aluminum is taken as the material for the rotor because aluminum is light in weight and also aluminum will not get attached to magnets, if which we are using is a magnetic attractive material the movement of the disc will be restricted. As shown in Fig.1 .

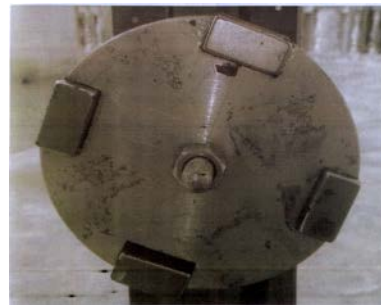


FIG.1 ROTOR

2.2 Neodymium Magnet :

Magnet specifications :

1x1x1/2 inch magnets 4

These are also called as N45 magnets

Four neodymium magnets weighing 62 grams each

Residual flux density = 13.3-13.7 KGS
 Coercive force = >923 Ka/m
 Intrinsic Coercive Force =>955kA/m
 2x1x1/2 inch magnets 2
 These are also called as N42 magnets
 Residual flux density = 12.8-13.2
 Coercive force =>915 Ka/m
 Intrinsic Coercive Force =>955Ka/m
 Two N42 magnets with a weight of 181 grams each.

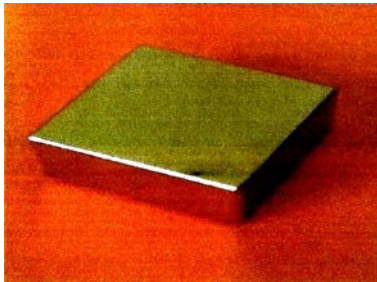


Fig.2 MAGNET

Table 1: Comparison of physical properties of sintered neodymium and Sm-Co magnets.

Property	Neodymium	Sm-Co
Remanence (T)	1-1.3	0.82-1.16
Coercivity (MA/m)	0.875-1.99	0.439-1.59
Relative permeability	1.05	1.05
Temperature coefficient of remanence (%K)	-0.12	-0.03
Temperature coefficient of corecivty (%K)	-0.55 to -0.65	-0.15 to -0.30
Curie temperature (°C)	320	800
Density (g/cm ³)	7.3-7.5	8.2-8.4
Flexural strength (N/mm ²)	250	150
Compressive strength (N/mm ²)	1100	800
Tensile strength (N/mm ²)	75	35
Vickers hardness (HV)	550-650	500-550
Electrical resistance (Ω.cm)	(110-170x10 ⁻⁶)	86x10 ⁻⁶

2.3SHAFT OR AXLE :

- A cylindrical, usually solid metal object which commonly goes through and holds other rotating items (e.g. pulleys, wheels, gears, bearings, sleeves) and which may also transmit rotational forces.
- One of a pair of poles between which a horse in harnessed to a vehicle.
- Axle, a shaft around which one or more wheels rotate.
- Drive shaft, a shaft for transferring torque.

- Line shaft, a power transmission system.
- Shaft (golf), the long, tapered tube which connects the golfers hands to the club head.
- Staff (stick), various applications.

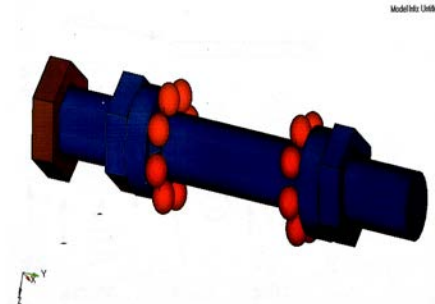


Fig.3 SHAFT

2.4.HUB SHELL AND FLANGES:

The hub shell is the part of the hub to which the spokes (or disc structure) attach. The hub shell of a spoked wheel generally has two flanges extending radially outward from the axle. Each flange has holes or slots to which spokes are affixed. Some wheels (like the full speed ahead RD-800) have an additional flange in the center the hub. Others (like the some from Bontrager and Zipp) do not have a noticeable flange. The spokes still attach to the edge of the hub but not through visible holes. Other wheels (like those from Velomax/Easton) have a threaded hub shell that the spokes thread into.

On traditionally spoked wheels, flange spacing effects the lateral stiffness of the wheel, with wider being stiffer, and flange diameter effects the torsional stiffness of the wheel and the number of spoke holes that the hub can accept, with larger diameter being stiffer and accepting more holes. Asymmetrical flange diameters, tried to mitigate the adverse effects of asymmetrical spacing and dish necessary on rear wheels with many sprockets, have also been with modest benefits.

2.5.BEARINGS :

These are cylindrical or ring shaped bearings designed to carry radial loads. The terms sleeve and are used more or less synonymously since sleeve the general configuration while journal pertains to portion of a shaft supported by a bearing.

The simplest and most widely used types of sleeve bearings are cast-bronze and porous-bronze (powdered metal) cylindrical bearings. Cast-bronze bearings are oil or grease lubricated. Porous bearings are impregnated with oil and often have an oil reservoir in the housing.

Plastic bearings are being used increasingly in place of metal. Originally, plastic was used only in small, lightly loaded bearings where cost saving were the primary objective. More recently, plastics are being used because

of functional advantages, including resistance to abrasion, and they being made in large sizes.

2.6. WASHER :

Washers are used in this arrangement for reducing the loose ness between the mating parts.

2.7.NUTS :

Nuts are used hear for fixing rotor fan to the wooden frame and nuts are give to the total system fixed correctly.

2.8.FAN :

Fan is made up of plastic material for its light weight property. Fan easily rotates because of its flexibility.

2.9 WOODEN STAND:

Whole rotor assembly is fixed to a wooden stand to have a support and to tightly hold the hub without moving, now a simple light weight fan is assembled to the other end of the shaft with the help of lock nut.

3. BASIC PRINCIPLE :

We know that in magnetism like poles repel and unlike poles attract, in this mechanism we are using these properties of magnets to produce energy.

The magnets are arranged in the grooves of a disc and the magnets are arranged in such a way that all the poles of the magnets facing out should be same north or south. Now this disc is mounted on bicycle wheel hub which consists of a shaft and a bearings to reduce friction when moving and to ensure smooth movement under load conditions.

This whole rotor assembly is fixed to a wooden stand to have a support and to tightly hold the hub without moving, now a simple light weight fan is assembled to the other end of the shaft with the help of lock nut.

The power to drive this rotor is obtained from other magnets which are placed above the magnets at some distances and these magnets are placed in such a way that these magnets repel the magnets which are arranged on the disc, this repulsive force is converted into rotary movement and thus the fan rotates and gives out the air.

Hear we are not using any kind of external source of energy to rotate the motor.



Fig.4

4. POWER CALCULATIONS :

Diameter of the disc (D) = 100 mm = 0.1 m

Speed N = 300 rpm

Time = 5 secs

Initial angular velocity $\omega_1 = 0$ rad/sec

Final angular velocity $\omega_2 = \frac{2\pi n}{60} = 1.570$ rad/sec

Torque (T) = $I\alpha$

I = moment of inertia

α = angular acceleration

$\alpha = \frac{\Delta W}{\Delta T} = 0.314$ rad/sec²

$I = \frac{1}{2}mr^2 = 0.000625$ kg-m²

m = mass of disc = 0.5kg.

Repelling force (F) of N45 magnet = 5.6 Kgs.

Torque = 0.000189185 Nm or 2 kgcm

Power = torque x 2π x rotational speed

= 0.000000594326kw = 0.0059432 watts.

5.COST ANALYSIS :

Under the revised traffic, the domestic consumer will have to pay Rs 1.45 per unit for the consumption of up to 50 units of power, Rs 2.6 per unit for 50 to 100 units, Rs 3.6 per unit for 100 to 200 units slab, Rs 5.75 per unit for 300 to 400units slab, Rs 6.75 for 400 to 500 units slab and Rs 7.25 per unit for the consumption of above 500 units.

For a table fan the power usage will be 20 watts per month.

1 unit of electricity is 1 Kw.hr. That is one kilo watt hour.

If you switch on appliances that have a combined power demand of one thousand watts and you run them for one hour you will have consumed one kilo watt hour of electricity, or one unit.

1 watt = 5.75 /-

20 watts = 20 x 5.75 /-

= 115 rupees per month

12 x 115 = 1380 rupees per year

The cost of magnetic rotor fan is 5000 /-

5000 / 1380 = 3.6 years

Payback period is 3 years 6 months.

6.APPLICATIONS :

1. Ring magnets
2. Hard disc drive
3. Head actuators for computer hard disks
4. Magnetic resonance imaging
5. Loud speakers and head phones
6. Magnetic bearing and coupling
7. Electric motors
8. Cordless tools
9. Servo motors

First Author P.VARALAKSHMI, Asst.Prof CJITS, Jangaon.

Second Author DV.Madhuri, Asst.Prof CJITS, Jangaon..

6.CONCLUSION :

We are spending huge amount of money in producing energy or power in today's generation, price hikes on electricity bills, and pollution is generated, which is also resulting in global warming, we have some renewable energy resources like wind energy, solar energy, etc to produce energy without any cost and pollution but these are only available in some places of the world where a common cannot use the free energy, but the mechanism which we have used is produce energy or power in any condition and the energy is available free of cost, a common can also utilize the power because it is very cheap and can produce energy for a longer period of time. This mechanism in other words can also be called as perpetual motion mechanism.

Until the repulsive energy from the magnets stops the energy can be utilized, the magnets which are used in this mechanism are neodymium magnets, they are also called as permanent magnet or rare earth magnets. These magnets are very powerful and they possess high strength magnetic fields, the life time of these magnets is 400 years. Research work is going on to develop these green machines or free energy machines in different parts of the world. In future a lot these machines are expected to rule the machine world without polluting the atmosphere and at very low costs.

Acknowledgement :

Thanks to the Director CJITS, Jangaon for providing facilities.

References :

- [1] Zhe Sun, Ying He, Jingjing Zhao, " Identification of active magnetic bearing system with a flexible Rotor" Mechanical System & Signal processing . Volume 49, issues 1-2, 20 December 2014, Pages 302-316.
- [2] Soren Enemark, Ilmar F.Santos "Non linear Dynamic behavior of a rotor foundation system coupled through passive magnetic bearing with magnetic anisotropy" Journal of sound & Vibrations volume 363, 17 February 2016. Pages 407-427.