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Experiment for the proof of Newton's Third Law Violation in Unipolar Motor

Abstract

The author proposes to perform an experiment proving that in unipolar motor the Newton's third law is being violated.

There exist several explanations of the cause for violation of Newton's third law in the process of unipolar motor's work. They were obtained by different methods: [1] using the theory of relativity and in [2] on the basis of the law of conservation of momentum. However, until now the debates continue about whether Newton's third law is really violated at unipolar motor's work. Proponents of the "non-violation" claim that the resting contacts experience the reaction force. To refute this assertion one should have to link the contact with a rotating disk-magnet. But if the contacts are linked with the disk, unipolar motor does not run. Note that this is also why the movement of conductive magnet, through which the current flows perpendicular to the magnetic lines of force, is not possible - and such devices are considered quite often. Magnet with current cannot move itself - it reminds also of the fact that the charge cannot repulse itself. Thus, it is necessary that in the unipolar motor the magnet should rotate around the radius in which the current flows, and it can be proved experimentally. By default it is assumed that the radius must be stationary in the system, relative to which the magnet rotates.

Let us abandon this assumption and consider the following scheme – see Fig. 1, where

1. Magnet disk
2. Contact
3. Axis
4-8. Cogwheels
9а, 9в. Guide for cogwheels 5 and 6
10. Holder of contact 2
11. Holder and axis for cogwheels 5 and 6
12. Holder and axis for cogwheels 7
13. Thrust bearing
14. Foundation of construction

15. Current source attached to cogwheel 4 and connected electrically with the axis 3 and the contact 2

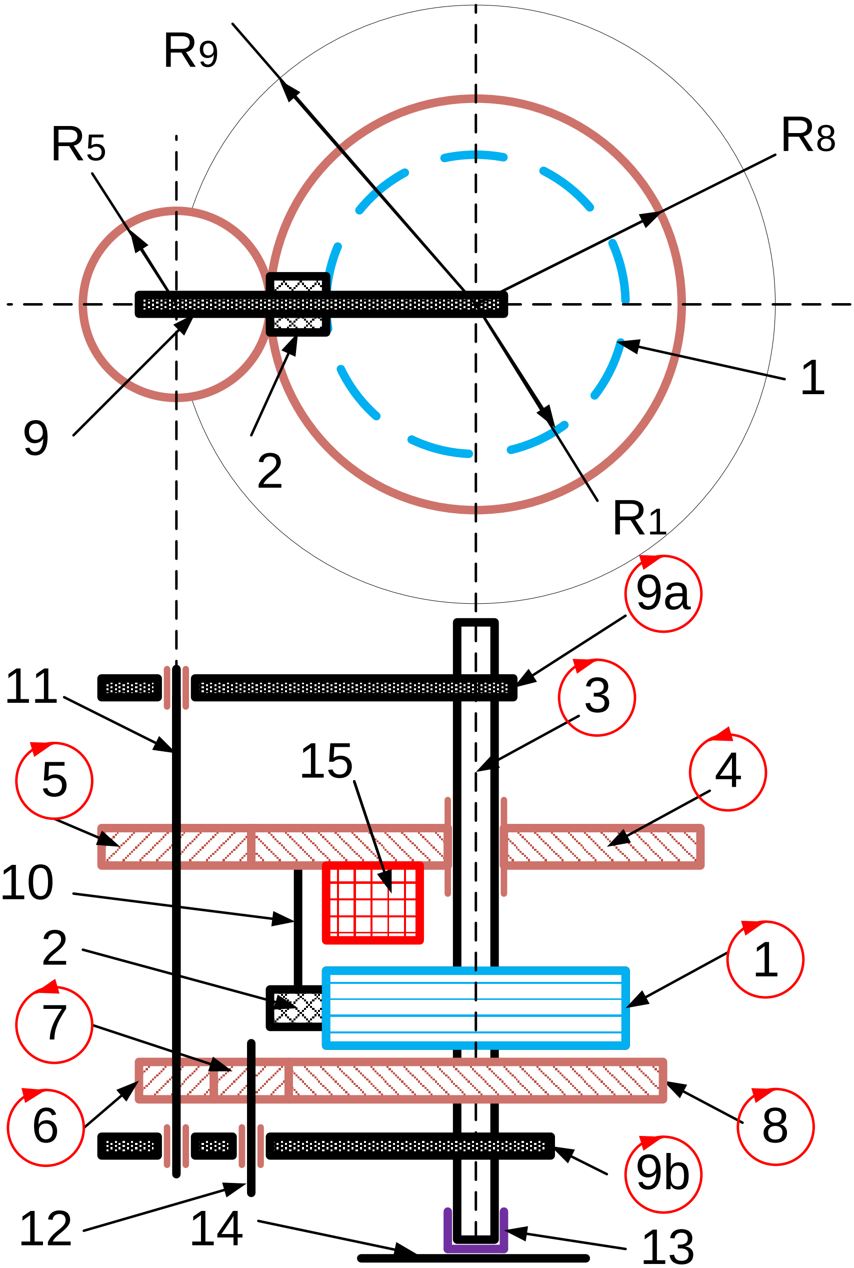

Fig. 1.

Let us denote radii of parts by symbols R, and speed of rotation of parts by symbols ω with index numbers of corresponding parts. In device the contact 2 is fixed to the cogwheel 4 by the aid of holder 10. Consequently, <u>the current conductive radius</u> between the axle 3 and contact 2 and the rotational speed of the radius are as follows:

$$\omega_t = \omega_4 . \tag{1}$$

The cogwheel 4 rotates freely around the axis 3, and the disk 1 and the guide 9 are rigidly attached to the axle 3, i.e.

$$\omega_9 = \omega_1 . \tag{2}$$

The cogwheel 8 is also rigidly attached to axle 3, i.e.

$$\omega_8 = \omega_1 . \tag{3}$$

Cogwheel 6 and rigidly connected with it cogwheel 5 unwinds through two cogwheels 7 and 8. Therefore the rotational speed of cogwheel 5 is proportional to the rotational speed of cogwheel 8, i.e.

$$\omega_5 = m \cdot \omega_1 . \tag{4}$$

where

$$m = R_8 / R_6 . \tag{5}$$

In addition, in the planetary mechanism of the device between rotating speeds and radii in this device there exists a relation of the form

$$\omega_9 R_9 - \omega_5 R_5 = \omega_4 R_4 . \tag{6}$$

Substituting (1-5) in (6), we get

$$\omega_1 R_9 - m\omega_1 R_5 = \omega_t R_4 \tag{7}$$

or

$$R_9 = R_4 + R_5 . \tag{8}$$

From (7, 8) we get:

$$\omega_t = \omega_1 \left(\frac{R_5 (1 - m)}{R_4} + 1 \right). \tag{9}$$

Let us choose the radii to satisfy the equality

$$\omega_t = 0 . \tag{10}$$

For example, equation (10) holds for $R_5 = R_4$ and $m = 2$ or $R_8 = 2R_6$. Then **<u>current conductive radius will stay stationary</u> <u>relative to the axis 3.</u>**

All torques in such a device are internal. Its rotation is contrary to Newton's third law by definition. Therefore, the result of the proposed experiment (positive or negative) would have to stop the aforementioned dispute.

Литература

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