Inertial propeller
(Theory)

The offered material is continuation of clause of the author: “ The Third law of Newton is not carried out for a unbalanced body with rotary fluctuation “ // - “Гравитон” # 12, 2005, p. 9.

The principle of operation of the device “Inertial propeller” can be explained using the scheme without a gyroscope (see Fig 1).

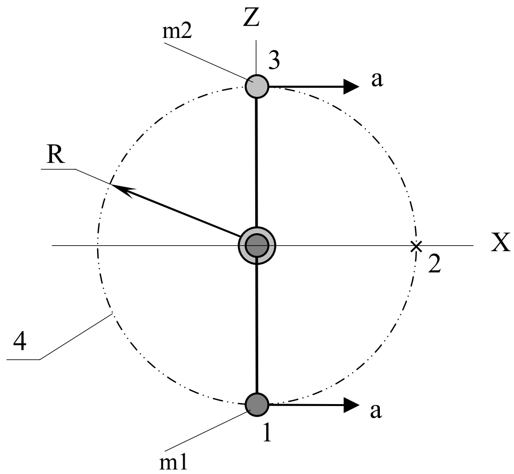

Fig 1

Along the ring 4 with radius R, masses m1 and m2 can oppositely-symmetrically move using the power drive. In order to simplify the numerical evaluations, we set m1 = m2, while the sum of masses m1 + m2 = m, where m is the mass of ring 4 along with the drive. The sequence of movement is as follows. Masses m1 and m2 speed up continuously with the tangential acceleration *a* within the sectors 1-2 and 3 - 2 respectively. Masses m1 and m2 slow down continuously with the tangential acceleration -*a* within the sectors 2-3 and 2-1 respectively to a full stop at points 3 and 1. Then, the acceleration/deceleration process is repeated in the opposite direction. The point 2 is the acceleration reversal one. In order that the acceleration/deceleration process started and was over at points 1 and 3, the braking moment M_T should be taken to be equal to the acceleration moment: $M_T = M_a$. For definiteness sake, let the braking torque M_T be the frictional moment.

So, under the action of the acceleration moment M_a , the acceleration of masses m1 and m2 begins at initial points 1 and 3 respectively and ends at point 2 where the rotary drive is turned off ($M_a = 0$). At that instant, the pulse P of mass m is equal to zero: P = 0, and each of masses m1 and m2 takes on the tangential pulse $P_m \neq 0$.

Further, let us assume first that the braking moment is absent within the sectors 2-3 and 2-1($M_T = 0$).

The subsequent movement of masses m1 and m2 occurs mechanically. At that, under the action of the centripetal force and in conformity with the law of action and reaction, the turning of pulse vectors P_m will occur opposite to the X axis direction (without change in their values). At the same time, the vector of pulse P will increase along the X axis direction. When masses m1 and m2 move to the points 3 and 1, these pulses will become numerically equal and opposite in direction ($2P_m = P$). In this case, the system common centre of gravity will remain motionless.

Let us repeat the interaction process beginning from the point 2 with turned-on braking moment, $M_T \neq 0$ (at the same time, $M_a = 0$). For definiteness sake, the braking moment M_T is the moment of dry friction numerically equal to

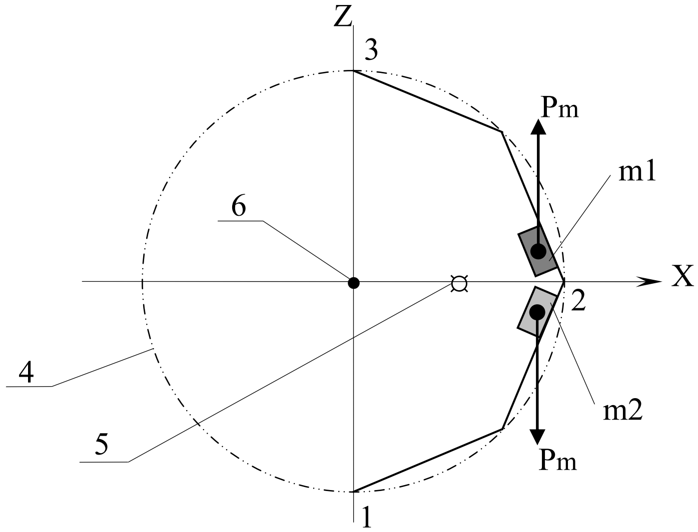

Fig 2

the accelerating moment: $M_T = M_a$.

So, prior to beginning of slowing down of masses m1 and m2, each of them has taken on the tangential pulse equal to P_m. In this case, the pulse P of the rest of mass m of the system is equal to zero: $P = 0$ as mass m was motionless at this instant. The subsequent movement of masses m1 and m2 occurs mechanically

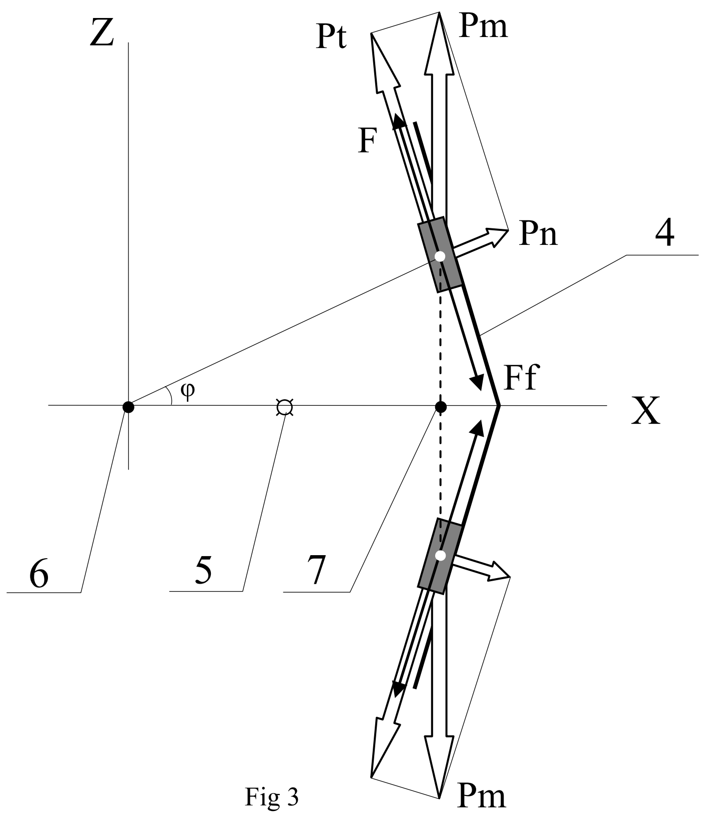

Fig 3

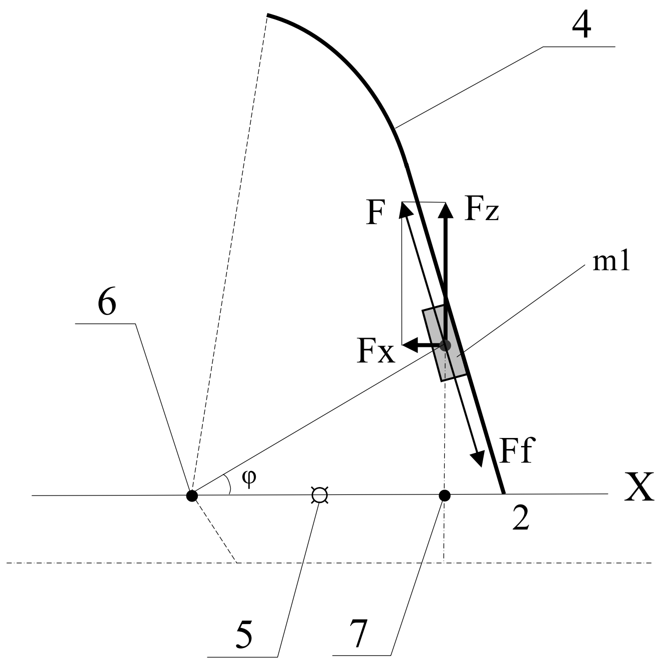

Fig 4

but their motion is hindered by the friction force Ff on the mass *m* side which generates the frictional moment M_T (it is the braking moment). For the greater obviousness sake, we represent a part of the ring 4 in the form of inclined planes as shown in Fig.2 and enlarged in Fig 3. Hereinafter: 6 - center of gravity for mass m, 7 - center of gravity for sum (m1 + m2), 5 - common center of gravity for the whole system. The vector of pulse P_m can be resolved into two components: parallel to the plane - P_t and perpendicular to the plane - P_n. In the course of sliding of masses m1 and m2 over the planes 4 against the friction forces Ff, the work is done, therefore, the magnitude of pulse P_t will decrease. However, as it is well known, the change in the magnitude of pulse is the force F $= \partial(P_t)/\partial t$ where $\partial(P_t)/\partial t$ is the derivative of pulse P_t with respect to time t. The force F is numerically equal to the friction force: F = Ff and is in opposition to the latter. The force F is force with which the masses (m1 + m2) act on mass m. By its nature, it is inertial force. Let us resolve the force F for each mass m1 and m2 into two components: F_x and F_z. The forces F_z are mutually balanced while the forces F_x are not balanced. Masses m1 and m2 together with the ring 4 form the common mechanical system, therefore, the forces F_x are applied to the common center of gravity 5 of the system. Hence it follows that the center of gravity 5 of the whole system is shifted in the direction of action of forces F_x. The described interaction is similar to that of two bodies in case of the oblique inelastic impact with each other when, initially, one of bodies was motionless (m) while the other (m1 + m2) has moved (i.e., had a pulse). After collision, these bodies stick together and continue the motion as a single whole. Fig 5 and Fig 6 present the illustrative example of interaction of two plasticine balls 8 imitating the direct impact as a result of which the common center of gravity 5 is shifted. Position 9 in Fig 6 shows the location of the common center of gravity 5 of the

system prior to interaction.
The unit “Inertial Propeller” (Pub. No. US 2005/0169756 A1) differs from one described in the text in that one of masses, for example, m2, is replaced by a gyroscope. In the unit “Inertial Propeller” (see Pub. No. US 2005/0169756 A1, Fig.3), the points *a*, *b* and *c* correspond to points 1, 2 and 3 of the current description. The mass of imbalance 7 corresponds to mass m1. The starting moment $M_п$ corresponds to the accelerating moment M_a while the counter moment ($-M_п$) corresponds to the braking moment $M_т$ in the current description. At the point *b* of the unit “Inertial Propeller”, there is a reversal of the rotary moment of imbalance 7: the accelerating moment $M_п$ is turned off and the braking moment ($-M_п$) is turned on. It is evident that the braking moment $(-M_п) \equiv M_т$ can be of any nature: it can be moment of dry friction as shown above or electrodynamic moment originating as a result of the electric motor operation, for example, in the mode of current generation.

It should be noted once more (see Pub. No. US 2005/0169756 A1, Fig 3) that, under the action of the drive moment $M_п$, the acceleration of imbalance 7 occurs within the sector *a* - *b*. At point *b*, the moment $M_п$ is turned off (i.e. $M_п = 0$). The position of imbalance 7 at point *b* corresponds to the initial position of plasticine balls 8 in Fig. 5 of the current description. At that, imbalance 7 takes on the tangential pulse $P_m = m1 \cdot \mathbf{a} \cdot t = m1\sqrt{2\varphi R\mathbf{a}}$, where m1 is the mass of imbalance 7, **a** is tangential acceleration of imbalance, t is a duration of turning from point *a* to point *b* and φ is angle to the X axis, R is the radius of rotation. The pulse P of the rest of mass (m) of the unit at this instant was equal to zero as the mass m at that moment is motionless (position 6 in Fig 5 hereof). At that, the numerical value of tangential pulse of imbalance 7 at point *b* is $P_m = m1\sqrt{\pi R\mathbf{a}}$. The subsequent motion of imbalance 7 in the sector *b* - *c* occurs mechanically but, at that, the centripetal force on the mass m side and braking moment ($-M_п$) on the side of the electric motor of rotation drive are applied to it. As a result of turning of the vector P_m according to the law of action and reaction, its projection onto X axis increases:

$$P_x = P_m \cdot \sin\varphi = m1\sqrt{\pi R\mathbf{a}} \cdot \sin\varphi,$$

and, at the same time, the pulse P of the rest of mass (m) in the opposite direction increases which is equal to:

$$P = m1\sqrt{2\varphi R\mathbf{a}} \cdot \sin\varphi.$$

In this case, the centers of gravities 6 and 7 draw together while the common center of gravity 5 remains motionless (see Fig 5 hereof). Within the range of angles of $\pi/2 > \varphi > 0$, $P_x > P$, i.e.:

$$\Delta P = P_x - P = m1\sqrt{\pi R\mathbf{a}} \cdot \sin\varphi - m1\sqrt{2\varphi Ra} \cdot \sin\varphi \neq 0.$$

Because, at that, the value of the pulse P_m decreases simultaneously under the action of the braking moment ($-M_п$) then, along the X axis, the component of force F appears, $F_x = \partial(P_x)/\partial t$ (where P_x is the projection of vector Pt onto the X axis, see Fig 3 hereof), which is applied to the common center of gravity 5 of the whole mechanical system.

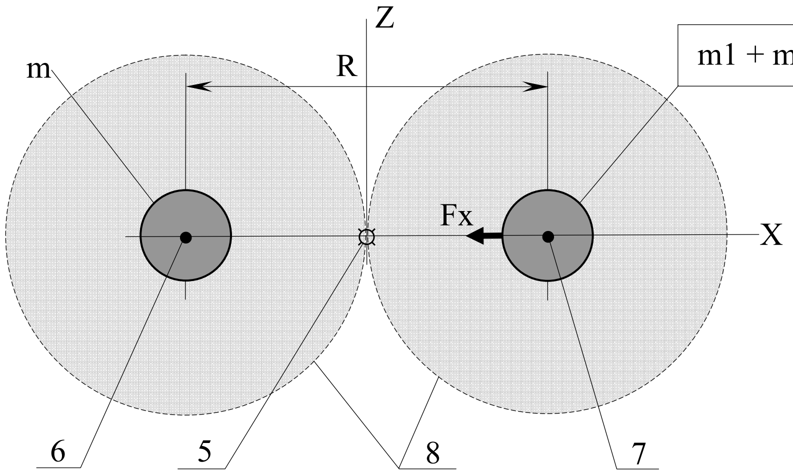

Fig 5

The force Fx shifts the common center of gravity 5 of the system in the same manner as shown in Fig 5 - Fig 6 hereof and well known from experiments of inelastic collision of, for example, plasticine balls 8.

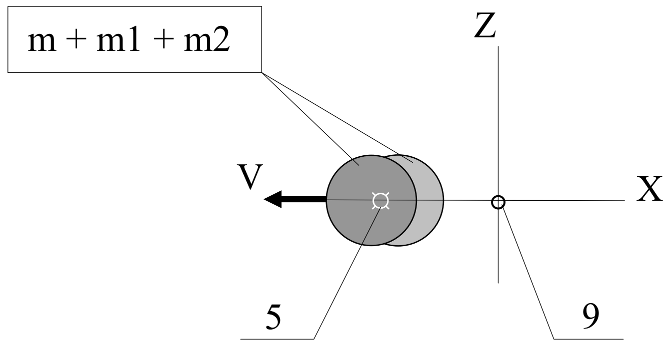

Fig 6

THE LITERATURE

1. Линевич Э. И. «Геометрическое обоснование эксперимента Хаясака-Такеучи с вращающимися роторами». Доклад на 2-ой СНГ Межнаучной конференции «Единая теория мира и её практическое применение». 20-21 сентября 1993 г. Петрозаводск, Россия.
2. Hayasaka H., Takeuchi S. Phys. Rev. Lett.– V.63. P.2701-2704.
3. Линевич Э. И. Явление антигравитации физических тел (ЯАФТ).– Хабаровск: ПКП «Март», 1991.
4. Линевич Э. И. Динамическая симметрия вселенной.– «Природа и аномальные явления» № 1-2, 1995, с. 6, г. Владивосток.
5. Линевич Э. И. О технической возможности управления темпом времени.– «Гравитон» №8, 2002, с. 10-11.
6. Kishkintsev V. A. Galilean Electrodynamics, 1993. V.4, №3, P.47-50.
7. Forward R. L. Journal of Propulsion and Power. 1989 №1, p.28-37.
8. Линевич Э. И. Аналитический вывод физических констант на основе классических представлений.– Ноябрь 1999 (в переписке с ред. «Гравитон» и с bradleu@usra.edu), или http://www.dlinevitch.narod.ru/analitika.htm

9. Линевич Э. И., Ежов А. Ф. Инерционный движитель.– «Новая энергетика» №3, 2004, с. 12-15.
10. Линевич Э. И. Гравиинерционный двигатель. Патент RU2080483. 4.05.1994
11. Астахов А. В., Широков Ю. М. Курс физики т.3. Квантовая физика/ Под ред. Ю. М. Широкова.– М.: Наука, 1983.
12. Шипов Г. И. Теория физического вакуума: Теория, эксперименты и технологии. 2-е изд., испр. и доп.– М.: Наука, 1996.
13. Абрамов И. М., Брехман И. И., Лавров Б. П., Плисс Д. А. «Явление синхронизации вращающихся тел (роторов)». Диплом №333. Журнал «Открытия изобретения» №1, 1988.
14. Калашников С. Г. Электричество.– М., 1977, с. 155.
15. www.dlinevitch.narod.ru
16. http://www.ntpo.com/physics/studies/28.shtml
17. http://www.sciteclibrary.ru/rus/catalog/pages/3964.html
18. Яблонский А. А. Курс теоретической механики. Ч.2. Динамика.– М., «Высшая школа», 1971.
19. http://www.tts.lt/~nara/amper/neutron.html
20. Толчин В. Н. Инерцоид.– Пермь: Пермское книжное издательство. 1977.
21. Pound R. V., Rebka G. A., Phys. Rev. Let., 1960, V.4, P.337.
22. Линевич Э. И. «Третий закон Ньютона не выполняется для неуравновешенного тела с вращательным колебанием»// - «Гравитон» №12, 2005, с. 9.
23. Linevich E. I. On basics of potential dynamics.- «New Energy Technologies» #2, 2005, p.44 – 48.
24. http://vuz.exponenta.ru/PDF/book/t400.pdf

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