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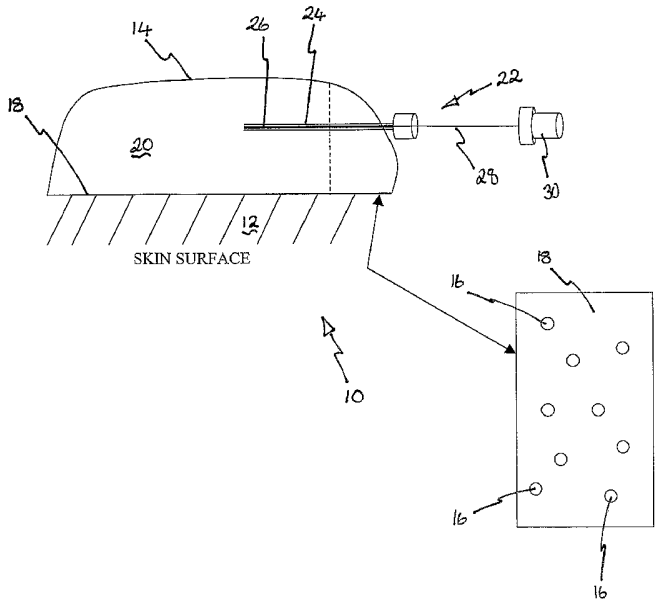
(54) **Title:** METHOD AND APPARATUS FOR SAMPLING VOLATILE COMPOUNDS



(57) **Abstract:** An apparatus and method for sampling volatile compounds transpiring from the skin is described. The apparatus includes an enclosure that is adapted to engage a skin surface closing the aperture and thereby enclosing a volume within the enclosure. The apparatus also has a sampling element that is contained within the enclosure and that contains sampling material that is adapted to adsorb or absorb volatile compounds transpiring from the skin surface. The sampling material is also adapted to be inserted into at least one analytical device and the volatile compounds transferred from the material into the analytical device.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Method and apparatus for sampling volatile compounds

The present invention relates to a method and apparatus for sampling volatile compounds and relates particularly, but not exclusively, to a method and apparatus for sampling volatile compounds or derivatives thereof which are transpired through the skin, particularly, but not limited to, compounds secreted in sweat.

It is known that the skin of an animal transpires many volatile compounds particularly in the case of mammals in their sweat. These compounds can be used as indicators of such things as health and to activities such as drug taking by analysing for metabolites of the drugs. Furthermore, the study of odour and its link to genetics and interpersonal relations is a field of current interest.

A typical example of a method of analysing the volatile components contained in sweat requires a pad, typically of cotton, to be held in contact with the skin, typically under the arm, for a period of several hours. The pad is then removed and an extraction process undertaken to prepare a sample for analysis. The extraction process is typically dissolving the volatile components of the sweat in a solvent. These solvent extraction steps are time consuming, can result in loss of sample and render such techniques unsuitable for some applications, particularly where rapid in field testing is required.

Such techniques suffer from a number of disadvantages. Firstly, the pad used presents a significant risk of contaminating the sample, due in part to its initial chemical impurity. Although a control can provide a base

line against which the sample can be compared for noise relating to the pad used, the noise experienced from many pads is so significant as to hide important volatile compounds in the sample which may be present in low levels. In figure 1 an example of a chemical profile from a GC/MS is shown. The upper line represents the profile taken from a cotton pad which had been held under a subject's arm, whilst the lower line is a control showing a chemical profile from an unused cotton pad. The control profile shows significant contamination with volatiles This technique also suffers from the disadvantage that over a long sampling period the compounds of highest volatility may not be captured by the cotton pad or may be lost to the atmosphere before they can be analysed. Furthermore, the introduction of a cotton pad, which is held in position for a number of hours, can significantly alter the microfloral composition of the skin. It has been shown that the microfloral composition of the skin effects the compounds transpired and can therefore alter the results obtained.

US Patent No. 6063041 discloses a device used in the perfume industry to sample perfume as it evaporates from a person's skin to determine the changing composition of the evaporate over time. The device encloses a volume of air, termed a headspace, above the skin to which a perfume has been added. An absorbent material is trapped behind a gauze and volatile compounds of the perfume are absorbed into the sampling material. The material is removed and the perfume compounds extracted by a process of thermal desorption followed by recondensation before they are injected into a gas chromatograph. This technique is insensitive and is only conceived for use where the volatile compounds have been added to the skin's surface as

is the case with perfumes. Due to the construction of the device and the nature of the sampling material used this would not be suitable to collect the low levels of complex mixtures of volatiles transpired through the skin. The packing effect of the powder sampling material does not allow the free circulation of air through the sampling material. This may lead to reduced or uneven exposure of the material to volatiles, particularly if the testing subject moves. This in turn adds a significant level of variability to the results obtained, will make it difficult to determine the sampling time required for a specific volatile and may make quantitative measurements difficult.

As with the sweat patch, the lack of airflow allows contamination and masking of important volatile compounds which are transpired through the skin by the formation of anaerobic conditions affecting the microflora found on the skin. In addition to this, the sampling material lies directly on a mesh which when in the sampling position is an open outer surface of the device and does not protect the sampling material from contamination by elements of the skin surface such as body hair, sweat, bacteria, dead skin cells, particularly if the subject under analysis is moving. The device is particularly unsuitable for sampling body surfaces where important volatiles are transpired from the skin such as the human armpit. A device such as the watch is not ergonomically designed to fully engage with the skin surface in the armpit cavity thus ensuring a tight seal is formed such that efficient collection occurs without contamination from the environment.

Preferred embodiments of the present invention seek to overcome disadvantages of the prior art, including, but not limited to, those set out above.

According to an aspect of the present invention there is provided a method of sampling volatile compounds transpired from the skin of a mammal, the method comprising:-

forming at least one enclosed volume around a skin surface of a mammal, the volume being bounded by the skin surface and containing at least one sampling material adapted to adsorb or absorb at least one volatile compound transpired from said skin surface; and

maintaining said volume in position on said skin surface for a period of time sufficient to allow at least one volatile compound to be absorbed into or adsorbed onto at least one sampling material.

By sampling volatile compounds transpired by the skin according to the method set out above, the advantage is provided that very sensitive measurements of compounds can be made without the interference of contaminents found in techniques of the prior art. As a result, this sampling method can be used in the diagnosis of disease and medical conditions, can be used for the detection of drug metabolites to demonstrate the use of drugs and can be used in research relating to genetic tendencies to transpire certain volatile compounds. Because sampling times are considerably shorter than those of the prior art, the microflora present on the skin of the person being tested is not affected by the sampling technique used. This sampling technique has further advantages over other known

drug testing techniques. For example, when compared to taking of a urine sample, the above technique is regarded as significantly less intrusive. The technique is also less invasive than taking a blood sample and can be used to take samples continually in real time thereby allowing factors which may have an effect on the biological system to be studied, for example during a period of exercise as opposed to urine or blood where sampling would have to be taken afterwards.

This method has particular advantages therefore when it is useful to study the effects of external influences on the metabolism. The ability to monitor the system with this sensitivity and without contaminants opens up application to metabalomics, drug discovery, clinical trials, pharmacogenetics as well as diagnostics, monitoring environmental exposure to an individual, screening for drugs of abuse and biometrics. Such a disclosed method of direct sampling is designed to enable the increased capture levels of compounds which are required for analysis of the low levels of volatiles transpired from the skin. The method also ensures the sample collected is truly representative of molecules emanating from the surface of the skin without the introduction of contaminants from the environment, skin, sampling materials or the masking effect caused by the anaerobic metabolism of bacteria on the skin.

In a preferred embodiment gases contained within said volume are circulated within said volume thereby passing over at least one said sampling material.

By circulating the air in the sampling volume this allows the volatiles transpired from the skin to pass over the

sampling material increasing the likelihood of absorption and adsorption.

In a preferred embodiment gases contained within said volume are mechanichally circulated within said volume thereby facillitated passing over at least one said sampling element. This can be achieved by for example installation of a fan within the device which is powered by a watch battery.

In another preferred embodiment at least one said sampling material is moved within said volume.

By moving the air within the sampling volume, or moving the sampling element within the volume, the advantage is provided that the more gases and volatile compounds within the volume are able to contact the sampling material thereby increasing the likelihood of being adsorbed or absorbed. This in turn increases the sensitivity of the sampling technique allowing a reduction in the sampling time.

According to another aspect of the present invention there is provided a method of detecting volatile compounds transpired from the skin of a mammal, the method comprising:-

sampling volatile compounds according to the method defined above; and

extracting at least one extract from at least one said sampling material and analysing at least one said extract for the presence of at least one volatile compound.

In a preferred embodiment said sampling material is inserted into at least one analytical device or sample extraction device to extract at least one said extract.

By directly inserting the sampling material into at least one analytical device or sample extraction device, the advantage is provided that there is less opportunity for contamination of the sampling material between the time of sampling and analysis of the sample collected.

In another preferred embodiment said extract is extracted from said sampling material by thermal desorption.

In a further preferred embodiment said sampling material is inserted into the injector port of a gas chromatograph.

In a further preferred embodiment sampling material is inserted directly into a thermal desorption device

According to a further aspect of the present invention there is provided an apparatus for the direct in situ sampling of volatile compounds transpiring from the skin of a mammal, the apparatus comprising:-

at least one enclosure having at least one aperture, the enclosure being adapted to engage a skin surface of a mammal, the or each surface substantially closing the or each aperture thereby enclosing a volume within the or each enclosure;

at least one sampling element contained within said enclosure and comprising sampling material adapted to

adsorb or absorb at least one volatile compound transpiring from at least one said surface, wherein at least one said sampling material is adapted to be inserted into at least one analytical device and at least one said volatile compound transferred from at least one said material into at least one said analytical device.

A sealed unit forming at least one enclosed space and having at least one outer surface designed to engage with and form a tight seal against the skin surface of a mammal, such a surface comprising at least one aperture which is open when said surface is placed in direct contact with the skin surface, thereby allowing volatile compounds transpired through the skin to enter the enclosed space. It will be appreciated that more than one outer surface may be designed to contact some skin surfaces, such as sub-axilliary in humans, in which case each outer surface designed to contact the skin will form a tight seal with the skin surface and comprise at least one aperture which is open when in contact with the skin surface, thereby enclosing a volume within enclosure. In each instance the enclosed space will contain at least one sampling element contained within said enclosure and adapted to adsorb or absorb at least one volatile compound transpiring from at least one said skin surface, wherein at least one said sampling element is adapted to be inserted into at least one analytical device or one thermal desorption device and at least one said volatile compound transferred from at least one said material into at least one said analytical device or thermal desorption device.

Furthermore the sealed volume contains at least one sampling element, which consists of a discrete unit which

has been positioned within the enclosed volume so that air can freely circulate around it and it cannot directly touch the internal surface of any skin engaging surface or the skin surface and is comprised of material designed to adsorb or absorb at least one volatile compound transpired from said skin surface. The element has the further advantage in that it can be transferred without further manipulation into a GC/MS or suitable thermal desorption unit.

In a preferred embodiment at least one said sampling element is mounted within at least one said enclosure such that said sampling element cannot directly contact the internal surface bounding the enclosed space, the skin surface or any physical element on the skin surface sampling material.

In another preferred embodiment the device may contain a shield between the internal surface of the skin engaging surface and the element, such a shield providing a physical barrier to prevent any contact between the element and said internal surface or any component of the skin such as hair, or skin debris.

In another preferred embodiment at least one said sampling element is located within said enclosure such that gases within said volume can circulate around at least one said material.

The apparatus may further comprise at least one gas circulating device for circulating the gases within said volume.

In a preferred embodiment, at least one said sampling material is contained within a needle and in use is at least partially extended from said needle.

By sheathing the sampling material within a needle, the advantage is provided that the sampling material is protected when it is not un use. Furthermore, the needle can be used to puncture the seal on the injection port of a gas chromatograph and the sampling material can then be extended into the injection port to allow the volatile compounds to be driven off by desorption.

The apparatus may also further comprise at least one closure to close the or each aperture when the apparatus is not engaged with at least one said skin surface in order to prevent environmental contamination while the device is not in use.

In a preferred embodiment the maximum distance between at least one said surface and an internal surface of said enclosure.

Preferred embodiments of the present invention will now be described, by way of example only and not in any limitative sense, with reference to the accompanying drawings in which:-

Figure 1 is a chemical profile from a GC/MS of body odour sampled using an apparatus and method of the prior art;

Figure 2 shows a schematic sectional view of a sampling device of the present invention;

Figure 3 is a schematic side view of an alternative sampling device of the present invention; and

Figure 4 is a chemical profile from a GC/MS of auxiliary body odour sampled using the apparatus and method of the present invention.

Referring to Figure 2, an apparatus 10 for sampling volatile compounds transpiring from a preferably flat skin surface 12 has an enclosure 14 which has a plurality of apertures 16 in a skin engaging surface 18. When the apparatus 10 is in use, the skin engaging surface 18 with open apertures 16 is placed in engagement with skin surface 12 so as to seal the device and form an enclosed volume of air 20 within enclosure 14. The device 10 also includes a sampling element 22 which is held within enclosure 14 so that skin surface 12, or any hairs extending from the skin surface, cannot contact the sampling element 22. Volatile compounds transpired through skin surface 12 diffuse into enclosed space 20 and are captured by absorption into or adsorption onto the sampling element. The element 22 has a protective sheath 24 which extends around a sampling material 26. The sampling material 26 is rod-shaped and is typically dimensioned so as to be inserted directly into the injection port of a gas chromatograph, or thermal desorption unit. The sampling material is connected to an extension portion 28 which is typically made of a material other than the sampling material 26.

The extension portion 28 is connected to a handle 30 which allows extension portion 28 to be pushed into sheath 24 thereby exposing sampling material 28 within volume 20. The sheath 24 can act as a piercing needle so that it can be

inserted into a gas chromatograph and then the sampling material 26 pushed into the injection port. The sampling material 26 is typically but not limited to a solid-phase microextraction fibre (SPME) supplied by Supelco. The SPME fiber assembly may be coated with various absorbent or adsorbant materials such as: Carbowax / Divinylbenzene (CW/DVB); Carbowax / Templated Resin; Divinylbenzene / Carboxen / Polydimethylsiloxane; Polyacrylate; Polycrylate; Polydimethylsiloxane / Divinylbenzene. Alternatively the sampling may be formed from Solid Phase Aroma Concentration Extraction (SPACE) rod which comprises a steel rod 9cm x 1.2 mm coated with an absorbent mixture of 18% graphite and 2% activated carbon and was developed by T. Hasegawa Co. Ltd. In a further alternative a Twister Stir bar which is coated with Poly dimethylsiloxane PDMS and supplied by Gerstel is used. It will be appreciated that the above list is not exhaustive and any such similar sampling methodology may be employed. Such materials are able to absorb or adsorb volatile compounds and these compounds may be later desorbed from the sampling material for analysis.

Although not shown in the embodiment described above, the apertures 16 can be provided with a sealing mechanism which can seal the apertures 16 following sampling allowing the material to be transported within the enclosure without the risk of contamination from the environment.

In use, the skin engaging surface 18 of sampling device 10 is placed on skin surface 12 so as to seal apertures 16. The enclosure 14 is held in position against skin surface 12 by any suitable retaining means. For example, where the device is used on an arm, the enclosure 14 may be held in

engagement with skin surface 12 by an elasticated strap extending around the arm.

Once the enclosure 14 is engaged with skin surface 12, the sampling material 26 is extended from within sheath 24 by pushing handle 30. The sampling material 26 is then exposed to the atmosphere within volume 20 and volatile compounds which have evaporated through apertures 16 into volume 20 will be absorbed into or adsorbed onto the sampling material.

After a predetermined sampling period, the sampling material 26 is withdrawn into sheath 24. The sampling element 22 can then be removed from the enclosure 14 and sheath 24 can be used to pierce the injector port of a gas chromatograph. Once the sheath 24 is within the injector port, the handle 30 is pushed so as to extend sampling material 26 into the injector port. Because of the raised temperature within the injector port of the gas chromatograph, the volatile compounds which were adsorbed onto or absorbed into sampling material 26 are desorbed and pass along the chromatographic column. Typically, the gas chromatograph is provided with a mass spectrograph for further analysis of the volatile compounds using known techniques.

An example of the output from a GC/MS using the method and apparatus of the present invention is shown in Figure 4. The upper line represents the chemical profile sampled from the body odour of a subject and the lower line is a background control. It is clear that the contamination of the control is significantly less in techniques of the present invention than has been possible in the prior art.

This sampling technique may be useful in a number of fields. The technique can be used to detect metabolites of many substances including drugs and can therefore be used to determine whether a person who is sampled has taken drugs. This technique may be of particular interest since it is possible to take samples during activity allowing the detection of quickly metabolised fast-acting drugs. In an adaptation of this technique, a number of sampling materials could be exposed to the atmosphere enclosed within the volume at different times to obtain time dependent samples. This could be done by exposing the sampling materials from within the needle sheaths or by having separate sampling enclosures by having automatically opening aperture doors which are timed to open at pre-determined intervals during an exercise period. Such sampling of metabolites is not possible using urine or blood samples.

This sampling technique has proved sufficiently sensitive to detect genetically dependent transpiration of volatile compounds. The inventors were surprisingly able to detect a minor compound in body odour which is representative of genetic odour signature. This identification was not possible when sampled using the sweat patch technique due to the poor signal to noise ratio. Furthermore, this technique can be used to detect symptoms or diagnose diseases or conditions which cause changes in the transpiration of volatile compounds through the skin.

It will be apparent to persons skilled in the art that the above embodiments have been described by way of example only, and not in any limitative sense, and that various

alterations and modifications are possible without departure from the scope of the invention as defined by the appended claims. For example, the apparatus may be adapted to be positioned under the arm and therefore more than one surface of the enclosure may be provided with apertures so as to engage the skin surface of the armpit. Such a device is schematically shown in Figure 3.

The device may also include more than one detection element, either of different chemical composition in order to detect a wider spectrum of volatile compounds or the same composition in order to improve sensitivity.

Claims

1. A method of sampling volatile compounds transpired from the skin of a mammal, the method comprising:-

forming at least one enclosed volume around a skin surface of a mammal, the volume being bounded by the skin surface and containing at least one sampling material adapted to adsorb or absorb at least one volatile compound transpired from said skin surface; and

maintaining said volume in position on said skin surface for a period of time sufficient to allow at least one volatile compound to be absorbed into or adsorbed onto at least one sampling material.

2. A method according to claim 1, wherein gases contained within said volume are circulated within said volume thereby passing over at least one said sampling material.

3. A method according to claim 1 or 2, wherein at least one said sampling material is moved within said volume.

4. A method of sampling volatile compounds transpired from the skin of a mammal substantially as hereinbefore described with reference to the accompanying drawings.

5. A method of detecting volatile compounds transpired from the skin of a mammal, the method comprising:-

sampling volatile compounds according to the method of claims 1 to 4; and

extracting at least one extract from at least one said sampling material and analysing at least one said extract for the presence of at least one volatile compound.

6. A method according to claim 5, wherein said sampling material is inserted into at least one analytical device to extract at least one said extract.

7. A method according to claim 5 or 6, wherein said extract is extracted from said sampling material by thermal desorption.

8. A method according to claim 7, wherein said sampling material is inserted into the injector port of a gas chromatograph.

9. A method of detecting volatile compounds transpired from the skin of a mammal as hereinbefore described with reference to the accompanying drawings.

10. An apparatus for sampling volatile compounds transpiring from the skin of a mammal, the apparatus comprising:-

at least one enclosure having at least one aperture, the enclosure being adapted to engage a skin surface of a mammal, the or each surface substantially closing the or each aperture thereby enclosing a volume within the or each enclosure;

at least one sampling element contained within said enclosure and comprising sampling material adapted to adsorb or absorb at least one volatile compound transpiring

from at least one said surface, wherein at least one said sampling material is adapted to be inserted into at least one analytical device and at least one said volatile compound transferred from at least one said material into at least one said analytical device.

11. An apparatus according to claim 10, wherein at least one said sampling element is located within at least one said enclosure such that portions of the or each surface cannot contact the or each sampling material of the element.

12. An apparatus according to claim 10 or 11, wherein at least one said sampling element is located within said enclosure such that gases within said volume can circulate around at least one said material.

13. An apparatus according to any one of claims 10 to 12, further comprising at least one gas circulating device for circulating the gases within said volume.

14. An apparatus according to any one of claims 10 to 13, at least one said sampling material is contained within a needle and in use is at least partially extended from said needle.

15. An apparatus according to any one of claims 10 to 14, further comprising at least one closure to close the or each aperture when the apparatus is not engaged with at least one said surface.

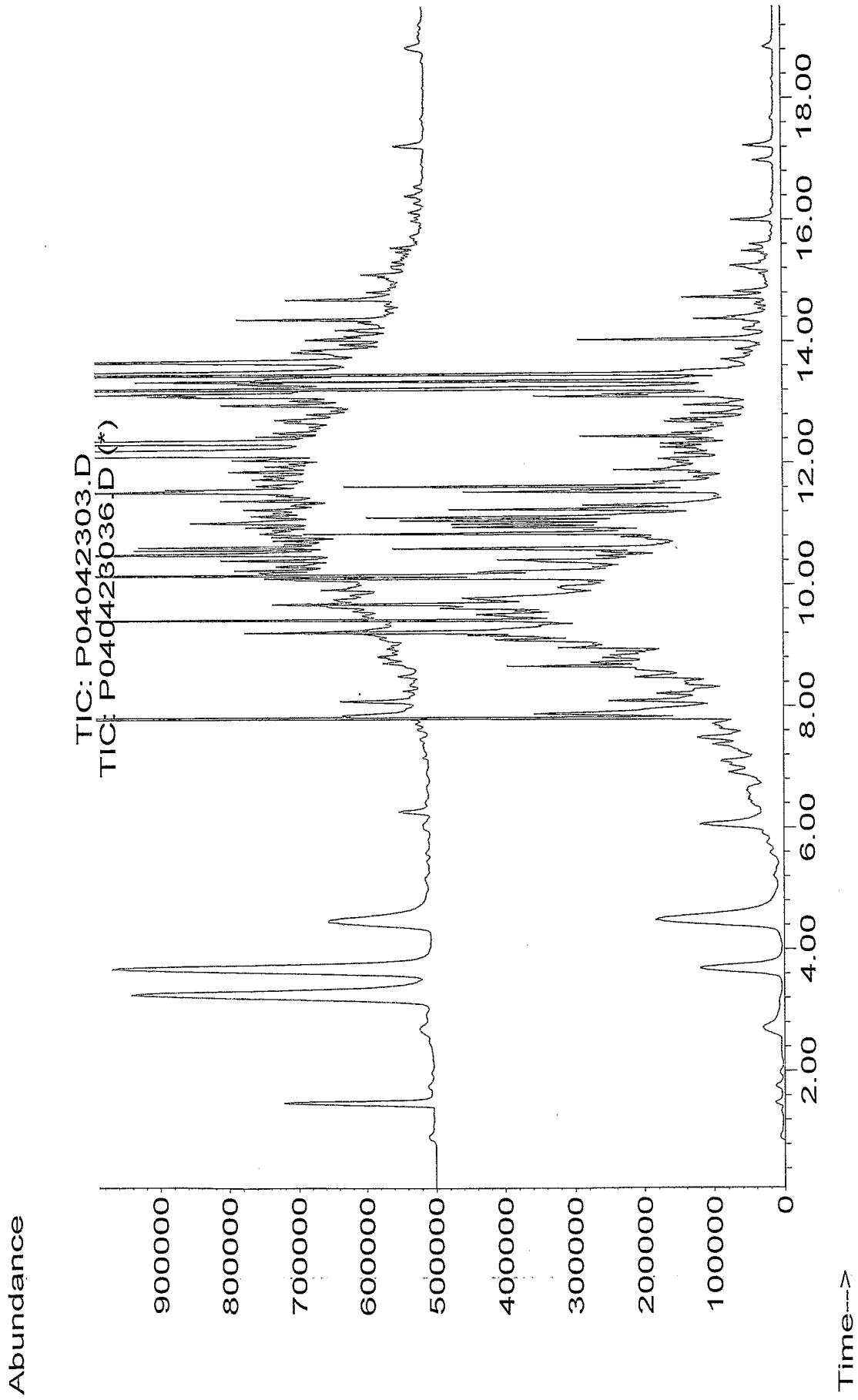
16. An apparatus according to any one of claims 10 to 15, wherein the maximum distance between at least one said

surface and an internal surface of said enclosure is between 0.001mm and 100mm.

17. An apparatus according to claim 16, wherein the maximum distance between at least one said surface and an internal surface of said enclosure is between 0.1mm and 35mm.

18. An apparatus for sampling volatile compounds transpiring from the skin of a mammal substantially as hereinbefore described with reference to the accompanying drawings.

Fig 1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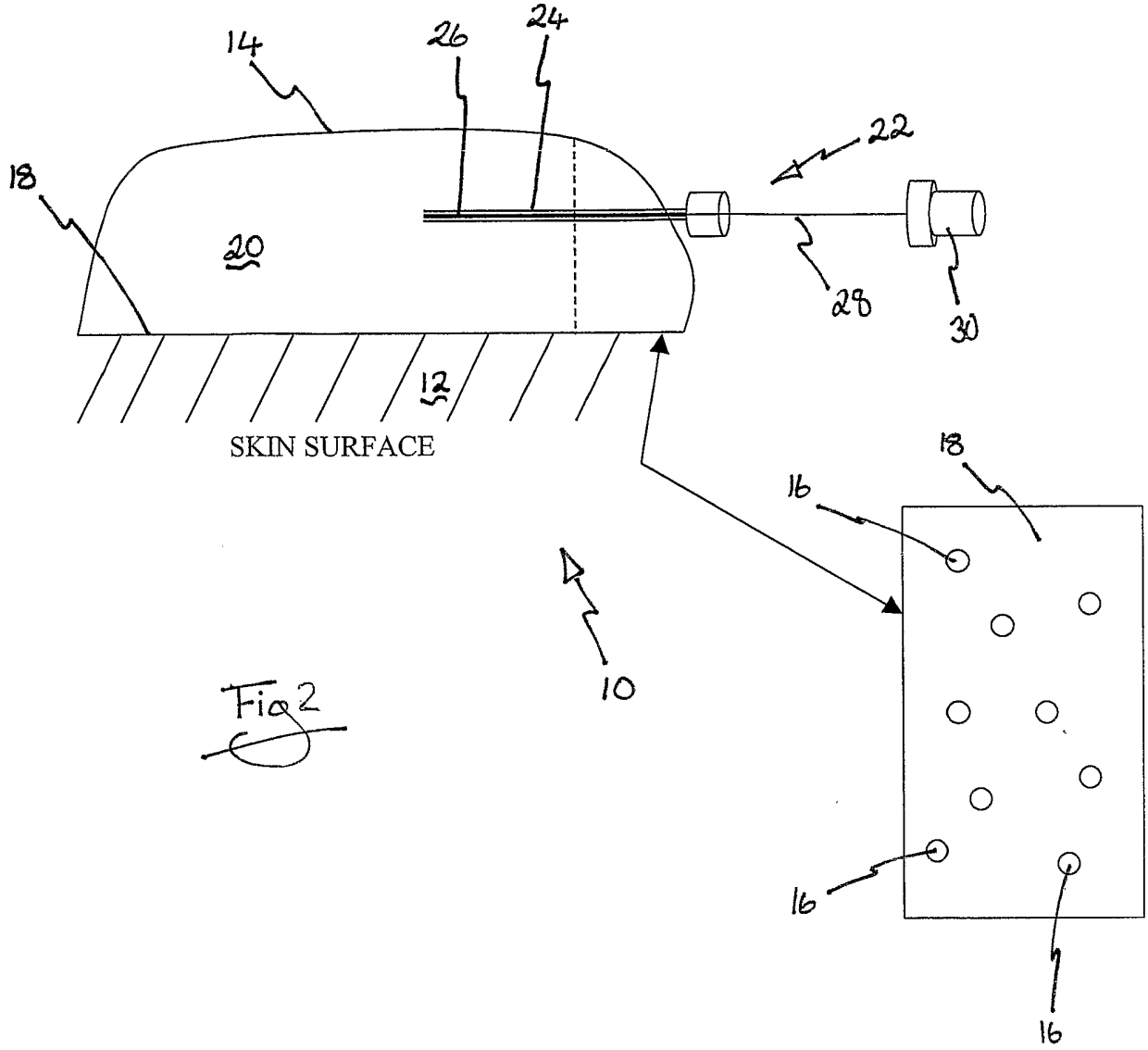


Fig 2

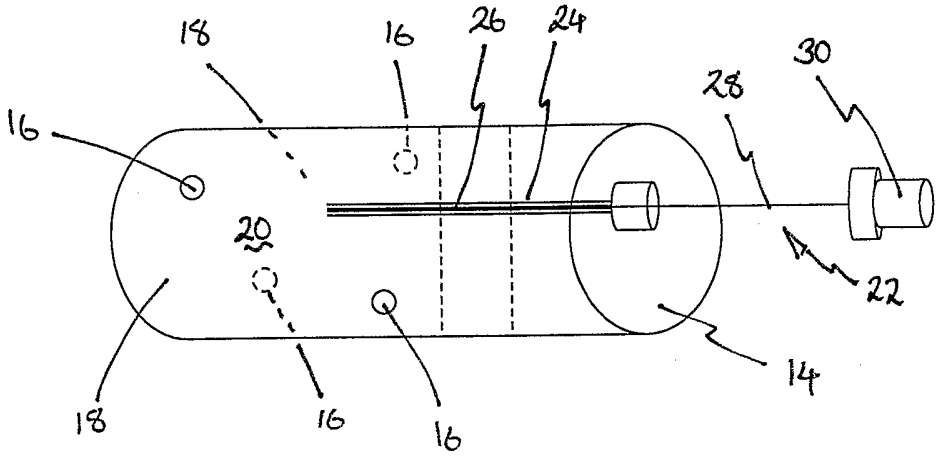
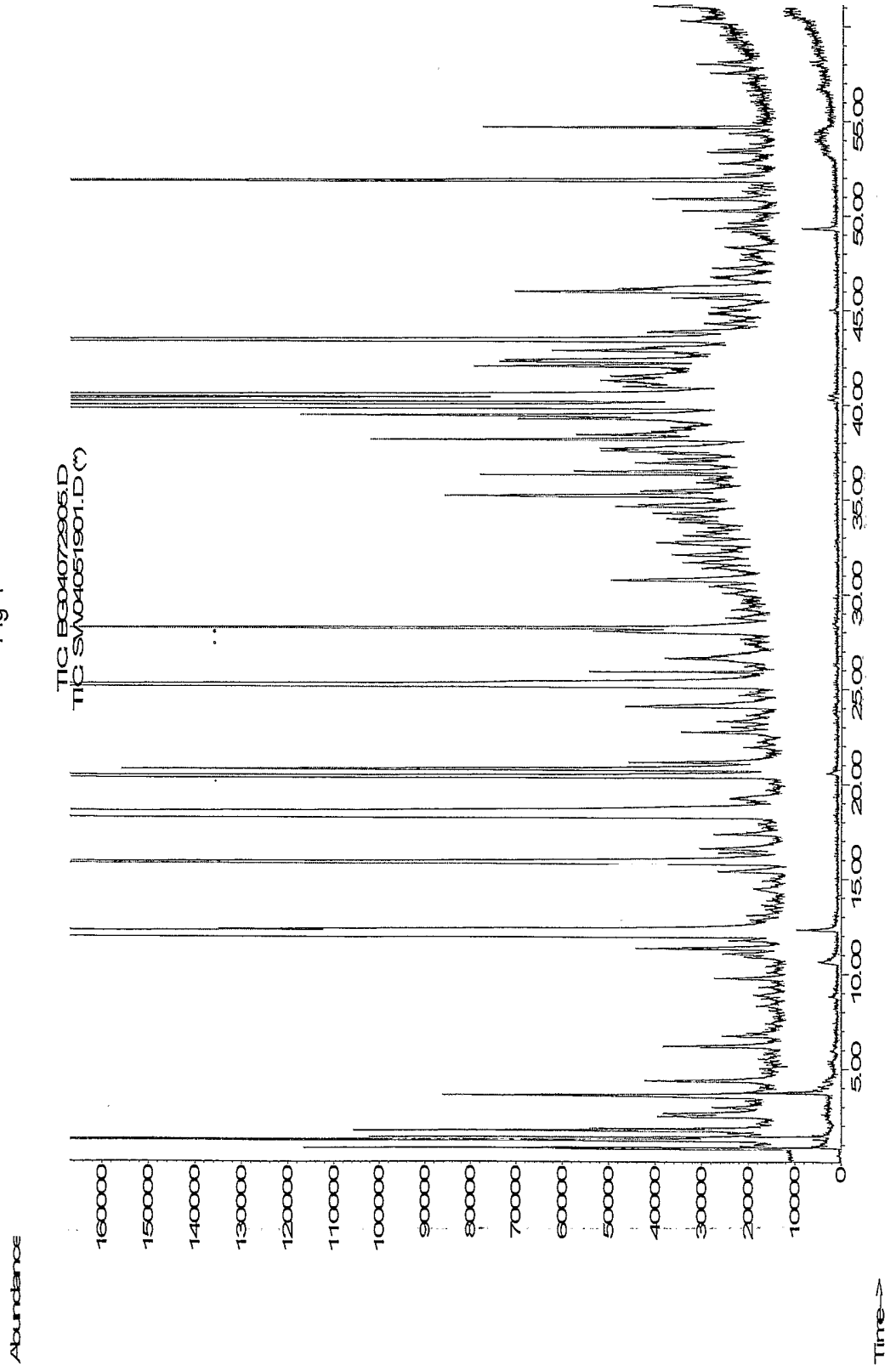


Fig 3

Fig 4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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/001436

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B10/00
ADD. A61B5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 063 041 A (FLAMENT ET AL) 16 May 2000 (2000-05-16) cited in the application column 2, line 66 - column 3, line 18; figure 1	10-12, 15-17
X	WO 89/04630 A (DERMAL SYSTEMS INTERNATIONAL) 1 June 1989 (1989-06-01) page 8, line 1 - line 12; figure 1	1,2,5-8, 10,12, 15-17
X	US 5 944 662 A (SCHOENDORFER ET AL) 31 August 1999 (1999-08-31) column 9, line 32 - column 10, line 15; figures 2,2a	1,2,5-8, 10-12, 16,17

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 July 2006	24/07/2006

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Mayer-Martenson, E

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/001436

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98/21578 A (SUDOR PARTNERS) 22 May 1998 (1998-05-22) abstract; figures 1,2	1,10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2006/001436

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 4,9,18
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 4,9,18

Rule 6.2 (a) PCT: Claims should not rely on references to the description or drawings;

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2006/001436

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