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Selected Patents Related to Thermal Spraying

Issued between April 1, 2006 and June 30, 2006

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Applications

Aluminum Particles with Wear-Resistant Coatings and Methods for Applying the Coatings onto the Articles. A method for coating a surface of a component formed from aluminum or an alloy thereof includes the step of cold gas-dynamic spraying a powder material on the component surface to form a coating, the powder material comprising at least one alloy from the group consisting of titanium, a titanium alloy, nickel, a nickel alloy, iron, an iron alloy, aluminum, an aluminum alloy, copper, a copper alloy, cobalt, and a cobalt alloy. In one embodiment, the method further includes the step of heat treating the turbine component after the cold gas-dynamic spraying.

WO 6050329: T. Duffy, V. Chung, M. Madhava, and D. Raybould. Company: Honeywell Intl. Inc. Issued/Filed: May 11, 2006/Oct 28, 2005.

Bipolar Plate with Enhanced Stability. An enhanced stability and inexpensive bipolar plate for a fuel cell is disclosed. The enhanced stability bipolar plate includes a bipolar plate substrate and a corrosion-resistant coating thermally sprayed on the bipolar plate substrate. A method for enhancing corrosion resistance of a bipolar plate is also disclosed.

WO 6041562: M.H. Abd Elhamid, G. Vyas, Y.M. Mikhail, R.H. Blunk, and D.J. Lisi. Company: General Motors Corp. Issued/Filed: April 20, 2006/Aug 11, 2005.

Corrosion-Resistant ABS Tone Ring. A tone ring of a vehicle antilock braking system of the type that is integrated into a disc brake rotor. The tone ring has a protective layer that enables it to withstand the combination of extreme heat and harsh environmental conditions to which it is exposed during operation of the vehicle. The protective layer is applied by thermally spraying a selected one of a plurality of materials, such as a nickel-base alloy, a high-chrome stainless steel, or nonferrous materials such as an aluminum, copper-base alloys or a ceramic, on teeth of the tone ring, and without causing the protective layer to be deposited on the rotor braking surfaces. The protective layer generally prevents the formation of oxidation and corrosion by-product layers on the teeth to thereby maintain sensitivity for detection of teeth movement by the anti-lock braking system sensor during operation of the system.

WO 6065400: C. Redgrave. Company: Hendrickson International. Corp. Issued/Filed: June 22, 2006/Nov 8, 2005.

Direct Application of Catalysts to Surfaces of Vehicle Heat Exchanger Via a Thermal Spray Process for Treatment of the Atmosphere. Disclosed is a method for direct application of a catalyst to a substrate for treatment of atmospheric pollution including ozone. The method includes applying a catalytic metal to a substrate utilizing a thermal spray process. The process can be utilized to apply a base metal such as copper to a substrate and the base metal becomes the catalytically active oxide during and following application to the substrate. This system replaces a multistep process within a single-step process to provide a catalytically active surface that can be utilized to reduce ground level ozone and other atmospheric pollutants.

EP 1405670: J.R. Smith, M.F. Sultan, M.-C. Wu, and Z. Zhao. Company: Delphi Technologies, Inc. Issued/Filed: June 14, 2006/Sept 15, 2003.

Glass Lining Application Method. A new glass lining application method enables stable, uniform glass lining layers to be applied to large glass-lined instruments composed of a stainless base material, the method including forming a thermal spray treatment layer by applying a thermal spray treatment to a surface of a stainless base material using a thermal spray material selected from a group composed of a stainless material identical to the base material, Ni metal, Cr metal, Fe metal, Co metal, Ni-Cr alloys, and Fe-Cr alloys, then forming a glass lining layer on the thermal spray treatment layer by means of a glass lining heat treatment using a ground coat and a cover coat, a surface roughness R_z of the thermal spray treatment layer being within a range from 5 to 100 μm, and an open pore diameter being within a range from 3 to 60 μm.

EP 1354978: Y. Iizawa, M. Shirasaki, and J. Ono. Company: Ikebukuro Horo Kogyo Co. Ltd. Issued/Filed: June 7, 2006/April 15, 2002.

Insulation Covering of Electric Drilling String Separator. Field: mining, particularly electric spacers adapted to transmit drilling direction information. Substance: covering comprises steel substrate, damping layer, insulation layer and glass tissue layer, which are overlapped and connected to the substrate. The damping layer has nickel-aluminum base and is applied by gas thermal spraying method. Insulation layer is formed of metal oxides, for instance of aluminum oxide, is impregnated with enamel or varnish and is applied by the same method. Glass tissue layer is impregnated with mixture including epoxy resin and metal oxide filler. Effect: increased reliability and service life.

RU 2278258: G.K. Nil'evich, N.E. Nikolaevich, and S.L. Iosifovich. Issued/Filed: June 20, 2006/Dec 16, 2004.

Method of Applying a Wear-Resistant Coating on a Thin, Metallic Strip-Shaped Carrier. A method of making coater and doctor blades for use on papermaking machinery is disclosed. A bond coating and then a wear-resistant coating are applied to one edge of an endless steel carrier strip. The strip is passed together with a masking strip continuously in only one direction through a coating zone for spraying by a plasma gun. The masking strip masks a transverse portion of the carrier strip so as to leave one edge of the latter exposed to the spray. Spraying continues for the number of passes necessary to apply desired thicknesses of the coatings to the carrier strip.

CA 2167037: K.H. Hewitt. Company: Pacific Saw and Knife Co. Issued/Filed: April 18, 2006/Jan 11, 1996.

Method of Making Articles in Sheet Form, Particularly Abrasive Articles. The present invention provides a method

of making sheet articles, for example, abrasive articles, retroreflective articles (such as traffic signs), pavement marking articles, or traction or nonskid articles. The method includes passing particles through a thermal sprayer to heat the particles and impinging the heated particles into a polymeric sheet so that the particles are at least partially embedded in the polymeric sheet. Preferably, the polymeric sheet is heated before impingement of the heated particles. One preferred method of softening the sheet is by a thermal sprayer that is used to heat the particles. A preferred thermal sprayer is a flame sprayer having a nozzle for emitting a flame, where the nozzle has a crossweb width and a downweb thickness, the width being substantially greater than the thickness.

CA 2295694: J.E. Krech. Company: Minnesota Mining and Manufacturing Co. Issued/Filed: May 2, 2006/Nov 12, 1997.

Method for Making an Infused Composite. This invention relates to a method of producing a composite object with an infused metal surface, where a thermal spray metal material layer is applied to a release agent coated pattern, mold or tool face, followed by a composite backing structure. The composite backing structure can be produced by resin infused fiber or similar filler. The thermal sprayed material and the composite backing structure result in a metal surface infused composite object when separated from the pattern, mold, or tool face.

MX 6003754: M.M. Shade. Company: Praxair S.T. Technology, Inc. Issued/Filed: June 14, 2006/March 31, 2006.

Method for Producing Machine Parts Having at Least One Sliding Surface. Field: manufacture of machine parts such as piston rings and (or) pistons and (or) engine cylinder sleeves, preferably two-cycle diesel engines with large working volume having at least one sliding surface. Substance: method comprises steps of applying coating on sliding zone by thermal deposition onto basic material; forming coating due to aggregation of aluminum bronze and at least one other material not alloyed with it; depositing coating inclusions more rigid in comparison with other coating materials in the form of powder non-melt during deposition together with other materials melt for deposition; in order to create stream for deposition, melting at least one hollow wire including in its cavity powders of carbides and (or) oxides forming inclusions non-melting at deposition. Stream created for deposition includes air and (or) nitrogen and (or), argon and (or) helium, and (or) hydrogen. Effect: simplified process of coating deposition, reliable metering, and uniform distribution of inclusions in coating.

RU 2276199: M. Lekh. Issued/Filed: May 10, 2006/Sept 27, 2000.

Method of Producing Metal Article Having Internal Passage Coated with a Ceramic Coating. The present application relates to a method of producing a metal article having an internal passage coated with a ceramic coating. The method comprises: preparing a core for defining the internal passage, applying the ceramic coating on the core, assembling the core with the ceramic coating applied thereon into a mold, casting metal into the mold at a pour temperature lower than the melting temperature of the ceramic coating, and removing the core. The ceramic coating may be applied by plasma spraying or slurry deposition.

US 7055574: T.E. Strangman and U.K. Schuelke. Company: Honeywell International Inc. Issued/Filed: June 6, 2006/July 27, 2004.

Method for Producing a Multifunctional Catalytic Element. The invention relates to the automotive industry, in particular to designing devices for detoxifying exhaust gases of an internal combustion engine and more specifically to honeycomb electrically heated structures. The inventive catalytic unit consists of two metal strips, each of which is provided with a coating made of chemically active substances applied by thermal spraying, wherein one strip is coated with a substance in the form of nitrogen oxide adsorbents and the other strip is coated with a catalyst for oxidizing a carbon oxide and hydrocarbons. One strip is corrugated. Afterward, the two strips are folded in such a way that transversal channels are formed, wherein said channels have a three-angle cross section, two sides thereof are coated with the adsorbent and the third side is coated with an oxidizing catalyst or vice versa. When the exhaust gases pass through, the nitrogen oxides are sorbed on certain walls of the channels and a carbon oxide and hydrocarbons are oxidized in such a way that a carbon dioxide and water vapors are sorbed on the other walls. When the absorbent is saturated with nitrogen oxides, the catalytic unit is heated by electric current and a reducing gas in added therein, thereby generating the desorption and reduction of nitrogen oxides.

WO 6041273: A.P. Khinsky and R. Pakamanis. Company: UAB "Norta." Issued/Filed: April 20, 2006/Oct 15, 2004.

Method for Producing Steel Pipe Plated with Metal by Thermal Spraying. A method for producing a metal pipe wherein a metal plate having a first chemical composition is continuously formed into a pipe and butt ends are continuously welded to thereby form a metal pipe, which comprises forming a metal layer exhibiting no discontinuity in the circumference direction and in the length direction and having a second chemical composition different from the above first chemical composition by thermal spraying, directly on the surface of the metal pipe after the above continuous welding. It is preferred that the method further comprises, after the formation of a thermal sprayed metal layer on the outer surface of the pipe, a working step for improving the uniformity of the thickness of said metal layer.

WO 6054350: S. Nakamura and T. Tamamura. Company: Daiwa Steel Tube Industries Co., Ltd. Issued/Filed: May 26, 2006/Nov 18, 2004.

Method of Producing Thin Sheet of Al-SiC Composite Material. Disclosed herein is a method for producing a thin sheet of an Al + SiC composite material, which comprises the steps of: mixing aluminum powders and SiC powders to give spraying powders and plasma spraying the spraying powders on a graphite substrate to form a thin sheet. According to the method of the present invention, the composite material having low thermal expansion coefficient, high thermal conductivity, and low density, which is suitable for use as a thermal management material for electronic devices, can be produced by a simple production process.

US 7056467: S.B. Kang, K.J. Euh, and M. Gui. Issued/Filed: June 6, 2006/Sept 2, 2003.

Method for Production of Cast Pieces and Insert for Cast Pieces. The invention relates to a method for production of cast pieces from a molten metal, whereby the molten metal is cast around an insert at least in sections. A metal layer is applied by thermal spraying of an aluminum alloy before the pouring of the molten metal to the insert at least on the regions thereof which come into contact with the molten metal in the finished cast piece, which

provides qualitatively high-grade cast pieces with at least one insert. The above is achieved, whereby the aluminum alloy forming the metal layer has a purity of at least 96%, such that the metal layer obtained on the insert is essentially free from low-melting eutectic phases. The invention further relates to an insert embodied in a corresponding manner. Said method is particularly suitable for the production of engine blocks, in which cylinder liners are cast as the inserts, coated as above.

WO 6034850: M. Speicher, M. Buchmann, P. Godel, and D. Kube. Company: Hydro Aluminium Alucast GmBH/ Federal-Mogul Friedberg GmBH. Issued/ Filed: April 6, 2006/Sept 28, 2005.

Method of Production of Coatings. Field: medical equipment; methods of production of coatings. Substance: the invention is pertaining to the field of medical equipment, in particular, to the method of production of coatings and may be used at application of the porous morphologically significant coatings on the articles of the medical equipment. The offered method provides for sputtering on the substrate by the plasma spray of the coating or the sublayer with the coating and usage in the capacity of the coating or the sublayer of the alloy containing the fundamental component of the substrate or the substrate and the coating in the amount smaller than is necessary for formation of a eutectic, and the second component forming the eutectic with the fundamental component as a result of the contact smelting. At that the components of the alloy are selected considering the possibility of formation by them of no less than two eutectics: one eutectic more fusible and the other eutectic with the fusion point exceeding the fusion point of the first one, but at the greater content of the second component, and no less than one resistant chemical compound, in which the concentration of the components takes an intermediate position between the concentrations of the components in these eutectics and with the concentration of the components taking the intermediate position between the chemical compound and the eutectic with the greater fusion point; and the heat treatment within the range of the temperatures above the fusion point of the more fusible eutectic and below the fusion point of other eutectic for formation and smelting of the eutectic in the zone of the contact of the substrate—the coating or the substrate—the sublayer and the sublayer—the coating. The invention ensures the high strength of cohesion of the coating with the substrate. Effect: the invention ensures the high strength of cohesion of the coating with the substrate.

RU 2275441: L.V. Nikolaevich, K.A. Alekseevich, and N.A. Sergeevich. Issued/Filed: April 27, 2006/June 9, 2004.

A Molding Process and Product. In a molding process for producing automobile parts, the female part of a two-part mold is sprayed with a metal such as stainless steel, tin, nickel-tin, copper, or zinc. A thermal expansion compensation layer is laid on the sprayed mold surface and a layer of a resin-impregnated fibrous material is applied thereto. The resultant assembly is cured and then removed from the female part of the mold or removed from the mold and then cured. The metal surface of the composite part may be subject to further treatment such as polishing, coating, and painting, or a combination of these. "Windows" may be produced by leaving areas of the mold part unsprayed with metal. In this way panels for lights, aerials, or proximity sensors may be integrally formed.

WO 6048617: A. Dodworth. Company: Bentley Motors Ltd. Issued/Filed: May 11, 2006/Oct 31, 2005.

Mold Material Processing Device, Method and Apparatus for Producing Same. The invention relates to a molten material processing device having an elongated thermal element such as a heating element, a thermocouple, a sensor, a heatpipe and a cooling pipe which is characterized in that said elongated thermal element is located in a recess provided in a surface of the molten material processing device, the recess, comprising a first portion and a second portion, has a cross section which is larger than a cross section of the thermal element, so as to provide a clear space between the thermal element and the surface of the processing device, the clear space which is limited by the first portion and the thermal element is filled by a thermally sprayed material and the second portion, which is adapted to the cross section of the thermal element, partially surrounds and directly contacts same.

US 7044191: J. Fischer and D. Zuraw. Company: Mold-Masters Ltd. Issued/ Filed: May 16, 2006/May 25, 2001.

Production of a Gastight, Crystalline Mullite Layer by Using a Thermal Spraying Method. The invention relates to a method for producing a tight crystalline mullite layer on a metallic and/or ceramic substrate by using the plasma spraying technique. To this end, a sol containing mullite precursors with a proportion of 2 to 25 wt.% with regard to the oxides ($3Al_2O_3/2SiO_2$) is used as a spraying additive. This method is carried out under atmospheric conditions, and the sol is injected with a focused jet and with an overpressure of at least one 1 bar into the plasma flame. An additional compacting of the layer can be advantageously effected by repeatedly passing over the layer with the plasma flame. The method is particularly suited for applying a gastight crystalline mullite layer to a steel substrate.

WO 6034674: R. Siegert, S. Latzel, R. Hansch, D. Stover, and R. Vassen. Company: Forschungszentrum Juelich GmBH. Issued/Filed: April 6, 2006/Sept 17, 2005.

Thermal Spray Application of Brazing Material for Manufacture of Heat Transfer Devices. The invention relates to a method of manufacturing and coating heat transfer parts for a heat exchanger such as tubes in an automobile radiator. The tubes are coated with brazing material by thermal spraying, such as plasma deposition or wire-arc deposition. The coating is then melted by application of heat to braze the tubes to the fins and to the headers to complete the formation of the heat exchanger.

US 7032808: Y.L. Shabtay. Company: Outokumpu Oyj. Issued/Filed: April 25, 2006/Oct 6, 2003.

Thermal Spray Grit Roller. Thermal spray grit roller for printers, has roller shaft, roller body, and grit layer comprising grit particles deposited on roller body outer surface by thermal spray process.

HK 1080676: C.K. Leung. Company: Nam Wah Development Ltd. Issued/ Filed: June 30, 2006/March 10, 2005.

Wear Resistant Layer for Downhole Well Equipment. The present disclosure provides a method, system, apparatus, and related alloy to provide a protective wear coating on a downhole component for a well through a synergistic use of a thermal spraying process in combination with a novel iron-base alloy. The thermal spraying process melts the material to be deposited while a pressurized air stream sprays the molten material onto the downhole component. The coating operation takes place at low temperatures without

fusion or thermal deterioration to the base material. The wear resistance is increased while providing a lower coefficient of friction by the wear-resistant layer relative to a coefficient of friction of the downhole equipment without the wear-resistant layer. In at least one embodiment, the disclosed process using the iron-base alloy can apply a much thicker coating than heretofore has been able to be applied without spalling and without necessitating an intermediate buffer layer.

WO 6055230: J.H. Gammage, R.A. Daemen, and J.L. Scott. Company: Wear Sox, L.P. Issued/Filed: May 26, 2006/Oct 31, 2005.

Diagnostics and Characterization

Quality Assurance During Thermal Spray Coating by Means of Computer Processing or Encoding of Digital Images. A thermal spray coating method for creating a coating layer on a surface of a substrate is monitored by determining characteristics of the thermal spray coating as it affects the quality of the coating layer by recording, controlling, and monitoring through a digital camera whose image is analyzed and characterized.

US 7043069: P. Heinrich, W. Kroemmer, K. Landes, J. Zierhut, and T. Streibl. Company: Linde Gas AG. Issued/Filed: May 9, 2006/March 13, 2000.

Temperature Profile Determination. Apparatus for determining the temperature profile of the surface being sprayed or otherwise treated, the apparatus comprising four electric arc spray guns spraying molten steel. The guns are connected to a six-axis industrial robot that is adapted to move them over the surface of the ceramic substrate. The metal deposited by the spray builds up a metal shell referred to as the sprayform. The temperature profile of the sprayform surface is recorded periodically by a thermal imaging camera positioned directly above the surface. The apparatus includes a pruning filter for receiving each pixel of an image captured by the camera and for applying at least a lower temperature limit to it so as to reject or disregard any pixels determined to have a temperature less than the lower temperature limit.

US 7029172: P. Jones, S.R. Duncan, and R. Daniel. Company: Isis Innovation Ltd. Issued/Filed: April 18, 2006/June 27, 2002.

Thermal Spraying Apparatus. Instrument to control a thermal projection torch in real time by measuring the jet characteristics by a combined camera and pyrometer and computer analysis to determine the required feed parameter.

EP 1340577: M. Vardelle, T. Renault, C. Bossoutrot, F. Braillard, and H. Hoffmann. Company: Snecma Services. Issued/Filed: May 3, 2006/Feb 28, 2003.

EP 1340578: M. Vardelle, C. Bossoutrot, H. Hoffmann, T. Renault, and F. Braillard. Company: Snecma Services. Issued/Filed: May 3, 2006/Feb 28, 2003.

Feedstock

Improved Thermal Spray Powder. It is found that calcining chromium oxide powders having a particle size component smaller than 10 μm reduces the volume proportion of smaller particles and increases the general uniformity of particle sizes in the distribution and the roundness of the particles.

CA 2403653: R.F. Quinlivan, S.H. Yu, and H. Wallar. Company: Saint-Gobain Ceramics & Plastics, Inc. Issued/Filed: June 20, 2006/April 19, 2001.

Thermal Spray Composition and Method of Deposition for Abradable Seals. A thermal spray composition and method of deposition for abradable seals for use in gas turbine engines, turbochargers, and steam turbines. The thermal spray composition comprises a mixture of metal-clad solid lubricant particles and unclad solid lubricants particles for producing an abradable seal used in the compressor section of gas engines, aircraft engines, radial compressors, and the like. The metal is selected from alloys of Ni, Co, Cu, Fe, and Al, preferably Ni alloys, and the solid lubricant is at least one of hexagonal boron nitride, graphite, calcium fluoride, lithium fluoride, and molybdenum disulfide, preferably hexagonal boron nitride or hexagonal boron nitride and graphite.

US 7052527: K. Hajmrle and P. Fiala. Company: Sulzer Metco (Canada) Inc. Issued/Filed: May 30, 2006/April 29, 2004.

Pretreatment and Post Treatment

Method for Repairing Steel Spray Formed Tooling with TIG Welding Process. A machine tool or die that is fabricated from thermally spray formed steel is repaired on the factory floor by first cleaning the area to be repaired to removed all dirt and impurities. Next the surface is prepared by means of preheating the surface with propane torches at a rate not exceeding 50 °C/h to boil off the moisture in the tool. The weldment is formed by the TIG welding process and then finished by conventional machining, grinding, and polishing.

EP 1092496: N. Hussary and P.E. Pergande. Company: Ford Global Technologies, Inc. Issued/Filed: June 14, 2006/Oct 6, 2000.

A Thermal Spraying Preprocessing Method and a Cylinder Block of an Engine So Preprocessed. The adhesiveness of a thermal spray coating and a cylinder internal surface is improved by forming a sufficient roughened surface on an internal surface. A processing roller is installed on the main shaft of a processing device via a pressurizing mechanism. An uneven surface is provided on the external periphery of the processing roller. By pressing the processing roller against the internal surface while the roller rotates and moves, a fine unevenness that corresponds to the unevenness of the roller is formed on the cylinder internal surface. A thermal spray coating is formed on the internal surface where the inner surface has been roughened by forming the aforementioned unevenness.

WO 6040746: T. Sekikawa, M. Iizumi, T. Ogino, K. Nishimura, E. Shiotani, and H. Takahashi. Company: Nissan Motor Ltd./Nissan North America, Inc. Issued/Filed: April 20, 2006/Oct 14, 2005.

Spraying Systems and Methods

Cold Gas Spraying Method. The invention relates to a cold gas spraying method. According to said method, a gas jet into which particles are introduced is generated with the aid of a cold gas spray gun. The kinetic energy of the particles results in a layer being formed on a substrate. Said substrate is provided with a structured texture that is transferred to the layer that is formed. The inventive method makes it advantageously possible to produce a high-temperature superconducting layer on the substrate by selecting an appropriate particle composition. Said process can be additionally supported using a heating device in a subsequent thermal treatment step.

WO 6061384: U. Kruger and R. Ullrich. Company: Siemens AG. Issued/Filed: June 15, 2006/Dec 6, 2005.

Installation for Spraying of the Gas-Thermal Coatings. Field: mechanical engineering; installations for spraying of the plasma gas thermal coatings. Substance: the invention is pertaining to the field of mechanical engineering, in particular, to the installation for spraying of the plasma gas thermal coatings and may be used for deposition of metallic, metal-ceramic, and ceramic coatings by spraying onto a surface at manufacture and restoration of the details of the different configuration. The installation contains: the heat-sound-insulation chamber, the circular plate, the plasmatron holder, the plasmatron, the plasma generator, the shotblasting gun, and the hopper. The circular plate with a hole in its middle is mounted horizontally with a possibility of rotation around of the vertical axis. On it and coaxially to it there is an installed workpiece. The circular plate through its central hole is connected to the hopper having two chambers: the central chamber and the peripheral chamber. The chambers are partitioned from each other by the separation mesh. The central chamber of the hopper has the conical bottom with the collector. The peripheral ring-shaped chamber is connected to the air duct. The technical result of the invention ensures: the possibility for keeping the workpiece of the complex configuration and the big mass on the circular plate without fastening, because due to its big mass it reliably stands on the circular plate; significant simplification of the plasmatron feeding and fixation of all the communications to the plasmatron, as compared with on their horizontal feeding. Effect: the invention ensures the possibility for keeping the workpiece of the complex configuration and the big mass on the circular plate without fastening, its reliable standing on the circular plate, significant simplification of the plasmatron feeding and the all communications fixation to the plasmatron, as compared with the horizontal feeding.

RU 2278904: N.E. Nikolaevich. Issued/Filed: June 27, 2006/Nov 26, 2004.

Method for Coating a Workpiece. The invention relates to a method for coating a workpiece, whereby a coating material and an aggregate material are applied to the workpiece by thermal spraying. The inventive method is characterized by applying to the workpiece, in addition to the coating material, an aggregate material in which or to which a fluorescent marker material is firmly fixed. The spraying process is monitored online by detecting and evaluating at least the particles of the fluorescent marker material present in the spray jet.

WO 6060991: M. Hertter, A. Jakimov, and W. Wachter. Company: MTU Aero Engines GmBH. Issued/Filed: June 15, 2006/Nov 30, 2005.

Method of Fabricating Free Standing Objects Using Thermal Spraying. The method of fabricating free-standing objects using thermal spraying, preferably of a metal, in the following process. A wire mesh is formed into a three-dimensional shape of the desired finished product and the shaped mesh is then thermally sprayed with a coating material to substantially cover the visible portions of the mesh. The preferred coating material is metal.

US 7026016: E.C. Bauer. Issued/Filed: April 11, 2006/Jan 2, 2004.

Method of Shielding Effluents in Spray Devices. This invention provides a unique gas shield or shroud surrounding the effluent of a thermal spray device that effectively can extend the working distance or standoff between the thermal spray device and the surface being coated. This invention provides a method of spraying materials, including ceramic materials and reactive materials, at a long standoff and a method of controlling the temperature of the effluent being deposited using heated gas shield.

US 7045172: T.A. Taylor and J.E. Jackson. Company: Praxair S.T. Technology, Inc. Issued/Filed: May 16, 2006/July 31, 2003.

Thermal Spray Nozzle Device and Thermal Spray Device Using the Same. A thermal spray nozzle device in which a carrier gas is introduced into the entrance side of a nozzle to form a supersonic gas flow in the entire region inside the nozzle and a thermal spray material is atomized and ejected by the gas flow. The thermal spray nozzle device has a thermal spray material insertion section through which the thermal spray material, formed in a linear shape, is inserted into the nozzle from the entrance side so as to be substantially parallel to the gas flow, and has a laser device for heating and melting, in the vicinity of the fore-end of the thermal spray material insertion section, the thermal spray material projecting from the thermal spray material insertion section. Thermal spray material particles that are melted and atomized by the laser device are quickly cooled by the gas flow in the nozzle and ejected in a coagulated state or a semicoagulated state.

WO 6057284: T. Oda, H. Hata, Y. Maeda, and K. Fukutani. Company: Kabushiki Kaisha Kobe Seiko Sho. Issued/Filed: June 1, 2006/Nov 24, 2005.

Thermal Barrier Coatings and Bondcoats

Durable Thermal Barrier Coating Having Low Thermal Conductivity. This invention provides a thermal barrier ceramic coating for application to a metallic article, with the ceramic coating having a formula of $Nd_xZr_{1-x}O_y$ with Z dissolved in, where $0 < x < 0.5$ and $1.75 < y < 2$ and wherein Z is an oxide of a metal selected from the group consisting of Y, Mg, Ca, Hf, and mixtures thereof. In one embodiment Nd is added at a level up to 7 mol%. In another embodiment Z is yttrium and is added at a level of at least 6 wt%.

US 7041383: Y. Liu and P. Lawton. Company: Chromalloy Gas Turbine Corp. Issued/Filed: May 9, 2006/May 3, 2004.

Method of Obtaining Coatings That Protect Against High-Temperature Oxidation. The invention relates to a method of obtaining coatings that protect against high-temperature oxidation, based on MCrAlY, wherein M is selected from the group containing Ni, Co, or Fe or the alloys thereof, and comprises the thermal spraying of MCrAlY-based powders using high-frequency pulsed detonation (HFPD) techniques. Optionally, a high-density ceramic layer can be deposited on the MCrAlY layer using high-frequency pulsed detonation (HFPD) techniques.

WO 6042872: I.F. Altuna, C.V. Gonzalez, and G. Barykin. Company: Turbodetco, S. L. Issued/Filed: April 27, 2006/Sept 14, 2004.