Perpetual motion machine of the second kind.
(Gas-thermal-motion engine 2).

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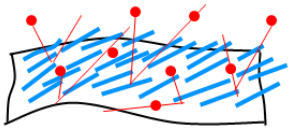
Main page

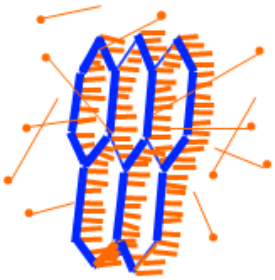
Substance of the previous proposal.

In 2005 the author of this article published a proposal of an option of a perpetual motion machine of the 2nd kind at a nanolevel. See Perpetual motion machine of second kind. Gas-thermal-motion engine. The article was published in a scientific magazine of the Russian Academy of Sciences "Nano- and microsystem equipment" No4, 2005.

The idea consisted in the following:

It was suggested that the surface should be covered with some "villi" with a decided slant towards one side. The length of the "villi" was suggested as about a nanometer, i.e. about 10 atomic diameters. It was also proposed that the surface was located in an artificial atmosphere of artificial "particles" that played the role of a gas medium. The mass of such a "particle" was supposed as about that of the "villus", so that during the lateral impacts on the "villi" the latter would elastically bend. The particles' sizes should be sufficient (about 2 atomic diameters) to collide with the "villi" as frequent as possible.





Perpetual motion machine of the 2nd kind. Asymmetry of a membrane pattern.

Another "villi" option is possible. To put it simply, it is a membrane with holes. On one side of the membrane, the contour of each hole is surrounded with villi. It forms something like a set of basketball baskets arranged together in such a manner that the nets of these "baskets" are located on one side. Apparently, the throughput capacity for each "particle" is different on different sides of the membrane. The efficiency is high. But a pure "gas medium" without debris is needed, and a very high pressure on the membrane.

Let us briefly remember the very essence of the phenomenon of pressure on a surface of a so-called "ideal gas". The influence of one molecule (of a gas particle) on the surface during the impact with reflection is determined by the momentum that the particle imparts to the surface. The total influence of all particles on a unit of area in a unit of time is the pressure force. Eventually, the force of molecules' pressure on the surface is expressed through the density of gas particles and their mean kinetic energy, i.e. through the gas temperature.

The molecules of gas hit the surface at different angles, reflecting from the surface. The motion of the gas molecules (and the influence) may formally be resolved into 2: "normal" (perpendicular) to the surface and "tangential", i.e. parallel to the surface. The theory suggests that on average (statistically) the picture of the angles of incidence and reflection is symmetrical with respect to all directions on the surface. This is why the force of the particles' influence on the surface is suggested to be strictly normal with respect to the surface. I.e., it is suggested that the force of pressure cannot have tangential

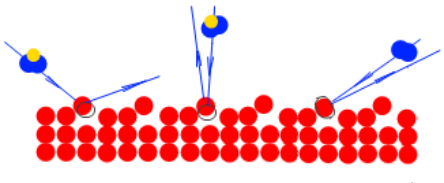
component.

In case there are "villi" with a slant to one side, it was suggested that the statistical symmetry of all directions on the surface is disturbed. It was supposed that the particles falling on the surface against the "villi" encounter greater resistance than the particles falling in direction of the slant of the "villi" and bending the "villi". I.e. we should expect the appearance of tangential component of the particles influence on the surface, which should be oriented against the slant of the "villi".

What negative aspects were seen in this proposal? Under the "normal atmospheric conditions" the average distance between the molecules of gas (air) is approximately 10 times greater than the size of the molecules themselves. I.e. filling of the empty space is substantial. The increase of the particles' mass and sizes is necessarily associated with the necessity to decrease their density so that the particles stay free in motion. And this is associated with the decrease of the effect itself. Moreover, the creation of the special "media" of artificial particles is also not quite desirable line of development of the idea. Also, the creation of the "unidirectional villi" is also rather a difficult task.

The new option suggests descending from the nanolevel to the atomic level, decreasing the "villi's" size down to the atom level and using the real air medium as the "medium"

Various options of creating the required asymmetry on the surface are possible. As an example, let us consider the following option.



Perpetual motion machine of the 2nd kind. Reflections on the surface with asymmetry.

In this option, the role of "villi" play the atoms of the regular crystal lattice that lost a part of their bonds with the lattice, which resulted in that their axis of symmetry is positioned aslant to the crystal surface. It is necessary that all these atoms have their axes looking in the same direction.

Let us consider the options of collisions.

The figure shows that: 1) the particles that hit the "slanted atom" on the "back" side (in the left in the figure) tilt it, and this is why encounter lesser tangential resistance; 2) the particles that hit the "slanted atom" on the "front" side (in the right in the figure), deform it without additional slanting and encounter greater tangential resistance from this atom; 3) the particles that hit the "slanted atom" from above, slant its axis. But on average such hitting of the "slanted atom" does not considerably influence the formation of the tangential component in the pressure force.

It should be recognized that in the proposed model, apart from the asymmetry, an important role is given to the elasticity of the surface elements. In the current theory, the surface can be of an arbitrary complex shape, but necessarily rigid. Any of its small fragments may be presented (approximated) by a fragment of a rigid plane with some slant. It is not difficult to show that in the vicinity of such element the statistical distribution of particles by speeds and directions of motion is equal everywhere, and based on this the force of pressure on this fragment is perpendicular to this element of the surface. It is also not difficult to show that the total pressure on the total common (of a compound curvature) surface is also perpendicular to the "total averaged surface". I.e. there should not be any statistical tangential component of the force in this case. But in our option of

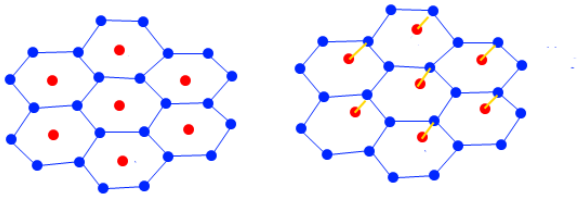
the surface, with elastic flexible elements and with a decided asymmetry in one direction, the tangential component may exist.

Possible effect.

Let us imagine that the considered possible asymmetry causes appearance in the pressure force of the tangential component with a value of just 0.01 (1%) of the normal (regular) force of pressure on the unit of surface area. The atmospheric pressure in "normal conditions" is about 10t per square meter (10t/m²). 1% is 100kg/m² of the surface. This is very much. One square meter of such surface is enough the fly in the air. And the value of the asymmetry of 0.1% of the normal pressure is also not a little, 10kg/m². 10 m² of such surface is enough for flying without motors.

What should the study and development of this direction begin with?

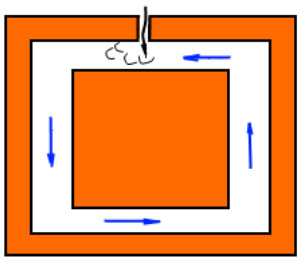
With the experimental proof of the very possibility of the tangential component of pressure. For a start, it is possible to try to find crystal surfaces with an asymmetry in the atomic structure on the crystal's surface in one direction. Here is a simplified example of such crystal surface. In the left option there is no asymmetry. In the right option the central atoms in the hexagons are shifted to one side. How could we try to achieve such asymmetry?



Perpetual motion machine of the 2nd kind. Asymmetry on the crystal.

Presumably, this could be done using a strong electric or magnetic field (or both) in the process of crystal formation. Crystals with natural asymmetry in the crystal pattern axes are also possible, which means that on the crystal surfaces too.

Further, we could create an object with an inner closed circular cavity. The cavity should be covered with the suggested crystal surfaces with asymmetry. The direction of the asymmetry should be along the contour of the cavity. In such cavity should begin (at least a slight one) motion of air along the contour in one direction. And it can be registered, for example by injecting small portions of smoke in the cavity.



Perpetual motion machine of the 2nd kind. Scheme of experimental confirmation.

A just reward definitely expects the one who will be the first to confirm the possibility of the tangential component in the pressure force.