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(54) Title: A ROUNDED RECTANGULAR GEMSTONE

(57) Abstract: A rounded rectangular gemstone which comprises a crown provided with a planar table, a pavilion whose facets converge at a cutlet being disposed below said crown, and a girdle extending from said crown to said pavilion, said girdle being substantially perpendicular to said table and assuming a rectangular shape when viewed thereabove and therebelow, wherein said crown and said pavilion have substantially circular cross-sections along a plane parallel to said table and the facets of said pavilion are arranged in rotational symmetry about said cutlet and in mirror symmetry about lines of symmetry passing through said cutlet and the midpoint of each side of said girdle and through said cutlet and each corner of said girdle.

A ROUNDED RECTANGULAR GEMSTONE

Field of the Invention

The present invention relates to the field of gemstones. More particularly, the invention relates to a rounded rectangular gemstone exhibiting the brilliance and fire of a Brilliant cut gemstone.

Background of the Invention

Two commonly found crystalline structures of diamonds are the octahedron and dodecahedron. A diamond with an octahedral structure has eight triangular facets, or sides, such that each facet is equally spaced from the center. A diamond with a dodecahedral structure has twelve rhombic facets, such that each facet intersects two axes of symmetry, forming an equal spacing from the point of intersection, and perpendicular to a third axis of symmetry.

To properly utilize these crystalline structures and to minimize loss of material during diamond cutting (normally referred to as polishing), two corresponding diamond cuts are commonly used: the Round Brilliant Cut and the Princess cut. The Round Brilliant Cut is the most popular cut, achieving a good balance of brilliance and dispersion as a result of its symmetrical shape, and is generally produced from a dodecahedron, which approaches a spherical shape; however a material loss of 40-50 percent results with this cut. Traditionally a Round

Brilliant Cut is produced with 58 facets. A Princess cut, having a rectangular shape and resulting in a corresponding material loss of approximately 20 percent, is generally produced from a given octahedral rough diamond, while the Round Brilliant Cut is generally produced from a given dodecahedral rough diamond. Even though a Princess cut diamond has a much lower material loss than that of a Brilliant cut, the cost of a Princess cut diamond is not significantly lower since it is produced from an octahedral rough diamond. The cost of an octahedral rough diamond is much higher than of a dodecahedron, from which a Brilliant cut is produced.

Two important characteristics of a diamond when used as a gem are its brilliance and fire. External brilliance, or luster, refers to the amount of light that is reflected from the top of the diamond. Internal brilliance is determined by the light rays that enter the top (generally referred to as "crown"), and that are reflected from facets of the base (generally referred to as "pavilion") and then are reflected again through the top (or through the so-called "table", if provided) as undispersed light. Fire, also referred to as dispersion, occurs when white light is separated into its spectral colors so that the gem sparkles when properly cut.

Maximum brilliance occurs when a diamond is cut to enable maximum light return through the surface of the diamond. As shown in Fig. 1, light rays 2 penetrate top 3 of the diamond, are reflected from lower facets 4 and return to

top 3. Even if a light ray 2 penetrates a top facet 5, it will be reflected through top 3 and will be visible to an observer as undispersed light. If the diamond cut significantly deviates from the optimal dimensions and shapes, light may escape from the side or bottom of the gem, and as a result diminishing its luster. The Gemological Institute of America (GIA) defines Class 1 stones, which are provided with a harmonious balance between their physical dimensions and optical display, as having table sizes from 53 to 60 percent, crown angles from 34° to 35°, even girdles that are medium to slightly thick, pavilion depths very close to 43 percent, small to medium cutlets, and very good to excellent polish and symmetry. The physical characteristics of a diamond will be defined hereinafter.

Diamond appraisers rely on another attribute, in addition to those mentioned above, in order to determine the quality of the cut. Since the cross section of both the top and bottom portions of a Brilliant Cut diamond is round, the image of the table is reflected around the cutlet, within the bottom portion of the diamond. The table reflection is an indication of the depth of the pavilion. For example, at a pavilion depth of 48 percent, a black spot appears throughout the table, whereas at the ideal pavilion depth of 43 percent the table reflection appears as a spot encompassing one-third of the area of the table. It would be appreciated that the appearance of the table reflection occurs only with Brilliant Cut diamonds due to its radial symmetry.

There have been attempts to reproduce the dispersion and brilliance of Brilliant Cut diamonds without a corresponding high material loss. US Patents 4,020,649 and 4,555,916 to Grossbard disclose a step-cut diamond, usually referred to as an Emerald cut, whose facets are broad with flat planes resembling a flight of stairs, that exhibits improved brilliance. According to these patents a diamond is cut with a straight edged polygonal girdle, a crown having table and girdle breaks in addition to a table, a pyramidal base having girdle and cutlet breaks, and a cutlet. US 5,970,744 to Greeff discloses a cut cornered mixed-cut square gemstone in which the crown and pavilion are substantially square with four equal sides and corners about one-third the length of the sides. The pavilion sides and corners are defined by eight rib lines which extend substantially continuously from the girdle to the cutlet. Although these patents attempt to achieve the good brilliance and dispersion of a Brilliant cut, the effect nevertheless does not duplicate that of the Brilliant cut. Furthermore, the prior art diamonds do not have radial symmetry, and therefore a table reflection does not appear.

All of the prior art described above have not yet provided satisfactory solutions to the problem of producing a diamond with the brilliance and dispersion of a Brilliant cut without a corresponding high material loss.

It is an object of the present invention to provide a diamond exhibiting the brilliance and dispersion of a Brilliant cut.

It is an additional object of the present invention to provide a diamond lacking the large material loss of a Brilliant cut.

It is an additional object of the present invention to provide a diamond in which a table reflection appears.

It is yet an additional object of the present invention to provide a cost-effective diamond that is produced from a dodecahedral rough diamond

Other objects and advantages of the invention will become apparent as the description proceeds.

Summary of the Invention

The present invention relates to a rounded rectangular gemstone comprising a crown provided with a planar table, a pavilion whose facets converge at a cutlet being disposed below said crown, and a girdle extending from said crown to said pavilion, said girdle being substantially perpendicular to said table and assuming a rectangular shape when viewed thereabove and therebelow, wherein said crown and said pavilion have substantially circular cross-sections along a

plane parallel to said table and the facets of said pavilion are arranged in rotational symmetry about said cutlet and in mirror symmetry about lines of symmetry passing through said cutlet and the midpoint of each side of said girdle and through said cutlet and each corner of said girdle.

The pavilion comprises:

a) a plurality of pavilion facets the lower edge of each converging at the cutlet, said plurality of pavilion facets comprising kite-shaped pavilion facets and shortened pavilion facets, the vertex of each of said kite-shaped pavilion facets extending from the corresponding corner of the girdle, whereby each of said kite-shaped pavilion facets is interspersed between a pair of said shortened pavilion facets and each of said shortened pavilion facets is interspersed between a pair of said kite-shaped pavilion facets, said kite-shaped and shortened pavilion facets arranged in rotational symmetry about said cutlet;

b) a plurality of lower hexagon facets arranged in such a way that a pair of lower hexagon facets is disposed between each pair of adjacent pavilion facets, each of said pair of lower hexagon facets comprising a larger and smaller facet, whereby said plurality of lower hexagon facets is provided with mirror symmetry about lines of symmetry passing through said cutlet and the

midpoint of each side of the girdle and through said cutlet and each corner of the girdle; and

c) a plurality of hexagon facets, one side being collinear with the girdle, four sides being collinear with corresponding lower hexagon facets, and the remaining side being collinear with the end of said shortened pavilion facet.

The hexagon pavilions are cut at an angle ranging from 52-60 degrees, each of the lower hexagon facets is cut at an angle ranging from 47-53 degrees, and each of the pavilion facets is cut at an angle ranging from 39-44 degrees, with respect to the table.

Preferably, each of the hexagon pavilions is cut at an angle of 55 degrees, each of the lower hexagon facets is cut at an angle of 50 degrees, and each of the pavilion facets is cut at an angle of 41 degrees, with respect to the table.

The maximum depth of each hexagon facet ranges from 25-30 percent, and preferably 27 percent, of the maximum girdle length and the minimum depth of each hexagon facet is 0 percent.

As referred to herein, unless otherwise stated, the term "percent" relates to the ratio of a given gemstone dimension to the maximum girdle length. The girdle length is measured along a plane parallel to the table.

The pavilion depth ranges from 72-83 percent, and preferably from 77-78 percent, of the maximum girdle length.

Preferably 8 pavilion facets are employed, 16 lower hexagon facets are employed and 4 hexagon facets are employed.

The crown comprises:

a) a plurality of triangular star facets, the long side of which is collinear with one side of the table;

b) a plurality of intermediate bezel facets, two sides of each of said intermediate bezel facets being collinear with the short side of two adjacent star facets and the remaining two sides converging to the midpoint of one side of the girdle;

c) a plurality of corner bezel facets, two short sides of each of said corner bezel facets being collinear with the short side of two adjacent star facets and the long sides converging to the corresponding corner of the girdle; and

d) a plurality of triangular upper girdle facets, the long side of each of said upper girdle facets being collinear with the girdle and one of the short sides being collinear with a short side of an adjacent upper girdle facets.

Each star facet is cut at angle ranging from 13-22 degrees, each intermediate and corner bezel facet is cut at an angle ranging from 27-40 degrees, and each upper girdle facet is cut at an angle ranging from 39-62 degrees, with respect to the table.

Preferably, each star facet is cut at an angle ranging from 15.0-19.5 degrees, each intermediate and corner bezel facet is cut at an angle ranging from 33.0-35.0 degrees and each upper girdle facet is cut at an angle ranging from 47-55 degrees with respect to the table.

The vertex of each corner bezel facet that abuts each corresponding girdle corner defines a circle whose center is the projection of the cutlet onto the table, thereby providing radial symmetry.

The vertex of each intermediate bezel facet that abuts the midpoint of the corresponding girdle side defines a circle whose center is the projection of the cutlet onto the table, thereby providing radial symmetry.

The structure of the gemstone according to the present invention, wherein each hexagon facet is not projected onto a corner bezel facet, precludes the appearance of any shadows.

The girdle has a non-uniform height. The minimum height of the girdle ranges from 1-5 percent and the maximum height of the girdle ranges from 10-20 percent. Each side of the girdle ranges from 86-94 degrees, and is preferably 90 degrees, with respect to the table.

The table size ranges from 53-63 percent, and preferably at 58 percent, of the maximum girdle length.

Preferably 8 star facets, 4 intermediate bezel facets, 4 corner bezel facets and 16 upper girdle facets are employed.

Brief Description of the Drawings

In the drawings:

Fig. 1 illustrates the reflection of light rays within a diamond;

Fig. 2 illustrates a side view of a typical Brilliant cut diamond;

Fig. 3 illustrates the top view of a typical Brilliant cut diamond;

Fig. 4 illustrates a bottom view of a typical Brilliant cut diamond;

Fig. 5 illustrates a top view of a typical Princess cut diamond;

Fig. 6 illustrates a bottom view of a typical Princess cut diamond;

Fig. 7 illustrates a top view of a diamond according to the present invention;

Fig. 8 illustrates a bottom view of a diamond according to the present invention;

Fig. 9 illustrates a bottom view of a diamond according to the present invention showing its rotational symmetry;

Fig. 10 illustrates a superimposition of the crown and pavilion;

Fig. 11 illustrates a side view of a diamond according to the present invention;

Fig. 12 illustrates another side view of a diamond; showing the interconnection of the sides of the girdle;

Fig. 13 illustrates a cross-section cut along plane A-A of Fig. 12;

Fig. 14 illustrates a cross-section cut along plane B-B of Fig. 12;

Fig. 15 is a picture of the pavilion of a rounded rectangular gemstone that was produced in accordance with the present invention;

Fig. 16 is a picture of the crown of a rounded rectangular diamond that was produced in accordance with the present invention;

Fig. 17 is a perspective view of the gemstone of the present invention facing a girdle corner; and

Fig. 18 is a perspective view of the gemstone of the present invention taken above the crown.

Detailed Description of Preferred Embodiments

Figs. 2-4 illustrate the shape of a typical diamond 10 produced with a Brilliant cut. As shown in a side view of diamond 10 in Fig. 2, girdle 8, a band which defines the widest part of the diamond, divides diamond 10 into an upper portion, referred to as the crown designated by 12, and into a lower portion, referred to as the pavilion designated by 14. Crown 12 includes several facets located below a horizontally disposed area 15 called the table. The crown permits light to enter the diamond, and the pavilion allows the light to be reflected within the gem and then returned through the table or crown, depending on the penetration angle of the light rays. The facets of pavilion 14 converge at cutlet 16, the smallest facet located at the bottom of the diamond.

Before commencement of diamond polishing, in order to achieve the cut illustrated in Fig. 2, a dodecahedron is sawed at its midsection, thereby resulting in two rough diamonds. After smoothening each flat portion that results, a table is produced. A top view of crown 12 is shown in Fig. 3 in which eight star facets 21(a)-(h) are inclined with respect to table 15. Each star facet 21 is triangular and equally sized, and the long side of which is collinear with one end of octagonal table 15. Crown 12 is also provided with eight equally sized bezel facets 24(a)-(h). Each bezel facet 24 is quadrangularly shaped, such that two of its sides are collinear with two short sides of adjacent star facets 21. One of the

vertices abuts a corresponding vertex of an adjacent bezel facet, and the lower vertex of each bezel facet 24 abuts girdle 8.

As seen more clearly in Figs. 3 and 4, girdle 8 is circular. After preparation of table 15, the girdle, which is perpendicular with respect to the table, is cut with a cutting machine such that the circularity thereof is provided with an accuracy of 20 microns. After cutting of girdle 8, bezel facets 24 and then sixteen upper girdle facets 31-38 are produced, followed by the polishing of star facets 21. Bezel facets, star facets and upper girdle facets are cut by means of a polishing mill. During polishing eight sets of triangularly shaped upper girdle facets 31(a),(b)-38(a),(b) are produced, such that the two facets of each set have collinear sides and a vertex of one set abuts a corresponding vertex of an adjacent set. The second side of an upper girdle facet abuts girdle 8, while the third side coincides with a bezel facet.

The facets of crown 12, as well as those of pavilion 14, as will be described hereinafter, are cut in such a way so as to provide a round shape that has rotational symmetry with respect to cutlet 16, thereby enabling the appearance of table reflection 17. The cut of the crown results in a particular table size, defined as the ratio of the length T of table 15 to the length G of girdle 8, and in a particular crown angle ø (see Fig. 2), defined as the angle of bezel facets 24 with respect to girdle 8.

A bottom view of pavilion 14 is shown in Fig. 4. Pavilion 14 is comprised of eight pairs of lower girdle facets 40, which are triangularly shaped, eight kite-shaped pavilion facets 41 and cutlet 16. The lower girdle facets are cut after the polishing of the pavilion facets. The two lower girdle facets 40 of each pair have collinear sides. The upper vertex of each pavilion facet 41 abuts girdle 8 and separates each pair of lower girdle facets. Lower girdle facets 40 and pavilion facets 41 are cut in such a way so as to provide pavilion 14 with a tapered and conical appearance, with the facets converging at cutlet 16. The cut of the pavilion results in a particular pavilion depth, defined as the ratio of the depth of pavilion 14, when measured in a plane perpendicular to table 15 (Fig. 3), to the length of girdle 8.

Fig. 5 and 6 illustrate top and bottom views, respectively, of a Princess cut diamond. Girdle 45 is square, on top of which is cut crown 43, comprised of a plurality of steps, bezel facets, star facets and a table. Pavilion 47 is comprised of lower girdle facets and pavilion facets. It would be appreciated that the various facets are arranged in sets of four, and the particular configuration of the facets is selected to minimize material loss of the diamond during polishing.

Fig. 7 is a top view of the diamond of the present invention, which is a rounded rectangular gemstone. The present invention is produced from a dodecahedral

rough diamond, and a cost-effective diamond with rotational symmetry may be therefore achieved. It would be appreciated that any gemstone may be cut with the use of the present invention whereby the brilliance of a Brilliant cut gemstone is noticeable; however, for sake of illustration the ensuing description will refer to a diamond, since a diamond cut with the use of the present invention advantageously provides the fire of a round diamond as well as its brilliance.

Crown 50 is comprised by girdle 52, table 55, eight star facets 21(a)-(h), eight bezel facets 56(a)-(d) and 58(a)-(d), and sixteen upper girdle facets 60(a),(b)-67(a),(b). Girdle 52, which assumes a rectangular shape when viewed above and below the diamond, and defines the boundary of crown 50, is perpendicularly disposed with respect to table 55. The table size, or ratio of table length T to maximum girdle length G (see Fig. 11) ranges from 53-63 percent, and preferably at 58 percent. The ratio of maximum girdle length G to its minimum length ranges from 1-5, and preferably assumes the shape of a square, having a ratio of 1. Star facets 21(a)-(h) are identical to those of a Brilliant cut, and the long side of each equally sized triangular star facet is collinear with one side of the octagonal table 55. Each star facet is cut at angle ranging from 13-22 degrees, and preferably from 15.0-19.5 degrees, with respect to table 55. Bezel facets 58(a)-(d) have similar proportions to those of a Brilliant cut, and two sides of each bezel facet 58 are collinear with the short side of two adjacent star facets

21, while the remaining two sides converge to the midpoint of one of the projections of girdle 52.

Corner bezel facets 56(a)-(d) are adapted to the configuration of a rectangular girdle on one hand and the requirement of radial symmetry on the other. As a result the two short sides of each bezel facet 56 are collinear with the short side of two adjacent star facets 21, while the long sides converge to a corresponding corner of girdle 52. The four vertices of the corresponding bezel facets 56 that abut each corner of the girdle define a circle whose center is the projection of cutlet 69 (Fig. 8) onto table 55, thereby providing radial symmetry. Similarly radial symmetry is provided by the four vertices of intermediate bezel facets 58 that abut the midpoint of each side of girdle 52, by which a circle whose center is the projection of cutlet 69 onto table 55 is traceable. Each bezel facet 56 and 58 is cut at an angle ranging from 27-40 degrees, and preferably from 33.0-35.0 degrees, with respect to table 55. Eight sets of triangular upper girdle facets 60(a),(b)-67(a),(b) are provided to extend from girdle 52 to a corresponding bezel facet, whereby the two facets of each set are disproportionate to each other. Two sets are disposed along each side of the girdle, such that each of these two sets is a mirror image of the other. For example, upper girdle facet 60(a) is a mirror image of 61(b), while facet 60(b) is a mirror image of 61(a). The long side of each upper girdle facet is collinear with girdle 52, and one of the short sides is collinear with a short side of the other facet of the corresponding set of upper

girdle facets. The remaining side is collinear with a corresponding side of a bezel facet 56 or 58. Each upper girdle facet is cut at an angle ranging from 39-62 degrees, and preferably from 47-55 degrees, with respect to table 55.

Fig. 8 is a bottom view of the pavilion, generally designated as 70. Whereas the crown of the present invention is an adaptation of the crown of a conventional Brilliant cut diamond, having similar types of facets although the proportions and inclination of which are different in order to conform with the rectangular girdle, pavilion 70 incorporates a novel type of facet cut with six unequal sides, hereinafter referred to as a "hexagon facet." Pavilion 70 consists of four similarly shaped hexagon facets 72, eight sets of lower hexagon facets 76(a),(b)- 83(a),(b), eight pavilion facets 90-97 and cutlet 69.

Two types of pavilion facets are provided: kite-shaped pavilion facets 90, 92, 94, 96 and shortened pavilion facets 91, 93, 95 97. Each pavilion facet is cut at angle ranging from 39-44 degrees, and preferably at an angle of 41 degrees, with respect to table 55 (Fig. 7). Each pavilion facet is cut from two short sides 87 of equal length. Each kite-shaped pavilion facet is cut from two long sides 88 of equal length, and each shortened pavilion facet is cut from two long sides 89 of equal length. Each kite-shaped pavilion facet is interspersed between two shortened pavilion facets, and each shortened pavilion facets is interspersed two

kite-shaped pavilion facets, such that each short side 87 of one pavilion facet is collinear with that of the adjacent pavilion facet.

The vertex of each kite-shaped pavilion facet extends from a corresponding girdle corner 99 to cutlet 69, such that the four kite-shaped pavilion facets, as well as the four shortened pavilion facets, converge thereto. As shown in Fig. 9, the pavilion facets are provided with rotational symmetry about cutlet 69. By extending sides 101 and 102 of each shortened pavilion facets 91, 93, 95, 97 until each side intersects with the other, corresponding imaginary vertices 91V, 93V, 95V, 97V may be constructed, whereby imaginary circle 103 whose center is cutlet 69 may be constructed from each of the imaginary vertices. Imaginary circle 103 also coincides with each girdle corner 99 and the vertex of the corresponding kite-shaped pavilion facet. Enhanced brilliance and fire, as well as appearance of a table reflection, is contingent upon this rotational symmetry.

In addition to its rotational symmetry, pavilion 70 is advantageously arranged with mirror symmetry. Without mirror symmetry, the light which is reflected from the pavilion would not be uniform, and one zone of the table may be darker than another zone, thus detracting from the resulting fire. Referring now to Fig. 8, lines of symmetry 105-108 are shown, whereby each line of symmetry passes through cutlet 69. Lines of symmetry are perpendicular to girdle 52 and divide each shortened pavilion facet in two, while lines of symmetry 107 and 108

intersect opposite girdle corners 99 and divide each kite-shaped pavilion facet in two. Each lower hexagon facet and each set of lower hexagon facets is provided with a mirror image with respect to the corresponding line of symmetry. For example with respect to line of symmetry 106, lower hexagon set 76 is the mirror image of lower hexagon set 83 and set 79 is the mirror image of set 80, while lower hexagon facet 78(a) is the mirror image of lower hexagon facet 81(b) and facet 77(a) is the mirror image of 82(b). Likewise with respect to line of symmetry 107, set 78 is the mirror image of set 79 and set 76 is the mirror image of set 81. To achieve this mirror symmetry, each set of lower hexagon facets consists of a larger and smaller triangular facet having a common side. The long end of the larger facet is collinear with long side 88 of the adjacent kite-shaped pavilion facet and one end of the smaller facet is collinear with long side 89 of the adjacent shortened pavilion facet. The remaining end of each lower hexagon facet is collinear with the corresponding hexagon facet 72. Each lower hexagon facet is cut with an angle ranging from 42-53 degrees, and preferably 50 degrees, with respect to table 55 (Fig. 7).

Hexagon facet 72 is adapted to provide a rectangular girdle with a pavilion having rotational and mirror symmetry. One side of each hexagon facet 72 is collinear with girdle 52. Four sides are collinear with corresponding sides of four lower hexagon facets, respectively, and the remaining sixth side is collinear with end 98 of the corresponding shortened pavilion facet. Each hexagon facet is cut

at an angle ranging from 52-60 degrees, and preferably at an angle of 55 degrees with respect to table 55 (Fig. 7). The maximum depth of each hexagon facet, measured by a perpendicular line from girdle 52 to end 98 of the shortened pavilion facet, ranges from 25-30 percent, and preferably 27 percent, of the maximum girdle length, i.e. measured in a plane parallel to table 55 (Fig. 7). The minimum depth of each hexagon facet is 0 percent, at the point coinciding with lower girdle border 51 (Fig. 11).

Fig. 10 illustrates the relative location of the facets of the crown and the pavilion. The facets of the crown are indicated by solid lines, whereas the facets of the pavilion are indicated by dotted lines. It would be appreciated that lines of symmetry 105 and 106 connect the corresponding vertices of intermediate bezel facets 58, which abut the corresponding midpoints of girdle 52, and that cutlet 69 is located at the intersection of lines 105 and 106. It has been surprisingly found that hexagon facet 72 does not project into corner bezel facets 56, and as a result any blemish or inclusion that would normally diminish the beauty and brilliance of the diamond is not noticeable and is not reflected into the crown. Even though hexagon facet 72 is not reflected into the crown, light rays are nevertheless reflected through both corner bezel facets 56 and through intermediate bezel facets 58, due to the index of refraction of the diamond, thereby precluding the appearance of any shadows. In contradistinction to pavilion 47 of a Princess diamond (Fig. 6) whose lower girdle facets cast

shadows, hexagon facet 72 does not cast any shadow and does not diminish the brilliance of the diamond.

Fig. 11 illustrates a side view of the diamond, in accordance with the present invention. The crown height ranges from 33-44 percent, and preferably from 38-39 percent, of the maximum girdle length. The crown angle ranges from 27-40 degrees, and preferably from 33.0-35.0 degrees, with respect to table 55. The pavilion depth ranges from 72-83 percent, and preferably from 77-78 percent, of the maximum girdle length.

Girdle 52 is shown to have a non-uniform height, ranging from a minimum height at the lower vertex of corner bezel facet 56 to a maximum height at the lower vertex of intermediate vertex 58. Since each side of girdle 52 is substantially perpendicular, i.e. ranging from 86-94 degrees, and preferably 90 degrees, with respect to table 55, its vertical projection, as shown in Figs. 7-10, is a line. Lower border 51 of the girdle is a line parallel to table 55; however, the upper border of each side of the girdle is comprised of four distinct segments each of which is collinear with the neighboring upper girdle facets. Accordingly, lower vertex 59 of intermediate bezel facet 58 is located at a height above that of lower vertex 68 of upper girdle facet 65(a), for example. The height of girdle 52 at girdle corner 99 ranges from 1-5 percent, and preferably is 3 percent of the maximum girdle length, and at vertex 59 ranges from 10-20 percent, and

preferably 15 percent of the maximum girdle length. Fig. 12, which is another side view of the diamond at which girdle corner 99 is shown to be at an intermediate point along lower girdle border 51, illustrates that each side of the girdle is interconnected at the point of minimal height.

Fig. 13 illustrates that crown 50 has a substantially round cross section, cut along a plane parallel to table 55. Star facets 21, intermediate bezel facets 58 and corner bezel facets 56 are cut at the predetermined angles, as described hereinabove, so as to allow for a rounded gemstone with rotational symmetry about the cutlet, thereby enhancing the brilliance and fire of the gemstone and enabling the appearance of a table reflection. Similarly Fig. 14 illustrates that pavilion 70 has a substantially round cross section, cut along a plane parallel to table 55 due to the rotational symmetry of the pavilion and lower hexagon facets.

Fig. 15 is a picture of the pavilion of a rounded rectangular gemstone that was produced in accordance with the present invention, and Fig. 16 is a picture of the crown. Fig. 17 is a perspective view of the gemstone of the present invention facing a girdle corner. Fig. 18 is a perspective view of the gemstone of the present invention taken above the crown.

As can be appreciated from the above description, the present invention demonstrates a novel gemstone exhibiting the brilliance and fire of a Brilliant

cut gemstone even though the girdle is rectangular, when viewed thereabove or therebelow. It has been surprisingly found that the material loss associated with the gemstone of the present invention ranges from 30-40 percent of a rough dodecahedron, in contrast to a Brilliant cut, which results in a material loss of 40-50 percent of a rough dodecahedron. Novel facets are employed to achieve rotational and mirror symmetry, while being adapted to the structural limitation of a rectangular girdle.

While some embodiments of the invention have been described by way of illustration, it will be apparent that the invention can be carried into practice with many modifications, variations and adaptations, and with the use of numerous equivalents or alternative solutions that are within the scope of persons skilled in the art, without departing from the spirit of the invention or exceeding the scope of the claims.

CLAIMS

1. A rounded rectangular gemstone comprising a crown provided with a planar table, a pavilion whose facets converge at a cutlet being disposed below said crown, and a girdle extending from said crown to said pavilion, said girdle being substantially perpendicular to said table and assuming a rectangular shape when viewed thereabove and therebelow, wherein said crown and said pavilion have substantially circular cross-sections along a plane parallel to said table and the facets of said pavilion are arranged in rotational symmetry about said cutlet and in mirror symmetry about lines of symmetry passing through said cutlet and the midpoint of each side of said girdle and through said cutlet and each corner of said girdle.

2. The gemstone of claim 1, wherein the pavilion comprises:

a) a plurality of pavilion facets the lower edge of each converging at the cutlet, said plurality of pavilion facets comprising kite-shaped pavilion facets and shortened pavilion facets, the vertex of each of said kite-shaped pavilion facets extending from the corresponding corner of the girdle, whereby each of said kite-shaped pavilion facets is interspersed between a pair of said shortened pavilion facets and each of said shortened pavilion facets is interspersed between a pair of said kite-shaped pavilion facets, said kite-shaped and shortened pavilion facets arranged in rotational symmetry about said cutlet;

b) a plurality of lower hexagon facets arranged in such a way that a pair of lower hexagon facets is disposed between each pair of adjacent pavilion facets, each of said pair of lower hexagon facets comprising a larger and smaller facet, whereby said plurality of lower hexagon facets is provided with mirror symmetry about lines of symmetry passing through said cutlet and the midpoint of each side of the girdle and through said cutlet and each corner of the girdle; and

c) a plurality of hexagon facets, one side being collinear with the girdle, four sides being collinear with corresponding lower hexagon facets, and the remaining side being collinear with the end of said shortened pavilion facet.

3. The gemstone of claim 2, wherein each of the hexagon pavilions is cut an angle ranging from 52-60 degrees, each of the lower hexagon facets is cut an angle ranging from 47-53 degrees, and each of the pavilion facets is cut an angle ranging from 39-44 degrees, with respect to the table.

4. The gemstone of claim 3, wherein each of the hexagon pavilions is cut an angle of 55 degrees, each of the lower hexagon facets is cut an angle of 50 degrees, and each of the pavilion facets is cut an angle of 41 degrees, with respect to the table.

5. The gemstone of claim 2, wherein the maximum depth of each hexagon facet ranges from 25-30 percent of the maximum girdle length and the minimum depth of each hexagon facet is 0 percent.

6. The gemstone of claim 5, wherein the maximum depth of each hexagon facet is 27 percent of the maximum girdle length.

7. The gemstone of claim 2, wherein the pavilion depth ranges from 72-83 percent of the maximum girdle length.

8. The gemstone of claim 7, wherein the pavilion depth ranges from 77-78 percent of the maximum girdle length.

9. The gemstone of claim 2, wherein 8 pavilion facets are employed, 16 lower hexagon facets are employed and 4 hexagon facets are employed.

10. The gemstone of claim 2, wherein the crown comprises:

a) a plurality of triangular star facets, the long side of which is collinear with one side of the table;

b) a plurality of intermediate bezel facets, two sides of each of said intermediate bezel facets being collinear with the short side of two adjacent

star facets and the remaining two sides converging to the midpoint of one side of the girdle;

c) a plurality of corner bezel facets, two short sides of each of said corner bezel facets being collinear with the short side of two adjacent star facets and the long sides converging to the corresponding corner of the girdle; and

d) a plurality of triangular upper girdle facets, the long side of each of said upper girdle facets being collinear with the girdle and one of the short sides being collinear with a short side of an adjacent upper girdle facets.

11. The gemstone of claim 10, wherein each star facet is cut at angle ranging from 13-22 degrees, each intermediate and corner bezel facet is cut at an angle ranging from 27-40 degrees, and each upper girdle facet is cut at an angle ranging from 39-62 degrees, with respect to the table.

12. The gemstone of claim 11, wherein each star facet is cut at an angle ranging from 15.0-19.5 degrees, each intermediate and corner bezel facet is cut at an angle ranging from 33.0-35.0 degrees and each upper girdle facet is cut at an angle ranging from 47-55 degrees with respect to the table.

13. The gemstone of claim 10, wherein the vertex of each corner bezel facet that abuts each corresponding girdle corner defines a circle whose center is the projection of the cutlet onto the table, thereby providing radial symmetry.

14. The gemstone of claim 10, wherein the vertex of each intermediate bezel facet that abuts the midpoint of the corresponding girdle side defines a circle whose center is the projection of the cutlet onto the table, thereby providing radial symmetry.

15. The gemstone of claim 10, wherein 8 star facets, 4 intermediate bezel facets, 4 corner bezel facets and 16 upper girdle facets are employed.

16. The gemstone of claim 10, wherein each hexagon facet is not projected onto a corner bezel facet.

17. The gemstone of claim 1, wherein the girdle has a non-uniform height, the minimum height thereof ranging from 1-5 percent of the maximum girdle length and the maximum height thereof ranging from 10-20 percent of the maximum girdle length.

18. The gemstone of claim 1, wherein each side of the girdle ranges from 86-94 degrees, with respect to the table.

19. The gemstone of claim 1, wherein the ratio of maximum girdle length to minimum girdle length, when measured on a plane parallel to the table, ranges from 1-5.

20. The gemstone of claim 1, wherein the table size ranges from 53-63 percent, and preferably at 58 percent, of the maximum girdle length.

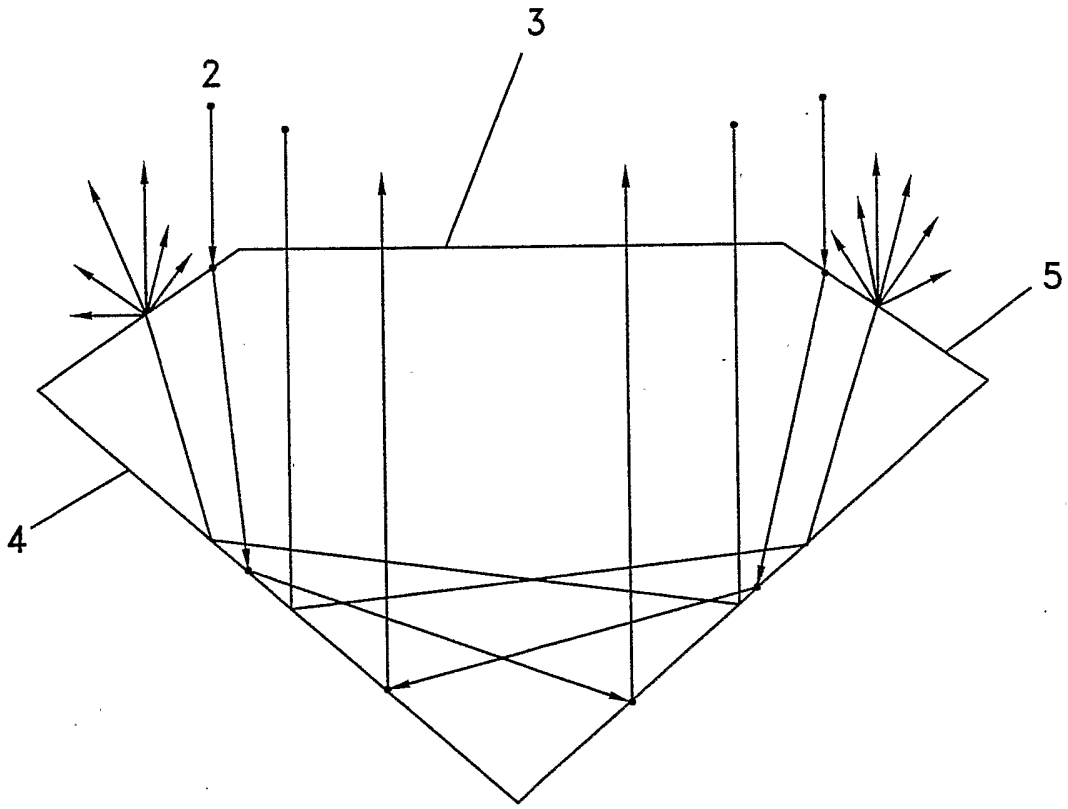


FIG. 1

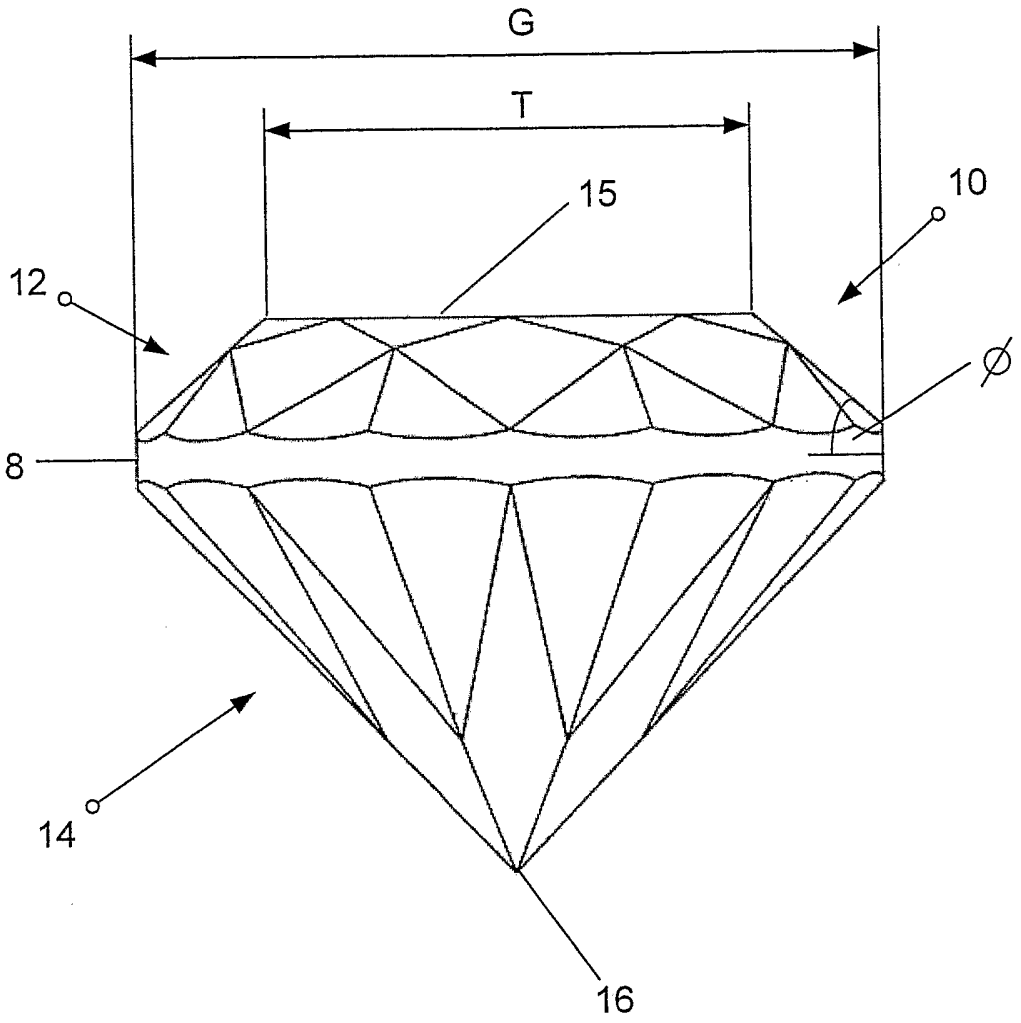


FIG. 2
PRIOR ART

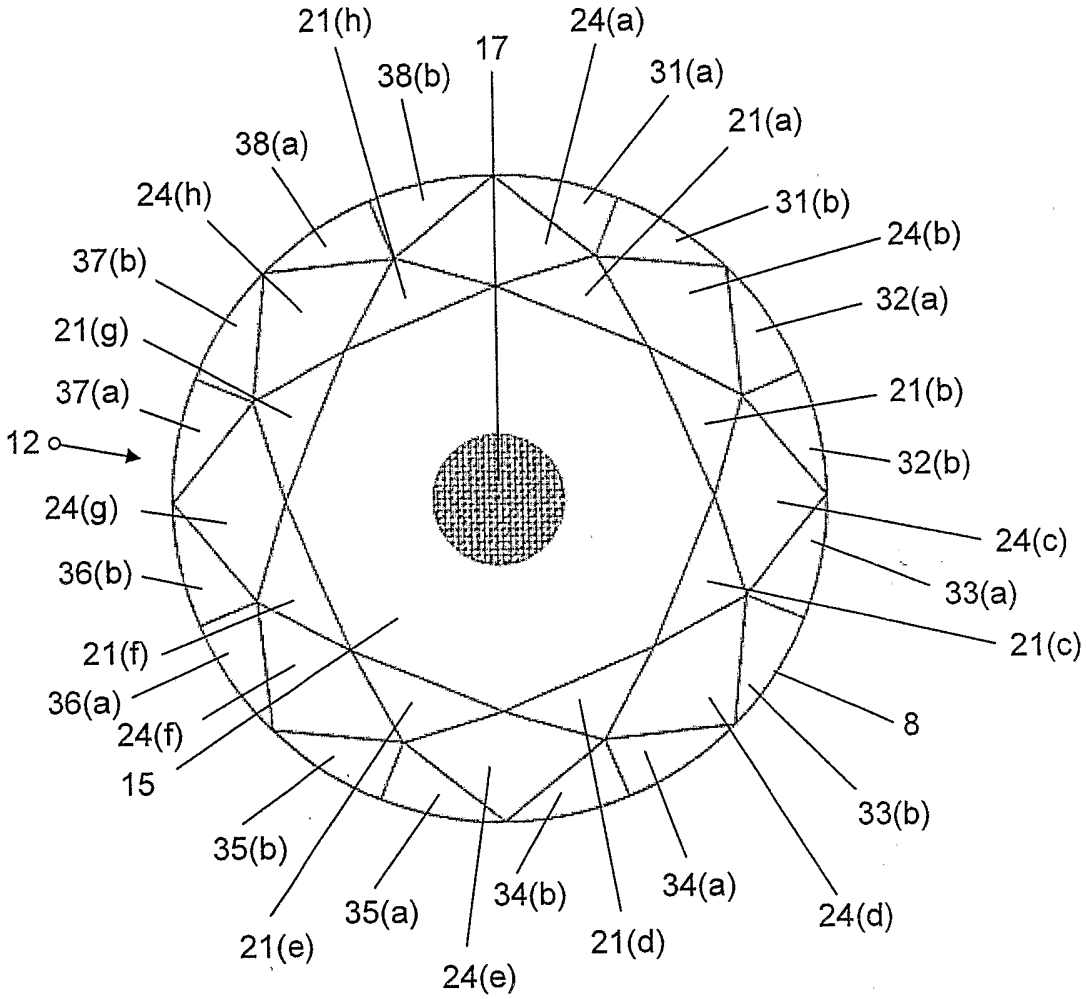


FIG. 3
PRIOR ART

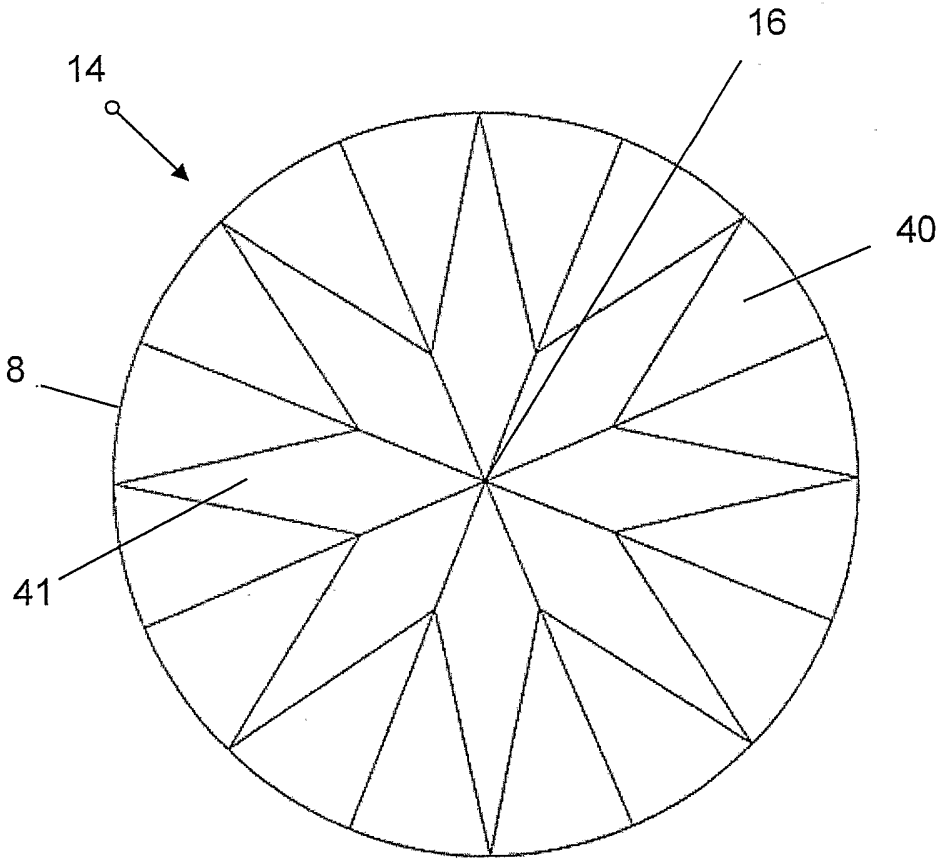


FIG. 4
PRIOR ART

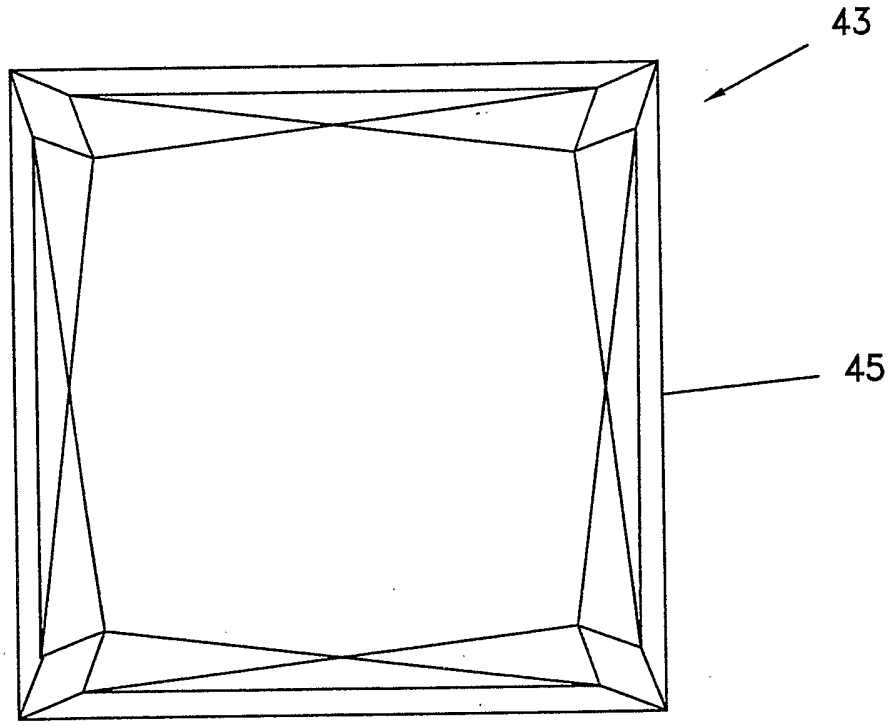


FIG. 5
PRIOR ART

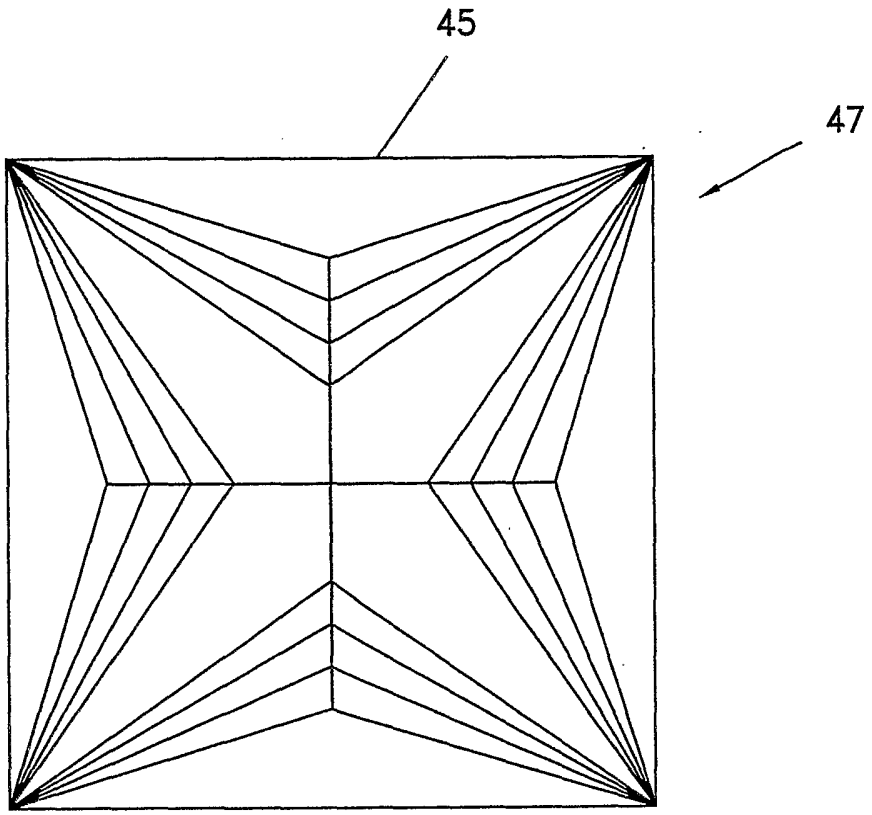


FIG. 6
PRIOR ART

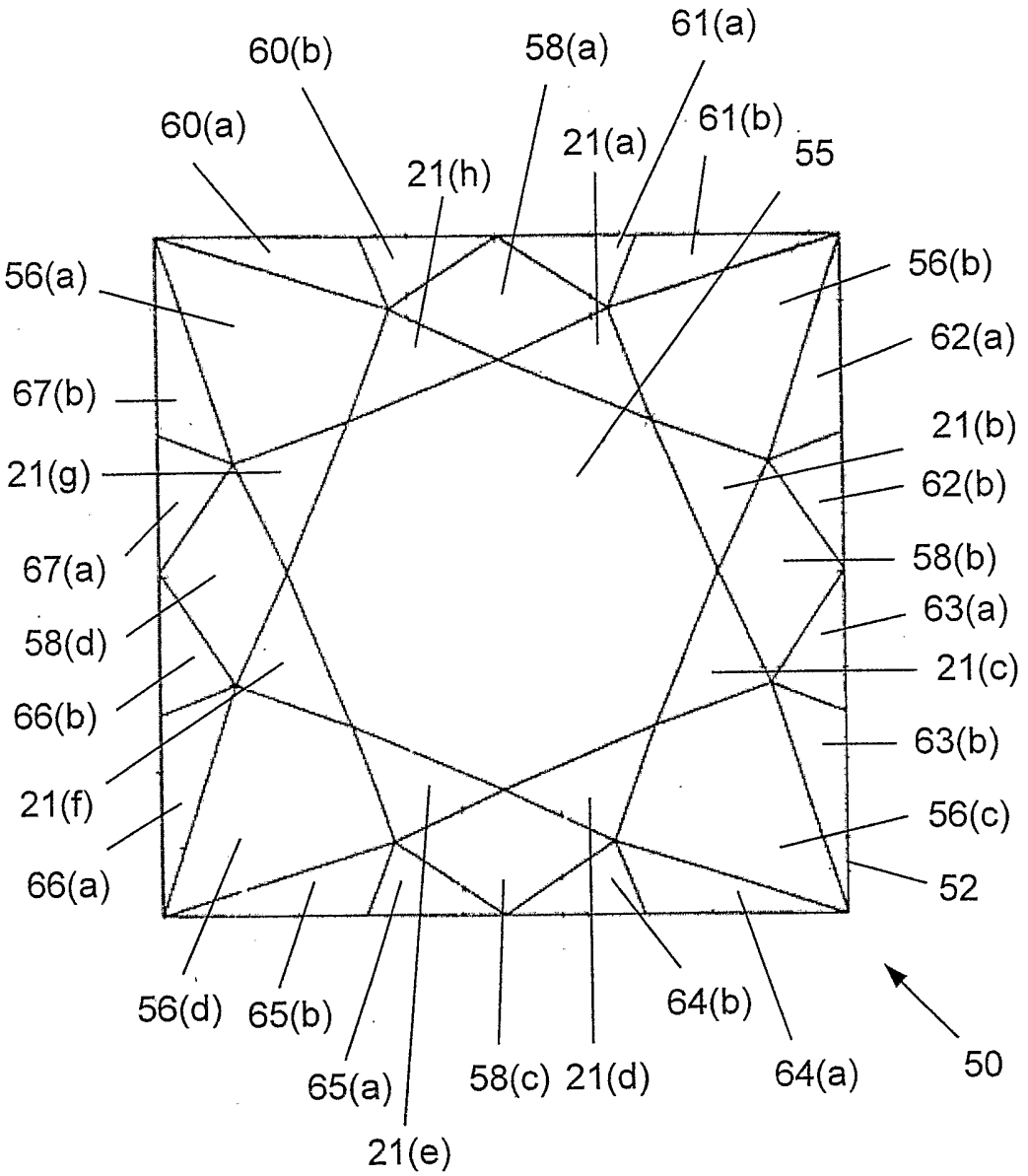

60(b)
58(a)
61(a)
60(a)
21(a)
61(b)
21(h)
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56(a)
56(b)
62(a)
67(b)
21(b)
21(g)
62(b)
67(a)
58(b)
58(d)
63(a)
21(c)
66(b)
63(b)
21(f)
56(c)
66(a)
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64(a)
21(e)

FIG. 7

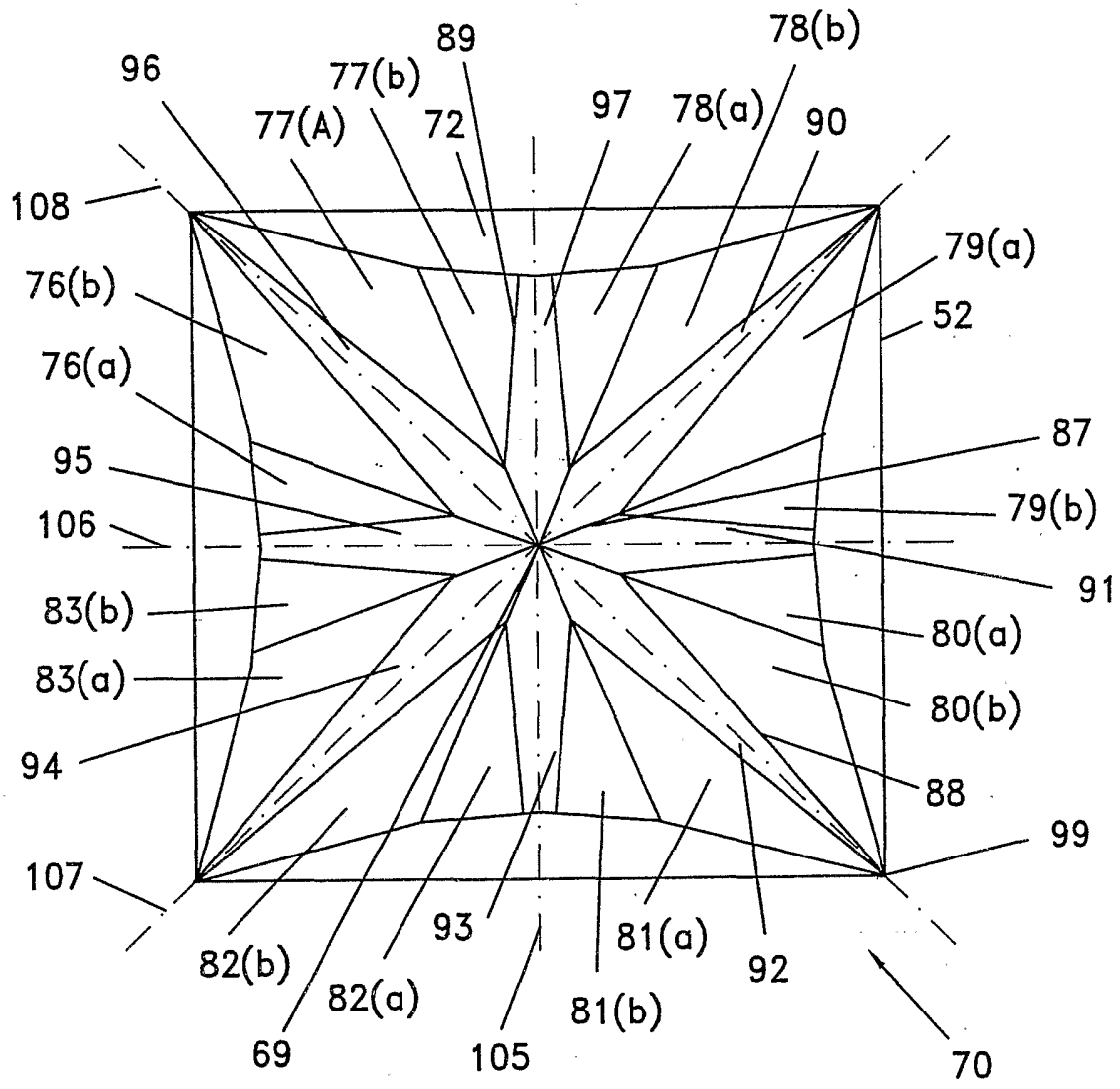

96
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77(b)
77(A)
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105
70

FIG. 8

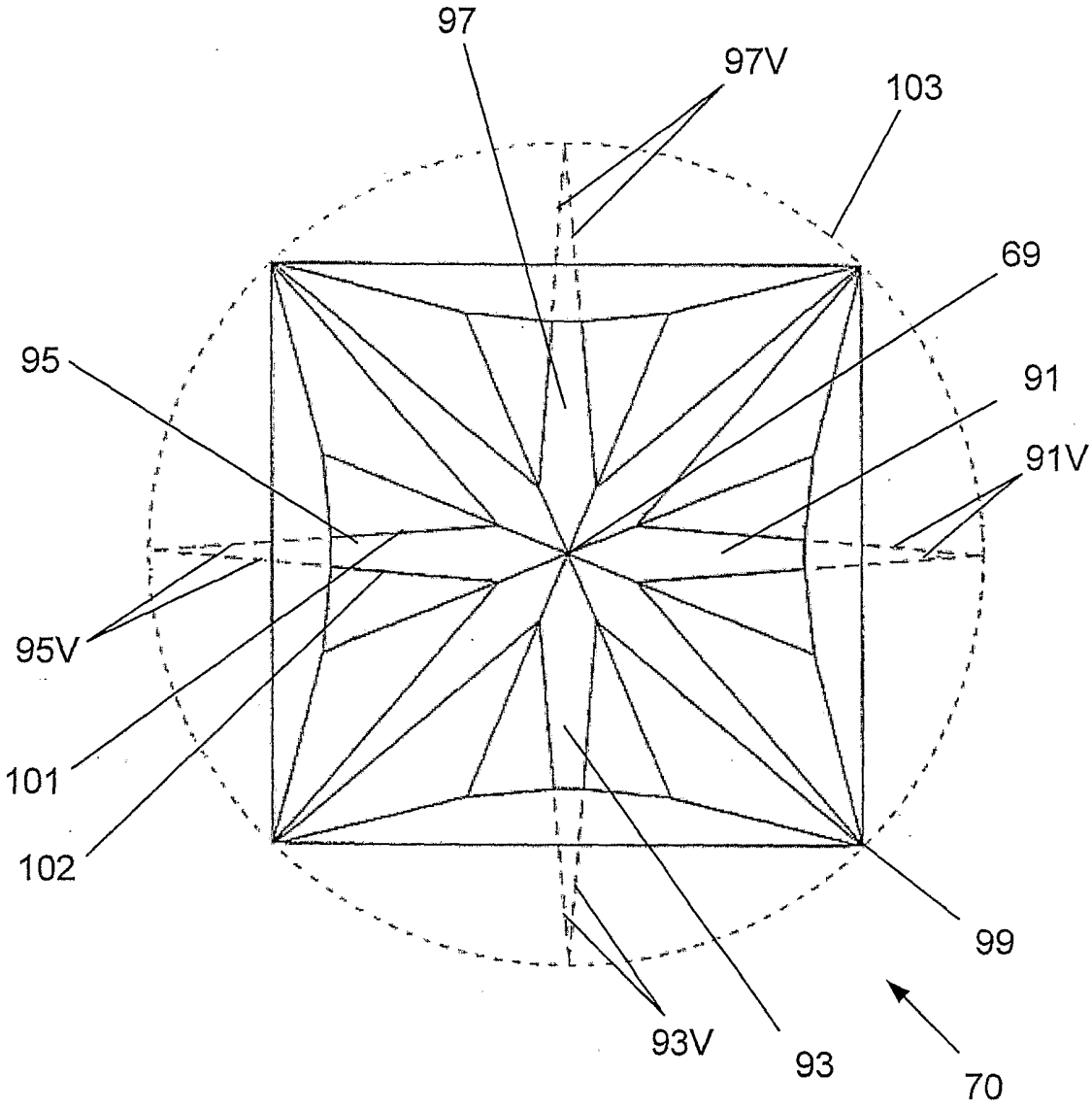


FIG. 9

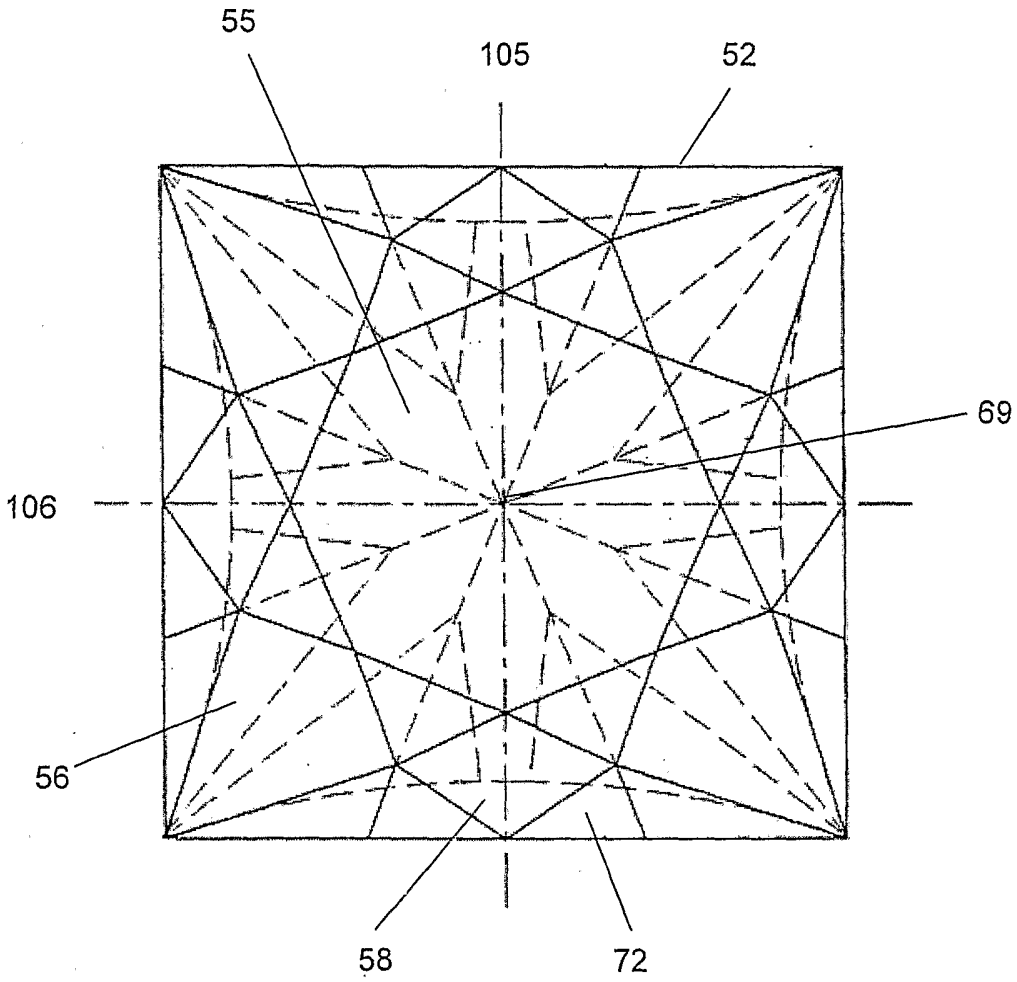


FIG. 10

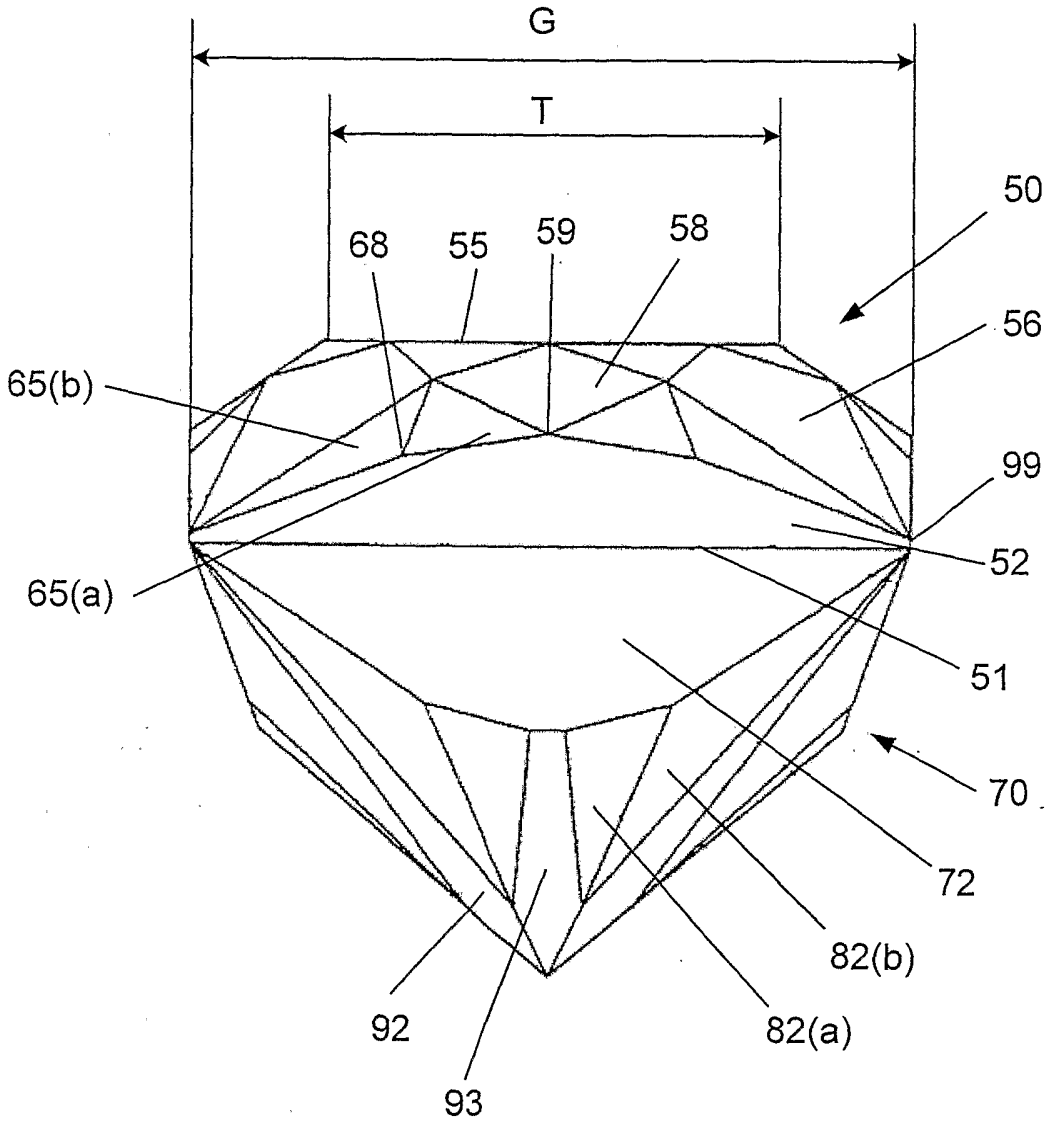


FIG. 11

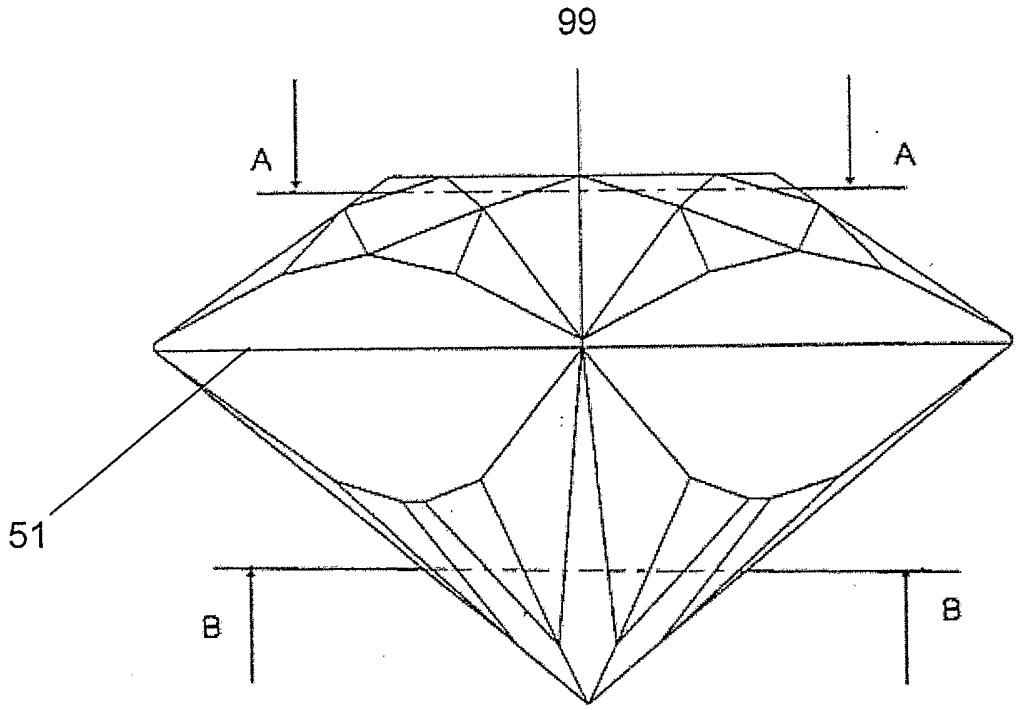


FIG. 12

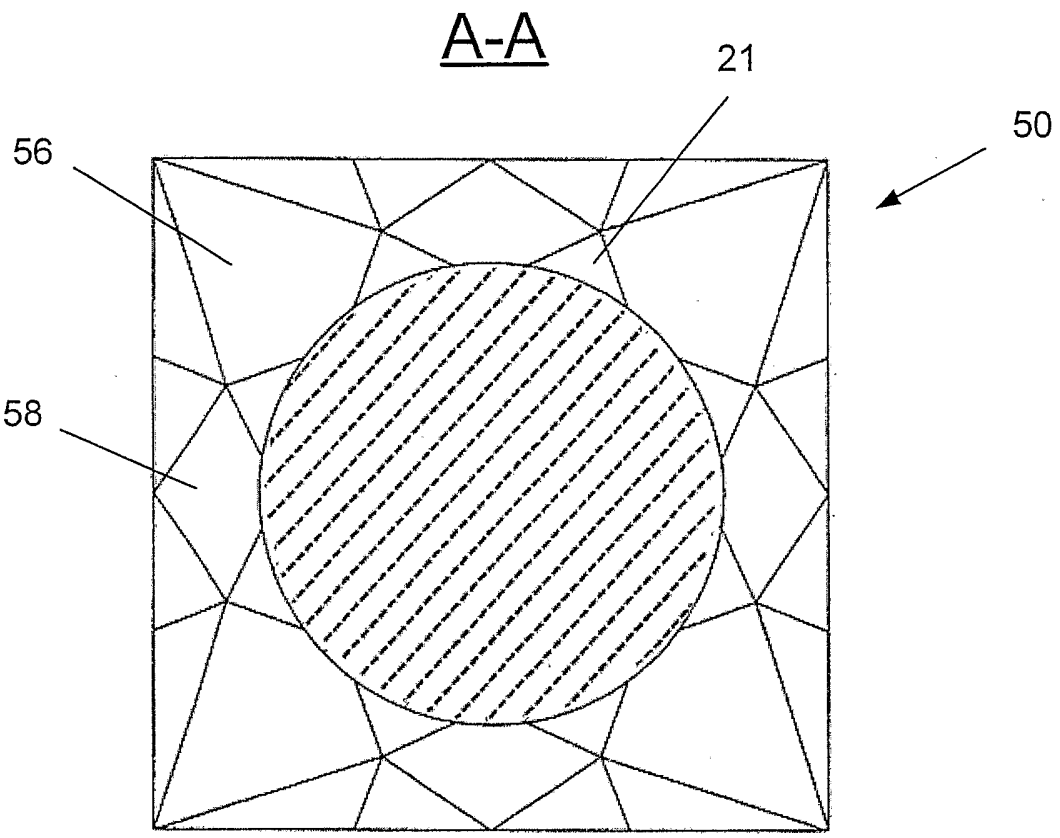


FIG. 13

B-B

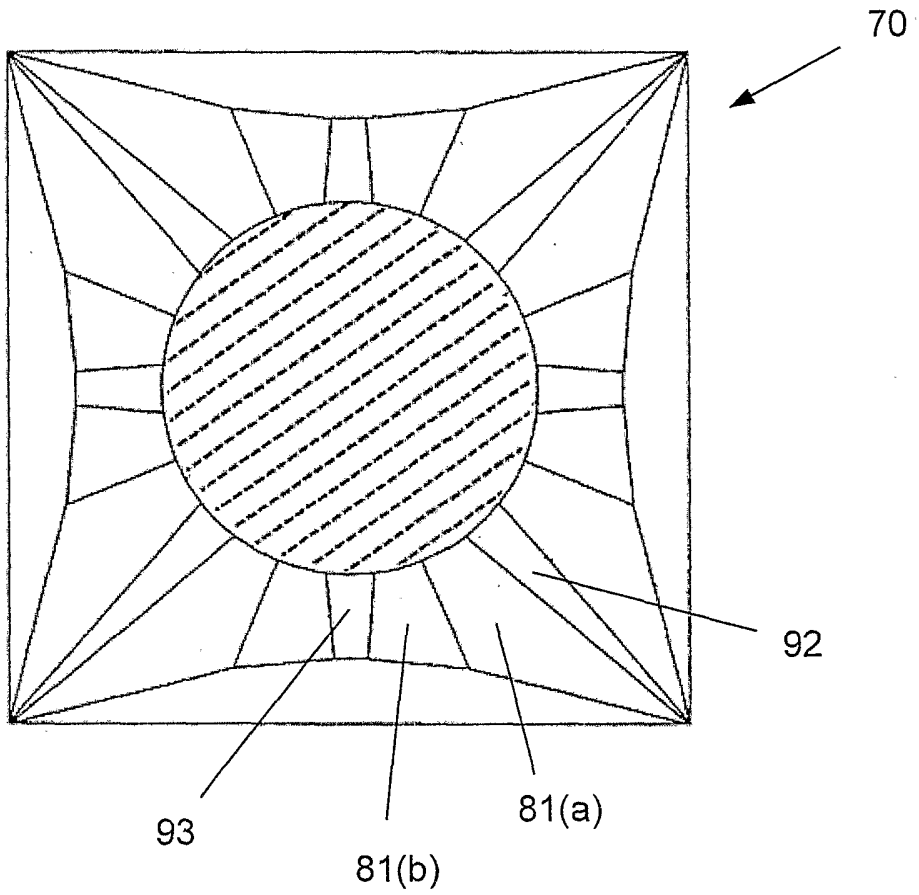


FIG. 14

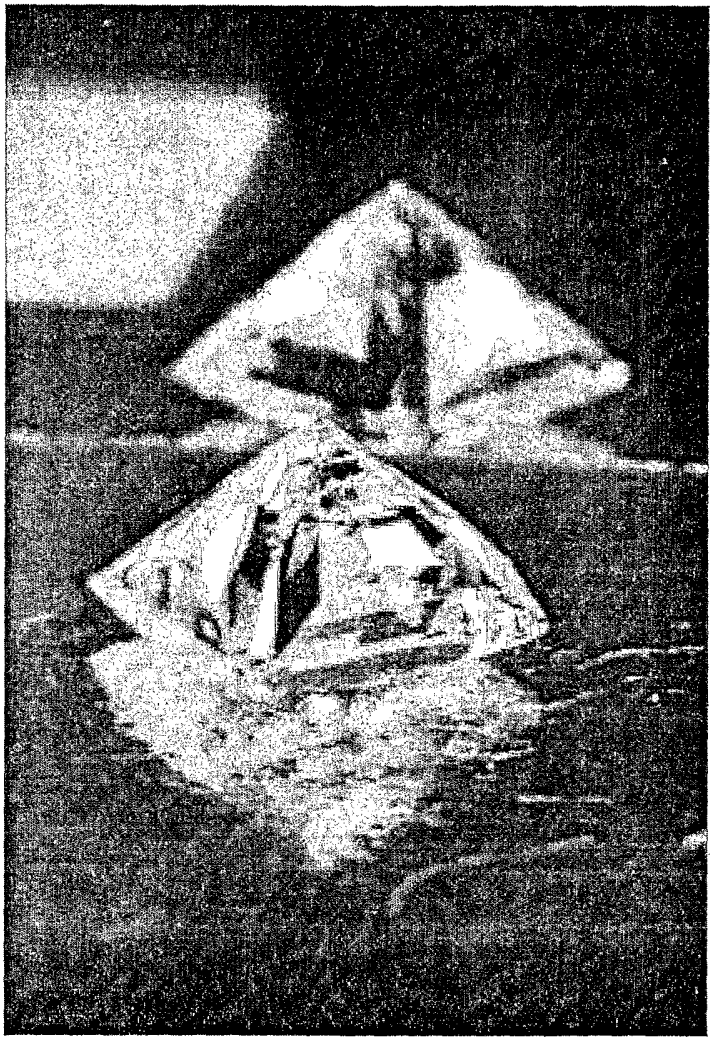


FIG. 15

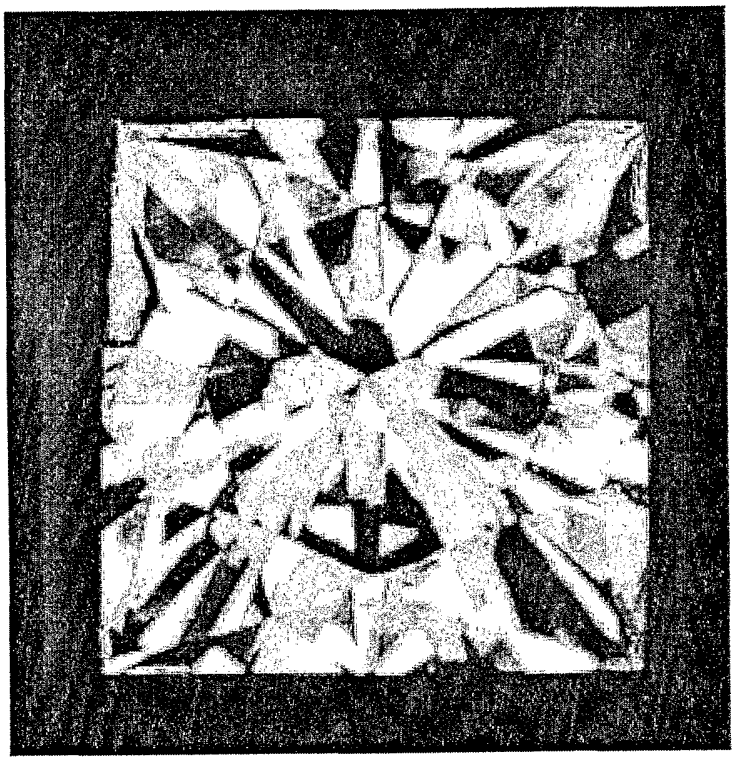


FIG. 16

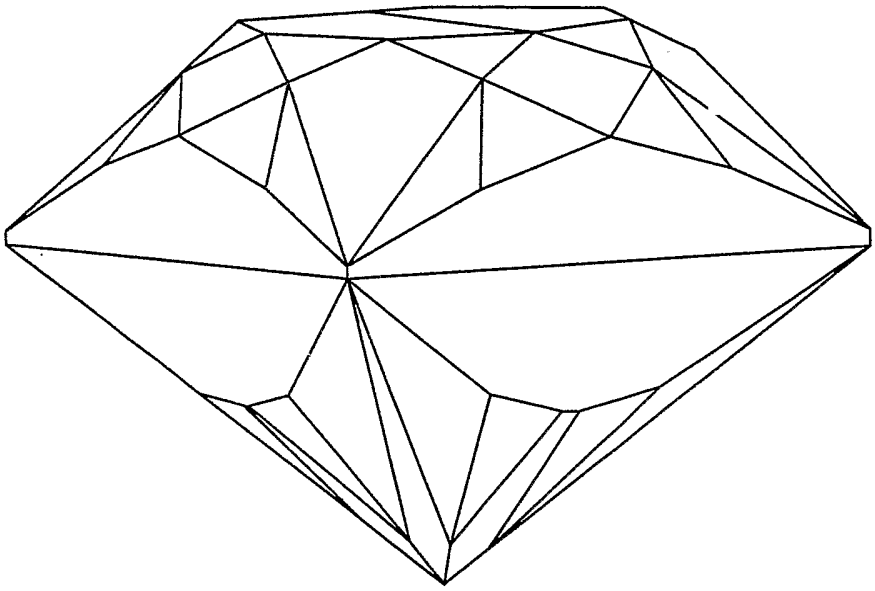


FIG. 17

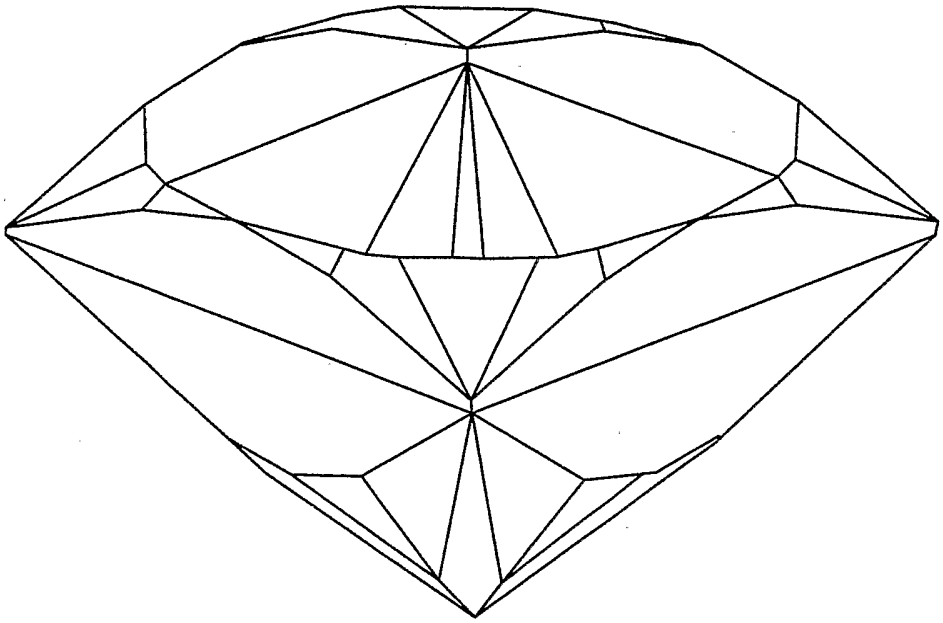


FIG. 18