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(57) **ABSTRACT**

A gem having a faceted crown which is inclined with respect to the main axis and which is defined on the one hand by a preferably flat table and on the other hand by a peripheral edge of the gem, and a faceted pavilion which is inclined with respect to the main axis and which adjoins the peripheral edge and which converges to a tip, wherein the facets (3) of the crown (2) are all inclined at the same crown angle (β) with respect to the main axis (1), while the facets (7, 7') of the pavilion (6) are inclined at two different pavilion angles (α_1, α_2) with respect to the main axis (1), wherein the facets (7) of the pavilion (6) which are inclined at a first pavilion angle (α_1) extend to the peripheral edge (5) and the facets (7') of the pavilion (6) which are inclined at a second pavilion angle (α_2) start from the tip (8) without reaching the peripheral edge (5).

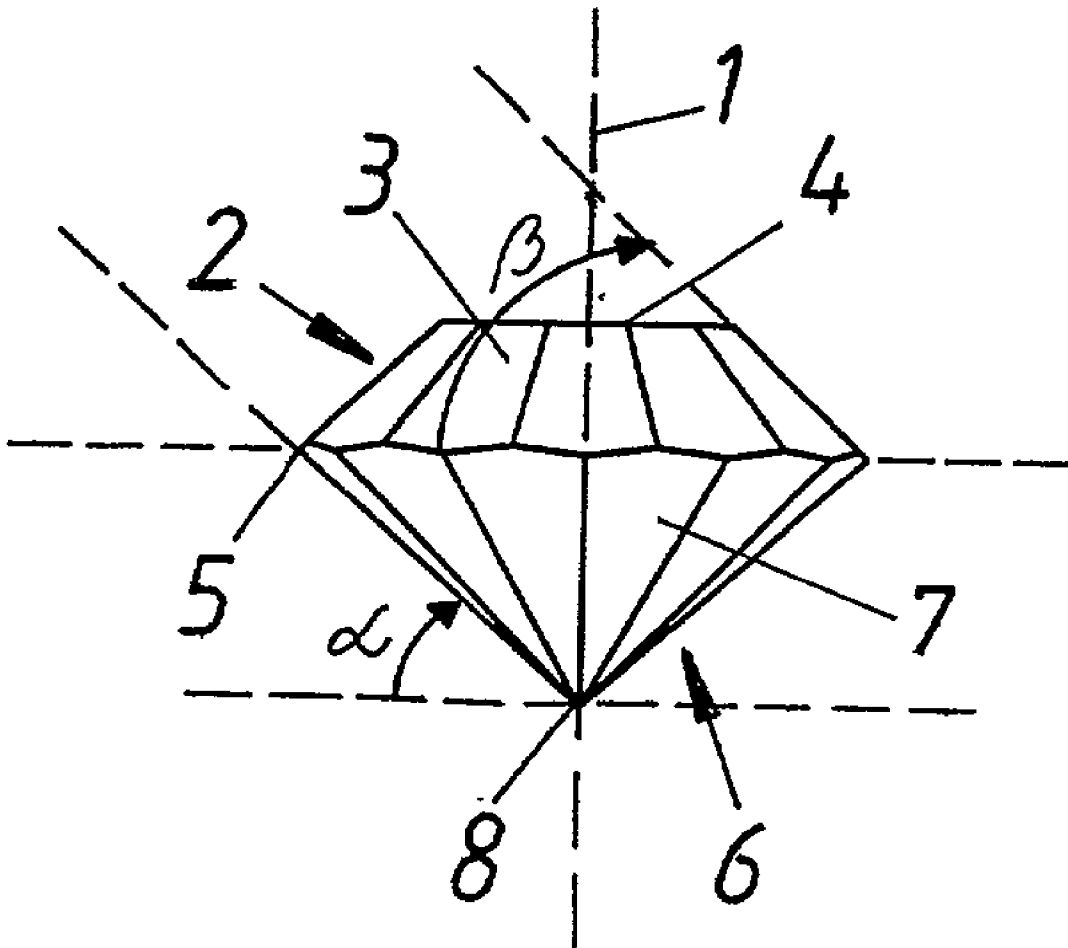


Fig. 1a

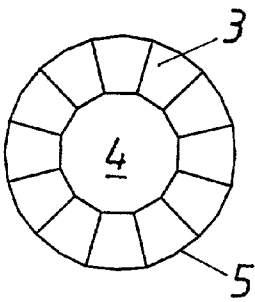


Fig. 1b

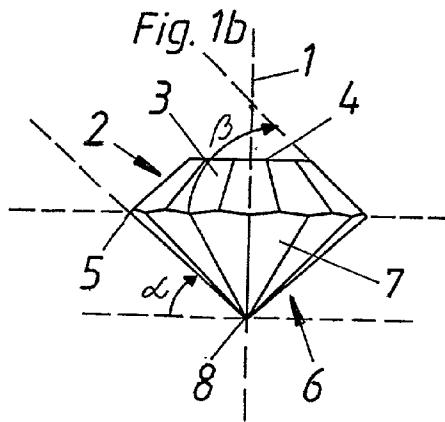


Fig. 1c

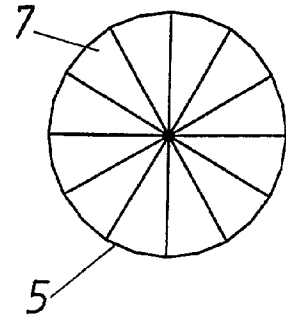


Fig. 2a

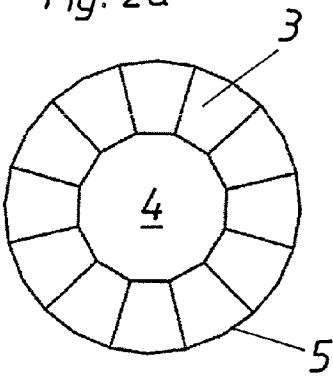


Fig. 2b

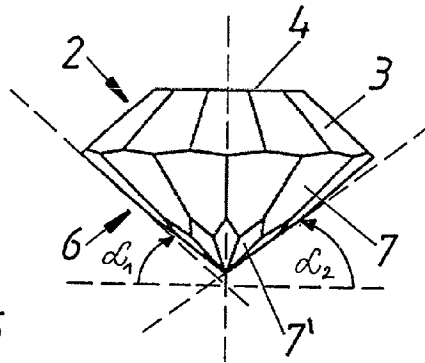


Fig. 2c

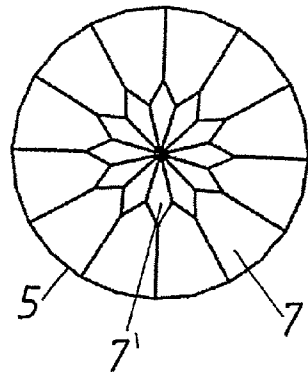


Fig. 3a

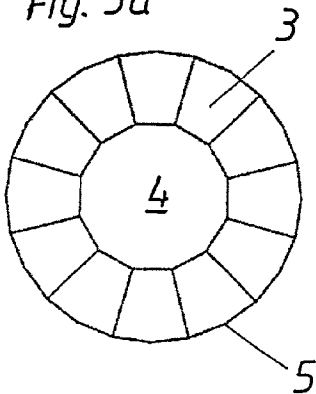


Fig. 3b

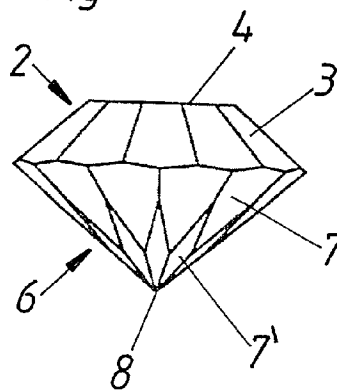
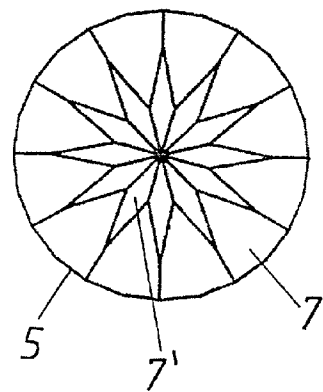
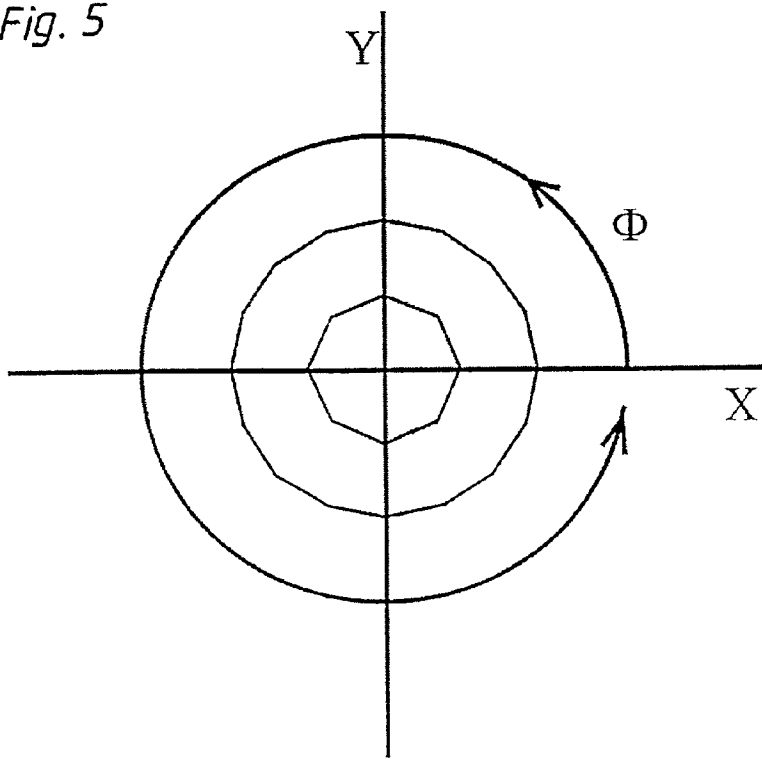
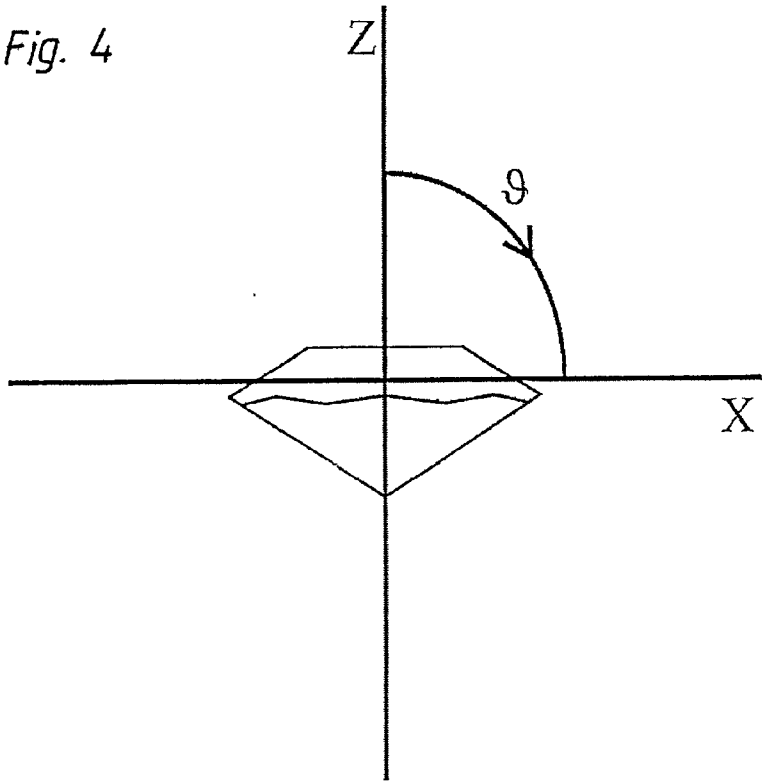
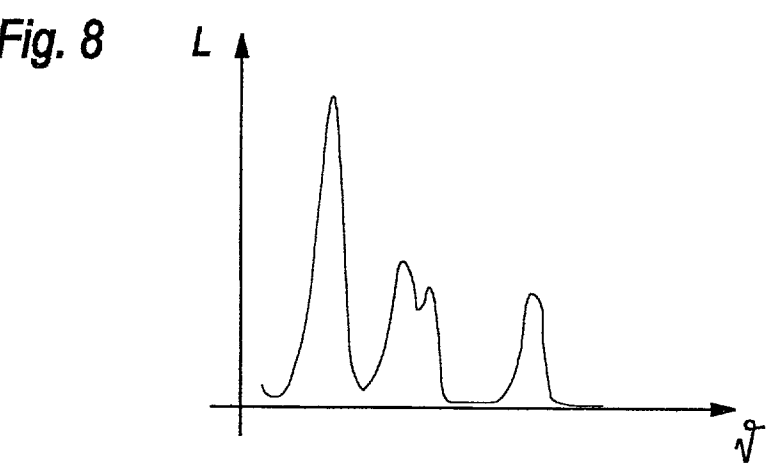
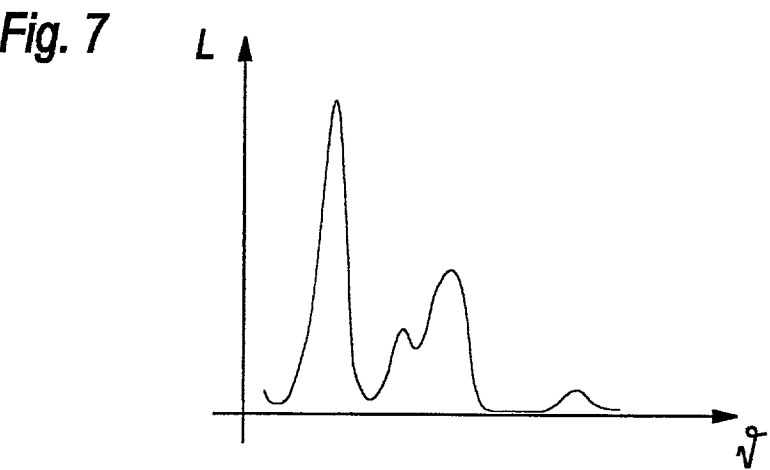
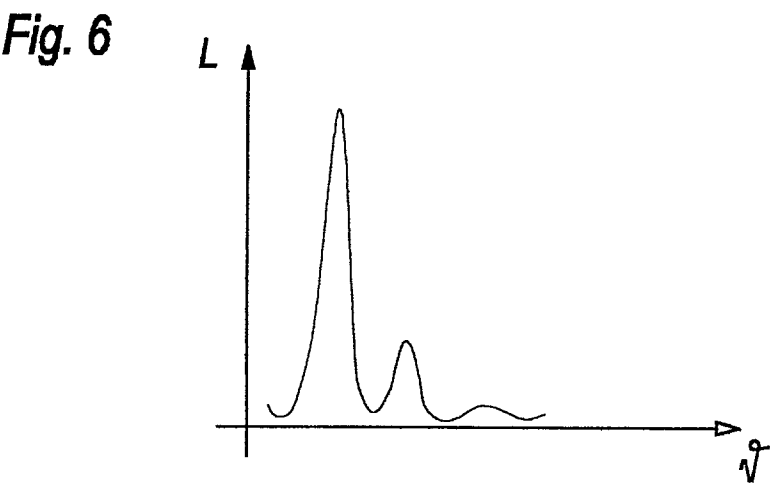


Fig. 3c







GEM

[0001] The invention concerns a gem having a faceted crown which is inclined with respect to the main axis and which is defined on the one hand by a preferably flat table and on the other hand by a peripheral edge of the gem, and a faceted pavilion which is inclined with respect to the main axis and which adjoins the peripheral edge and which converges to a tip.

[0002] In the case of artificial gems, in particular of glass, there is from time to time an interest in achieving a reflection characteristic which radiates in as wide-spread a fashion as possible, when there is central illumination on to the table.

[0003] In order to achieve that, the invention proposes that the facets of the crown are all inclined at the same crown angle with respect to the main axis while the facets of the pavilion are inclined at two different pavilions angles with respect to the main axis, wherein the facets of the pavilion which are inclined at a first pavilion angle extend to the peripheral edge and the facets of the pavilion which are inclined at a second pavilion angle start from the tip without reaching the peripheral edge.

[0004] The applicants' measurements have shown that a widening of the reflection characteristics can be achieved by cutting a second pavilion angle, that is to say a second layer of facets, which are inclined at a shallower angle with respect to the main axis. Upon central illumination in the direction of the main axis on to the table therefore relevant levels of radiation intensity are still to be expected even at relatively large angles with respect to the main axis.

[0005] It has proven to be particularly advantageous if the facets of the pavilion which are inclined at the second pavilion angle, in a view from below directed on to the tip of the gem, extend radially over a distance of between 25% and 75% of the projected tip-peripheral edge spacing (grinding depth of the second layer of between 25% and 75%).

[0006] A further alternative configuration of the invention is characterised in that the facets of the crown are all inclined at the same crown angle with respect to the main axis while the facets of the pavilion are inclined at two different pavilion angles with respect to the main axis, wherein the facets of the pavilion which are inclined at a first pavilion angle extend to the peripheral edge and the facets of the pavilion which are inclined at a second pavilion angle start from the tip, wherein the crown angle is between 40° and 44°, preferably about 42°, the first pavilion angle is between 40° and 44°, preferably about 42°, and the second pavilion angle is between 32° and 36°, preferably about 34°.

[0007] Further advantages and details of the invention are described in greater detail with reference to the specific description hereinafter.

[0008] FIGS. 1a, 1b and 1c show a 12-facet gem (chaton) in accordance with the state of the art, which has a single-layer crown and a single-layer pavilion.

[0009] FIGS. 2a, 2b and 2c show an embodiment of a gem (chaton) according to the invention, having a second pavilion layer with a 50% grinding depth.

[0010] FIGS. 3a, 3b and 3c show a further embodiment of a gem according to the invention with a second pavilion layer with a grinding depth of 75%.

[0011] **FIG. 4** shows measurement of the height angle theta,

[0012] FIG. 5 shows measurement of the width angle phi,

[0013] FIGS. 6, 7 and 8 each show diagrammatic representations of the reflected light strength in dependence on the height angle theta with a constant angle phi=0, wherein FIG. 6 concerns a gem according to the state of the art as shown in Figures 1a, 1b and 1c, FIG. 7 shows a gem according to the invention as shown in FIGS. 2a, 2b and 2c and FIG. 8 concerns a gem according to the invention as shown in FIGS. 3a, 3b and 3c.

[0014] The gems illustrated in the Figures are of the type of a so-called chaton.

[0015] The 12-facet chaton shown in Figures 1*a*, 1*b* and 1*c* has a crown **2** with twelve facets **3**, which is inclined with respect to the main axis **1** and which is delimited by a flat table **4**. Adjoining the peripheral edge **5** which can also be in the form of a girdle bevelled parallel to the main axis **1** is the pavilion **6** which also has twelve facets **7** which converge to a tip **8**. The crown angle is denoted by β and the pavilion angle by α .

[0016] A 12-facet chaton as shown in Figures 1a, 1b and 1c gives, for a width angle ϕ 0 in dependence on the height angle θ a reflection characteristic as is shown approximately in FIG. 6.

[0017] An increase in the width of that reflection characteristic, that is to say relevant levels of light intensity with greater angles theta, can be achieved if, in accordance with the invention, there is ground in from the tip 8 a second layer of facets with a second pavilion angle, as is shown by **FIGS. 2a, 2b, 2c and 3a, 3b and 3c**. The crown 2 of the gem according to the invention is in that respect of the same configuration as in the state of the art, that is to say of a single-layer configuration with a single crown angle β of the facets 3 with respect to the main axis 1.

[0018] Now, in accordance with the invention, on the pavilion 6, there are twelve facets 7 which are inclined at the pavilion angle α_1 with respect to the main axis 1. In addition there are twelve further facets 7' which are inclined at a second shallower pavilion angle α_2 with respect to the main axis 1 and which are ground in from the tip 8 but without reaching the peripheral edge 5.

[0019] In the embodiment shown in FIGS. 2a, 2b and 2c the facets 7', in the view from below directed on to the tip 8 of the gem, as in FIG. 2c, extend radially outwardly over a distance of 50% of the projected tipperipheral edge spacing. Reference is made here to a grinding depth of the second layer of 50%.

[0020] Such a gem in accordance with the invention, as shown in **FIGS. 2a, 2b and 2c**, affords a reflection characteristic as is shown approximately in **FIG. 7**. In comparison with **FIG. 6**, there are light components with greater theta angles, that is to say a distribution of light which radiates more widely.

[0021] FIGS. 3a, 3b and 3c show an embodiment of a gem according to the invention with a grinding depth of 75%. That affords the light distribution approximately as shown in FIG. 8.

[0022] In accordance with a variant of the invention there is provided a gem in which the crown angle β is between 40° and 44° , preferably being about 42° . The first pavilion angle α_1 is desirably between 40° and 44° , preferably being about 42° , while the second pavilion angle α_2 is between 32° and 36° , preferably being about 34° . With those angles, particularly in the case of a gem of ground glass with a refractive index of between 1.50 and 1.65, the reflection characteristic is good and radiates widely.

[0023] It will be appreciated that the invention is not limited to the embodiments illustrated by way of example, for example the number of facets may differ. Even numbers of facets 8, 12 or 16 have proven to be preferable. In principle however other numbers of facets, in particular odd numbers of facets, are certainly conceivable and possible. The number of facets of the crown on the one hand and the pavilion on the other hand also do not necessarily have to be the same, although an identical number of facets in the crown of the first pavilion angle and the second pavilion angle has been found to be advantageous.

1. A gem having a faceted crown which is inclined with respect to the main axis and which is defined on the one hand by a preferably flat table and on the other hand by a peripheral edge of the gem, and a faceted pavilion which is inclined with respect to the main axis and which adjoins the peripheral edge and which converges to a tip, characterised in that the facets of the crown are all inclined at the same crown angle (β) with respect to the main axis, while the facets of the pavilion are inclined at two different pavilion angles (α_1 , α_2) with respect to the main axis, wherein the facets of the pavilion which are inclined at a first pavilion angle (α_1) extend to the peripheral edge and the facets of the pavilion which are inclined at a second pavilion angle (α_2) start from the tip without reaching the peripheral edge.

2. A gem as set forth in claim 1, characterised in that the number of facets of the crown, the number of facets at the first pavilion angle (α_1) and the number of facets at the second pavilion angle (α_2) are the same and preferably 8, 12 or 16.

3. A gem as set forth in claim 1, characterised in that the facets of the pavilion which are inclined at the second pavilion angle (α_2), in a view from below directed on to the tip of the gem, extend radially over a distance of between 25% and 75% of the projected tip-peripheral edge spacing.

4. A gem as set forth in claim 1, characterised in that it comprises ground glass.

5. A gem as set forth in claim 4, characterised in that the refractive index of the glass is between 1.50 and 1.65.

6. A gem having a faceted crown which is inclined with respect to the main axis and which is defined on the one hand by a preferably flat table and on the other hand by a peripheral edge of the gem, and a faceted pavilion which is inclined with respect to the main axis and which adjoins the peripheral edge and which converges to a tip, characterised in that the facets of the crown are all inclined at the same crown angle (β) with respect to the main axis, while the facets of the pavilion are inclined at two different pavilion angles (α_1 , α_2) with respect to the main axis, wherein the facets of the pavilion which are inclined at a first pavilion angle (α_1) extend to the peripheral edge and the facets of the pavilion which are inclined at a second pavilion angle (α_2) start from the tip, wherein the crown angle (β) is between 40° and 44° , preferably about 42° , the first pavilion angle (α_1) is between 40° and 44° , preferably about 42° , and the second pavilion angle (α_2) is between 32° and 36° , preferably about 34° .

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