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(72) Feltaláló(k):
KRIEF, Jérôme, F-38410 Vaulnaveys Le Bas (FR)

(73) Jogosult(ak):
Becton Dickinson France, 38800 Le Pont-de-Claix (FR)

(74) Képviselő:
ifj. Szentpéteri Ádám, SBGK Szabadalmi Ügyvivői Iroda, Budapest

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(54) **METHOD FOR MARKING A TRANSPARENT CONTAINER**

VERFAHREN ZUR MARKIERUNG EINES TRANSPARENTER BEHÄLTERS

PROCÉDÉ DE MARQUAGE D'UN RÉCIPIENT TRANSPARENT

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(73) Proprietor: **Becton Dickinson France**
38800 Le Pont-de-Claix (FR)

(72) Inventor: **KRIEF, Jérôme**
F-38410 Vaulnaveys Le Bas (FR)

(74) Representative: **Delorme, Nicolas et al**
Cabinet Germain & Maureau
BP 6153
69466 Lyon Cedex 06 (FR)

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Description

[0001] The present invention relates to a method for marking a container having at least a transparent wall, such as containers for use in the medical field like syringe bodies. The invention also relates to the marked containers thus obtained and to a method for identifying such marked containers.

[0002] In the present application, the distal end of an article is to be understood as meaning the end furthest from the user's hand and the proximal end is to be understood as meaning the end closest to the user's hand when the article is in use. Likewise, in this application, the "distal direction" is to be understood as meaning the direction of injection, and the "proximal direction" is to be understood as meaning the opposite direction to the direction of injection.

[0003] Containers having at least a transparent wall, made of glass or plastic for example, are commonly used in the medical field. These containers may be any container used for the administration and/or the injection of medical products such as, for example, medicaments, and also any analytical, testing or diagnostic container. These containers may take the shape of a bottle, a syringe body, a vial or a tube, and they may be used to obtain an injection device, for example a syringe or an injection pen cartridge. These containers may be coated on one or more of their walls with a surface coating. These containers may also be filled with a substance, for example a medicament in divided or undivided solid, gel, powder or liquid form, in order to obtain an administration, for example injection, device, or a finished, ready-to-use, article for medical, testing, analytical or diagnostic use.

[0004] Because of their various uses and applications, and because of the various medicines they may contain, it is particularly important to determine exactly where a container comes from, what it contains, and to which use it is intended. Other information may be needed, in particular for a safe use of the container. It is also important that the information provided with said container may not be falsified. In this view, it is desirable to provide this information under the form of a mark, attached to the container, and containing the information needed. Indeed, marking a container is desirable for various purposes such as the following:

- protection against copying or imitating the containers and/or the the substance they may contain;
- authentication of the original containers and of the substance they may contain;
- traceability of the containers and of the substance they may contain, per batch or series, and possibly per unit; and
- identification of the prefilled or not container, in the distribution chains and/or in use, in particular within a regulatory and/or security context regarding the origin of the container.

[0005] Various methods of marking and/or identifying a container have already been proposed. For example, it is known to identify various articles by external marking such as labelling, printing, etching or other techniques. These known methods have the drawback that the information supported by the marking may be modified, destroyed or damaged, removed or copied, falsified or altered, thereby making these methods of identification not very effective and not very useful, in particular for combating fraud and copies.

[0006] Other methods have been described, such as those providing the container with a marking obtained by modifying the substrate forming the wall of said container. For example, lasers are used for engraving information on a glass container.

[0007] For instance, it is known to engrave micro points with the help of a laser at the surface of a glass wall of a container. Nevertheless, such a marking method has the drawback of damaging the substrate, for instance the glass material, the container is made of : the engraving of the surface of the glass wall may actually cause microcracks at the place the micropoints are engraved, thereby weakening the glass wall of the container. Moreover, such a method may also generate glass micro-particles during the engraving step. In addition, once the marking is obtained, the information contained therein is not easily and rapidly readable. Indeed, the glass engraving implies a modification of the refractive index of the glass material at the location of the marking, thereby rendering the reading of the information difficult. In such cases, the marking must be read by transmission : such a reading step may be fastidious and time consuming.

[0008] It is also known to engrave information and/or data within the thickness of a glass wall of a container. Nevertheless, such a method requires the use of a femtosecond LASER and is very expensive.

[0009] Document WO03/020527 describes a method for marking a glass substrate comprising a data matrix in an enamel spot applied on the substrate and further firing the substrate. Document FR 2 927 839 describes a method for marking a bottle comprising a step of engraving the wall of the bottle.

[0010] One aspect of the present invention is to propose a method of providing a marking incorporated definitively at a surface of the substrate forming a transparent wall of a container without thereby significantly affecting the mechanical properties or characteristics, such as the impact strength for example, of the transparent wall of the container thus marked.

[0011] One aspect of the invention is to provide a method for marking a container comprising at least a transparent wall comprising the following steps :

- a) applying at least one spot of ink on an outer surface of said transparent wall,
- b) heating said transparent wall,
- c) engraving a data matrix in the spot of ink of said transparent wall.

[0012] By "transparent" material is meant according to the present application, a material allowing at least 5% of light transmission in the visible, preferably allowing at least 50% of light transmission in the visible, and more preferably allowing at least 90% of light transmission in the visible. As an example, glass usually allows at least 90% of light transmission in the visible. For example, opalescent materials, which allow at least 5% of light transmission in the visible, for example at least 50% of light transmission in the visible, may be used in the present invention. Translucent materials, which allow the diffusion of a certain percentage of the light they receive, and which also allow at least 5% of light transmission in the visible, for example at least 50% of light transmission in the visible, may also be used in the present invention. Opalescent materials and translucent materials are therefore comprised in the term "transparent" according to the present application.

[0013] For example, said transparent wall is selected from glass walls, polyolefin walls, polycarbonate walls and combinations thereof.

[0014] The method of the invention allows preserving the integrity of the material forming the transparent wall of the container that is marked. Indeed, with the method of the invention, it is the ink spot that is engraved, not the substrate forming the transparent wall of the container to be marked. As a result, the substrate forming the transparent wall of the container is not affected by the marking process. The marking is provided at the surface of the container without any risk of damaging the structure of the container. In particular, in the case where the transparent wall of the container is made of glass, there is neither risk to cause microcracks in said glass wall nor to generate micro-particles of glass. The glass wall is not affected by the engraving step of the ink spot.

[0015] Moreover, the marking provided by the method of the invention is resistant and long lasting. With the marking method of the invention, the information supported by the marking may not be modified, destroyed or damaged, removed or copied, falsified or altered.

[0016] In addition, the method of the invention is cost effective : it does not require the use of high performance laser, such as a femtosecond LASER.

[0017] In an embodiment of the method of the invention, the application of step a) is performed via tampography. For example, in an embodiment, in step b), said transparent wall is heated at a temperature ranging from 55 to 65°C, preferably at about 60°C, for a time period ranging from about 6 to 8 minutes, preferably about 7 minutes.

[0018] In another method of the invention, the application of step a) is performed via serigraphy. For example, in an embodiment, in step b), said transparent wall is heated at a temperature ranging from 625 to 660°C, preferably at about 650°C, for a time period ranging from about 3 to 22 minutes, preferably about 5 minutes.

[0019] In embodiments, the engraving step c) is performed with a LASER.

[0020] In embodiments, the method further comprises a step d), subsequent to step c), during which the ink remaining around the data matrix is removed. For example, the removing of step d) may be performed with a LASER.

[0021] Another aspect of the invention is a marked container obtained according to the method described above.

[0022] As seen above, such a marked container is provided with reliable data and information that may not be copied or altered. In addition, the marked container of the invention preserves its integrity, and its mechanical properties are not altered by the marking method described above. The marked container of the invention may be prefilled before the marking process. There is no risk that the substance contained therein be altered, damaged or modified by the marking method of the invention.

[0023] The marked container of the invention may further be submitted to treatments requiring specific conditions of temperature and pressure, such as sterilisation treatment, without any risk that the marking be altered.

[0024] The marked container of the invention may be prefilled with a substance. In embodiments, said transparent wall is made of glass. The marked container may be a syringe body, for example provided with a needle.

[0025] Another aspect of the invention is a method for identifying a marked container as described above, comprising the following steps :

- illuminating with a light source the data matrix engraved in the ink spot of said transparent wall,
- reading the information contained in the data matrix by means of a camera capturing the reflected light emitted by the data matrix.

[0026] The indentifying method of the invention is easy to perform. In particular, because the material forming the transparent wall of the container is not altered by the marking method of the invention, it is possible to read the information supported by the marking by reflection of a light previously directed to said marking. As a consequence, the reading step may be completed very rapidly. Moreover, the reading step may also be efficiently performed, even if the container is filled with a substance, whatever the nature of that substance: in particular, this substance may not be transparent. Thanks to the marking method of the invention, the data matrix engraved is particularly visible and the reading step is therefore facilitated.

[0027] The identifying method of the invention allows for example the identification of more than 18 000 marked containers per hour. Such a method is therefore particularly advantageous in chain assembly lines.

[0028] The methods of the invention and marked container of the invention will now be further described in reference to the following description and attached drawings in which:

- Figure 1 is a side view of a container intended to be marked according to the method of the invention,
- Figure 2 is a side view of the container of Figure 1 having undergone step a) of the marking method of the invention,
- Figure 3 is a schematic view of step c) of the marking method of the invention,
- Figure 4 is a schematic view of optional step d) of the marking method of the invention,
- Figure 5 is a schematic view illustrating the identifying method of the invention.

[0029] With reference to Figure 1 is described a container, under the form of a syringe body 1 comprising a tubular barrel 2 having a transparent wall 3. As defined above, "transparent" means herein that the wall 3 is made of a material allowing at least 5% of light transmission in the visible, preferably allowing at least 50% of light transmission in the visible, and more preferably allowing at least 90% of light transmission in the visible. For example, the tubular barrel may be made of glass material or of plastic material, such as polyolefin, polycarbonate or mixtures thereof. The syringe body 1 shown on Figure 1 is not prefilled. In embodiments not shown, the syringe body is prefilled with a medical substance and this medical substance may not be transparent. The syringe body 1 is provided at its distal end with a needle 4.

[0030] In embodiments not shown, the container could be a cartridge, a vial, a bottle, a tube such as a catheter, or other known or hereafter developed articles suitable for containing a drug substance.

[0031] A first step of the marking method of the invention is to apply a spot of ink on an outer surface of the transparent wall 3. By "outer" surface is meant that the spot of ink is not engraved in the thickness of the wall 3 and does not penetrate the thickness of the wall on which it is applied, but is applied on the surface of the wall.

[0032] By "ink" is meant according to the present application a printing ink. The ink used is for example all inks suitable for tampography or serigraphy. In particular, the ink used in the method of present invention is water resistant and is suitable for being printed on glass materials.

[0033] The spot of ink may have any shape : for example it can be a round spot or a square or rectangle spot. The size of the spot of ink is function of the size of the data matrix desired to be engraved therein. For instance, the spot of ink may be a round spot of 3 mm diameter. The spot of ink is usually full (no voids) and printed in dark color, such as black.

[0034] In an embodiment of the method of the invention, the spot of ink is applied on the outer surface of the transparent wall via tampography. Such a technique is well known from persons of skill in the art and will not be described in great details herein. Basically, in such a technique, an inking pad is used, which is dripped into an ink reservoir and the inking pad is then applied on the surface to be printed. For example, one can use tampography machines provided by companies Thermofla, Febvre, Cartolux or Sisma.

[0035] In such an embodiment, the transparent wall, provided with the spot of ink is then heated at a temperature ranging from 55 to 65°C for a time period ranging from about 6 to 8 minutes. Such a step allows the fixing and the curing of the ink. For example, the transparent wall is heated at a temperature of 60°C for about 7 minutes. Such a technique allows in particular marking a container such as a syringe body having a needle assembled by glue. Indeed, the relatively low temperature (around 60°C) at which the heating step is conducted does not affect adhesion of the needle for a syringe in which the needle is secured by an adhesive.

[0036] In an alternative embodiment of the method of the invention, the spot of ink is applied via serigraphy, also called screen printing. Such a technique is well known from persons of skill in the art and will not be described in great details herein. Basically, in such a technique, stencils or screens are used to protect the parts of a surface that should not receive ink and the ink is projected on the parts not protected by a screen.

[0037] In such an embodiment, the transparent wall, provided with the spot of ink is then heated at a temperature ranging from 625 to 666°C for a time period ranging from about 3 to 22 minutes. Such a step allows the fixing and the curing of the ink. For example, the transparent wall is heated at a temperature of 650°C for about 5 minutes.

[0038] On Figure 2 is shown the syringe body 1 of Figure 1 having the spot of ink 5 applied on an outer surface of its transparent wall 3.

[0039] In a third step (step c)) of the marking method of the invention, a data matrix 6 is engraved in the spot of ink 5, as shown on Figure 3. The engraving is usually performed with a LASER, materialized on Figure 3 by arrow F. The engraving consists in removing parts of the ink of the ink spot in order to create white parts (squares, bars), defined by the parts of the surface of the transparent wall 3 thus left visible, thereby creating a twodimensional barcode print which will form the data matrix 6. It will then be possible to read a black data matrix on a white background, the white background being the outer surface of the transparent wall 3, within the limits of the ink spot 5. During the engraving step, the LASER is used at such a frequency that the integrity of the transparent wall 3 is not affected. One skilled in the art knows how to determine which frequency of the LASER should be used so that the thickness of the transparent wall 3 is not attacked by the LASER. The engraving has therefore no influence, no effect on the transparent wall. Only the ink of the spot of ink is affected by the engraving. In particular, in the case where the transparent wall 3 of the container is made of glass, there is neither risk to cause microcracks in said glass wall nor to generate micro-particles of glass.

[0040] During the engraving step, such information as batch number, manufacturing date, manufacturing com-

ponents, identification number, nature of substance contained, graduations, expiration date, etc... may be "engraved" within the data matrix.

[0041] After the engraving step, the syringe body 1 is marked : thanks to the engraved data matrix 6, the syringe body 1 is provided with reliable data and information that may not be copied or altered. In addition, the marked syringe body 1 preserves its integrity, and its mechanical properties are not altered by the marking method described above. The marked container of the invention may be prefilled before the marking process. There is no risk that the substance contained therein be altered, damaged or modified by the marking method of the invention.

[0042] The marked container 1 of the invention may further be submitted to treatments requiring specific conditions of temperature and pressure, such as sterilisation treatment, without any risk that the marking be altered.

[0043] In an optional additional step (step d)), the ink remaining around the data matrix 6 may be removed from the outer surface of the transparent wall 3, for example by means of a LASER, as shown on Figure 4, on which the LASER is materialized by arrow G.

[0044] One skilled in the art knows how to determine which frequency of the LASER should be used to remove the remaining ink so that the thickness of the transparent wall 3 is not attacked by the LASER and without damaging the engraved data matrix 6. The step of removing the remaining ink has therefore no influence, no effect on the transparent wall. Only the remaining ink of the spot of ink which is located around the data matrix 6 is affected by the present step. In particular, in the case where the transparent wall 3 of the container is made of glass, there is neither risk to cause microcracks in said glass wall nor to generate micro-particles of glass.

[0045] With reference to Figure 5 is illustrated the identifying method of the invention. The marked syringe body 1, ie provided with the data matrix 6 marked as described in reference to Figures 1-4, is illuminated by a light source 7. The data matrix 6 is therefore illuminated by the light source 7 and it reflects a part of this light : this reflected light emitted by the illuminated data matrix 6 is captured by a camera 8 and may be futher analysed, for example by a suitable software of a computer, so as to retrieve the information and data contained in the data matrix 6.

[0046] The indentifying method of the invention is easy to perform, in particular, because the material forming the transparent wall of the container or syringe body is not altered by the marking method of the invention. In particular, because the refractive index of the transparent wall 3 is not affected by the marking method of the present invention, the information contained in the data matrix may be read simply by reflection of a light projected on said data matrix. As a consequence, the reading step may be completed very rapidly. Moreover, the reading step may also be efficiently performed, even if the container or syringe body is filled by a substance, whatever the nature of that substance: in particular, this substance may not be transparent. Thanks to the marking method of the invention, the data matrix engraved is particularly visible and the reading step is therefore facilitated.

[0047] The identifying method of the invention allows the identification of more than 18 000 marked containers per hour. Such a method is therefore particularly advantageous in chain assembly lines.

Claims

1. Method for marking a container (1) comprising at least a transparent wall (3) comprising the following steps:

   - a) applying at least one spot of ink (5) on an outer surface of said transparent wall,
   - b) heating said transparent wall,
   - c) engraving a data matrix (6) in the spot of ink of said transparent wall.

2. Method according to claim 1 wherein the application of step a) is performed via tampography.

3. Method according to claim 2, wherein in step b), said transparent wall is heated at a temperature ranging from 55 to 65°C, preferably at 60°C, for a time period ranging from 6 to 8 minutes, preferably 7 minutes.

4. Method according to 1, wherein the application of step a) is performed via serigraphy.

5. Method according to claim 4, wherein in step b), said transparent wall is heated at a temperature ranging from 625 to 660°C, preferably at 650°C, for a time period ranging from 3 to 22 minutes, preferably 5 minutes.

6. Method according to any one of Claims 1 to 5, wherein the engraving step c) is performed with a LASER.

7. Method according to any one of claims 1 to 6, wherein it further comprises a step d), subsequent to step c), during which the ink remaining around the data matrix is removed.

8. Method according to claim 7, wherein the removing of step d) is performed with a LASER.

9. Marked container (1) obtained by a method according to any one of claims 1 to 8.

10. Marked container (1) according to claim 9, wherein said container is prefilled with a substance.

11. Marked container (1) according to claim 9 or 10, wherein said transparent wall is made of glass.

12. Marked container according to any one of claims 9

to 11, wherein said container is a syringe body (1).

13. Marked container according to claim 12, wherein said syringe body (1) is provided with a needle (4).

14. Method for identifying a marked container (1) according to any one of claims 9 to 13, comprising the following steps:

- illuminating with a light source (7) the data matrix (6) engraved in the ink spot (6) of said transparent wall (3),
- reading the information contained in the data matrix by means of a camera (8) capturing the reflected light emitted by the data matrix.

Patentansprüche

1. Verfahren zum Markieren eines Behälters (1), der mindestens eine durchsichtige Wand (3) umfasst, umfassend folgende Schritte:

a) Auftragen mindestens eines Tintenflecks (5) auf eine Außenfläche der durchsichtigen Wand,
b) Erhitzen der durchsichtigen Wand,
c) Eingravieren einer Datenmatrix (6) in dem Tintenfleck der durchsichtigen Wand.

2. Verfahren nach Anspruch 1, wobei das Auftragen aus Schritt a) durch Tampondruck erfolgt.

3. Verfahren nach Anspruch 2, wobei in Schritt b) die durchsichtige Wand auf eine Temperatur, die von 55 bis 65 °C reicht und bevorzugt 60 °C beträgt, während eines Zeitraums, der von 6 bis 8 Minuten reicht und bevorzugt 7 Minuten beträgt, erhitzt wird.

4. Verfahren nach Anspruch 1, wobei das Auftragen aus Schritt a) durch Siebdruck erfolgt.

5. Verfahren nach Anspruch 4, wobei in Schritt b) die durchsichtige Wand auf eine Temperatur, die von 625 bis 660 °C reicht und bevorzugt 650 °C beträgt, während eines Zeitraums, der von 3 bis 22 Minuten reicht und bevorzugt 5 Minuten beträgt, erhitzt wird.

6. Verfahren nach einem der Ansprüche 1 bis 5, wobei der Schritt des Eingravierens c) mit einem Laser ausgeführt wird.

7. Verfahren nach einem der Ansprüche 1 bis 6, wobei es ferner nach Schritt c) einen Schritt d) umfasst, in dem die Tinte, die um die Datenmatrix herum verbleibt, entfernt wird.

8. Verfahren nach Anspruch 7, wobei das Entfernen aus Schritt d) mit einem Laser ausgeführt wird.

9. Markierter Behälter (1), der durch ein Verfahren nach einem der Ansprüche 1 bis 8 erzielt wird.

10. Markierter Behälter (1) nach Anspruch 9, wobei der Behälter mit einer Substanz vorgefüllt ist.

11. Markierter Behälter (1) nach Anspruch 9 oder 10, wobei die durchsichtige Wand aus Glas besteht.

12. Markierter Behälter nach einem der Ansprüche 9 bis 11, wobei der Behälter ein Spritzenkörper (1) ist.

13. Markierter Behälter nach Anspruch 12, wobei der Spritzenkörper (1) mit einer Nadel (4) versehen ist.

14. Verfahren zum Identifizieren eines markierten Behälters (1) nach einem der Ansprüche 9 bis 13, umfassend folgende Schritte:

- Beleuchten mit einer Lichtquelle (7) der Datenmatrix (6), die in den Tintenfleck (6) der durchsichtigen Wand (3) eingraviert ist;
- Lesen der Informationen, die in der Datenmatrix enthalten sind, anhand einer Kamera (8), die das reflektierte Licht auffängt, das von der Datenmatrix reflektiert wird.

Revendications

1. Procédé de marquage d'un récipient (1) qui comprend au moins une paroi transparente (3) comprenant les étapes suivantes qui consistent :

- a) à appliquer au moins une tâche d'encre (5) sur une surface externe de ladite paroi transparente,
- b) à chauffer ladite paroi transparente,
- c) à graver une matrice de données (6) dans la tâche d'encre de ladite paroi transparente.

2. Procédé selon la revendication 1, dans lequel l'étape d'application a) est effectuée par tampographie.

3. Procédé selon la revendication 2, dans lequel à l'étape b), ladite paroi transparente est chauffée à une température se situant dans la plage allant de 55 à 65°C, de préférence à 60°C, pendant une durée se situant dans la plage allant de 6 à 8 minutes, de préférence de 7 minutes.

4. Procédé selon la revendication 1, dans lequel l'étape d'application a) est effectuée par sérigraphie.

5. Procédé selon la revendication 4, dans lequel à l'étape b), ladite paroi transparente est chauffée à une température se situant dans la plage allant de 625 à 660°C, de préférence à 650°C, pendant une durée

allant de 3 à 22 minutes, de préférence de 5 minutes.

6. Procédé selon l'une quelconque des revendications 1 à 5, dans lequel l'étape de gravure c) est effectuée avec un LASER.

7. Procédé selon l'une quelconque des revendications 1 à 6, dans lequel il comprend en outre une étape d), subséquente à l'étape c), au cours de laquelle l'encre restant autour de la matrice de données est enlevée.

8. Procédé selon la revendication 7, dans lequel l'étape d'enlèvement d) est effectuée avec un LASER.

9. Récipient marqué (1) obtenu par un procédé selon l'une quelconque des revendications 1 à 8.

10. Récipient marqué (1) selon la revendication 9, dans lequel ledit récipient est pré-rempli d'une substance.

11. Récipient marqué (1) selon la revendication 9 ou 10, dans lequel ladite paroi transparente est réalisée en verre.

12. Récipient marqué selon l'une quelconque des revendications 9 à 11, dans lequel ledit récipient est un corps de seringue (1).

13. Récipient marqué selon la revendication 12, dans lequel ledit corps de seringue (1) est doté d'une aiguille (4).

14. Procédé d'identification d'un récipient marqué (1) selon l'une quelconque des revendications 9 à 13, comprenant les étapes suivantes qui consistent :

- à éclairer avec une source de lumière (7) la matrice de données (6) gravée dans la tâche d'encre (6) de ladite paroi transparente (3),
- à lire les informations contenues dans la matrice de données au moyen d'une caméra (8) capturant la lumière réfléchie émise par la matrice de données.

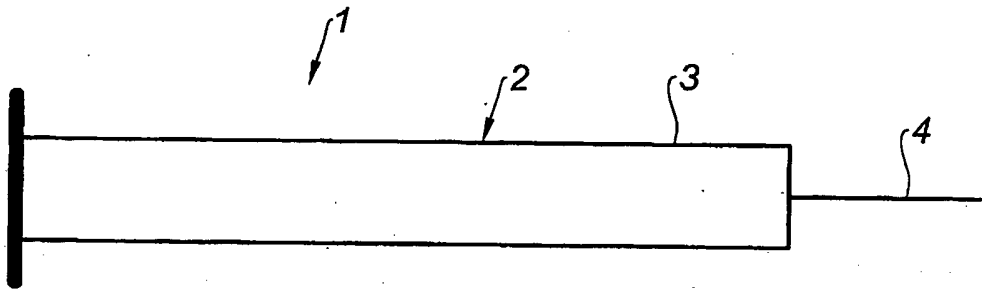

Fig. 1

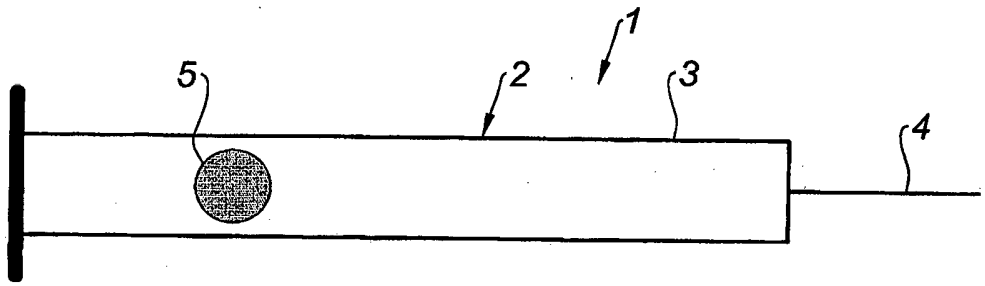

Fig. 2

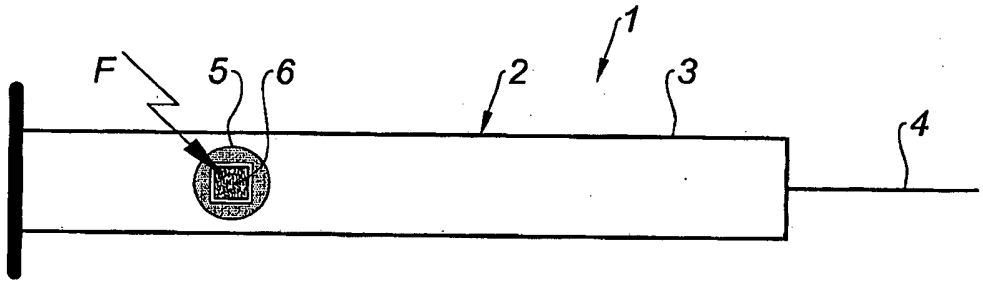

Fig. 3

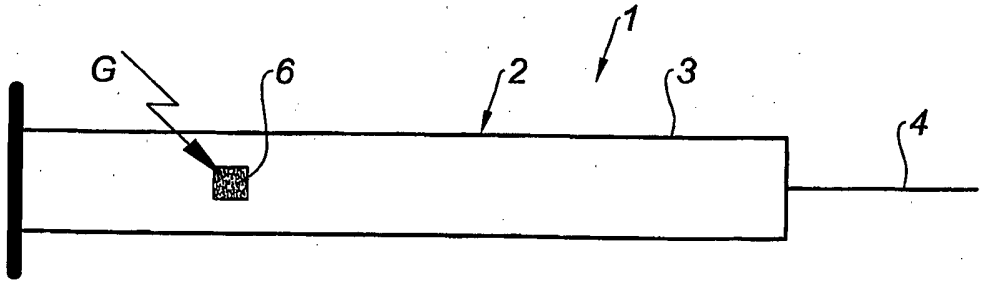

Fig. 4

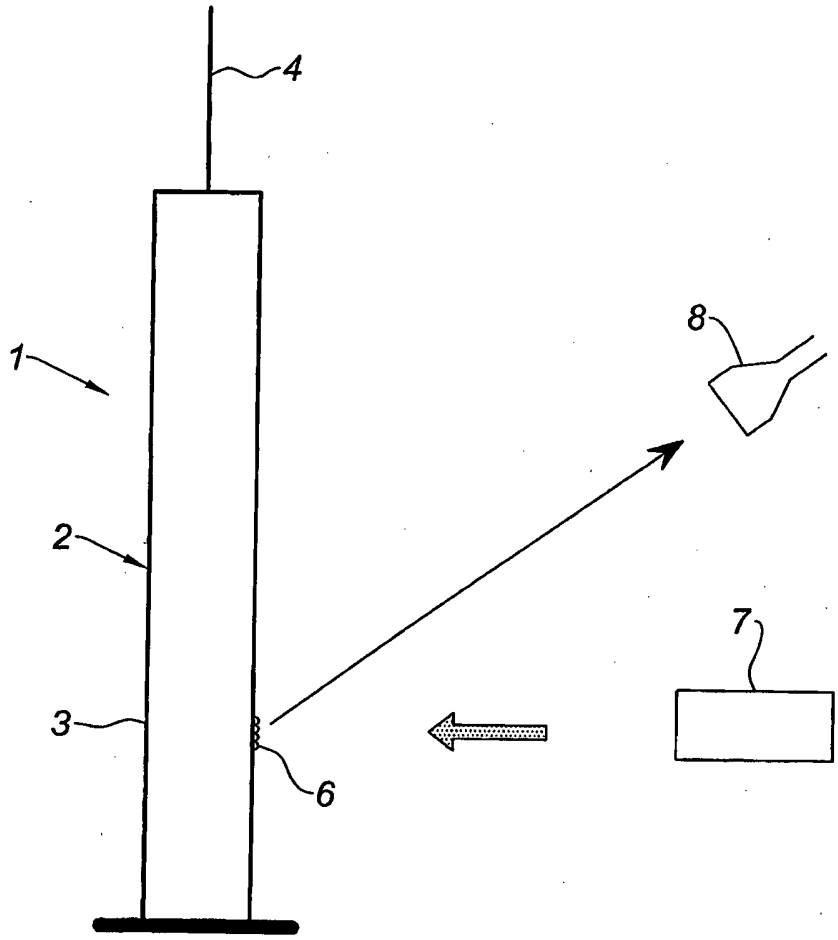

Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 03020527 A **[0009]**
- FR 2927839 **[0009]**

SBGK
Szabadalmi
Ügyvivői Iroda

713247/SZE EP2563600

Eljárás átlátszó tartály jelölésére

Szabadalmi igénypontok

1. Eljárás egy legalább egy átlátszó fallal (3) ellátott tartály (1) jelölésére, melynek során
- a) legalább egy tinta foltot (5) viszünk fel az átlátszó fal egy külső felületére,
- b) az átlátszó falat melegítjük,
- c) az átlátszó falra felvitt tinta foltba egy adat matrixot (6) gravírozunk.

2. Az 1. igénypont szerinti eljárás, ahol az a) lépés szerinti felvitelt tampográfiával végezzük.

3. A 2. igénypont szerinti eljárás, ahol a b) lépésben az átlátszó falat 55-65°C, előnyösen 60°C hőmérsékleten melegítjük, 6 és 8 perc közötti, előnyösen 7 perc időtartamban.

4. Az 1. igénypont szerinti eljárás, ahol az a) lépés szerinti felvitelt szerigráfiával végezzük.

5. A 4. igénypont szerinti eljárás, ahol a b) lépésben az átlátszó falat 625-660°C, előnyösen 650°C hőmérsékleten melegítjük, 3 és 22 perc közötti, előnyösen 5 perc időtartamban.

6. Az 1-5. igénypontok bármelyike szerinti eljárás, ahol a c) lépés szerinti gravírozást lézerrel végezzük.

7. Az 1-6. igénypontok bármelyike szerinti eljárás, mely a c) lépés után egy további d) lépést is magában foglal, melynek során az adat mátrix körül visszamaradt tintát eltávolítjuk.

8. A 7. igénypont szerinti eljárás, ahol a d) lépés szerinti eltávolítást lézerrel végezzük.

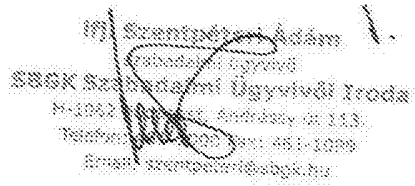
9. Az 1-8. igénypontok bármelyike szerinti eljárással előállított jelölt tartály.

10. A 9. igénypont szerinti jelölt tartály (1), ahol a tartály valamely anyaggal előzetesen töltött.

11. A 9. vagy 10. igénypont szerinti jelölt tartály (1), ahol az átlátszó fal üvegből készült.

12. A 9-11. igénypontok bármelyike szerinti jelölt tartály (1), ahol a tartály egy fecskendő test (1).

13. A 12. igénypont szerinti jelölt tartály (1), ahol a fecskendő test (1) tüvel ellátott.

14. Eljárás a 9-13. igénypontok bármelyike szerinti jelölt tartály (1) azonosítására, melynek során:
- fényforrással (7) megvilágítjuk az átlátszó fal (3) tinta foltjába (5) gravírozott adat mátrixot (6),
- az adat mátrixban található információt az adat mátrix által kibocsátott visszavert fényt felfogó kamerával (8) leolvassuk.

A meghatalmazott.