Howard Johnson magnet motor reexamined

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***Abstract*—A guideline is provided for analyzing a well-known self-rotating magnet motor from a perspective in which angular vibrations, previously considered *objectionable*, are instead viewed as essential for explaining the transfer of energy to the prime-mover shaft.**

I. Introduction

In the United States an inventor named Howard Johnson has become relatively famous for his permanent magnet motor [1], which also secured a US Patent in April 1979 [2].

Many independent researchers have had the opportunity to examine the invention, with all components fully disclosed, and to test prototypes in action. For example, in the detailed presentation of Howard Johnson's magnet motor in [3], with the cover page shown in Fig. 1, the author confirms that the motor, which relies solely on permanent magnets, unquestionably operates autonomously and generates electrical power.

It took Johnson, who holds academic credentials in chemistry and physics, nearly six years of legal challenges to finally secure his patent. This process included demonstrations of working prototypes to patent examiners during the appeal proceedings. Ultimately, there was no doubt that it is possible to construct a motor powered by permanent magnets [1], [3].

Fig. 1: Front cover of the magazine featuring a detailed rendering of Johnson's magnet motor [3].

II. Again a motor that does not work in theory, only in practice

Fig. 2 presents an image from Johnson's US patent, illustrating the arrangement of magnets (bar-shaped in the stator and banana-shaped in the rotor). As the rotor magnets pass over the stator magnets, they experience alternating repulsive and attractive forces, which generate pulsations.

In the sequence, a few selected excerpts from the patent text are emphasized :

"In the rotary embodiment of the permanent magnet motor of the invention the stator magnets are arranged in a circle, and the armature magnets rotate about the stator magnets..." ([2], column 3/lines 62-65).

"Three armature magnets are mounted on the armature portion … The magnets are staggered with respect to each other in a circumferential direction wherein the magnets are not disposed as 120° circumferential relationships to each other. Rather, a slight angular staggering of the armature magnets is desirable to "smooth out" the magnetic forces ..." ([2], col. 7/lines 36-45).

"If the distance between the armature magnets and the stator magnets is reduced, the forces imposed upon the armature magnets by the stator magnets are increased, and the resultant force vector tending to displace the armature magnets in their path of movement increases.

However, the decreasing of the spacing between the armature and stator magnets creates a "pulsation" in the movement of the armature magnets, which is objectionable, but can be, to some extent, minimized by using a plurality of armature magnets.

The increasing of the distance between the armature and stator magnets reduces the pulsation tendency of the armature

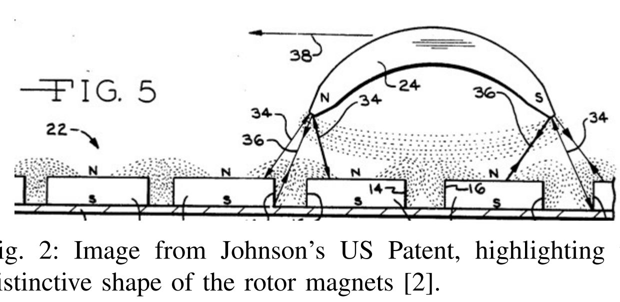

Fig. 2: Image from Johnson's US Patent, highlighting the distinctive shape of the rotor magnets [2].

magnets, but also reduces the magnitude of the magnetic forces imposed upon the armature magnets.

Thus, the most effective spacing between the armature and stator magnets is that spacing which produces the maximum force vector in the direction of armature magnet movement, with a minimum creation of objectionable pulsation" ([2], col. 7/line 65 - col. 8/line 16).

It is worth noting that the author in [3], who witnessed the motor in action during the interview demonstration and conducted the experiments himself, explicitly states that *"there is a noticeable pulsing action in the simple prototype units that may be undesirable in a practical motor. The movement can be smoothed, the inventor believes, by simply using two or more staggered armature magnets as shown in another drawing"* ([3], pag. 117).

III. The secret life of objectionable pulsations

In [4-III], i.e. specifically in *Part III - Pathway for energy transfer*, a method for analyzing autonomous magnet motors is proposed.

Based on the vibrational model presented in [4-III], the *angular staggering of armature magnets in a circumferential direction*, as described in Johnson's patent, forms the basis of a helical arrangement, intended to induce resonances in spacetime. Furthermore, the *pulsations in the movement of the armature magnets*, earlier considered *objectionable*, are, according to [4-III], actually the necessary angular vibrations that facilitate the transfer of energy to the rotating shaft, and should not be seen as undesirable.

An intricate superposition of magnetic field components is present in the structure shown in Fig. 2. However, in [4-III], a first-order approximation is provided for analysis, which, with simple adjustments, can be naturally applied to the current situation.

According to [4-III], the combination of helical staggering of the rotor magnets and mechanical vibrations caused by angular motion evokes a self-rotating magnetic field in the air-gap environment between the rotor en stator. So, a B-field fundamental component should be present in the situation of Fig. 2, being described by Eqs. (III-8) and (III-9)[1] as

$$\vec{B}_{\text{ext}} = (B_S + B'_S \cos(\eta\phi)) \left[\cos\phi\, \vec{a}_x + \sin\phi\, \vec{a}_y\right],$$

which represent the magnetic flux density interacting with the rotor magnets. This circularly polarized plane wave has a constant carrier magnitude, B_S, modulated by radial flux oscillations $B'_S \cos(\eta\phi)$, where η pulsations are synchronized with the rotation angle ϕ. These flux pulsations arise from the mechanical vibrations induced by the interaction forces between the rotor and stator magnets.

The recognition of the plane wave in Fig. 2 is sufficient to further track the outcomes discussed in [4-III]. Moreover, when examining the subsequent developments, it becomes evident that only the modulation term $B'_S \cos(\eta\phi)$ participates in the energy transfer. This is because the derivatives in the extended Lorentz force formula (Eqs. (III-7), (III-12), and (III-13)) effectively eliminate the constant carrier component B_S.

[1]References to the equations in [4-III] are given in the form Eq. (III-xx).

The resulting asymmetric radial force on the rotor, shown in Fig. III-2, induces proportional angular vibrations (as described in Eqs. (III-24) and (III-37), and illustrated in Fig. III-5). The impact of these asymmetric vibrations is depicted in Fig. III-4, where, according to Eq. (III-26), the rate-of-change of the work done by the rotational force on the angular vibrations is quantified.

Summarizing, the energy transfer to the rotor shaft can be understood as a consequence of applying the extended magnetic force formula, where the energy source rests on the intrinsic elementary magnetic spins that generate the permanent magnet fields. These magnetic spins, in turn, are sustained by quantum vacuum fluctuations.

The key to this "rectification" process lies in the cross-coupling between small angular mechanical vibrations and radial forces, which leads to asymmetric transfer of energy, as illustrated in Fig. III-4.

IV. Conclusion

The development of Johnson's magnet motor was abandoned sometime after 1980. Despite successful open demonstrations, it failed to store up sustained interest from academic institutions, which did not pursue further research. Additionally, perhaps the inventor's focus on eliminating mechanical vibrations in the structure may have diverted attention away from investigating the mechanisms for energy transfer.

The ideas presented in these discussion notes aim to explore alternative paths for the future development of autonomous prime movers - magnetic-wind mills - such as Howard Johnson's motor.

Acknowledgements

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References

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