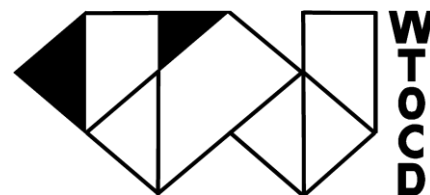


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Patent News nr. 122 (2015)



JP2015114317A YUAN CHIH CHUNG

Publication / filed : 2015-06-22 / 2014-09-17

Title: DETECTION METHOD FOR DETECTING CVD SYNTHESIS DIAMOND AND DETECTION DEVICE OF THE SAME

PROBLEM TO BE SOLVED: To provide a detection method which can quickly detect a CVD synthetic diamond in a large number of diamonds with high detection efficiency and accuracy

SOLUTION: The detection method includes: (1) a step of clearly wiping a diamond to be detected and placing the diamond at a fixing position; (2) a step of irradiating the diamond with light of different wavelengths within a certain wave length range; (3) a step of collecting light of different wavelengths reflected by the diamond to be detected;(4) a step of calculating a reflectance for the diamond to be detected having light of different wavelengths and obtaining a wavelength-reflectivity curve by intensity of the reflected light; (5) a step of detecting whether a peak appears on the wavelength-reflectivity curve, removing the diamond to be detected in which the peak does not appear, and retaining the diamond to be detected in which the peak appears; and (6) a step of detecting the diamond to be detected in which the peak in (5) appears and judging the diamond in which the peak appears in the wavelength range of 227 nm to 233 nm as a CVD synthetic diamond

US9040931B1 & US20150160129A1 YUAN CHIH-CHUNG

Publication / filed : 2015-06-11 / 2014-09-15

Title: METHOD AND APPARATUS FOR IDENTIFYING CVD DIAMOND

Abstract: Method for identifying CVD diamond comprises (1) placing a clean diamond on a fixed platform; (2) illuminating the diamond with light having various wavelengths; (3) receiving reflected light from the diamond; (4) calculating a reflectance value at each wavelength based on a light intensity at each wavelength of the reflected light, generating a spectral reflectance curve; (5) determining whether the spectral reflectance curve has a sharp trough, then storing the diamond if the spectral reflectance curve thereof does not have the sharp trough, while selecting the diamond for a further identification if the spectral reflectance curve thereof has the sharp trough; and (6) determining whether the sharp trough of the diamond selected from the step (5) is at a wavelength

between 227 nm and 233 nm, and identifying the diamond to be the CVD diamond if the sharp trough is at the wavelength between 227 nm and 233 nm

EP2884268A1 YUAN CHIH-CHUNG

Publication / filed : 2015-06-17 / 2014-09-17

Title: Method and apparatus for identifying CVD diamond

Abstract: Method and apparatus for identifying CVD diamond comprises (i) placing a clean diamond on a fixed platform; (ii) illuminating the diamond with light having various wavelengths; (iii) receiving reflected light from the diamond; (iv) calculating a reflectance value at each wavelength based on a light intensity at each wavelength of the reflected light, generating a spectral reflectance curve; (v) determining whether the spectral reflectance curve has a sharp trough, then storing the diamond if the spectral reflectance curve thereof does not have the sharp trough, while selecting the diamond for a further identification if the spectral reflectance curve thereof has the sharp trough; and (vi) determining whether the sharp trough of the diamond selected from the step (v) is at a wavelength between 227 nm and 233 nm, and identifying the diamond to be the CVD diamond if the sharp trough is at the wavelength between 227 nm and 233 nm

JP2015059069A NAT INST OF ADV IND & TECHNOL

Publication / filed : 2015-03-30 / 2013-09-19

Title: MANUFACTURING METHOD OF SINGLE CRYSTAL DIAMOND

PROBLEM TO BE SOLVED: To provide a method for manufacturing high-quality single crystal diamond by additionally depositing vapor phase synthesized single crystal diamond stably on a single crystal diamond seed substrate obtained by vapor phase synthesis

SOLUTION: There is provided a manufacturing method of a single crystal diamond in which vapor phase synthesized single crystal diamond is additionally deposited on a single crystal diamond seed substrate obtained by vapor phase synthesis, which has: (1) a process of measuring flatness a seed substrate; (2) a process of determining whether or not planarization of the seed substrate is performed based on a measurement result of flatness; and (3) either one process of the following two processes: (3a) a process of additionally depositing vapor phase synthesized single crystal diamond after planarization is performed to a seed substrate that requires planarization based on a determination; and (3b) a process of additionally depositing vapor phase synthesized single crystal diamond without performing planarization to a seed substrate that requires no planarization based on a determination

JP2015194467A CENTRAL GEM LAB

Publication / filed : 2015-11-05 / 2014-11-14

Title: EVALUATION DEVICE AND EVALUATION METHOD FOR GEM

PROBLEM TO BE SOLVED: To provide an evaluation device and an evaluation method capable of evaluating the quality of a gem with a small device on the basis of scintillation of refractive reflection of the gem, such as a diamond

SOLUTION: The evaluation device is provided with a holding part 8a on which a gem 9 is loaded or held and rotatable, a ring-like light source part 11 for illuminating the gem 9 from above the holding part, and an observation part 12 above the light source part for observing a pattern that is refractive-reflected from the gem 9. The light source part 11 can be configured with a plurality of point light sources 10 arranged in the circumferential direction with spaces therebetween. The observation part 12 is positioned above the central part in the radial direction of the ring-like light source part 11. The holding part 8a can be covered by a truncated cone-shaped translucent cap 15, the upper part of which is opened, the translucent cap comprising color bands 15a-15c having different color phases, which are formed in the vertical direction of the translucent cap

US20150187065A1 CENTRAL GEM LAB

Publication / filed : 2015-07-02 / 2014-12-28

Title: METHOD OF DETERMINING QUALITY OF HEART & CUPID OPTICAL EFFECTS OF DIAMOND AND DEVICE THEREFOR

Abstract: The present invention includes the steps of: storing data such as the symmetry, the variation degree in the area, the displacement of a tip portion, the depth of a slit, the shoulder widths, and the like of eight heart marks and the symmetry, the variation degree in the area, the displacement or sharpness of an arrow tip, and the like of eight cupid marks into a computer database; and performing arithmetic processing of the data and ranking determination of the quality of the heart marks and the cupid marks. It is an object of the present invention to provide a method and device capable of objectively determining the quality on the basis of the same determination criterion using determination software in both of a case where the diamond is directly imaged by a CCD camera

JP2015100861A TOYO SEIKAN GROUP HOLDINGS LTD

Publication / filed : 2015-06-04 / 2013-11-21

Title: DIAMOND SURFACE POLISHING METHOD

PROBLEM TO BE SOLVED: To provide a diamond surface polishing method that can be adapted easily for the polishing of an uneven three-dimensional surface with a long lifetime of a polishing

member and an ease in control and enables simple means to effectively remove abrasive powder generated during polishing

SOLUTION: A diamond surface polishing method, which uses a metal-made polishing member to heat the polishing member and/or diamond surface, is characterized by polishing while abrasive powder derived from the polishing member remaining on the diamond surface is being removed by rubbing

US9149901B2 TOYO SEIKAN GROUP HOLDINGS LTD

Publication / filed : 2015-10-06 / 2013-06-03

Title: Method of polishing the diamond-surface

Abstract: A method of polishing the diamond-surfaces generates abraded powder less, enables the polishing member to maintain an extended life and to be easily controlled, makes it possible to obtain the surfaces of a high degree of smoothness, and can be easily applied to polishing rugged three-dimensional surfaces, too. A method of polishing the diamond-surface by using a polishing member that has a metal-surface that easily reacts with carbon or of a carburizing metal, irradiating the diamond-surface with a laser beam prior to polishing the diamond-surface with the polishing member, following the irradiation with the laser beam, the polishing is conducted by rubbing a laser beam-irradiated portion with the polishing member

JP2015066434A WORLDWIDE DIAMOND TRADEMARKS LTD

Publication / filed : 2015-04-13 / 2014-09-11

Title: DECAGONAL SHAPED DIAMOND WHICH DISPLAYS HEARTS AND ARROWS PATTERN

PROBLEM TO BE SOLVED: To provide a decagonal 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

SOLUTION: The decagonal shaped diamond is cut to form: ten main crown facets of substantially equal size symmetrically arranged relative to one another surrounding a table facet; twenty star facets with two star facets polished on every main crown facet; ten main pavilion facets; an equal number of crown half facets as pavilion half facets; ten subsidiary pavilion half facets; twenty subsidiary pavilion facets; and ten main girdle facets with the girdle facets polished at a given angle relative to one another for forming the decagonal shape of the diamond

JP2015043954A WORLDWIDE DIAMOND TRADEMARKS LTD

Publication / filed : 2015-03-12 / 2013-08-30

Title: CUSHION SHAPED HEARTS AND ARROWS GEMSTONE AND METHOD

PROBLEM TO BE SOLVED: To provide a cushion cut diamond which is characterized in a true hearts and arrows pattern in a round cut diamond when subjected to light, and a polishing method for forming a cushion cut

SOLUTION: The cushion cut is formed by: polishing a diamond into a symmetrical rounded shaped geometry; forming four main crown facets MFC1-MFC4 on four long sides and on four corner sides; forming a square shaped table facet TF having four cut corners; forming eight crown star facets on the main crown sides; and forming 16 crown half facets, eight main pavilion facets, 16 pavilion half facets, four subsidiary pavilion facets, 16 subsidiary pavilion half facets, and plural girdle facets

EP2826392A1 WORLDWIDE DIAMOND TRADEMARKS LTD

Publication / filed : 2015-01-21 / 2014-07-16

Title: Cushion shaped hearts and arrows gemstone and method

Abstract: A cushion cut diamond (5) and method for polishing a diamond to form a cushion cut which will display a hearts and arrows pattern characteristic of the true hearts and arrows pattern in a round cut diamond when subjected to light. The cushion cut is formed by polishing a diamond into a symmetrical rounded shaped geometry having four curvilinear long sides (10, 12, 14, 16) and four curvilinear corner sides (18, 20, 22, 24) of equal radius with the four curvilinear corner sides interconnecting the four curvilinear long sides to form the rounded shape; forming 4 main crown facets (MCF) of substantially equal geometry and dimension on the four long sides of the diamond and 4 main crown facets of an equal geometry and dimension on the four corner sides with the main crown facets on the corner sides being substantially different in geometry and size from the four main crown facets formed on the long sides; forming a substantially square shaped table facet (TF) with four cut corners adjacent to the 4 main crown facets on the corner sides; forming 8 crown star facets on the main crown sides adjacent the square shaped sides of the table facet; 16 crown halve facets surrounding the four long sides and four corner sides of the diamond; 8 main pavilion facets (MPF), 16 pavilion half facets (PHF), 4 subsidiary pavilion facets (SPF), 16 subsidiary pavilion half facets (SHF) and multiple girdle facets on both the long and corner sides of the diamond with the girdle facets being of varying thickness

US9016089B2 WORLDWIDE DIAMOND TRADEMARKS LTD

Publication / filed : 2015-04-28 / 2013-01-14

Title: Heart shaped diamond cut and method having hearts and arrows pattern

Abstract: A heart shaped diamond possessing a hearts and arrows pattern characteristic comprising: eight main crown facets symmetrically aligned relative to one another, with each of the eight main crown facets having a straight edge in parallel alignment with a straight edge of another main crown facet disposed opposite thereto; eight main pavilion facets aligned at a fixed given angle of approximately 45° to each other and converging at a common point corresponding to the center of the diamond; sixteen pavilion half facets aligned at 22.5° with respect to each other, a girdle which is non-uniform and has a substantially unequal thickness throughout the diamond, a table facet, and a multiple number of crown star facets in an arrangement surrounding the table facet

JP2014133099A SUNDIAMOND USA CORP

Publication / filed : 2014-07-24 / 2013-12-05

Title: HEART SHAPED DIAMOND CUT HAVING HEARTS AND ARROWS PATTERN

PROBLEM TO BE SOLVED: To provide a heart shaped diamond having main crown facets for generating a hearts and arrows pattern characteristic when exposed to light comparable to the hearts and arrows pattern generated by an ideal round cut diamond

SOLUTION: A heart shaped diamond comprises: 8 main crown facets symmetrically aligned relative to one another; 8 main pavilion facets aligned at a fixed given angle of approximately 45° to each other and converging at a common point corresponding to the center of the diamond; 16 pavilion half facets aligned at 22.5° with respect to each other; a girdle which is non-uniform; a table facet; and a multiple number of crown star facets in an arrangement surrounding the table facet. Each of the 8 main crown facets has a straight edge aligned in parallel with a straight edge of another main crown facet disposed opposite thereto

JP2015211728A TASUKO CO LTD

Publication / filed : 2015-11-26 / 2014-05-01

Title: JEWEL

PROBLEM TO BE SOLVED: To provide a jewel which is subjected to cutting being excellent in symmetry, and which has originality, and is subjected to also a novel kind of cutting excellent in aesthetic property

SOLUTION: A piece of diamond 1 as jewel comprises; a crown 3 having a table 2; and a pavilion 5 having a culet 4. The diamond 1 can exhibit a heart-shaped pattern when being observed from the table 2 side, by devising shapes and arrangement of main facets 8 formed on the pavilion 5

WO2015166989A1 TASUKO CO LTD

Publication / filed : 2015-11-05 / 2015-04-30

Title: JEWEL

Abstract: [Problem] The purpose of the present invention is to provide a jewel on which cuts with excellent symmetry are made, such cuts having originality, exceling aesthetically, and being novel. [Solution] A diamond (1), serving as a jewel, is cut so as to have a crown (3) provided with a table (2), and a pavilion (5) provided with a culet (4). By creatively modifying the shape and disposition of a main facet (8) formed in the pavilion (5), the diamond (1) is configured so that a heart pattern can be made to appear when the diamond (1) is viewed from the table (2) side

JP2015120229A UNIV KYUSHU

Publication / filed : 2015-07-02 / 2013-12-25

Title: WORKPIECE POLISHING DEVICE

PROBLEM TO BE SOLVED: To provide a workpiece polishing device which can efficiently polish even a workpiece of high hardness such as SiC, GaN, and diamond

SOLUTION: A workpiece polishing device 10 includes a surface plate 12 with a polishing cloth 16 adhered on its upper surface, and a polishing head 18 which holds a workpiece on a lower surface. The workpiece held by the polishing head 18 is pressed on the polishing cloth of the surface plate 12, and the surface plate 12 and the polishing head 18 are relatively moved while supplying a polishing liquid to polish the workpiece. The workpiece polishing device includes a bank 38 which is arranged so as to surround an outer circumference part of the surface plate 12 and has a height enough to prevent the polishing liquid flowing out from the surface plate 12 from scattering outside, and a return flow passage 42 which returns the polishing liquid, which flows outside the surface plate 12 and creeps up an inner wall of the bank 38, by centrifugal force generated by rotation of the surface plate 12

USD727785S1 ROSY BLUE INDIA PRIVATE LTD

Publication / filed : 2015-04-28 / 2014-08-08

Title: Multiple facet gemstone

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

WO2015100036A1 HASENFELD STEIN INC

Publication / filed : 2015-07-02 / 2014-12-12

Title: CUSHION CUT GEMSTONE EXHIBITING EXCELLENT OPTICAL BRILLIANCE

Abstract: A gemstone including a substantially rectangular girdle with rounded corners, a crown extending in a first direction from the girdle, and a pavilion extending in a second direction from the girdle opposite the first direction. The gemstone has 69 uniquely arranged and angled facets, 41 of which are in the crown, and 28 of which are in the pavilion. The height of the crown is preferably between 12 to 19 1/2 % of the width of the stone, the total depth of the stone is preferably between 58-68% of the width of the stone, and the width of the table is preferably between 55-65% of the width of the stone

US9055792B2 LAUTREC CORP

Publication / filed : 2015-06-16 / 2013-03-19

Title: Sapphire coated gemstone

Abstract: The present invention provides a diamond simulant with greater similarity to a diamond than cubic zirconia. The present invention further provides a diamond simulant with durability, hardness, and optical features closer to that of a genuine diamond that previously afforded by other diamond simulants, such as cubic zirconia

WO2015070266A2 & WO2015070266A3 SWAROVSKI D KG

Publication / filed : 2015-05-21 / 2014-10-27

Title: GEM HAVING A STELLAR APPEARANCE

Abstract: Disclosed is a gem (1) that has a stellar appearance. Said gem (1) comprises a crown (2) having a plurality of crown facets, including a first group (6) of crown facets that taper in the direction of a girdle (4) and extend at an angle (α) of $22.5^\circ \pm 3^\circ$, preferably $22.5^\circ + 2^\circ$ from the girdle plane (E), and a second group (7) of crown facets that adjoin the girdle (4) by their large side and extend at an angle (β) of $34^\circ \pm 3^\circ$, preferably $34^\circ \pm 2^\circ$ from the girdle plane (E). Also disclosed is an arrangement comprising a gem

EP2906073A1 SWAROVSKI D KG

Publication / filed : 2015-08-19 / 2013-10-09

Title: CUT FOR GEMSTONE

Abstract: The invention relates to a gemstone (1) having a chaton cut, in which a crown (2) adjoins a flat table (5) and has facets (11, 12, 13) that are inclined downwardly relative to the table (5) all

the way round, wherein the crown (2) has main facets (11) that extend substantially from the table (5) as far as a girdle (4) at which the gemstone (1) has the largest transverse dimension, and wherein a pavilion (3) of facets (8, 9, 10), preferably facets converging to a point, adjoins below the girdle (4), and wherein the gemstone (1) consists preferably entirely of topaz, wherein the angle of the main facets (11) relative to a cross-sectional face (7) arranged parallel to the table (5) is between 32.5° and 34.5°

US20150201720A1 SWAROVSKI D KG

Publication / filed : 2015-07-23 / 2015-04-01

Title: CUT FOR GEMSTONE

Abstract: The invention relates to a gemstone (1) having a chaton cut, in which a crown (2) adjoins a flat table (5) and has facets (11, 12, 13) that are inclined downwardly relative to the table (5) all the way round, wherein the crown (2) has main facets (11) that extend substantially from the table (5) as far as a girdle (4) at which the gemstone (1) has the largest transverse dimension, and wherein a pavilion (3) of facets (8, 9, 10), preferably facets converging to a point, adjoins below the girdle (4), and wherein the gemstone (1) consists preferably entirely of topaz, wherein the angle of the main facets (11) relative to a cross-sectional face (7) arranged parallel to the table (5) is between 32.5° and 34.5°

US20150052947A9 WEITMAN ZEV W

Publication / filed : 2015-02-26 / 2012-10-26

Title: GEMSTONE CUT

Abstract: A gemstone cut into a round stone and method of cutting a gemstone are disclosed herein. A crown having a table may be surrounded by eight star sets. The eight star sets may be surrounded by eight bezel facets. The eight bezel facets may be surrounded by eight pairs of upper girdle facet sets. Each upper girdle facet set may have one primary upper girdle facet and two secondary upper girdle facets. Each star set may have one primary star facet and four secondary star facets. A bottom having a culet may be surrounded by 8 pavilions the eight pavilions may be surrounded by 8 lower girdle facet sets. Each lower girdle facet set may have one primary lower girdle facet and two secondary lower girdle facets. Both the crown and bottom may be surrounded by 16 girdle facets or by perfectly circular girdle

US8947111B2 SHENZHEN DIKAI IND CO LTD

Publication / filed : 2015-02-03 / 2011-02-16

Title: Multi-functional precious stone testing apparatus and method thereof

Abstract: A multi-functional precious stone testing apparatus includes a portable housing, a testing unit, and an indication unit. The portable housing includes a hand-held casing and a probe casing extended from a front end of the hand-held casing. The testing unit includes a conductive probe having a testing end portion extended out of a tip end of the probe casing for contacting a testing object to determine a conductivity of the testing object. The indication unit includes a LED light unit received in the hand-held casing for illuminating the testing end portion of the conductive probe during testing, wherein the LED light unit is positioned away from the tip end of the probe casing for preventing heat generated from the LED light unit being transmitted toward the conductive probe to affect an accurate measurement for the conductivity of the testing object

WO2015155740A1 CHOW TAI FOOK JEWELLERY COMPANY LTD

Publication / filed : 2015-10-15 / 2015-04-10

Title: FACETED PRECIOUS STONES

Abstract: A cut precious stone having its crown main facet tier and said pavilion main facet tier out of alignment about a central axis is disclosed. The example faceted precious stone comprises a crown portion (C), a girdle (G), a pavilion portion (P) and a base B. The girdle is intermediate the crown portion and the pavilion portion and the pavilion portion is intermediate the base and the girdle. The crown portion comprises one table facet (TF) and a crown main facet tier that is intermediate the table facet and the girdle, the crown main facet tier consisting of N crown main facets (C1), N being a plural integer number. The pavilion portion comprises a pavilion main facet tier consisting of N pavilion main facets (P2), wherein the N pavilion main facets are radially distributed about a central axis to form a star pattern, the central axis extends through the base and is orthogonal to said table facet or a girdle plane defined by said girdle

WO2015100467A1 JHEHD P LATF THE JOHN HUDSON DISCRETIONARY TRUST

Publication / filed : 2015-07-09 / 2014-07-30

Title: NOVA CUT GEMSTONE AND METHODS FOR CUTTING THE SAME

Abstract: A gemstone comprising numerous facets cut so as to display one or more heart shapes or heart shaped patterns when viewed, either with the naked eye or via magnification, at an angle between -90 degrees and +90 degrees from the top centre of the crown portion of the stone

EP2860003A3 GOLDWAY TECHNOLOGY LTD

Publication / filed : 2015-06-24 / 2014-05-22

Title: Method of providing markings to precious stones including gemstones and diamonds, and markings and marked precious stones marked according to such a method.

Abstract: An identifiable mark on a portion of a polished facet of a surface of an article and being identifiable by an optical magnifying viewing device, said identifiable mark comprising a nano-structure (200) formed by a two- dimensional or a three-dimensional lattice of a plurality of discrete nanometer sized recessed or protruded entities (201), wherein said entities are arranged within a predefined region of said polished facet in a predetermined arrangement in relation to each other and such that an outer interface surface (101) between the facet of the article and air is formed and an inner interface surface (105) between the facet of the article and air is formed. Said predetermined arrangement of said entities is non-uniform and non-periodic arrangement, and wherein said entities are sized and shaped so as to cause optical scattering upon reflection of incident light and the distance from the inner interface surface to the outer interface surface is greater than the amplitude of the non-marked portion of said polished face. Upon reflection of incident light having one or more predetermined wavelengths by said lattice at a predetermined angle of incidence to said lattice, interference due to scattering of light from said lattice is induced such that said reflected light has a variation in intensity providing one or more local maxima of one or more wavelengths. Said mark is identifiable by way of an optical magnifying viewing device inclined at a requisite viewing angle such that a local maxima is detected

WO2015051640A1 GOLDWAY TECHNOLOGY LTD

Publication / filed : 2015-04-16 / 2014-05-22

Title: METHOD OF PROVIDING MARKINGS TO PRECIOUS STONES INCLUDING GEMSTONES AND DIAMONDS, AND MARKINGS AND MARKED PRECIOUS STONES MARKED ACCORDING TO SUCH A METHOD

Abstract: An identifiable mark on a portion of a polished facet of a surface of an article and being identifiable by an optical magnifying viewing device, said identifiable mark comprising a nano-structure formed by a two-dimensional or a three-dimensional lattice of a plurality of discrete nanometer sized recessed or protruded entities, wherein said entities are arranged within a predefined region of said polished facet in a predetermined arrangement in relation to each other and such that an outer interface surface between the facet of the article and air is formed and an inner interface surface between the facet of the article and air is formed. Said predetermined arrangement of said entities is non-uniform and non-periodic arrangement, and wherein said entities are sized and shaped so as to cause optical scattering upon reflection of incident light and the distance from the inner interface surface to the outer interface surface is greater than the amplitude of the non-marked portion of said polished face. Upon reflection of incident light having one or more predetermined wavelengths by said lattice at a predetermined angle of incidence to said lattice, interference due to scattering of light from said lattice is induced such that said reflected light has a variation in intensity providing one or more local maxima of one or more wavelengths. Said mark is identifiable by way of an optical magnifying viewing device inclined at a requisite viewing angle such that a local maxima is detected

EP2227977A4 HOHOEMI BRAINS INC

Publication / filed : 2015-11-18 / 2008-01-09

Title: ORNAMENTAL DIAMOND HAVING TWO-STAGE PAVILION

US20150121960A1 ROFIN SINAR TECHNOLOGIES INC

Publication / filed : 2015-05-07 / 2014-10-22

Title: METHOD AND APPARATUS FOR MACHINING DIAMONDS AND GEMSTONES USING FILAMENTATION BY BURST ULTRAFAST LASER PULSES

Abstract: A non-ablative laser machining method and apparatus for cutting facets of a diamond, using a material machining technique involving filamentation by burst ultrafast laser pulses well suited to mass production. Coupled with 3D modeling and the computerized laser machining system, complex geometric surfaces can be created on the diamond. The facets of the diamond need not be planar in configuration, and may incorporate acute as well as oblique angles. This method minimizes the need for diamond polishing, speeds up production, and realizes great reductions in the quantity of lost material from the cutting process

EP2868421A1 ROFIN SINAR TECHNOLOGIES INC

Publication / filed : 2015-05-06 / 2014-10-30

Title: Method of machining diamond using laser machining

Abstract: A non-ablative laser machining method and apparatus for cutting facets of a diamond, using a material machining technique involving filamentation by burst ultrafast laser pulses well suited to mass production. Coupled with 3D modeling and the computerized laser machining system, complex geometric surfaces can be created on the diamond. The facets of the diamond need not be planar in configuration, and may incorporate acute as well as oblique angles. This method minimizes the need for diamond polishing, speeds up production, and realizes great reductions in the quantity of lost material from the cutting process

US20150101365A1 MASTER DYNAMIC LTD

Publication / filed : 2015-04-16 / 2014-05-23

Title: METHOD OF PROVIDING MARKINGS TO PRECIOUS STONES INCLUDING GEMSTONES AND DIAMONDS, AND MARKINGS AND MARKED PRECIOUS STONES MARKED ACCORDING TO SUCH A METHOD

Abstract: An identifiable mark on a portion of a polished facet of a surface of an article and being identifiable by an optical magnifying viewing device, said identifiable mark comprising a nano-

structure formed by a two-dimensional or a three-dimensional lattice of a plurality of discrete nanometer sized recessed or protruded entities, wherein said entities are arranged within a predefined region of said polished facet in a predetermined arrangement in relation to each other and such that an outer interface surface between the facet of the article and air is formed and an inner interface surface between the facet of the article and air is formed. Said predetermined arrangement of said entities is non-uniform and non-periodic arrangement, and wherein said entities are sized and shaped so as to cause optical scattering upon reflection of incident light and the distance from the inner interface surface to the outer interface surface is greater than the amplitude of the non-marked portion of said polished face. Upon reflection of incident light having one or more predetermined wavelengths by said lattice at a predetermined angle of incidence to said lattice, interference due to scattering of light from said lattice is induced such that said reflected light has a variation in intensity providing one or more local maxima of one or more wavelengths. Said mark is identifiable by way of an optical magnifying viewing device inclined at a requisite viewing angle such that a local maxima is detected

US20150059404A1 HAXIN HUANG

Publication / filed : 2015-03-05 / 2013-11-08

Title: COLORFUL AND BRIGHT DIAMOND

Abstract: The present invention involves the field of jewellery products, and especially, relates to a colourful and bright diamond which comprises an even number of main crown facets and an even number of main pavilion facets. The colourful and bright diamond has a total reflection gross efficiency of two 90% and the optical performance which is 12 times more than the existing ordinary diamonds

US20150296934A1 ZHANG KUNZHI

Publication / filed : 2015-10-22 / 2015-04-22

Title: A DIAMOND WITH EIGHTY-ONE FACETS HAVING A TEN HEARTS AND TEN ARROWS INNER STRUCTURE

Abstract: The present invention relates to a diamond with eighty-one facets having a ten hearts and ten arrows inner structure, it includes ten main crown facets and ten main pavilion facets; said diamond also has one table facet; crown star facets are provided at the junction of said main crown facets with the table facet, the number of said crown star facets is ten; crown small facets are provided at the junction of main crown facet edge with the crown star facets, the number of said crown small facets are ten; small sectors are provided at the junction of the main crown facets with the crown small facets, the number of said small sectors are twenty; the main pavilion facet auxiliary surfaces are provided at the junction of said main pavilion facets, the number of the auxiliary surfaces of said main pavilion facets is 20. The beneficial effect of the invention is that: by cutting the diamond into eighty-one facets and having the ten hearts and ten arrows inner

structure, not only endowing the diamond with higher quality and value by an advanced cutting technology, but also improving the brilliance of the diamond under sunlight, and its brilliance can be improved by 20-30%. The diamond of the present invention has more brilliance

US20150305451A1 DAVIDOR LLC

Publication / filed : 2015-10-29 / 2015-02-05

Title: NOVEL ARCHED GEMSTONE AND METHOD OF MANUFACTURE

Abstract: A diamond, which has a step-cut arched configuration on one end and a baguette-style configuration on the other, comprising a girdle, a top or crown above the girdle, and a pavilion or base below the girdle. The crown terminates in an upper planar surface known as a “table,” which is generally parallel to the girdle plane. The arched end is comprised of step-cut crown facets that are preferably arranged about a common center, and upstanding pavilion facets that are also preferably arcuately arranged about the common center. The pavilion also includes a large, arched window facet

US9210973B2 DANOG PROPERTY AND INVEST LTD

Publication / filed : 2015-12-15 / 2012-08-29

Title: Gemstone cut grading method and apparatus

Abstract: A system for controlling the cut of a gemstone includes a gemstone scanner adapted to scan a plurality of facets of an actual gemstone so as to determine facet parameters pertaining to each one of the plurality of facets. The system also includes a control module operatively coupled to the gem scanner and adapted to receive the determined facet parameters of the plurality of facets of the gemstone. The control module generates an actual 3D model of the actual gemstone from determined facet parameters and an idealized 3D model for an idealized gemstone. The control module compares the actual 3D model with the idealized 3D model to determine leakage values for facet parameters of each one of the facets of the gemstone such that the leakage value is used to control the cut of the gemstone. A method implemented by the system is also disclosed

US20150259790A1 UNIT CELL DIAMOND LLC

Publication / filed : 2015-09-17 / 2015-05-15

Title: METHODS FOR PRODUCING DIAMOND MASS AND APPARATUS THEREFOR

Abstract: Methods and apparatus are disclosed for producing diamond masses and products thereof using diamond unit cell forming reactions in vapor phase and solid phase. The present invention enables the fabrication of diamond products having a purity and morphology previously unattainable

US9008832B2 ETERNITY MFG LTD

Publication / filed : 2015-04-14 / 2012-03-20

Title: Diamond sorting system

Abstract: 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

EP2454399B1 DESIGNED MATERIALS LTD

Publication / filed : 2015-09-09 / 2010-07-19

Title: A METHOD AND APPARATUS FOR TREATING DIAMOND USING LIQUID METAL SATURATED WITH CARBON

Abstract: 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

WO2015127990A1 UNIVERSIT DEGLI STUDI DI MILANO BICOCCA

Publication / filed : 2015-09-03 / 2014-02-28

Title: METHOD OF SPECTROSCOPIC ANALYSIS OF A DIAMOND AND APPARATUS THEREOF.

Abstract: A spectroscopic analysis method and apparatus for enabling the distinction of artificially treated coloured diamonds from natural coloured diamonds. By illuminating a diamond with an excitation wavelength of less than 675 nm, the occurrence of specific combinations of discrete photoluminescence features positioned at 681 nm (1), 705 nm (2), and at 725 nm (3) indicates artificial treatments in the examined diamond. In particular, a spectral pattern comprising either at least a spectral feature at 681 nm or at least the co-existence of spectral features at 705 nm and 725 nm is associated with an artificially treated diamond. The method and the apparatus are particularly useful to discriminate artificially treated brown-coloured, orange-coloured, and yellow-coloured diamonds

US8961920B1 US SYNTHETIC CORP

Publication / filed : 2015-02-24 / 2011-04-26

Title: Methods of altering the color of a diamond by irradiation and high-pressure/high-temperature processing

Abstract: Embodiments of methods of altering the color of diamonds are disclosed. In an embodiment, a method for altering the color of diamonds includes identifying and selecting a diamond having a suitable nitrogen content, HPHT processing the selected diamond under diamond-stable conditions to alter the color of the selected diamond from a first color to a second color, irradiating the HPHT-processed diamond with an electron source having an energy between about 1 MeV and about 20 MeV so as to alter the color of the selected diamond from the second color to a third color, and annealing the irradiated diamond either under partial vacuum conditions, or under HPHT diamond-stable conditions so as to alter the color from the third color to a fourth color (e.g., pink, red, or purple, depending on the nitrogen content of the selected diamond)

US20150223580A1 SECURED WORLDWIDE LLC

Publication / filed : 2015-08-13 / 2015-02-11

Title: SECURE DIAMOND SMART CARDS AND EXCHANGE SYSTEMS THEREFOR

Abstract: A tamperproof diamond package comprises a package body; at least one chip embedded in the package body and at least one antenna configured to enable communication with the chip; anti-counterfeiting visual impressions on the package body; a diamond pouch formed at a predetermined section within the package body; and

one or more diamonds located inside the diamond pouch and an outer covering encasing the package body and configured to reveal any tampering with the one or more diamonds located in the diamond pouch. The diamond package can be credit card shaped and also contains serial number and website information and be provided in nominal dollar values. An associated diamond exchange system utilizes the diamond packages and provides a registration server which stores unique identifying information that enable interrogating the individual diamond packages and checking their authenticity with the registration server

US9134263B2 SY KESSLER SALES INC

Publication / filed : 2015-09-15 / 2014-06-10

Title: Gem tester

Abstract: A gem tester for testing a gem under test and a kit including a horizontal recharging stand are disclosed. In one embodiment of the gem tester, an elongated body has a line-of-sight contour tapering from a bulbous end to a radially deviating frontal nose having a probe extending therefrom. Internal circuitry measures electrical and thermal conductivity of the gem under test in order to

identify the type of gem under test and drive a color control signal in response thereto. A luminescent mounting extends about the contact to provide, in response to the control signal, a color indication of the identified gem type

WO2015024979A1 SWISS GEMMOLOGICAL INST SSEF

Publication / filed : 2015-02-26 / 2014-08-20

Title: METHOD AND APPARATUS FOR THE SEPARATION OF COLOURLESS DIAMONDS

Abstract: The present invention relates to a method and an apparatus for the separation of colourless untreated natural diamonds from: • a) colourless diamond imitations; • b) colourless treated natural diamonds; • c) colourless untreated synthetic diamonds and • d) colourless treated synthetic diamonds; comprising: • a step A of removing the colourless diamond imitations; and • a step B of removing the colourless diamonds which are suspected to be treated natural diamonds, untreated synthetic diamonds or treated synthetic diamonds; • wherein said step A is carried out before said step B and using Raman Shift Detection (RSD), the diamonds having, at a predetermined wavelength (λ_e), an emission signal, the intensity of which is lower than a predetermined value (I_e) being removed, and wherein said step B is carried out using a UVc transmission measurement (UTM), the diamonds having, in a predetermined wavelength region (λ_a), a transmission value V_T which is higher than a predetermined value (V_{T0}), being removed

EP2840384A1 SWISS GEMMOLOGICAL INST SSEF

Publication / filed : 2015-02-25 / 2013-08-20

Title: Method and apparatus for the classification of colourless diamonds

Abstract: The present invention relates to a method for the separation of colourless untreated natural diamonds from:

- a) colourless diamond imitations;
- b) colourless treated natural diamonds;
- c) colourless untreated synthetic diamonds and
- d) colourless treated synthetic diamonds;

comprising:

a step A of removing the colourless diamond imitations; and

a step B of removing the colourless diamonds which are suspected to be treated natural diamonds, untreated synthetic diamonds or treated synthetic diamonds;

wherein said step A is carried out (13) before said step B and using Raman Shift Detection (RSD), the diamonds having, at a predetermined wavelength (W_e), an emission signal, the intensity of which is lower than a predetermined value (V_e) being removed (11), and wherein said step B is carried out (14) using a UVc transmission measurement (UTM), the diamonds having, in a predetermined wavelength region (R_a), a transmission value V_T which is higher than a predetermined value (V_T'), being removed (20)

The invention also relates to an apparatus for carrying out this method

US20150112643A1 DE BEERS CENTENARY AG

Publication / filed : 2015-04-23 / 2014-12-09

Title: INFRA-RED ANALYSIS OF DIAMONDS

Abstract: The invention provides a method of automating the classification of a diamond gemstone. An infra-red absorption spectrum of the gemstone is provided. Features corresponding to absorption by water and intrinsic absorption by a diamond lattice are subtracted from the absorption spectrum. The spectrum is analysed to identify predetermined absorption features corresponding to lattice defects in the diamond. The gemstone is classified according to the intensities of the predetermined absorption features. The results of the classification are saved in a database

US9188542B2 BEERS UK LTD DE

Publication / filed : 2015-11-17 / 2011-05-17

Title: Gemstone viewer

Abstract: 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

US9079331B2 DE BEERS CENTENARY AG

Publication / filed : 2015-07-14 / 2012-03-22

Title: Gemstone alignment

Abstract: An apparatus and method for aligning a gemstone such as diamond (106) with a predetermined vertical axis (108) is described. The apparatus includes an upwardly extending nozzle (105) aligned with the vertical axis (108) and sized to allow the gemstone (106) 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 (105) 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 (105), so that it can be reduced gradually

WO2015007873A1 DE BEERS CENTENARY AG

Publication / filed : 2015-01-22 / 2014-07-17

Title: MEASURING PARAMETERS OF A CUT GEMSTONE

Abstract: Apparatus and corresponding methods for measuring a plurality of parameters of a cut gemstone while it is positioned at a single measurement location. Apparatus comprise a plurality of light sources, each configured to emit light at a different one of a plurality of emission wavelengths or ranges of wavelengths such that the emitted light illuminates at least part of the measurement location. Apparatus further comprise a sensor assembly configured to sense light at a plurality of sensing wavelengths or ranges of wavelengths for measuring the plurality of parameters. The sensed light is received at the sensor assembly from the measurement location as a result of illumination of a cut gemstone located at the measurement location

EP2914387A1 BEERS UK LTD DE

Publication / filed : 2015-09-09 / 2013-10-29

Title: MEASURING PARAMETERS OF PARTICULATE MATERIAL

Abstract: An apparatus for appraising gemstones, the apparatus comprising: a measurement cell comprising at least one sensor and a measurement location, the at least one sensor being arranged to measure one or more parameters of a gemstone when the gemstone is located at the measurement location; and a transportation means for transporting the gemstone to the measurement location; wherein the transportation means is configured to cause or allow the gemstone to be stationary at the measurement location whilst the at least one sensor measures one or more parameters of the gemstone

EP2825322A1 DE BEERS CENTENARY AG

Publication / filed : 2015-01-21 / 2013-03-13

Title: GEMSTONE INSPECTION

Abstract: There is described an apparatus and method for inspecting and optionally sorting gemstones. The apparatus includes a nozzle or array of nozzles operatively connected to a vacuum pump such that a gemstone located generally underneath one of the nozzles will be supported against that nozzle by air pressure when a vacuum is applied above the nozzle. A drive system moves the nozzles along a path past a gemstone pick-up location so that a gemstone can be picked up by each nozzle as that nozzle passes the pick-up location. One or more measurement devices are located on or near the predetermined path and configured to measure at least one property of the gemstone. One or more ejection locations are provided on the path at which the vacuum applied to each nozzle is reversible to eject the gemstone from that nozzle. The apparatus may also include a plurality of dispensing bins into which the gemstones are dispensed. The bin into which each gemstone is dispensed is chosen in dependence on the measured property

US20150015877A1 DE BEERS CENTENARY AG

Publication / filed : 2015-01-15 / 2014-09-12

Title: GEMSTONE INSPECTION

Abstract: There is described an apparatus and method for inspecting and optionally sorting gemstones. The apparatus includes a nozzle or array of nozzles operatively connected to a vacuum pump such that a gemstone located generally underneath one of the nozzles will be supported against that nozzle by air pressure when a vacuum is applied above the nozzle. A drive system moves the nozzles along a path past a gemstone pick-up location so that a gemstone can be picked up by each nozzle as that nozzle passes the pick-up location. One or more measurement devices are located on or near the predetermined path and configured to measure at least one property of the gemstone. One or more ejection locations are provided on the path at which the vacuum applied to each nozzle is reversible to eject the gemstone from that nozzle. The apparatus may also include a plurality of dispensing bins into which the gemstones are dispensed. The bin into which each gemstone is dispensed is chosen in dependence on the measured property

US20150353363A1 CHU XI

Publication / filed : 2015-12-10 / 2015-05-21

Title: Method and System to Produce Large Size Diamonds

Abstract: The invention provides methods and systems for producing large size diamonds. The methods include using carbon containing gases and supplementary gases to form reaction zones that are suitable for diamonds to grow; controlling the temperatures that are suitable for diamonds

to grow; and keeping the small size seeds in motion in the reaction zones to form large size diamonds. The method provides controlling the high temperature durable small size seeds at suitable temperatures for diamonds to grow and keep them in motion in the reaction zones. The invention also provides systems that allow all the surfaces of the high temperature durable small size seeds continually extend to form diamonds, then to form large size diamonds. The invention provides a large-scale, low cost production of large size diamonds

US20150022801A1 SARINE COLOR TECHNOLOGIES LTD

Publication / filed : 2015-01-22 / 2014-07-23

Title: COMPUTER-IMPLEMENTED METHOD OF AND SYSTEM FOR TEACHING AN UNTRAINED OBSERVER TO EVALUATE A GEMSTONE

Abstract: A computer-implemented method teaches a user to evaluate a gemstone, such as a cut diamond. The method includes providing a computer system connected to an apparatus capable of capturing an image of a gemstone. The computer system is arranged to process a received image of a gemstone to determine one or more optical properties of the gemstone. In one aspect, the method presents on a display of the computer system a series of pre-stored screens comprising a graphical representation how the cut of a gemstone affects its light handling ability, and a user interface screen. The user interface screen allows the user to control the operation of the apparatus to measure the one or more optical properties of a particular gemstone provided to the apparatus, to view an image of the gemstone measured, and to view representations of the measured one or more optical properties

US20150377793A1 SARINE COLOR TECHNOLOGIES LTD

Publication / filed : 2015-12-31 / 2015-08-06

Title: COMPUTERIZED METHOD AND SYSTEM FOR LIGHT PERFORMANCE GRADING OF GEMSTONES BY ONE SINGLE GRADING SCALE

Abstract: There are provided a computerized method of grading a gemstone and a system thereof. The method comprises: upon obtaining in a memory of a computer a single grading scale including for each parameter a sub-grade scale, borderlines thereof, unique groups of values of the parameter and final grades corresponding to the unique groups; and upon obtaining values of the parameters of the gemstone to be graded, assigning to the obtained value of each parameter its sub-grade using the sub-grade scale and borderlines thereof specified in the single grading scale; recognizing among the unique groups specified in the single grading scale a unique group corresponding to the assigned sub-grades; and assigning to the gemstone, in accordance with the recognized unique group, a final grade in the single grading scale

US9151717B2 SARINE COLOR TECHNOLOGIES LTD

Publication / filed : 2015-10-06 / 2011-09-12

Title: Methods and systems of imaging cut stones

Abstract: A method of imaging a cut stone. The method comprises a) identifying an orientation of a cut stone, b) creating a volumetric model of the cut stone according to the orientation, c) capturing a plurality of images of the cut stone from a plurality of viewing angles around the cut stone, d) cropping a plurality of segments depicting the cut stone from the plurality of images using the volumetric model, and e) generating a volumetric image of the cut stone from the plurality of segments

US20150041483A1 TITAN IND LTD

Publication / filed : 2015-02-12 / 2013-12-14

Title: AUTOMATION SYSTEM FOR DIAMOND BAGGING

Abstract: A system for counting diamonds includes a rotary table configured to accommodate diamonds, a collection box assembly provided in communication with the rotary table, an ejecting mechanism configured to enable controlled ejection of said diamonds from the rotary table to the collection box assembly, at least one scanner and a controller configured to regulate functioning of at least one of the rotary table, the collection box assembly, the ejecting mechanism and the scanner. Further, the scanner is configured to determine the number of diamonds collected in the collection box assembly

US9023307B2 CARNEGIE INST OF WASHINGTON

Publication / filed : 2015-05-05 / 2011-05-17

Title: Production of large, high purity single crystal CVD diamond

Abstract: The invention relates to single crystal diamond with high 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

US9176068B1 RADOMYSHELKY LEONID

Publication / filed : 2015-11-03 / 2014-11-23

Title: Utility electronic precious gemstone type and quality detector

Abstract: The Utility Electronic Precious Gemstone Type And Quality Detector (Utility Gem Tester) is a simple, portable, rugged and dependable hand held device that identifies gemstones and rates a gemstone's quality using an internal tabulation of the gemstone's wide spectral response

to ultra violet irradiation. The device contains a low power UV LED and a multichannel photodiode array for a wide band spectral analysis of a gemstone's response to the impinging UV laser beam. The spectral analysis is then compared with the internal tabulation of spectral fingerprints of known gemstones and an analysis is visually displayed. The Utility Gem Tester is intended to fill the needs of amateur (gemstone) rock hunters and jewelry kiosk personnel in identifying the various marketable precious stones

WO2014203266A1 PATEL ARVINDBHAI LAVJIBHAI

Publication / filed : 2014-12-24 / 2013-09-11

Title: METHOD AND DEVICE FOR GEMSTONE EVOLUTION

Abstract: A method and device are provided for determining the properties and evolution of gemstone by detecting the internal and external structure of the gemstone. The method and device are used to identify the size, location of impurities/defects in raw gemstone with the help of optimized spectroscopy scanning and are used for precise automatic evolution of gemstones and possibilities of final value of planned gemstone after remaining gemstone processing cycle

US20150185155A1 UNIV TSINGHUA

Publication / filed : 2015-07-02 / 2014-12-19

Title: GEM IDENTIFICATION METHOD AND APPARATUS

Abstract: Embodiments of the present invention provide gem identification method and apparatus. The method comprises the steps: (a) placing a sample to be detected over a light transmission hole formed on a carrying surface of an object table and emitting, by an optical probe disposed below the carrying surface, an exciting light onto the sample through the light transmission hole and then collecting a Raman scattered light from the sample by the optical probe; (b) acquiring a Raman spectrogram of the sample from the collected Raman scattered light from the sample; and (c) comparing the Raman spectrogram with a reference Raman spectrogram library for gems to identify the sample. The method and apparatus may achieve effective, convenient and accurate inspections of the gems

EP1211503B2 DIAMCAD

Publication / filed : 2015-12-02 / 2000-12-04

Title: A method and apparatus for locating inclusions in a diamond stone

Abstract: A method and apparatus to localizing inclusions in a diamond, wherein said diamond is fixed on a holder, said diamond on the holder is observed under a predetermined angle to obtain an image, further a second measurement is carried out to obtain two data to be calculated in a

computer, said second data can be obtained by a depth measurement, or by changing the direction of observation to said diamond, in order to localize the inclusion with respect to the outer surface of said diamond.

US9128062B2 GEMOLOGICAL APPRAISAL ASS INC

Publication / filed : 2015-09-08 / 2012-07-05

Title: Gemstone registration system

Abstract: A device for producing a reproducible identification pattern of a polished gemstone includes light directing means for directing a focused beam of light onto a gemstone orientated in a particular known manner to produce an output of the internal refraction and reflection characteristics of the gemstone including reflected light beams having particular locations, sizes and intensities. The device also includes automated means for changing a position of the gemstone relative to the focused beam of light; and also a means for recording the output in a manner to record the relative size and location of the reflected light beams

US20150346108A1 GEMOLOGICAL APPRAISAL ASS INC

Publication / filed : 2015-12-03 / 2015-05-27

Title: Gemstone Registration and Recovery System, and Systems for Evaluating the Light Performance of a Gemstone and Capturing Forensic Characteristics of a Gemstone

Abstract: A computer-implemented system is provided and includes a processor and a memory accessible by the processor, with the system being configured to measure light performance properties of a gemstone and generate an objective grade for the gemstone

WO2015183947A1 GEMOLOGICAL APPRAISAL ASS INC

Publication / filed : 2015-12-03 / 2015-05-27

Title: GEMSTONE REGISTRATION AND RECOVERY SYSTEM, AND SYSTEMS FOR EVALUATING THE LIGHT PERFORMANCE OF A GEMSTONE AND CAPTURING FORENSIC CHARACTERISTICS OF A GEMSTONE

Abstract: A computer-implemented system is provided and includes a processor and a memory accessible by the processor, with the system being configured to measure light performance properties of a gemstone and generate an objective grade for the gemstone

US8993375B2 DIAROTECH

Publication / filed : 2015-03-31 / 2013-07-03

Title: Method for synthesizing a material, in particular diamonds, by chemical vapor deposition, as well as device for applying the method

Abstract: Method for synthesizing a material by chemical vapor deposition (CVD), according to which a plasma is created in a vacuum chamber in the vicinity of a substrate, and according to which a carbon-carrying substance and H₂ are introduced into the chamber in order to produce in the chamber a gas comprising substances carrying reactive-carbon atoms in the form of unsaturated molecules or radicals from which the synthesis of said material will be performed, and in that the electromagnetic absorption and inelastic diffusion spectra of the solid material to be synthesized are used to take from these spectra the absorption frequencies that contribute to the reactions that lead to the formation of the solid material to be synthesized, and in that energetic rays are produced in the form of a photon beam carrying quantities of energy determined by each of the frequencies corresponding to said absorption and inelastic diffusion frequencies, said photon beam being injected into the plasma where, for energy states of the solid material, an absorption of these photons having the energy corresponding to these energy states is effected by the substances carrying said reactive-carbon atoms

EP2891008A2 GEMEX SYSTEMS INC

Publication / filed : 2015-07-08 / 2013-08-30

Title: GEM IDENTIFICATION METHOD AND APPARATUS USING DIGITAL IMAGING VIEWER

Abstract: A system and an apparatus for capturing a digital image of a particular gemstone from which specific and unique data can be extracted using digital image processing analysis, which data is used to positively identify a single gemstone from a database of gemstone images

WO2015082985A1 SAHAJANAND TECHNOLOGIES PVT LTD

Publication / filed : 2015-06-11 / 2014-12-05

Title: DETECTING SYNTHETIC GEMSTONES USING IMAGE PROCESSING

Abstract: An apparatus and a method for detecting synthetic gemstones using image processing are described herein. The apparatus includes an illumination means (104) for illuminating a gemstone (102) by a laser beam (106). When the laser beam (106) strikes the gemstone (102), a reflection/refraction pattern is produced on a screen (110). An image of the reflection pattern is captured by an image capturing device (112) mounted opposite to the screen (110). This image is fed to a computing device (114) for processing the captured image to determine a plurality of white spots. Further, co-ordinates of these white spots are identified and based on these coordinates, a

final pattern of the image is obtained. The final pattern of the gemstone (102) is analyzed to identify whether the gemstone (102) is synthetic

US9222893B2 OPAL PRODUCERS AUSTRALIA LTD

Publication / filed : 2015-12-29 / 2011-09-02

Title: Modified apparatus and method for assessment, evaluation and grading of gemstones

Abstract: An apparatus (10) for assessment, evaluation and grading of gemstones has a stage (11) upon which a gemstone may be supported. The stage is enclosed in a housing (15) that is impervious to light. There is at least one light source (14) located in the housing which is adapted to project incident light onto the gemstone. Means for rotating and tilting the stage so as to vary the orientation of the gemstone to the incident light are also present. A digital camera (16) is located in the housing adjacent the or each light source and is adapted to take images of the gemstone based on reflection and/or refraction of the incident light. The apparatus also includes information processing means for calibrating and analyzing the images. The information processing means is programmed with instruction sets for assessing one or more of color, cut, clarity, scintillation, brilliance, lustre, dispersion and sheen. The gemstone is supported upon the stage by securing means (17) engaging the gemstone at its bottom surface

WO2015132785A1 MAMASH PRODUCTION GROUP LTD

Publication / filed : 2015-09-11 / 2015-03-03

Title: PORTABLE APPARATUS AND SYSTEM FOR ONLINE PRESENTATION AND ANALYSIS OF SMALL SIZE ITEMS

Abstract: The subject matter disclosed herein is directed to a portable photographing apparatus configured to allow a user quickly and economically creating a high quality photographs of a small size item by a smartphone camera for professional inspection and analysis of the photographed item on an internet platform, said photographing apparatus comprising at least a photographing chamber configured to allow insertion and extraction of said small size item, said chamber comprising a rotatable stage for positioning said item within the photographing chamber and rotating the item during photographing so as to obtain a full view of the photographed item, and at least one light source for lighting said photographing chamber; said photographing chamber is connected to a power source and to a smartphone holder having a dedicated hole connected to a lens for allowing positioning of a smartphone on said holder in a manner that said smartphone camera is positioned on said hole to obtain a sight view into said photographing chamber for photographing said item. The invention is further directed to a photographing system for small size items configured to allow a creation of an internet platform for professional inspection and analysis of photographed items by multiple users, said system comprising at least: (a) a portable photographing apparatus according to the above; (b) a smartphone having an intrinsic camera and a dedicated software application configured to obtain image data from said smartphone camera and

upload the data to a server; and (c) a server having at least a web application with advanced image processing techniques for analyzing the uploaded images and creating a database of photographed items

US20150219567A1 PRESIDIUM INSTR PTE LTD

Publication / filed : 2015-08-06 / 2015-03-18

Title: GEMSTONE TESTER AND A METHOD OF CHARACTERISING A GEMSTONE

Abstract: A gemstone tester for characterising a gemstone and a method of characterising a gemstone are provided, the gemstone tester comprising a detector unit for detecting one or more transmittances of the gemstone; and a processing unit for determining a first parameter based on one or more of the transmittances of light; and for characterising the gemstone based on the first parameter; wherein each transmittance of the gemstone is a fraction of light of a specific wavelength that is passed through the gemstone

WO2015023230A1 CARATELL PTE LTD

Publication / filed : 2015-02-19 / 2014-08-06

Title: METHOD AND SYSTEM FOR CERTIFICATION AND VERIFICATION OF GEMSTONES

Abstract: The present invention discloses a method and system for certifying and verifying gemstones and a document certifying and verifying gemstones. The method comprises the steps of capturing at least one image of an inclusion in a gemstone; storing the image in a first database; and displaying the image on a certification document for presenting to a consumer, wherein the image is of sufficient magnification to allow the consumer to compare the image on the document to the gemstone viewed through an optical device to determine if the gemstone matches the image

EP2898124A1 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-07-29 / 2013-09-13

Title: SINGLE CRYSTAL CHEMICAL VAPOUR DEPOSITED SYNTHETIC DIAMOND MATERIALS HAVING UNIFORM COLOUR

Abstract: A coloured single crystal CVD synthetic diamond material comprising: a plurality of layers, wherein the plurality of layers includes at least two sets of layers which differ in terms of their defect composition and colour, wherein defect type, defect concentration, and layer thickness for each of the at least two sets of layers is such that if the coloured single crystal CVD diamond material is fabricated into a round brilliant cut diamond comprising a table and a culet, and having a table to culet depth greater than 1 mm, the round brilliant cut diamond comprises a uniform colour

as viewed by naked human eye under standard ambient viewing conditions in at least a direction through the table to the culet

US20150240382A1 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-08-27 / 2015-03-06

Title: SINGLE CRYSTAL CHEMICAL VAPOUR DEPOSITED SYNTHETIC DIAMOND MATERIALS HAVING UNIFORM COLOUR

Abstract: A coloured single crystal CVD synthetic diamond material comprising: a plurality of layers, wherein the plurality of layers includes at least two sets of layers which differ in terms of their defect composition and colour, wherein defect type, defect concentration, and layer thickness for each of the at least two sets of layers is such that if the coloured single crystal CVD diamond material is fabricated into a round brilliant cut diamond comprising a table and a culet, and having a table to culet depth greater than 1 mm, the round brilliant cut diamond comprises a uniform colour as viewed by naked human eye under standard ambient viewing conditions in at least a direction through the table to the culet

JP2015145338A ELEMENT SIX LTD

Publication / filed : 2015-08-13 / 2015-05-07

Title: METHOD OF MANUFACTURING FANCY PALE BLUE OR FANCY PALE BLUE/GREEN SINGLE CRYSTAL CVD DIAMOND AND OBTAINED PRODUCT

PROBLEM TO BE SOLVED: To provide a fancy pale blue or fancy pale blue/green single crystal CVD diamond and a method of manufacturing the same

SOLUTION: There is disclosed a method of manufacturing a fancy pale blue or fancy pale blue/green CVD diamond material. The method includes a process of introducing isolated holes into the diamond material by irradiating a single crystal diamond material grown in a CVD process with an electron. The diamond material having been irradiated (or after further irradiation post processing) has a total hole concentration [VT] and a path length L such that total hole concentration[VT]×path length L is at least 0.072 ppm cm and at most 0.36 ppm cm, and the diamond material has a fancy pale blue or fancy pale blue/green color. Further, there is also disclosed a fancy pale blue diamond

US9017632B2 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-04-28 / 2010-06-25

Title: Diamond material

Abstract: 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 color. Fancy pale blue diamonds are also described

JP2015155377A ELEMENT SIX LTD

Publication / filed : 2015-08-27 / 2015-05-25

Title: PROCESSING METHOD OF SINGLE CRYSTAL CVD DIAMOND, AND OBTAINED PRODUCT

PROBLEM TO BE SOLVED: To provide a method for introducing an NV center into a single crystal CVD diamond material

SOLUTION: In one process of a method, isolation holes are introduced into a diamond material at the concentration of at least 0.05 ppm and 1 ppm at most by irradiating the diamond material containing single substitution type nitrogen. In another process of the method, an irradiated diamond is annealed and thereby an NV center is formed from at least some of single substitution type nitrogen defects and the introduced isolation holes. A pink CVD diamond material and a CVD diamond material having a spintronics characteristic are also described

JP2014166956A ELEMENT SIX LTD

Publication / filed : 2014-09-11 / 2014-04-15

Title: PROCESSING METHOD OF SINGLE CRYSTAL CVD DIAMOND, AND OBTAINED PRODUCT

PROBLEM TO BE SOLVED: To provide a method for introducing an NV center into a single crystal CVD diamond material

SOLUTION: In one process of a method, isolation holes are introduced into a diamond material at the concentration of at least 0.05 ppm and 1 ppm at most by irradiating the diamond material containing single substitution type nitrogen. In another process of the method, an irradiated diamond is annealed and thereby an NV center is formed from at least some of single substitution

type nitrogen defects and the introduced isolation holes. A pink CVD diamond material and a CVD diamond material having a spintronics characteristic are also described

JP2014221713A ELEMENT SIX LTD

Publication / filed : 2014-11-27 / 2014-06-13

Title: SYNTHETIC CVD DIAMOND

PROBLEM TO BE SOLVED: To provide a synthetic CVD diamond material having a high-grade color with the content of defects controlled

SOLUTION: A method of synthesizing a diamond material by chemical vapor deposition (CVD) includes supplying a substrate, supplying a raw material gas, dissociating the raw material gas and synthesizing a homo-epitaxial diamond material on the substrate. The synthesis atmosphere include nitrogen in an atomic concentration of about 0.4-50 ppm, and the raw material gas has a) a hydrogen atomic fraction Hf of about 0.40-0.75, b) a carbon atomic fraction Cf of about 0.15-0.30 and c) an oxygen atomic fraction Of of about 0.13-0.40, with $Hf+Cf+Of=1$, and the synthetic CVD diamond material has a ratio of about $0.45:1 < Cf:Of < \text{about } 1.25:1$. The synthetic CVD diamond contains single substituted nitrogen (Ns0) in a concentration of higher than 0.5 ppm, and at least 35% of the total integral absorption in the range of 350-750 nm can be assigned to Ns0

JP2015134722A ELEMENT SIX LTD

Publication / filed : 2015-07-27 / 2015-05-07

Title: METHOD FOR TREATING DIAMOND MATERIAL AND OBTAINED PRODUCT

Abstract:

PROBLEM TO BE SOLVED: To provide irradiation controlled to a diamond material in order to minimize the variation of an absorption properties, which may occur when a certain type nitrogen containing diamond material is exposed to a specific condition

SOLUTION: The diamond material showing a difference between absorption properties after exposure to a radiation (typically a UV ray) having an energy of at least 5.5 eV and heat treatment at 525°C(798K) is prepared and is subjected to irradiation controlled so as to introduce defects in the diamond material. After the controlled irradiation, the difference between the absorption properties is reduced after the exposure to a radiation having an energy of at least 5.5 eV and the heat treatment at 525°C (798K). A diamond material having absorption properties showing the properties of isolated holes is also disclosed

US20150027363A1 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-01-29 / 2014-09-04

Title: PROCESS FOR MANUFACTURING SYNTHETIC SINGLE CRYSTAL DIAMOND MATERIAL

Abstract: A method for manufacturing a plurality of synthetic single crystal diamonds, the method comprising: forming a plurality of seed pads, each seed pad comprising a plurality of single crystal diamond seeds anchored to, or embedded in, an inert holder; loading a carbon source, a metal catalyst, and the plurality of seed pads into a capsule; loading the capsule into a high pressure high temperature (HPHT) press; and subjecting the capsule to a HPHT growth cycle to grow single crystal diamond material on the plurality of single crystal diamond seeds, the HPHT growth cycle comprising: initiating HPHT growth of single crystal diamond material on the plurality of single crystal diamond seeds by increasing pressure and temperature; maintaining HPHT growth of single crystal diamond material on the plurality of single crystal diamond seeds via a pressure driven growth process by controlling and maintaining pressure and temperature; and terminating HPHT growth of single crystal diamond material on the plurality of single crystal diamond seeds by reducing pressure and temperature, wherein the plurality of single crystal diamond seeds remain anchored to, or embedded in, the inert holders during the HPHT growth cycle

US20150030786A1 ELEMENT SIX LTD

Publication / filed : 2015-01-29 / 2013-10-29

Title: MICROWAVE PLASMA REACTOR FOR MANUFACTURING SYNTHETIC DIAMOND MATERIAL

Abstract: A microwave plasma reactor for manufacturing synthetic diamond material via chemical vapour deposition, the microwave plasma reactor comprising: a plasma chamber; a substrate holder disposed in the plasma chamber for supporting a substrate on which the synthetic diamond material is to be deposited in use; a microwave coupling configuration for feeding microwaves from a microwave generator into the plasma chamber; and a gas flow system for feeding process gases into the plasma chamber and removing them therefrom; wherein the gas flow system comprises a gas inlet nozzle array comprising a plurality of gas inlet nozzles disposed opposite the substrate holder for directing process gases towards the substrate holder, the gas inlet nozzle array comprising: at least six gas inlet nozzles disposed in a substantially parallel or divergent orientation relative to a central axis of the plasma chamber; a gas inlet nozzle number density equal to or greater than 0.1 nozzles/cm², wherein the gas inlet nozzle number density is measured by projecting the nozzles onto a plane whose normal lies parallel to the central axis of the plasma chamber and measuring the gas inlet number density on said plane; and a nozzle area ratio of equal to or greater than 10, wherein the nozzle area ratio is measured by projecting the nozzles onto a plane whose normal lies parallel to the central axis of the plasma chamber, measuring the total area of the gas inlet nozzle area on said plane, dividing by the total number of nozzles to give an area

associated with each nozzle, and dividing the area associated with each nozzle by an actual area of each nozzle

US8986645B2 ELEMENT SIX LTD

Publication / filed : 2015-03-24 / 2006-07-06

Title: Diamond

Abstract: A method of producing a CVD single crystal diamond layer on a substrate includes adding into a DVD synthesis atmosphere a gaseous source comprising silicon. The method can be used to mark the diamond material, for instance to provide means by which its synthetic nature can more easily be determined. It can also be exploited to generate single crystal diamond material of high color

WO2015071484A1 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-05-21 / 2014-11-18

Title: METHODS OF FABRICATING SYNTHETIC DIAMOND MATERIALS USING MICROWAVE PLASMA ACTIVATED CHEMICAL VAPOUR DEPOSITION TECHNIQUES AND PRODUCTS OBTAINED USING SAID METHODS

Abstract: A method of fabricating synthetic diamond material using a microwave plasma activated chemical vapour deposition technique is provided which utilizes high and uniform microwave power densities applied over large areas and for extended periods of time. Products fabricated using such a synthesis technique are described including a single crystal CVD diamond layer which has a large area and a low nitrogen concentration, and a high purity, fast growth rate single crystal CVD diamond material

EP2253746B1 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-07-22 / 2003-09-05

Title: COLOURED DIAMOND

Abstract: A method of producing a single crystal CVD diamond of a desired colour which includes the steps of providing single crystal CVD diamond which is coloured and heat treating the diamond under conditions suitable to produce the desired colour. Colours which may be produced are, for example, in the pink-green range

US9115443B2 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-08-25 / 2010-10-07

Title: Coloured diamond

Abstract: A diamond layer of single crystal CVD diamond which is colored, preferably which has a fancy color, and which has a thickness of greater than 1 mm

US9157170B2 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-10-13 / 2010-12-15

Title: Single crystal diamond material

Abstract: 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 $\langle 100 \rangle$ edge, the length of the said at least one $\langle 100 \rangle$ edge exceeding any dimension of the surface that is orthogonal to the said at least one $\langle 100 \rangle$ 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.

US20150315027A1 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-11-05 / 2015-05-27

Title: DIAMOND MATERIAL

Abstract: The present disclosure relates to a method of making fancy orange synthetic CVD diamond material. Among other things, the method may involve (i) providing a single crystal diamond material that has been grown by CVD and has a $[N_s 0]$ concentration less than 5 ppm; (ii) irradiating the provided CVD diamond material so as to introduce isolated vacancies V into at least part of the provided CVD diamond material such that the total concentration of isolated vacancies [VT] in the irradiated diamond material is at least the greater of (a) 0.5 ppm and (b) 50% higher than the $[N_s 0]$ concentration in ppm in the provided diamond material; and (iii) annealing the irradiated diamond material to forming vacancy chains from at least some of the introduced isolated vacancies

US9068257B2 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-06-30 / 2010-06-25

Title: Diamond material

Abstract: 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

US9061263B2 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-06-23 / 2007-11-09

Title: Method of improving the crystalline perfection of diamond crystals

Abstract: This invention relates to a method of improving the crystalline perfection of IIA diamond crystals by heating the grown diamond crystals at an elevated temperature and an elevated pressure. The invention extends to grown diamond material having a low extended defect density with low nitrogen concentration

US9039832B2 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-05-26 / 2011-07-14

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

Abstract: 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 utilized is described. The growth is effected at a temperature in the range from 1280° C. to 1390° C

US9034296B2 ELEMENT SIX TECHNOLOGIES LTD

Publication / filed : 2015-05-19 / 2013-09-06

Title: Diamond

Abstract: The present invention relates to an HPHT method for synthesizing single crystal diamond, wherein a single crystal diamond seed having an aspect ratio of at least 1.5 is utilized. Single crystal diamond seeds having an aspect ratio of at least 1.5 and synthetic single crystal diamond which may be obtained by the method recited are also described. The growth surface is substantially aligned along a <100> or <110> direction in the plane of the growth surface