

GeoEngineering & Related Patents

Below you will find information about and references to 31 patents related to GeoEngineering. It is estimated that there are over 100 patents that have been discovered to date. Each of the patents below relates to weather modification, atmospheric aerosol spraying, or weaponization of the atmosphere.

We would like to especially point out Patent #5003186, which describes aluminum oxide as a component of aerosol spraying, thereby the most likely reason why aluminum is now (newly) being found in rain and other water sources in very high levels around the world. ([see our local-area water test results](#))

These and other patents can be found on the GeoEngineeringWatch.com website.

All of these patents were found on the U.S. Patent Office official website. They have a fully searchable database that can be found here: <http://patft.uspto.gov/netahtml/PTO/search-bool.html> (thank you to Steve Aquino for compiling this information)

U.S. Patent #3,429,507 – Rainmaker

Date: February 25, 1969 (Patent #3429507)

Description — Rainmaker.

Abstract — Apparatus including a large venturi passage carried by an airborne device for impelling moisture laden atmosphere at high velocity therethrough to produce a large volume seeding area for inducing atmospheric precipitation. Supporting mechanisms for the artificial cooling of the impelled atmosphere and for the injection therein of catalytic condensation inducing particles is provided.

U.S. Patent #3,613,992 – Weather Modification Method

Date: October 19, 1971 (Patent #3613992)

Description — Weather Modification Method.

Abstract — The present invention provides a method for producing rain or snow from natural atmospheric clouds using seeding agents characterized by a high solubility in water and a large endothermic heat of solution in water. Typical examples of materials suitable for use in practicing this invention are urea, potassium nitrate, potassium nitrite, and ammonium nitrate. Laboratory experiments have shown urea to be effective in producing ice crystals in a vapor cloud having a temperature as high as +6° C. In field experiments, urea has been observed to cause snow showers in supercooled clouds.

U.S. Patent #3,659,785 – Weather Modification / Microencapsulated Material

Date: May 2, 1972 (Patent #3659785)

Description — Weather Modification Utilizing Microencapsulated Material.

Abstract — A fog and cloud seeding method and agent utilizing microencapsulation techniques whereby controlled seeding particle size for both dry initial particles and particles dispensed as solution droplets provides for the production and maintenance of a predetermined particle spectrum when using hygroscopic chemical compounds which are fragile, brittle or friable in crystalline structure. A hygroscopic chemical agent to be utilized

in cloud or fog seeding is provided with a liquid permeable capsule shell such that optimization of particle size for improved seeding results is obtained.

U.S. Patent #3,813,875 – Barium Release System to Create Clouds

Date: June 4, 1974 (Patent #3813875)

Description — Rocket Having Barium Release System To Create Ion Clouds In The Upper Atmosphere.

Abstract — A chemical system for releasing a good yield of free barium (Ba^0) atoms and barium ions (BA^+) to create ion clouds in the upper atmosphere and interplanetary space for the study of the geophysical properties of the medium.

U.S. Patent #3,899,144 – Powder Contrail Generation

Date: August 12, 1975 (Patent #3899144)

Description — Powder contrail generation.

Abstract — Light scattering pigment powder particles, surface treated to minimize inparticle cohesive forces, are dispensed from a jet mill deagglomerator as separate single particles to produce a powder contrail having maximum visibility or radiation scattering ability for a given weight material.

U.S. Patent #4,035,726 – Cold Plasma Injection into Ionosphere

Date: July 12, 1977 (Patent #4035726)

Description — Method of controlling and/or improving high-latitude and other communications or radio wave surveillance systems by partial control of radio wave et al.

Abstract — There is disclosed a method of controlling high-latitude communications by cold plasma injection in the distant magnetosphere, and to thereby control the ionospheric and or magnetospheric medium through which the waves are to be propagated. This application incorporates the substance of the invention disclosed in applicant's application Ser. No. 174,047 filed concurrently herewith and now abandoned.

U.S. Patent #4,362,271 – Weather Modification Utilizing Dimethyl Sulfoxide

Date: December 7, 1982 (Patent #4362271)

Description — Procedure for the artificial modification of atmospheric precipitation as well as compounds with a dimethyl sulfoxide base for use in carrying out said procedure.

Abstract — A process for artificially modifying atmospheric precipitation wherein a liquid composition containing dimethyl sulfoxide as the principal ingredient is dispersed into the atmosphere from a container in microdroplet form having an average diameter ranging from 1 to 10 microns.

U.S. Patent #4,412,654 – Laminar Microjet Atomizer / Aerial Spraying of Liquids

Date: November 1, 1983 (Patent #4412654)

Description — Laminar microjet atomizer and method of aerial spraying of liquids.

Abstract — A laminar microjet atomizer and method of aerial spraying involve the use of a

streamlined body having a slot in the trailing edge thereof to afford a quiescent zone within the wing and into which liquid for spraying is introduced. The liquid flows from a source through a small diameter orifice having a discharge end disposed in the quiet zone well upstream of the trailing edge. The liquid released into the quiet zone in the slot forms drops characteristic of laminar flow. Those drops then flow from the slot at the trailing edge of the streamlined body and discharge into the slipstream for free distribution.

U.S. Patent #4,653,690 – Method of Producing Cumulus Clouds

Date: March 31, 1987 (Patent #4653690)

Description — Method of producing cumulus clouds.

Abstract — The disruption of a thermal inversion and formation of cumulus clouds is caused by the ignition of a pyrotechnic composition containing an alkali earth metal. The combined heats of hydration, condensation and combustion of the composition disrupt the thermal layer allowing the passage of warm moist air into a zone of cooler air. The formation of cumulonimbus or cumulus clouds results.

U.S. Patent #4,684,063 – Particulates Generation / Electrically Charged Aerosols

Date: August 4, 1987 (Patent #4684063)

Description — Particulates generation and removal.

Abstract — A mixer/charger is used simultaneously to mix and electrically to charge a fluid or fluid-like material, and such electrically charged product is distributed into another fluid for various purposes. In one case the charged product may be mixed with particulate matter used to form smoke--an appropriate polarity can cause repulsion of the smoke producing particulates thereby to reduce agglomeration and to maximize the suspension time of such particulates in surrounding environment. Alternatively, by distributing the charged product into particulate containing fluid and selecting the polarity such that such particulates tend to agglomerate, expeditious removal of such particulates can be accomplished. The charged product also may be used for distributing mist, distributing ionic material in air, e.g. for sense of well-being, and for seeding clouds.

U.S. Patent #4,686,605 – Altering a Region in the Earth's Atmosphere

Date: August 11, 1987 (Patent #4686605)

Description — Method and apparatus for altering a region in the earth's atmosphere, ionosphere, and/or magnetosphere.

Abstract — A method and apparatus for altering at least one selected region which normally exists above the earth's surface. The region is excited by electron cyclotron resonance heating to thereby increase its charged particle density. In one embodiment, circularly polarized electromagnetic radiation is transmitted upward in a direction substantially parallel to and along a field line which extends through the region of plasma to be altered. The radiation is transmitted at a frequency which excites electron cyclotron resonance to heat and accelerate the charged particles. This increase in energy can cause ionization of neutral particles which are then absorbed as part of the region thereby increasing the charged particle density of the region.

U.S. Patent #4,704,942 – Charged Aerosol and Warfare Clouds

Date: November 10, 1987 (Patent #4704942)

Description — Charged aerosol.

Abstract — A method of defending against a warfare cloud of toxic aerosol utilizes a charged defensive aerosol which is sprayed into the cloud. The defensive aerosol is made of a defensive agent which may be chemically or biologically active. The agent is sprayed through charged nozzles to impart a charge to the aerosol. The charge should be at least several thousands of volts with respect to ground so that particles of the defensive aerosol combine and coagulate with particles of the toxic aerosol to neutralize and cause rapid settling of the warfare cloud.

U.S. Patent #4,766,725 – Method of Suppressing Formation of Contrails

Date: August 30, 1988 (Patent #4766725)

Description — Method of suppressing formation of contrails and solution therefor.

Abstract — A method of suppressing the formation of contrails from the exhaust of an engine including the steps of providing a solution of a non-corrosive surfactant in a combined carrier and nucleating agent selected from the group of water soluble monohydric, dihydric, trihydric or other polyhydric alcohols, forming the solution into a vapor, and injecting the solution into the exhaust of the engine. The solution may include by weight between about 0.01% to 2.5% of the non-corrosive surfactant, between about 1% and 8% water, and between about 85% and 99% ethylene glycol. Another solution may include by weight a monohydric, dihydric or polyhydric alcohol in an amount of between about 85% and 99% and the non-corrosive surfactant in an amount of between about 0.01% and 8%. Still another solution may include an inorganic nucleating or hygroscopic salt, such as ammonium iodide, ammonium fluoride, silver iodide or calcium chloride in monohydric, dihydric or polyhydric alcohols and surfactant mixtures.

U.S. Patent #4,948,050 – Liquid Atomizing Apparatus for Aerial Spraying

Date: August 14, 1990 (Patent #4948050)

Description — Liquid atomizing apparatus for aerial spraying.

Abstract — A rotary liquid spray atomizer for aerial spraying is driven by a variable speed motor, driven in turn by power from a variable speed AC generator. The generator is driven from a power take-off from the engine of the spraying aircraft, a drive assembly includes a device for controlling the speed of the generator relative to the speed of the engine. The particularly convenient drive assembly between the generator and the power take-off is a hydraulic motor, which drives the generator, driven by a hydraulic pump driven from the power take-off. The speed of the hydraulic motor can be controllably varied. Conveniently the AC motor is a synchronous motor.

U.S. Patent #4,999,637 – Creation of Artificial Ionization Clouds

Date: March 12, 1991 (Patent #4999637)

Description — Creation of artificial ionization clouds above the earth.

Abstract — A method for forming a cloud of artificial ionization above the earth by initially

heating the resident plasma at a desired altitude with electromagnetic radiation having a frequency approximately the same as that of the ambient plasma. As the plasma frequency increases due to heating, the radiation frequency is also increased until the final maintenance frequency is attained.

U.S. Patent #5,003,186 – Stratospheric Welsbach Seeding / Global Warming

Date: March 26, 1991 (Patent #5003186)

Description — Stratospheric Welsbach seeding for reduction of global warming.

Abstract — A method is described for reducing atmospheric or global warming resulting from the presence of heat-trapping gases in the atmosphere, i.e., from the greenhouse effect. Such gases are relatively transparent to sunshine, but absorb strongly the long-wavelength infrared radiation released by the earth. The method includes the step of seeding the layer of heat-trapping gases in the atmosphere with particles of materials characterized by wavelength-dependent emissivity. Such materials include Welsbach materials [e.g., *aluminum oxide*] and the oxides of metals which have high emissivity (and thus low reflectivities) in the visible and 8-12 micron infrared wavelength regions.

U.S. Patent #5,286,979 – Process for Absorbing Ultraviolet Radiation

Date: February 15, 1994 (Patent #5286979)

Description — Process for absorbing ultraviolet radiation using dispersed melanin.

Abstract — This invention is a process for absorbing ultraviolet radiation in the atmosphere by dispersing melanin, its analogs, or derivatives into the atmosphere. By appropriate choice of melanin composition, size of melanin dispersoids, and their concentration, the melanin will absorb some quantity of ultraviolet radiation and thereby lessen its overall effect on the critters who would normally absorb such radiation.

U.S. Patent #5,762,298 – Satellite Weather Modification System (#1)

Date: June 9, 1998 (Patent #5762298)

Description — Use of artificial satellites in earth orbits adaptively to modify the effect that solar radiation would otherwise have on earth's weather.

Abstract — A Satellite Weather Modification System (SWMS) uses earth satellites to harness solar energy to modify the thermodynamics and composition of the earth's atmosphere. SWMS has three subsystems: The first subsystem includes a network of earth satellites called Satellite Engines (SEs) used to reflect solar energy and/or transform solar energy into other forms of energy beams discharged at specified locations. The media at these locations and the media through which the energy beams pass absorb these energies and change them into heat. The second subsystem includes a large network of Remote Sensing Devices (RSDs). These sensors are used to measure local media compositions, dynamic parameters and thermodynamic properties. Sensor measurements are fed back to the third subsystem, which includes a network of Ground Control Stations (GCSs). GCSs provide energy beam guidance by estimating each beam's characteristics and its aim point trajectory as functions of time. Integration of these three subsystems establishes a sensor feedback energy beam guidance and control loop. SWMS's weather modification applications include alteration of precipitation, reclaiming of wasteland, reducing damage by bad weather, and improving environment. Its non-weather related applications include supplying concentrated energy to

electricity generating stations (solar, wind and hydro), high latitude greenhouse farms, and solar powered airplanes.

U.S. Patent #5,984,239 – Satellite Weather Modification System (#2)

Date: November 16, 1999 (Patent #5984239)

Description — Weather modification by artificial satellites.

Abstract — A Satellite Weather Modification System (SWMS) uses earth satellites to harness solar energy to modify the thermodynamics and composition of the earth's atmosphere. SWMS has three subsystems: The first subsystem includes a network of earth satellites called Satellite Engines (SEs) used to reflect solar energy and/or transform solar energy into other forms of energy beams discharged at specified locations. The media at these locations and the media through which the energy beams pass absorb these energies and change them into heat. The second subsystem includes a large network of Remote Sensing Devices (RSDs). These sensors are used to measure local media compositions, dynamic parameters and thermodynamic properties. Sensor measurements are fed back to the third subsystem, which includes a network of Ground Control Stations (GCSs). GCSs provide energy beam guidance by estimating each beam's characteristics and its aim point trajectory as functions of time. Integration of these three subsystems establishes a sensor feedback energy beam guidance and control loop. SWMS's weather modification applications include alteration of precipitation, reclaiming of wasteland, reducing damage by bad weather, and improving environment. Its non-weather related applications include supplying concentrated energy to electricity generating stations (solar, wind and hydro), high latitude greenhouse farms, and solar powered airplanes.

U.S. Patent #6,315,213 – Method of Modifying the Weather

Date: November 13, 2001 (Patent #6315213)

Description — Method of modifying weather.

Abstract — A method for artificially modifying the weather by seeding rain clouds of a storm with suitable cross-linked aqueous polymer. The polymer is dispersed into the cloud and the wind of the storm agitates the mixture causing the polymer to absorb the rain. This reaction forms a gelatinous substance which precipitate to the surface below. Thus, diminishing the clouds ability to rain.

U.S. Patent #6,520,425 – Production of Nanofibers

Date: February 18, 2003 (Patent #6520425)

Description — Process and apparatus for the production of nanofibers.

Abstract — A nozzle for forming nanofibers by using a pressurized gas stream comprises a center tube, a first supply tube that is positioned concentrically around and apart from the center tube, a middle gas tube positioned concentrically around and apart from the first supply tube, and a second supply tube positioned concentrically around and apart from the middle gas tube. The center tube and first supply tube form a first annular column. The middle gas tube and the first supply tube form a second annular column. The middle gas tube and second supply tube form a third annular column. The tubes are positioned so that first and second gas jet spaces are created between the lower ends of the center tube and

first supply tube, and the middle gas tube and second supply tube, respectively. A method for forming nanofibers from a single nozzle is also disclosed.

U.S. Patent #7,134,857 – Electrospinning of Fibers

Date: November 14, 2006 (Patent #7134857)

Description — Electrospinning of fibers using a rotatable spray head.

Abstract — Apparatus and method for electrospinning fibers in which the apparatus includes a spray head having a longitudinal axis and including at least one electrospinning element disposed in a peripheral wall of the spray head surrounding the longitudinal axis. The electrospinning element includes a passage by which a substance from which the fibers are to be electrospun is provided to a tip of the extrusion electrospinning element. The electrospinning element extends from the peripheral wall in a direction from the longitudinal axis and is configured to electrospin the fibers by electric field extraction of the substance from the tip of the extrusion electrospinning element. Accordingly, the method includes providing a substance from which the fibers are to be composed to a tip of an electrospinning element in a peripheral wall of a spray head having a longitudinal axis, rotating the spray head or a collector configured to receive the fibers around the longitudinal axis, applying in a direction from the longitudinal axis of the spray head an electric field to the tip of the electrospinning element to electrospin by electric field extraction the substance from the tip of the electrospinning element to form the fibers, and collecting the fibers on the collector.

U.S. Patent #7,291,300 – Coated Nanofiber Webs

Date: November 6, 2007 (Patent #7291300)

Description — Coated nanofiber webs.

Abstract — The present invention is directed to a method of forming nonwoven webs comprising coated fibers. The method of forming the nonwoven web generally comprises the steps of forming fibers from a melt fibrillation process, forming at least one fluid stream containing a coating substance, applying the coating substance onto the surface of the fiber, and depositing the coated fibers on a surface to form a web. Typically, the fibers are coated in flight. Preferably, the melt fibrillation process to form the fibers is a melt film fibrillation process. A melt film fibrillation process generally includes the steps of providing a polymeric melt, utilizing a central fluid stream to form an elongated hollow polymeric film tube, and using air to form multiple nanofibers from the hollow tube. The nonwoven web may comprise a layer having a significant number of nanofibers with diameters less than one micron. The layer may comprise two or more pluralities of fiber diameter distributions wherein at least one plurality has an average fiber diameter of less than about one micron.

U.S. Patent #7,332,321 – Viral Fibers

Date: February 19, 2008 (Patent #7332321)

Description — Viral fibers.

Abstract — Long rod shaped M13 viruses were used to fabricate one dimensional (1D) micro- and nanosized diameter fibers by mimic the spinning process of the silk spider. Liquid crystalline virus suspensions were extruded through the micrometer diameter capillary tubes in cross-linking solution (glutaraldehyde). Resulting fibers were tens of

micrometers in diameter depending on the inner diameter of the capillary tip. AFM image verified that molecular long axis of the virus fibers were parallel to the fiber long axis. Although aqueous M13 virus suspension could not be spun by electrospinning, M13 viruses suspended in 1,1,1,3,3,3-hexafluoro-2-propanol were spun into fibers. After blending with highly water soluble polymer, polyvinyl 2-pyrrolidone (PVP), M13 viruses was spun into continuous uniform virus blended PVP (virus-PVP) fibers. Resulting virus-PVP electrospun fibers showed intact infecting ability to bacterial hosts after suspending in the buffer solution.

U.S. Patent #7,582,809 – Sorghum Aluminum Tolerance Gene

Date: September 1, 2009 (Patent #7582809)

Description — Sorghum aluminum tolerance gene, SbMATE.

Abstract — The major aluminum tolerance gene, the SbMATE gene, encodes a root citrate efflux transporter that is Al-inducible at the level of gene transcription and is also Al-activated at the level of protein function. High level of expression of the SbMATE gene and the protein was found in roots. SbMATE orthologs with high degree of sequence homology were found in other higher plants, including rice. Successful transformation of Arabidopsis provides strong evidence that SbMATE can work across species to enhance tolerance to Al in other important crops grown in localities worldwide where Al³⁺ cations are present in acid soils and are toxic to plants.

U.S. Patent #7,645,326 – RFID Environmental Manipulation

Date: January 12, 2010 (Patent #7645326)

Description — RFID environmental manipulation.

Abstract — A system and method to reduce signal to noise ratio within an RFID enabled warehouse or distribution center by introducing highly reflective aluminum oxide particulate into the atmospheric environment of the warehouse or distribution center. The aluminum oxide will be comprised of nano size particulate manufactured in an aerosol format. This particulate will be introduced into the environment through the auspices of the heating, ventilation and air conditioning mechanism associated with the environment. The levels of particulate will be monitored through the use of strategically placed sensors in order to maintain regulatory compliance. Furthermore, the signal to noise ratio will be enhanced by reducing ambient noise emanating from light fixtures in the environment through the strategic placement of inferential filters. Furthermore, the signal to noise ratio from man made sources will be reduced by using horizontally configured backscatter transmitting antenna within the environment.

U.S. Patent #8,010,048 – Microradio Design

Date: August 30, 2011 (Patent #8010048)

Description — Microradio design, manufacturing method and applications for the use of microradios.

Abstract — A microradio (10) is provided with a hysteretic switch (16) to permit an optimum range increasing charging cycle, with the charging cycle being long relative to the transmit cycle. Secondly, an ensemble of microradios permits an n2 power enhancement to increase range with coherent operation. Various multi-frequency techniques are used both for

parasitic powering and to isolate powering and transmit cycle. Applications for microradios and specifically for ensembles of microradios include authentication, tracking, fluid flowing sensing, identification, terrain surveillance including crop health sensing and detection of improvised explosive devices, biohazard and containment breach detection, and biomedical applications including the use of microradios attached to molecular tags to destroy tagged cells when the microradios are activated. Microradio deployment includes the uses of paints or other coatings containing microradios, greases and aerosols.

U.S. Patent #8,119,091 – Carbon Dioxide Capture (David Keith)

Date: February 21, 2012 (Patent #8119091)

Description — Carbon dioxide capture.

A method of carbon dioxide capture is disclosed. In a step (a) anhydrous sodium carbonate is separated from a first aqueous solution formed by reacting carbon dioxide and an aqueous solution of sodium hydroxide. In step (b) the anhydrous sodium carbonate is treated by causticization to generate carbon dioxide and sodium hydroxide. The first aqueous solution of step (a) is formed by scrubbing a gas containing carbon dioxide with an aqueous solution of sodium hydroxide.

U.S. Patent #8,204,438 – RF ID Tag Reader

Date: June 19, 2012 (Patent #8204438)

Description — RF ID tag reader utilizing a scanning antenna system and method.

Abstract — An embodiment of the present invention provides an RF ID card reader, comprising RF ID circuitry to generate an RF ID signal, a transceiver in communication with said RF ID circuitry and an array antenna associated with said transceiver for scanning an area for at least one tag and establishing communication with at least one tag.

U.S. Patent #8,204,575 – Locating Guide

Date: June 19, 2012 (Patent #8204575)

Description — Locating guide.

Abstract — A locating guide for locating a target tissue site within a patient includes a body, a first substantially radiopaque reference marker on the body, and a second substantially radiopaque reference marker extending from a major surface of the body. The reference markers provide reference points that extend in at least two dimensions, and may be useful for registering a medical image of tissue with an actual location on or within the patient in order to more accurately and precisely locate a target tissue site within the patient. In some embodiments, the second reference marker is oriented at a predetermined angle relative to the major surface of the body, and provides a guide that a clinician may reference in order to orient a medical element introducer when introducing the introducer into the patient to access a particular target tissue site.

U.S. Patent #RE29,142 – Combustible Compositions for Generating Aerosols

Date: February 22, 1977 (Patent #RE29142)

Description — Combustible compositions for generating aerosols, particularly suitable for

cloud modification and weather control and aerosolization process.

Abstract — A combustible composition for generating aerosols for the control and modification of weather conditions consisting of a readily oxidizable substance selected from the group consisting of aluminum, magnesium, alkali-metals and alkaline earth metals; an oxidizing agent selected from the groups consisting of: (a) sulphur and sulphur yielding compounds; and (b) organic and inorganic nitrates, alkali-metal and ammonium chlorates and perchlorates; The molar ratio of the oxidizable substance to the oxidizing agent being between 1.5:1 and 3.5:1 and a stable hygroscopic solid which does not directly participate in the combustion process of the combustible composition, said hygroscopic solid being present in an amount up to 40% of the total weight of the combustible composition, the oxidizable substance, the oxidizing agent and the hygroscopic substance having a particle size in the range of from -140 to +270 mesh, and a primer initiating the combustion of said composition whereby during combustion, a finely dispersed aerosol smoke consisting of moderately hygroscopic condensation nuclei, and a non-hygroscopic gas are simultaneously evolved, said gas acting to disperse said nuclei.

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