

Schauberger Technology

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ABSTRACT: This article aims to demonstrate that Viktor Schauberger developed a mechanical system for atmospheric air ionization that can be used in airplanes and flying saucer propulsion. His observations on water courses gave him the understanding about how to accelerate air to create cyclonic vortexes and ionize the air over the rapidly rotating metallic surfaces. This ionization produces a low pressure gradient that may be harnessed to produce thrust and energy. So, it will be developed a mathematical approach to quantify this propulsion system.

KEYWORDS: water vortex, air vortex, cyclonic force, rotating chamber, repulsive turbine, discoid aircraft.

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1 Introduction

In one of his statements, described in the book *Living Energies*, Schauberger says: [1]

Nature is not served by rigid laws, but by rhythmical, reciprocal processes. Nature uses none of the preconditions of the chemist or the physicist for the purposes of evolution. Nature excludes all fire on principle for purposes of growth; therefore all contemporary machines are unnatural and constructed according to false premises. Nature avails herself of the bio-dynamic form of motion through which the biological prerequisite for the emergence of life is provided. Its purpose is to ur-procreate higher conditions of matter out of the originally inferior raw materials, which afford the evolutionally older, or the numerically greater rising generation, the possibility of a constant capacity to evolve, for without any growing and increasing reserves of energy there would be no evolution or development. This results first and foremost in the collapse of the so-

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called Law of the Conservation of Energy, and in further consequence the Law of Gravity, and all other dogmatics lose any rational or practical basis.

Viktor Schauberger extensively developed the production of atmospheric air vortexes observing the natural movements of the waters. Initially, his work was related to water treatment systems, therefore, he observed how Nature carried out its renovation, revitalization and reconstitution of its nutrients. He built countless water transport, storage and treatment systems, always observing, copying and perfecting the natural processes that occur in rivers, rapids and waterfalls.

He also looked for ways to generate energy with water through the interaction of complementary and opposite energy forms such as heat and cold, suction and pressure, electricity and magnetism, through their synthesis and reciprocal interaction. Eventually he found that if a suction effect was ingeniously employed first and then pressure was introduced behind it on the same axis, an extremely powerful propulsion system could be created. In the years 1937-38 Schauberger applied for patents on these new ideas.

He made clear the working principle of the “trout turbine”, which powered its flying saucer project, as described in the book *Living Water*: [2]

If water or air is rotated into a twisting form of oscillation known as 'colloidal', a build up of energy results, which, with immense power, can cause levitation. This form of movement is able to carry with it its own means of power generation. This principle leads logically to its application in the design of the ideal airplane or submarine... requiring almost no motive power.

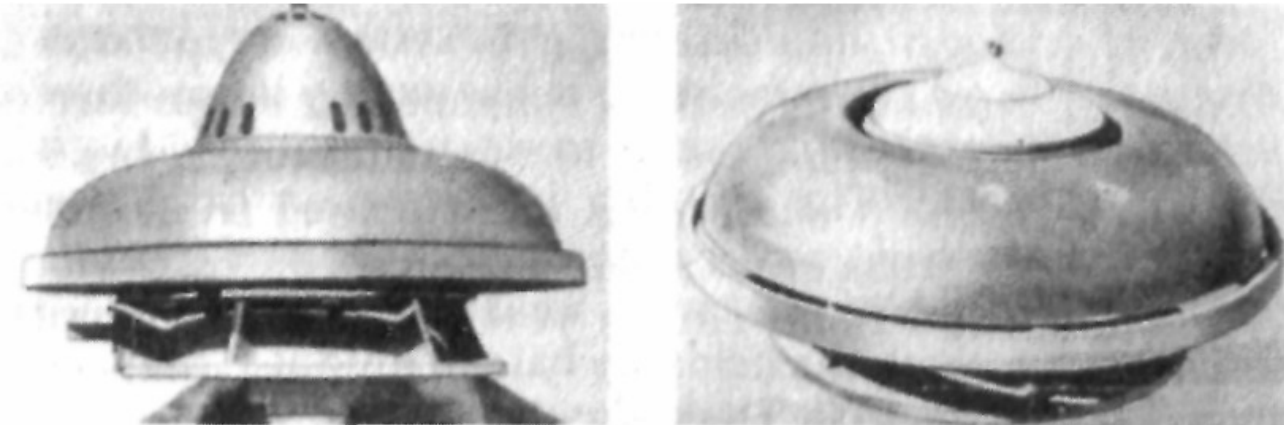


Figure 1: Discoid models of aircraft type A (left) and type B (right) called Repulsive.

In a letter to Werner Zimmermann, described in the book *Energy Evolution*, Schauberger talks about a granted patent (No. 145,141) for an air turbine: [3]

The principle of this vacuum-turbine consists in the fact that an artificial thunderstorm, or high-tension electrical charge develops in a capillary tube and a double-spiral pipe in which electromagnets have been incorporated, which transforms the substances of the air into electrical energies. These discharge into the sidewalls and from there, through diffusion, are ducted away downwards as heat. Through the transmutation of aeriform matter into energies, a self-intensifying physical vacuum is created in an upward direction and through the recurrent development of a heat gradient in a downward direction, a powerful up-current of air evolves, which after a few minutes intensifies to cyclonic force. Because the air-pressure in an upward direction can be progressively reduced in this extremely simple way, the counter-flow of air can be raised to over 200 kph (124 mph), producing about 10,000 brake horsepower on the inclined surfaces of the propeller (turbine).

2 The Vortexes of Viktor Schauberger

Before studying the atmospheric vortexes that allow levitation, we will briefly review the beginning of the development of the vortexes, carried out with water pipes.

The proper use of guides inside the water pipe allowed to generate a double flow of fluid: an internal axial flow that moved faster than its peripheral flow, which was directed in a cycloidal path close to the walls of the pipe. In this separation of flow lies the secret of what Schauberger referred to as implosion – an opposite force but many times more powerful than an explosion. This unique force, however, was merely a stage in a complete cycle of transitions resulting in a thermoelectric process that transformed water, air or salt water into a superkinetic biomagnetic force.

This pipeline work gives an example of how Schauberger approached what he referred to as a "fermentation" process and a "cold oxidation" of natural water. Using his terminology, its task was to segregate the carbon and oxygen particles from the water or fluid, process and reconstitute them with a different energy configuration – with a much higher energy share than it normally was – and then, using certain characteristics of a vortex in conjunction with the implosion effect, channel the resulting release of repulsion energy and use it for the kinetic propulsion of the generating device.

While this peripheral cycloid flow close to the tube walls acted on the fluid centrifugally, its movement would remove and subordinate the organic carbons in the fluid. Correspondingly, near the center of the tube, inorganic oxygen would be conducted rotating under a reactive centripetal force, and between the two flows there would be a sliding flow. His discovery that the carbons of water and air react to centrifugal influence, while oxygen react to centripetal force came after many years of previous observation and experimentation.

The special guide fins trapped inside the tube to rotate the flow of the peripheral fluid were also placed longitudinally at specific intervals along the entire length of the tube to cause an alternating increase and decrease in the flow pressure along the tube, which resulted in a general cooling in the temperature of the entire flowing body of water.

What happened under the influence of these opposing rotation forces in the water was a metabolic process of transformation or, as Schauberger explains: [3]

... It is also known that dissociation and recombination, therefore the rearrangement of atoms, can be effected in the substrate with aid of catalytic processes. In this regard, it has been observed that these processes take place in a characteristic cycle or oscillating rhythm until a new state of equilibrium is established.

Schauberger found that, by cooling the fluid, its density increases and, as the central (oxygen) core in differential rotation and the spiral peripheral carbons rotate over each other, its bipolar ingredients constantly rub against the sliding flow interface plane and against the guide fins

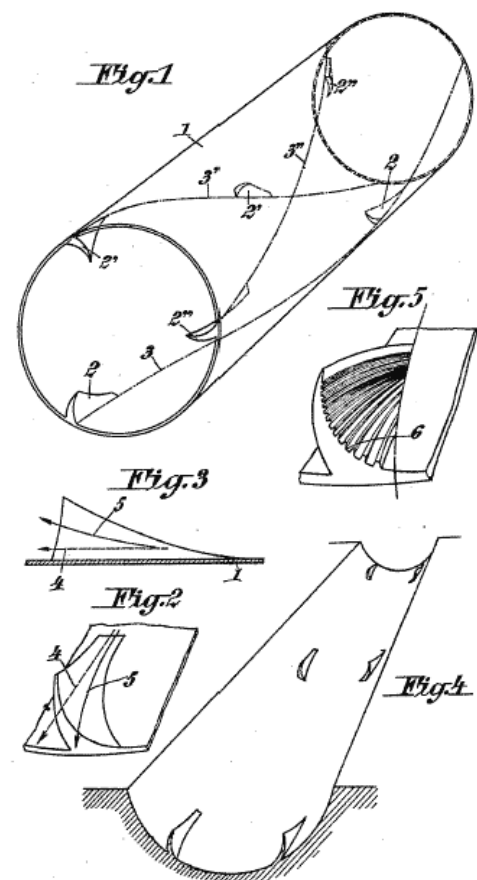


Figure 2: Inner guide fins on the tube.

of the external wall. This breaking or refining process subsequently induces a dissociation of the micro-particles from the two separate fluid streams, first by a process that Schauburger called the oligodynamic effect of decomposition and, consequently, a release of supplementary influences and, second, by a paralysis and densification of the separate oxygen and carbon elements – thus causing a reduction in volume. Third, carbons, or rather, carbon residues, are made unipolar (and potentially different from oxygen).

As a result, the axial core of the fluid accelerates forward from the peripheral spiral flow, thus increasing the potential difference between the two flows. So, in what can be best described here as a highly complicated bio-electric chain reaction trigger, an energetic exchange takes place between the rubbed carbon residues and the axially flowing oxygen. So, as Schauburger established: [3]

Through the continuous approach of the through-flowing water-masses towards the anomaly point of +4°C (+39.2°F), on the one hand the terrestrial elements attain their relatively highest energetic state and on the other, the oxygens become increasingly indifferent and more dispersed, thus reaching the condition proper to a fertilizing substance. If this state is reached at the anomaly point, then the highly energized terrestrial residues (the former carbons) bind their fertilizing counter-parts, and the naturalesque product of synthesis is complete.

One might assume that this "charged water" could be compared to a fluid in a colloidal form where its molecules would have merely induced a strong negative electrical charge in them – but according to Schauburger, this is not the case. He explained that the product of this process was a much higher form of energy. [3]

If on the other hand a tripolar mass is split up by suction-intensifying and temperature-reducing dynamic influences, then the true creative substance (sweet matter) will be exposed to revitalizing (cooling) temperatures. In this case the formative (levitative) sweet-matter becomes free, unipolar and so highly active that it binds, consumes and digests the oxygen (fertilizing substance), which has become passive under this other dynamic influence. The end product of this magnetolytic dissociation is the predominantly magnetically charged ion, whose original formative and levitative force, which as everything else in Nature is to be understood as an indirect effect, can be intensified by up to 96%. Imbued with levitative force, these ions suck up the inferior matter and the generating device in their wake with elemental ur-force...

From the above outlines about what happens inside this special tube, we can conclude that, in this multistage transition process, there is initially a radial to axial (centripetal) force, then a chain reaction that performs a highly dynamic transformation on the fluid that flows through the tube and then the reaction that accelerates the fluid core in a perpendicular motion along the longitudinal axis. The fluid core moves much faster through the tube than the rest of the fluid.

2.1 Description of Air Vortexes

With the understanding of natural processes and their application in the control of rotational movements of fluids inside tubes, Schauburger learned how to use the dynamics of natural movements for the development of several devices, among them, the discoid models called Repulsine. In these machines, the tube processes were transferred and configured as a centrifugal air chamber that alternatively brakes and pulls the air fluid which moves through it. These devices created air vortexes by rotating the chamber with high-speed electric motors (from 10,000 to 20,000 RPM), and were so powerful that the traction force of the air currents accelerated the entire machine upwards.

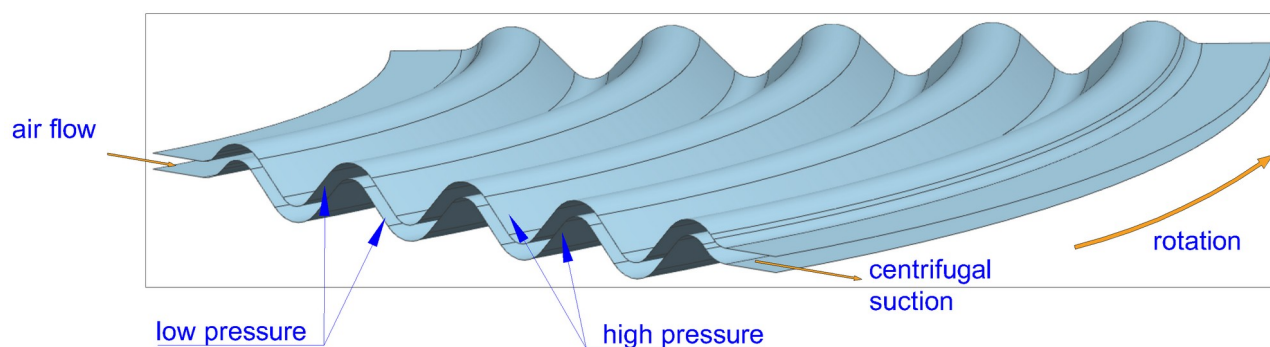


Figure 3: Circular section of the Repulsine rotating chamber.

When the chamber rotated, considerable suction was created in the central inlet ducts of the chamber as a result of the centrifugal forces that dragged the fluid radially to the periphery. The aqueous or air fluid directed inward was sucked through the low pressure chamber (made, says Schauburger, of inorganic silvered copper), where this flow was “pumped” by flow restrictors across the circumference (which could make up concentric rings), located inside the chamber in order to mold and momentarily exert pressure on the fluid flow. In addition to these centrifugal forces (axial to radial), the rotating forces are operating perpendicularly to the centrifugal forces, dragging the air fluid into the low pressure chamber.

Here occurs what Schauburger called a transition promoted by planetary movement together with a rhythmic change in suction and braking pressures. This alternating motion causes the dissociation process of oxygen and carbon from the air that flows through the chamber into two separate components.

Essentially, there are two forces involved here:

1. Centrifugal suction-pressure-suction force – which can be transformed into a rhythmic force;
2. Rotating frictional force – from the turbine's low pressure chamber that revolves around 10,000 RPM.

With these forces, Schauburger used with great advantage the fact that carbons react more readily to a centrifugal force than oxygen. When normal atmospheric air enters the mechanism through the air inlets in the center of the chamber and initiates the dissociation process, the oxygen in the air that flows into the device reacts less to centrifugal forces than does the carbons (as occurs in tubes) and they will be more dragged by the rotating frictional force into the low pressure chamber than the carbons. This means that the oxygen will follow a longer radial curve than the carbons in its external radial flow. There will be a double flow – as in the example of the pipe where there will be the expulsion of a superior and inferior form of this synthesis – ready for the next stage of the process, the reconstitution process.

In this way, we have a highly energetic force at the periphery of the machine – and it needs to be reconstituted. If a properly curved wall is placed below this peripheral rotating force that can bend and guide this force downward and back to the center towards the machine axis – to transform this energy flow into a centripetal force, then, as Schauburger describes its effect, it becomes a radial to axial rotational force curved inward.

And we are again in the same situation that occurred inside the pipe, which resulted in the axial fluid being accelerated at great speed through the pipe. However, in this configuration there is much more energy involved because it has already passed through a synthesis stage and now it is physically forced centripetally towards the center of the machine for its final transformation. This reaction is very powerful because a large volume of energized mass will be compressed in a small volume duct.

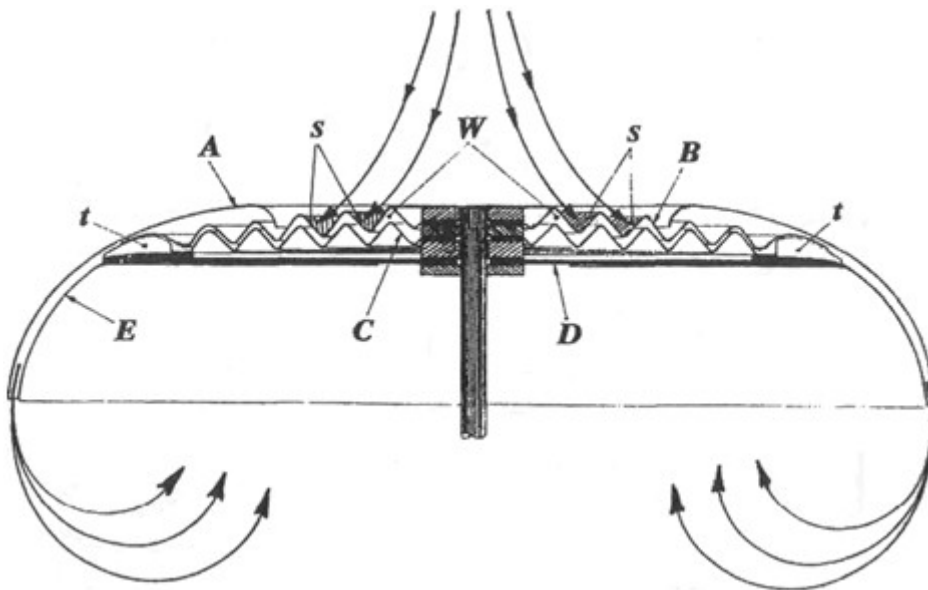


Figure 4: Air flow in the Repulsive turbine.

This is one of Schauberger's descriptions of what happens to this energy: [3]

... As the end product of a natural or unnatural sequence of motion, it will be accelerated along either the longitudinal or the transverse axis.

In the naturalesque – formative – direction of acceleration, which must take place along the longitudinal axis (centripetally), so-called electricism acts as the absolutely indispensable resistance for all motion. As the formative velocity rises, the resistance increases commensurately in order to provide the additional frictional (resisting) surfaces required by the accelerating matter. The actual loss of formative energy associated with this amounts to about 4%, i.e. in this case approximately 96% of the formative energy (= magnetism streaming upwards at enormous speed = levitism) is freed, which sucks up its generating device and a portion of its immediate environs in its wake.

In fact, in all descriptions of this levitative force, Schauberger nowhere describes it as a propulsive effect created by a pressure force, or as an electrokinetic force created by an electrical effect. He refers in various ways to this projection force that the ship reacts as a "magnetism", a "bio-magnetism", an "organic vacuum", a "totally attractive force" or, as it was more often called, a "diamagnetism". In some cases, more with respect to the implosion of water than air, he refers to this "magnet tractor of the surrounding air masses" as dissociated H, where H refers partially to a suction force and partially to an atom with less density quantity, more because there was no better way to describe this previously unrecognized force. In all cases, it meant "an attractive force that moved like a magnetic flux curve".

2.2 How the Vortexes Work

Given the description of the vortexes, we can say, with certainty, that the result of creating air vortexes is the dissociation of their molecular and atomic constituents into ions, that is, the production of electrically charged particles. The large amount of these particles in circular motion behaves like electric currents that produce a magnetic field at their center of rotation.

While there is rotation in the chamber, the dissociation of air causes a low pressure (implosion) inside the chamber itself, sufficient to suck more air through the upper inlets. The production of electrically charged particles would therefore be proportional to the rotation speed of the chamber and the availability of atmospheric air. In this way, the device resembles an

electrostatic generator, producing electricity (ions) by friction of the air with the rotating chamber. The design of the rotating chamber is intended to facilitate the molecules fractionation to increase the production of ions, because due to the concentric curves or fins, the air driven by the centrifugal force rubbed much more with the walls of the rotating chamber, reducing its radial velocity and, therefore, remained longer inside it being dissociated.

The type of material used in the chamber lining (inorganic silvered copper) also contributed to the production of ions, since, as it spins with rotation above 10,000 RPM, the collision of air molecules with the chamber surface causes the fractionation of these molecules, as a consequence of the kinetic energy involved in the impacts. The result is a cloud of electric charges that increases in quantity the closer to the periphery, and that reaches the same tangential speed as the chamber.

It should be noted that the low pressure of the chamber and the collisions of ions on the surface of the chamber that spins in high rotation dissociate and detach atoms from the material that makes up the chamber. It is known that the surface of materials subjected to low pressures undergoes a disintegration process, so it is expected that there is a dispersion of metallic particles that will add to the atmospheric particles in the creation of a rotating vortex or cyclone inside the chamber. If this cloud of charged particles comes into contact with atmospheric air, as is the case with the Schauberger vortexes, there will be ambient lighting by the corona effect that will identify the origin of the particles by their light spectrum, as described in the chapter The Universal Source of Energy of the book Implosion Instead of Explosion. [4]

The following observations may serve as proof that the Flying Saucers are diamagnetically propelled. As already mentioned in our chapter on diamagnetism, copper is a diamagnetic metal. When the UFO's fly at a relatively low rate of speed, they are surrounded by a light greenish hue. The spectral line of burning copper has been observed to fall within this specific green. Furthermore, air samples taken from the atmosphere in the regions where, beginning in 1947, the UFOs have been frequently observed, have shown high concentrations of copper particles in very fine dispersion. On the other hand, air samples taken before the appearance of the Flying Saucers, show a complete absence of copper.

It is important to emphasize the need to use diamagnetic materials in the rotating chamber because the high rotation of these materials produces a magnetic field in the rotation axis, as we saw in the chapter Magnetic Propulsion Through Mass Rotation in the article EM-GI Propulsion Systems [5]. We can understand that the silver layer deposited on the copper surface of the rotating chamber, for having a higher hardness and refractive index than copper, had the objective of withstanding lower pressures before presenting the disintegration phenomenon.

Thus, the diamagnetism observed by Schauberger was created by the rotation of the electric charges inside the chamber and on the periphery of the device and also by the rotation of the metallic chamber itself, as both processes result in a circular electric current. This circular electric current creates an intense magnetic field on the rotation axis of the chamber. As these ions return together with the non-dissociated air to the central vortex, they ascend like a tornado and recombine with the incoming new air, multiplying the dissociation effect of the air. With the closed circuit of internal ionized air circulation, fresh air enters only in proportion to the dissociation of air in the rotation chamber.

With the creation of a vortex of electric charges and a magnetic field perpendicular to the movement of these charges, there is a separation of electric charges as a consequence of the Lorentz's force $\vec{F} = q_E(\vec{v} \times \vec{B})$. The direction of the magnetic field shaped initially is determined by the rotation direction of the chamber, as we can determine it by the right hand rule used to identify the direction of the magnetic field inside a solenoid. After being created, this same magnetic field radially separates the rotating electric charges, according to the right hand rule used to identify the Lorentz's force. In this way, the negative charges are displaced to the periphery of the

chamber and further reinforce the magnetic field, while the positive charges are displaced to the center of the chamber. The accumulation of positive electrical charges in the center and negative at the periphery of the chamber creates an intense radial electric field capable of further ionizing the air inside the chamber.

Experience shows that the simple presence of excess negative charges cools the environment. In the case of an electronic cloud rotating inside a chamber, as in the Schauburger disk, the cooling effect would be very high, which could make the material of the chamber superconducting. In this situation, the magnetic field produced would be amplified by a minimum factor of 1,000. We could think that the presence of excess positive charges in the center of the chamber would cause the opposite effect, however, the mobility of electrons within the chamber and around its perimeter is much greater. There are no records regarding this effect, however, it is perfectly acceptable for it to occur.

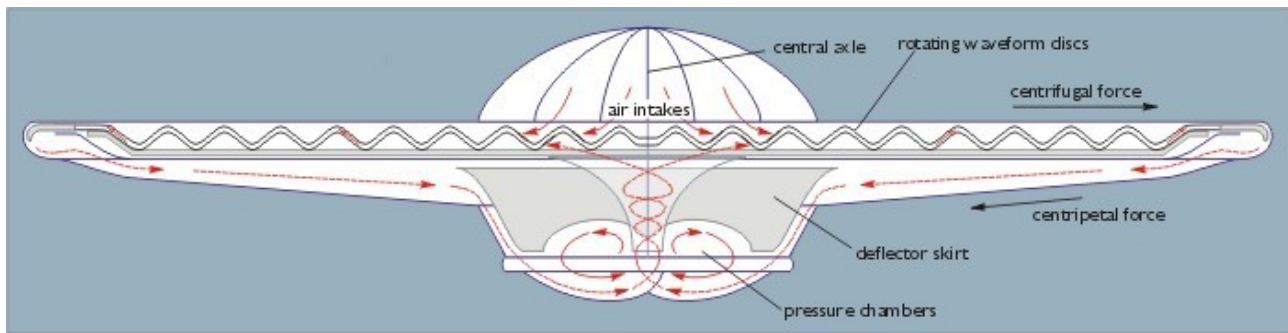


Figure 5: Repulsive discoid spaceship model and the air flux inside it.

Considering that the main objective of the rotating chamber is the ionization of atmospheric air, we can estimate its rotation speed so that this effect occurs taking into account the ionization potentials of the gases that make up the atmospheric air. So, we are considering that the collisions between the atoms of the chamber material in rotation with the air molecules (initially stationary) provide enough energy to ionize the air inside the chamber.

In the chapter Atmospheric Air Ionization of the article Power from Air Ionization [6] we saw that the greatest energy of 1st ionization of the gases that make up 99.03% of the volume of atmospheric air (N₂ + O₂) corresponds to nitrogen molecule N₂, which is 14.53 eV (2.5*10⁻¹⁸ J). If the kinetic energy of the atoms that make up the chamber material is equal to or greater than this value, then there will be ionization of the air up to the proportion of almost 100%, i.e. almost absolute vacuum, depending on the rotation speed of the chamber., so there is complete control over the equipment propulsion.

The angular velocity of the chamber determines the kinetic energy of its atoms, which is the average inertial energy acquired when they are accelerated.

$$\bar{U}_I = K = \frac{1}{2} m v^2 = \frac{1}{2} m (\omega r)^2 \quad \Rightarrow \quad \omega = \frac{1}{r} \sqrt{\frac{2K}{m}} .$$

With:

\bar{U}_I = Average inertial energy [J];

K = Kinetic energy [J];

m = Gravitational charge (mass) of atom [kg];

v = Linear speed of atoms [m s⁻¹];

ω = Angular velocity of atoms [rad s⁻¹];

r = Distance from axis (radius) [m].

The above equation shows that not all atoms of the material in the rotating chamber reach the ionization potential of the air because the kinetic energy acquired depends on the angular velocity and the radius. To facilitate the identification of the required rotation, we can present this equation in RPM (revolutions per minute):

$$\omega = \frac{2\pi}{60} v_{RPM} \Rightarrow v_{RPM} = \frac{60}{2\pi r} \sqrt{\frac{2K}{m}} .$$

The mass of the atom is obtained from the Periodic Table, knowing that the atomic mass values in the table correspond to 1 mole of atoms. For copper with $M_{Cu} = 63.546$ g/mol and silver with $M_{Ag} = 107.868$ g/mol, considering the number of Avogadro $N_A = 6.0225 * 10^{23}$ atom/mol, we have:

$$m_{Cu} = \frac{M_{Cu}}{N_A} = \frac{63.546}{6.0225 * 10^{23}} = 1.055 * 10^{-22} g = 1.055 * 10^{-25} kg ;$$

$$m_{Ag} = \frac{M_{Ag}}{N_A} = \frac{107.868}{6.0225 * 10^{23}} = 1.791 * 10^{-22} g = 1.791 * 10^{-25} kg .$$

Example:

Repulsine chamber with 12 m in diameter made of copper (diamagnetic material). Calculate the rotation so that 5/6 of the radius causes ionization of the air, that is, ionization starts with 1 m from the rotation center.

$$v_{RPM} = \frac{60}{2\pi r} \sqrt{\frac{2K}{m}} = \frac{60}{2\pi * 1} \sqrt{\frac{2 * 2.5 * 10^{-18}}{1.055 * 10^{-22}}} = 2.08 * 10^3 RPM .$$

With:

v_{RPM} = Rotation speed [RPM];

$K = 2.5 * 10^{-18}$ J;

$m = 1.055 * 10^{-25}$ kg;

$r = 1$ m.

As we can see, copper atoms colliding with air molecules cause their ionization already from 2,000 RPM. This explains why, in Schauburger's experiments, rotations ranging from 10,000 to 20,000 RPM were used with excellent results, taking into account that the camera's undulations played a major role in increasing collisions.

With the detailed study of the vortex-propelled equipment of Viktor Schauburger, we can identify three types of propulsion:

1. Magnetic system produced by the vortex of ions created inside the chamber (electrodynamic effect) and the metallic (diamagnetic) chamber rotation;
2. Low pressure mechanical systems like the aerodynamic one based on the Magnus and Coanda effects – derived from the Bernoulli principle; and the pressure gradient produced by air dissociation and ionization;
3. Gravito-inertial system resulting from the Repulsine chamber high rotation, that creates an effect of canceling the gravitational field force by the gyroscopic effect.

It is reasonable to think that the excellent results obtained with the Repulsine prototypes are the outcome of more than one of these propulsion systems.

3 Magnetic Propulsion System 1

The magnetic propulsion system works with the principle of neutralizing the gravitational field force by repelling the vertical component of the Earth's magnetic field. We saw in the chapter Magnetic Propulsion Through Vortexes of the article EM-GI Propulsion Systems [5], how we can calculate magnetic fields capable of canceling the earth's gravitational effects through the circulation of electric charges. In the Viktor Schaubeger's system, the electric charges circulation is achieved by creating an ionized air vortex projected to the periphery of the rotating Repulsine chamber.

These circulating electric charges are equivalent to a high electric current, as we saw in the chapter Electric Charge Gathering by Magnetic Vortex of the article Power from Electrostatic Charges [7], which produces a very intense magnetic field, required to cause the necessary propulsion effects. The process of recirculating the ionized air inside the chamber greatly amplifies the production of ions inside the chamber, however, as we are unable to specify the density of ions produced, we will make modest estimates for our calculations.

To calculate the magnetic field generated at the rotation center of the chamber, we need to estimate the amount of electric charges that circulate around the periphery of the chamber in the time unit, because it is equivalent to an electric current $I_E = q_E/t = q_E f$.

However, the amount of electric charges that circulates in the periphery at each rotation of the disk depends on the tangential speed of the ionized air inside the rotating chamber. Estimating the amount of ions that circulates is difficult because the entire amount of ions that circulates outside the chamber, when returning to the central vortex, also contributes to the amplification of the magnetic field. To simplify our calculations, we will consider that the tangential velocity is that of the mean radius of the chamber and the amount of ions is given by the estimate of the average density of ions within the chamber.

$$I_E = q_E f = q_E \frac{v_{RPM}}{60} = n_e e S v = n_e e S \left(2\pi \frac{r}{2} \frac{v_{RPM}}{60} \right) = n_e e S \left(\pi r \frac{v_{RPM}}{60} \right) .$$

With:

I_E = Electric current [A];

q_E = Electric charge [C];

n_e = Average ion density inside chamber [electron m^{-3}];

e = Electron charge = $1.602 \cdot 10^{-19}$ C;

S = Chamber section area + return section area = $r \cdot 2h$ [m^2];

v = Average tangential velocity = $\omega r/2 = \pi r f = \pi r (v_{RPM}/60)$ [$m s^{-1}$];

$v_{RPM} = 60 f$ = Rotation speed (rotation per minute) [RPM];

r = Distance from axis (radius) [m].

We will consider that the dissociation and ionization inside the chamber multiplies the density of electrostatic charges in the atmosphere by a factor of 1,000. As the ion density of the atmosphere is $4 \cdot 10^{25}$ electrons/ m^3 , inside the chamber we will have $n_e = 4 \cdot 10^{28}$ electrons/ m^3 .

At the rotation center of the electric charges, the magnetic field is determined by $H = I_E/2r$, calculated in a similar way to the magnetic field created inside an electric current loop. As the charges are deflected towards the periphery of the device, the central magnetic field is increased and also collaborates in the deflection of the charges. The system will then find an equilibrium point that depends on the density of the magnetic field created, the rotation speed of the chamber and the density of electric charges in the chamber.

Example:

Repulsive discoid equipment with 10 m diameter rotating chamber coupled to an electric motor that spins at 12,000 RPM. The average height where the repulsive rotating chamber is and the return of ionized air to the central axis (below the rotating chamber) is 20 cm.

$$I_E = n_e e S \left(\pi r \frac{V_{RPM}}{60} \right) = 4 * 10^{28} * 1.602 * 10^{-19} * 2 \left(\pi * 5 \frac{12,000}{60} \right) = 4.026 * 10^{13} \text{ A} .$$

With:

$$\begin{aligned} I_E &= \text{Electric current [A]}; \\ n_e &= 4 * 10^{28} \text{ electron m}^{-3}; \\ e &= 1.602 * 10^{-19} \text{ C}; \\ S &= r * 2h = 5 * 2 * 0,2 = 2 \text{ m}^2; \\ V_{RPM} &= 10,000 \text{ RPM}; \\ r &= 5 \text{ m}. \end{aligned}$$

Applying the formula of the magnetic field, without the introduction of magnetic material inside, we have:

$$H = \frac{I_E}{2r} = \frac{4.026 * 10^{13}}{2 * 5} = 4.026 * 10^{12} \text{ A m}^{-1} .$$

With:

$$\begin{aligned} H &= \text{Magnetic field [A m}^{-1}\text{]}; \\ I_E &= \text{Electric current} = 4.026 * 10^{13} \text{ A}; \\ r &= \text{Chamber radius} = 5 \text{ m}. \end{aligned}$$

$$B = \mu_0 H = 1.256637 * 10^{-6} * 4.026 * 10^{12} = 5.060 * 10^6 \text{ T} .$$

With:

$$\begin{aligned} B &= \text{Surface density of magnetic charge or magnetic induction [Wb m}^{-2}\text{] [T]}; \\ \mu_0 &= \text{Magnetic permeability of medium} = 1.256637 * 10^{-6} \text{ Wb A}^{-1} \text{ m}^{-1}; \\ H &= 4.026 * 10^{12} \text{ A m}^{-1}. \end{aligned}$$

With this information we can calculate the repulsion force between the magnetic fields and the amount of gravitational charge (mass) that can be levitated.

$$F = q_M H = B S H = 10^{-9} * 78.54 * 4.026 * 10^{12} = 3.16 * 10^5 \text{ N} .$$

With:

$$\begin{aligned} F &= \text{Repulsion/attraction force [N]}; \\ q_M &= \text{Magnetic charge [Wb]}; \\ B &= \text{Vertical component of the planet's magnetic field} = 10^{-9} \text{ T}; \\ S &= \text{Area exposed to the generated magnetic field} = \pi r^2 = \pi(5)^2 = 78.54 \text{ m}^2; \\ H &= \text{Generated magnetic field} = 4.026 * 10^{12} \text{ A m}^{-1}. \end{aligned}$$

$$q_G = \frac{F}{G} = \frac{3.16 * 10^5}{9.80665} = 3.22 * 10^4 \text{ kg} .$$

With:

$$\begin{aligned} q_G &= \text{Gravitational charge or mass [kg]}; \\ F &= \text{Force} = 3.16 * 10^5 \text{ N}; \\ G &= \text{Gravitational field} = \text{gravity acceleration} = 9.80665 \text{ m s}^{-2}. \end{aligned}$$

4 Magnetic Propulsion System 2

A second magnetic propulsion system resulting from the rotation of the metallic chamber can be calculated as described in the chapter Magnetic Propulsion Through Mass Rotation of the article EM-GI Propulsion Systems [5]. In fact, the high speed of the chamber made of a good electrical conductor material is equivalent to a high electric current that induces a considerable magnetic field at its center of rotation. If we take into account that the material of the chamber, when it is super-cooled by the movement of the electronic vortex and absorbing a great deal of electric charges, becomes close to a superconductor, then the intensity of the magnetic field created in the center of the chamber will be multiplied by the increase in the density of electric charges of the material.

Example:

Repulsive discoid craft with copper chamber 10 m in diameter and 1 cm thick, spinning on its geometric center with 12,000 RPM. The disk axis has a diameter of 10 cm. Due to the movement of the electronic cloud, the material of the disk cooled to extremely low temperatures (close to 0 K or absolute zero), which made the metal superconducting with an electric charge density close to 10^{13} C/m^3 .

$$I_E = n_e e S d f = 10^{13} * 15.55 * 10^{-2} * 200 = 3.110 * 10^{14} \text{ A} .$$

With:

$$\begin{aligned} n_e * e &\approx 10^{13} \text{ C m}^{-3}; \\ S &= \pi(R^2 - r^2) = 3.14 * (5 - 5 * 10^{-2}) = 15.55 \text{ m}^2; \\ d &= 10^{-2} \text{ m}; \\ f &= 12,000/60 = 200 \text{ Hz}. \end{aligned}$$

Applying the formula of the magnetic field, without the introduction of magnetic material inside, we have:

$$H = \frac{I_E}{2r} = \frac{3.110 * 10^{14}}{2 * 5} = 3.110 * 10^{13} \text{ A m}^{-1} .$$

With:

$$\begin{aligned} H &= \text{Magnetic field [A m}^{-1}\text{]}; \\ I_E &= \text{Electric current} = 3.110 * 10^{14} \text{ A}; \\ r &= \text{Chamber radius} = 5 \text{ m}. \end{aligned}$$

$$B = \mu_0 H = 1.256637 * 10^{-6} * 3.110 * 10^{13} = 3.908 * 10^7 \text{ T}$$

With:

$$\begin{aligned} B &= \text{Surface density of magnetic charge or magnetic induction [Wb m}^{-2}\text{] [T]}; \\ \mu_0 &= 1.256637 * 10^{-6} \text{ Wb A}^{-1} \text{ m}^{-1}; \\ H &= 3.110 * 10^{13} \text{ A m}^{-1}. \end{aligned}$$

With this information we can calculate the repulsion force between the magnetic fields and the amount of gravitational charge (mass) that can be levitated.

$$F = q_M H = B S H = 10^{-9} * 78.54 * 3.110 * 10^{13} = 2.443 * 10^6 \text{ N} .$$

With:

$$\begin{aligned} F &= \text{Repulsion/attraction force [N]}; \\ q_M &= \text{Magnetic charge [Wb]}; \\ B &= \text{Vertical component of the planet's magnetic field} = 10^{-9} \text{ T}; \end{aligned}$$

$S = \text{Area exposed to the generated magnetic field} = \pi r^2 = \pi(5)^2 = 78.54 \text{ m}^2$;
 $H = \text{Generated magnetic field} = 3.110 \cdot 10^{13} \text{ A m}^{-1}$.

$$q_G = \frac{F}{G} = \frac{2.443 \cdot 10^6}{9.80665} = 2.49 \cdot 10^5 \text{ kg} .$$

With:

$q_G = \text{Gravitational charge or mass [kg]}$;
 $F = \text{Force} = 2.443 \cdot 10^6 \text{ N}$;
 $G = \text{Gravitational field} = \text{gravity acceleration} = 9.80665 \text{ m s}^{-2}$.

5 Mechanical Propulsion System 1

The first mechanical propulsion system is a consequence of the existing pressure gradient in the lower hull of the disk: the external side is subjected to atmospheric pressure and the internal side is subjected to a low pressure resulting from the collision of the chamber and ions with the air, which cause its dissociation and ionization. We could think that the upper hull was also subjected to an equivalent but opposite pressure difference, but it happens that the air intakes in the upper hull reduce the pressure difference between its external and internal sides.

The calculations of propulsion systems based on the ionization of atmospheric air with high speed ions are described in the article EM-GI Propulsion Systems [5] but we will show the final equations again for completeness. Unlike the atmospheric ionization system based on electric fields studied in the article Power from Air Ionization [6], the Repulsine turbine can achieve the same effects through a mechanical procedure – the high speed of the chamber. So, controlling the speed of the chamber it is possible to create different pressure gradients to vary the speed of the craft.

Thus, assuming that the system is able to maintain a pressure difference between the two sides of the lower hull, this will generate a vertical buoyant force, given by:

$$F = (P_a - P_i) S = \Delta P * S .$$

With:

$F = \text{Resulting force [N]}$;
 $\Delta P = \text{Pressure difference [N m}^{-2}\text{]}$;
 $P_a = \text{Atmospheric pressure} = 1.013 \cdot 10^5 \text{ N m}^{-2}$;
 $P_i = \text{Pressure resulting from air ionization [N m}^{-2}\text{]}$;
 $S = \text{Ionized surface area [m}^2\text{]}$.

The disk acceleration, which is equivalent to a gravitational field, can be calculated by:

$$F = \Delta P * S = q_G G = q_G a \quad \Rightarrow \quad a = \frac{F}{q_G} = \frac{\Delta P * A}{q_G} .$$

With:

$a = \text{Acceleration [m s}^{-2}\text{]} = G = \text{Gravitational field [N kg}^{-1}\text{]}$;
 $\Delta P = \text{Pressure difference [N m}^{-2}\text{]}$;
 $S = \text{Area subjected to pressure gradient [m}^2\text{]}$;
 $q_G = \text{Disk gravitational charge (mass) [kg]}$.

Example:

Repulsin discoid equipment with a diameter of 10 m and a mass of 20,000 kg. It has a rotating chamber coupled to an electric motor that rotates at 12,000 RPM and causes a dissociation and ionization of the air inside the chamber equivalent to $\frac{1}{4}$ of atmosphere. The air intakes in the disc's upper hull make this difference drop to $\frac{1}{2}$ atmosphere, so that the upper hull has a negligible

pressure difference. Therefore, the outer side of the lower hull is subjected to integral atmospheric pressure and its inner side is subject to $\frac{1}{2}$ atmosphere pressure, that is, this is its final resulting pressure.

$$F = (P_a - P_i)S = (1.013 * 10^5 - 5.065 * 10^4) \pi r^2 = 5.065 * 10^4 * \pi (5)^2 = 3.98 * 10^6 N \quad .$$

With:

$$\begin{aligned} P_a &= 1.013 * 10^5 \text{ N m}^{-2}; \\ P_i &= P_a/2 = 5.065 * 10^4 \text{ N m}^{-2}; \\ S &= \pi r^2 = \pi (5)^2 = 78.54 \text{ m}^2. \end{aligned}$$

Part of this force will only cancel the weight of the device, which is:

$$F_p = q_G G = 20,000 * 9.80665 = 1.96 * 10^5 N \quad .$$

The resultant force will accelerate the device:

$$a = \frac{\Delta F}{q_G} = \frac{3.98 * 10^6 - 1.96 * 10^5}{20,000} = 1.89 * 10^2 \text{ m s}^{-2} \quad .$$

6 Mechanical Propulsion System 2

The second mechanical propulsion system is based on the laminar flow of air on the outer surface of the disc's upper hull. If the air intakes are designed to capture the air in such a way that it runs parallel to the outside of the upper hull, we will have created an even greater pressure difference due to the Bernoulli principle.

The theorem states that the laminar flow of air over a surface determines a pressure that is inversely proportional to the square of the velocity:

$$P_i - P_f = \Delta P = \frac{1}{2} \rho (v_f^2 - v_i^2) \quad .$$

With:

$$\begin{aligned} P_i &= \text{Initial pressure [N m}^{-2}\text{]}; \\ P_f &= \text{Final pressure [N m}^{-2}\text{]}; \\ \Delta P &= \text{Air pressure difference [N m}^{-2}\text{]}; \\ \rho &= \text{Air density at sea level and } 0^\circ\text{C} = 1.29 \text{ kg m}^{-3}\text{;}; \\ v_f &= \text{Air final speed [m s}^{-1}\text{]}; \\ v_i &= \text{Air initial speed [m s}^{-1}\text{]}. \end{aligned}$$

As before, the disk acceleration, which is equivalent to a gravitational field, can be calculated by:

$$F = \Delta P * S = q_G G = q_G a \quad \Rightarrow \quad a = \frac{F}{q_G} = \frac{\Delta P * S}{q_G} \quad .$$

With:

$$\begin{aligned} a &= \text{Acceleration [m s}^{-2}\text{]} = G = \text{Gravitational field [N kg}^{-1}\text{]}; \\ \Delta P &= \text{Pressure difference [N m}^{-2}\text{]}; \\ S &= \text{Area subjected to pressure gradient [m}^2\text{]}; \\ q_G &= \text{Disk gravitational charge (mass) [kg]}. \end{aligned}$$

Example:

Repulsin discoid equipment with a diameter of 10 m and a mass of 20,000 kg. It has a rotating chamber coupled to an electric motor that rotates at 12,000 RPM and causes a laminar displacement of air in the upper part of the hull of 200 m/s.

$$\Delta P = \frac{1}{2} \rho (v_f^2 - v_i^2) = \frac{1.29 * (4 * 10^4 - 0)}{2} = 2.58 * 10^4 \text{ N m}^{-2} .$$

With:

ΔP = Pressure difference [N m⁻²];

ρ = 1.29 kg m⁻³;

v_f = 200 m s⁻¹;

v_i = 0 m s⁻¹.

$$F = \Delta P * S = 2.58 * 10^4 * \pi r^2 = 2.58 * 10^4 * \pi (5)^2 = 2.03 * 10^6 \text{ N} .$$

With:

ΔP = 2.58 * 10⁴ N m⁻²;

$S = \pi r^2 = \pi (5)^2 = 78.54 \text{ m}^2$.

Part of this force will only cancel the weight of the device, which is:

$$F_p = q_G G = 20,000 * 9.81 = 1.96 * 10^5 \text{ N} .$$

The resultant force will accelerate the device:

$$a = \frac{\Delta F}{q_G} = \frac{2.03 * 10^6 - 1.96 * 10^5}{20,000} = 91.7 \text{ m s}^{-2} .$$

7 Mechanical Propulsion System 3

The ions produced inside the rotating chamber are projected to the periphery of the device by the centrifugal force of the rotation. If the equipment provides lateral outlets, these electric charges can be projected to the outside in a controlled manner and provide, through the dissociation and ionization of the external air, a low pressure wrap that can be directed upwards, downwards or to the sides of the device. The deflection of these electric charges can be done through blocking and releasing mechanical devices or by magnetic deflection fields. In this way, the atmosphere itself will push the device along the side of the ionized area, which will be subjected to a lower atmospheric pressure. The acceleration, in this case, will be proportional to this pressure gradient.

The calculations of propulsion systems based on the ionization of atmospheric air are studied in the article Power from Air Ionization [6] and used in the article EM-GI Propulsion Systems [5], and also remade in the section [Mechanical Propulsion System 1](#), which is why we will not do them again here.

8 Gravitoinertial Propulsion System

The theoretical development that allows to neutralize the gravitational field force in function of the speed of an object was made in the chapter Gravitational Neutralization of the article Inertial Field [8], by analogy to the balance of forces that keeps a satellite in orbit around the planet. This gravitational neutralization was further studied in the section Gravitational Potential Neutralization in the article EM-GI Propulsion Systems [5]. We saw that when an object is in high rotation, it is

possible to overcome the planet's gravitational field force, and we performed calculations that allow quantifying this phenomenon, known as the gyroscopic effect.

If the Repulsine chamber rotates at high speed, it can help neutralize the weight of the discoid spacecraft considering that the inertial current is the velocity squared and this induces a gravitational potential. The involved equations are:

$$I_I = v^2 = \omega^2 r^2 = \frac{\omega^2}{2} (r_2^2 - r_1^2) = V_G \quad \Rightarrow \quad \omega = \sqrt{\frac{2V_G}{r_2^2 - r_1^2}} .$$

With:

- I_I = Inertial current [$m^2 s^{-2}$];
- ω = Angular speed of object [$rad s^{-1}$];
- r_1 = Internal radius of chamber [m];
- r_2 = External radius of chamber [m];
- V_G = Gravitational potential [$m^2 s^{-2}$].

The gravitational potential on the planet's equatorial surface is:

$$V_G = k_g \frac{Q_G}{R} = 6.6739 * 10^{-11} \frac{5.976 * 10^{24}}{6.378 * 10^6} = 6.253 * 10^7 m^2 s^{-2} .$$

With:

- V_G = Gravitational potential [$N m kg^{-1}$] [$m^2 s^{-2}$];
- k_g = Universal gravitational constant = $6.6739 * 10^{-11} N m^2 kg^{-2}$ [$m^3 kg^{-1} s^{-2}$];
- Q_G = Gravitational charge (mass) of the Earth = $5.976 * 10^{24} kg$;
- R = Equatorial radius of Earth = $6.378 * 10^6 m$.

In the case of a discoid spacecraft, in which the total weight is much greater than the weight of the rotating chamber, we must calculate the additional gravitational potential by matching the inertial energy of the amount of rotating gravitational charge with the gravitational energy of the total gravitational charge of the device:

$$U = q_{G1} V_{G1} = q_{G1} I_I = q_{G1} \frac{\omega^2}{2} (r_2^2 - r_1^2) = q_{G2} V_G \quad \Rightarrow \quad \omega = \sqrt{\frac{2V_G}{r_2^2 - r_1^2} \frac{q_{G2}}{q_{G1}}} = \sqrt{\frac{2k_g}{(r_2^2 - r_1^2)R} \frac{Q_G q_{G2}}{q_{G1}}} .$$

With:

- U = Energy [J];
- q_{G1} = Rotating gravitational charge [kg];
- q_{G2} = Total Gravitational charge [kg];
- V_{G1} = Gravitational potential of the rotating object [$m^2 s^{-2}$];
- V_G = Gravitational potential of the planet [$m^2 s^{-2}$];
- I_I = Inertial current of the rotating object [$m^2 s^{-2}$];
- ω = Angular speed of the object [$rad s^{-1}$];
- r_1 = Internal radius of chamber [m];
- r_2 = External radius of chamber [m].

Example:

A discoid flying saucer is constructed with a metallic Repulsin chamber 10 m in diameter with 250 kg of mass. The total mass of the device is 10,000 kg. Calculate the speeds to cancel 30% and 100% of the total weight.

In the case of eliminating 30% of the weight we have:

$$\omega = \frac{1}{r} \sqrt{\frac{2k_g Q_G q_{G2}}{R q_{G1}}} = \frac{1}{5} \sqrt{\frac{2 * 6.674 * 10^{-11} * 5.976 * 10^{24} * 0.3 * 10,000}{6.378 * 10^6 * 250}} = 7.748 * 10^3 \text{ rad s}^{-1} .$$

$$v_{RPM} = \frac{60}{2\pi} \omega = \frac{60}{2\pi} 7.748 * 10^3 = 7.40 * 10^4 \text{ RPM} .$$

In the case of eliminating 100% of the weight we have:

$$\omega = \frac{1}{r} \sqrt{\frac{2k_g Q_G q_{G2}}{R q_{G1}}} = \frac{1}{5} \sqrt{\frac{2 * 6.674 * 10^{-11} * 5.976 * 10^{24} * 10,000}{6.378 * 10^6 * 250}} = 1.415 * 10^4 \text{ rad s}^{-1} .$$

$$v_{RPM} = \frac{60}{2\pi} \omega = \frac{60}{2\pi} 1.415 * 10^4 = 1.35 * 10^5 \text{ RPM} .$$

9 Conclusion

The main propulsion principle behind the Schauburger technology is the low pressure created inside the Repulsin chamber with a mechanical process for the ionization of atmospheric air, that is the rotation of metallic undulated plates. The high pressure gradient produced between inside and outside of the hull is the cause of the vertical acceleration of the whole discoid craft.

But we have showed that there are several mechanisms for the production of thrust involved here:

1. Magnetic propulsion between the magnetic field created in the center of the chamber, with the circulation of electric charges around the periphery, and the vertical component of the terrestrial magnetic field;
2. Magnetic propulsion between the magnetic field created in the center of the chamber rotation by the superconducting and heavy charged state of the chamber and the vertical component of the terrestrial magnetic field;
3. Mechanical propulsion with the pressure gradient between the inside and outside of the lower hull of the craft, caused by the air ionization inside the chamber;
4. Mechanical propulsion with the pressure gradient between the inside and outside of the upper hull of the craft, caused by the Magnus and/or Coanda effects.
5. Mechanical propulsion with the pressure gradient caused by directing the produced ions inside the chamber to periphery outlets, that ionize the air and produces low pressure in any direction;
6. Gravito-inertial propulsion with the high speed rotating chamber that neutralizes the terrestrial gravitational field by the gyroscopic effect.

It is possible that several of these processes collaborate to the production of thrust in the Repulsin disks, and the mathematical approach developed here is only a first attempt to get understanding about how it works and how it can be practically applied.

The chamber rotation of 12,000 RPM used in the examples gave us huge results, but it is very likely that, in practice, the rotations are much higher, which would multiply the results. So, this is a very promising propulsion system that deserves experimentation.

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