(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 289 401 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
06.11.2013 Bulletin 2013/45

(51) Int Cl.:
A61B 5/00 *(2006.01)* ***A61B 10/00*** *(2006.01)*

(21) Application number: **10170418.7**

(22) Date of filing: **14.12.2006**

(54) **Methods of manufacturing a transdermal analyte sensor assembly**

Verfahren zur Herstellung einer Sensoranordnung zur transdermalen Analyse

Procédés de fabrication d'un ensemble de capteur d'analytes transdermiques

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

(30) Priority: **16.12.2005 US 751238 P**

(43) Date of publication of application:
02.03.2011 Bulletin 2011/09

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
06847666.2 / 1 962 673

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EP 2 289 401 B1

Printed by Jouve, 75001 PARIS (FR)

Description

FIELD OF THE INVENTION

[0001] The present invention relates generally to a transdermal test sensor assembly. More particularly, the invention relates to a method of forming a transdermal test sensor assembly adapted to assist in determining a concentration of at least one analyte, where the test sensor assembly has hydrating features.

BACKGROUND OF THE INVENTION

[0002] The quantitative determination of analytes in body fluids is of great importance in the diagnoses and maintenance of certain physiological abnormalities. For example, lactate, cholesterol, and bilirubin should be monitored in certain individuals. In particular, determining glucose in body fluids is important to diabetic individuals who must frequently check the glucose level in their body fluids to regulate the glucose intake in their diets. The results of such tests may be used to determine what, if any, insulin or other medication needs to be administered. In one type of testing system, test sensors are used to test a fluid such as a sample of blood.

[0003] According to some existing techniques, a lancet may be used to pierce a user's skin to draw fluid (e.g., blood) from the user. This fluid is then used with an instrument or meter to determine an analyte (e.g., glucose) concentration. Piercing a user's skin each time an analyte concentration reading is desired is an inconvenient and invasive procedure. Moreover, the procedure is undesirable because of the resulting pain and discomfort often experienced by a user.

[0004] International Patent Publication No. WO/1996/000110 discloses an apparatus for the transdermal monitoring of a target substance, comprising a first collection reservoir with a first ionically conductive medium and a second collection reservoir with a second ionically conductive medium. A first iontophoresis electrode contacts the first conductive medium and a second iontophoresis electrode contacts the second conductive medium. A sensor detects the target substance contained within at least one conductive medium. The conductive medium is either an ionically conductive hydrogel or a wicking material containing an ionically conductive medium. Also disclosed is a method for using the transdermal monitoring apparatus for continuous in vivo monitoring of the blood glucose level of a patient comprising the following steps: (a) placing a collection reservoir on a collection site on a tissue surface of the patient; (b) applying electrical energy to the collection site to move glucose or a glucose metabolite into the collection reservoir; (c) analyzing the collection reservoir for concentration of glucose or glucose metabolite; (d) correlating the concentration determined in step (c) with blood glucose level; and (e) performing steps (a)-(d) substantially continuously.

[0005] One non-invasive method for obtaining a sample for determining an analyte concentration involves using a transdermal sample of one or more analytes found in, for example, interstitial fluid (ISF). In this method, a transdermal test sensor is placed on a user's skin. The transdermal sensor typically includes a hydrogel composition to facilitate the extraction of the analyte of interest from the ISF via the user's skin to an analyte-testing instrument or meter. The hydrogel must be sufficiently mechanically and thermally stable to provide a relatively static, reactive, and aqueous conduct between a dermal sampling site and an analyte-testing instrument.

[0006] One problem with existing transdermal test sensors relates to having a hydrogel that is sufficiently hydrated and can maintain such hydration. Inadequate hydration may be caused by exposure to the outside environment and/or the lack of a hermetic seal between the skin and the test sensor. The level of hydration of the hydrogel (e.g., solvent content) generally decreases over time. If the level of hydration of the hydrogel falls below a certain level, the hydrogel may cease to provide intimate contact between the skin and the hydrogel and/or the hydrogel and the test sensor. Such intimate contact is necessary for accurate testing results.

[0007] Thus, it would be desirable to have a transdermal test sensor that assists in addressing one or more of the above disadvantages.

SUMMARY OF THE INVENTION

[0008] According to the present invention, a method of forming a transdermal test sensor assembly adapted to determine an analyte concentration of a fluid sample is disclosed. The method comprises providing a sensor support including at least one reservoir configured to hold a liquid, coupling a test sensor to the sensor support, the test sensor having at least one aperture formed therein, at least a portion of the at least one aperture being adjacent to the at least one reservoir; and positioning a hydrogel on the test sensor, the hydrogel being linked to the at least one reservoir via the at least one aperture.

[0009] The above summary of the present invention is not intended to represent each embodiment, or every aspect, of the present invention. Additional features and benefits of the present invention are apparent from the detailed description and figures set forth below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1a is a perspective view of a test sensor assembly according to one embodiment of the present invention.

[0011] FIG. 1b is an exploded, perspective view of the test sensor assembly of FIG. 1a.

[0012] FIG. 2 is a perspective view of a test sensor assembly of the present invention being coupled to an analyte-testing instrument.

DESCRIPTION OF ILLUSTRATED EMBODIMENTS

[0013] The present invention is directed to a method of forming a transdermal test sensor assembly adapted to assist in determining a concentration of at least one analyte. The transdermal test sensor assembly has hydrating features.

[0014] Transdermal test sensors contain a hydrogel composition, which may serve as an interface between the sensor and the skin. A hydrogel composition is defined herein as a crosslinked polymer gel. The hydrogel composition generally comprises at least one monomer and a solvent. The solvent is typically substantially biocompatible with the skin. Non-limiting examples of solvents that may be used in the hydrogel composition include water and a water mixture. The amount of solvent in the hydrogel is generally between about 10 to about 95 weight percent and may vary depending on the monomer amount, crosslinking, and/or the desired composition of the gel.

[0015] The transdermal test sensor assists in determining the concentration of the desired analyte by using the hydrogel as an osmotic agent to extract the analyte from a fluid such as ISF. Analytes that may be measured include glucose, lipid profiles (e.g., cholesterol, triglycerides, LDL, and HDL), fructose, lactate, and/or bilirubin. It is contemplated that other analyte concentrations may be determined. One non-limiting example of the transdermal sensor's use is to determine the glucose concentration in a user's ISF.

[0016] In the embodiment of FIGs. 1a,b, a transdermal test sensor assembly 10 is illustrated according to one embodiment of the present invention. Although in this embodiment, the test sensor is an electrochemical sensor, it is contemplated that the present invention may also be applied to other sensors (e.g., optical test sensors). An example of an electrochemical sensor includes a standard, three-electrode design utilizing a catalytic, platinum-containing working electrode, a counter electrode, and a reference electrode. It is contemplated that other electrochemical sensors may be used including those with fewer electrodes such as a two-electrode electrochemical sensor, which includes a counter electrode and a working electrode.

[0017] The test sensor assembly 10 includes a sensor support 12 and a test sensor 14. The test sensor 14 is positioned generally parallel and adjacent to the sensor support 12. The sensor support 12 of FIGs. 1a,b includes a recessed area 16 having dimensions generally similar to the dimensions of the test sensor 14. It is desirable for the recessed area 16 to have dimensions substantially similar to the dimensions of the test sensor 14 to inhibit movement of the test sensor 14 relative to the sensor support 12. It is contemplated that the test sensor assembly of the present invention may include a mechanism to further inhibit movement of the test sensor 14 relative to the sensor support 12. For example, the test sensor 14 of FIGs. 1a, b includes a flexible element 18a that may be adapted to attach to a corresponding curved element 18b of the sensor support 12. It is contemplated that other mechanisms suitable for inhibiting movement of the test sensor 14 with respect to the sensor support 12 may also be used. For example, an adhesive may be positioned between the sensor 14 and the sensor support 12. Alternatively, the sensor support 12 may include plastic molded pins extending from the recessed area 16 through corresponding holes in the test sensor 14. The pins may be, for example, heat-staked or sonic welded to maintain the sensor 14 in place.

[0018] An outwardly-facing surface 20 of the test sensor 14 includes a hydrogel composition 22a,b. Although in the illustrated embodiment, the hydrogel 22a,b is generally circular in shape, it is contemplated that the hydrogel 22a,b may be of any shape. Moreover, although two hydrogel compositions 22a,b are illustrated, it is contemplated that any number of hydrogel compositions 22a,b may be included on the surface 20 of test sensor 14. The hydrogel 22a,b generally has a thickness of from about 0.05 mm to about 5 mm and, more specifically, has a thickness of from about .01 mm to about 1 mm. The surface area of the test sensor 14 covered by the hydrogel 22a,b in one embodiment is from about 0.1 cm^2 to about 100 cm^2. The hydrogel 22a,b is generally positioned over a plurality of electrodes 23. The plurality of electrodes 23 includes a counter electrode, a reference electrode, and a working (measuring) electrode. It is contemplated that other electrode structures may be used.

[0019] In the embodiments of FIGs. 1a,b and 2, the test sensor 14 is a dual-sensor test sensor, wherein each of two sensors 27a,b is independent of the other. The test sensor assembly 10 includes two corresponding reservoirs 24a,b (see FIG. 1b). It is contemplated that a different number of sensors 27 and corresponding reservoirs 24 may be used with the present invention.

[0020] The reservoirs 24a,b of the illustrated embodiment are located within the recessed area 16. The reservoirs 24a,b are adapted to store a liquid 26 for hydrating the hydrogel composition 22a,b. The types of liquid that may be stored in the reservoirs 24a,b include a second hydrogel, a solvent, or the like. The solvent may be the same as or different from the solvent used in the hydrogel composition 22a,b. Although in the illustrated embodiment of FIG. 1b, the reservoirs 24a,b have a generally round shape, it is contemplated that the reservoirs 24a, b may have other shapes.

[0021] The test sensor 14 includes at least one aperture 28a,b per sensor 27a,b formed therein that is positioned generally below the hydrogel 22a,b and generally above the reservoir 24a,b, as shown in FIGs. 1a,b. The at least one aperture 28a,b serves as a conduit for the liquid 26 and the hydrogel 22a,b. Thus, as the hydration of the hydrogel 22a,b begins to decrease, the liquid 26 in the reservoir 24a,b supplies additional hydration to the hydrogel 22a,b. It is desirable for the liquid 26 to generally include a greater percent of solvent than the hydrogel 22a,b so that the hydrogel 22a,b may more readily absorb

the liquid 26. The hydrogel 22a,b may become saturated at a certain point at which it will no longer be able to absorb the liquid 26. By reducing or substantially eliminating dehydration of the hydrogel 22a,b, the transport properties of the hydrogel 22a,b are not altered, and more accurate testing results may be obtained.

[0022] The test sensor assembly of the present invention may be coupled to an analyte-testing instrument, or meter, as shown in the embodiment of FIG. 2. Referring to FIG. 2, a meter assembly 100 includes a test sensor assembly 110 coupled to a meter 111. The test sensor assembly 110 of FIG. 2 is substantially similar to the test sensor assembly 10 of FIGs. 1a,b and described above. In the illustrated embodiment, the meter 111 is coupled to a surface of a sensor support 112 opposite a test sensor 114. It is contemplated that the meter 111 may be coupled to other portions of the test sensor assembly 110. It is contemplated that any mechanism suitable for maintaining the test sensor assembly 110 and the meter 111 in a substantially fixed position may be used including, but not limited to, snaps, screws, or other fasteners. The meter 111 is adapted to determine the concentration of the desired analyte in a fluid sample such as an ISF sample.

[0023] To test an analyte (e.g., glucose) concentration in an ISF sample, a hydrogel composition 128a,b on the test sensor 114 is placed against a user's skin, thereby coupling the skin and the test sensor 114. The test sensor assembly 110 may be applied at a skin site such as the volar forearm between the wrist and elbow such that the hydrogel 122a,b is positioned generally between the skin site and the test sensor 114. It is contemplated that the test sensor assembly 110 may be applied at other skin sites such as the abdomen. It is contemplated that the meter 111 and/or the test sensor assembly 110 may be used for continual glucose monitoring or for non-continual glucose monitoring.

[0024] It may be desirable for the skin to be pre-treated to increase the skin permeability prior to applying the test sensor assembly 110. One example of pre-treating is to use ultrasound energy to disrupt the lipid bilayer of the stratum corneum so as to increase the skin permeability. By increasing the skin permeability, the amount of ISF used in transdermal sampling is increased. This results in improved sampling of the analytes of interest found in the ISF.

[0025] One non-limiting source of an ultrasound energy system is Sontra SonoPrep® ultrasonic skin permeation system marketed by Sontra Medical Corporation (Franklin, Massachusetts). The SonoPrep® system applies relatively low frequency ultrasonic energy to the skin for a limited duration (from about 10 to 20 seconds). The ultrasonic horn contained in the device vibrates at about 55,000 times per second (55 KHz) and applies energy to the skin through the liquid-coupling medium to create cavitation bubbles that expand and contract in the coupling medium.

[0026] Referring again to FIG. 2, according to one method, the meter assembly 100 is used for continual, transdermal monitoring of an analyte (e.g., glucose). In a continual monitoring system, the meter assembly 100 measures an analyte concentration (e.g., glucose) at regular intervals, which may range from milliseconds to minutes. Because the meter 100 may remain coupled to the sensor support 112 for extended periods of time, it is desirable that the meter 113 be of a compact size to minimize the bulkiness and inconvenience to a user. The meter 100 may also be adapted to wirelessly transmit testing data to, for example, a remote computer data management system.

[0027] As discussed above, the hydrogel generally includes a monomer(s) and a solvent. In addition to a monomer and solvent, it is contemplated that the hydrogel composition may include other materials. For example, an electrolyte may be added to the hydrogel composition. The electrolyte desirably contains a high salt concentration that assists in exerting osmotic pressure on the skin. By exerting osmotic pressure on the skin, the electrolyte assists in driving out the ISF that contains the analyte. Non-limiting examples of electrolytes that may be used include sodium and potassium salts of chloride, phosphate, citrate, acetate, and lactate.

[0028] The hydrogel composition may further include a liquid. The liquid may include electrolytes. The concentration of electrolytes in the liquid is generally high enough to ensure the functionality of the process of determining an analyte concentration, yet low enough that the liquid remains hypotonic relative to the body fluid being tested (e.g., ISF). The electrolytes may cause a diffusional driving force of numerous solutes into the hypotonic liquid. The driving force may also enhance the transport of analyte (e.g., glucose) toward the sensor surface. Alternatively or additionally, the liquid may include a composition for generally increasing the efficiency of reactions involved in the process of determining the analyte concentration. For example, the liquid may include a buffer having a pH level conducive for the glucose oxidase conversion of glucose in the hydrogel.

[0029] The hydrogel composition may further include an enzyme to assist in determining the analyte concentration. Depending on the analyte, an enzyme may assist in converting the analyte into a species amenable to detection, such as electrochemical detection. One example of an enzyme that may be used in determining glucose is glucose oxidase. It is contemplated that other enzymes may be used, such as glucose dehydrogenase. If other analytes are of interest, an appropriately selected enzyme may assist in determining the concentration of that analyte.

[0030] The hydrogel composition may further include a permeation enhancer. Permeation enhancers are desirable in applications in which the hydrogel composition is applied to the skin. The permeation enhancer assists in opening up pores of the skin. Non-limiting examples of permeation enhancers that may be used include, but are not limited to, squalene, unsaturated fatty acids, glyc-

erol derivatives of fatty alcohols, dimethylsulfoxide, and alkyl esters of fatty acids.

[0031] Other materials that may be added to the hydrogel composition include, but are not limited to, biocides, humectants, surfactants, and combinations thereof. Biocides assist in exhibiting bacterial growth. Non-limiting examples of biocides that may be used include the Paraben series of preservatives, sodium benzoate, benzalkonium chloride, and trialkyl amines. Humectants assist in applications in which it is desirable to keep the skin moist. Non-limiting examples of humectants that may be used include glycerol, hexylene glycol and sorbitol, maltitol, polydextrose, propylene glycol, lactic acid, and lactate metal salts. Surfactants assist in coupling the hydrogel composition with the skin to obtain an improved contact therebetween. Non-limiting examples of surfactants that may be used include alkyl phenols such as TRITON® X-100 (octyl phenol ethoxylate having a molecular formula of $C_{14}H_{22}O(C_2H_4O)_n$ in which an average "n" is 9 or 10), and sorbitol and sorbitol derivatives such as the TWEEN™ series.

[0032] The hydrogel composition desirably possesses sufficient mechanical and thermal stability to provide a relatively static, reactive, and aqueous conduit between the dermal sampling site and the sensor. More specifically, it is desirable for the hydrogel composition to have physical uniformity and flexibility, and mechanical stability against shear force. It is also desirable for the hydrogel composition to maintain the porosity of the skin. The hydrogel composition also desirably displays a relatively high degree of compressibility to assist in securing good skin/sensor connectivity or skin adhesiveness.

[0033] It is also desirable for the hydrogel composition to have porosity large enough for enzyme entrapment. For example, in some applications involving the determination of glucose concentration, it is desirable for the hydrogel composition to provide a matrix for glucose oxidase and a diffusion passage for glucose and hydrogen peroxide.

[0034] A hydrogel that may be used with the present invention may comprise a first monomer, a second monomer, a cross-linking agent, and a solvent. The first monomer is selected from the group consisting of N-vinyl pyrrolidone, hydroxy alkyl methacrylates, acrylamide, and N,N di-alkyl acrylamides. The second monomer is selected from the group consisting of alkyl (meth)acrylates, N-vinyl acylamide, vinyl esters, and vinyl ethers. The ratio of the first monomer to the second monomer is from about 0.1:99.9 to about 99.9:0.1.

[0035] One example of a hydrogel that may be used comprises N-vinyl pyrrolidone as a first monomer and vinyl acetate as a second monomer. The hydrogel further comprises a photoinitiator (2-Hydroxy-4'-(2-hydroxyethoxy)-2-methylpropiophenone) marketed as Irgacure® 2959 by Ciba Specialty Chemicals Pty Ltd., and a cross-linking agent (diethylene glycol divinyl ether). The copolymeric mixture includes 50 parts N-vinyl pyrrolidone, 50 parts vinyl acetate, 0.5 parts Irgacure® 2959, and 0.5 parts diethylene glycol divinyl ether.

Claims

1. A method of forming a test sensor assembly (10), the method comprising:

   providing a sensor support (12) including at least one reservoir (24a,b) configured to hold a liquid (26);
   coupling a test sensor (14) to the sensor support (12), the test sensor (14) having at least one aperture (28a,b) formed therein, at least a portion of the at least one aperture (28a,b) being adjacent to the at least one reservoir (24a,b); and
   positioning a hydrogel (22a,b) on the test sensor (14), the hydrogel (22a,b) being linked to the at least one reservoir (24a,b) via the at least one aperture (28a,b).

2. The method of claim 1, wherein the at least one reservoir (24a,b) further includes a liquid (26).

3. The method of claim 2, wherein the hydrogel (22a, b) includes a solvent and the liquid (26) of the at least one reservoir (24a,b) includes a solvent, the solvent percentage of the liquid (26) being greater than the solvent percentage of the hydrogel (22a,b).

4. The method of one of the claims 1 to 3, wherein the sensor support (12) further includes a recessed area (16) having dimensions generally similar to dimensions of the test sensor (14), the recessed area (16) being adjacent to the test sensor (14), the at least one reservoir (24a,b) being positioned within the recessed area (16).

5. The method of one of the claims 1 to 4, further comprising providing a coupling mechanism for coupling the test sensor assembly (10) to an analyte-testing instrument.

6. The method of one of the claims 1 to 5, wherein the hydrogel composition (22a,b) comprises at least one monomer and a solvent.

7. The method of one of the claims 1 to 6, wherein the analyte-testing instrument is adapted to determine the analyte concentration at pre-selected time intervals.

8. The method of one of the claims 1 to 7, further comprising forming a plurality of electrodes (23) on the test sensor (14), the hydrogel (22a,b) being positioned on the plurality of electrodes.

9. The method of one of the claims 1 to 8, further comprising providing a mechanism for inhibiting the movement of the test sensor (14) relative to the sensor support (12).

Patentansprüche

1. Verfahren zum Bilden einer Prüfsensoranordnung (10), wobei das Verfahren umfasst:

Bereitstellen eines Sensorträgers (12) einschließlich mindestens eines Vorratsbehälters (24a,b), der ausgestaltet ist, um eine Flüssigkeit (26) zu enthalten;
Koppeln eines Prüfsensors (14) an den Sensorträger (12), wobei der Prüfsensor (14) mindestens eine Öffnung (28a,b) aufweist, die darin gebildet ist, und mindestens ein Teil der mindestens einen Öffnung (28a,b) dem mindestens einen Vorratsbehälter (24a,b) benachbart ist; und
Positionieren eines Hydrogels (22a,b) auf dem Prüfsensor (14), wobei das Hydrogel (22a,b) über die mindestens eine Öffnung (28a,b) mit dem mindestens einen Vorratsbehälter (24a,b) verbunden wird.

2. Verfahren nach Anspruch 1, wobei der mindestens eine Vorratsbehälter (24a,b) ferner eine Flüssigkeit (26) beinhaltet.

3. Verfahren nach Anspruch 2, wobei das Hydrogel (22a,b) ein Lösemittel beinhaltet und die Flüssigkeit (26) des mindestens einen Vorratsbehälters (24a, b) ein Lösemittel beinhaltet und der prozentuale Lösemittelanteil der Flüssigkeit (26) größer als der prozentuale Lösemittelanteil des Hydrogels (22a,b) ist.

4. Verfahren nach einem der Ansprüche 1 bis 3, wobei der Sensorträger (12) ferner einen ausgesparten Bereich (16) beinhaltet, der Abmessungen aufweist, die Abmessungen des Prüfsensors (14) im Allgemeinen ähnlich sind, wobei der ausgesparte Bereich (16) dem Prüfsensor (14) benachbart ist und der mindestens eine Vorratsbehälter (24a,b) innerhalb des ausgesparten Bereichs (16) positioniert wird.

5. Verfahren nach einem der Ansprüche 1 bis 4, ferner umfassend das Bereitstellen eines Kopplungsmechanismus zum Koppeln der Prüfsensoranordnung (10) an ein Analytprüfinstrument.

6. Verfahren nach einem der Ansprüche 1 bis 5, wobei die Hydrogelzusammensetzung (22a,b) mindestens ein Monomer und ein Lösemittel umfasst.

7. Verfahren nach einem der Ansprüche 1 bis 6, wobei das Analytprüfinstrument eingerichtet wird, um die Analytkonzentration in vorgewählten Zeitabständen zu bestimmen.

8. Verfahren nach einem der Ansprüche 1 bis 7, ferner umfassend das Bilden mehrerer Elektroden (23) auf dem Prüfsensor (14), wobei das Hydrogel (22a,b) auf den mehreren Elektroden positioniert wird.

9. Verfahren nach einem der Ansprüche 1 bis 8, ferner umfassend das Bereitstellen eines Mechanismus zum Hemmen der Bewegung des Prüfsensors (14) in Bezug auf den Sensorträger (12).

Revendications

1. Procédé de fabrication d'un ensemble (10) de capteur de test, le procédé comportant les étapes consistant à :

mettre en place un support (12) de capteur comprenant au moins un réservoir (24a, b) configuré pour contenir un liquide (26) ;
coupler un capteur (14) de test au support (12) de capteur, le capteur (14) de test étant doté d'au moins une ouverture (28a, b) formée dans celui-ci, au moins une partie de l'ouverture ou des ouvertures (28a, b) étant adjacente au(x) réservoir(s) (24a, b) ; et
positionner un hydrogel (22a, b) sur le capteur (14) de test, l'hydrogel (22a, b) étant lié au(x) réservoir(s) (24a, b) via l'ouverture ou les ouvertures (28a, b).

2. Procédé selon la revendication 1, le ou les réservoirs (24a, b) comprenant en outre un liquide (26).

3. Procédé selon la revendication 2, l'hydrogel (22a, b) comprenant un solvant et le liquide (26) du ou des réservoirs (24a, b) comprenant un solvant, le pourcentage de solvant du liquide (26) étant supérieur au pourcentage de solvant de l'hydrogel (22a, b).

4. Procédé selon l'une des revendications 1 à 3, le support (12) de capteur comprenant en outre une zone (16) en creux présentant des dimensions généralement similaires à des dimensions du capteur (14) de test, la zone (16) en creux étant adjacente au capteur (14) de test, le ou les réservoirs (24a, b) étant positionnés à l'intérieur de la zone (16) en creux.

5. Procédé selon l'une des revendications 1 à 4, comportant en outre l'étape consistant à mettre en place un mécanisme de couplage servant à coupler l'ensemble (10) de capteur de test à un instrument de test d'analytes.

6. Procédé selon l'une des revendications 1 à 5, la composition (22a, b) de l'hydrogel comportant au moins un monomère et un solvant.

7. Procédé selon l'une des revendications 1 à 6, l'instrument de test d'analytes étant prévu pour déterminer la concentration d'analyte à des intervalles de temps présélectionnés.

8. Procédé selon l'une des revendications 1 à 7, comportant en outre l'étape consistant à former une pluralité d'électrodes (23) sur le capteur (14) de test, l'hydrogel (22a, b) étant positionné sur la pluralité d'électrodes.

9. Procédé selon l'une des revendications 1 à 8, comportant en outre l'étape consistant à mettre en place un mécanisme servant à entraver le mouvement du capteur (14) de test par rapport au support (12) de capteur.

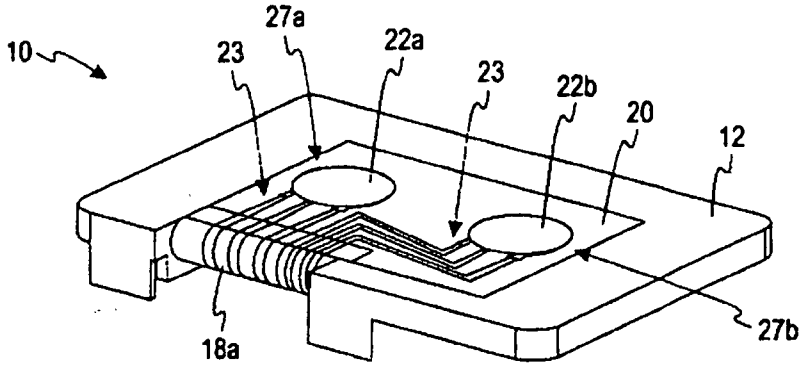
10
27a
23
22a
23
22b
20
12
18a
27b

Fig. 1a

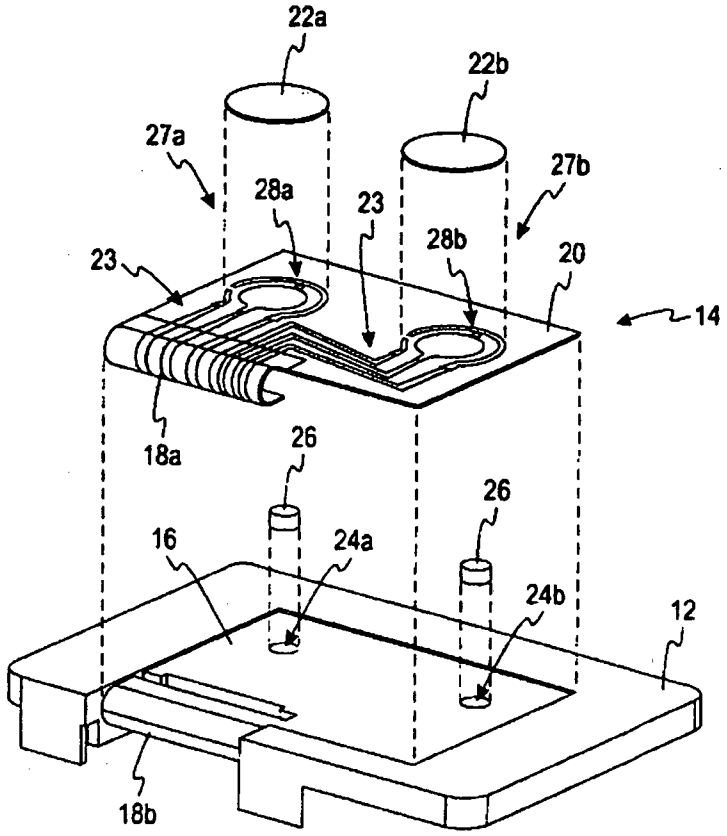
22a
22b
27a
27b
28a
23
28b
23
20
14
18a
26
26
16
24a
24b
12
18b

Fig. 1b

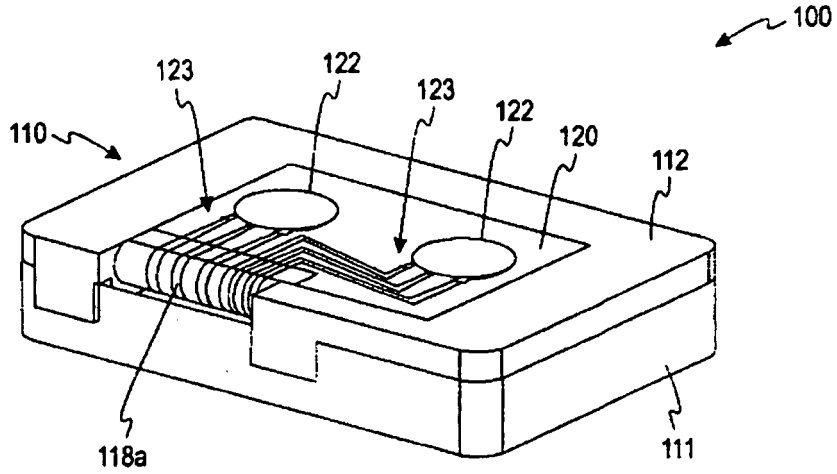

Fig. 2

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 1996000110 A **[0004]**

专利名称(译)	制造透皮分析物传感器组件的方法		
公开(公告)号	EP2289401B1	公开(公告)日	2013-11-06
申请号	EP2010170418	申请日	2006-12-14
[标]申请(专利权)人(译)	拜尔健康护理有限责任公司		
申请(专利权)人(译)	拜耳医药保健有限责任公司		
当前申请(专利权)人(译)	拜耳医药保健有限责任公司		
[标]发明人	BRENNEMAN ALLEN J		
发明人	BRENNEMAN, ALLEN J.		
IPC分类号	A61B5/00 A61B10/00		
CPC分类号	A61B5/14532 A61B5/14514 A61B5/1486 A61B5/6833 A61B2562/12		
优先权	60/751238 2005-12-16 US		
其他公开文献	EP2289401B8 EP2289401A1		
外部链接	Espacenet		

摘要(译)

公开了一种适于确定流体样品的分析物浓度的透皮测试传感器组件。该组件包括传感器支撑件，该传感器支撑件包括至少一个适于容纳液体该组件还包括耦合到传感器支撑件的测试传感器。测试传感器在其中形成至少一个孔。至少一个孔的至少一部分与至少一个贮存器相邻。该组件还包括位于测试传感器上的水凝胶组合物。水凝胶组合物通过至少一个孔与至少一个贮存器连接。

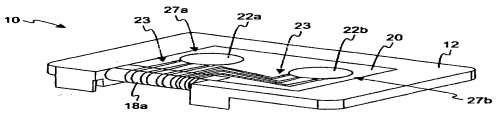

Fig. 1a

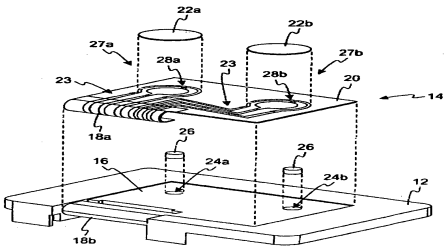

Fig. 1b