[0926] Furthermore, optionally, sides **9.31** and **9.32** differ in shape such that one of the sides has one convex withers and the opposite side has a two-humped airfoil profile providing for the two-stage operation of the Coanda-jet-effect as described hereinabove with the reference to FIG. **8***d*. Such asymmetrical blades, when exposed to oncoming fast airflow **9.1** moving with a high M-velocity, higher than the specific M-velocity, become subjected, on the one hand, to the de Laval retarding effect, and on the other hand, to the de Laval enhanced jet-effect. This provides for extra-increased lift-forces rotating axle **9.2**. In this case, the extra-efficiency of the modified improved wind-turbine is expected in a wide range of velocities.

[0927] FIG. **9***h* is a schematic drawing comprising the side view and front view of an improved wind-turbine **9.7**, constructed according to the principles of the present invention to operate under relatively fast airflow **9.70** for producing the electrical power at the expense of the warmth of relatively fast airflow **9.70**. In relation to all the principal features, the improved wind-turbine **9.7** is similar to the improved wind-turbine **9.0**, described hereinabove referring to FIG. **9***g*, but now, referring to the aforementioned optional diversity of the principal features implementation, the biconvex actually-airfoil blades, which having opposite at least partially convex sides **9.71** and **9.72** with withers differing in convexity, are further curved and screwed to optimize a suppression of turbulences as well as are cascaded one downstream after another to provide a multi-stage repeated operation of the Coanda-jet-effect thereby contributing to the desired cumulative lift-force to rotate axle **9.73**.

[0928] In view of the foregoing description referring to FIGS. **9***g* and **9***h*, it will be evident to a person skilled in the art that modified improved wind-turbine **9.0** or **9.7**, when attached to a flying aircraft, is capable for efficient harvesting of the electrical power from the ambient air warmth.

[0929] Furthermore, in view of the description expound hereinabove with references to FIGS. **5***i*, **5***j*, **5***k*, **9***a*, **9***b*, **9***c*, **9***d*, **9***e*, and **9***f*, the inventor points out that the mentioned multiplicity of modified improved wind-turbines **9.0** or **9.7**, arranged sequentially one downstream after another [not shown here], results in generation of acoustic waves accompanied by extraction of the internal heat energy of ambient air in favor for the wave power due to the enhanced waving jet-effect. Thus, a system, comprising the arrangement and a detector of the acquired wave power, has an additional degree of freedom to increase the efficacy of the producing of electricity.

[0930] In view of the foregoing description referring to FIGS. **9***g* and **9***h* in combination with the foregoing description of subparagraphs "Point of Sail" and "Flying Bird", both with the reference to prior art FIG. **1***i*, it will be evident to a person skilled in the art that the construction of modified improved wind-turbine **9.7**, when having a controllable speed of the axle **9.73** rotation adapted to the velocity of oncoming airflow **9.70** to keep the airflow remaining laminar, provides a controllable net jet-thrust against the oncoming airflow **9.70** and so becomes applicable as a kind of jet-engine for a controllable and substantially noiseless flying.

A Jet-Transformer

[0931] FIG. **9***i* is a schematic illustration of a concept to transform the ambient warmth into electricity. The concept is embodied as a jet-transformer **9.80** comprising:

- **[0932]** a vertically oriented specifically shaped pipe **9.81** having the optimized convergent-divergent inner tunnel, described hereinabove in sub-paragraph "Convergent-Divergent Jet-Nozzle" with reference to FIG. **6***a*,
- **[0933]** at least one laminar flow maker **9.82**, conceptually, having a geometry of convex-concave corpus **9.821** supplied by a heater **9.822**, i.e. being designed as the convex-concave corpus **512** described hereinabove with reference to FIG. **5***e*, and
- **[0934]** at least one improved wind-turbine **9.83**, designed as the improved wind-turbine **9.7** described hereinabove referring to FIG. **9***h*,

the all, constructed according to the principles of the present invention.

[0935] The specifically shaped pipe **9.81** is elevated above the ground to allow for the ambient air **9.841** entering the optimized convergent-divergent inner tunnel from below. The heater **9.822** supplies the heat energy to a fluid portion adjacent the focus of the parabolically-concave surface **9.823** of the convex-concave corpus **9.821**, thereby, on the one hand, to trigger the Archimedes upward-vectored buoyant force lifting the heated fluid portion and, on the other hand, to align the airflow **9.842** upward along the vertical axis **9.851**. The upward airflow **9.842** is relatively slow and substantially-laminar. The optimized convergent-divergent inner tunnel is designed according to the equation of principle (**6.13**) to provide for a substantial suppression of jumps of the air thermodynamic parameters and, thereby, to provide for the substantial acceleration of the airflow **9.842**, laminarly and so noseless streaming upward. So, the heating triggers the upward motion of air, and, in turn, the fluid motion itself triggers the convective acceleration as the airflow moves through the narrowing cross-section of the optimized convergent-divergent inner tunnel.

[0936] Considering:

- **[0937]** the ambient temperature above the exhaust **9.854** equal T_e,
- **[0938]** the temperature near the level **9.852** equal T_0, and
- **[0939]** the temperature near the narrow throat **9.853** equal T*,

equation (7.1c), described hereinabove referring to FIG. **7***a*, says that:

- **[0940]** on the one hand, to obtain the de Laval jet-effect for air utilizing the optimized convergent-divergent inner, one must provide the ratio T_0/T, at least of 1.2; and
- **[0941]** on the other hand, to accelerate an air portion up to the velocity of sound, one must provide the ratio T_0/T_e at least of 1.7.

[0942] Hence, providing the heating of air near the level **9.852** up to about the temperature 234° C. only, the condition of the enhanced de Laval jet-effect becomes satisfied, in turn, providing that the relatively low heat power, supplied by heaters **9.822**, triggers the enhanced de Laval jet-effect transforming the warmth of the moving airflow into the acquired kinetic power of the airflow.

[0943] The energy E_0, necessary for warming **1** cube meter of air from the temperature 25° C. up to the temperature 234° C., is estimated as $E_0=\rho V C_V(T_0-T_e)$, where V is the volume of 1 cube meter, ρ is the air density, $\rho\approx1.2\ \text{kg/m}^3$, C_V is the air heat capacity, $C_V\approx0.72$ kJ/(kg·K), thereby, $E_0\approx1.2\times1\times0.72\times(234-25)\approx180$ kJ.

[0944] As the mentioned assumed condition allows to accelerate the airflow portion **9.854** up to the specific M-velocity $M^*=\sqrt{(\gamma-1)/\gamma}$ near the narrow throat **9.853** and to accelerate the airflow portion **9.854** up to almost the speed of sound (i.e. the exhaust M-velocity is of $M_e \approx 1$), then:

[0945] the acquired kinetic energy, K_e, of the outflowing airflow portion **9.854**, which (the acquired kinetic energy K_e) is specified as the difference between bringing heat energies, equals $K_e \approx n\times(T_0-T_e)\times R$, where n is number of moles in the considered **1** cube meter of air, $n\approx 44.64$, and R is the specific gas constant, approximated for the air by R=287 J/(kg·K), i.e. K_e 44.64×209×287≈2,677 kJ, that, in turn, says that the acquired kinetic energy K_e may exceed the consumed energy E_0 at least at subsonic velocities by the factor of 15; and

[0946] the acquired kinetic energy, K*, of the airflow portion **9.854**, when crossing the narrow throat, equals $K^* \approx n\times(T_0-T^*)\times R \approx 764$ kJ, thereby showing that the acquired kinetic energy K* may exceed the consumed energy E_0 by the factor of 4.24.

[0947] It will be evident to a commonly educated person that, if not to use the optimized convergent-divergent inner tunnel, designed according to the equation of principle (**6.13**), the mentioned effective conversion of the airflow heat energy into the airflow kinetic energy is impossible because of originated turbulences and Mach waves, both accompanied by noise and energy dissipation back to the air warmth.

[0948] The improved wind-turbine **9.83** meets the upping laminar airflow and provides for a production of electricity neither retarding the upward airflow and nor distorting the upward airflow laminarity as described hereinabove referring to FIGS. **9***g* and **9***h*. The inventor points out again that the improved wind-turbine **9.83** harvests electrical power at the expense of the airflow warmth but not from the airflow kinetic power, wherein the increased kinetic power of the airflow plays the role of an enforced trigger of the lift-force rotating the improved wind-turbine. Moreover, optionally, in-line arranged several improved wind-turbines **9.83** provide for a multi-stage repeatedly harvesting of electricity from the same airflow portion.

Method for Computational Analysis

[0949] FIG. **10** is a schematic block-diagram **1000** of a method for computational fluid dynamics numerical analysis, based on the principles of the present invention.

[0950] Block **1010** represents standard pre-processing comprising a defining the calculation space and mesh for the space quantization.

[0951] Block **1020** represents the processing itself, i.e. the algorithm calculating numerically the spatial distribution of the velocity-vector (three components), static pressure, temperature, and density (total six components), programmed according to the principles of the present invention, and applying a computational analysis basic principle, comprising a digital approximation of a space, comprising the flowing fluid, by a virtual spatial mesh partitioned into non-overlapping quantization cells bordered by imaginary boundaries.

[0952] The processing is such that the calculated spatially distributed values are satisfied, on the one hand, to suggested modified equations of fluid motion (**5.6**), (5.7), (5.9) having an exact solution, and, on the other hand, to the gravitational, thermodynamic, and kinetic theory laws represented by specified equations (5.2), (5.3), (5.4), (5.5), and (5.8), wherein the adequacy of the solution is confirmed by the Bernoulli theorem, equation (5.10).

[0953] Block **1030** represents the standard post-processing procedure for the solution filing and visualization.

[0954] Thereby, one can implement blocks **1010**, **1020**, and **1030** as a computer program product comprising a computer usable medium having computer readable code and instructions embodied and stored therein for execution on a general purpose computer. The code and instructions, when executed by the computer, cause the computer to perform the method for computational fluid dynamics.

[0955] FIG. **11** comprises Table-1 showing several equations:

[0956] On the one hand, classical, derived from the Euler theory in frames of the continuum mechanics and thermodynamics; and

[0957] On the other hand, specified in the present invention, derived basing on the principles of the kinetic theory of matter.

[0958] The inventor points out that:

[0959] The difference between the expressions of the equations of fluid motion: classical and specified, is predetermined by the difference of definitions of the inner static pressure and density. Namely, in the continuum mechanics, the static pressure is defined as an integrated mechanical parameter characterizing the force acting on a wall, wherein the static pressure and mass density are inter-independent; and, in the present invention, the interrelated inner static pressure and mass density, both are defined from the point of view of the kinetic theory of matter applied to molecular fluid;

[0960] The generalized adiabatic compressibility parameter, indicated by γ, generalizes the adiabatic compressibility-constant, indicated by j, by taking into the consideration that the adiabatic compressibility properties are predetermined by both: the adiabatic compressibility-constant and the van der Waals constants;

[0961] The equation of principle (**6.13**) differs from the classical equation (1) derived basing on the Euler equation defined in frames of the continuum mechanics; and

[0962] The specific M-velocity $M^*=\sqrt{(\gamma-1)/\gamma}$ differs from the M-velocity of 1 Mach, which plays the role of the specific M-velocity in the classical aerodynamic theory of the de Laval nozzle.

[0963] The method, based on the kinetic theory of matter, provides the modified equations of fluid motion, thereby, reducing a sense of one of the Millennium Goals to solve the problem of the Navier-Stokes equation solution existence.

[0964] Considering a fluid as a substance composed of randomly moving molecules, the method enables applications optimization, the physical essence of which is to bring in an asymmetrical influence into the molecular fluid, and, thereby, to originate a motion of molecules in a prevalent direction. For instance, such an asymmetry is provided by a structured and heated surface thereby repelling the molecular fluid in a prevalent direction, or by a structured naturally hydrophobic surface contacting with water, or by a structured and electrically charged surface interacting with an