NEW CONCEPTS ON MODERN AEROSPACE VEHICLES

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Abstract: *In the context of very rapid development of technology (also the Revolution in Military Affairs) and the growing importance of the vertical component in the modern warfare, a special attention should be given to possible ways of action and improvements in this field. A number of important physical phenomena open interesting possibilities of applications in the aerospace engineering, based on new principles of operation, able to completely revolutionize the constructive conceptions and the modalities of achieving the aerospace vehicles in the near future. To these physical phenomena and their possible applications in aerospace engineering, is dedicated the present work.*

Keywords: *Coanda, lenticular aerodyne, MHD propulsion, lifter, high-lift.*

1. INTRODUCTION

This paper seeks to highlight the modalities of application of some physical phenomena in the modern aerospace transport. In such a manner is put into attention a part of the bibliography of inventions used by the author in order to identify new constructive solutions and to draw the fundamental elements of new conceptions in aerospace engineering. Indeed, the present conceptions are largely wrong, and anyway, they not allow anymore notable improvements. Therefore, to get more and more new improvements will be necessary to completely modify our conception about the modalities to design/built and about the operating mode of the aerospace vehicles.

For example, we have to admit that *the lenticular form* is *optimal* for a modern aircraft, and such examples may continue. Another aspect investigated by this paper is the attempt of the author to present several models of aerospace vehicles based on hybrid technology.

In the author's conception, the use of hybrid technologies (adapted to the specific environment in which flies the vehicle) represents the solution that should be considered in the coming decades. Thus, we enter in a very few explored field and about that we still have much to learn...

2. NEW CONCEPTIONS

We will begin by presenting some technologies little or no further applied in the design and construction of the current aerospace vehicles, and how can be achieved the hybrid concepts using in this regard a discoidal aerodynamic cell. In fig. 1 is shown an proposed conceptual model for an experimental piloted aerospace vehicle, designed as *unconventional technologies demonstrator* for the following technologies:

-*cyclonoidal sustentation* (lift) and *propulsion* (the vacuum-propulsion type Liciar) using yhe elements (1) which are rotoric devices type cyclonoid (according the patent RO 21,370 granted in 1933 to Rudolf Liciar), also RO 24,293 granted to R. Liciar for the so-called "Turbomobil" or patent US 2,918,230 granted to Alexander Lippisch in 1956 etc.;

-*the hyper-sustentation (high lift) type Coanda*, with toroidal tank of compressed air and annular gap;

as shown in the drawing at (3) and according to Coanda's patents US 2,988,303 (in 1961, June) for an "Jet-Sustained Aircraft", US 2,939,654 granted in 1960, US 2,108,652 granted in 1938, US 2,920,448 for an "Aparatus for imparting a rapid speed to a mass of fluid" granted in 1960, US 2,946,540 for an "Jet propelled aircraft" granted to Coanda in 1960 etc.;

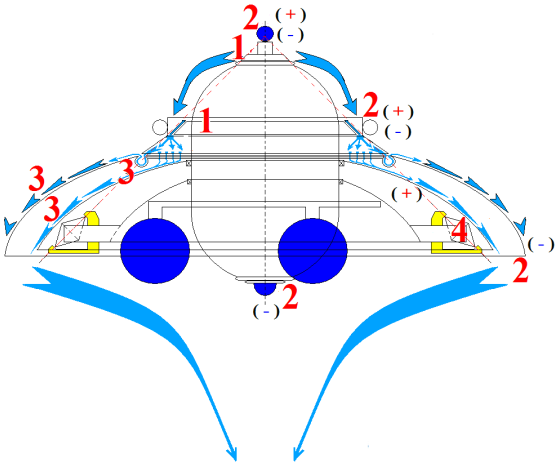

Fig. 1 A model of hybrid aerospace vehicle type electrokinetic/electrodynamic gyroscope with vacuum-sustentation.

-*the electrokinetic sustentation and propulsion* with high voltage electric field using beams of air which is preliminary (photo)ionized by the action of UV sources having an appropriate frequency and intensity, some of this electrokinetic installation are shown in the drawing by number (2); according the patents

US 7,182,295 (S. Redmond) in 2007,
US 3,227,901 (Bahnson) from 1966,
US 2,958,790 (Bahnson) from 1960,
US 3,263,102 (Bahnson) from 1966,
US 2,949,550 (T. T. Brown) from 1960, US 3,120,363 (G. Hagen) in 1964,
US 3,699,387 (Harrison) in 1972,
US 3,130,945 (De Seversky) in 1964,
US 3,464,207 (E. Okress) in 1969,
US 3,662,554 (De Broqueville) in 1972, US 6,145,298 (K. Burton) in 2000,
US 6,404,089 (M. Tomion) in 2002,

US 3,223,038 in 1965, GB 1,073,778 for "A system of flying balistic or space bodies" granted to Werner von Enjel in 1963, US 2,279,586 for an "Electric discharge system" granted to W. H. Bennett in 1939, US 2,552,050 for an "Method of and means for generating electrical energy" granted to E. G. Linder in 1959, US 3,095,163 for an "Ionized boundary layer fluid pumping system" granted to G. A. Hill in 1963, US 3,360,220 for a "Magnetohydrodynamic method and apparatus" granted to R. X. Meyer in 1967, US 6,570,333 for a "Method for generating surface plasma" granted to P. A. Miller and B. P. Aragon in 2003, WO 2008/016928 for "Wingless hovering of micro air vehicle" granted to Roy Subrata in 2008 etc.

-*the enhance of electrokinetic thrust effects* by rotating the armatures between it is applied the electric field; according US 2,958,790 (Bahnson) from 1960;

-to use *the engines with magnetic energy* for driving the alternators (but there are other technological solutions: classic thermal engines with the Coanda's low-pressure turbine, the Tesla turbine etc.); according the patents RO 109,405 granted to N. Moraru in 1995, RO 122,470 granted to Gabriel Diaconu in 2009, RO 126,006 also granted to G. Diaconu in 2011 (all for engines which use the magnetic energy),

US 3,892,653 for an hydrogen generator, granted to Fr. Pacheco, GB 1908/22740 granted to Nicolaus Mischin in 1909 for an high voltage engine, or (in the field of thermal engines) RO 126,687 ”Hydrogen generator with combustible emulsions” (G. Bordeianu), RO 123,124 for ”Internal combustion engine” (G. Bordeianu), RO 122,868 for ” Cylinder Head with rotating valves for the internal combustion engine” (G. Bordeianu), RO 122,351 ”Vehicle powerplant” (G. Bordeianu), RO 119,561 ”Complex Cylinder Head” (G. Bordeianu), RO 119,560 ”Internal combustion engine” (G. Bordeianu), US 3,301,233 (Gianni Dotto) for an rotary engine, FR 661,254 granted to Tr. Vuia and E. Yvonneau in 1929 for s steam generator, FR 740,226 also granted to Tr. Vuia and E. Yvonneau in 1933 for a steam generator, the patents RO 41,446 (in 1960) and RO 42,186 (in 1959) granted to Henri Coanda and N. Teodorescu-Tintea for a turbine applying the Coanda effect, the patent US 4,935,639 for an improved turbine using the Coanda effect etc.

-to use *the improved secondary electrochemical sources*, powerful and compact battery type Pb-acid *with granulated electrodes and gelatinous electrolyte*, according the inventions of Nicolae Moraru;

-the sustentation *using very high vacuum which is electrodynamically generated* (the Marcel Pages’s inventions);

-sustentation using *the gyroscopic vectorial force*;

-*the peripheral driving of air fascicles* using rotational (disc) surfaces provided with helicoidal slideways;

-to use the high voltage transformer type Tesla in order to achieve the high voltage and high frequency electric field for applying it between the armatures of the electrokinetic system, according the patent US 1,119,732 (Tesla) in 1914;

-to use the electromagnetic thrust vectoring, by the controlled varying of fields configuration and electromagnetic interactions.

Our proposed model is a hybrid aerospace vehicle,VTOL type, functioning completely silent, two-seater, five engines, equipped with five categories of virtually independent systems of lift/ propulsion, operating on totally different principles which are indicated in the drawing by the numbers 1 - 4:

1- the vacuum-propulsion system (consisting of two motors with *cyclonoidal rotors*, one located at the leading edge and the other, inside the structure, used for driving the air fascicles through the internal ducts) forming an important low-pressure region at the leading edge of the flying vehicle and provides the boundary layer blowing on the all upper surface of the vehicle, so that the aerodynamic drag decreases considerably and the lift force is improved; on the surface of the rotative armatures described at 2, there are a series of helicoidal guides that make the air blown by cyclonoidal rotors to be engaged in a vortex motion and therefore, it participates in increasing the total thrust;

2- the electrokinetic installation consists of a dome (semi discoidal) which is fixed rigidly to the cabin and it is powered by the secondary of the Tesla transformer, being charged with positive or negative electric charges; other two devices which have the shape of a dome (semi discoidal) but smaller than the previously mentioned, being contra rotating (one rotates in one direction, the other in reverse) and being drived even by the applied electric field; one of these rotating domes is the electric armature of the opposite sign (+ or -) and the other is simply a reactive element which rotates contrary to the direction rotary electric armature;

3- the hypersustentation/propulsion installation type Coanda, supplied with the air under pressure which come out of the cyclonoid blades and it is used for boundary layer blowing on the upper surface of the static semi-discoidal dome, which could be (optionally) used as electrical armature into the electrokinetic installation, as described at 2;

4- the gyroscopic system (rigidly secured to one of the semi-discoidal rotating domes) that provides the vector summation of forces which have the application sense in upward, thus participating in the lifting and propulsion, independent from the electrokinetic system functioning and from the vacuum-propulsion system, the latter needing the presence of the relatively dense atmosphere in order to operate; the gyroscopic system need no atmosphere, but only an gravitational field;

5- the toroidal lifting system provided with an vacuum chamber, the vacuum being electrodynamically generated, in this regard, inside the annular chambers electron beams are accelerated to relativistic speed (*not shown in drawing*).

3. SEVERAL HYBRID MODELS

The description of an discoidal aircraft (shown in fig. 2) entirely based on unconventional technologies: 1- the upper armature of the electric discharge system; 2- lifting cyclonoid; 3- the secondary of the

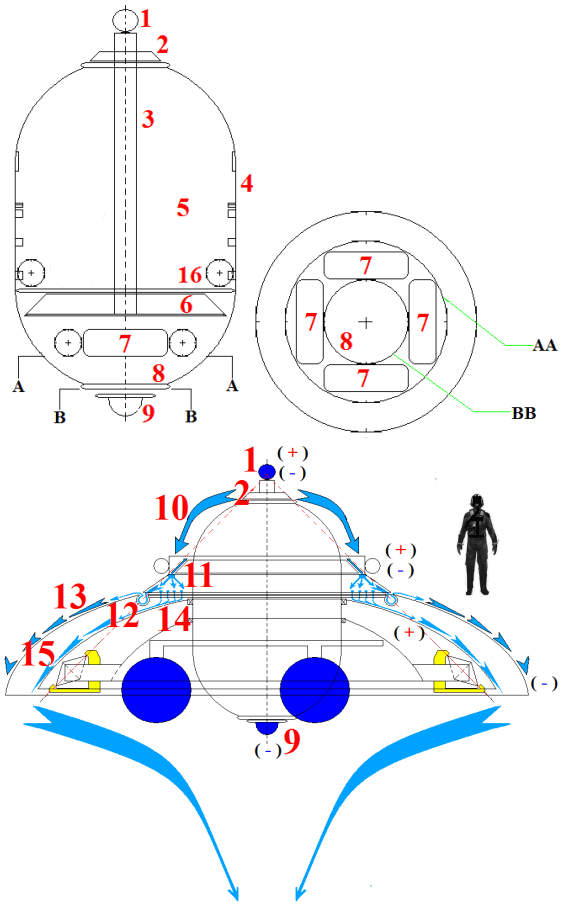

Fig. 2 An model of discoidal aerospace vehicle based on new technologies.

Tesla transformer; 4- the hermetical outer cabin having the outer envelope made from dielectric material; 5- the cockpit; 6- the primary of Tesla transformer (designed to operate at 1 MW power); 7- pair motor-generator group composed of magnetic engine type Moraru and a compact three-phase alternator developing a rated output of 125 kVA; there are provided 4 such pairs of motor-generator with a total power (output) of 500 kVA and a weight of approx. 200 kg, the Moraru magnet motor operates at a ratio of 7 HP (5.15 kW) / kg of magnetic core, and develops 125 kW using to this end 25 kg of magnetic material, and the 125 kW alternator has about 25 kg; 8- acces hatch for crew; 9- lower armature; 10- the air jets ejected from the lifting cyclonoid, by applying the Coanda effect adhere to the cabin wall going into the annular air-intakes of the propulsion cyclonoid; 11- the propulsion cyclonoid sends the high-speed air jets in the aircraft's internal pipes; 12- annular device (invented by Coanda) provided with exhaust slot for the air jets which make the boundary layer blowing on the outer wall surface, applying an upward force; 13- by applying the Coanda effect on the semi-lenticular surface, the air adheres to the outer surface, creating depression;

14- the air jets which could not enter into the Coanda device, above mentioned, go on the semi-lenticular interior wall, where they make a depression on the upper surface and thus another force oriented upwards, due to excess pressure from the low surface; 15- the air flows on the semi-lenticular rotating surface provided at the upper side with a network of helical grooves, which makes the air to get a swirling motion and that causes the exhaust to produce an additional thrust; 16- the motor-generator backup system, developing also 500 kVA. Alternator Lucas AE 2134: Rated output power- 120 kVA, Maximum power- 180 kVA, Short time power- 240 kVA (for 5 seconds), Power factor- 0,75 – 0,95, Rated voltage- 200/115 V, Rotation speed- 12,000 rot/min, Cooling system- with pulverized oil weight- 26,3 kg.

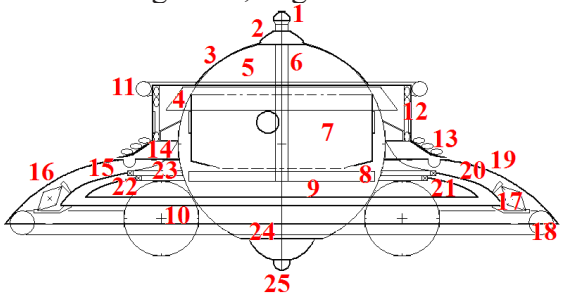

Fig. 3 Another model of unconventional aerospace vehicle

In fig. 3 is shown a possible model of an electrokinetic/gyroscopic vehicle with vacuum-propulsion: 1- the upper electrode of the high voltage (and high frequency) installation powered by the secondary of a Tesla transformer (patent US 1,119,732 1914); 2- the annular rotor of the lifting cyclonoid (patent RO 21,370 in 1933, March 11th) whose purpose is to produce a vacuum region (p-) at the leading edge of the vehicle; 3- the surface where is flowing the air ejected from the cyclonoid (2) and thus is surrounded (by applying the Coanda effect, according to the patent FR 792,754, also published as US 2,052,869) by a low pressure (p-) boundary layer in order to reduce the air friction (the aerodynamic drag) and therefore, to increase the total lifting force; 4- the annular rotor of propulsion cyclonoid, which sends the compressed air into the vehicle's internal ducts; 5- the pressurized cabin, made from (electro)insulated material; 6- the metal pillar (insulated on the outside) that provides (according the Patent US 1,119,732 granted in 1914) the high-voltage power supply of the components (1) and (19); 7- the cockpit provided for a team of two persons, at least; it is a hermetic cabin fitted with side portholes and access hatches at it's upper and lower side; in the top of the cabin is a service module that has inside several components of the electrical installation and tanks with materials for the air conditioning installation, magnet motors (according the Patent RO 109,405 granted in 1995) used to drive the rotors of cyclonoids etc.; in the lower side of the cabin is the compartment of the electrokinetic engine aggregates, which contains among other things, electrogene groups, the Tesla transformer etc.; 8- the primary of the Tesla transformer (an large diameter Tesla coil); 9- the compartment for the engine aggregates; 10- the spherical capacitors of the maneuvering system (according the Patent US 2,958,790 granted in 1960, US 3,263,102 granted in 1966 and US 3,322,374, granted in 1964) which are rigidly fixed to a annular platform (not shown in illustration) made from dielectric material and rigidly fixed to the cabin structure (5) ; 11- the toroidal winding participating at the air ionization (according the Patent US 3,322,374 granted in 1964) and the formation of a magnetic field which drives the ionized particles; 12- UV-C bulbs used for the photo-ionization of the air in the boundary layer region (according the Patent US 7,182,295 in 2007); 13- intermediate annular electrodes (according the Patent US 3,322,374 granted in 1964); 14- shaped surface for guiding the air jets; 15- the toroidal chamber fitted with a Coanda annular gap (according the Patent US 2,990,103 granted in 1961, or the Patent RO 24,690 granted in 1936) in order to blow the boundary layer on the upper surface of dome (semi-discoidal) surface (19);

16- the low-pressure region (p-) made by blowing the boundary layer according the model of the Coanda lenticular aerodyne (the patent FR 1,156,516 granted in 1958); 17- gyroscopic devices of reaction, that develops precession forces which are oriented obliquely upwards; they are mounted in bearings and fixed to the rotating disc (20); 18- toroidal chamber in which electron beams are accelerated at relativistic speed creating the total vacuum and therefore (according the Patent FR 1,253,902 granted in 1961) applying the principle of Archimedes; 19- the outer electrode which is rigidly fixed to the cabin (5) and it has as power supply, like the upper electrode (1), the secondary (6) of the Tesla transformer; 20- the internal rotating electrode (according the Patent US 3,223,038 granted in 1965) which is coupled to the opposite terminal of the voltage source, it is charged with electric charges of opposite sign than the armature (19); in its peripheral region, this rotational (gyro) electrode has several counter-rotating components (of reaction) which use the force of precession; 21- the (semi)discoidal dome which rotates contrary to the rotating discoidal armature (20) therefore canceling its gyroscopic torque; 22- bearings devices on that are attached the two semi-discoidal rotating domes (20) and (21); 23- annular platforms rigidly fixed to the cabin (5), which have to their end the bearings (22); 24- the lower access hatch; 25- the lower side electrode which has the same high voltage power supply as the components (1), (19) and (20).

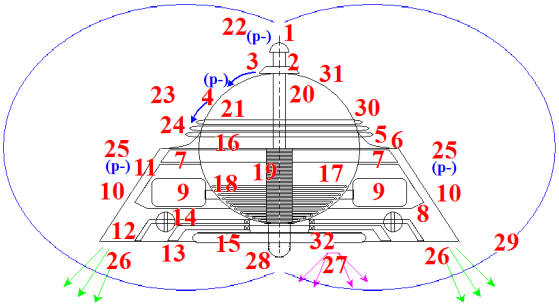

Fig.4 A simplified model of unconventional aerospace flying vehicle.

As part of the designing were taken into account the technological solutions proposed by the inventors: *Scott Redmond* (according the Patent US 7,182,295 granted for „Flying Individual Apparatus"), *Mark Tomion* (according the patent US 6,404,089 granted for „Electrodynamic Field Generator"), *R. J. King* (US 3,322,374 for „Magnetohydrodynamic propulsion apparatus"), *A. H. Bahnson* (US 3,263,102 for „Electrical Thrust production device", US 3,227,901 for „Electrical Thrust production device", US 3,223,038 for „Electrical Thrust production device „, US 2,958,790 for „Electrical Thrust production device"), *Otis Carr* (US 2,912,244 for „Amusement device"), *Harvey Fiala* (US 2011/0219893 for „inertial propulsion device"), *Harold Aspden* (GB 2,209,832 for „Gyroscope propulsion and levitation"), *Marcel Pages* (FR 1,253,902 for „Engin pour vols cosmiques"), *Ya-Ta You* and others (US 6,794,783 for „Flat rotary electric generator"), *Subrata Roy* (US 2010/0102174 for „Micro Air-vehicle of Wingless hovering").

The description of model shown in fig.4: 1- the upper side armature of the electrokinetic installation, powered by the secondary of the Tesla transformer; 2- central pillar (used for power supply) made of a (electro)conducting material; 3- lifting cyclonoid (used for sustentation); 4- region of low-pressure created by blowing the boundary layer; 5- aerodynamic flap; 6- annular air inlet for the propulsion cyclonoid; 7- propulsion cyclonoid; 8- the fairing of the service module which is located within the structure of the aerospace vehicle and it has inside the electrogen groups; 9- the electrogen groups; 10- armature fixed rigidly to the cabin; 11- toroidal conduit using for the air outlet; 12- internal mobile armature; 13- counter-rotating disk with anti-torque role and for maximizing the field effect (it is not powered by any electric source, but located within the electric field of 12 and reacting to this field); 14- reactive gyro-elements located on the periphery of the rotor (13); 15- capacitors organized in three segments offset at 120^0 each;

16- the platform of cockpit that separates the cabin from the engine module; 17- the engine module; 18- the primary of Tesla transformer; 19- the secondary of Tesla transformer; 20- the region where work the UV-C radiation sources; 21- the cockpit; 22- the low-pressure zone at the leading edge; 23- ionized air; 24- intermediate toroidal coils powered at high-frequency (microwaves) in order to ionise the air and to drive the ionized air molecules after the field lines; 25- low-pressure zone at the trailing edge; 26- ejected air at the trailing edge; 27- the action of the electric field made by the capacitors; 28- the lower side armature of the electrokinetic installation, powered by the Tesla transformer together with the elements (1), (10), (12) and (24); 29- the field lines formed around the vehicle; 30- the portholes; 31- external video cameras; 32- the landing gear compartment located in the spaces between the segments of the capacitors used for maneuvering.

4. NEW SOLUTIONS

Currently, based on the previously submitted models, it can be designed such an experimental VTOL [1] (or STOL [2]) aerospace vehicle as a demonstrator for the following *technical solutions*:

- the steam generator type Vuia – Moraru [3] operated anaerobic and applied as orientation-stabilization engine, using for flight commands the TVC [4] method;

-the oxygen plant [5] type electrolyte-regenerative [6], using an homopolar [7] generator and an hydrolytic [8] device, with a system that provides the partial regeneration [9] of the expired gas and of the water into the microatmosphere [10] of the cabin;

-the magnetic engine[11] type Moraru [12] used to drive the rotors of the eletrogene groups and the cyclonoidal devices;

-the electrostatic generator, capacitive [13] type, made by J. G. Trump [14], device operating in a high vacuum;

-the improved brushless homopolar generator [15];

- the internal wing [16] type Coanda, endowed with an high-lift system which absorbs the boundary layer on the upper side of the wing, using porous shell [17];

- the thrust vector control [18] using aerodynamic control surfaces working at the trailing edge [19];

- lifting and propulsion within the Earth's atmosphere using the cyclonoid [20] system;

- the wing with negative dihedral [21] and variable wing span, also used as landing tripod [22];

- the MHD [23] rocket engine with pulsed plasma source type Z-pinch [24] and a magnetic accelerator type Bitter [25];

- MHD propulsion system integrated [26] into the surface of the wings and containing the high voltage electric discharge device and the magnetic winding;

- the secondary electrochemical sources with granular electrodes and gelatinous [27] electrolyte.

An experimental aircraft designed to test all these technologies, might be in the form of a multi-engine rocket-plane, two-seater cote-à-cote, monoplane, mid-wing, with variable dihedral angle and span, when the wing has its maximum negative dihedral position, it can be used as a part of a landing tripod.

This flying apparatus type VTOL (vertical take-off/landing) is provided with lifting system type cyclonoid, equipped with a special semi-lenticular [28] surface for high/low-lifting [29]. When the cyclonoid [30] rotor is positioned above the surface of semi-lenticular surface, it operates in the high-lifting mode, and when the rotor is positioned on the underside of the semi-lenticular surface, it works in operating as low-lift device (the controled decreasing of lift force in order to make the downward movement of the aircraft in the vertical plane). With the lifting-cyclonoid and the high/low-lift surface, the vehicle can take-off and land slow and vertically, using almost any land surface, even the undeveloped land [31].

The control of spatial position and movement in flight is ensured through a system of vector commands composed of aerodynamic flaps at trailing edge, fitted in behind the ejector (nozzle) of the main *atmospheric engine* [32] engine, and formed from two pairs of horizontal and vertical tail assemblies located at the trailing edge and provided with mobile command surfaces. Besides this system, the experimental flying vehicle also might have an improved steam generator type Vuia-Moraru [33], with anaerobic work. This has four mini-nozzles arranged symmetric and antagonist (up-down, left-right) plus a nozzle disposed in the longitudinal axis ejecting the gases against the direction of flight, this latter facilitates the braking when the flying apparatus is moving with low speed near the ground, to land slowly and vertical. The steam generator type Vuia-Moraru (operating anaerobic) provides mini-jets for the correction of the position and orientation in space, especially in the upper atmosphere, where the classic aerodynamic surfaces become ineffective or even useless above a certain height [34].

The actuation of the *cyclonoid* devices (for lifting and propulsion) can be performed using the engine type Moraru [35], powered by the electrochemical secondary source with granular electrodes and gelatinous electrolyte.

The wing can be trapezoidal, rectangular, with variable negative dihedral and variable span, adjusted according to speed; another solution is to use the fixed tail assemblies type 4-fins placement or other models, having the same structure and role as the variant with variable geometry wing. In the latter case, the end (wing tip) of the wing is provided with an aerodynamically shaped body, type winglet [36], and a front rod which serves to ensure the good stability of the ground stationing (part of the landing tripod). The wing is also provided with an internal leakage surface (the so-called "internal wing type Coanda"), a porous upper-surface of wing, which absorbs the boundary layer. Both the upper side and the lower surface of the wing might be equipped on all its area, with discharge electrodes supplied with high voltage, and with magnetic winding [37]. Using MHD-type systems it can achieve improved performances [38], [39], [40] for the systems which apply the Coanda [41] effect, but also in the systems designed to reduce [42] the aerodynamic resistance (the drag). The air is ionized by the electric discharges and then accelerated in a magnetic field, thus optimized the air leakage in the region of boundary layer and optimized the propulsion by a significant drop in air resistance (drag force) and the warming caused by the air friction. With the increased speed of flight, the crew can adjust the negative dihedral angle and the wing span [43]. The work of the wing can be both improved by high-lift device which absorbs the boundary layer optimizating its aerodynamic performances, and by the magnetohydrodynamic control of the air flow. At the same time, the wing might be used (during the landing and ground parking) as a landing tripod (instead of the classic landing gear) and in this regard it can be equipped at its end with a rubber roller package [44]. To serve as a landing tripod, the wing have to be adjusted to the position of the maximum negative dihedral angle.

The power supply of the MHD system inserted in the wing structure, but also of the plasma source of the main engine, might be achieved using the Trump electrostatic capacitive generator [45] (or improved models [46] of it) operating under vacuum. It can supply megawatt [47] power and high voltage if operating in pulsed mode. The magnetic coil that enfolds the wings is powered by an improved model of the brushless homopolar generator [48], that provides a current high enough to obtain the required magnetic induction. The electrostatic capacitive generators can also supply special engines [49] which work at high voltages and are much more simple and efficient than the classic electric engines.

The motorization is made via three main types of propulsion systems:

- *the atmospheric propulsion system*, which has to ensure the functioning exclusively within the Earth's low atmosphere and stratosphere;
- *the space propulsion system*, which has to operate in the upper atmosphere and outer space;
- *the orientation-stabilization engine* that works both in the dense atmosphere and outer space.

The atmospheric propulsion system consists of two rotary devices type *cyclonoid*, one used for lifting and the another for propulsion [50]. Also, the MHD system inserted in the wing structure and the internal air-leakage system or for the absorption of boundary layer on the upper side of the wing, still belong in this category.

The space propulsion system (the engine for cosmic flight) consists of a chamber with coaxial electrodes Z-pinch [51] type, with pulse operation, supplied by a DC high voltage generator (pulse operation too), like the one invented by J. G. Trump. The same propulsion system contains a *Bitter* [52] magnetic accelerator with continuous operation. It is supplied from the homopolar generator, and the Z-pinch co-axial discharge chamber is fueled with the hydrogen produced in the hydrolytic basin of the oxygen plant [53]. There, the water is decomposed into hydrogen and oxygen, of which the oxygen is sent in the micro-atmosphere of the cockpit, and hydrogen is sent to a storage tank endowed with metal hydrides [54] or is sent directly inside the Z-pinch discharge chamber of the cosmic engine.

The hydrogen is ionized, magnetic compressed and accelerated using the phenomenon of Z-pinch, being sent inside the magnetic accelerator where the plasma is again confined and accelerated to relativistic values for the effective exhaust velocity.

During the movement in the upper atmosphere and outer space, as any time when a quick correction of the orientation and spatial position of the vehicle is necessary, it might be used the orientation-stabilization engine with micro-jets of steam. It uses an anaerobic combustion mixture which fueled a steam generator, according to the invention of Traian Vuia [55], later improved by Nicolae Moraru [56]. This high pressure steam generator, supplies five mini-nozzles located right at the leading edge of the aerospace vehicle, and it can act on the direct command of the pilot or automatically, on the autopilot command. Its consumption is small, its interventions being brief and with very low flow rates. Given the very high initial pressure of the steam, the thrust is sufficient to achieve the desired positioning/orientation of the vehicle. Regarding the main engine operation, it is optimal in the rarefied strata of the atmosphere and in outer space, however, it is not impossible (but not recomanded) in the dense layers [57] of the atmosphere. The hydrogen plasma is initially accelerated (about 1000 km/sec) by the magnetic compression (Z-pinch) and then (within the magnetic accelerator type Bitter) with a magnetic field of more than 20 Tesla. The action of the magnetic field on the plasma represents the reaction force underlying the thrust developed by this engine.

CONCLUSIONS

First, we need to notice that the current technologies applied in the aerospace field are based on a number of fundamental errors:

-the optimal aerodynamic configurations are not used or even no model close to them;

-there are not canceled but only reduced in small measure the shock waves and the marginal vortices formed during the movement in the atmosphere;

-there are not used the electrical and magnetic phenomena that could force the air to follow much better controlled trajectories;

-the external surface of the aircrafts is not used to obtain the full lift and propulsion capacity (using the MHD methods);

-there are not taken into account the methods of creating regions of vacuum or low pressure at the leading edge or in the boundary-layer zones;

-there are not considered the hybrid methods and technologies etc.

All these aspects and others not mentioned here, will therefore be considered in order to obtain completely new models for the design of aerospace vehicles in the near future.

The revolutionizing of the aerospace technologies represent a field which still reserve us a lot of surprises and therefore, more and more opinions are expected in this respect, particularly from specialists.

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