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(54) METHOD TO CREATE THREE DIMENSIONAL IMAGE INSIDE STONE

VERFAHREN ZUR HERTSELLUNG EINES DREIDIMENSIONALEN BILDES IN EINEM STEIN

PROCÉDÉ POUR PRODUIR UNE IMAGE 3-D DANS UNE GEMME

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Description

The Related Art

[0001] The invention relates to a method for creation of image inside transparent stones.

[0002] The invention particularly relates to a method for creation of various figures in three dimensions in inner parts of precious stones and/or accessories used in jewellery.

Background of the Related Art

[0003] Processing embodiments inside and on various stones have been realized in order to create images from different designs, pictures and figures in inner parts of transparent stones. The said processing is made by means of designs and colouring coating made on the stone in the simplest way. Another embodiment relates to processes conducted inside transparent stones. Processing the inner part of the stone to give image outside is another applied method. The said method has some problems in terms of application. Cutting inner part of the stone brings the risk of damaging the stone. There are always risks such as breaking or weakening of the stone during removal of inner part of the stone. Processing the inner part of the stone is not easy by use of modern processing members either. One of the said applications is disclosed under patent application numbered TR200607117 entitled "process for sculpture processing in stone". The said application discloses a process containing curving the inner part of the stone and removal of it by use of special methods and filling the space by filling material after painting thereof. The steps of process consisting of 3 steps obtaining a space by means of eroding the lower part of the jewellery stone by use of mechanical method as required by the desired architecture, leaving the eroded and spaced shape as it is in the simple manner or painting in colours by appropriate paint, and filling the space areas of the stone of which painting has been completed, by use of a filling material of hardness close to hardness of the stone.

[0004] The said art and applications are for forming a two dimensional image in or on the stone. The known technical applications do not allow to create three dimensional image on or in the stone. Upon development of imaging technologies, capability to create three dimensional images has become alternative to two dimensional images not having depth. Creating three-dimensional image on or in the stone enables giving an effect much closer to the real effect of accessories and is one of the factors determining the preference of consumer. In order to create three-dimensional image and depth, gradual curving in the stone outward is conducted and thus 3-dimensional image can be created. Although it is no so close to the real appearance, the depth can be provided. Even it is likely to create this image for one single member, when images of objects independent of each other are, the gradual curving remains inadequate.

[0005] US 6 003 228 discloses a method of forming a three-dimensional image inside a transparent stone comprising the process steps of:

- curving the inner side of the stone (col.7, l.25-38), forming a space and leaving an outer shell,
- connecting at least one three-dimensional object to an inward facing surface of the stone and closing the lower part of the stone (col.10, l.12-34, fig.16,17).

[0006] In order to eliminate the said disadvantages, it is aimed to produce jewellery accessories having three-dimensional effect.

Purpose of the Invention

[0007] From the current status of the related art, the purpose of the invention is to eliminate the existing disadvantages by means of improvements made in manufacturing methods used for creation of various three-dimensional figures in inner parts of the precious stones and/or accessories used particularly in jewellery.

[0008] Another purpose of the invention is to disclose a stone processing method for image details of real like image which are connected to the desired part of any jewellery and decorative properties such as ring, bracelet, necklace, earrings, brooch and cuff links. A further purpose of the invention is to enhance visual depth. Another purpose of the invention is to provide visual effect of figures, shapes, pictures, designs closer to real.

[0009] Another purpose of the invention is to provide complex figures having different details. A further purpose of the invention is to provide coloured and non-coloured images. Thus various alternatives in jewellery have been provided. Therefore, process of figures not intended to be applied in jewellery accessories has been provided. Use of foreign material has been prevented by means of providing design on the stone in this way. Thus, decrease in value of jewellery accessories has been prevented.

[0010] In order to achieve the said purposes, it is a method for creation of three-dimensional image in transparent stones used as jewellery and accessories in particularly jewellery and precious stones sector.

[0011] The invention is defined by the appended claims.

[0012] A preferred embodiment of the invention is a method for creation of three-dimensional image in the said transparent stone and it comprises process steps of curving the inside of the said transparent stone, forming space therein and providing an outer shell, making at least one designing on the surface of the said outer shell facing inside, making at least one transparent fill layer on the surface of the said outer shell facing inward, making at least one designing on the surface of the said filling layer facing inward, repeating one under the other the designing and filling layer designing as per the design on the surface of the said filling layer facing inward, connecting a at least one three-dimensional object to the inward facing surface of the filling layer at the very bottom, and closing the lower part of the stone.

Description of Figures

[0013]

Figure-1a ; Is a general view of an illustrative stone with processed inner side of the stone.

Figure-1b ; Is a section view of the curved form of the stone in illustrative embodiment shown in Figure 1a.

Figure-1c ; Is a section view of the curved form of the stone and covered with a layer in illustrative embodiment shown in Figure 1 b.

Figure -1d ; Is a section view of the form of stone comprising processed layers of the inner part in illustrative embodiment shown in Figure 1c.

Figure -2a ; Is a general view of the stone and three-dimensional object connected thereto in illustrative embodiment shown in Figure 1 a.

Figure -2b ; Is a sectional view of the stone with space therein and three-dimensional object therein in illustrative embodiment shown in Figure 1b.

Figure -2c ; Is a sectional view of filling and three-dimensional object applied to the stone with space in illustrative embodiment shown in Figure 2b.

Figure -2d ; Is a sectional view of three-dimensional object applied to the stone with inside filling and processed in illustrative embodiment shown in Figure 1c.

Figure -2e ; Is a sectional view of three-dimensional object with filling in outer surface and processed and connected to the stone with inside filling and processed in illustrative embodiment shown in Figure 1d and 1e.

Figure -2f ; Is a sectional view of three-dimensional object with filling in inner surface and processed and connected to the stone with inside filling and processed in illustrative embodiment shown in Figure 1d and 1e.

Reference Numbers

1	Stone	5	Three-dimensional object
1.1	Outer shell	5.1	Space
2	Filling layer	5.2	Filling inner figure
3	Engraving	5.3	Filling outer figure
4	Relief		

Detailed Description of the Invention

[0014] The application shown in figures of the invention relates to a manufacturing method used for creation of various figures in three dimensional in inner parts of precious stones and/or accessories used in jewellery.

[0015] The manufacturing processes of the method to form a three-dimensional image inside the transparent stone (1) shown in Figures -1a, 1b, 1c and 1 d are as follows.

The manufacturing process comprises process steps of curving the inside of the transparent stone (1), forming a space therein and providing an outer shell (1.1), making at least one first designing on the surface of the said outer shell (1.1) facing the inside, making at least one transparent filling layer (2) on the surface of the said outer shell (1.1) facing inward, making at least one second designing on the surface of the said filling layer (2) facing inward, repeating one under the other the designing and filling layer (2) designing as per the design on the surface of the said filling layer (2) facing inward, connecting one three-dimensional object (5) to the inward facing surface of the filling layer (2) at the very bottom, and closing the lower part of the stone (1) to complete the manufacturing. The three-dimensional object (5) applied to inner part of the space (5.1) can be provided in the convenient different colour and image designs as per the stone (1).

[0016] The first designing process may be an engraving (3) formed by means of curving on the inward facing surface of the outer shell (1.1) (Figure 1c). The first designing process may be a relief (4) formed by means of embossing on the inward facing surface of the outer shell (1.1) Figure 1c).

[0017] The second designing process may be an engraving (3) formed by means of curving on the inward facing surface of the filling layer (2). The second designing process may be a relief (4) formed by means of embossing on the inward facing surface of the filling layer (2). Relief (4) may be a painting layer forming thickness and colour on the inside surface of the outer shell.

[0018] Figure 2a and Figure 2b show a different non-claimed manufacturing method wherein three-dimensional object (5) of three dimensional image has been provided in the stone (1).

The transparent stone (1) shown in Figures-2a, 2b, 2c and 2d, is formed by curving of the inner side thereof, forming space and leaving an outer shell (1.1), making a transparent filling layer (2) on the inner facing surface of the outer shell (1.1) and connection of a three-dimensional object (5) onto inward facing surface of the filling layer (2). The three-dimensional object (5) is a three-dimensional figure.

[0019] The three-dimensional object (5) shown in Figures 2d, 2e and 2f can complete the figures located in the stone (1) upon subjecting it to various processes. The process steps of the method shown in Figures 2b and 2f comprises curving of the inner side of the three-dimensional object (5), forming space (5.1), making a filling inner figure (5.2) on the inner surface of the three-dimensional object (5), making the transparent filling layer (2) on the inner surface of the three-dimensional object (5) and connection of three-dimensional object (5) with processed inner part to the inner surface of the outer shell (1.1). When forming figure in the inner part of the three-dimensional object (5), three-dimensional object (5) is designed from transparent material. The space (5.1) is reinforced by means of a filling material and lower surface of the stone (1) is covered. The filling applied to inner part of the space (5.1) can be provided in the convenient different colour and image designs as per the stone (1).

[0020] The three-dimensional object (5) shown in Figures 2a and 2e can complete the figures located in the stone (1) upon subjecting it to various processes. The sequence of process steps comprises respectively making a filling outer figure (5.3) on outer surface of the three-dimensional object (5), making a transparent filling layer (2) on the outer surface of the three-dimensional object (5), connection of the three-dimensional object (5) covered on the inner surface of the outer shell (1.1).

[0021] A method for forming a three-dimensional image inside a transparent stone (1) is characterized in that the filling layer (2) is a transparent material which can be processed to create depth.

[0022] The steps of the method shown in Figures-1a, 1b, 1c and 1d

After the stone is provided with a space with a desired depth from lower part of the stone (Figure 1 b), relief is curved in the formed space onto inner walls. After painting the curved figures and coating agent is applied, new engraving is made as the second layer on this coating and then painted. A 3-dimensional depth is provided to the architecture and engraving inside the stone by applying the processes several times.

[0023] The method is shown in Figures-1a, 1b, 1c and 1d generally comprises 3 steps.

At step 1, the jewellery is emptied by method of mechanical eroding at the convenient size and depth from lower part of the stone (Figures 1-b, 2b).

At step 2, a desired object (three-dimensional object (5)) is located inside the stone (Figures 2d, 2e, 2f).

At step 3, a transparent filling material (filling layer (2)) appropriate to the colour and features of the stone (1) is filled in the space remaining after location of object (three-dimensional object (5)). (Figure 2c).

[0024] Process steps comprises process of the stone (1), curving of the inside as convenient for the figure, painting the inside of the curving appropriate to the figure, and filling the curving in a manner supporting the curving.

[0025] The basic application in forming three-dimensional image is to create original image of any figure. A negative figure is formed inside the stone (1). A negative eroding is made in the inner surface of the stone (1). Thus space is provided by eroding. The eroding is preferably performed by hand because of sensitivity. Thus the curving is realized. The limits of the inner volume are removed as much as possible and is used. The inside of the stone (1) is emptied in a manner the outer shell (1.1) remains.

In an illustrative application of the invention,

[0026] By means of curving from one edge inward of a precious and/or side precious stone (1) for instance, amethyst colour quartz, tourmalines, citrine, topaz aquamarines etc. by use of digging curving tools, the inside thereof is removed in a manner only one thin outer shell (1.1) remains on other edges. After completion of removing the inside by curving, any portrait, scene, religious symbol, word, devil eye symbol, shape, figure, pattern, picture etc. is drawn on the inner surfaces of the stone turned into a lantern by use of any paint and brushes. The painted picture forms the top coating of the work performed inside the stone. Then the inner surface of the outer shell (1.1) is coloured by dye. A desired image is provided to the inner part by engraving (3) or relief (4). The relief (4) can be provided by painting (Figure 1c). Depth can be provided by applying filling layer (2) as required by the figure details. Filling layers (2) are applied in an order. Integrity is provided by performing engraving (3) on the filling layers (2) or colouring layers. Processing different images and painting (relief (4)) on each filling layer (2) is carried out. Gradual image is provided by means of creating image on each filling layer (2). The filling layers (2) connected to each other are displayed by various shading (Figure-1d).

[0027] Among examples of figures made are birds flying over each other, flying butterflies, birds on a building and flying birds over a building, a home seen through an open window, imam at reading desk in a mosque, home view through an open window or dragon which can been imaged easily. It can be said that a kind of pictures over each other is made by means of the created images.

[0028] By filling the space remaining in the inner part of the stone (1) of which inner part is processed and shaped with layers, the process is completed. Support is provided by mine and a similar stone as three-dimensional object (5) (Figure-2b).

[0029] The stone (1) to be processed can be transparent or opaque/mat colour as required by the design. The stone (1) material can be different mineral stone, glass. The process can be made to any types of stone (1). Curving technique depending on type of stone can be made by painting and filling technique.

[0030] In a different application, the figure can be located not in the form of a picture but as a processed material in the stone (1) such as a three-dimensional object (5) without curving. In other words, the figure can be located to lower base of the transparent stone (1) by means of a three-dimensional object (5). Or it can be supplemented with layer inside the stone (1) by processing a part of the figure on the three-dimensional object (5). The three-dimensional object (5) can also be a precious stone. The inner surface of the three-dimensional object (5) can also be processed.

[0031] Shaped stone (1) is inserted or fixed into jewellery and used. The products with coloured or non-coloured inside negative sculpture and decorated with stones formed according to the above description is attached to desired part of any jewellery and decorative belongings such as rings, bracelet, necklace, ear-rings, broche, cuff links by use of any fixing and adhering processes.

[0032] The invention cannot be limited to the illustrative embodiments given under this section. Alternative embodiments can be developed by persons skilled in the related art.

Claims

1. A method to form a three-dimensional image inside transparent stone (1) comprising the following process steps:

   - curving of the inner side of the said transparent stone (1), forming a space and leaving an outer shell (1.1),
   - making at least one first designing onto the inward facing surface of the said outer shell (1.1),
   - making at least one transparent filling layer (2) onto the inward facing surface of the said outer shell (1.1),
   - making at least one second designing onto the inward facing surface of the said filling layer (2),
   - repeating one under the other of the designing and filling layer (2) designing on the inward facing surface of the said filling layer (2) as per the design,
   - connecting at least one three-dimensional object (5) to the inward facing surface of the said filling layer (2) at the very bottom, and closing the lower part of the stone (1).

2. A method for creating a three-dimensional image inside a transparent stone (1) according to claim 1 wherein the said first designing process is at least a engraving (3) formed on the inward facing surface of the said outer shell (1.1) by curving.

3. A method for creating a three-dimensional image inside a transparent stone (1) according to any one of the above claims wherein the said first designing process is at least a relief (4) formed on the inward facing surface of the said outer shell (1.1) by embossing.

4. A method for creating a three-dimensional image inside a transparent stone (1) according to any one of the above claims wherein the said second designing process is at least a relief (3) formed on the inward facing surface of the said filling layer (2) by curving.

5. A method for creating a three-dimensional image inside a transparent stone (1) according to any one of the above claims wherein the said second designing process is at least a relief (4) formed on the inward facing surface of the said filling layer (2) by embossing.

6. A method for forming a three-dimensional image inside a transparent stone (1) according to any one of the above claims wherein a relief (4) is a paint coating forming thickness and colour on the inside surface of said outer shell.

Patentansprüche

1. Verfahren zur Bildung eines dreidimensionalen Bilds im Inneren eines durchsichtigen Steins (1), umfassend die folgenden Prozessschritte:

   - Schnitzen der Innenseite des durchsichtigen Steins (1), wobei ein Raum gebildet wird und eine Außenhülle (1.1) zurückbelassen wird,
   - Herstellen wenigstens einer ersten Gestaltung an der einwärts gewandten Fläche der Außenhülle (1.1),
   - Herstellen wenigstens einer durchsichtigen Füllschicht (2) an der einwärts gewandten Fläche der Außenhülle (1.1),
   - Herstellen wenigstens einer zweiten Gestaltung an der einwärts gewandten Fläche der Füllschicht (2),
   - Wiederholen der Gestaltung und der Gestaltung der Füllschicht (2) an der einwärts gewandten Fläche der Füllschicht (2) untereinander je nach der Ausgestaltung,
   - Verbinden wenigstens eines dreidimensionalen Objekts (5) mit der einwärts gewandten Fläche der Füllschicht (2) an der untersten Seite und Schließen des unteren Teils des Steins (1).

2. Verfahren zur Erzeugung eines dreidimensionalen Bilds im Inneren eines durchsichtigen Steins (1) nach Anspruch 1, wobei der erste Gestaltungsprozess wenigstens eine Gravur (3) ist, die durch Schnitzen an der einwärts gewandten Fläche der Außenhülle (1.1) gebildet wird.

3. Verfahren zur Erzeugung eines dreidimensionalen Bilds im Inneren eines durchsichtigen Steins (1) nach einem der obigen Ansprüche, wobei der erste Gestaltungsprozess wenigstens ein Relief (4) ist, dass durch Prägen an der einwärts gewandten Fläche der Außenhülle (1.1) gebildet wird.

4. Verfahren zur Erzeugung eines dreidimensionalen Bilds im Inneren eines durchsichtigen Steins (1) nach einem der obigen Ansprüche, wobei der zweite Gestaltungsprozess wenigstens ein Relief (4) ist, das durch Schnitzen an der einwärts gewandten Fläche der Füllschicht (2) gebildet wird.

5. Verfahren zur Erzeugung eines dreidimensionalen Bilds im Inneren eines durchsichtigen Steins (1) nach einem der obigen Ansprüche, wobei der zweite Gestaltungsprozess wenigstens ein Relief (4) ist, das durch Prägen an der einwärts gewandten Fläche der Füllschicht (2) gebildet wird.

6. Verfahren zur Bildung eines dreidimensionalen Bilds im Inneren eines durchsichtigen Steins (1) nach einem der obigen Ansprüche, wobei ein Relief (4) eine Farbschicht an der Innenfläche der Außenhülle ist, die Dicke und Farbe bildet.

Revendications

1. Procédé de formation d'une image tridimensionnelle à l'intérieur d'une pierre transparente (1), comprenant les étapes de procédé suivantes :

   - incurver la face intérieure de la pierre transparente (1), formant un espace et lassant une enveloppe extérieure (1.1),
   - réaliser au moins un premier marquage sur la surface tournée vers l'intérieur de l'enveloppe extérieure (1.1),
   - réaliser au moins une couche de remplissage transparente (2) sur la surface tournée vers l'intérieur de l'enveloppe extérieure (1.1),
   - réaliser au moins un second marquage sur la surface tournée vers l'intérieur de la couche de remplissage (2),
   - répéter l'un sous l'autre le marquage et le marquage de la couche de remplissage (2) sur la surface tournée vers l'intérieur de la couche de remplissage (2) conformément au marquage,
   - relier au moins un objet tridimensionnel (5) à la surface tournée vers de la couche de remplissage (2), tout au bas, et fermer la partie inférieure de la pierre (1).

2. Procédé de création d'une image tridimensionnelle à l'intérieur d'une pierre transparente (1) selon la revendication 1, dans lequel le procédé de premier marquage est au moins une gravure (3) formée par une courbe sur la surface tournée vers l'intérieur de l'enveloppe extérieure (1.1).

3. Procédé de création d'une image tridimensionnelle à l'intérieur d'une pierre transparente (1) selon l'une quelconque

des revendications précédentes, dans lequel le procédé de premier marquage est au moins un relief (4) formé par gaufrage sur la surface tournée vers l'intérieur de l'enveloppe extérieure (1.1).

4. Procédé de création d'une image tridimensionnelle à l'intérieur d'une pierre transparente (1) selon l'une quelconque des revendications précédentes, dans lequel le procédé de second marquage est au moins un relief (4) formé par une courbe sur la surface tournée vers l'intérieur de la couche de remplissage (2).

5. Procédé de création d'une image tridimensionnelle à l'intérieur d'une pierre transparente (1) selon l'une quelconque des revendications précédentes, dans lequel le procédé de second marquage est au moins un relief (4) formé par gaufrage sur la surface tournée vers l'intérieur de la couche de remplissage (2).

6. Procédé de formation d'une image tridimensionnelle à l'intérieur d'une pierre transparente (1) selon l'une quelconque des revendications précédentes, dans lequel un relief (4) est un revêtement de peinture formant une épaisseur et une couleur sur la surface intérieure de l'enveloppe extérieure.

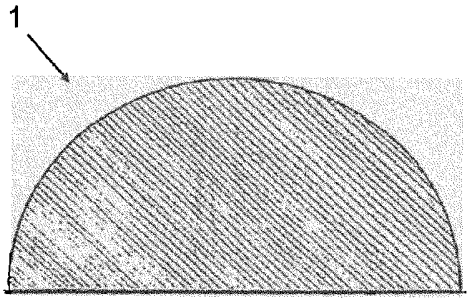

Figure - 1a

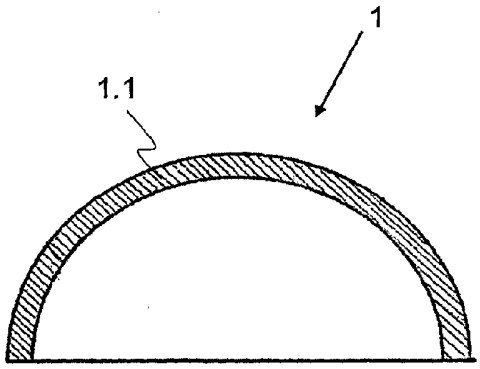

Figure - 1b

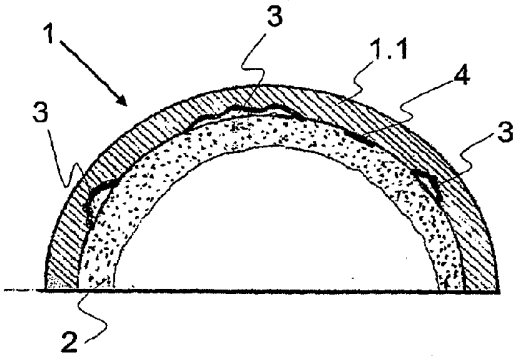

Figure - 1c

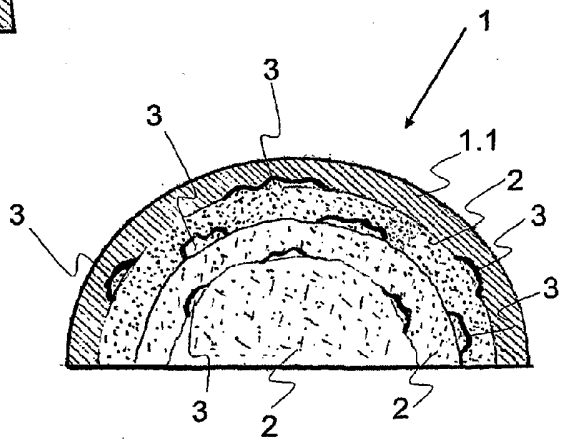

Figure - 1d

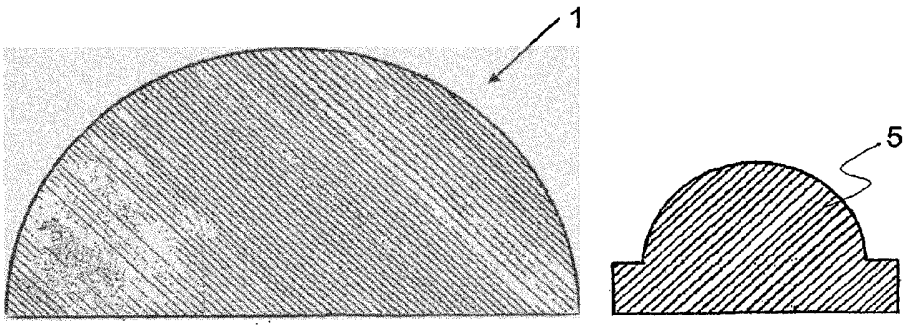

Figure -2a

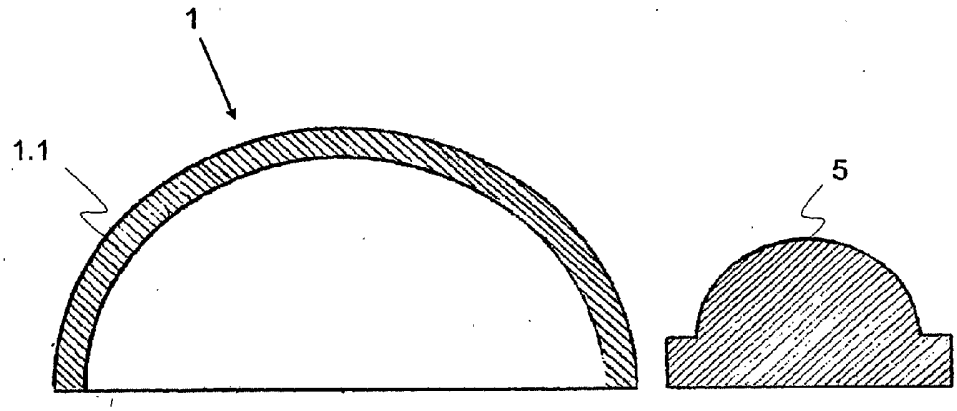

Figure - 2b

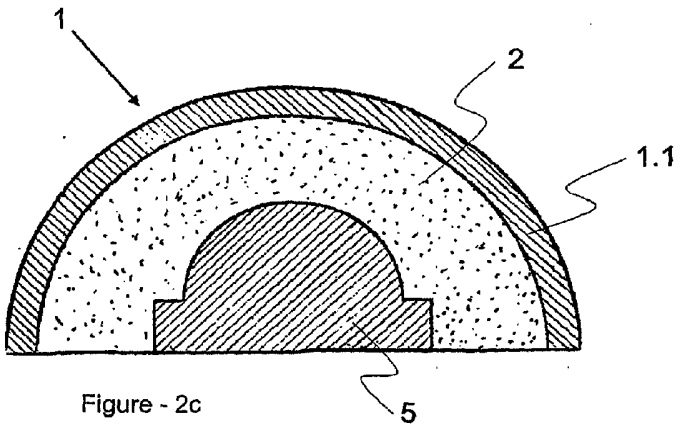

Figure - 2c

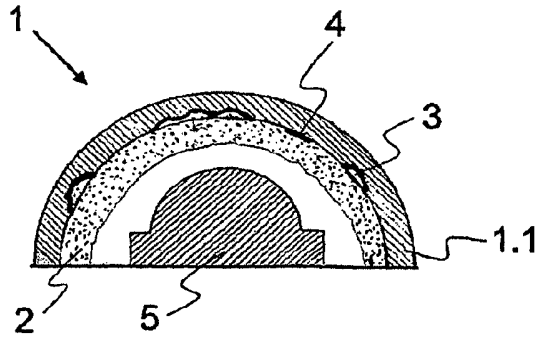

Figure - 2d

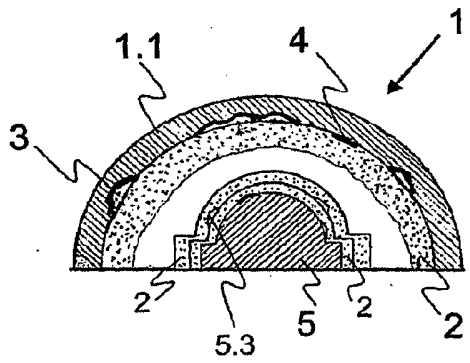

Figure - 2e

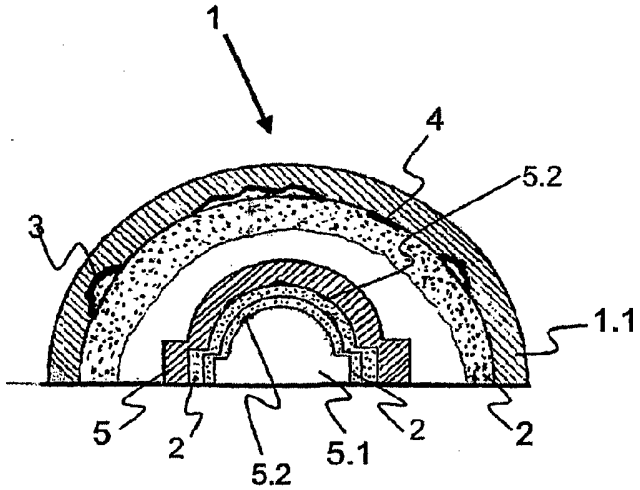

Figure - 2f

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- TR 200607117 **[0003]**
- US 6003228 A **[0005]**

ELJÁRÁS HÁROMDIMENZIÓS KÉP KÉSZÍTÉSÉRE EGY KŐ BELSEJÉBEN

Szabadalmi igénypontok

1. Eljárás egy háromdimenziós kép kialakítására egy átlátszó kő (1) belsejében, amely magában foglalja a következő eljárási lépéseket:
   - a nevezett átlátszó kő (1) belső oldalának görbe vonalú vésése, ahol kialakul egy tér és visszamarad egy külső burok (1.1),
   - legalább egy első szerkesztés készítése a nevezett külső buroknak (1.1) a befelé néző felületére,
   - legalább egy átlátszó kitöltő réteg (2) készítése a nevezett külső buroknak (1.1) a befelé néző felületére,
   - legalább egy második szerkesztés készítése a nevezett kitöltő rétegnek (2) a befelé néző felületére,
   - a szerkesztésnek és a kitöltő réteg (2) szerkesztésének megismétlése egymás alatt a nevezett kitöltő rétegnek (2) a befelé néző felületén a szerkesztés szerint,
   - legalább egy háromdimenziós objektum (5) összekapcsolása a nevezett kitöltő rétegnek (2) a befelé néző felületével a legalsó részen, és kő (1) alsó részének lezárása.
2. Eljárás egy háromdimenziós kép készítésére egy átlátszó kő (1) belsejében az 1. igénypont szerint, ahol a nevezett első szerkesztési eljárás legalább egy gravírozás (3), amely a nevezett külső buroknak (1.1) a befelé néző felületén van kialakítva görbe vonalú vésés révén.
3. Eljárás egy háromdimenziós kép készítésére egy átlátszó kő (1) belsejében az előző igénypontok bármelyike szerint, ahol a nevezett első szerkesztési eljárás legalább egy dombormű (4), amely a nevezett külső buroknak (1.1) a befelé néző felületén van kialakítva dombornyomás révén.
4. Eljárás egy háromdimenziós kép készítésére egy átlátszó kő (1) belsejében az előző igénypontok bármelyike szerint, ahol a nevezett második szerkesztési eljárás legalább egy dombormű (3), amely a nevezett kitöltő rétegnek (2) a befelé néző felületén van kialakítva görbe vonalú vésés révén.
5. Eljárás egy háromdimenziós kép készítésére egy átlátszó kő (1) belsejében az előző igénypontok bármelyike szerint, ahol a nevezett második szerkesztési eljárás legalább egy dombormű (4), amely a nevezett kitöltő rétegnek (2) a befelé néző felületén van kialakítva dombornyomás révén.
6. Eljárás egy háromdimenziós kép kialakítására egy átlátszó kő (1) belsejében az előző igénypontok bármelyike szerint, ahol egy dombormű (4) egy festékbevonat, amely kialakít egy vastagságot és színt a nevezett külső buroknak a belső felületén.