

## **"State of the art" mailing service**

**Patent News nr. 82 (01-2011)**



### **EP1741359B1: Oval cut diamond**

Applicant: Hohoemi Brains, Japan  
Publication: 2010-12-15  
Filed: 2005-03-25  
Status: granted

An oval-cut diamond comprises a girdle having a contour line in an oval or oval-like shape, a crown above the girdle having an octagonal table facet on a top of it and a pavilion below the girdle. The girdle is of a ratio (b/a) of a short radius to a long radius of 0.6 or more, in which a radius in long axis direction is "a", and a radius in short axis direction is "b". A pair of pavilion main facets positioned opposite to each other with respect to a central axis has a pair of crown main facets or star facets facing the pair of pavilion main facets through the girdle. The two pavilion main facets, the two crown main facets or star facets and the table facet have a common vertical plane within the facets so that brilliancy of reflection lights coming out of the table facet and crown facets is enhanced.

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### **US20100326135A1: Diamond material**

Applicant: -  
Publication: 2010-12-30  
Filed: 2010-06-25  
Status: application

A method of making fancy orange synthetic CVD diamond material is described. The method comprises irradiating a single crystal diamond material that has been grown by CVD to introduce isolated vacancies into at least part of the CVD diamond material and then annealing the irradiated diamond material to form vacancy chains from at least some of the introduced isolated vacancies. Fancy orange CVD diamond material is also described.

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### **NZ0561610A: Method and system for laser marking in the volume of gemstones such as diamonds**

Applicant: Internat Gemstone Registry Inc  
Publication: 2010-11-26  
Filed: 2005-08-26

Status: application

Three methods for adaptive control of the creation of indicia in the bulk of a gemstone specimen are disclosed. The methods include using a series of laser pulses in the femtosecond range focused below the surface of the specimen. The indicia identify the specimen without affecting the surface of the specimen and are invisible under 10X magnification. The first method comprises: predetermining characterising features of the indicia to be created; executing a predetermined marking protocol for the series of laser pulses using parameters selected from among the group comprising wavelength, pulse duration, number of pulses, repetition rate, energy per pulse, numerical aperture of focusing optics and target coordinates; automatically monitoring the creation of the indicia as the protocol is being executed; and automatically interrupting further execution of the protocol when the monitoring reveals that the indicia exhibits the characterising features. The second method comprises: generating an identification code for association with the specimen; determining a characteristic pattern for a plurality of indicia corresponding to the identification code; and executing a marking protocol for the series of laser pulses by applying the pulses to attempt to sequentially create each of the indicia according to the characteristic pattern. If execution of the protocol creates one but not all of the indicia according to the characteristic pattern, the method includes generating a new identification code corresponding to a new characteristic pattern that is consistent with those of the indicia that have been successfully created, and if required executing a marking protocol to create additional indicia to attempt to complete the new characteristic pattern. The third method comprises: establishing a marking protocol for an ultrashort laser pulse marking system comprising a plurality of predetermined sets of parameters, each set comprising parameters selected from among the group comprising wavelength, pulse duration, number of pulses, repetition rate, energy per pulse, numerical aperture of focusing optics, and target coordinates; attempting to create an indicium by executing a first set of parameters determined by the protocol; and automatically assessing whether an indicium was created using the first set of parameters. If an indicium was not created, the method includes automatically attempting to create an indicium according to a second set of parameters predetermined by the protocol.

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#### **US20100329965A1: Diamond material**

Applicant: -  
Publication: 2010-12-30  
Filed: 2010-06-25  
Status: application

A method of making fancy pale blue or fancy pale blue/green CVD diamond material is described. The method comprises irradiating single crystal diamond material that has been grown by a CVD process with electrons to introduce isolated vacancies into the diamond material, the irradiated diamond material having (or after a further post-irradiation treatment having) a total vacancy concentration [VT] and a path length L such that [VT]×L is at least 0.072 ppm cm and at most 0.36 ppm cm, and the diamond material becomes fancy pale blue or fancy pale blue/green in colour. Fancy pale blue diamonds

are also described.

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**US20100329962A1: Diamond material**

Applicant: -  
Publication: 2010-12-30  
Filed: 2010-06-25  
Status: application

A method of introducing NV centres in single crystal CVD diamond material is described. One step of the method comprises irradiating diamond material that contains single substitutional nitrogen to introduce isolated vacancies into the diamond material in a concentration of at least 0.05 ppm and at most 1 ppm. Another step of the method comprises annealing the irradiated diamond to form NV centres from at least some of the single substitutional nitrogen defects and the introduced isolated vacancies.

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**US20100329961A1: Diamond material**

Applicant: -  
Publication: 2010-12-30  
Filed: 2010-06-25  
Status: application

Starting from a diamond material which shows a difference in its absorption characteristics after exposure to radiation with an energy of at least 5.5 eV (typically UV radiation) and thermal treatment at 798K, controlled irradiation is applied so as to introduce defects in the diamond material. After the controlled irradiation the difference in the absorption characteristics after exposure to radiation with an energy of at least 5.5 eV and thermal treatment at 798K is reduced.

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**EP1332352B1: System and method for evaluating the appearance of a gemstone**

Applicant: Gemological Institute of America, United States of America  
Publication: 2010-12-08  
Filed: 2001-10-11  
Status: granted

A method for providing a cut grade for a gemstone comprising: (1) providing a list of proportion grades including combinations of cut proportions and calculations for dispersed colour light return corresponding to the cut proportions, said calculations for dispersed colour light return being derived from a mathematical model in which light is traced from a modelled point light source through a mathematical representation of a gemstone of chosen cut proportions and in which a dispersed colour light return metric is derived that takes into account the size, exit angle, number and colour of incident light elements that exit the gemstone; (2) analyzing cut proportions of the gemstone; (3)

comparing the cut proportions of the gemstone with the list; and (4) providing a cut grade for the gemstone based on the list of proportion grades.

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**EP1021271B1: Laser marking system and method for gemstones**

Applicant: Lazare Kaplan International, United States of America  
Publication: 2010-12-08  
Filed: 1996-11-14  
Status: granted

A laser microinscribing system includes a Q-switched Nd: YLF laser with a harmonic converter producing an output of about 530 nm, an optical system including a focussing lens, a gemstone mounting holder that is displaceable along three axes for moving a workpiece such as a gemstone with respect to the optical system so that laser energy is presented to desired positions, an imaging system for viewing the gemstone from a plurality of viewpoints including a top CCD and a side CCD, a processor controlling the position of the holder based on marking instructions and a predetermined program, and a storage system for storing information relating to images of a plurality of workpieces. A rigid frame supports the laser, the optical system and the holder to increase immunity to vibrational misalignments. A secure certificate of authenticity of a marked workpiece is preferably provided having an image of the marking as well as the outline of a girdle of the gemstone.

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**US7854823: Synthesis of diamond by extraction of a pulse derived from the abrupt collapse of a magnetic field**

Applicant: -  
Publication: 2010-12-21  
Filed: 2006-06-20  
Status: granted

A process for converting carbonaceous material into diamond utilizing the compressive force derived from an abruptly collapsing magnetic field.

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**WO2010149779A1: Method for making fancy pale blue or fancy pale blue /green single crystal cvd diamond and product obtained**

Applicant: Element Six Limited, United Kingdom  
Publication: 2010-12-29  
Filed: 2010-06-25  
Status: application published without search report

A method of making fancy pale blue or fancy pale blue/green CVD diamond material is described. The method comprises irradiating single crystal diamond material that has been grown by a CVD process with electrons to introduce isolated vacancies into the diamond material, the irradiated diamond material having (or after a further post-

irradiation treatment having) a total vacancy concentration [VT] and a path length L such that [VT] x L is at least 0.072 ppm cm and at most 0.36 ppm cm, and the diamond material becomes fancy pale blue or fancy pale blue/green in colour. Fancy pale blue diamonds are also described.

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**WO2010149775A1: Method for treating single crystal cvd diamond and product obtained**

Applicant: Element Six Limited; Twitchen, Daniel James; Geoghegan, Sarah Louise; Perkins, Neil, United Kingdom  
Publication: 2010-12-29  
Filed: 2010-06-25  
Status: international application published with international search report

A method of introducing NV centres in single crystal CVD diamond material is described. One step of the method comprises irradiating diamond material that contains single substitutional nitrogen to introduce isolated vacancies into the diamond material in a concentration of at least 0.05 ppm and at most 1 ppm. Another step of the method comprises annealing the irradiated diamond to form NV centres from at least some of the single substitutional nitrogen defects and the introduced isolated vacancies. Pink CVD diamond material and CVD diamond material with spintronic properties is also described.

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**WO2010149777A1: Method for making fancy orange coloured single crystal cvd diamond and product obtained**

Applicant: Element Six Limited; Twitchen, Daniel James, United Kingdom  
Publication: 2010-12-29  
Filed: 2010-06-25  
Status: international application published with international search report

A method of making fancy orange synthetic CVD diamond material is described. The method comprises irradiating a single crystal diamond material that has been grown by CVD to introduce isolated vacancies into at least part of the CVD diamond material and then annealing the irradiated diamond material to form vacancy chains from at least some of the introduced isolated vacancies. Fancy orange CVD diamond material is also described.

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**JP2010201043A2: Diamond and imitation gem thereof**

Applicant: Rosy Blue; Aoyanagi Takeshi  
Publication: 2010-09-16  
Filed: 2009-03-04  
Status: application

Problem to be solved: To provide a diamond, allowing viewing of an arrow pattern and a heart pattern at the same time in a crown part under a predetermined condition.

Solution: In this diamond, when incident light from a table or a crown is reflected on one side pavilion and it is again reflected on the other side pavilion to produce outgoing light, an upper V-shaped line of the heart pattern is formed by a boundary line in the vicinity of a girdle facet point of adjacent pavilion facets. When outgoing light is transmitted through the crown and emitted, a lower V-shaped line of a heart pattern and the other lines of the heart pattern are formed by a boundary line of a star facet formed on the crown, thereby the heart pattern is visually recognized as well as the arrow pattern on the crown part.

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**WO2010149776A1: Method for treating diamond material and product obtained**

Applicant: Element Six Limited, United Kingdom  
Publication: 2010-12-29  
Filed: 2010-06-25  
Status: application

Starting from a diamond material which shows a difference in its absorption characteristics after exposure to radiation with an energy of at least 5.5 eV (typically UV radiation) and thermal treatment at 798K, controlled irradiation is applied so as to introduce defects in the diamond material. After the controlled irradiation the difference in the absorption characteristics after exposure to radiation with an energy of at least 5.5 eV and thermal treatment at 798K is reduced. Diamond material with absorption features characteristic of isolated vacancies is also described.

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**GB2428690B2: High colour diamond**

Applicant: Element Six Limited, United Kingdom  
Publication: 2010-12-29  
Filed: 2006-06-22  
Status: granted

A method of producing CVD diamond having a high colour (near colourless), which is suitable for optical and electrical applications in addition to as a gem stone. The method includes adding a gaseous source comprising a second impurity atom type to counter the detrimental effect on colour caused by the presence in the CVD synthesis atmosphere of a first impurity atom type. The first and second impurity atoms are different from one another and can be selected from nitrogen and atoms that are solid in their elemental state (e.g. silicon, boron, phosphorus or sulphur). The described method applies to the production of both single crystal diamond and polycrystalline diamond.

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**AT0489490E: Verfahren zum ändern die farbe eines cvd-artigen diamanteinkristalles und dadurch hergestellte diamant-schicht**

Applicant: Element Six Limited, United Kingdom  
Publication: 2010-12-15  
Filed: 2003-09-05

Status: -

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**AT0489489E: Gefärbter diamant**

Applicant: Element Six Limited, United Kingdom

Publication: 2010-12-15

Filed: 2002-12-13

Status: -

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**"State of the art"  
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**Patent News nr. 83 (02-2011)**



**US20110000259A1: Gemstone and method for cutting the same**

Applicant: -  
Publication: 2011-01-06  
Filed: 2008-01-22  
Status: application

A gemstone is provided that has an improved brilliance, especially at the crown portion of the gemstone. The gemstone has a crown angle that is less than an ideal cut round diamond and, preferably the crown angle is less than 27 degrees. By reducing the crown angle of the gemstone, light entering one end of the crown portion may exit the opposite end of the gemstone. In addition, reducing the crown angle reduces the mass necessary for the gemstone. As a result, the gemstone has a width or diameter that corresponds to a larger mass gemstone that is cut according to conventional ideal proportions.

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**US20110016918A1: Ornamental diamond having two-stage pavilion**

Applicant: Hohoemi Brains, Japan  
Publication: 2011-01-27  
Filed: 2008-01-09  
Status: application

An ornamental diamond is provided as an extremely bright diamond with numerous reflection patterns when viewed from above its table facet and crown facets. The diamond has the same crown as the round brilliant cut and its pavilion consists of a first pavilion and a second pavilion separated by a horizontal division plane. Lower girdle facets and pavilion main facets are bent by the horizontal division plane between the first and second pavilions, and a first pavilion angle is larger than a second pavilion angle. The ornamental diamond having the two-stage pavilion is much more brilliant than and has twice as many reflection patterns as the conventional round brilliant cut.

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**US7878025: Oval shaped diamond cut having hearts and arrows pattern**

Applicant: SanDiamond USA, United States of America  
Publication: 2011-02-01  
Filed: 2007-05-04  
Status: granted



An oval shaped diamond, adapted to display a hearts and arrows pattern when exposed to light characteristic of the hearts and arrows pattern in a round diamond, comprising: an oval shape having two long sides symmetrical to each other, two short sides symmetrical to each other and four corner sides symmetrically located between the long sides and the short sides respectively, eight main crown facets of unequal size and eight main pavilion facets of unequal size, sixteen pavilion half facets; a girdle of non-uniform thickness separating the crown and pavilion facets and two subsidiary pavilion facets in alignment with each other on the long sides of the diamond adjacent a main pavilion facet.

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**CZ0302229B6: Thick single crystal diamond layer, method for producing thereof and gemstones produced from this layer**

Applicant: Element Six, South Africa  
Publication: 2011-01-05  
Filed: 2001-06-14  
Status: patent specification

A layer of a single crystal chemically vaporized diamond of high quality having a thickness greater than 2 mm, which has one or more of following characteristics: a) a high charge collection distance at 300 K is at least 100  $\mu\text{m}$ , measured at an applied field of 1 V/ $\mu\text{m}$ ; a high value for the product of the average carrier mobility and lifetime  $\mu_i T$  which exceeds  $1.0 \times 10^{-6} \text{ cm}^2/\text{V}$  at 300 K; c) an electron mobility ( $\mu_{ie}$ ) measured at 300 K is higher than  $2400 \text{ cm}^2/\text{V}\cdot\text{s}$ ; d) a hole mobility ( $\mu_{ih}$ ) measured at 300 K is higher than  $2100 \text{ cm}^2/\text{V}\cdot\text{s}$ ; e) in the off state, a resistivity at 300 K is greater than  $10^{12} \Omega\cdot\text{cm}$  at an applied field of 50 V/ $\mu\text{m}$ ; The invention involves a diamond in a form of a gemstone produced from the layer of single crystal chemically vaporized diamond and method for producing the layer of single crystal chemically vaporized diamond.

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**AT0491361E: Diamant mit ovalem schnitt**

Applicant: Hohoemi Brains, Japan  
Publication: 2011-01-15  
Filed: 2005-03-25  
Status: -

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**CN101920478A:**

Applicant: -  
Publication: 2010-12-22  
Filed: 2010-04-23  
Status: application

Making a multi-faceted diamond, comprises obtaining diamond having euhedral morphology and many primary crystallographic faces, and polishing many primary

apexes defined by the faces to form many secondary faces and secondary apexes

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**WO2011004244A1: The genesis and identification of a diamond**

Applicant: University of Cape Town, South Africa  
Publication: 2011-01-13  
Filed: 2010-07-06  
Status: application

A method is provided for the determination of the genesis or likely genesis of a diamond wherein the magnetic properties of a diamond are measured at a higher temperature that is above the Verwey transition temperature, typically a temperature of about 300 Kelvin, and at a lower temperature that is below the Verwey transition temperature, typically about 4 Kelvin. The measurements are compared or processed in order to develop an indication as to characteristic inclusions in the diamond. Generally, measurements are made at a series of different temperatures between the higher temperature and the lower temperature. The magnetic measurements may include the determination of a magnetic hysteresis loop and the magnetic moment of the diamond. Measurements may be carried out with the diamond in different positions in order to determine its anisotropy. The magnetic field may have a maximum field strength of from 3 to 7 Tesla. A diamond is also provided that has an identification or certification record comprising data that includes, or is developed from, higher temperature and low temperature magnetic properties of the diamond.

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**WO2011004189A1: Gemstone alignment**

Applicant: De Beers Centenary AG, Switzerland  
Publication: 2011-01-13  
Filed: 2010-07-07  
Status: application

An apparatus and method for aligning a gemstone such as diamond with a predetermined vertical axis is described. The apparatus includes an upwardly extending nozzle aligned with the vertical axis and sized to allow the gemstone to settle into it under the action of gravity so that the article is supported by the aperture. A fluid supply system supplies fluid to the nozzle under sufficient pressure to support the article within or above the aperture. A fluid pressure control system controls the pressure of fluid supplied to the nozzle, so that it can be reduced gradually.

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**US20110017126A1: Coloured diamond**

Applicant: -  
Publication: 2011-01-27  
Filed: 2010-10-07  
Status: application

A diamond layer of single crystal CVD diamond which is coloured, preferably which has a fancy colour, and which has a thickness of greater than 1 mm.

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**US20110014112A1: Method for growing monocrystalline diamonds**

Applicant: -  
Publication: 2011-01-20  
Filed: 2009-06-18  
Status: application

A method of forming mono-crystalline diamond by chemical vapour deposition, the method comprising the steps of: (a) providing at least one diamond seed; (b) exposing the seed to conditions for growing diamond by chemical vapour deposition, including supplying reaction gases that include a carbon-containing gas and hydrogen for growing diamond and include a nitrogen-containing gas; and (c) controlling the quantity of nitrogen-containing gas relative to other gases in the reaction gases such that diamond is caused to grow by step-growth with defect free steps without inclusions. The nitrogen is present in the range of 0.0001 to 0.02 vol %. Diborane can also be present in a range of from 0.00002 to 0.002 vol %. The carbon-containing gas can be methane.

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**US7879148: System and method for producing synthetic diamond**

Applicant: Apollo Diamond, United States of America  
Publication: 2011-02-01  
Filed: 2008-03-13  
Status: granted

Synthetic monocrystalline diamond compositions having one or more monocrystalline diamond layers formed by chemical vapor deposition, the layers including one or more layers having an increased concentration of one or more impurities (such as boron and/or isotopes of carbon), as compared to other layers or comparable layers without such impurities. Such compositions provide an improved combination of properties, including color, strength, velocity of sound, electrical conductivity, and control of defects. A related method for preparing such a composition is also described, as well as a system for use in performing such a method, and articles incorporating such a composition.

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**CA2466077C: Apparatus and method for diamond production**

Applicant: Carnegie Inst of Washington; UAB Research  
Publication: 2011-01-04  
Filed: 2002-11-07  
Status: granted

An apparatus for producing diamond in a deposition chamber including a heat/sinking holder for holding a diamond and for making thermal contact with a side surface of the diamond adjacent to an edge of a growth surface of the diamond, a noncontact

temperature measurement device positioned to measure temperature of the diamond across the growth surface of the diamond and a main process controller for receiving a temperature measurement from the noncontact temperature measurement device and controlling temperature of the growth surface such that all temperature gradients across the growth surface are less than 20 ~ C. The method for producing diamond includes positioning diamond in a holder such that a thermal contact is made with a side surface of the diamond adjacent to an edge of a growth surface of the diamond, measuring temperature of the growth surface of the diamond to generate temperature measurements, controlling temperature of the growth surface based upon the temperature measurements, and growing single-crystal diamond by microwave plasma chemical vapor deposition on the growth surface, wherein a growth rate of the diamond is greater than 1 micrometer per hour.

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**CN101596641B: Method for chemical finishing of surface defect of diamond cutter by atmosphere low-temperature plasma**

Applicant: -  
Publication: 2011-01-05  
Filed: 2009-06-30  
Status: application

The invention relates to a method for the chemical finishing of the surface defect of a diamond cutter by atmosphere low-temperature plasma, which belongs to the method for the chemical finishing of the surface defect of the diamond cutter by the atmosphere low-temperature plasma, aiming at solving the problem that after the diamond cutter at present adopts mechanical type grinding to carry out processing, microscopic defects existing on the grinding surface and a cutting edge of the cutter can not be removed, which influences the cutting performance and the service life of the diamond cutter. In the method, a mixture of plasma gas and reacting gas is introduced between a cathode and an anode of a plasma generator, a radio-frequency power signal is applied to the cathode and the anode, then plasma discharge is generated between the two electrodes, the diamond cutter after being ground is taken out after the diamond cutter is put in a plasma discharge area and processed for 10 minutes to 30 minutes, the finishing of the cutter can be realized, and circulating cooling water is introduced into hollow cavities in the electrodes. The invention is used for removing the surface microscopic defect of the diamond cutter.

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**JP04584904B2:**

Applicant: -  
Publication: 2010-11-24  
Filed: 2006-12-13  
Status: granted

Laser system for marking gemstones for subsequent authentication has laser and cameras used to perform micro-inscribing and recording of gem details for later comparison and

certification

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**JP2010207998A2: Method of manufacturing diamond part and diamond part**

Applicant: Sumitomo Electric  
Publication: 2010-09-24  
Filed: 2009-03-12  
Status: application

Problem to be solved: To achieve excellent surface roughness, even in a fine diamond part having a maximum length of several hundreds micrometer or below.

Solution: This diamond part includes projection parts made of diamond of prismatic shapes, pyramid shapes, truncated pyramid shapes or convex lens shapes. Each of the projection parts has a maximum length of 200 micrometer or below. The surface roughness  $R_{max}$  of the projection parts is 0.1 micrometer or below.

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**DE60335117C0: Verfahren zum ändern die farbe eines cvd-artigen diamanteinkristalles und dadurch hergestellte diamant-schicht**

Applicant: Element Six Limited, United Kingdom  
Publication: 2011-01-05  
Filed: 2003-09-05  
Status: patent

Production of a single crystal vapor deposition diamond e.g. gemstone of a desired color involves heat treating the diamond under specific temperature conditions.

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**DE60238442C0: Gefärbter diamant**

Applicant: Element Six Limited, United Kingdom  
Publication: 2011-01-05  
Filed: 2002-12-13  
Status: -

Diamond layer of single crystal chemical vapor deposition for use in preparing e.g. gemstone, is colored and has specified thickness.

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## **"State of the art" mailing service**

**Patent News nr. 84 (03-2011)**



### **EP2289361A1: Enhancing the optical characteristics of a gemstone**

Applicant: California Institute of Technology, United States of America

Publication: 2011-03-02

Filed: 2006-12-06

Status: application

Various embodiments described herein comprise a gemstone or other piece of jewelry, which incorporates one or more diffractive optical elements to enhance the fire displayed by the gemstone. In certain embodiments, the diffractive optical element comprises a diffraction grating etched on one or more facets of the gemstone.

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### **DE602005025333C0: Diamant mit ovalem schnitt**

Applicant: Hohoemi Brains, Japan

Publication: 2011-01-27

Filed: 2005-03-25

Status: granted

Diamond has pair of pavilion main facets arranged opposite to each other with respect to central axis, which have crown main facet pair respectively facing them across girdle

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### **CA2516994C: Method of encapsulating material from humans or animals in a natural gemstone and its product**

Applicant: Alberta Ltd, Canada

Publication: 2011-01-25

Filed: 2004-02-25

Status: granted

A method of creating a diamond includes the steps of creating entry points and internal passages in a natural or synthetic diamond, infiltrating a mixture comprising ashes produced from living human and animal parts or deceased human or animal parts into the diamond, and crystallizing the mixture. The diamond may then be repolished or refaceted. The invention also includes diamonds having discrete internal portions comprising ashes made from living human and animal parts, which internal portions are substantially transparent and which have an index refraction substantially matching that

of the diamond.

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**WO2011007156A1: A method and apparatus for treating diamond using liquid metal saturated with carbon**

Applicant: Designed Materials Limited, United Kingdom  
Publication: 2011-01-20  
Filed: 2010-07-19  
Status: application

A method of treating a diamond, the method comprising: (i) providing a liquid metal saturated with carbon with respect to graphite precipitation; (ii) lowering the temperature of the liquid metal such that the liquid metal is saturated with carbon with respect to diamond precipitation; (iii) immersing a diamond in the liquid metal; and (iv) removing the diamond from the metal.

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**US7887631: System and high pressure, high temperature apparatus for producing synthetic diamonds**

Applicant: The Gemesis Corporation, United States of America  
Publication: 2011-02-15  
Filed: 2005-06-24  
Status: granted

An apparatus for growing a synthetic diamond comprises a growth chamber, at least one manifold allowing access to the growth chamber, and a plurality of safety clamps positioned on opposite sides of the growth chamber; wherein the growth chamber and the plurality of safety clamps are comprised of a material having a tensile strength of about 120,000-200,000 psi, a yield strength of about 100,000-160,000 psi, an elongation of about 10-20%, an area reduction of about 40-50%, an impact strength of about 30-40 ft-lbs, and a hardness greater than 320 BHN.

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**US7887628: Thick single crystal diamond layer method for making it and gemstones produced from the layer**

Applicant: Element Six Technologies (Pty) Ltd, South Africa  
Publication: 2011-02-15  
Filed: 2007-03-05  
Status: granted

A layer of single crystal CVD diamond of high quality having a thickness greater than 2 mm. Also provided is a method of producing such a CVD diamond layer.

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**US7883684: Colorless single-crystal CVD diamond at rapid growth rate**

Applicant: Carnegie Institution of Washington, United States of America  
Publication: 2011-02-08  
Filed: 2006-05-23  
Status: granted

The present invention relates to a method for producing colorless, single-crystal diamonds at a rapid growth rate. The method for diamond production includes controlling temperature of a growth surface of the diamond such that all temperature gradients across the growth surface of the diamond are less than about 20° C., and growing single-crystal diamond by microwave plasma chemical vapor deposition on the growth surface of a diamond at a growth temperature in a deposition chamber having an atmosphere, wherein the atmosphere comprises from about 8% to about 20% CH<sub>4</sub> per unit of H<sub>2</sub> and from about 5 to about 25% O<sub>2</sub> per unit of CH<sub>4</sub>. The method of the invention can produce diamonds larger than 10 carats. Growth rates using the method of the invention can be greater than 50 ¼m/hour.

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**US7879148: System and method for producing synthetic diamond**

Applicant: Apollo Diamond, Inc., United States of America  
Publication: 2011-02-01  
Filed: 2008-03-13  
Status: granted

Synthetic monocrystalline diamond compositions having one or more monocrystalline diamond layers formed by chemical vapor deposition, the layers including one or more layers having an increased concentration of one or more impurities (such as boron and/or isotopes of carbon), as compared to other layers or comparable layers without such impurities. Such compositions provide an improved combination of properties, including color, strength, velocity of sound, electrical conductivity, and control of defects. A related method for preparing such a composition is also described, as well as a system for use in performing such a method, and articles incorporating such a composition.

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**EP2284298A2: Optical quality diamond material**

Applicant: Element Six Limited, United Kingdom  
Publication: 2011-02-16  
Filed: 2003-11-20  
Status: application published without search report

A CVD single crystal diamond material suitable for use in, or as, an optical device or element. It is suitable for use in a wide range of optical applications such as, for example, optical windows, laser windows, optical reflectors, optical refractors and gratings, and etalons. The CVD diamond material is produced by a CVD method in the presence of a controlled low level of nitrogen to control the development of crystal defects and thus achieve a diamond material having key characteristics for optical applications.

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**WO2011017615A2: Currency market utilizing precious metals and gemstones**

Applicant: Top Hat, Inc. United States of America  
Publication: 2011-02-10  
Filed: 2010-08-06  
Status: international application published without international search report

Systems and methods for purchasing jewelry can include accepting jewelry from an individual, and evaluating the jewelry to generate a bid using an automated evaluation process including: accepting input of a plurality of attributes associated with the jewelry; and accessing a database to set the bid for the jewelry. Methods also include providing the bid to the individual, and, if acceptance of the bid is received from the individual, assuming ownership of the jewelry, and paying the individual for the jewelry. If denial of the bid is received from the individual, returning the jewelry to the individual.

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**WO2011018791A1: Wine enhancement using gems**

Applicant: -  
Publication: 2011-02-17  
Filed: 2010-08-12  
Status: application

During the process of wine production, the appropriate gem or gems are introduced into the fermenting tank, to influence the character of the wine. The gem is kept in the fermentation tank together with the wine. During the fermentation, a process of exchange and resonance of frequencies takes place between the gem and the wine.

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**US20110031213A1: Method for marking valuable Articles**

Applicant: -  
Publication: 2011-02-10  
Filed: 2007-07-27  
Status: application

The disclosure relates to methods of marking valuable items, mainly precious stones and in particular, cut diamonds, and can be used for their identification. To implement the marking procedure, the identification surface of the product is first polished. A marking image, optically visible in reflected light is formed on the polished surface by modifying the identification area of said surface by means of a guided ion beam with a given ion energy. In the modification process, the composition of the surface layer is modified with the possibility of changing the optical properties of modified sites in relation to the optical properties of untreated sites of the identification surface. The modification of the identification surface is carried out by a pulse ion beam through a stencil mask, resulting in implantation of modifier ions into the crystal lattice of the marking area of the surface layer without damaging the covalent bonds between the atoms of the lattice and, accordingly, without damage to the original topography of this layer. Said changes in the

optical properties of the marking area are provided through the use as a modifier of such material, the ions of which alter the complex refractive index of the base material upon implantation into its crystal lattice as doping additives.

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**JP2010201043A2: Diamond and imitation gem thereof**

Applicant: Rosy Blue; Aoyanagi Takeshi  
Publication: 2011-01-04  
Filed: 2002-11-07  
Status: granted

Problem to be solved: To provide a diamond, allowing viewing of an arrow pattern and a heart pattern at the same time in a crown part under a predetermined condition.

Solution: In this diamond, when incident light from a table or a crown is reflected on one side pavilion and it is again reflected on the other side pavilion to produce outgoing light, an upper V-shaped line of the heart pattern is formed by a boundary line in the vicinity of a girdle facet point of adjacent pavilion facets. When outgoing light is transmitted through the crown and emitted, a lower V-shaped line of a heart pattern and the other lines of the heart pattern are formed by a boundary line of a star facet formed on the crown, thereby the heart pattern is visually recognized as well as the arrow pattern on the crown part.

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**JP04521171B2:**

Applicant: -  
Publication: 2010-08-11  
Filed: 2003-09-24  
Status: granted

Oval girdle cut structure for diamond, has distance from center axis to lower girdle facet set at predetermined range by major axis

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**JP04584904B2:**

Applicant: -  
Publication: 2010-11-24  
Filed: 2006-12-13  
Status: granted

Laser system for marking gemstones for subsequent authentication has laser and cameras used to perform micro-inscribing and recording of gem details for later comparison and certification

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**GB1021985A0: Dislocation engineering in single crystal synthetic diamond material**

Applicant: Element Six Ltd

Publication: 2011-02-02  
Filed: 2010-12-24  
Status: application

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**GB1021913A0: Microwave plasma reactors and substrates for synthetic diamond manufacture**

Applicant: Element Six Ltd  
Publication: 2011-01-05  
Filed: 2010-12-23  
Status: application

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**GB1021870A0: A microwave plasma reactor for manufacturing synthetic diamond material**

Applicant: Element Six Ltd  
Publication: 2011-02-02  
Filed: 2010-12-23  
Status: application

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**GB1021865A0: A microwave plasma reactor for manufacturing synthetic diamond material**

Applicant: Element Six Ltd  
Publication: 2011-02-02  
Filed: 2010-12-23  
Status: application

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**GB1021860A0: A microwave plasma reactor for diamond synthesis**

Applicant: Element Six Ltd  
Publication: 2011-02-02  
Filed: 2010-12-23  
Status: application

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**GB1021853A0: A microwave plasma reactor for manufacturing synthetic diamond material**

Applicant: Element Six Ltd  
Publication: 2011-02-02  
Filed: 2010-12-23  
Status: application

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## **"State of the art" mailing service**

**Patent News nr. 85 (04-2011)**



### **US7915564: Laser marking system**

Applicant: Lazare Kaplan International, Inc., United States of America

Publication: 2011-03-29

Filed: 2007-09-04

Status: granted

A laser energy microinscribing system, comprising a semiconductor excited Q-switched solid state laser energy source; a cut gemstone mounting system, allowing optical access to a mounted workpiece; an optical system for focusing laser energy from the laser energy source onto a cut gemstone; a displaceable stage for moving said gemstone mounting system with respect to said optical system so that said focused laser energy is presented to desired positions on said gemstone, having a control input; an imaging system for viewing the gemstone from a plurality of vantage points; and a rigid frame supporting said laser, said optical system and said stage in fixed relation, to resist differential movements of said laser, said optical system and said stage and increase immunity to vibrational misalignments. The laser energy source is preferably a semiconductor diode excited Q-switched Nd:YLF laser with a harmonic converter having an output of about 530 nm. The system may further comprise an input for receiving marking instructions; a processor for controlling said displaceable stage based on said marking instructions and said imaging system, to selectively generate a marking based on said instructions and a predetermined program; and a storage system for electronically storing information relating to images of a plurality of workpieces. A secure certificate of authenticity of a marked workpiece is also provided.

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### **US7910083: Coloured diamond**

Applicant: Element Six Limited, United Kingdom

Publication: 2011-03-22

Filed: 2007-03-08

Status: granted

A diamond layer of single crystal CVD diamond which is coloured, preferably which has a fancy colour, and which has a thickness of greater than 1 mm.

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### **EP2225731B1: Method and system for improved optical modeling of gemstones**

Applicant: Ideal-Scope Pty. Ltd., Australia

Publication: 2011-03-30  
Filed: 2008-10-06  
Status: patent specification

Method of constructing virtual model of gemstone, such as diamond, by computer modeling involves generating dataset representing three-dimensional virtual model

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**EP1819637B1: Synthesis of diamond**

Applicant: Element Six, South Africa  
Publication: 2011-03-30  
Filed: 2004-12-09  
Status: patent specification

A method or synthesising diamond comprises the steps of providing a reaction mixture of a carbon source and a solvent/catalyst, pre-treating the reaction mixture or individual components at a temperature greater than 1100°C and a vacuum of less than  $1 \times 10^{-1}$  mbar to remove substantially all of the atmospheric gases and other light volatile atoms and replaying them with a desirable process gas at a reduced temperature, and subjecting the pro-treated reaction mixture to elevated temperature and pressure conditions in the diamond stable region of the carbon phase diagram in the presence of the process gas.

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**WO2011037481A1: Diamond sorting system**

Applicant: Eternity Manufacturing, China; Blijlevens, New Zealand  
Publication: 2011-03-31  
Filed: 2010-09-22  
Status: application

A diamond sorting system comprising a diamond source for supplying one or more diamonds to be graded by a vision system having one or more cameras arranged to take one or more images of the diamond, and a processor arranged to receive the image data and execute an algorithm on the data to grade the diamond. The sorting system further comprising a diamond collection unit arranged to receive a graded diamond from the vision system and an electromechanical diamond transporter arranged to transport a diamond to be graded from the diamond source to the vision system, and further arranged to transport a graded diamond from the vision system to the diamond collection unit.

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**GB1100598A0: CVD single crystal diamond material**

Applicant: Element Six  
Publication: 2011-03-02  
Filed: 2011-01-14  
Status: patent specification

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**EP2074564A4: Diamond valuation method, apparatus and computer readable medium product**

Applicant: Rosy Blue DMCC United Arab Emirates

Publication: 2011-03-16

Filed: 2007-07-30

Status: supplementary search report

Diamond valuation method for determining the true value of a diamond, involves calculating total adjusted price of selected diamond based on determined shape, size, color, clarity, cut and other parameters of selected diamond

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## **"State of the art" mailing service**

**Patent News nr. 86 (05-2011)**



### **EP1984147B1: Method of satinizing a hard material**

Applicant: Comadur, Switzerland

Publication: 2011-05-04

Filed: 2007-01-12

Status: granted

Hard metal satinizing method for making e.g. case, involves moving active part and tool so that surface is in contact with active part, where part has cluster forming patterns distributed regularly on substrate

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### **US7935548: Deposition apparatus and deposition method**

Applicant: Kochi Industrial Promotion Center, Japan; Casio Computer, Tokyo, Japan

Publication: 2011-05-03

Filed: 2008-12-15

Status: granted

A deposition apparatus includes: a first electrode for placing a processing object; a second electrode for generating plasma with the first electrode, the second electrode being opposed to the first electrode; and a heat flow control heat transfer part for drawing heat from the processing object to generate a heat flow from a central area to a peripheral area of the processing object.

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### **US7922815: System and method for epitaxial deposition of a crystal using a liquid-solvent fluidized-bed mechanism**

Applicant: -

Publication: 2011-04-12

Filed: 2009-06-15

Status: granted

A system and method for growing diamond crystals from diamond crystal seeds by epitaxial deposition at low temperatures and atmospheric and comparatively low pressures. A solvent is circulated (by thermal convection and/or pumping), wherein carbon is added in a hot leg, transfers to a cold leg having, in some embodiments, a range of progressively lowered temperatures and concentrations of carbon via the circulating solvent, and deposits layer-by-layer on diamond seeds located at the progressively lower

temperatures since as diamond deposits the carbon concentration lowers and the temperature is lowered to keep the solvent supersaturated. The solvent includes metal(s) or compound(s) that have low melting temperatures and transfer carbon at comparatively low temperatures. A controller receives parameter signals from a variety of sensors located in the system, processes these signals, and optimizes diamond deposition by outputting the necessary control signals to a plurality of control devices (e.g., valves, heaters, coolers, pumps).

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**EP1957689B1: High crystalline quality synthetic diamond**

Applicant: Element Six, South Africa  
Publication: 2011-04-20  
Filed: 2006-12-08  
Status: patent specification

Single crystal chemical vapor deposition diamond material production for optical devices, e.g. laser windows, comprises selecting substrate with extremely low density of extended defects.

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**WO2011044467A1: CVD apparatus**

Applicant: Hemlock Semiconductor Corporation, United States of America  
Publication: 2011-04-14  
Filed: 2010-10-08  
Status: application

A manufacturing apparatus for deposition of a material on a carrier body and an electrode for use with the manufacturing apparatus are provided. The manufacturing apparatus includes a housing that defines a chamber. The housing also defines an inlet for introducing a gas into the chamber and an outlet for exhausting the gas from the chamber. At least one electrode is disposed through the housing with the electrode at least partially disposed within the chamber. The electrode includes a shaft having a first end and a second end, and a head disposed on one of the ends of the shaft. The head of the electrode has an exterior surface having a contact. An exterior coating is disposed on the exterior surface of the electrode, outside of the contact region. The exterior coating has a greater wear resistance than nickel as measured in  $\text{mm}^3/\text{N}^*\text{m}$ .

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**WO2011044441A1: CVD apparatus with electrode**

Applicant: Hemlock Semiconductor Corporation, United States of America  
Publication: 2011-04-14  
Filed: 2010-10-08  
Status: application

A manufacturing apparatus for deposition of a material on a carrier body and an electrode for use with the manufacturing apparatus are provided. The manufacturing apparatus



includes a housing that defines a chamber. The housing also defines an inlet for introducing a gas into the chamber and an outlet for exhausting the gas from the chamber. At least one electrode is disposed through the housing with the electrode at least partially disposed within the chamber. The electrode has an exterior surface. A first exterior coating having an electrical conductivity of at least  $7 \times 10^6$  Siemens/meter at room temperature is disposed on the exterior surface of the electrode. A second exterior coating different from the first exterior coating is disposed on the first exterior coating. A power supply device is coupled to the electrode.

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**WO2011044457A1: Manufacturing apparatus for depositing a material and an electrode for use therein**

Applicant: Hemlock Semiconductor Corporation, United States of America  
Publication: 2011-04-14  
Filed: 2010-10-08  
Status: application

A manufacturing apparatus for deposition of a material on a carrier body and an electrode for use with the manufacturing apparatus are provided. The manufacturing apparatus includes a housing that defines a chamber. The housing also defines an inlet for introducing a gas into the chamber and an outlet for exhausting the gas from the chamber. At least one electrode is disposed through the housing with the electrode at least partially disposed within the chamber. The electrode has an exterior surface. The exterior surface has a contact region that is adapted to contact a socket. A contact region coating is disposed on the contact region of the electrode for maintaining electrical conductivity between the electrode and the socket. The contact region coating has an electrical conductivity of at least  $7 \times 10^6$  Siemens/meter at room temperature and a greater wear resistance than nickel as measured in  $\text{mm}^3/\text{N} \cdot \text{m}$ .

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**US7931384: Method and apparatus for object viewing, observation, inspection, identification, and verification**

Applicant: -  
Publication: 2011-04-26  
Filed: 2008-03-14  
Status: granted

In an object verifier having a housing and an object holder, an object may be placed in the object holder for observation by an operator. The object is illuminated using a collimated beam of white light that is generated by a light generator. The collimated beam of white light is passed through a beam splitter with the two portions of the collimated beam of white light presented to the object at a 90 degree angle one from the other. The interior of the housing includes a reflective surface for maximal illumination of the object. The observer may view the illuminated object through a viewing window and/or through a magnification window. The magnification window provides for the

viewing of the object in greater detail.

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**JP2010269962A2: Substrate for growth of single crystal diamond layer and method for producing single crystal diamond substrate**

Applicant: Shin-Etsu Chemical Co  
Publication: 2010-12-02  
Filed: 2009-05-20  
Status: application

Problem to be solved: To provide a substrate for the growth of a single crystal diamond layer by which a uniform highly crystalline single crystal diamond can be produced with high reproducibility at a low cost and to provide a method for producing a single crystal diamond substrate.

Solution: A substrate for the growth of a single crystal diamond layer is composed of a substrate made of a single crystal diamond and an iridium film or a rhodium film heteroepitaxially grown on the substrate on the side on which the single crystal diamond layer is grown, wherein the peripheral margin of the face of the substrate on the side on which the single crystal diamond layer is grown is chamfered with a radius of curvature  $(r) \geq 50 \mu\text{m}$ .

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**GB1102877A0: Controlling doping of synthetic diamond material**

Applicant: Element Six  
Publication: 2011-04-06  
Filed: 2011-02-18  
Status: application

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**CA2469789C: Coloured diamond**

Applicant: Element Six, United Kingdom  
Publication: 2011-03-22  
Filed: 2002-12-13  
Status: granted

Diamond layer of single crystal chemical vapor deposition for use in preparing e.g. gemstone, is colored and has specified thickness.

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**AT0503722E: Synthese von diamant**

Applicant: Element Six Production, South Africa  
Publication: 2011-04-15  
Filed: 2004-12-09  
Status: -

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## **"State of the art" mailing service**

**Patent News nr. 87 (06-2011)**



### **WO2011064446A1: Method for forming a decorative coating on a gemstone, a decorative coating on a gemstone, and uses of the same**

Applicant: Beneq Oy Finland  
Publication: 2011-06-03  
Filed: 2010-11-19  
Status: application

A decorative coating and a method for forming a decorative coating on a gemstone to change the natural visual appearance of the gemstone. The decorative coating comprises an optically absorbing film. Depositing the absorbing film on the substrate comprises the alternating steps of introducing a first precursor to the reaction space such that at least a portion of the first precursor gets adsorbed onto the surface of the substrate, and subsequently purging the reaction space, and introducing a second precursor to the reaction space such that at least a portion of the second precursor reacts with the portion of the first precursor adsorbed onto the surface of the substrate to form a conformal absorbing film on the substrate comprising the gemstone, and subsequently purging the reaction space. The material of the absorbing film is selected from the group of oxides, carbides, noble metals or a mixture thereof.

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### **CN101585958B: Composition and method for preparing artificial gem**

Applicant: -  
Publication: 2011-05-04  
Filed: 2009-06-25  
Status: examined application used until 1993

The present invention provides a combination for preparing an artificial gem, composed of 100 weight shares of a resin component and 25-50 weight shares of a solidify component; wherein said resin component is prepared by the following method: fetching 70-80 weight shares of bisphenol F glycidyl ether, 10-20 weight shares of bisphenol F epoxy resin and 5-10 weight shares of reactive diluent to mix, heating until 40-60 DEG C, agitating to react for one to two hours, and cooling to a room temperature; the solidify component is prepared by the following method: (1) fetching 10-20 weight shares of non reactive diluent, 15-25 weight shares of aliphatic amine and 20-40 weight shares of alicyclic ring amine to mix, heating until 50-60 DEG C, (2) adding 10-20 weight shares of reactive diluent slowly when agitating, then elevating the temperature to 80 DEG C, heat preserving for one to two hours, (3) cooling to 40 DEG C, adding 10-20 weight

shares of polyetheramine, agitating until non precipitation, then cooling to the room temperature.

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**AT0507932E: Verfahren zum satinieren eines harten materials**

Applicant: Comadur SA Switzerland  
Publication: 2011-05-15  
Filed: 2007-01-12  
Status: application

A system and method for growing diamond crystals from diamond crystal seeds by epitaxial deposition at low temperatures and atmospheric and comparatively low pressures. A solvent is circulated (by thermal convection and/or pumping), wherein carbon is added in a hot leg, transfers to a cold leg having, in some embodiments, a range of progressively lowered temperatures and concentrations of carbon via the circulating solvent, and deposits layer-by-layer on diamond seeds located at the progressively lower temperatures since as diamond deposits the carbon concentration lowers and the temperature is lowered to keep the solvent supersaturated. The solvent includes metal(s) or compound(s) that have low melting temperatures and transfer carbon at comparatively low temperatures. A controller receives parameter signals from a variety of sensors located in the system, processes these signals, and optimizes diamond deposition by outputting the necessary control signals to a plurality of control devices (e.g., valves, heaters, coolers, pumps).

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**WO2011054822A1: Inclusion detection in polished gemstones**

Applicant: De Beers Centenary AG Switzerland  
Publication: 2011-05-12  
Filed: 2010-11-02  
Status: application

A method and apparatus for generating a 3D model of and/or detecting inclusions in a polished gemstone such as diamond is described. The gemstone (103) is rotated in a series of discrete increments. At each rotational position of the gemstone, the gemstone is illuminated with collimated light and a silhouette image recorded. At each rotational position, the gemstone is also (before further rotation) illuminated with diffuse light, and a diffuse image recorded. The images are analysed to obtain a 3D model of the surface of the gemstone. Features may then be identified in the diffuse images and tracked between subsequent diffuse images. The tracked features may be located relative to the 3D model of the gemstone, taking into account reflection and refraction of light rays by the gemstone. Some or all of the located features may then be identified as inclusions.

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**US20110126759A1: System and high pressure, high temperature apparatus for producing synthetic diamonds**

Applicant: The Gemesis Corporation, United States of America

Publication: 2011-06-02  
Filed: 2011-01-28  
Status: application

An apparatus for growing a synthetic diamond comprises a growth chamber, at least one manifold allowing access to the growth chamber, and a plurality of safety clamps positioned on opposite sides of the growth chamber; wherein the growth chamber and the plurality of safety clamps are comprised of a material having a tensile strength of about 120,000-200,000 psi, a yield strength of about 100,000-160,000 psi, an elongation of about 10-20%, an area reduction of about 40-50%, an impact strength of about 30-40 ft-lbs, and a hardness greater than 320 BHN.

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**US7955434: Diamond single crystal substrate**

Applicant: Sumitomo Electric Industries, Japan  
Publication: 2011-06-07  
Filed: 2005-02-14  
Status: granted

A diamond single crystal substrate obtained by a vapor-phase growth method, wherein the diamond intrinsic Raman shift of the diamond single crystal substrate surface measured by microscopic Raman spectroscopy with a focused beam spot diameter of excitation light of 2  $\mu\text{m}$  is deviated by +0.5  $\text{cm}^{-1}$  or more to +3.0  $\text{cm}^{-1}$  or less from the standard Raman shift quantity of strain-free diamond, in a region (region A) which is more than 0% to not more than 25% of the surface, and is deviated by -1.0  $\text{cm}^{-1}$  or more to less than +0.5  $\text{cm}^{-1}$  from the standard Raman shift quantity of strain-free diamond, in a region (region B) of the surface other than the region A. The diamond single crystal substrate can be obtained with a large size and high-quality without cracking and is suitable for semiconductor materials, electronic components, and optical components or the like.

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**US7942966: Method of growing boron doped single crystal diamond in a plasma reactor**

Applicant: Apollo Diamond, United States of America  
Publication: 2011-05-17  
Filed: 2004-10-29  
Status: granted

Synthetic monocrystalline diamond compositions having one or more monocrystalline diamond layers formed by chemical vapor deposition, the layers including one or more layers having an increased concentration of one or more impurities (such as boron and/or isotopes of carbon), as compared to other layers or comparable layers without such impurities. Such compositions provide an improved combination of properties, including color, strength, velocity of sound, electrical conductivity, and control of defects. A related method for preparing such a composition is also described, as well as a system for

use in performing such a method, and articles incorporating such a composition.

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**JP04663855B2:**

Applicant: -  
Publication: 2011-04-06  
Filed: 2000-08-02  
Status: granted

Judging method for decorative jewelry e.g. new diamond, involves identifying jewelry by observing the light reflected from the surface of the jewelry

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**JP04584904B2:**

Applicant: -  
Publication: 2010-11-24  
Filed: 2006-12-13  
Status: granted

Laser system for marking gemstones for subsequent authentication has laser and cameras used to perform micro-inscribing and recording of gem details for later comparison and certification

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**KR2011043529A: Diamond material**

Applicant: Element Six  
Publication: 2011-04-27  
Filed: 2009-07-22  
Status: application

Preparation of high chemical and isotopic purity diamond material for spintronic applications comprises activating and/or dissociating source gas mixture and solid carbon source and allowing homoepitaxial diamond growth on substrate surface.

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**DE602004032063C0: Synthese von diamant**

Applicant: Element Six, United Kingdom  
Publication: 2011-05-12  
Filed: 2004-12-09  
Status: granted

Synthesizing diamond involves pre-treating reaction mixture at high temperature and vacuum, to remove atmospheric gases and light volatile atoms in the mixture; and replacing the gases and atoms with a process gas, at reduced temperature

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**AT0506464E: Synthetischer diamant mit hoher kristalliner qualität**

Applicant: Element Six Production, South Africa

Publication: 2011-05-15

Filed: 2006-12-08

Status: -

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## **"State of the art" mailing service**

**Patent News nr. 88 (07-2011)**



### **EP2329739A2: Gemstone and method for cutting the same**

Applicant: Paresh Mehta, India  
Publication: 2011-06-08  
Filed: 2010-11-30  
Status: application published without search report

The invention relates to a gemstone comprises a girdle, a crown and a pavilion. The crown has a table, ten star facets surrounding the table, ten bezel facets aligned between the star facets and twenty upper girdle facets aligned between the bezel facets. The pavilion is provided with ten pavilion main facets, twenty pavilion hook facets aligned between the pavilion main facets and ten pavilion star facets aligned between the pavilion hook facets. The invention also relates to a method of cutting the gemstone.

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### **EP1415564B1: Rectangular brilliant-cut diamond**

Applicant: Hohoemi Brains, Japan  
Publication: 2011-06-08  
Filed: 2003-10-13  
Status: granted

From equivalent EP1415564A1. A diamond is provided which is subjected to an improved rectangular brilliant-cut producing a facet configuration having an optimal shape for the purpose of increasing the visual-perceptible reflection ray amount. In the rectangular brilliant-cut diamond, the bezel facets at the four crown vertexes each is bent along the diagonal line parallel to the girdle, to yield the facet configuration in which the bezel facet is divided into the lower bezel facet and the upper bezel facet. The upper crown angle of an upper bezel facet can be made smaller than the crown angle of a lower bezel facet, and hence even without altering the crown height, by making the table facet slightly smaller, the tilt angles from the horizontal of the star facets and the second bezel facets, both provided with intense reflection, can be made small and the areas thereof can be made large. Thus, the reflection patterns become all alike in size in a manner preferable for the visual perception, and making the star facets and the second bezel facets have small tilt angles from the horizontal permits making the reflection extremely intense in cooperation with enlargement of the areas of the star facets and the second bezel facets.

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**US20110146350A1: Round brilliant cut gemstone and method for cutting the same**

Applicant: -  
Publication: 2011-06-23  
Filed: 2010-12-06  
Status: application

The invention relates to a gemstone comprises a girdle, a crown and a pavilion. The crown comprises a table, eight star facets surrounding the table, eight first half facets aligned between the star facets, eight second half facets aligned adjacent to the first half facets and sixteen upper girdle facets aligned between the second half facets. The pavilion comprises sixteen pavilion main facets and sixteen lower girdle facets aligned between the pavilion main facets. The invention also relates to a method of cutting the gemstone.

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**US20110146349A1: Gemstone and method for cutting the same**

Applicant: -  
Publication: 2011-06-23  
Filed: 2010-11-29  
Status: application

The invention relates to a gemstone comprises a girdle, a crown and a pavilion. The crown has a table, ten star facets surrounding the table, ten bezel facets aligned between the star facets and twenty upper girdle facets aligned between the bezel facets. The pavilion is provided with ten pavilion main facets, twenty pavilion hook facets aligned between the pavilion main facets and ten pavilion star facets aligned between the pavilion hook facets. The invention also relates to a method of cutting the gemstone.

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**DE602007014326C0: Verfahren zum satinieren eines harten materials**

Applicant: Comadur, Switzerland  
Publication: 2011-06-16  
Filed: 2007-01-12  
Status: granted

Hard metal satinizing method for making e.g. case, involves moving active part and tool so that surface is in contact with active part, where part has cluster forming patterns distributed regularly on substrate.

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**BE1018665A5: Product met verbeterde optische karakteristieken.**

Applicant: Diamscan, Belgium  
Publication: 2011-06-07  
Filed: 2009-02-20  
Status: 20 year patent-modified claims

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**BE1018664A5: Verbeterde werkwijze en verbeterd product.**

Applicant: Diamscan, Belgium  
Publication: 2011-06-07  
Filed: 2009-02-20  
Status: 20 year patent-modified claims

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**AT0511773E: Diamant mit rechteckigem brillantschliff**

Applicant: Hohoemi Brains Inc, Japan  
Publication: 2011-04-06  
Filed: 2000-08-02  
Status: -

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**US20110151226A1: Synthetic cvd diamond**

Applicant: -  
Publication: 2011-06-23  
Filed: 2010-12-15  
Status: application

The present disclosure relates to methods for synthesizing synthetic CVD diamond material and high quality synthetic CVD diamond materials.

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**US20110150745A1: Single crystal diamond material**

Applicant: -  
Publication: 2011-06-23  
Filed: 2010-12-15  
Status: application

A method of producing a grown single crystal diamond substrate comprising: (a) providing a first diamond substrate which presents a (001) major surface, which major surface is bounded by at least one <100> edge, the length of the said at least one <100> edge exceeding any dimension of the surface that is orthogonal to the said at least one <100> edge by a ratio of at least 1.3:1; and (b) growing diamond material homoepitaxially on the (001) major surface of the diamond material surface under chemical vapour deposition (CVD) synthesis conditions, the diamond material growing both normal to the major (001) surface, and laterally therefrom.

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**US20110146211A1: Authentication, security and/or marketing display kit for a precious gem and method**

Applicant: -  
Publication: 2011-06-23  
Filed: 2010-12-17

Status: application

A new system of packaging and offering precious gems for sale are disclosed. A precious gem and an abbreviated certificate of authenticity about that gem are sealed within an at least partly see-through security case. The sealed security case is secured inside of an enclosed compartment in a security carton, and the gem and the abbreviated certificate of authenticity are visible through one or more windows in the security carton. Additional information about the gem is stored in a storage compartment in the security carton, which is separately accessible from the enclosed compartment. A retailer displays and offers the gem for sale directly to end consumers in the display package, and the consumer is assured by the display package that the gem has the characteristics disclosed on the abbreviated certificate of authenticity without requiring an intermediate local jeweler to verify the characteristics.

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**US7964280: High colour diamond layer**

Applicant: -  
Publication: 2011-06-21  
Filed: 2006-06-22  
Status: granted

A method of producing CVD diamond having a high color, which is suitable for optical applications, for example. The method includes adding a gaseous source comprising a second impurity atom type to counter the detrimental effect on colour caused by the presence in the CVD synthesis atmosphere of a first impurity atom type. The described method applies to the production of both single crystal diamond and polycrystalline diamond.

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**US7964280: High colour diamond layer**

Applicant: -  
Publication: 2011-06-21  
Filed: 2006-06-22  
Status: granted

A method of producing CVD diamond having a high color, which is suitable for optical applications, for example. The method includes adding a gaseous source comprising a second impurity atom type to counter the detrimental effect on colour caused by the presence in the CVD synthesis atmosphere of a first impurity atom type. The described method applies to the production of both single crystal diamond and polycrystalline diamond.

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**EP1361961B1: Forming a mark on a gemstone or industrial diamond**

Applicant: De Beers Centenary AG, Switzerland  
Publication: 2011-06-29

Filed: 2002-02-18  
Status: granted

A method of forming a mark on a gemstone or industrial diamond which comprises projecting an exposure radiation onto the gemstone or diamond to form an exposure image thereon, the method also comprising locating and/or orientating and/or focusing the exposure image by projecting onto the gemstone or diamond a setting-up radiation different from the exposure radiation, the setting-up radiation not affecting the gemstone or diamond in such a way that a mark is or will be formed, characterised in that a setting-up image is formed on the gemstone or diamond and the location and/or orientation and/or focusing of the setting-up image on the gemstone or diamond is adjusted, to thereby adjust the location, orientation and/or focusing of the exposure image, the setting-up image on the gemstone or diamond being sensed outside the optical path which is followed by the setting-up radiation before it reaches the gemstone or diamond.

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**US20110132256A1: Capsule and elements for synthesised diamond production**

Applicant: Instituto de Monocristales, Spain  
Publication: 2011-06-09  
Filed: 2005-08-16  
Status: application

The present invention consists in obtaining, with the capsule described, a vertical gradient favorable for diamond growth that prevails over any radial gradient by means of heating discs placed at the ends of the heating area, which implies a considerable control over the growth conditions. More specifically, in regard to the rate of growth, it allows for a better control of the quality of large crystals. Another important novelty is to use a source of carbon with a special design formed by cylindrical and conical hollows (graphite, amorphous carbon, diamond or other) with a solvent metal with a number of gases that are introduced in the capsule. Also, a nitrogen scavenger is used to avoid the formation of nitrides, carbides and oxides that are harmful for the growth and that as a significant novelty is placed outside the reaction area.

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**WO2011074599A1: Method for producing mosaic diamond**

Applicant: National Institute of Advanced Industrial Science and Technology, Japan  
Publication: 2011-06-23  
Filed: 2010-12-15  
Status: application

Disclosed is a method for producing mosaic diamond characterized in that ion implantation is applied to the vicinity of the surfaces of a plurality of diamond single crystal substrates arranged in the form of mosaic, or of mosaic diamond single crystal substrates, the back surfaces of which are bonded by a single crystal diamond layer so as to form a non-diamond layer, and then after the single crystal diamond layer is grown by a vapor-phase synthesis method, the non-diamond layer is etched to separate the single

crystal diamond layer upper than the non-diamond layer. A simpler production method than conventional methods makes it possible to avoid destruction of the diamond single crystal substrates to stably and efficiently produce large amounts of the mosaic diamond.

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**WO2011076642A1: Single crystal diamond material**

Applicant: Element Six Limited, United Kingdom  
Publication: 2011-06-30  
Filed: 2010-12-15  
Status: application

A method of producing a grown single crystal diamond substrate comprising: (a) providing a first diamond substrate which presents a (001) major surface, which major surface is bounded by at least one <100> edge, the length of the said at least one <100> edge exceeding any dimension of the surface that is orthogonal to the said at least one <100> edge by a ratio of at least 1.3 : 1; and (b) growing diamond material homoepitaxially on the (001) major surface of the diamond material surface under chemical vapour deposition (CVD) synthesis conditions, the diamond material growing both normal to the major (001) surface, and laterally therefrom.

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**JP04680507B2:**

Applicant: -  
Publication: 2011-05-11  
Filed: 2002-12-31  
Status: granted

Grading system for gems, has personal computer, hard disc, operating system, color calibrated display screen, Internet browser and Web communication mechanism, and database.

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**WO2011076643A1: Synthetic CVD diamond**

Applicant: Element Six Limited, United Kingdom  
Publication: 2011-06-30  
Filed: 2010-12-15  
Status: application

A chemical vapour deposition (CVD) method for synthesizing diamond material on a substrate in a synthesis environment, said method comprising: providing the substrate; providing a source gas; dissociating the source gas; and allowing homoepitaxial diamond synthesis on the substrate; wherein the synthesis environment comprises nitrogen at an atomic concentration of from about 0.4 ppm to about 50 ppm; and wherein the source gas comprises: a) an atomic fraction of hydrogen, Hf, from about 0.40 to about 0.75; b) an atomic fraction of carbon, Cf, from about 0.15 to about 0.30; c) an atomic fraction of oxygen, Of, from about 0.13 to about 0.40; wherein  $Hf + Cf + Of = 1$ ; wherein the ratio

of atomic fraction of carbon to the atomic fraction of oxygen, Cf:Of, satisfies the ratio of about 0.45: 1 < Cf:Of < about 1.25: 1; wherein the source gas comprises hydrogen atoms added as hydrogen molecules, H<sub>2</sub>, at an atomic fraction of the total number of hydrogen, oxygen and carbon atoms present of between 0.05 and 0.40; and wherein the atomic fractions H<sub>f</sub>, C<sub>f</sub> and O<sub>f</sub> are fractions of the total number of hydrogen, oxygen and carbon atoms present in the source gas.

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**GB2476306A: Single crystal diamond material**

Applicant: Element Six Limited, United Kingdom  
Publication: 2011-06-22  
Filed: 2009-12-21  
Status: patent specification

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**DE602006021467C0: Synthetischer diamant mit hoher kristalliner qualität**

Applicant: Element Six Technologies, South Africa  
Publication: 2011-06-01  
Filed: 2006-12-08  
Status: granted

Single crystal chemical vapor deposition diamond material production for optical devices, e.g. laser windows, comprises selecting substrate with extremely low density of extended defects

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## **"State of the art" mailing service**

**Patent News nr. 89 (08/09-2011)**



### **US7992410: Modified princess cut diamond having hearts and arrows pattern and method**

Applicant: Worldwide Diamond Trademarks, Canada  
Publication: 2011-08-09  
Filed: 2005-11-23  
Status: granted

A modified princess cut diamond and method of forming a modified princess cut diamond into a symmetrical shape possessing a hearts and arrows pattern characteristic of the true hearts and arrows pattern in a round cut diamond. The modified princess cut diamond includes: a tablet facet, 4 main crown facets, 8 crown halves, 8 crown star facets, 4 subsidiary crown facets, 8 subsidiary crown halves, 8 main pavilion facets, 4, subsidiary pavilion facets, 16 pavilion halves, a girdle and 4 subsidiary cut corner girdle facets with each main crown facet having a pair of crown star facets symmetrically disposed on one side thereof adjacent to the tablet facet and a pair of crown halves symmetrically disposed on the opposite side thereof with each pair of crown star facets having the side thereof adjoining the table facet meeting at a point equal to essentially half the longer distance of the main crown facet measured horizontally and with all crown star facets and crown halves adjacent each main crown having identical polished angles with a maximum tolerance of 0.3°.

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### **US7971452: Triangular shaped diamond which displays hearts and arrows pattern**

Applicant: Worldwide Diamond Trademarks, Canada  
Publication: 2011-07-05  
Filed: 2007-05-04  
Status: granted

A triangular shaped diamond adapted to display a hearts and arrows pattern when exposed to light comparable to the hearts and arrows pattern in a round diamond, comprising: six main crown facets, twelve crown half facets, a table facet, six main pavilion facets and a plurality of girdle facets separating the crown facets from the pavilion facets with each main crown facet having a symmetrically positioned opposite crown facet of substantially equal size surrounding the table facet and having at least one edge in parallel alignment with a corresponding edge in the main crown facet opposite thereto.

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**US20110185964A1: Method and system for diamond deposition using a liquid-solvent carbon-transfer mechanism**

Applicant: -  
Publication: 2011-08-04  
Filed: 2011-04-11  
Status: application

A system and method for growing diamond crystals from diamond crystal seeds by epitaxial deposition at low temperatures and atmospheric and comparatively low pressures. A solvent is circulated (by thermal convection and/or pumping), wherein carbon is added in a hot leg, transfers to a cold leg having, in some embodiments, a range of progressively lowered temperatures and concentrations of carbon via the circulating solvent, and deposits layer-by-layer on diamond seeds located at the progressively lower temperatures since as diamond deposits the carbon concentration lowers and the temperature is lowered to keep the solvent supersaturated. The solvent includes metal(s) or compound(s) that have low melting temperatures and transfer carbon at comparatively low temperatures. A controller receives parameter signals from a variety of sensors located in the system, processes these signals, and optimizes diamond deposition by outputting the necessary control signals to a plurality of control devices (e.g., valves, heaters, coolers, pumps).

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**US20110206234A1: Arrangement for and method of examining gemstones**

Applicant: Photostrip, United States of America  
Publication: 2011-08-25  
Filed: 2011-02-14  
Status: application

The invention relates to a gemstone comprises a girdle, a crown and a pavilion. The crown has a table, ten star facets surrounding the table, ten bezel facets aligned between the star facets and twenty upper girdle facets aligned between the bezel facets. The pavilion is provided with ten pavilion main facets, twenty pavilion hook facets aligned between the pavilion main facets and ten pavilion star facets aligned between the pavilion hook facets. The invention also relates to a method of cutting the gemstone.

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**US20110205525A1: Arrangement for and method of holding gemstones**

Applicant: Photostrip, United States of America  
Publication: 2011-08-25  
Filed: 2011-02-14  
Status: application

A gemstone to be optically examined is held by a holder having an internal compartment. A mounting plate supports the gemstone table-side up in an upright position within the internal compartment. A protective lid is mounted on the holder for movement between a



closed position in which the lid overlies the mounting plate and the gemstone supported thereon, and an open position in which the lid uncovers the gemstone for optical examination.

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**CN1840748B: Diamond substrate and manufacturing method thereof**

Applicant: -  
Publication: 2011-06-22  
Filed: 2006-03-28  
Status: application

The present invention provides a manufacturing method for a large-scale diamond substrate and a substrate produced by the method suitable for semiconductor lithography processing and large-scale optical parts, semiconductor materials, thermal-release substrate, semiconductor wafer processing, and back-feed devices, and others. The manufacturing method for a diamond substrate of the present invention comprises: the mounting step of preparing a substrate having a main face comprising a first region which is a concave and having a second region which surrounds the first region, and mounting, on the first region, a single crystalline diamond seed substrate having a plate thickness thicker than the concave depth of the first region; a connecting step of forming a CVD diamond layer from the single crystalline diamond seed substrate using a chemical vapor deposition, and mutually connecting by forming a CVD diamond layer on the second region at the same time; and a polishing step of polishing to substantially flatten both the CVD diamond layers on the single crystalline diamond seed substrate and on the second region by mechanically polishing.

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**JP04709088B2:**

Applicant: -  
Publication: 2011-06-22  
Filed: 2006-07-14  
Status: granted

Diamond for decoration, has pavilion that is divided into two pavilions in horizontal-split plane parallel to girdle bottom-horizontal-discharge cross section

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**JP04709087B2:**

Applicant: -  
Publication: 2011-06-22  
Filed: 2006-07-14  
Status: granted

Diamond for two-stage pavilion decoration has X-axis marks of regular octagon vertex of table facet that are set when girdle lower outer periphery is set to a point

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**JP04663855B2:**

Applicant: -  
Publication: 2011-04-06  
Filed: 2000-08-02  
Status: granted

Judging method for decorative jewelry e.g. new diamond, involves identifying jewelry by observing the light reflected from the surface of the jewelry.

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**JP2011084411A2: Base material for growing single crystal diamond and method for producing single crystal diamond substrate**

Applicant: Shin-Etsu Chemical  
Publication: 2011-04-28  
Filed: 2009-10-13  
Status: application

Problem to be solved: To provide a base material for growing a single crystal diamond which allows a single crystal diamond having a large area and good crystallinity to be grown and thereby allows a high-quality single crystal diamond substrate to be inexpensively produced, and to provide a method for producing the single crystal diamond substrate.

Solution: The base material for growing single crystal diamond includes an iridium film or a rhodium film heteroepitaxially grown on a side of a single crystal SiC substrate where single crystal diamond is to be grown, wherein the iridium film or rhodium film functions as a good buffer layer in growing single crystal diamond. Further, a base material for growing single crystal diamond may be used, where the base material having an MgO film heteroepitaxially grown between the single crystal SiC substrate and the iridium film or rhodium film. Since the substrate has the MgO film, the overlay iridium film or rhodium film can be formed with better crystallinity, and the MgO film can be used as a good separation layer upon separating the grown single crystal diamond.

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**USD643326: Multiple facet gemstone**

Applicant: Rosy Blue Jewelry, United States of America  
Publication: 2011-08-16  
Filed: 2011-02-02  
Status: granted

The ornamental design for a multiple facet gemstone, as shown.

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**USD640951: Multiple facet gemstone**

Applicant: Rosy Blue Jewelry, United States of America  
Publication: 2011-07-05

Filed: 2011-03-02  
Status: granted

The ornamental design for a multiple facet gemstone, as shown.

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## **"State of the art" mailing service**

**Patent News nr. 90 (10-2011)**



### **WO2011114102A1: Method for synthesising diamond**

Applicant: Designed Materials Limited / Stoneham, United Kingdom

Publication: 2011-09-22

Filed: 2011-03-16

Status: application

A method of synthesising diamond, the method comprising; providing, in the presence of an atomic hydrogen plasma and/or in the presence of atomic hydrogen radicals, in a dissolution zone a liquid metal saturated with carbon with respect to graphite precipitation; transferring at least a portion of the liquid metal from the dissolution zone to a deposition zone,- exposing the liquid metal in the deposition zone to atomic hydrogen plasma and/or to atomic hydrogen radicals, the temperature of the liquid metal in the deposition zone being lower than the temperature of the liquid metal in the dissolution zone such that the liquid metal in the deposition zone is saturated, preferably supersaturated, with carbon with respect to diamond precipitation; precipitating carbon from the liquid metal in the deposition zone to synthesise diamond; and optionally removing the synthesised diamond from the metal.

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### **WO2011101724A2: GEMSTONE ADMINISTRATION AND IDENTIFICATION**

Applicant: -

Publication: 2011-08-25

Filed: 2011-02-16

Status: international application published without international search report

A certificate of authenticity of a unique gemstone is provided that carries physical details of the general shape, size and configuration of the gemstone. The certificate includes data developed spectroscopically as regards impurities contained within the gemstone and any other necessary properties thereof whereby the gemstone can be uniquely identified. The spectroscopically developed data may include a sequence trace showing the absorption frequencies pertinent to the particular gemstone and may be produced using a Fourier transform infrared (FTIR) spectroscope spanning a frequency or wave number range appropriate to the type of gemstone. The certificate may include a UV-VIS record. The invention also provides a gemstone administration system wherein spectroscopically developed data generated in relation to each individual gemstone is such that it uniquely identifies that gemstone in amongst others and the spectroscopically developed data, together with other physical data the relevant gemstone, is maintained in a database for

future use and reference.

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**US20110229719A1: Manufacturing method for crystal, manufacturing apparatus for crystal, and stacked film**

Applicant: Sumitomo Electric Industries, Japan  
Publication: 2011-09-22  
Filed: 2011-03-15  
Status: application

A manufacturing method for a crystal, a manufacturing apparatus for a crystal, and a stacked film capable of growing a high-quality crystal are provided. The manufacturing method for a crystal includes the steps of: preparing a seed crystal having a frontside surface and a backside surface opposite to the frontside surface; forming at least one film selected from the group consisting of a hard carbon film, a diamond film, a tantalum film, and a tantalum carbide film on the backside surface of the seed crystal; and growing the crystal on the frontside surface of the seed crystal.

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**US20110228063A1: Gemstone viewer**

Applicant: De Beers Centenary AG, Switzerland  
Publication: 2011-09-22  
Filed: 2009-07-16  
Status: application

An apparatus for viewing images of a gemstone is described. The apparatus comprises a support structure for supporting the gemstone at an observation position. An illumination structure comprises a plurality of directional light sources directed towards the observation position so as to illuminate the gemstone. The support structure and illumination structure are relatively rotatable relative to one another about a rotation axis. An imaging device is arranged to obtain images of the gemstone at the observation position at a variety of relative rotational positions between the illumination structure and support structure: the imaging device has an imaging axis passing through the observation position. The support structure is arranged so that the gemstone can be placed at the observation position in such a way that the normal to a selected facet of the gemstone is within a range of tilt angles from the rotation axis. The arrangement of directional light sources is such that, for any tilt angle within the range, at least one of the directional light sources will be specularly reflected from the selected facet into the imaging device for at least one rotational position of the support structure.

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**US8007754: Separation of diamond from gangue minerals**

Applicant: Mineral and Coal Technologies, United States of America  
Publication: 2011-08-30  
Filed: 2006-02-03  
Status: granted

The present invention relates to a method for separating diamond from gangue minerals. In particular, this method relates to the addition of a first reagent or reagents which contact the diamond in diamond ore slurry to at least partially remove hydrophilic coatings from the diamond surfaces. A second reagent or reagents may also be added to the slurry so that the reagent may adsorb on the diamond surfaces and thereby enhance the hydrophobicity of diamonds. The increase in hydrophobicity may improve the flotation of diamonds.

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**US8020909: Pincers illuminating items grasped therein**

Applicant: -  
Publication: 2011-09-20  
Filed: 2009-02-27  
Status: granted

A pincer (e.g., a tweezer) has tips which are at least substantially transparent, such that a user can at least partially view an object being grasped through the tips, and/or such that the tips collect and channel incident light onto the grasped item. The tips preferably have an exterior which is convex in one or more dimensions, and are configured and/or coated such that light falling on the tip exteriors is focused onto a spot or band on the item. Since the tips can enhance illumination of an item being grasped, they can particularly enhance the viewing of translucent materials such as gemstones or selected biological materials.

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**WO2011106604A1: Arrangement for examining gemstones**

Applicant: Photostrip, United States of America  
Publication: 2011-09-01  
Filed: 2011-02-25  
Status: application

An arrangement for accurately determining at least one optical property, such as coverage and/or symmetry, of a gemstone, employs an energizable, stationary light source for directing light rays at different orientations to an uncovered table of the gemstone, and an energizable, stationary backlight spaced away from a culet of the gemstone. A holder holds the gemstone table-side up. A controller energizes the light source to generate return light from the gemstone for each light ray, and energizes the backlight to illuminate the gemstone from behind. An imager images the return light as a plurality of frontlit images, and images the backlit gemstone as a backlit image. The controller processes at least one of the images to determine the optical property of the gemstone.

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**JP04709088B2:**

Applicant: -  
Publication: 2011-06-22  
Filed: 2006-07-14

Status: granted

Diamond for decoration, has pavilion that is divided into two pavilions in horizontal-split plane parallel to girdle bottom-horizontal-discharge cross section

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**JP04709087B2:**

Applicant: -  
Publication: 2011-06-22  
Filed: 2006-07-14  
Status: granted

Diamond for two-stage pavilion decoration has X-axis marks of regular octagon vertex of table facet that are set when girdle lower outer periphery is set to a point

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**JP2011079683A2: Base material for growing single crystal diamond and method for producing single crystal diamond substrate**

Applicant: Shin-Etsu Chemical  
Publication: 2011-04-21  
Filed: 2009-10-02  
Status: application

Problem to be solved: To provide a base material for growing a single crystal diamond and a method for producing a single crystal diamond substrate, by which single crystal diamond having a large area and good crystallinity is grown and a high quality single crystal diamond substrate is produced at a low cost.

Solution: The base material for growing the single crystal diamond is composed of a single crystal silicon substrate, an MgO film which is heteroepitaxially grown on a side of the single crystal silicon substrate, where the single crystal diamond is to be grown, and an iridium film or rhodium film heteroepitaxially grown on the MgO film.

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**CA2496710C: SINGLE CRYSTAL DIAMOND**

Applicant: Element Six, United Kingdom  
Publication: 2011-09-06  
Filed: 2003-09-19  
Status: granted

A method of producing a large area plate of single crystal diamond from CVD diamond grown on a substrate substantially free of surface defects by chemical vapour deposition (CVD). The homoepitaxial CVD grown diamond and the substrate are severed transverse to the surface of the substrate on which diamond growth took place to produce the large area plate of single crystal CVD diamond.

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## **"State of the art" mailing service**

**Patent News nr. 91 (11-2011)**



### **US20110265514A1: Method of cutting diamonds**

Applicant: -  
Publication: 2011-11-03  
Filed: 2009-12-28  
Status: application

In a method of taking a star facet of a diamond and extending its length to the girdle (the outside perimeter) of the diamond, a shield style (obelisk-shaped) facet is produced in rounds and fancy cut diamonds, and on square and off squares it remains a three-sided facet but is made larger and longer. The facet becomes larger than it was previously. It becomes a five-sided facet when it was a three before (or a much larger three-sided facet on squares and off squares). The reason it becomes five-sided is because when the facet is extended it collides with the bezel and both upper girdle facets as it extends to the girdle on rounds and fancy cut diamonds. The new facet on square and off square becomes longer and larger but remains three-sided. When the new star facet of rounds, fancy, square and off square diamonds collide with the others it produces a new larger facet and makes an exchange of positions of the previous largest facet which is true of all rounds, fancy, square and off square. This new facet has a different angle from the previous largest facet. Because of the adjustment it appears a little different because the world is used to the standard cuts. The new cut produces new angles for the largest facet and produces a very appealing display of light performance.

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### **US20110239705A1: Decorative jewel and method for cutting decorative jewel**

Applicant: Hohoemi Brains, Tokyo, Japan  
Publication: 2011-10-06  
Filed: 2009-09-24  
Status: application

The color stone 1 is formed of a material with a refractive index  $n$  of 1.55 to 2.40, and is subjected to round brilliant-cutting. The pavilion angle  $p$  and the crown angle  $c$  satisfy the correlation of,  $-A(n) \times p + B(n) + K1$  and  $gcg - A(n) \times p + B(n) + K2$  where,  $A(n)$  is represented by  $A(n) = -1.122 \times n^5 + 9.14 \times n^4 - 26.752 \times n^3 + 32.982 \times n^2 - 12.842 \times n$ ,  $B(n)$  is represented by  $B(n) = -22.323 \times n^5 + 184.166 \times n^4 - 527.616 \times n^3 + 594.102 \times n^2 - 128.68 \times n$ ,  $K1$  is represented by  $K1 = +4$ , and  $K2$  is represented by  $K2 = -4$ .

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**US8033136: Enhancing the optical characteristics of a gemstone**

Applicant: California Institute of Technology, United States of America  
Publication: 2011-10-11  
Filed: 2006-12-06  
Status: granted

Various embodiments described herein comprise a gemstone or other piece of jewelry, which incorporates one or more diffractive optical elements to enhance the fire displayed by the gemstone. In certain embodiments, the diffractive optical element comprises a diffraction grating etched on one or more facets of the gemstone.

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**US8056363: Method for producing a highly refractive composite gemstone, and product**

Applicant: Betterthandiamond, United States of America  
Publication: 2011-11-15  
Filed: 2008-06-16  
Status: granted

A method for providing a protective coating and enhanced optical qualities to a gemstone. The method includes coating a first portion and a second portion of a gemstone with TiO<sub>2</sub> doped with calcium oxide (TiO<sub>2</sub>+). The TiO<sub>2</sub>+ coated gemstone is next coated with a diamond like carbon (DLC) coating. The gemstone may be synthetic or natural. The composite gemstone, having been coated with both TiO<sub>2</sub> and DLC, exhibits high refractivity and enhanced wear resistance and color.

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**ES2366115T3: Diamante de talla brillante rectangular.**

Applicant: Hohoemi Brains, Japan  
Publication: 2011-10-17  
Filed: 2003-10-13  
Status: translation of granted european patent

Un diamante de talla brillante rectangular que comprende un filetín columnar rectangular que tiene una faceta tabla octogonal en la parte superior de una corona formada encima del filetín y un pabellón debajo del filetín, donde el filetín columnar rectangular posee una sección transversal rectangular superior paralela a la faceta tabla en el límite entre el filetín y la corona, la corona comprende cuatro facetas filetín de la corona trapezoidales, cuatro facetas en bisel, cuatro segundas facetas en bisel triangulares y ocho facetas estrella triangulares en una superficie externa que circunda la corona, la faceta tabla tiene cuatro primeros vértices y cuatro segundos vértices, donde cada uno de los cuatro primeros vértices está situado adyacente a cada uno de los cuatro vértices de la sección transversal superior del filetín y cada uno de los cuatro segundos vértices está en un punto desplazado hacia afuera del punto medio de un segmento lineal que conecta los dos primeros vértices vecinos, las cuatro facetas filetín de la corona tienen cada una, una base que coincide con un lado de la sección transversal superior del filetín, y el pabellón

comprende cuatro facetas principales del pabellón cuadrilaterales y una pluralidad de facetas filetín del pabellón triangulares en una superficie exterior que circunda el pabellón. las facetas principales del pabellón tienen cada una dos vértices opuestos, uno de los cuales es un ápice inferior del diamante en una línea central y el otro coincide con cada uno de los vértices inferiores del filetín, y dos lados que coinciden cada uno con un lado que pertenece a una faceta principal del pabellón vecino en un plano que divide el centro que pasa por la línea central y por un centro entre los dos vértices inferiores vecinos del filetín, caracterizado porque las cuatro facetas en bisel comprenden, cada una, una faceta en bisel triangular inferior y una faceta en bisel triangular superior, estando las cuatro facetas filetín de la corona y las cuatro facetas en bisel inferiores alineadas alternadamente para formar una hilera a lo largo y encima del límite, y las facetas en bisel inferiores tienen, cada una, un vértice, dos lados que pasan por el vértice y una base opuesta al vértice, el vértice coincide con cada uno de los vértices de la sección transversal superior del filetín y es propiedad conjunta de las dos facetas filetín de la corona en ambos lados de cada una de las facetas en bisel inferiores, donde los dos lados coinciden cada uno con un lado de cada una de las facetas filetín de la corona y la base tiene dos extremos que coinciden cada uno con un vértice que es propiedad de cada una de las dos facetas filetín de la corona, estando las cuatro facetas en bisel superiores, las cuatro segundas facetas en bisel y las ocho facetas estrella alineadas para formar otra hilera entre la faceta tabla y la hilera que tiene el filetín de la corona y las facetas en bisel inferiores, las facetas en bisel superiores tienen cada una un vértice que coincide con uno de los primeros vértices de la faceta tabla y una base que coincide con la base de las facetas en bisel inferiores, las facetas en bisel inferiores tienen cada una un ángulo con la faceta tabla mayor que un ángulo entre cada una de las facetas en bisel superiores y la faceta tabla.

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### **EP1953273A3: Method of incorporating a mark in CVD diamond**

Applicant: Element Six Limited, United Kingdom  
Publication: 2011-10-12  
Filed: 2004-12-10  
Status: search report

A method of incorporating a mark of origin, such as a brand mark, or fingerprint in a CVD single crystal diamond material, includes the steps of providing a diamond substrate, providing a source gas dissociating the source gas thereby allowing homoepitaxial diamond growth, and introducing in a controlled manner a dopant into the source gas in order to produce the mark of origin or fingerprint in the synthetic diamond material. The dopant is selected such that the mark of origin or fingerprint is not readily detectable or does not affect the perceived quality of the diamond material under normal viewing conditions, but which mark of origin or fingerprint is detectable or rendered detectable under specialised conditions, such as when exposed to light or radiation of a specified wavelength, for example. Detection of the mark of origin or fingerprint may be visual detection or detecting using specific optical instruments, for example.

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**US20110280790A1: Production of Large, High Purity Single Crystal CVD Diamond**

Applicant: Carnegie Institution of Washington, United States of America  
Publication: 2011-11-17  
Filed: 2011-05-17  
Status: application

The invention relates to single crystal diamond with optical quality and methods of making the same. The diamond possesses an intensity ratio of the second-order Raman peak to the fluorescence background of around 5 or greater.

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**US20110271900A1: High pressure high temperature (HPHT) method for the production of single crystal diamonds**

Applicant: -  
Publication: 2011-11-10  
Filed: 2010-01-15  
Status: application

A high pressure high temperature (HPHT) method for synthesizing single crystal diamond, wherein a single crystal diamond seed having an aspect ratio of at least (1) and a growth surface substantially parallel to a {110} crystallographic plane is utilised is described. The growth is effected at a temperature in the range from 1280° C. to 1390° C.

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**US20110247362A1: Natural fluorescent diamond ornament that emits multi-color light and hidden text/pattern**

Applicant: -  
Publication: 2011-10-13  
Filed: 2011-04-11  
Status: application

A natural fluorescent diamond ornament that emits multi-color light and hidden text/pattern includes an ornament base, multiple natural fluorescent diamonds inlaid on the ornament base and multiple natural non-fluorescent diamonds inlaid on the ornament base. Each of the natural fluorescent diamonds and the natural non-fluorescent diamonds is polygonal, refractive, and light-pervious. When exposed under UV light, the multiple natural fluorescent diamonds inlaid on the ornament base of the ornament will emit purplish-blue light which is distinct from the light emitted by the natural non-fluorescent diamonds inlaid on the ornament base. When the multiple natural fluorescent diamonds are arranged in a predetermined pattern and exposed to UV light, the natural fluorescent diamonds arranged in the predetermined pattern will emit purplish-blue light to exhibit a creative configuration that is amazingly mysterious and novel.

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**US8046274: Method for digital color grading of gems and communication thereof**

Applicant: -

Publication: 2011-10-25  
Filed: 2005-03-03  
Status: granted

A method of color grading gems by a user by their inherent properties of shape, hue, tone and saturation. Each of the properties is variable over a practical range derived from a database. The database is created by digitally coding gem shapes, hues, tones and colors from digital photographs of gems of different, shapes, hues, tones and saturation. The variable properties are displayed on a screen and the user selects the best matching respective shape, hue, tone and saturation in comparison to the particular gem being graded. Upon receiving the user's selections, an image of the a gem having the shape, hue, tone and saturation selected by the user is displayed on the screen and translated into alpha-numeric code which can be communicated to any other user of the same system, enabling remote discussion and evaluation of the same target gem.

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**WO2011127870A1: System for the registration and sale of precious stones and similar commodities**

Applicant: -  
Publication: 2011-10-20  
Filed: 2010-04-16  
Status: application

This particular solution involves a system for the registration and sale of precious stones and similar commodities whose substance lies in databank listing precious stones, being interactively linked to databank listing the names of stars, while databank of precious stones listing the registered gems (2.1, 2.2... 2.n) is interactively linked to seller's terminal and to customers databank, while each precious stone (2.1, 2.2... 2.n) is assigned an appropriate unique name of a star (1.1, 1.2... 1.n) listed in databank containing the names of stars. Each registered precious stone (2.1, 2.2... 2.n) is provided with identification signs in the form of implemented microdots.

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**US20110258235A1: System for the registration and sale of precious stones and similar commodities**

Applicant: -  
Publication: 2011-10-20  
Filed: 2010-06-28  
Status: application

This particular solution involves a system for the registration and sale of precious stones and similar commodities whose substance lies in databank listing precious stones, being interactively linked to databank listing the names of stars, while databank of precious stones listing the registered gems (2.1, 2.2... 2.n) is interactively linked to seller's terminal and to customers databank, while each precious stone (2.1, 2.2... 2.n) is assigned an appropriate unique name of a star (1.1, 1.2... 1.n) listed in databank containing the names

of stars. Each registered precious stone (2.1, 2.2... 2.n) is provided with identification signs in the form of implemented microdots.

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**US8035807: Engraved gemstone viewer**

Applicant: GemEx Systems, United States of America  
Publication: 2011-10-11  
Filed: 2008-12-23  
Status: granted

The present invention is an engraved gemstone viewer for viewing a smooth surface of a gemstone that has been micro or nano etched, engraved or embossed with an inscription such as an identification number. The gemstone is mounted on a piece of jewelry or can remain unmounted when received by the viewer. A source of light directs a light beam toward a magnifying lens coated with a reflection enhancing coating. The lens reflects the light beam along a path incident to the surface of the gemstone containing the inscription. The smooth gemstone surface specularly reflects the light beam along a path back toward the magnifying lens, which produces a viewable light image that reveals the inscription. The inscription is shown as a combination of darkened or lightened areas, lines and characters given the reduction or absence of light reflected, or highlighted by the reflection of light.

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**US20110261360A1: Method and apparatus for object viewing, observation, inspection, identification, and verification**

Applicant: -  
Publication: 2011-10-27  
Filed: 2011-04-22  
Status: application

In an object verifier having a housing and an object holder, an object may be placed in the object holder for observation by an operator. The object is illuminated using a collimated beam of white light that is generated by a light generator. The collimated beam of white light is passed through a beam splitter with the two portions of the collimated beam of white light presented to the object at a 90 degree angle one from the other. The interior of the housing includes a reflective surface for maximal illumination of the object. The observer may view the illuminated object through a viewing window and/or through a magnification window. The magnification window provides for the viewing of the object in greater detail.

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**CN101864560B: High power microwave plasma diamond film deposition device**

Applicant: -  
Publication: 2011-10-12  
Filed: 2010-05-24  
Status: application

The invention relates to a high power microwave plasma diamond film deposition device, which belongs to the technical field of chemical gas-phase deposition of the diamond film, and comprises an upper cylindrical body of a microwave cavity, a lower cylindrical body of the microwave cavity, a diamond film deposition platform, a microwave reflection body, a quartz window, a plasma, an adjusting mechanism A and an adjusting mechanism B. The diamond film deposition platform and the microwave reflection body are arranged inside the upper and the lower cylindrical bodies, and the quartz window is arranged below the diamond film deposition platform; and the height of the microwave reflection body is adjusted through the adjusting mechanism A, the height of the upper cylindrical body is adjusted by the adjusting mechanism B, and the microwave reflection body reflects and strengthens the microwave electric field. The upper cylindrical body, the lower cylindrical body, the diamond film deposition platform, the microwave reflection body, the adjusting mechanism A and the adjusting mechanism B can realize the direct water cooling. Under the high power, the diamond film of high quality is deposited at a high speed, and the device has the advantages of reliability, convenient adjustment and the like.

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**JP04663855B2:**

Applicant: -  
Publication: 2011-04-06  
Filed: 2000-08-02  
Status: granted

Judging method for decorative jewelry e.g. new diamond, involves identifying jewelry by observing the light reflected from the surface of the jewelry.

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**JP2011084411A2: Base material for growing single crystal diamond and method for producing single crystal diamond substrate**

Applicant: Shin-Etsu Chemical  
Publication: 2011-04-28  
Filed: 2009-10-13  
Status: application

Problem to be solved: To provide a base material for growing a single crystal diamond which allows a single crystal diamond having a large area and good crystallinity to be grown and thereby allows a high-quality single crystal diamond substrate to be inexpensively produced, and to provide a method for producing the single crystal diamond substrate.

Solution: The base material for growing single crystal diamond includes an iridium film or a rhodium film 12 heteroepitaxially grown on a side of a single crystal SiC substrate where single crystal diamond is to be grown, wherein the iridium film or rhodium film functions as a good buffer layer in growing single crystal diamond. Further, a base material for growing single crystal diamond may be used, where the base material having

an MgO film heteroepitaxially grown between the single crystal SiC substrate and the iridium film or rhodium film. Since the substrate 10' has the MgO film, the overlay iridium film or rhodium film can be formed with better crystallinity, and the MgO film can be used as a good separation layer upon separating the grown single crystal diamond.

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**JP2011144107A2: Diamond material of optical quality**

Applicant: Element Six Ltd  
Publication: 2011-07-28  
Filed: 2011-02-16  
Status: application

Problem to be solved: To provide a CVD single crystal diamond material suitable for using in an optical device or element or as the optical device or element.

Solution: In the CVD single crystal diamond material exhibiting at least one of the characteristics such as a processability, a mechanical strength, a wear resistance, a chemical inactivity exhibiting a high surface polishing while having a low and uniform birefringence, a uniform and high refringence, a low inductive birefringence or refringence variation as a distortion factor, a low and uniform light absorption, a low and uniform light scattering, a high light (laser) damaging threshold, a high heat conductivity and a high parallelism and flatness, a manufacturing method of the CVD single crystal diamond material includes a step for providing a substrate substantially having no crystal defect, a step for providing a raw material gas, a step for producing a synthesizing atmosphere containing 300 ppb to 5 ppm nitrogen calculated as a molecular nitrogen by dissociating the raw material gas and a step for growing a homoepitaxial diamond on the surface substantially having no crystal defect.

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**EP2379214A1: High pressure high temperature (HPHT) method for the production of single crystal diamonds**

Applicant: Element Six Ltd, United Kingdom  
Publication: 2011-10-26  
Filed: 2010-01-15  
Status: application

High pressure high temperature method for synthesizing single crystal diamond used for gem polishing application, involves performing crystal growth at specific temperature, to produce diamond with longest dimension on growth surface.

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## **"State of the art" mailing service**

**Patent News nr. 92 (12-2011)**



### **US8069688: Gemstones and methods for controlling the appearance thereof**

Applicant: California Institute of Technology, United States of America

Publication: 2011-12-06

Filed: 2008-11-28

Status: granted

Methods of fabricating improved gemstones and gemstones thus obtained are described. Roughness is introduced on facets of a gemstone through application of nanometer and/or micrometer sized features, to provide the facets with a hazy white-colored appearance. Alternatively, millimeter-sized reflective features can be applied on the facets, to form a gemstone with improved scintillation or play of light.

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### **US8071066: Method and apparatus for improving the quality of diamonds and other gemstones**

Applicant: Laor Consulting, United States of America

Publication: 2011-12-06

Filed: 2009-02-12

Status: granted

The present disclosure relates to methods for improving the quality of diamonds by eliminating internal defects, such as cracks and vacant volumes, without the use of filler materials such as glass, thereby improving the diamond's optical performance or appearance. More particularly, the disclosure relates to a method of curing defects in a genuine or synthetic diamond or other gemstone by using Atomic Layer Deposition ("ALD") processes to form atomic layers within vacant volumes or cracks in the diamond or gemstone. Alternatively, ALD may be used to form crystalline layers of a new diamond or other gemstone.

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### **US8048223: Grown diamond mosaic separation**

Applicant: Apollo Diamond, United States of America

Publication: 2011-11-01

Filed: 2005-07-21

Status: granted



The present invention provides in one example embodiment a synthetic diamond and a method of growing such a diamond on a plurality of seed diamonds, implanting the grown diamond with ions, and separating the grown diamond from the plurality of seed diamonds.

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**EP1920080B1: High colour diamond**

Applicant: Element Six Limited, United Kingdom  
Publication: 2011-11-30  
Filed: 2006-06-22  
Status: patent specification

A method of reducing the detrimental effect on the colour of a single crystal CVD diamond layer caused by the presence of nitrogen in a CVD synthesis atmosphere.

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**GB2471907B2: A method of treating diamond**

Applicant: Designed Materials, United Kingdom  
Publication: 2011-11-23  
Filed: 2009-07-17  
Status: amended patent specification

A method of reducing defects in diamond and/or modifying the optical properties of diamond is disclosed which comprises: providing a liquid metal saturated with carbon with respect to graphite precipitation; lowering the temperature of the liquid metal such that the liquid metal is saturated with carbon with respect to diamond precipitation; immersing a diamond in the liquid metal to reduce the defects in the diamond and/or modify the optical properties of the diamond; and removing the diamond from the metal. Also disclosed is a method of doping diamonds and an apparatus for treating diamond with liquid metal.

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**US20110261350A1: Apparatus and method for measuring optical characteristics of an object**

Applicant: -  
Publication: 2011-10-27  
Filed: 2010-03-17  
Status: application

Optical characteristic measuring systems and methods such as for determining the color or other optical characteristics of an object are disclosed. Perimeter receiver fiber optics are spaced apart from a source fiber optic and receive light from the surface of the object being measured. Light from the perimeter fiber optics pass to a variety of filters. The system utilizes the perimeter receiver fiber optics to determine information regarding the height and angle of the probe with respect to the object being measured. Under processor control, the optical characteristics measurement may be made at a predetermined height

and angle. Various color spectral photometer arrangements are disclosed. Translucency, fluorescence, gloss and/or surface texture data also may be obtained. Audio feedback may be provided to guide operator use of the system. The probe may have a removable or shielded tip for contamination prevention. A method of producing prostheses based on measured data also is disclosed. Measured data also may be stored and/or organized as part of a data base.

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**JP04709088B2:**

Applicant: -  
Publication: 2011-06-22  
Filed: 2006-07-14  
Status: granted

Diamond for decoration, has pavilion that is divided into two pavilions in horizontal-split plane parallel to girdle bottom-horizontal-discharge cross section.

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**JP04709087B2:**

Applicant: -  
Publication: 2011-06-22  
Filed: 2006-07-14  
Status: granted

Diamond for two-stage pavilion decoration has X-axis marks of regular octagon vertex of table facet that are set when girdle lower outer periphery is set to a point.

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**JP04680507B2:**

Applicant: -  
Publication: 2011-10-13  
Filed: 2011-04-11  
Status: granted

Grading system for gems, has personal computer, hard disc, operating system, color calibrated display screen, Internet browser and Web communication mechanism, and database.

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**GB2400115C: Coloured diamond**

Applicant: Element Six, United Kingdom  
Publication: 2011-11-02  
Filed: 2002-12-13  
Status: amended or corrected patent specification

A diamond layer of single crystal CVD diamond which is coloured, preferably which has a fancy colour, and which has a thickness of greater than 1 mm.

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