Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 21 February 2019

Case Number: T 1662/14 - 3.2.02

Application Number: 03710743.0

Publication Number: 1610681

IPC: A61B5/11, A61B5/083, G01N33/497

Language of the proceedings: EN

Title of invention:
METHOD AND APPARATUS FOR MONITORING INTRAVENOUS (IV) DRUG CONCENTRATION USING EXHALED BREATH

Patent Proprietor:
University of Florida Research Foundation, Incorporated

Opponent:
Drägerwerk AG & Co. KGaA

Headword:

Relevant legal provisions:
EPC Art. 87(1), 87(4), 54(3), 123(2)

Keyword:

Priority - validity of priority date for a European patent application claiming priority before the filing date of the patent (yes - partially)
Novelty - main, first to fourth and ninth auxiliary requests (no)
Amendments - undisclosed disclaimer - fifth to eighth auxiliary requests - allowable (no)

Decisions cited:

G 0001/03, G 0001/16

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1662/14 - 3.2.02

D E C I S I O N
of Technical Board of Appeal 3.2.02
of 21 February 2019

Appellant: (Patent Proprietor)	University of Florida Research Foundation, Incorporated 223 Grinter Hall Gainesville, Florida 32611 (US)
Representative:	Martin, Philip John Marks & Clerk LLP 62-68 Hills Road Cambridge CB2 1LA (GB)
Respondent: (Opponent)	Drägerwerk AG & Co. KGaA Moislinger Allee 53/55 23558 Lübeck (DE)
Representative:	Uexküll & Stolberg Partnerschaft von Patent- und Rechtsanwälten mbB Beselerstraße 4 22607 Hamburg (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 30 June 2014 revoking European patent No. 1610681 pursuant to Article 101(3)(b) EPC**

Composition of the Board:

Chairman	E. Dufrasne
Members:	D. Ceccarelli
	M. Stern

Summary of Facts and Submissions

I. The patent proprietor has appealed against the Opposition Division's decision to revoke European patent No. 1 610 681. The written decision was despatched on 30 June 2014.

II. The patent was opposed on the grounds of added subject-matter, insufficient disclosure, lack of novelty and lack of inventive step.

III. In the impugned decision, the Opposition Division held that the subject-matter of claim 1 of the third auxiliary request lacked novelty over the following document.

D2: WO-A-2004/000400

IV. Notice of appeal was filed on 1 August 2014. The appeal fee was paid the same day. A statement setting out the grounds of appeal was received on 10 November 2014.

V. The Board summoned the parties to oral proceedings. In the communication accompanying the summons, the Board stressed that it would have to be established whether the priority claim of D2 was valid for at least part of its subject-matter.

VI. By letter dated 13 December 2018, the respondent announced that it would not take part in the oral proceedings.

VII. By letter dated 22 January 2019, the appellant announced that it would not be attending the oral proceedings.

VIII. Oral proceedings took place on 21 February 2019 in the absence of the parties.
The appellant had requested in writing that the decision under appeal be set aside and that the patent be maintained on the basis of one of the main request and the first to ninth auxiliary requests, all filed by letter dated 10 November 2014.

The respondent had requested in writing that the appeal be dismissed.

IX. The following documents are also mentioned in the present decision.

D3: US application No 10/178,877
D11: US application No 10/054,619

X. **Claim 1 of the main request** reads as follows.

"An anesthetic agent delivery system for intravenously delivering a desired dose of propofol to a patient comprising:

an intravenous propofol supply having a controller for controlling the amount of propofol provided intravenously by the supply;

a breath analyzer for analyzing the patient's breath for concentration of at least one substance indicative of the free propofol concentration in the patient's bloodstream that provides a signal to indicate the free propofol concentration produced by the propofol intravenously delivered to the patient; and

a system controller connected to the propofol supply which receives the signal and controls the amount of propofol delivered intravenously based on the signal."

Claim 1 of the first auxiliary request reads as claim 1 of the main request except for the amendments highlighted below in the first line of the claim.

"~~An~~ total intravenous anesthetic agent delivery..."

Claim 1 of the second auxiliary request reads as claim 1 of the first auxiliary request except for the amendments highlighted below in the definition of the breath analyzer.

"...a breath analyzer for analyzing the patient's breath for concentration of free propofol and/or metabolites of propofol ~~at least one substance indicative of the free propofol concentration in the patient's bloodstream~~ that provides a signal to indicate the free propofol or metabolite concentration in the patient's bloodstream produced by the propofol intravenously delivered to the patient; and..."

Claim 1 of the third auxiliary request reads as claim 1 of the second auxiliary request except for the amendments highlighted below in the definition of the breath analyzer.

"...a breath analyzer for analyzing the patient's breath for concentration of free propofol and/or metabolites of propofol that provides a signal which is proportional to ~~indicate~~ the free propofol or metabolite concentration in the patient's bloodstream produced by the propofol intravenously delivered to the patient; and..."

Claim 1 of the fourth auxiliary request reads as claim 1 of the third auxiliary request with the

following wording added at the end of the claim.

"wherein the signal is based on average exhaled concentrations"

Claim 1 of the fifth auxiliary request reads as claim 1 of the first auxiliary request with the following wording added at the end of the claim.

"wherein the system does not involve exposing at least one sensor to inspired gases"

Claim 1 of the sixth auxiliary request reads as claim 1 of the fifth auxiliary request except for the amendments highlighted below in the definition of the breath analyzer.

"...a breath analyzer for analyzing the patient's breath for concentration of free propofol and/or metabolites of propofol ~~at least one substance indicative of the free propofol concentration in the patient's bloodstream~~ that provides a signal which is proportional to ~~indicate~~ the free propofol or metabolite concentration in the patient's bloodstream produced by the propofol intravenously delivered to the patient; and..."

Claim 1 of the seventh auxiliary request reads as claim 1 of the main request with the following wording added at the end of the claim.

"...wherein the system does not deliver anesthesia to a patient through a breathing circuit and does not comprise:

an anesthetic gas supply having a controller for controlling the amount of volatile anesthetic agent

provided by the supply to the breathing circuit and

an inspired gas analyser for analysing the concentration of anesthetic gas in the breathing circuit and

wherein the system controller does not control any anesthetic agent administered into the breathing circuit"

Claim 1 of the eighth auxiliary request reads as claim 1 of the seventh auxiliary request except for the amendments highlighted below in the definition of the breath analyzer.

"...a breath analyzer for analyzing the patient's breath for concentration of free propofol and/or metabolites of propofol ~~at least one substance indicative of the free propofol concentration in the patient's bloodstream~~ that provides a signal which is proportional to ~~indicate~~ the free propofol or metabolite concentration in the patient's bloodstream produced by the propofol intravenously delivered to the patient; and..."

Claim 1 of the ninth auxiliary request reads as claim 1 of the third auxiliary request with the following wording added at the end of the claim.

"wherein the breath analyzer comprises a collector for sampling the patient's expired breath, a sensor for analyzing the breath for concentration of free propofol and/or metabolites of propofol, a processor for calculating the effect of the propofol based on the concentration and determining depth of anesthesia;

wherein the sensor is selected from a metal-insulator-metal emsemble (MIME) sensor, a cross-reactive optical microsensor array, a fluorescent

polymer film, a surface enhanced raman spectroscope (SERS), a diode laser, a selected ion flow tube, a proton transfer reaction mass spectrometer, a metal oxide sensor, a non-dispersive infrared spectrometer, a bulk acoustic wave sensor, a colorimetric tube, an infrared spectroscope, semiconductor gas sensor technology, conductive polymer gas sensor technology, or surface acoustic wave gas sensor technology"

XI. The appellant's arguments, where relevant to the present decision, may be summarised as follows.

The patent in suit was based on an application that was identical to but did not claim priority from D11. D2 claimed priority from D3, which claimed continuation-in-part status from D11. There was subject-matter common to D11 and D3. Accordingly, D3 was not the first filing for the overlapping material. It followed that D2 belonged to the state of the art of the patent pursuant to Article 54(3) EPC only in respect of the material which was new to D2/D3 and not present in D11.

Claim 1 of the main request was limited to a system in which the anesthetic agent was only delivered intravenously, as disclosed in D11. If D2 were considered to teach such a system, its priority claim would be invalid since that system had been first disclosed in D11.

The same applied to claim 1 of the first auxiliary request, in which the limitation to the invention first disclosed in D11, i.e. a total intravenous anesthetic agent delivery system, had been made explicit.

In their claim 1, the second to fourth and the ninth auxiliary requests all specified a total intravenous

anesthetic agent delivery system. The arguments in relation to the first auxiliary request applied to those requests too.

The fifth to eighth auxiliary requests included disclaimers to establish novelty over D2, fulfilling the requirements of decisions G 1/03 and G 1/02 [sic]. All the embodiments of D2 included the delivery of anesthesia through a breathing circuit and a sensor exposed to inspired gases, with one or two separate controllers for the anesthetic supplies.

XII. The respondent's arguments, where relevant to the present decision, may be summarised as follows.

D2 was prior art according to Article 54(3) EPC because it validly claimed priority from D3. D3 disclosed an invention different from the one disclosed in D11.

The anesthesia delivery system disclosed in D2 was more specific than the subject-matter of the claims of the main request and was therefore novelty-destroying.

The first to fourth and the ninth auxiliary requests were not allowable for lack of novelty over D2. The system disclosed in D2 could be used without the delivery of inhalational anesthetics.

The fifth to eighth auxiliary requests contained unallowable disclaimers.

Reasons for the Decision

1. The appeal is admissible.

2. Although having been duly summoned by communication dated 22 November 2018, the appellant and the respondent were not present at the oral proceedings, as announced by letters dated, respectively, 22 January 2019 and 13 December 2018. In accordance with Rule 115(2) EPC and Article 15(3) RPBA, the proceedings were continued without the parties, who are treated as relying only on their written cases.

3. The invention

The invention relates to a system for the intravenous delivery of the anesthetic agent propofol to a patient. The system comprises a propofol supply and a controller for controlling the intravenous delivery. The control can be made based on a signal indicating the free propofol concentration in the patient's bloodstream, which, according to the patent, can be reliably correlated to the depth of anesthesia (column 2, lines 18 to 22 and 27 to 28).

In use, this signal is provided by a breath analyser which analyses the concentration of at least one substance in the breath indicative of the free propofol concentration in the patient's bloodstream.

Hence, a predictive and non-invasive apparatus for detecting the depth of anesthesia is provided (paragraphs [0010] and [0011] of the patent).

4. The state of the art

4.1 The assessment of novelty hinges on the question of whether D2, or at least part of its subject-matter, is state of the art according to Article 54(3) EPC for the

patent in suit.

4.2 D2 is an international application which entered the European phase with publication No. EP-A-1 519 767, designating all contracting states designated in the patent in suit.

D2 has a publication and a filing date both after the date of filing of the patent in suit. However, it claims priority from D3, a US application of the predecessor in title of the applicant of D2 with the same technical content as D2, which was filed before the date of filing of the patent in suit.

From the above it follows that D2 belongs to the state of the art according to Article 54(3) EPC if and to the extent to which the priority claim is valid.

4.3 The priority right is the subject of Article 87 EPC. According to Article 87(1) EPC, a right of priority in respect of the same invention can be enjoyed by the same applicant or his successor in title during a period of twelve months from the date of filing of the first application.

D11 is a US application of the predecessor in title of the applicant of D2 and has the same technical content as the original application from which the patent in suit is derived. D3 is a continuation-in-part of D11, granted as US patent No. 6,981,947. Hence, D11 has left some rights outstanding within the meaning of Article 87(4) EPC. This was not in dispute between the parties.

It follows that D11 - not D3 - is the first application within the meaning Article 87(1) EPC in respect of the

invention it discloses. As a consequence, D2 cannot validly claim priority from D3 for that invention.

4.4 The respondent argued that D2 disclosed a different, more specific invention compared with D11.

D2 concerns systems for the administration of anesthesia. In a section entitled "Background Information", D2 explains that "anesthesia can be achieved by using either inhalational **or** intravenous (IV) anesthetics, **or** combination of both" (paragraph [0003]). D2 identifies that combination as "balanced anesthesia". Paragraph [0016] states that "there is a need in the art for a monitoring system that determines concentration of both intravenous and inhalational anesthetics, **especially** during the delivery of 'balanced anesthesia'". Paragraph [0047] states that "the present invention provides a method and apparatus for non-invasive monitoring substance/compound concentration by utilising sensors that detect and measure concentration in expired breath and in the breathing circuit. As such, the invention **is extremely useful** in 'balanced anesthesia' delivery **where both** inhalational and IV anesthetics are used" (emphasis added by the Board).

It was established by the Board during the oral proceedings that while D2 is concerned with the delivery and monitoring of "balanced anesthesia", its disclosure also comprises the delivery and monitoring of intravenous anesthesia alone.

In paragraphs [0066] to [0084], which belong to a section entitled "Detailed Description of the Invention", "Intravenous IV Anesthesia Delivery" is discussed. The first sentence of paragraph [0066] reads

"during intravenous anesthesia, anesthetic agents are administered directly into a patient's bloodstream **rather than administering gases through a breathing circuit**". Consistently, paragraph [0073] discloses a method according to the invention, which includes "the steps of administering an agent to the subject and analyzing exhaled breath of the subject" for obtaining an indication of "a characteristic of metabolism of the agent in the subject". The same paragraph goes on to state that "the method further includes providing results from the analysis and controlling **the infusion pump for delivering the intravenous anesthesia agent** based on the results". (Emphasis added by the Board).

Thus, this method does not foresee any delivery of anesthesia other than by the infusion pump, which implies intravenous anesthesia alone.

Paragraphs [0091] to [0096], starting on page 23, concern an example according to the invention for "estimating the depth of intravenous propofol anesthesia by measurement of exhaled breath propofol vapour concentration and monitoring supplemental inhalation anesthesia". In paragraph [0091], an initial intravenous administration of propofol is proposed. The paragraph goes on to state that "the depth of anesthesia (or sedation) achieved depends on patient characteristics as well as the simultaneous use of other drugs as opioids and nitrous oxide". Paragraph [0092] concerns the patient's ventilation. Examples of closed breathing circuits are proposed that "facilitate positive pressure ventilation if needed, the administration of supplemental inhalation anesthesia with nitrous oxide (also measured with the sensors of the present invention), and the monitoring of ventilatory adequacy by carbon dioxide measurement".

Paragraph [0095], last sentence, states that "the presence of opioids or other anesthetic agents such as nitrous oxide will also lower the target range of propofol vapor concentrations [in the exhaled breath]". While these paragraphs clearly envisage the delivery of supplemental anesthesia other than intravenous propofol, such supplemental anesthesia is presented as optional. Thus, the example directly and unambiguously discloses the delivery of intravenous anesthesia alone. This view is corroborated by the fact that paragraphs [0053] to [0058] of the patent in suit (and D11), which in the appellant's view do not provide a direct and unambiguous teaching of delivering balanced anesthesia (page 9, fifth paragraph and page 10, third paragraph of the statement setting out the grounds of appeal), correspond verbatim to paragraphs [0091] to [0096] of D2 (and D3).

4.5 The appellant argued that if D2 were considered to teach a system in which the anesthetic agent was only delivered intravenously, then its priority claim would be invalid since that system had been first disclosed in D11.

The Board agrees with the appellant that D11 teaches an anesthetic agent delivery system for intravenously delivering a desired dose of propofol to a patient and controlling the amount of propofol delivered and that for this general subject-matter already present in D11 priority from D3 cannot be validly claimed by D2.

However, the disclosure of D2 contains more specific elements in that respect. In other words, D2 discloses a system comprising additional technical features not disclosed in D11.

For example, D2 discloses some features of a breath analyser of that system which are not disclosed in D11. More specifically, page 18, lines 4 to 13 (paragraph [0070]), paragraphs [0063] to [0065], and figures 3A and 3B disclose that the breath analyser may comprise a surface acoustic wave (SAW) sensor inserted as an active feedback element in an oscillator circuit and a frequency counter in communication with the oscillator circuit, all of which housed in a small printed circuit board.

As a consequence, D11 is not the first application within the meaning of Article 87(1) EPC for an anesthetic agent delivery system for intravenously delivering a desired dose of propofol to a patient and controlling the amount of propofol delivered, and comprising that specific breath analyser. Hence, the priority claim of D2 is valid in respect of such a system, for which D3 is the first application.

That specific system belongs to the state of the art for the patent in suit according to Article 54(3) EPC.

5. Main request

5.1 The main request corresponds to the third auxiliary request which the Opposition Division did not allow for lack of novelty of the subject-matter of claim 1 over D2.

The specific system of D2 which belongs to the state of the art according to Article 54(3) EPC anticipates the subject-matter of claim 1 of the main request.

More particularly, that system is an anesthetic agent delivery system for intravenously delivering a desired

dose of propofol to a patient (paragraph [0073], fourth to sixth sentence together with "Example I" described in paragraphs [0091] to [0096]) comprising:

an intravenous propofol supply (infusion pump mentioned in paragraph [0073], fourth sentence, in combination with the delivery of propofol of "Example I", paragraph [0091], first sentence) having a controller (the controller inherently present for providing the infusion) for controlling the amount of propofol provided intravenously by the supply;

a breath analyzer (the device for detecting substances in expired breath as disclosed in paragraph [0063], figure 3a and paragraph [0070], ninth to fourteenth sentence) for analyzing the patient's breath for concentration of at least one substance indicative of the free propofol concentration in the patient's bloodstream that provides a signal to indicate the free propofol concentration produced by the propofol intravenously delivered to the patient (paragraph [0067], fifth sentence); and

a system controller (CPU described in paragraph [0073]) connected to the propofol supply which receives the signal and controls the amount of propofol delivered intravenously based on the signal.

5.2 Hence, the main request is not allowable for lack of novelty of the subject-matter of claim 1 over D2 (Article 52(1) EPC in conjunction with Article 54(1) and (3) EPC).

6. First auxiliary request

As explained in points 4.4 and 4.5 above, the system of D2 for which the priority claim is valid, in an implementation, provides, in the language of the claim, "total" intravenous anesthesia, i.e. anesthesia

provided only by intravenous anesthetics, without inhalation of anesthetic gases.

It follows that the first auxiliary request is not allowable either for lack of novelty of the subject-matter of claim 1 over D2 (Article 52(1) EPC in conjunction with Article 54(1) and (3) EPC).

7. Second auxiliary request

The breath analyser of the system of D2 for which the priority claim is valid, in an implementation, is for analyzing the patient’s breath for concentration of free propofol and/or metabolites of propofol, and provides a signal to indicate the free propofol or metabolite concentration in the patient's bloodstream produced by the propofol intravenously delivered to the patient (paragraph [0067], fifth to ninth sentence).

It follows that the second auxiliary request is not allowable either for lack of novelty of the subject-matter of claim 1 over D2 (Article 52(1) EPC in conjunction with Article 54(1) and (3) EPC).

8. Third auxiliary request

The signal provided by the breath analyser of the system of D2 for which the priority claim is valid is proportional to the free propofol or metabolite concentration in the patient's bloodstream produced by the propofol intravenously delivered to the patient (figure 2 and paragraph [0067], first and fifth sentence).

It follows that the third auxiliary request is not allowable either for lack of novelty of the subject-

matter of claim 1 over D2 (Article 52(1) EPC in conjunction with Article 54(1) and (3) EPC).

9. Fourth auxiliary request

The signal provided by the breath analyser of the system of D2 for which the priority claim is valid can be based on average exhaled concentrations (paragraph [0093], third sentence, together with paragraph [0094], seventh sentence, and paragraph [0068], eleventh sentence).

It follows that the fourth auxiliary request is not allowable either for lack of novelty of the subject-matter of claim 1 over D2 (Article 52(1) EPC in conjunction with Article 54(1) and (3) EPC).

10. Fifth auxiliary request

Claim 1 of the fifth auxiliary request comprises an undisclosed disclaimer. The criteria to be fulfilled for an undisclosed disclaimer to be allowable under Article 123(2) EPC are set out in decision G 1/03 (point 2.1 of the Order), as confirmed in decision G 1/16 (Order).

As far as the present case is concerned, such a disclaimer may be allowable to restore novelty by delimiting a claim against the state of the art under Article 54(3) EPC.

The disclaimer of the fifth auxiliary request, however, does not restore novelty over D2. As explained in points 4.4 and 4.5 above, the system of D2 for which the priority claim is valid, in an implementation, provides "total" intravenous anesthesia, i.e. without

the administration of anesthetic gases to be inhaled. In such a situation, within the meaning of the claim, no gases are inspired, as also argued by the appellant on page 9, fifth paragraph, of the statement setting out the grounds of appeal. Hence, no sensor is exposed to inspired gases.

Since the undisclosed disclaimer does not restore novelty over D2, it does not fulfil the criteria set out in G1/03.

Hence, the fifth auxiliary request is not allowable either for non-compliance with Article 123(2) EPC.

11. Sixth auxiliary request

Compared with claim 1 of the fifth auxiliary request, claim 1 of the sixth auxiliary request comprises the same undisclosed disclaimer as well as some additional features.

As explained with respect to the second and third auxiliary request, those additional features do not establish novelty over D2.

Hence, for the same reasons as those applying to the fifth auxiliary request, the sixth auxiliary request is not allowable either for non-compliance with Article 123(2) EPC.

12. Seventh auxiliary request

Claim 1 of the seventh auxiliary request comprises an undisclosed disclaimer.

The disclaimer, however, does not restore novelty over

D2. As explained in points 4.4 and 4.5 above, the system of D2 for which the priority claim is valid, in an implementation, provides total intravenous anesthesia, i.e. without the administration of anesthetic gases to be inhaled. In such a situation, no anesthesia is delivered through a breathing circuit. Moreover, as also argued by the appellant on page 10, third paragraph, of the statement setting out the grounds of appeal, "since no anesthetic agent is inhaled, there can be no control of such an inhalant agent". By the same token, no inspired gas analyser can be present in the breathing circuit since, within the meaning of the claim, no gases are inspired.

Hence, the seventh auxiliary request is not allowable either for non-compliance with Article 123(2) EPC.

13. Eighth auxiliary request

Compared with claim 1 of the seventh auxiliary request, claim 1 of the eighth auxiliary request comprises the same undisclosed disclaimer as well as some additional features.

As explained with respect to the second and third auxiliary request, those additional features do not establish novelty over D2.

Hence, for the same reasons as those applying to the seventh auxiliary request, the eighth auxiliary request is not allowable either for non-compliance with Article 123(2) EPC.

14. Ninth auxiliary request

The breath analyser of the system of D2 for which the

priority claim is valid comprises a collector for sampling the patient's expired breath (paragraph [0068], tenth sentence), a sensor based on surface acoustic wave gas sensor technology for analyzing the breath for concentration of free propofol and/or metabolites of propofol (the SAW sensor described in paragraph [0070]), and a processor for calculating the effect of the propofol based on the concentration and determining the depth of anesthesia (processor 26, figure 3a described in paragraph [0063] together with the teaching of paragraph [0067], first to fifth sentence).

It follows that the ninth auxiliary request is not allowable either for lack of novelty of the subject-matter of claim 1 over D2 (Article 52(1) EPC in conjunction with Article 54(1) and (3) EPC).

15. Since none of the appellant's requests is allowable, the patent must be revoked.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Hampe E. Dufrasne

Decision electronically authenticated