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DESIGN OF A SPECIAL MOTOR WITH PERMANENT MAGNETS

PROJEKTOWANIE SPECJALNEGO SILNIKA Z MAGNESAMI TRWAŁYMI

Abstract: Described in the paper is a novel design of the permanent magnet motor for easy low power applications. Neither in-detail arrangement nor functioning of the magnetic motor are described herein for the device will be subject to patenting process. Currently, known are different technical solutions for electric motors that use magnetic and electromagnetic fields. The magnetic motor works only on the basis of repulsion of permanent magnets. The basis of the technical solution dwells is use of auxiliary magnets. Auxiliary magnets axially move the main drive magnets so that the rotor can be continuously rotated in defined direction.

Streszczenie: W artykule opisano nowy projekt silnika z magnesami trwałymi małej mocy. Obecnie znane są różne rozwiązania techniczne silników elektrycznych, które wykorzystują pola magnetyczne i elektromagnetyczne. Silnik magnetyczny działa na podstawie odpychania magnesów trwałych. Podstawą rozwiązania technicznego jest stosowanie magnesów pomocniczych. Magnesy pomocnicze przemieszczają osiowo główne magnesy napędu tak, że wirnik może być w sposób ciągły obracany w określonym kierunku.

Keywords: *magnetic motor, permanent magnet, design*
Słowa kluczowe: *silnik magnetyczny, magnes trwały, projektowanie*

1. Introduction

So far, many have tried building a free energy-producing magnetic motor. But we learned that energy is not free, perpetual motion machines do not exist, and all the energy is taken from somewhere and put elsewhere. Free energy from permanent magnets respects the same rule. Currently, known are different technical solutions for electric motors that use magnetic and electromagnetic fields. The magnetic motor works only on the basis of repulsion of permanent magnets. Originally, already in 1905, designed Nikola Tesla have been several permanent magnet motors-generators, i.e. magnet motors where the power comes from the permanent magnets, not an external supply of electricity. Most people think that the magnetic motor will never become a reality. But many ideas that have previously been regarded as unrealistic are commonly used today. Presently, development of technology has such a rapid pace, that what today cannot be made, in the future will become a possibility, and will commonly used.

Nowadays, scientists say the universe is 60% "Radiant/Dark" energy, which we cannot use at today's level of knowledge. "Engineers of Hitachi Magnetics Corp. of California have stated that a motor-generator run solely by magnets is feasible and logical but the politics of the matter make it impossible for them to pursue developing a magnet motor or any device that would compete with the energy cartels." [1]

On the internet, there is a lot of various videos and constructions and there are many books on the today controversial theme – the magnet motor. But vast majority of the magnetic motors work "only on the internet".

2. Constructions of magnetic motors

In the world today there are also many technical solutions of the magnetic motor that uses only permanent magnets and repulsive and attractive forces between magnets. Many patents and applications for industrial designs are filed. I will mention only a several of the best known of published solutions.

Probably the best known is the Perendev Motor. About this motor its inventor says it works by using the power of permanent magnets (neodymium magnets) to propel itself. The 3D model of Perendev motor is presented in Figure 1.

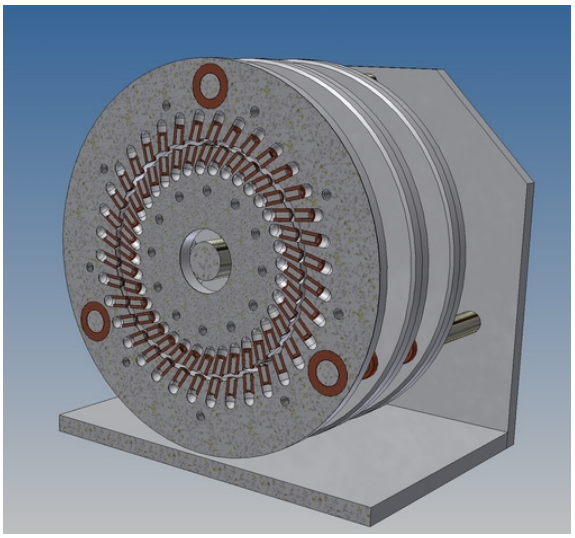

Fig. 1. The 3-D model of Perendev motor with PM [2]

Although construction of Perendev motor is relatively simple but no one has failed to make such a replica of the motor that could be rotate without interruption. The replica always rotates only for a while, and then additional external force must be added to maintain rotation.
American-Greek inventor Achilles Ligeras claims to have built a working prototype of Magnetic Engine (ALME) driven solely by magnets, with no other input (Fig. 2).

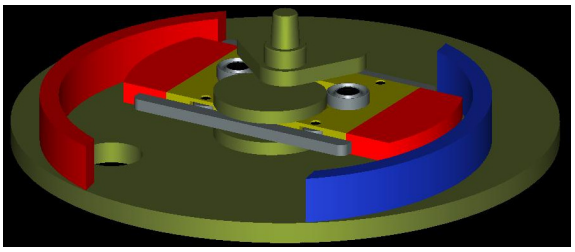

Fig. 2. The prototype of Magnetic Engine (ALME) [3]

Achilles claims that his first working prototype achieved rotation speed of approximately 1500 rpm for fifteen minutes, and was running continuously at a slower speed for about 48 hours. At the end of that run, the motor box housing was hot to the touch, though not too hot to be touched. The heat was most likely a function of friction from various rollers and bearings. He applied a bike generator to generate a few watts of electricity. A second, more professionally machined prototype was completed but, unfortunately, did not work.
Figure 3 presents the model of Bowman motor with permanent magnets.

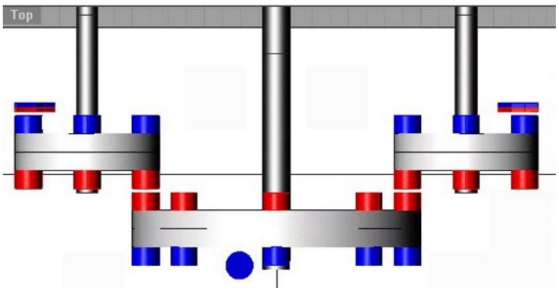

Fig. 3. Bowman permanent magnets motor [4]

The motor consists of three parallel shafts geared together so that the centre one turned in opposite direction to the two outside shafts. At the ends of the shafts attached were three discs (on the centre shaft one large disc and on the end of the outside shafts two small ones). The discs contained small AlNiCo magnets, eight of them spaced around the large disc, and four around each of the small discs (equally spaced). The motor rotated at a speed of almost half revolution per second of the side shafts.
Douglas A. Mann built a replica of the motor, which has been running for about three months before it stopped. Many enthusiasts wanted to build this motor, but so far neither of them did work reliably. [5]
Describing all the constructions of magnetic motors would be very lengthy, and hence above mentioned are only the best known ones.

3. Technical solution of magnetic motor

The disadvantage of all existing technical solutions of the magnetic motor is its relatively complicated construction, mechanical losses and often also high price. The above mentioned disadvantages are considerably eliminated by the self-magnetic energy source (SAMZEN) – a magnetic motor of new construction.
Figure 4 illustrates the schematic developed cut of electromagnetic circuit magnetic motor across mean diameter of permanent magnets.
The basis of the technical solution of the magnetic motor is that the motor is made of three main parts (Fig. 4 – 1, 2 and 3) that are stored one above the other. Each base part of the magnetic motor consists of two stators and two rotors. The rotors and stators are disc-shaped. All rotors are connected to a single shaft. Present on every rotor are three main magnets and one flip magnet having the form of a circular ring with a precisely defined but varying thickness.

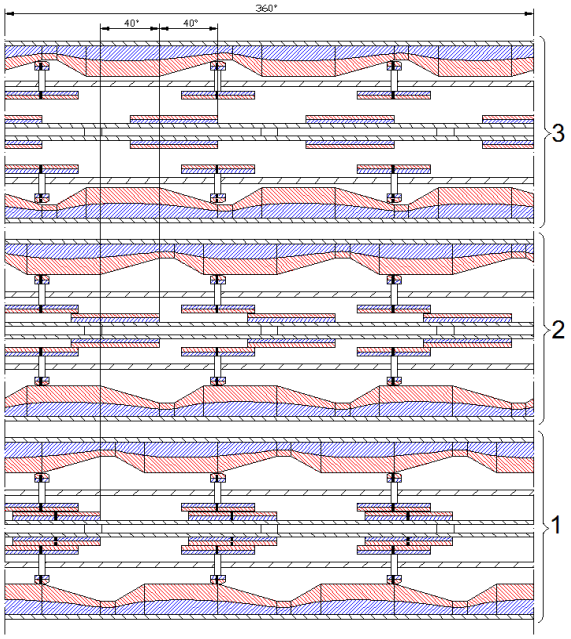

Fig. 4. Schematic developed cut of the electromagnetic circuit magnetic motor

The rotor main magnets have a sector of a circle with angle of 60° and width of 25 mm. The stator main magnets have a sector of a circle with angle of 50° and width of 20 mm. The rotors are in the individual parts of the motor (1 to 3) shifted relative to each other by 40° (Fig. 4). Very important are the remanence (Br) and the shape of the flip magnet. Flip magnet with an auxiliary spring continuously sets the distance between main stator and rotor magnets in individual parts of the motor. Without this, the motor operation is not possible.

4. Construction of magnetic motor

This chapter describes a new construction of the permanent magnet motor. The overall construction of the designed magnetic motor is shown in figure 5. It contains three parts, one above the other, but the magnets on rotors of different parts are shifted relative to each other by 40°. As a result, different is the distance between main stator and rotor magnets in individual parts of the motor.
To eliminate mechanical losses the motor shaft is mounted in magnetic bearings. On the bottom end of the shaft there is a magnet that acts against the gravity force of the rotor. This magnet also serves as a flywheel.
The detailed construction of flip mechanism is shown in figure 6.

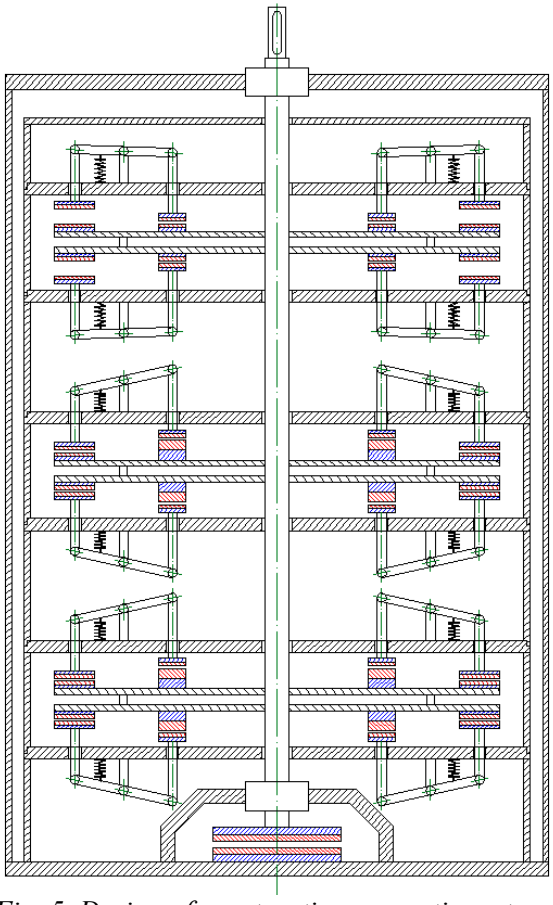

Fig. 5. Design of construction magnetic motor

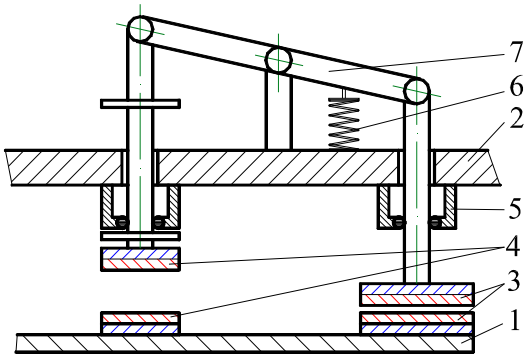

Fig. 6. Construction of flip mechanism

Description of flip mechanism at Figure 6: 1 – the rotor disk, 2 – the stator disk, 3 – main magnets, 4 – flip magnets, 5 – rod guiding, 6 – compression spring, 7 – connecting rod.

Flip mechanism continuously sets the distance between the main stator and rotor magnets in individual parts of the magnetic motor. Figure 7 and figure 8 illustrate distribution of the forces in flip mechanism.

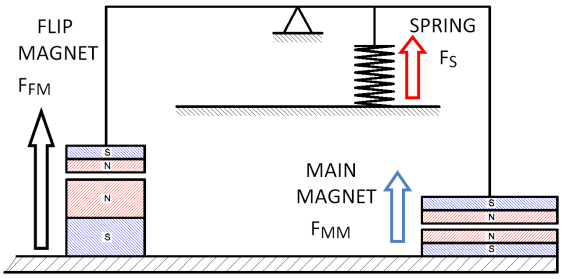

Fig. 7. Schematically illustrated forces - main magnets in minimal distance

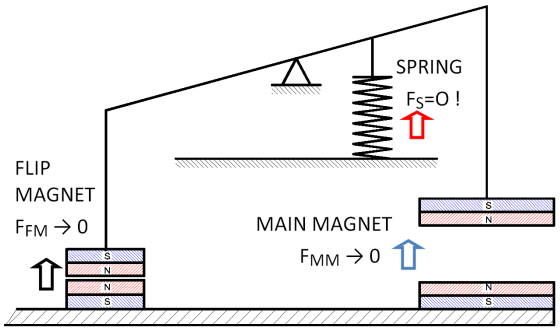

Fig. 8. Schematically illustrated forces - main magnets in maximal distance

The equation of forces in flip mechanism can be hence expressed as:

$$F_{MM}+F_S<F_{FM} \quad (1)$$

where: F_{MM} is force of main magnets, F_S is force of the spring, and F_{FM} is force of flip magnets.

At a minimum distance of main magnets repulsive force of flip magnets acts against repulsive force of main magnets and against the force of the spring. Repulsive force of magnets, depending on their distance, decreases quadratically. The course of the spring force depending on the compression is linear (Fig. 9).

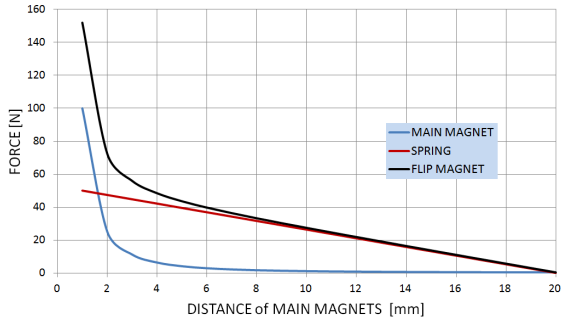

Fig. 9. Calculated waveforms of forces

Validity of equation (1) is achieved by variable thickness and variable remanence of flip magnet. As it is demonstrated in Figure 9, e.g. at a distance of the main magnets of 10 mm, the flip magnet overcomes only the force of spring. At a maximum distance of the main magnets (20 mm) the repulsive force is minimal, force of spring is zero and repulsive force of flip magnet can be minimal (Figures 8 and 9). The force of spring can be adjusted by distance of the spring from the rotation axis of the connecting rod.

This is the first construction design of fully magnetic motor. The design will be verified by simulation.

5. Conclusion

The present paper presents initial results of the construction design of magnetic motor with permanent magnets. Neither in-detail arrangement nor functioning of the magnetic motor are described herein for the device will be subject to patenting process.

One more brief consideration on the future of permanent magnet motors.

What does the future holds for permanent magnets motors? The evidence suggests that their use will continue to grow as they are used in new applications. New innovations are in the area of high energy permanent magnets (PM). One of these innovations is nanocomposite permanent magnets. These magnets are “artificially" constructed magnetic structures (referred to as metamaterials) that produce strong permanent magnets by fabricating nanostructured hard/soft phase composite materials. Currently, they are being used in biomedicine, magnetic storage media, magnetic particle separation, sensors, catalysts and pigments. In the future, the world may see nanocomposite magnetic materials finding use in upcoming generations of PM electric motors [6].

6. Acknowledgment

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