Improvements in the Design of the Gravitational Motor

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The Gravitational Motor is a new type of motor that can substitute the conventional motors with large advantage. This motor works without the use of any type of fuel. It converts energy from the Earth's gravitational field directly into rotational mechanical energy, and can have a very high-power (several thousand of HP), occupying only a volume smaller than one cubic meter. When a Gravitational Motor of this type is coupled to a conventional generator of electrical energy, the system Motor-Generator can supply several thousand kilowatt-hours of electrical energy, similarly to hydroelectric plants, but without the needs to use of water of the rivers.

Key words: Gravity, Gravitational Motor, High-power Motors, Generation of Electrical Energy.

In a previous paper [1], we have shown the design of a motor using Gravity Control Cells (GCCs) [2,3]. This motor called *Gravitational Motor* (BR Patent number: PI0805046-5, 2008), converts energy from the Earth's gravitational field directly into rotational mechanical energy. It can substitute the conventional motors with large advantage. Here, we show that the previous design of the Gravitational Motor can be improved in order to increase its power and stability.

In Fig.1 we show a schematic diagram (cross-section) of the new gravitational motor. Now the Gravitational Motor has 4 Gravity Control Cells-GCCs, which can be conventional GCCs (boxes filled with gas or plasma at ultra-low pressure) or *quantum* GCCs (See [3]). The GCC1, GCC2 and the GCC3 are placed below the rotor; GCC1 and GCC2 on the right and GCC3 on the left, as shown in Fig. 1. Above the GCC1 the local gravity (g) is intensified for $\chi_1\chi_2 g = +ng$, where $\chi_1 = -n$ and $\chi_2 = -1$ are the correlation factors between gravitational mass and inertial mass, produced by the gravitational shielding effect at the GCC1 and at the GCC2 respectively. Above the GCC3 the local gravity becomes $\chi_3 g = -ng$, where $\chi_3 = -n$ is due to the GCC3. The function of the GCC4 and of the GCC5, shown in Fig.1, is only for revert the gravity down to values very close to g.

Thus, the gravity acceleration on the left *half* of the rotor becomes $-ng$ while the gravity acceleration on the right *half* of the rotor becomes $+ng$. Consequently, this causes a torque $T = (-F'' + F')r$ and the rotor spins with angular velocity ω.

Then average power, P, of the gravitational motor is given by

$$P = T\omega = [(-F'' + F')r]\omega \qquad (1)$$

where

$$F' = \tfrac{1}{2} m_g g' \qquad F'' = \tfrac{1}{2} m_g g'' \qquad (2)$$

and $m_g \cong m_{i0}$ is the mass of the rotor. Thus, Eq. (1) gives

$$P = n m_i g \omega\, r \qquad (3)$$

On the other hand, we have that

$$-g'' + g' = \omega^2 r \qquad (4)$$

Therefore the angular speed of the rotor is given by

$$\omega = \sqrt{\frac{2ng}{r}} \qquad (5)$$

By substituting (5) into (3) we obtain the expression of the average power of the *gravitational motor*, i.e.,

$$P = nm_{i0}gr\sqrt{\frac{2ng}{r}} = m_{i0}\sqrt{2n^3g^3r} \qquad (6)$$

Now consider an electric generator coupling to the gravitational motor in order to produce electric energy.

Since $\omega = 2\pi f$ then for $f = 60Hz$ we have

$$\omega = 120\pi rad.s^{-1} = 3600rpm \qquad (7)$$

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Therefore for $\omega = 120\pi rad.s^{-1}$ and $n = 394$ the Eq. (5) tells us that we must have

$$r = \frac{2ng}{\omega^2} = 0.0545m \qquad (8)$$

Since $r = R/3$ and $m_i = \rho\pi R^2 h$ where ρ, R and h are respectively the mass density, the radius and the height of the rotor then for $h = 0.5m$ and $\rho = 7800Kg.m^{-3}$ (iron) we obtain

$$m_i = 327.05kg \qquad (9)$$

Then Eq. (6) gives

$$P \cong 2.59\times10^7 W \cong \ 25.9MW \cong 34{,}732.5HP$$

Thus, when coupled to a conventional generator of electrical energy, this Gravitational Motor can supply an amount of electrical energy of about[1] $0.9\left(2.59\times10^7 W\right)\left(3600s\right) = 8.39\times10^{10}\ j =$ $= 23{,}300kW$ per hour. This energy is enough to supply about 11,600 homes, each one with an average consumption of about 2kW per hour[2].

Note that this is made *without the use of any type of fuel*, because the energy, which moves the Gravitational Motor comes from Earth's gravitational field, i.e., the Gravitational Motor converts directly energy from the Earth's gravitational field into rotational mechanical energy.

Thus, the Gravitational Motors are similar to the turbines of the hydroelectric plants. While the turbines convert energy from the Earth's gravitational field into rotational mechanical energy, by means of water of the rivers, the Gravitational Motors convert energy from the Earth's gravitational field directly into rotational mechanical energy, by using the GCCs.

Finally, note the small volume of the rotor of a high-power Gravitational Motor, it shows that the total volume of the motor can be smaller than 1m3.

[1] Assuming an efficiency of 90%.

[2] In the US *typical household* power *consumption* is about 1.3 kW per hour. In 2013, the average annual electricity consumption for a U.S. *residential* utility customer was 10,908kWh [4].

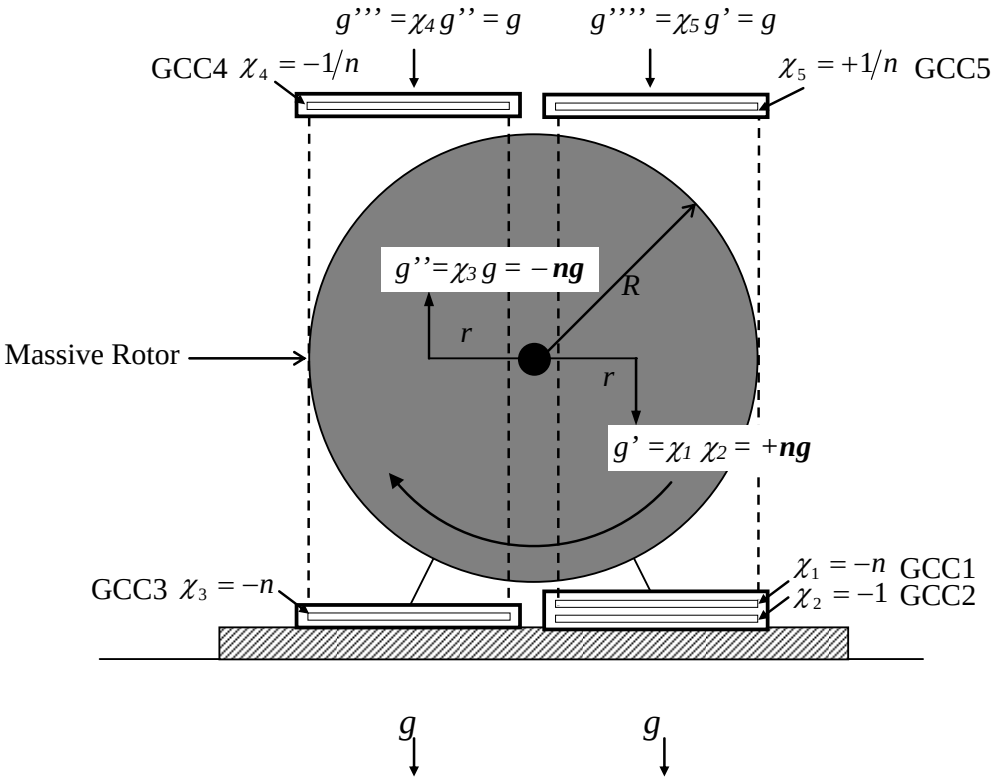

Fig. 1 – Schematic diagram (cross-section) of the new Gravitational Motor.

References

[1] De Aquino, F. (2010) *Mathematical Foundations of the Relativistic Theory of Quantum Gravity*, Pacific Journal of Science and Technology, **11** (1), pp. 173-232. Also available at: https://hal.archives-ouvertes.fr/hal-01128520

[2] De Aquino, F. (2010) *Gravity Control by means of Electromagnetic Field through Gas at Ultra-Low Pressure*, Pacific Journal of Science and Technology, **11**(2) November 2010, pp.178-247, Physics/0701091. Also available at: http://vixra.org/abs/1401.0119

[3] De Aquino, F. (2014) *Quantum Gravitational Shielding*, https://hal.archives-ouvertes.fr/hal-01074607v3

[4] U.S. Energy Information Administration (2013) http://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3