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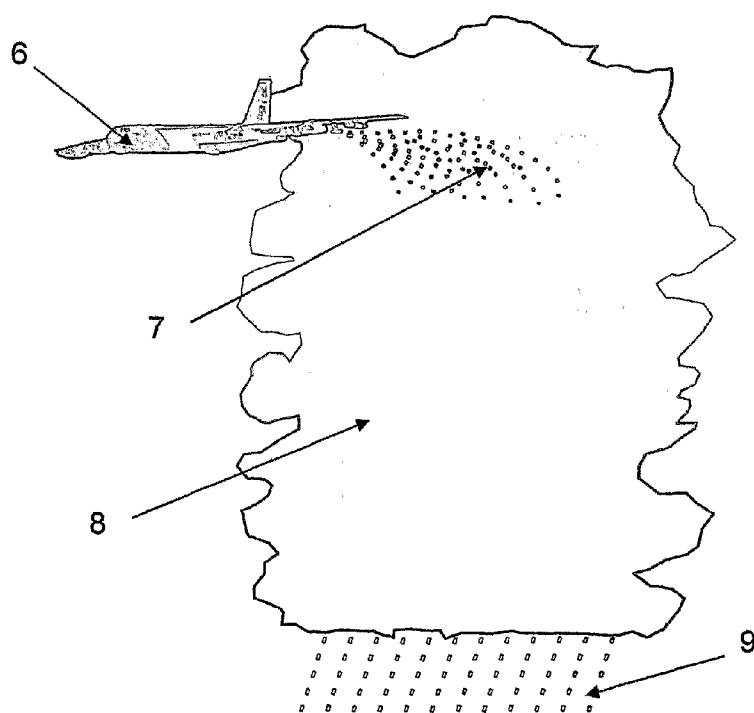
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(54) Title: PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A
RAIN WASH IN THE CIO GAS, REDUCE THE DESTRUCTION OF THE OZONE LAYER AND A REPLACEMENT PROCESS
IN SITU OF THE STRATOSPHERIC OZONE



(57) Abstract: Production of localized
artificial rains in polar stratospheric clouds,
to promote a "rain wash" in the CIO gas,
reduce the destruction of the ozone layer
and a replacement process "in situ" of
the stratospheric ozone. This patent is
summarized by the application of two new
processes, the first equipping a special aircraft
(8) to produce artificial rain (9) in the interior
of polar stratospheric clouds (2) unleashing
rains that brings to the ground the CIO gas,
responsible for the destruction of the ozone
at the Arctic and Antarctic poles. The second
process adapting a second aircraft specially
equipped to produce ozone gas "in situ"
using two already verified processes, the
production of ozone gas "in situ" using two
already verified processes, the production of
ozone in small scales through electric sparks
joined with the production of ozone through
the Doppler effect in large scale, designated
to recompose the ozone Layer in the Planet's
Stratosphere.

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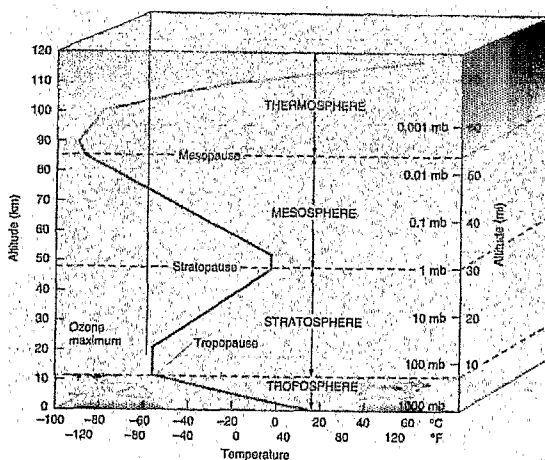
**“PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN
POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A “RAIN
WASH” IN THE CIO GAS, REDUCE THE DESTRUCTION OF THE
OZONE LAYER AND A REPLACEMENT PROCESS “IN SITU” OF
5 THE STRATOSPHERIC OZONE.”**

The so called Protecting Layer of Ozone is a region of the low and medium Stratosphere of the Planet at an altitude of 10 to 35 km where a higher concentration of the Ozone gas occurs in the Atmosphere. This layer is responsible for a vital function in the
10 maintenance of the thermal equilibrium of the Planet and in the protection of human, animal and vegetable life, because the Protecting Layer of Ozone absorbs great part of the Ultra Violet B (UVB) solar radiation of wave length from 10 to 400 nm (nanometers), which is reflected over the Planet, with great
15 energetic and destructive power, also considering that the UVB radiation is cancerous to the human skin and mutant in the DNA of animal and vegetable species.

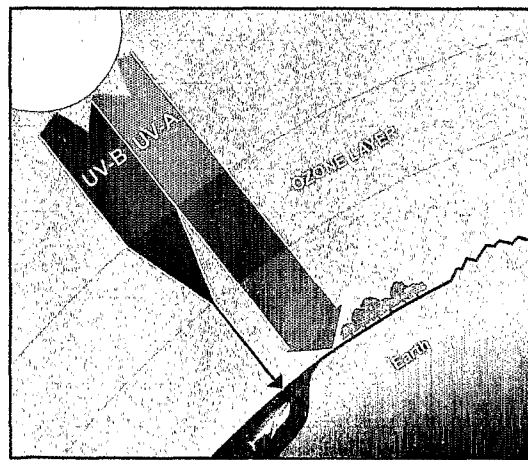
The Ultra Violet radiation constitutes approximately 9% of the solar radiations over the Planet, but in energetic power are more
20 powerful than the visible light radiations which's wave length go from 400 to 700 nm, the white light radiations close to the infra-red 700 to 4,000 nm, and the infra-red radiations of 4,000 to 10,000 nm, that composes the total solar radiation that reaches the Planet Earth. When absorbed by the gases oxygen (O₂) and ozone (O₃) in the
25 Ozone Layer situated in the low and medium part of the Stratosphere (between 12 and 35 km), it heats up and creates a thermal barrier between the Troposphere, the lowest layer of the

terrestrial atmosphere, and the Stratosphere. This barrier is known as the Tropopause, which occurs between 15 km of height at the equator and 10 km at the poles.

From the Planets ground that has a typical average temperature of approximately 15° , at the Troposphere, as the altitude increases, the air temperature decreases, and when we reach the tropopause, the temperature of the air that decreases reaches approximately -48°C . Entering the Stratosphere, the temperature stops dropping and remains the same for some kilometers of height and afterwards starts gradually increasing in the Stratosphere, according to graph 1. Thus the Tropopause, an aspheric surface that divides the Troposphere and the Stratosphere: division existing only because of the Ozone Layer that detains the energy proceeding from the UVB radiation absorbed by the Stratosphere, according to graph 2.



Graph 1



Graph 2

If the Ozone Layer didn't exist, the UVB Rays wouldn't be absorbed in the Stratosphere and would reach the ground with all its intensity: the consequences would be dramatic: the Ground (soil), the Oceans and the animals and vegetables directly absorbing the

UVB radiation, with short wave length, and much more powerful energetically. These rays proven to be cancerous and mutant, cause skin cancer, alter the human and animal DNA, and the living cells in general. The Stratosphere would cool down more, and not occurring the absorption of the UVB rays, the Tropopause would disappear. The Troposphere and the Stratosphere would be one, because the main distinction between them is done through the stratospheric ozone layer. The negative temperature would drop continuously, much lower than the current temperature, according to graphs 3 and 4 comparing graph 3 with the original Ozone Layer, and graph 4 with the Ozone Layer reduced in half.

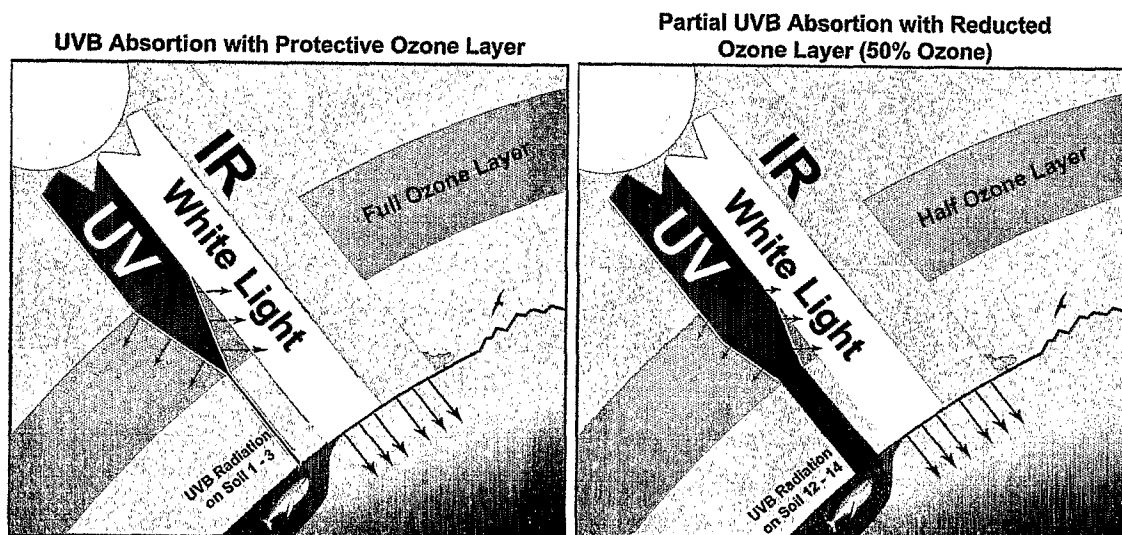
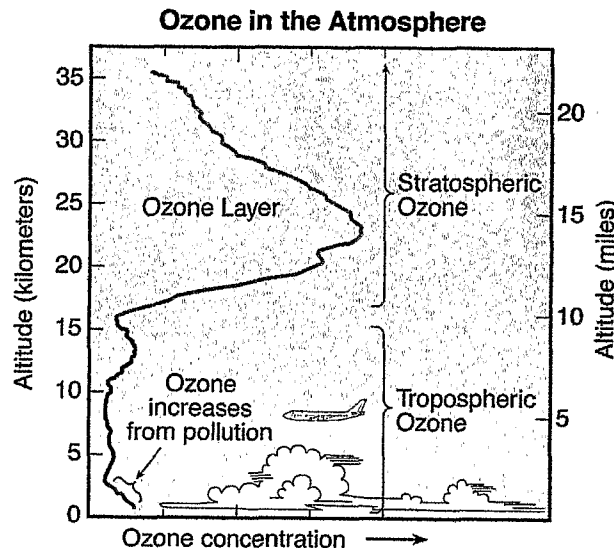


Image 1

Image 2

The Troposphere contains 80% of all the air in the Atmosphere, while the Stratosphere contains 19% of the air: 99% of the existing air in the atmosphere is contained in both layers. However, the ozone layer concentrates itself in a height between 12 and 35 kilometers and the Stratosphere goes from 12 to 48 kilometers in height. Above the Stratosphere two more layers exist,

the Mesosphere and the Thermosphere reaching the whole Atmosphere at a total of 120 km in height. The two last layers contain only 1% of the air in the atmosphere.



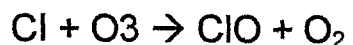
Graph 3

The ozone gas layer which is more concentrated between 12 and 35 km according to graph 5 actually has a small volume of Ozone Gas: in the lower parts of the Troposphere there are approximately 0.1 ppm near the ground, and 0.02 ppm in the highest parts of the Troposphere. In the Stratosphere the volumes of Ozone Gas besides being much higher, are still quite low: 10 to 12 ppm (see graph 6). It is estimated that from the 60's to the 70's the Global ozone in the atmosphere reached 6,000 megatons: today the layer has only 3,000 megatons of ozone.

With the industrialization, especially after the 50's, man started to produce innumerable chemical products adopted in an increasing scale in the 60's, while the world population grew considerably. One of the great products was the refrigerator to preserve the foods, another popular one in the 70's and 80's, was the Air Conditioner,

found in homes, offices and automobiles, last the plastic foam for packaging, mattresses and upholstery. All these products used the Freon gas or CFCs, or fluorocarbons, a gas with a very stable molecule, that once released in the atmosphere, does not
5 decompose with the clouds, rains, heat, chemical vapors, and many different particles existing in the Troposphere. These molecules, besides being heavier than the air, perfectly mix with the air and ascend gradually through the troposphere until they reach the stratosphere. Studies suggest that the gas ascends very slowly, with
10 authors diverging between 5 to 15 years of time for the molecule of CFC reach the medium stratosphere (20 to 30 km of height).

Arriving in the Stratosphere unharmed, the CFC gases reached by the UVB radiation, decomposes, releasing the chlorine gas in the Stratosphere, initiating a dramatic and continuous
15 destruction of the ozone gas in the Stratosphere, gradually destroying as a consequence the Protecting Ozone Layer, in a speed that is worrying the scientists: one atom of chlorine can destroy millions of Ozone molecules, through the years and since the existence of this problem, the world is on watch and the
20 observation began, global measures of containment by all the signatory countries from the Montreal Protocol were taken with relative success.



The Montreal Protocol united all the Countries in the World
25 and for the first time in history a historical understanding was reached, that was put in practice to eliminate the production of the CFC gas, something that actually occurred. Thus, nowadays the

production of CFC does not occur anymore. Nevertheless the CFC already produced is still in many old refrigerators and air conditioners and the estimated time for this gas to reach the Stratosphere is of 5 to 15 years and the continuous destruction of the Ozone worries more and more, because today it is verified that that 50% of the global ozone has already been destroyed and the destruction continues in a dramatic rate of 3% to 4% of the total ozone or approximately 80 megatons of global ozone.

In 2001 expert ozone scientists constituted by atmosphere chemists and photochemists had already admitted in their conclusions on the IPCC 2001 that ..."The exhaustion of the Global Ozone is a reality"... It was established that ..." the exhaustion would lead to a cooling of the stratosphere and that it is necessary to better understand the correlation with the global warming caused by the CO2 increase in the troposphere, that causes the warming of the planet"...

The author disagrees with the conclusions above and understands that the exhaustion of the Protecting Ozone Layer is one of the biggest challenges that humanity will have to face in short term, because the Planet is being reached directly and increasingly by the UVB radiation, which's consequences we are already feeling without realizing, for example in the unusual increase of the extreme storms since 1985. The annual loss of the total ozone increased significantly since 1985, compared to with the increasing incidence of extreme storms that clearly demonstrates the effect of direct UVB radiation increase over the planets surface. We need to hinder at all

cost the destruction of the ozone through obvious means, object of the present Patent of Invention:

1. Removing mainly from the polar Stratosphere the ClO Gas (chlorine monoxide), originated by the decomposing of the CFC gas in the stratosphere. This gas goes concentrating above the North and South Poles where its contents reaches approximately 1ppb, while around the planet it reaches much lower numbers. In the polar Stratosphere the ClO mixes with the Ozone that naturally concentrates above the Planets Poles, as a consequence of the air mass movement above the rotating planet.

During the polar winters, few scientists noticed the formation of polar stratospheric clouds, known as PSC (Polar Stratospheric Clouds), that occur during the polar nights when the temperature reaches figures below -78°C . These clouds not much studied by the climatologists and by experts in atmosphere photochemistry, that focus their studies in measuring the destruction of the ozone, reach approximately 35 km in height and cover the whole Antarctica during the polar winters. In the interior of the Polar Stratospheric Clouds on the long nights of the "Polar Winters" the ClO mixes with the ozone. When the polar night ends, the Polar Stratospheric Cloud starts receiving UVB radiation; and the presence of super cold water droplets and ice crystals in the interior of the PSC clouds, together with the O₃ and the ClO creates a UVB radiation diffused and amplified that, reflects intensively on the droplets and ice crystals present and in a period of four days, while the PSC cloud dissipates, the UVB Radiation destroys all the polar ozone existing in the interior of the cloud, which corresponds to approximately from 80 to

100 megatons of ozone destroyed annually, in the first weeks of October.

The process object of the present Patent of Invention was created to efficiently with draw, by an "Artificial Rain Wash" the CIO
5 concentrated in the polar stratosphere in levels of 1 ppb, causing an artificial stratospheric rain in the PSC clouds during the polar nights. These Artificial Polar Stratospheric Rains will be able to propitiate an important withdraw of the CIO through the "Rain Wash" until the presence of the stratospheric CIO extinguish, decisively contributing
10 to paralyze or reduce relevantly the destruction process of the Protecting Layer of Global Ozone. Without consistent data of the quantity of water in these clouds, in case the quantity of water of super cold water in the interior of these clouds is not enough to cause rain, we still can alternately use the same process with bigger
15 drops, producing a descending net of size controlled water drops containing approximately from 50 to 100 super cold collecting water drops that in free fall will collect the stratospheric CIO, bringing it to the ground.

Man has produced the CFC Gas that helped humanity
20 preserve food in the refrigerators and has helped providing more thermal comfort with the air conditioning and material comfort propitiated by the foam and plastic mattresses. Inadvertently the CFC causes severe destruction in the stratosphere of the Protecting Ozone Layer putting at risk humanity survival. Now it is left for man
25 himself to invent scientific solutions to fix consciously and efficiently the error inadvertently committed in the past, withdrawing the CIO gas from the stratosphere.

2. Artificially producing the Ozone "in situ" and in large scale with aircrafts in stratospheric flights, equipped with devices consciously created, that are able to return in large scale, superior volumes of the approximately 100 megatons of Global ozone destroyed during the polar winter, gradually returning the 6,000 megatons of global ozone initially existent in the atmosphere.

The author introduces in the present Patent request, the two processes authored by himself to Consciously Modify the Climate and the Environment, in relation to the Ozone Layer, aiming with his two Processes, the first to clean the CIO gas concentrated in the polar atmospheres through an "Artificial Rain Wash" and the second to return "in Situ" the ozone annually destroyed unconsciously by man.

How is the ozone produced by nature? The Scientific Literature reports three forms to obtain the ozone: In the Troposphere the ozone is produced through electrical sparks that also occurs naturally during the storms with the thunders and lightning. In the presence of these sparks two molecules of oxygen form one ozone molecule and release one oxygen atom. In the stratosphere, with the lack of electric sparks, the scientists suppose that the ozone is obtained by the breaking of the oxygen molecules (O_2) through the UVB radiation, releasing two atoms of oxygen ($O + O$). In sequence, most part of these atoms of oxygen once again reunites with the oxygen molecule (O_2) releasing heat that warms up the stratosphere; but a small fraction of the atomic oxygen can unite, in certain conditions, with the molecules of oxygen, forming the ozone:

In the Troposphere: $2\text{CO}_2 + \text{electric spark} \rightarrow \text{O}_3 + \text{O}.$

In the Stratosphere: $\text{O}_2 + \text{UVB} \rightarrow \text{O} + \text{O}.$ (occurs during the zenith)

$\text{O} + \text{O} \rightarrow \text{O}_2$ (occurs with most of the

5 O_2 after the zenith)

$\text{O}_2 + \text{O} \rightarrow \text{O}_3$ (forms in small volume)

This last reaction only occurs in certain rare conditions, with the existence of the Doppler effect as a physical catalyst (Liou), or in the presence of NOX as a chemical catalyst (Crutzen), producing
10 very small amounts of ozone, that are not able to return the volume that is being destroyed annually by the CIO accumulated at the polar region, being predicted the complete exhaustion of the stratospheric ozone by the IPCC 2001, by the next decades. These forms of stratospheric ozone production are tested and verified in laboratory.

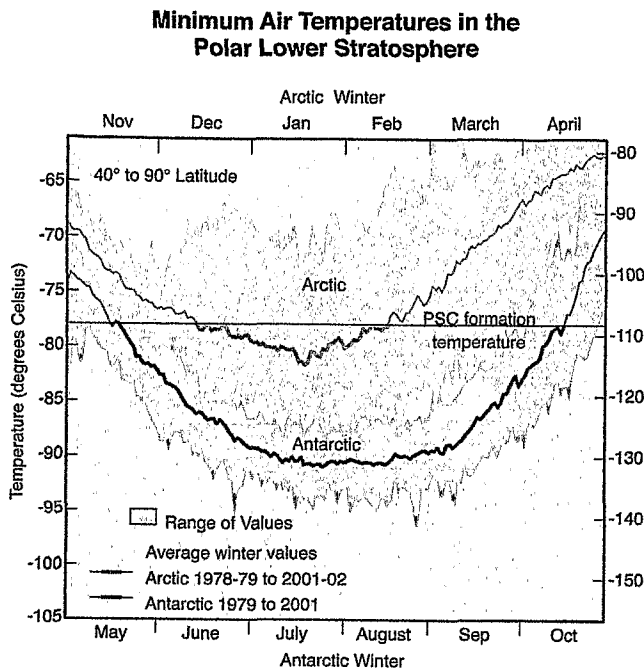
15 The natural production of the stratospheric ozone can result as a combination of two processes. The stratospheric ozone layer could have been produced and accumulated by thunder and lightening in the troposphere and slowly accumulated during millenniums or naturally produced in the stratosphere, in a small
20 scale and accumulated, by the Doppler process, and today is being destroyed in a few decades, because of the CIO inadvertently produced by Man. The fact that it is verified that approximately 50% of the existing ozone in the 70's has already been destroyed in approximately 20 to 25 years that the current rate of destruction is
25 3% of the total or 80 megatons per year, in a great destruction with a slow replacement is a reality scientifically verified.

SO IT BECOMES FUNDAMENTAL TO AVOID THE LOSS OF OZONE THAT OCCURS ANNUALLY IN THE POLAR STRATOSPHERE, URGENTLY DEVELOPING, PROCESSES THAT CAPTURE THE CHLORINE MONOXIDE THAT
5 **CONCENTRATES IN THE POLAR STRATOSPHERE, OBSTRUCTING THE CONTINUOUS DESTRUCTION OF THE OZONE AT THE POLES AND PROCESSES THAT HELP ARTIFICIALLY REPLACE THE DESTROYED OZONE.** These are

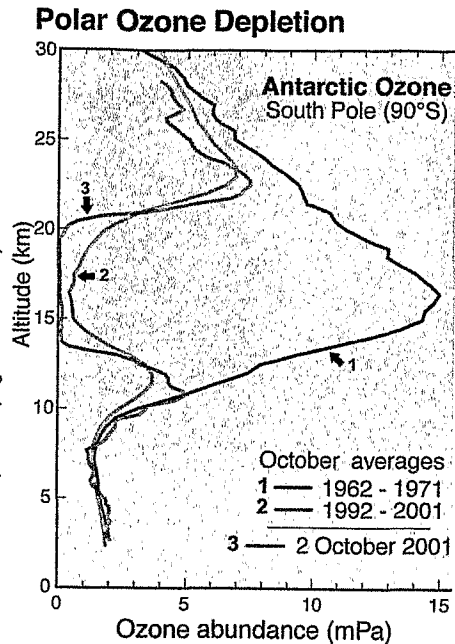
the objectives of this Patent of Invention.

10 Due to the rotation of the Planet and the air currents in the Stratosphere a natural and gradual concentration of the ClO gas occurs above the Artic and Antarctic Poles. At the place where the concentration of these gases occurs, an intense destruction of the stratospheric Ozone above the Poles occur, during the polar spring
15 in the beginning of October. During the winter there is the formation of an unusual clouds, not much perceived by meteorologists that do not cite its existence in books related. The Polar Stratospheric Clouds are known as the initials PSC (Polar Stratospheric Clouds) by the Ozone Layer experts. Graphs 7 and 8 show the progressive
20 decline of the ozone above the Antarctic polar cap and the total inexistence of the ozone in the year 2001, exactly where it is formed the "hole" in the Ozone Layer.

The phenomenon occurs when during the Antarctic winter coincidently forms a large polar stratospheric cloud, through
25 temperatures below -78°C .



Graph 4



Graph 5

It strangely forms every winter, a Polar Stratospheric Cloud more than 90,000 feet tall, known internationally by the ozone scientists as PSC Polar Stratospheric Clouds. To verify the theory that the gases released by the CFC that release chlorine were destroying the ozone layer, a historical flight was planned using a spy aircraft that flies in altitudes of at least 90,000 feet (for strategic reasons the maximum altitudes are not revealed). During the mission the aircraft received the ER-2 designation. The objective was to collect air samples in high altitudes and verify that there were concentration of ClO, which unfortunately was verified, causing great impact in the scientific world: it was verified that the accelerated destruction of the polar ozone occurred in the concentrated presence of ClO, a gas of anthropogenic origin, derived from CFC, present in the polar stratosphere.

An observation that maybe has passed unknown was the statement of the aircrafts Military Pilot, Ron Williams, veteran pilot of the U-2 in spy missions, who stated afterwards for Time Magazine: “... when I initiated my mission at 61,000 feet (20 km), I flew the whole time covered in a cloud and I never got out of it until I completed the mission... I never saw a cloud in these altitudes my whole life: I always flew in the stratosphere under a blue clean sky...”. Another conformation that catches our attention, is the conclusion of Scientist Joe Farman, who calls Antarctica with much property as “ The Planets Drain”.

If in the Antarctica polar winter a Polar Stratospheric Cloud PSC is being produced, Nature is clearly warning us that the Tropopause does not exist above the Antarctica, because the Ozone Layer does not exist. In the Antarctica Atmosphere there is not either Troposphere neither Stratosphere. The Ozone Hole is obviously the Tropopause Hole, which is progressively increasing. The convective and stratiform clouds that do not pass to heights above the Tropopause, are going further, transforming into Stratospheric Clouds. What does this statement teach us?

We will speak here about a very important concept of the Super Cold Water that occurs in the Troposphere, discovered by Bergeon in the 30's, which explains that in the Tropopause where the temperature reaches -48°C , the water remains in a tenuous equilibrium in liquid state called super cold water, without freezing and existing together with the water vapor and the ice crystals. Without the ozone layer absorbing the UVB radiation and

warming the Stratosphere, the Tropopause ends and the stratospheric temperature will be able to decrease.

Exist some actions of Conscious Modifications of the Climate and Environment, that can be unleashed to try to correct
5 the Climatic Changes Inadvertently Caused by Man, Certainly Putting at Risk The Survival of Its Own Specie:

Maybe with a lot of luck and lots of DIVINE HELP, we will be able to cause a Polar Artificial Rain in Antarctica, in the Polar Stratospheric Clouds. The author has developed a process of
10 localized artificial rain production, scattering size controlled water drops, which's patents are deposited under the number PI0104199 in Brazil and PCT 03/00027 in Geneva. This patent is a specific variant to try to produce rains in the Antarctic Continent with the process developed by the author and alternatively, by other
15 processes tried in the past successfully, to produce artificial rain, scattering Dry Ice or Silver Iodide in the form of vapor. These processes and the ones produced by the author, where verified to function in producing artificial rain in super cold clouds. The authors' process produced rain at -8°C . In this case the rains production has
20 a new purpose: to Wash ClO Gases harmful to the ozone layer in the interior of the polar stratospheric clouds, process described later on.

On the other hand, with the total ozone being drastically reduced at an annual rate of 80 to 100 megatons, already reaching
25 half of the total existing from the 60's to the 70's the equivalent thickness in Dobbs units reduced drastically. Furthermore since 1985, the direct incidence of the UVB radiation over the planet

started to increase significantly, causing the gradual increase of the UVB radiation intensity that reaches the planets' surface directly.

A greater volume of the incoming UVB radiation in the surface, especially in the equatorial regions where the protecting ozone layer has got alarmingly thinner, it is also observed an increase in the incidence of the Extreme Storms. The comparison of graphs 9 and 10 clearly show the increase of the occurrence of extreme storms compared to the loss of global ozone. The reason for this increase is very simple: the increase in the incidence of the UVB radiation directly on the oceans and grounds because of the dramatic decrease of the total volume of O₃ in the stratosphere, causes the water vapor to be released into the stratosphere: water vapor now produced with the strong help of the UVB radiation on the ground that increases while the Ozone Layer is reduced. Note that the water vapor produced by the UVB does not cause the increase of the water temperature like it occurs with the solar light radiation and infrared. Since it is a cold radiation, the UVB transfers an energy that opens the molecular distance of the liquid water converting it into water vapor, without the use of heat (thermal energy). Thus, an exponential increase in the incidence of extreme storms happens without the occurrence of considerable increase in the planets temperature.

The authors discovered and patented a possible form of producing ozone "in situ" in large scales, with the objective of artificially replacing the inadvertently destroyed ozone by the CFC gas. The process, object of the present Patent of Invention, where it was conceived a new ozonizer device of high productivity mounted

on the wings of an aircraft, capable of flying in stratospheric heights to produce "in situ" quantities of ozone superior to the quantities lost in the polar springs (above from 100 to 200 megatons) to artificially replace the ozone destroyed by the ClO gas consciously
5 reestablishing the thermal equilibrium of the stratosphere, reducing the occurrence of the extreme storms, the UVB radiation incidence and its harmful consequences to the animals and the vegetation of the Planet.

To explain in details the new processes proposed, we
10 produced below the indications through various explanatory figures and the equipment used in the created processes, remembering that the figures and schemes below are examples of the practical use of the invented concept, where small alterations in the constructive mechanical form can be considered as new alternative processes to
15 the present Patent Deposit.

Figure 1 schematically demonstrates the formation (1) of a polar stratospheric cloud (2) during the polar winter in the months from March to October and in the second image (3) of the figure in the polar spring the same cloud (2) being reached and dissipated by
20 the UVB (5) radiation, when the destruction of the existing ozone occurs over the poles with the dissipation of the polar stratospheric cloud (2).

Figure 2 demonstrates an aircraft (6) during a polar night flight in the interior of a Polar Stratospheric Cloud (2) pulverizing size
25 controlled super cold collecting water drops (7), with the purpose of collecting the existing super cold water drops in the interior of the polar stratospheric clouds to provoke artificial rains to collect the ClO

through Rain Wash in the interior of these clouds. It is possible to alternate the pulverizing of silver iodine vapor or dry ice.

Figure 3 demonstrates an ozonizer (23) device installed under the wings of an aircraft (6) in stratospheric flight producing electric sparks (12) to produce a small quantity of ozone (15), exciter of the process and simultaneously releasing micro wave radiation acting as physical catalyst, in the wave length that propitiates the production of ozone artificially induced through the Doppler effect (10) and one of the trajectories recommended during the ozone (15) production flights, flying right after the passing of the zenith, that makes available the maximum of atomic oxygen in the stratosphere.

Figure 4 shows the ozonizer device (23) at a lateral view, cut, showing the internal components.

Figure 5 shows a lateral cut view of the internal structure of the droplet (7) generator pulverizor (22) with homogenic diameters.

Figure 6 shows equipment installed inside the aircraft with a reservoir (26), control panel (25) and hydraulic pump (24) necessary for the ozonizers (23) and pulverizers adaptation (22).

Figure 7 shows the plane with the ozonizer (23) and pulverizor (22) devices installed in the external part of the aircraft in pre determined positions.

To explain in details the first process exposed on figures 1 and 2 that are related to the process of capturing the ClO (chlorine monoxide) that is concentrated at the latitudes near the poles according to graph 4, reaching approximately 1ppb over the poles, the PSC clouds demonstrated in figure 1a item (1) that form in the polar winter, grow over the hole south pole (4) reaching altitudes of

35 km and cover the whole Antarctic continent. Such as every formation of any super cold cloud, the PSC (2) contains and maintains in equilibrium the water in its 3 forms: saturated vapor, super cold liquid and the form of cloud droplets and ice in the form of crystals. In the beginning of spring figure (2) demonstrates the new vertical position of the planet and the solar radiations (5) starts to reflect directly on the polar stratospheric cloud (2) which initiates a quick process of dissipation. During this process that occurs in a couple of days, the solar radiation (5) that contains approximately 9 % of the UVB radiation becomes more diffuse for reflecting continuously on the super cold water drops and on the ice crystals of the PSC clouds (2) decomposing the ClO which releases the chlorine gas according to the equation below:



The atomic chlorine gas thus produced, once more rapidly destroys an O₃ molecule according to the reaction below:



These two reactions happen continuously and rapidly until the cloud (2) dissipates completely or the existing ozone in the cloud completely exhausts. The ozone hole opens above the polar stratosphere. The ClO remains in the polar stratosphere spinning and waiting for a gradual new increase of the polar ozone that starts accumulating at the poles to be destroyed on the next month of October.

With the pulverizing (7) through aircrafts (6) of the PSC clouds (2) during the polar night, pulverizing that can be done by three alternative forms still to be narrowed experimentally, where the

alternative A of pulverizing would be the application of pure super cold size controlled collecting water drops (7), to produce artificial rain inside the polar stratospheric clouds and cause artificial rains that promote the "artificial rain wash" of the ClO gas. Alternative B
5 would be scattering Silver Iodine vapors (7) to cause the agglutination of the ice crystals and the acceleration of the mechanism of water vapor diffusion to form bigger drops (9); and the alternative C, would be the scattering of dry ice (7) that has been verified to produce artificial rain in super cold clouds with
10 temperatures below -39°C . Experiments will be able to demonstrate that the combined use of the processes is the solution, object of this Patent of Invention.

Despite the CFC gas not be passable of being eliminated from the troposphere or stratosphere through Rain Wash, we know that
15 the ClO can be retrieved by this process, producing artificial rains at the poles, in an amusing situation, because there never are natural rains at the poles because the local polar troposphere where nature produces the clouds, the polar air currents are continuously descendent, obstructing the formation of polar tropospheric clouds
20 (2) and the natural rains consequently. The possibility of producing polar artificial rains only exists with the presence of stratospheric clouds (2), because tropospheric clouds do not exist at the poles, which are deserted.

In practice, this process will be done adapting old military pure
25 jet aircrafts with the old shelling B-52 that has compressors adapted on its turbines to reach altitudes of 90,000feet (30km) in the launching of the X3 rockets, or Russian similar. The efforts to

accomplish these missions necessarily needs the worlds consent as the ones obtained in the Montreal Protocol.

The second Process to produce "in situ" the destroyed ozone, according to figure 3, uses one or more aircrafts (6) equipped with ozone producing devices (23) to produce them at stratospheric heights above 50,000 feet (17km), to make microwave radiation applications (10) using as a physical catalyst, adequate wave length to favor the ozone formation with the production of ozone in small volumes through electric sparks (12) that act as exciters of the process to ease the ozone (15) production through micro wave radiation (10).

When the solar radiation reaches the apex on the warmest region and with an incidence angle more favorable that is near the equator (11) near 12 o'clock local, on the so-called zenith of the sunstroke, there will be at stratospheric level the greatest volume of the reaction below, where the UVB radiation breaks the molecular connection of the O₂, transforming it into two atoms of atomic oxygen. The energy from the UVB Radiation stays retained in the atoms as internal energy, increasing its reactivity.

20 O₂ + UVB Radiation (zenith) → O. + O.

After the Zenith when the intensity of the UVB radiation reduces due to the rotation of the planet, great part of the atomic oxygen recomposes, reshaping to the molecular form O₂. On this instance, the internal energy of the atomic oxygen is released in the form of heat. The UVB radiation in the conversion O₂ and O₃ that occurs in the stratosphere ends up capturing the solar Energy that arrives in the form of UVB and releases it in the form of Heat,

warming up the stratosphere. A small percentage of atomic oxygen released in the stratosphere transforms into O₃, in the presence of chemical and physical catalysts, verified in laboratory according to the reaction below:

5



(NOX as catalyst) (Prof. P. Crutzen)

(micro wave Radiation producing Doppler effect)

(Prof. Liou from UCLA)

10 The process uses the fundamentals of Prof. Liou and cited by Profs. Pereira and Orth, based on releasing micro wave radiation (10) with Doppler effect with the adequate wave length to propitiate the production of stratospheric ozone (15) joined with the production of O₃ (15) through electric sparks (12) aiming to propitiate an excitement and reduce the chemical inertia of the system

15 The aircraft (6) will fly in the regions that at first, have the greater content of atomic oxygen right after the zenith when there will be a higher concentration of Atomic Oxygen to produce the maximum of O₃ (15).

20 Figure 4 shows the internal components of the ozone device that through the aircrafts alternator will send energy to the high tension coil (14) or through the air movement during the air flight that will put into action a propeller that will create energy for the magnetic propellers (12) sending energy to the high tension coils (14), that will energize the electrodes (13) thus emitting high voltage electric
25 discharges. On the moment that the electric sparks are produced in the electrodes (13) the O₂ molecules (15) will enter the interior of the device, passing through the electrodes (13), that will emit electric

discharges over the O₂ (11) producing a chemical reaction in the O₂ (11) plus electric discharges forming the ozone (15) and Oxygen that will be released into the atmosphere.

Figure 5 shows the internal structure of the pulverizing device (22) that is constituted by an electric engine (16) that actions a rotating disk (20) which contains in its outside, asymmetric channels (21), that receive the water solution sent to a support bar (17), hose (18) and the tube injector (19). The asymmetric channels (21) with the water solution and the rotation generates the size-controlled droplets (7), that will be scattered into the atmosphere.

Figure 6 shows the main necessary components for the functioning of the whole system of recovery of the ozone layer, constituted by the pulverizing devices (22), ozonizer devices (23), reservoir (26) to store the water and the water solutions, that will be pulverized in the PSC cloud (2) in the form of size controlled water droplets, a control panel (25) responsible for the tracking and control of the functioning of the operation and all the pulverizing devices (22) and ozonizer devices (23) installed in the aircraft, the hydraulic pump (24) responsible to send the liquids to the pulverizing devices (22).

Figure 7 shows an aircraft in flight equipped with the pulverizing devices (22) and the ozonizing devices (23) installed in pre determined places for a better functioning.

Experiments to promote adjustment of the equipment and of the technology with practice will need to be elaborated, after the acceptance of the principles here exposed, by the International Scientific Community.

The two new technologies here proposed and object of the present Patent of Invention were developed to try to recover the Inadvertently Destroyed Ozone, in the benefit of Humanity, deserving legal protection preserving to its author the benefits of the

5 Patent of Invention.

CLAIMS

1- "PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A "RAIN WASH" IN THE ClO GAS, REDUCE THE DESTRUCTION OF THE OZONE LAYER AND A REPLACEMENT PROCESS "IN SITU" OF THE STRATOSPHERIC OZONE."

Characterized by the process of capturing the ClO that concentrates at the latitudes near the Poles, reaching approximately 1ppb over the poles, the PSC clouds (2) demonstrated by figure 1, item (1) that forms during the polar winter, grows all over the South Pole (4) reaching altitudes of 35 km and cover the whole Antarctic continent. Such as the formation of any super cold cloud, the PSC (2) contains and maintains the water in equilibrium in its three forms: saturated vapor, super cold liquid in the form of cloud droplets and ice in the form of crystals.

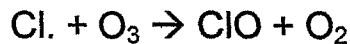
2- "PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A "RAIN WASH" IN THE ClO GAS, REDUCE THE DESTRUCTION OF THE OZONE LAYER AND A REPLACEMENT PROCESS "IN SITU" OF THE STRATOSPHERIC OZONE."

Characterized with the beginning of Spring demonstrated by figure (1), where the Earth remains in a new vertical position (3) of the Planet and the solar radiation (5) begins reaching the polar stratospheric cloud directly (2) which initiates a quick process of dissipation. During this process that occurs in some days the solar radiation (5) that contains approximately 9% of the UVB radiation becomes diffuse for repeatedly reaching the existing super cold water drops and the ice

crystals on the PSC (2) decomposing the ClO that releases the chlorine gas according to the equation below:



The chlorine gas thus produced, once again quickly destroys a molecule of O₃ according to the reaction below:



These two reactions happen quickly and continuously until the cloud (2) dissipates completely or until the existing ozone extinguishes completely. The ozone hole opens above the polar stratosphere. The ClO remains in the polar stratosphere spinning and waiting for a new gradual increase of the polar ozone that starts accumulating at the poles to be destroyed in the next month of October.

3- "PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A "RAIN WASH" IN THE ClO GAS, REDUCE THE DESTRUCTION OF THE OZONE LAYER AND A REPLACEMENT PROCESS "IN SITU" OF THE STRATOSPHERIC OZONE." Characterized by a scattering process (7) through aircrafts (6) on the PSC clouds (2) during the polar night, according to figure 2 from this patent, can be done through three alternative forms to be improved experimentally, where alternative A of scattering would be the application of supercold collecting water drops (7), to produce artificial rain in the interior of polar stratospheric clouds and provoke artificial rains (9) that promote the "artificial rain wash" of the ClO gas. Alternative B, scattering Silver Iodide vapors (7) to promote the agglutination of ice crystals and the acceleration of the diffusion mechanism of the water

vapor to form bigger water drops (9) and the alternative C would be the scattering of dry ice (7) that has been verified to produce artificial rain in super cold clouds with temperatures bellow – 39 °C.

Besides the possibility of the CFC not be eliminated from the troposphere or stratosphere through Rain Wash, we know that the CIO gas will be retrieved through this process, producing artificial rain at the poles, in a new situation, because there aren't natural rains at the poles because the local polar troposphere where nature produces the clouds and the polar air currents are descending continuously, blocking the formation of tropospheric polar clouds (9) with stratospheric clouds (2), because tropospheric clouds do not exist at the poles which are deserted.

4- "PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A "RAIN WASH" IN THE CIO GAS, REDUCE THE DESTRUCTION OF THE OZONE LAYER AND A REPLACEMENT PROCESS "IN SITU" OF THE STRATOSPHERIC OZONE." Characterized by a process to produce the ozone "in situ", according to figure 3, uses one or more aircrafts (6) equipped with ozone producing devices (23) to produce it in stratospheric levels above 50,000 feet (17km), to make microwave radiation applications (10) using as a physical catalyzer, adequate wave length to favor the ozone formation of ozone with the production of ozone in small volumes through electric sparks (12) that act as exciters of the process to facilitate the ozone production (15) through microwave radiation (10).

When the solar radiation reaches its top in the warmer region and with an incident angle more favorable that is near the Equator

(11) near 12 o'clock local time, the so called insulation zenith, will be at the stratospheric level a bigger volume of the reaction below, where the UVB radiation breaks the molecular structure of the O₂, transforming it into two molecules of oxygen. The UVB radiation's
 5 energy remains in the atoms as internal energy, increasing its reactivity.



After the Zenith when the intensity of the UVB radiation reduces because of the Planet's rotation, most part of the of the
 10 atoms of oxygen recombine, joining together to the O₂ molecular form. At this instant the internal energy of the Oxygen atom is released in the form of heat. The UVB radiation in the conversion O₂ and O₃ that occurs in the stratosphere ends up capturing the solar Energy in the form of UVB and releases it in the form of Heat,
 15 warming up the stratosphere. A small part of the oxygen released in the stratosphere transforms into O₃, in the presence of chemical and physical catalyzers, verified in laboratory according to the reaction below:



20 (Nox as catalyzer) (Prof. P Crutzen)
 (Microwave Radiation producing the Doppler effect)
 (Prof. Liou from UCLA).

The process is based on the fundamentals of Prof. Liou quoted by Professors Pereira and Orth, based in the release of microwave
 25 radiation (10) with the Doppler effect with adequate wave length to propitiate the production of stratospheric ozone (15) with the

production of O₃ (15) through sparks (12) which aims to propitiate an excitement and reduce the chemical inertia of the system.

The aircraft (6) will fly above the regions that at first have higher concentration of Oxygen Atoms right after the zenith when
5 there will be a higher concentration of Oxygen Atoms to produce the maximum of O₃ (15).

5- "PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A "RAIN WASH" IN THE CIO GAS, REDUCE THE DESTRUCTION OF THE
10 **OZONE LAYER AND A REPLACEMENT PROCESS "IN SITU" OF THE STRATOSPHERIC OZONE."** Characterized by figure 4 which demonstrates the internal components of the ozone device that through the alternator of the aircraft will send energy to the high tension energy coils(14) or through the air movement during the
15 flight that will action a propeller that will generate energy to the magnetic coils (12) and send energy to the high tension coils (14) that will energize the electrodes (13) thus emitting high voltage electric discharges. At the moment in which the electric sparks are produced in the electrodes (13) the O₂ molecules (11) will enter the
20 interior of the device passing through the electrodes (13), that will emit electric discharges over the O₂ (11) producing a chemical reaction on the O₂ (11) plus electric discharges forming the ozone (15) and Oxygen atom that will be released into the atmosphere.

6- "PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN
25 **POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A "RAIN WASH" IN THE CIO GAS, REDUCE THE DESTRUCTION OF THE OZONE LAYER AND A REPLACEMENT PROCESS "IN SITU" OF**

THE STRATOSPHERIC OZONE.” Characterized by figure 5 shows the internal structure of the pulverizing device (22) that is constituted by an electric engine (16) that actions a rotating disk (20) which contains in its outside, asymmetric channels (21), that receive the
5 water solution sent to a support bar (17), hose (18) and the tube injector (19). The asymmetric channels (21) with the water solution and the rotation generates the size-controlled droplets (7), that will be scattered into the atmosphere.

**7- “PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN
10 POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A “RAIN WASH” IN THE CIO GAS, REDUCE THE DESTRUCTION OF THE OZONE LAYER AND A REPLACEMENT PROCESS “IN SITU” OF THE STRATOSPHERIC OZONE.”** Characterized by figure 6 that demonstrates the main necessary components for the functioning of
15 the whole system of the ozone layer recovery, constituted by the pulverizing devices (22), ozonizer devices (23), reservoir (26) to store the water in water solutions, that will be scattered on the PSC clouds (2) in the form of size controlled water droplets, a control panel (25) responsible for the tracking and control of the functioning
20 and the operation of all of the pulverizing devices (22) and ozonizer devices (23) installed in the aircraft, the hydraulic pump (24) responsible for the sending of the liquids to the pulverizing devices (22).

**8- “PRODUCTION OF LOCALIZED ARTIFICIAL RAINS IN
25 POLAR STRATOSPHERIC CLOUDS, TO PROMOTE A “RAIN WASH” IN THE CIO GAS, REDUCE THE DESTRUCTION OF THE OZONE LAYER AND A REPLACEMENT PROCESS “IN SITU” OF**

THE STRATOSPHERIC OZONE.” Characterized by figure 7 that demonstrates an aircraft in flight equipped with the pulverizing devices (22) and the ozonizer devices (23) installed in pre determined spots for better utilization and functioning.

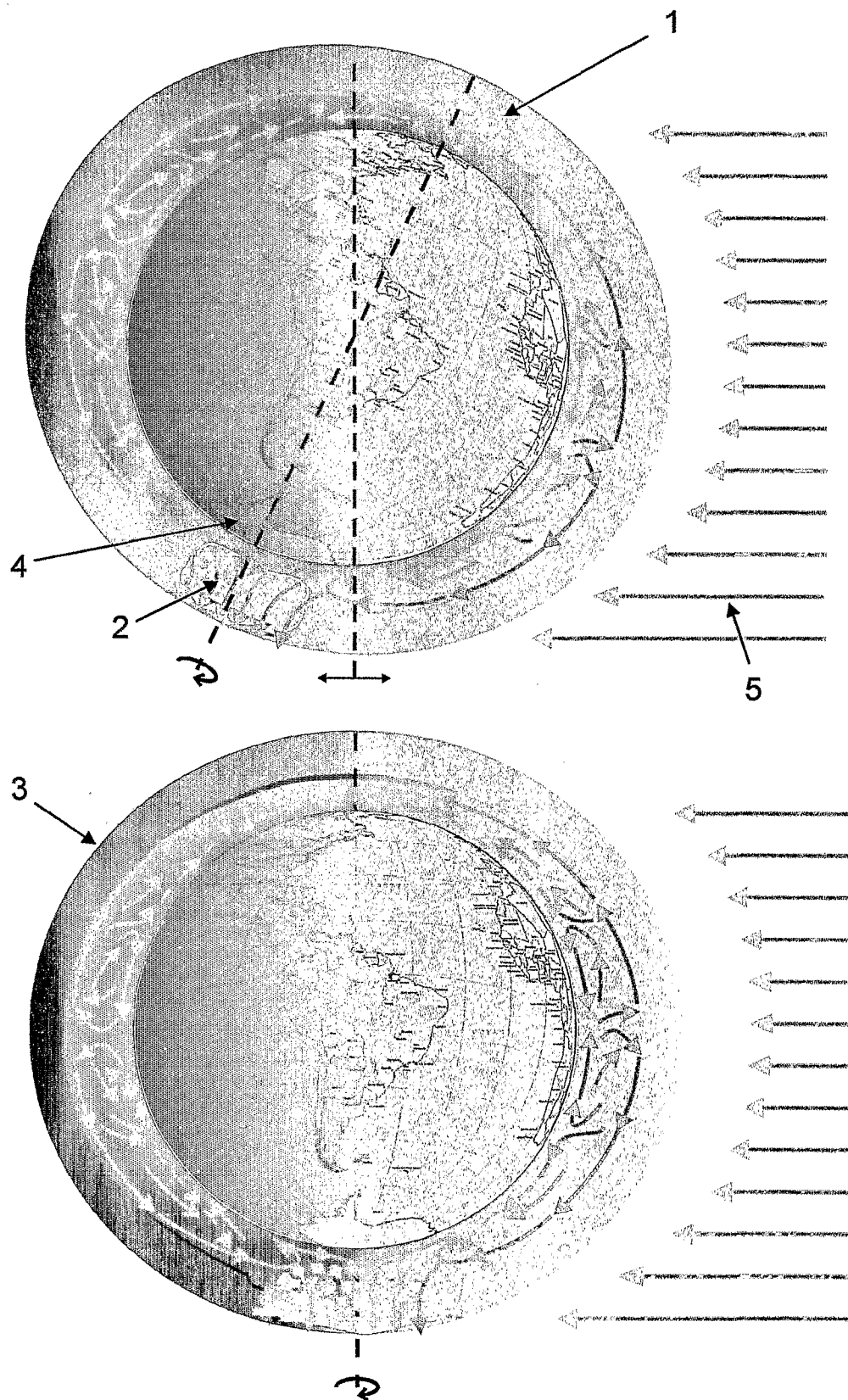


Figure 1

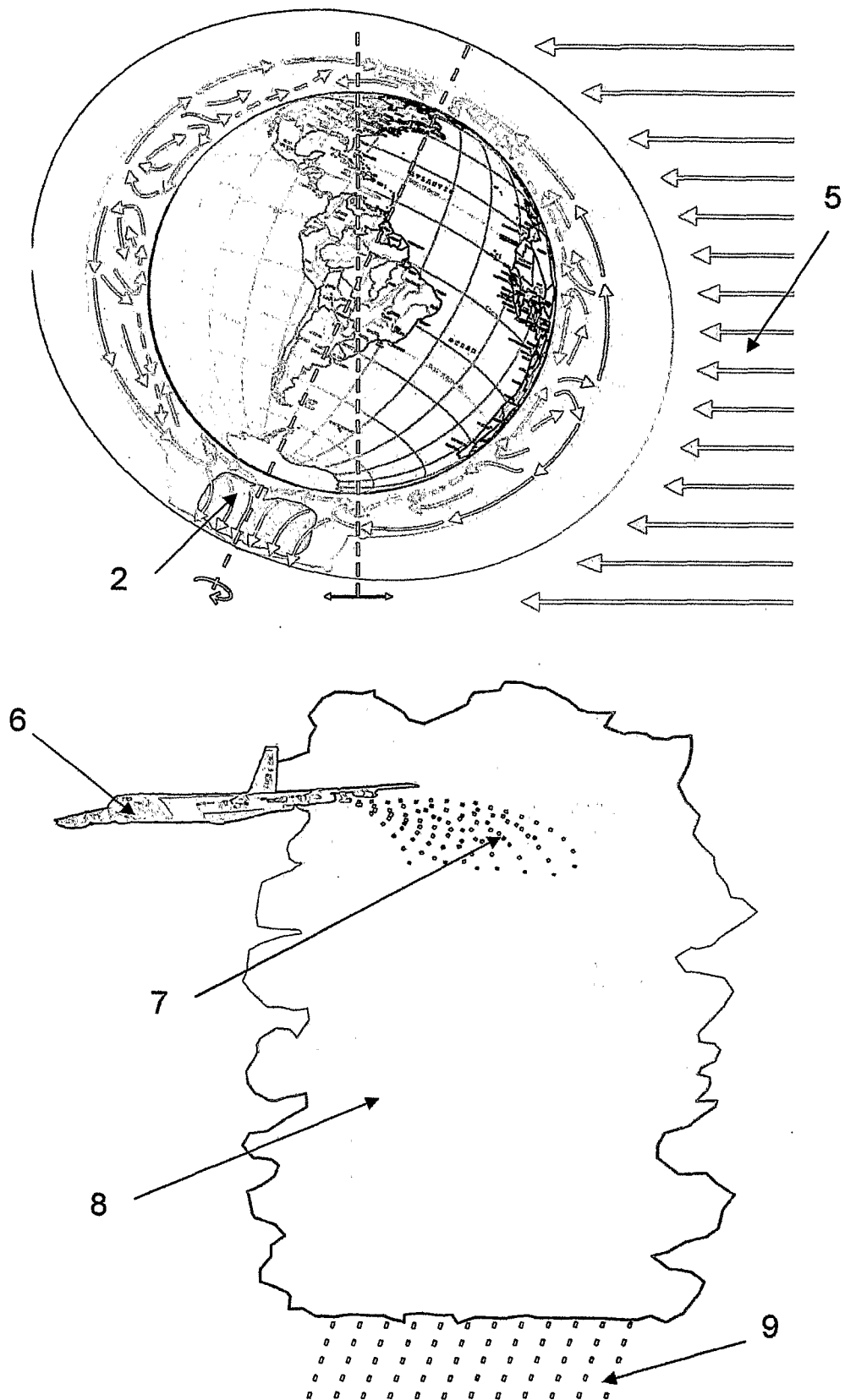


Figure 2

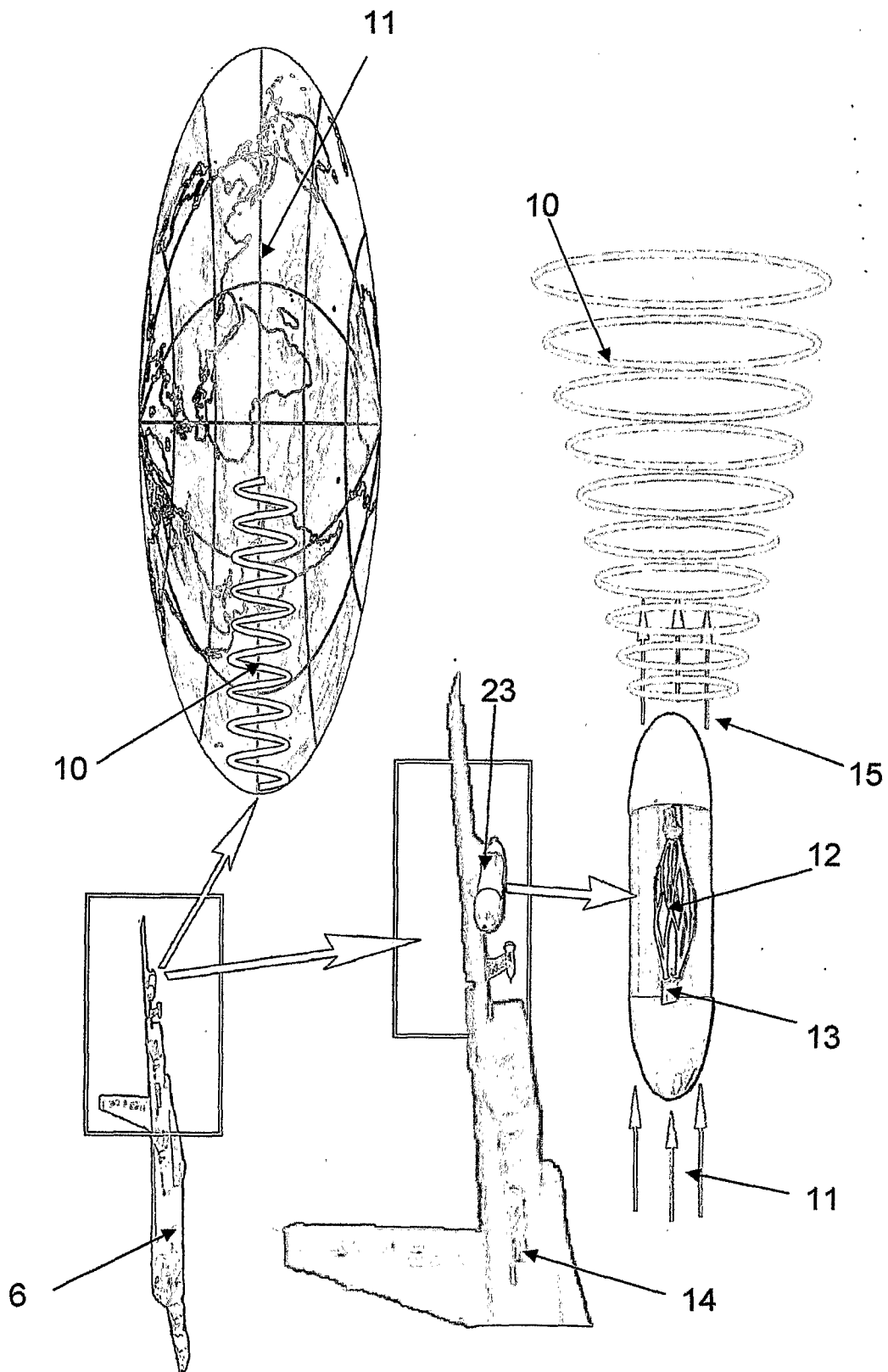


Figure 3

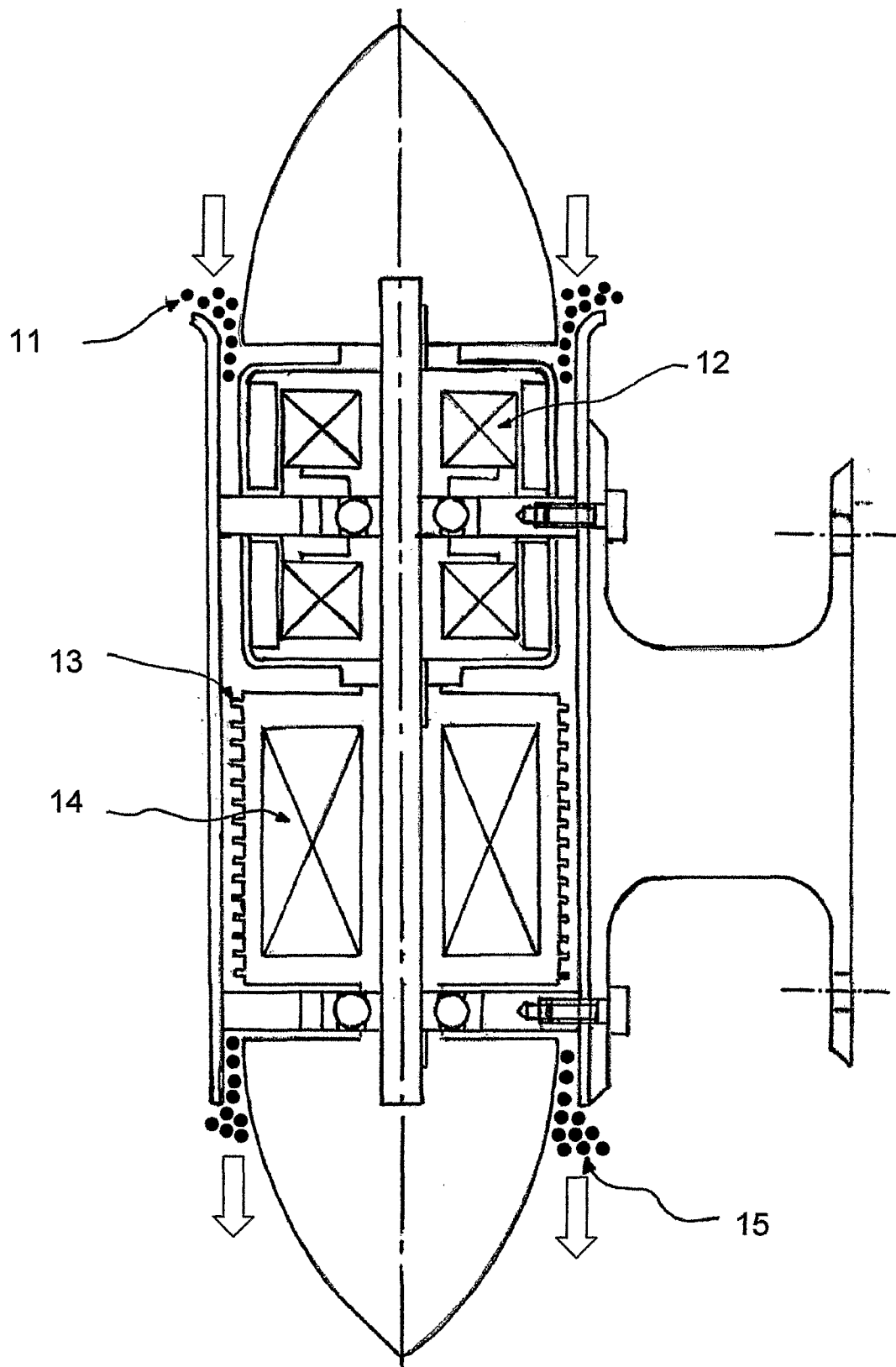


Figure 4

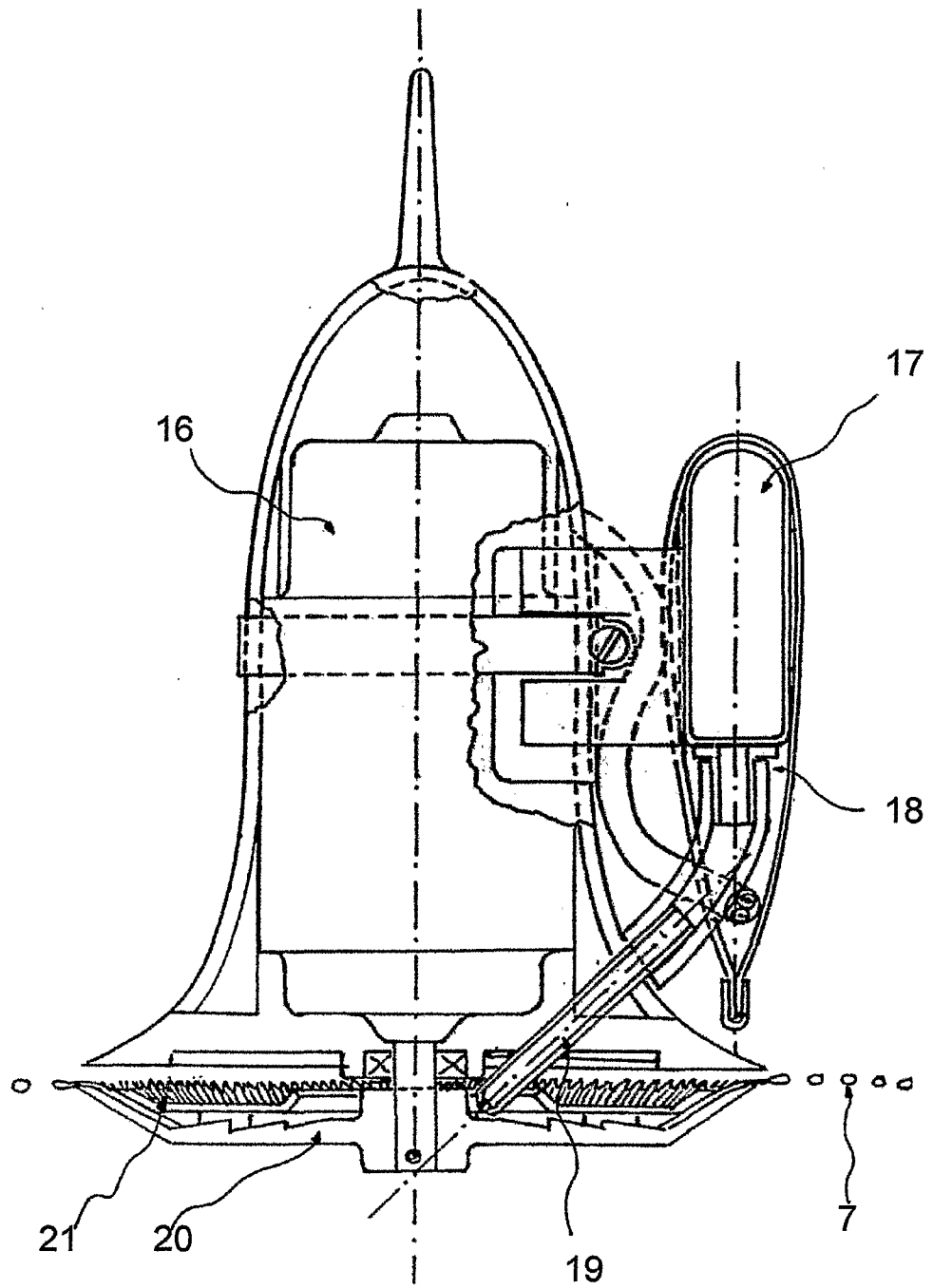


Figure 5

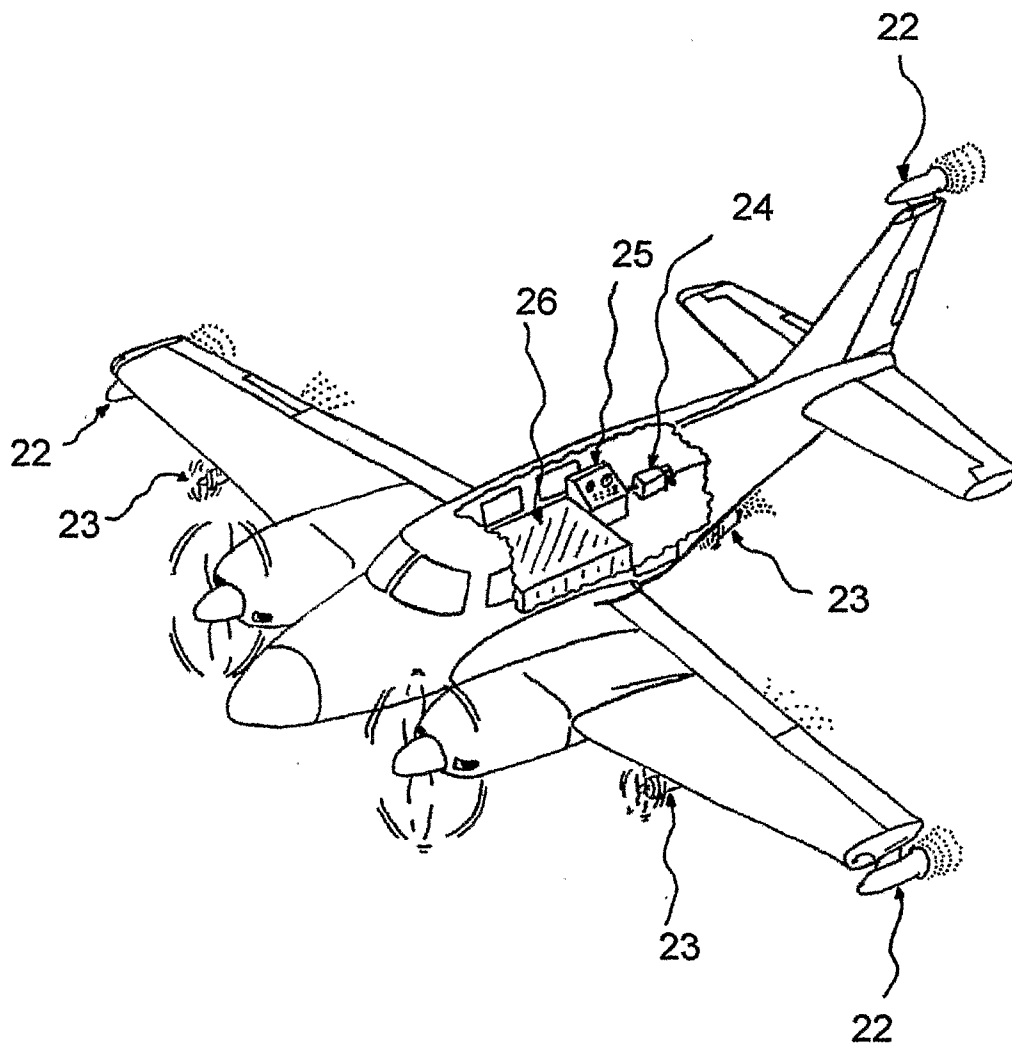


Figure 6

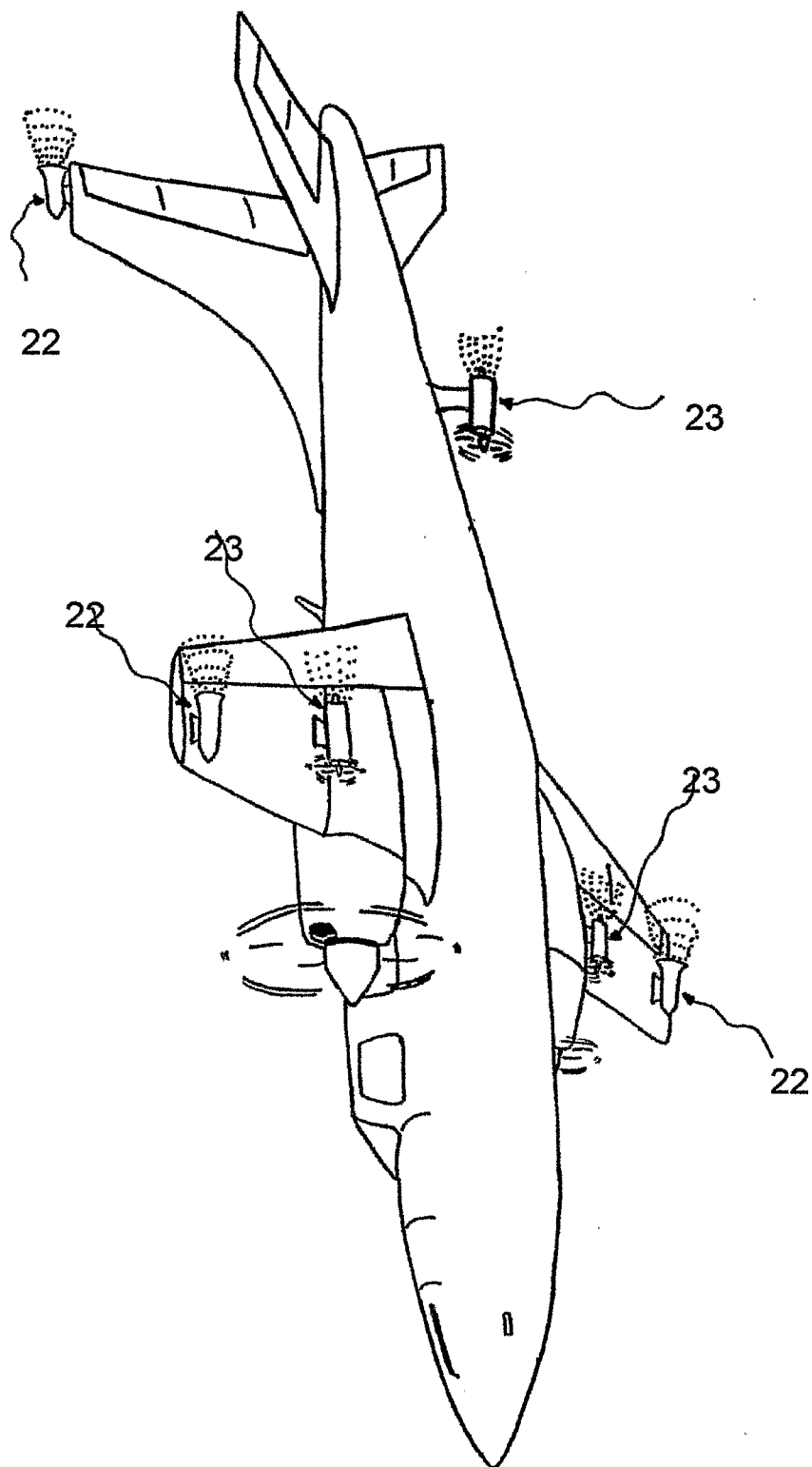


Figure 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/BR 2005/000195

A. CLASSIFICATION OF SUBJECT MATTER IPC⁸: A01G 15/00 (2006.01) According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC⁸: A01G 15/00 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched ----		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPODOC, WPI, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 376 346 A (POWERS) 27 December 1994 (27.12.1994) <i>abstract, claims 1, 2, 3, 9, 10, 11.</i> ----	1, 2, 3, 4, 6
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 20 April 2006 (20.04.2006)		Date of mailing of the international search report 26 April 2006 (26.04.2006)
Name and mailing address of the ISA/ AT Austrian Patent Office Dresdner Straße 87, A-1200 Vienna Facsimile No. +43 / 1 / 534 24 / 535		Authorized officer RIEMANN B. Telephone No. +43 / 1 / 534 24 / 363

INTERNATIONAL SEARCH REPORT

Information on patent family members

PCT/BR 2005/000195

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
US	A	5376346		none	