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**Datasheet for the decision
of 2 July 2018**

Case Number: T 0171/14 - 3.4.02

Application Number: 06720424.8

Publication Number: 1846755

IPC: G01N27/49, G01N27/42, G01N27/48

Language of the proceedings: EN

Title of invention:
METHOD, SYSTEM AND SOFTWARE APPLICATION FOR ELECTROCHEMICAL
ANALYSIS

Patent Proprietor:
DIONEX CORPORATION

Opponent:
Metrohm AG

Relevant legal provisions:
EPC Art. 52(2)(a), 52(2)(d), 52(3)
EPC 1973 Art. 54(2), 56, 100(a)
RPBA Art. 12(4)

Keyword:

Exclusion from patentability (no)

Public availability of a manual before the priority date (no)

Admissibility of documents filed in appeal

Inventive step (yes)

Decisions cited:

G 0003/08, T 0599/93, T 0953/94, T 0125/04, T 1741/08,

T 1715/11



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Case Number: T 0171/14 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 2 July 2018

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 28 November
2013 rejecting the opposition filed against
European patent No. 1846755 pursuant to Article
101(2) EPC.**

Composition of the Board:

Chairman R. Bekkering
Members: F. J. Narganes-Quijano
G. Decker

Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the decision of the opposition decision rejecting the opposition against European patent No. 1 846 755.

The opposition filed by the appellant against the patent as a whole was based on the grounds for opposition of

- exclusion from patentability pursuant to Article 100(a) EPC 1973 together with Articles 52(2)(a) and 52(2)(d) EPC, and
- lack of inventive step (Article 100(a) EPC 1973 together with Article 56 EPC 1973).

- II. Among the documents referred to during the first-instance proceedings, the following documents have been considered by the parties during the appeal proceedings:

D4: "Carbon fiber electrode cell for square wave voltammetric detection of biogenic amines in high-performance liquid chromatography", S. P. Kounaves *et al.*; Analytical Chemistry, Vol. 61 (1989); pages 1469-1472;

D5: "PHE200 Physical Electrochemistry Software", Gamry Instruments; PHE200 Rev. 2.0, 15 May 2003; pages 1 to 4; and

D9: "Getting Started Manual - Powersuite 2.40", Princeton Applied Research, copyright of "Nov 2003"; pages 1 to 42.

- III. In its decision the opposition division held in respect of the patent as granted that the method defined in claim 1 was not excluded from patentability under

Articles 52(2) (a) and 52(2) (d) EPC. In addition, the opposition division held that the method defined in claim 1 involved an inventive step (Article 56 EPC 1973)

- over the disclosure of document D4 and the common general knowledge,
 - over the combination of document D5 with document D4, and
 - over the disclosure of document D9, either alone or in combination with document D4,
- and that the same conclusion applied to the remaining claims 2 to 21 of the patent as granted.

IV. With the statement setting out the grounds of appeal the appellant submitted the following documents:

- D10: "Squarewave voltammetry", retrieved from en.wikipedia.org/wiki/Squarewave_voltammetry on 7 April 2014; two pages;
- D11: "Differential pulse voltammetry", retrieved from en.wikipedia.org/wiki/Differential_pulse_voltammetry on 7 April 2014; two pages;
- D12: "HPLC online reductive scanning voltammetric detection of diquat, paraquat and difenzoquat with mercury electrodes", I. Rühling *et al.*; Fresenius J. Anal. Chem., No. 364 (1999); pages 565 to 569; and
- D13: "Anwendung voltammetrischer Verfahren in Kopplung mit der HPLC zur Charakterisierung redoxaktiver Wirkstoffe", I. Rühling; Dissertation, Universität Hannover, 1999; seven bibliographic pages, and pages 1 to 147.

V. In reply to the statement of grounds of appeal, the respondent (patent proprietor) filed with the letter

dated 14 October 2014 an amended claim 1 according to a first auxiliary request.

VI. Oral proceedings before the board were held on 2 July 2018.

The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that the appeal be dismissed, or, in the alternative, that the decision under appeal be set aside and the patent be maintained in amended form on the basis of claim 1 of the first auxiliary request filed with letter of 14 October 2014 and claims 2 to 21 of the patent as granted.

At the end of the oral proceedings the chairman announced the decision of the board.

VII. Independent claim 1 of the patent as granted (main request) reads as follows:

"1. A method of analyzing and displaying data received from electrochemical analysis performed by applying one or more voltage waveforms on analyte(s) (104) and measuring the resulting current in the analyte(s), the method comprising:

receiving (704) raw data from the electrochemical analysis wherein the raw data is representative of the measured current parameters;

storing (708) the received raw data;

displaying the raw data in a first plot, the first plot being a plot of the raw data as a function of time;

displaying (716) the raw data in a second plot, the second plot being a three-dimensional plot of the raw data;

receiving a user-selected integration time interval based on a user-selected portion of a user-selected one of the first plot and the second plot;

integrating (712) the raw data based on the user-selected integration time interval; and

providing (716, 720) a response based on the processing."

The set of claims of the patent as granted also includes independent claim 17 directed to a computer program product for causing an application program to execute on a computer the method of claim 1, independent claim 18 directed to a system comprising a computer including the computer program product of claim 17, and dependent claims 2 to 16 and 19 to 21 referring back to claims 1 and 18, respectively.

The wording of the claims of the auxiliary request is not relevant for the present decision.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request - Exclusion from patentability*
 - 2.1 The appellant has contested the opposition division's conclusion that the invention defined in claim 1 was not excluded from patentability under Articles 52(2) (a) and 52(2) (d) EPC.

2.1.1 As regards the ground for opposition under Article 100(a) EPC 1973 together with Article 52(2)(a) EPC, the appellant has submitted that the method defined in claim 1 was a mathematical method excluded from patentability under Article 52(2)(a) EPC. According to the appellant, the method of claim 1 included steps (in particular, the processing and the integration of raw data) that constituted mathematical operations, and also other steps that could be implemented in an arbitrary way and had no technical character. In particular, the claimed method did not require the use of a computer, and it encompassed carrying out the claimed mathematical method by hand, in particular using rudimentary means such as paper and a pencil. Therefore, the claimed method constituted a purely abstract, mathematical method without a technical effect.

The board, however, does not find the arguments of the appellant persuasive. Apart from the fact that paper and a pencil, although rudimentary tools, constitute technical means, in the board's view the method of claim 1 constitutes the implementation of a mathematical method that requires technical means. In particular, at least the step of the method relating to "displaying" the raw data in two different plots requires, in its context, the use of a physical display and therefore the use of technical means for displaying the data, and - as submitted by the respondent - the use of these technical means goes beyond a mere step of a mathematical method.

The appellant has referred in this respect to decision T 953/94. However, the approach followed in this decision (see point 3 of the reasons), i.e. the so-

called "contribution approach", is no longer followed in the more recent case-law (see the opinion of the Enlarged Board of Appeal in G 3/08 (OJ EPO 2011, 10), points 10.7 and 10.8 of the reasons for the opinion). In addition, in decision T 953/94 the corresponding board held that a method comprising a series of steps which all related only either to a mathematical method or to the use of a computer for carrying out the mathematical method (reasons for the decision, point 3.4), wherein the mathematical method solved a problem lying in the mathematical field and independent of any technical field of application (reasons for the decision, points 3.5 and 3.7) and wherein no technical effect could be identified as being achieved by the method (reasons for the decision, point 3.9), was excluded from patentability. However, as submitted by the respondent, in the present case the features of the claimed method allow for the selection of electrochemical measurement data relevant for further processing, i.e. are applied to the solution of a technical problem (see, in particular, the different technical effects addressed in the assessment of inventive step in point 4 below), and, in addition, the claimed method requires, among other steps, displaying the raw data in two different plots, which step requires, as already mentioned above, the use of technical means.

Accordingly, in view of the above considerations, the claimed method goes beyond a mathematical method "as such", and also beyond a non-technical implementation of the same, and, in addition, the method defines a technical activity in a field of technology. For these reasons, the claimed method is not excluded from patentability pursuant to Article 52(2)(a) EPC under consideration of Article 52(3) EPC.

2.1.2 As regards the ground for opposition under Article 100(a) EPC 1973 together with Article 52(2)(d) EPC, the appellant has submitted that the claimed method allowed for an improved analysis of electrochemical data, but that this effect was confined to the way the raw data was represented to the user to facilitate the selection of an integration time interval. According to the appellant, this problem involved only the presentation of information and, independently of the content of the information, this problem was not technical in itself because only the selection by the user was pertinent in the claimed method.

The board notes that the claimed method requires displaying raw data in two different plots, and therefore involves the presentation of information. However, the claimed method requires, among other steps, receiving and storing raw data, receiving a user-selected integration time interval, integrating the raw data, and providing a response based on the processing of data, and all these steps go beyond the mere presentation of information. Already for this reason, the claimed method cannot be reduced to a mere presentation of information as such. In addition, the claimed method is not confined to a mere representation of data having been re-arranged and to the response of the user to said re-arranged data because both the content of the information being displayed (raw data received from electrochemical analysis) and the way the information is displayed (raw data as a function of time, and raw data in a three-dimensional representation) are technically related to each other and interact with the remaining claimed steps so as to generate new data with technical significance even when the user selects an arbitrary integration time

interval. For these reasons, the claimed invention is not excluded from patentability pursuant to Article 52(2)(a) EPC under consideration of Article 52(3) EPC.

The appellant has cited decisions T 125/04 and T 599/93 in support of its position. However, in decision T 125/04 the corresponding board concluded that a method of displaying predetermined entities on an output device was not excluded from patentability because it involved technical means (reasons for the decision, point 3.2), and the same conclusion applies to the present case. In addition, decision T 599/93 addressed an invention directed to an arrangement for displaying several images on a screen and the board held that predetermined features of the arrangement relating to the presentation of information did not have technical character and did not solve a technical problem and that, consequently, they lay in a field excluded from patentability under Article 52(2)(d) EPC (reasons for the decision, point 4); the board, however, did not conclude that the mere presence of these features in the claimed invention would have the effect that the claimed invention was excluded from patentability, but it only concluded that the mentioned features did not contribute to inventive step of the claimed invention (reasons for the decision, points 4 and 5). Therefore, none of these two decisions is at variance with the board's conclusion that the claimed method is not excluded from patentability under Article 52(2)(d) EPC.

3. *Documents D9 to D13*

With the statement setting out the grounds of appeal the appellant filed four new documents in support of the ground for opposition of lack of inventive step,

namely documents D10, D11, D12 and D13. In addition, during the appeal proceedings the respondent contested the opposition division's finding that document D9 constituted state of the art.

- 3.1 Document D9 was filed during the first-instance proceedings after expiry of the opposition period and the document was admitted into the proceedings by the opposition division on the grounds that the document constituted prior art and its disclosure was *prima facie* relevant.

Document D9 is an operating manual of a software containing the copyright information "Princeton Applied Research Nov 2003" on each of pages 2 to 42. In its decision the opposition division referred to the standard of proof of the balance of probabilities and concluded that, in view of the copyright date "Nov 2003", the manual had been available to the public in November 2003. However, as noted by the respondent, the manual shows on pages 16, 23, 35 and 39 to 41 a series of screenshots with a date running from "04.01.04" to "11.01.04". As submitted by the respondent, the manual has been issued by a US company and therefore the dates shown in these screenshots are presumably given in the American date format; at least this cannot be ruled out. Assuming that this is the case, the dates shown in the screenshots would then run from the 1st April 2004 to the 1st November 2004, with the consequence that the manual would contain information that had been updated months after the copyright date "Nov 2003" shown in the manual.

The patent claims a priority date of 11 February 2005, and the validity of the claimed priority has not been questioned during the proceedings. In view of the

discrepancies between the dates shown in document D9, of the one-year period between the copyright date "Nov 2003" and the last of the dates shown in the screenshots (1 November 2004), and of the proximity of the last of these dates (1 November 2004) and the priority date (11 February 2005) of the patent, there would then be reasonable doubts as to whether the content of document D9 was actually rendered available to the public before the priority date of the patent.

The opponent has submitted that the dates shown in the screenshots of document D9 could also have been given in the British date format and that, while the copyright date information disclosed in the document was clear, the intention in the disclosure of the dates of the screenshots was not clear and these dates might not reflect the real date of production of the screenshots.

However, the appellant's submissions are not sufficient to dispel the doubts expressed above. On the contrary, these submissions add further uncertainty as to the meaning of the different dates shown in the document, as to the actual date of production of the manual and/or of the possible updates of its content, and - especially - as to the actual date at which the manual was rendered available to the public. In addition, assuming that the dates of the screenshots are given in the British date format, the dates of the screenshots would then run between the 4th January 2004 and the 11th January 2004. This would constitute an indication that the content of the document had been updated at least more than one month after the copyright date "Nov 2003" shown in the document, i.e. that the manual would have been produced at least more than one month after the copyright date. In view of this indication it

cannot be excluded that the document has been produced or even further updated at an unspecified, later date.

In view of the doubts expressed above and arising from the discrepancies between the dates shown in document D9 and the uncertainty in the meaning of the copyright date "Nov 2003" shown in the document, the board is unable to conclude, on the balance of probabilities, that the content of document D9 was rendered available to the public before the priority date of the patent in suit. The board therefore concludes that document D9 cannot be considered to constitute prior art within the meaning of Article 54(2) EPC 1973.

- 3.2 Documents D10 and D11 were submitted by the appellant only as evidence of what is understood by square-wave voltammetry and differential pulse voltammetry in the technical field under consideration, and the admissibility of these documents was not disputed by the respondent. Under these circumstances, the board decided to admit documents D10 and D11 into the proceedings (Article 12(4) RPBA).
- 3.3 As regards documents D12 and D13, the respondent has submitted that the decision under appeal was based on the patent as granted and that consequently there was no specific circumstance that would justify the filing of documents D12 and D13 only with the statement of grounds of appeal.
- 3.3.1 The appellant, however, has submitted that in its decision the opposition division emphasized in its reasoning of lack of inventive step that document D4 did not disclose the simultaneous use of a two-dimensional and of a three-dimensional plot because the

two-dimensional and the three-dimensional plots shown respectively in Fig. 3A and in Fig. 3B or in Fig. 3C of document D4 did not belong to the same electrochemical measurement. According to the appellant, document D12 disclosed a two-dimensional and a three-dimensional plot (see document D12, Fig. 3 and 2, respectively) belonging to the same electrochemical measurement, and this disclosure justified the filing of document D12 with the statement of grounds of appeal.

The board notes that the opposition division's finding referred to above and relating to Fig. 3A and either one of Fig. 3B and 3C of document D4 has been contested by the appellant with the statement of grounds of appeal, and that, as an additional submission in reaction to the mentioned finding of the opposition division, the appellant has referred to document D12 as a disclosure analogous to that of document D4 but in which the finding of the opposition division did no longer apply. For these reasons, the board considers that, in the circumstances of the case, the filing of document D12 with the statement of grounds of appeal constituted an appropriate reaction to the way the opposition division construed the content of document D4. For this reason the board, in the exercise of its discretion (Article 12(4) RPBA), decided to admit document D12 into the appeal proceedings.

3.3.2 Document D13 is a copy of a thesis by one of the authors of document D12 and according to the appellant this document had been filed with the statement of grounds of appeal for the same reasons submitted in respect of document D12.

However, apart from the statements that chapter 4.1.6 of document D13 related to the same experiments

reported in document D12 and that the arguments based on document D12 also applied to document D13, the appellant has not identified any specific disclosure of document D13 that would go beyond the content of document D12, and has submitted no argument on the basis of document D13 that would go beyond those already submitted in respect of document D12. For these reasons, once document D12 has been admitted by the board into the proceedings, the board sees no reason that would also justify the admission of document D13 into the proceedings. Therefore, the board, in the exercise of its discretion under Article 12(4) RPBA, decided not to admit document D13 into the appeal proceedings.

4. *Main request - Inventive step*

The appellant has submitted a series of lines of argument of lack of inventive step based on each of documents D4, D5 and D12 as closest state of the art.

4.1 Document D4 and the common general knowledge

Document D4 pertains to the technical field of high-performance liquid chromatography (HPLC) and discloses a method of analysing and displaying data received from electrochemical analysis performed by applying voltage waveforms to an analyte and measuring the resulting current in the analyte (see title, the first paragraph of section "Experimental section" on page 1470, and the text from the last paragraph on page 1470 to the second paragraph in the right column of page 1471).

Document D4 discloses, in addition, the results of electrochemical measurements carried out on the same substance and representative of the measured current

parameters (page 1471, paragraph bridging the left and the right columns), namely

- the results measured upon application of a fixed potential of 650 mV and represented as a function of the elution time of the sample in the form of a two-dimensional chromatogram in Fig. 3A, and

- the results measured upon application of a SWR (square-wave voltammetry) potential scan between -100 and 900 mV and represented as a function of the elution time in the form of a three-dimensional chromatovoltammograph in Fig. 3B, and in the form of a three-dimensional contour plot in Fig. 3C.

4.1.1 According to a first line of argument of the appellant, the plot of Fig. 3A of document D4 constituted a first plot as claimed, and the plot of Fig. 3B or, alternatively, the plot of Fig. 3C constituted a second plot as claimed. In addition, according to the appellant, although the measurement results represented in Fig. 3A were obtained with a fixed potential of 650 mV and the measurement results represented in Fig. 3B and in Fig. 3C were obtained with a SWR potential, all the measurement results were obtained with the same sample; therefore, contrary to the finding of the opposition division in the decision under appeal, Fig. 3A and Fig. 3B or 3C did represent the same raw data within the meaning of the claimed method because claim 1 did not exclude that the raw data "received from electrochemical analysis performed by applying one or more voltage waveforms on analyte(s)" was constituted by complex data obtained with different voltages and selectively displayed in the claimed first and second plots.

The board is not convinced by this line of argument because, as submitted by the respondent, claim 1

requires that the first and the second plots display "the raw data", i.e. the same raw data, and this formulation excludes that the two plots display different raw data or different portions of the same raw data. In addition, the chromatogram of Fig. 3A is disclosed in document D4 for the purpose of comparison with the approach disclosed in the document with reference to Fig. 3B and 3C representing raw data obtained by square-wave voltammetry (see document D4, page 1471, left column, last paragraph reading "Figure 3A shows a standard chromatogram [...]", the same paragraph referring to "the dramatic improvement in both the qualitative and quantitative information obtained (Figure 3B, C)."). Therefore, there is no indication in document D4 relating to the simultaneous use of Fig. 3A together with either one of Fig. 3B and 3C in the same analysis of raw data.

The appellant has also submitted in this respect that document D4 referred to a "detection limit for a 'slice' at 650 mV" (page 1471, right column, lines 6 and 7), and that this disclosure would be interpreted by the skilled person as relating to the comparison of the approach shown in Fig. 3B and 3C with the approach shown in Fig. 3A, and therefore to a two-dimensional representation of the raw data of Fig. 3B and 3C in the form of a slice. The board, however, is not convinced by this argument because, as submitted by the respondent and also held by the opposition division, the mentioned passage only refers to the detection limit for a slice of the raw data, and therefore to the resolution of the approach presented in the document with reference to Fig. 3B and 3C when compared with that of the standard approach shown in Fig. 3A, and this passage alone does not provide an incentive to the skilled person to display a two-dimensional slice

representation or cut of the three-dimensional raw data represented in Fig. 3B and 3C.

In any case, even assuming that the skilled person would consider using the representation of raw data shown in one of Fig. 3B and 3C together with a representation of data as shown in Fig. 3A or of a "slice" of the mentioned raw data similar to Fig. 3A, document D4 does not - as also concluded by the opposition division in its decision - disclose integration of raw data as required by the claimed method, let alone the selection of an integration time interval in one of the representations. The appellant has submitted in this respect that the passage of document D4 according to which Fig. 3C allowed for the analytes "in the sample being clearly resolved and *quantified* in the contour plot" [*emphasis added*] (page 1471, sentence bridging the left and the right columns) constituted implicitly a disclosure of an integration operation of the raw data and therefore also an implicit disclosure of the selection of an integration time interval in one of the peaks represented in the plot of Fig. 3C.

However, as submitted by the respondent, document D4 already presents Fig. 3B and 3C as the final result of the approach proposed in the document, and there is no hint in the document pointing towards a further processing. In particular, the plot of Fig. 3C itself already provides quantitative information relating to the height, the width, and the position of the peaks of the different analytes discernible in the plot, and the reference in document D4 to an analyte being "quantified" in the plot of Fig. 3C does not suggest going beyond this quantitative information, let alone considering the integration of raw data as a function

of a selectable integration time interval as required by the claimed method.

The appellant has also referred to paragraph [0008] of the patent specification and has submitted that, contrary to the opposition division's view and to the submissions of the respondent, the problem solved by the claimed method would be the improvement of the quantification of the analytes in the sample, and not the improvement of the processing of the raw data as held by the opposition division, and that in view of the common general knowledge in this technical field it would be obvious for the skilled person to consider carrying out integration of raw data in the plot of Fig. 3C, this integration implicitly requiring the selection of an integration time interval. However, even assuming that the skilled person would consider integrating raw data in a time integration interval selected in Fig. 3C, the skilled person would still not arrive at the claimed method because document D4 contains no disclosure that would prompt the skilled person to conceive a method in which a user is given the possibility to observe in a display two plots as claimed and then the possibility to select one of the two plots before then selecting the integration time interval in the selected plot as required by the claimed method.

- 4.1.2 According to a second line of argument presented by the appellant during the appeal proceedings, the plot of Fig. 3B and the plot of Fig. 3C or, alternatively, the plot of Fig. 3C and the plot of Fig. 3B, constitute respectively a first and a second plot as claimed, i.e. a first plot of raw data as a function of time and a second, three-dimensional plot of raw data.

The board concurs with this identification of the plots disclosed in document D4 and the plots defined in claim 1. However, document D4 discloses that the plot of Fig. 3B is "useful only for a 'qualitative feeling' of the results", and that the plot of Fig. 3C allows for the analytes in the sample to be "clearly resolved and quantified" (page 1471, sentence bridging the left and the right columns). Although the complementary character of the qualitative and the quantitative information content of Fig. 3B and 3C noted in document D4 might prompt the skilled person to consider simultaneously displaying both plots, document D4 discloses the use of the plot of Fig. 3B for a qualitative assessment of the measurement results and the use of the plot of Fig. 3C for a quantitative assessment of the measurement results, and the document does not disclose or suggest displaying both plots to a user for a quantitative assessment of the measurement results of both plots, let alone the further claimed steps of receiving a user-selected integration time interval based on a user-selected portion of a user-selected one of the first plot and the second plot, integrating the raw data based on the user-selected integration time interval, and providing a response based on the processing as required by the claimed method.

According to a further argument of the appellant, in the event that the sample contained only a main analyte, Fig. 3B would present one single peak, and the skilled person would then consider that Fig. 3B could also be selected for quantification of the analyte in specific circumstances, thus opening the possibility of selecting the plot of Fig. 3B or the plot of Fig. 3C depending on the circumstances. This argument, however, is not convincing because document D4 clearly teaches

the use of the representation shown in Fig. 3C for quantification purposes and this representation would already achieve quantification of the analyte under the circumstances mentioned by the appellant. Therefore, contrary to the appellant's submissions, the skilled person would not derive from the disclosure of document D4 any benefit in displaying both plots to a user and operating with a selected one of the two plots for the purposes of improving the quantification of the analytes as claimed.

- 4.1.3 During the oral proceedings the appellant presented an alternative argument according to which any effect of the claimed method over document D4 was only due to the selection by the user, with the consequence that, in view of the considerations in decision T 1741/08, this effect could not be taken into account in the assessment of inventive step over document D4.

This argument corresponds in substance with the line of argument previously presented in detail by the appellant in the statement of grounds of appeal in respect of document D5 and discussed in point 4.4 below, and the argument is not found convincing for the reasons given in detail in point 4.4 below.

- 4.1.4 In view of these considerations, the board concludes that the method of claim 1 involves an inventive step with regard to the disclosure of document D4 and the common general knowledge in the technical field under consideration.

- 4.2 Document D4 in combination with document D5

- 4.2.1 As already concluded in point 4.1.2 above, document D4 discloses a first plot and a second plot (document D4,

Fig. 3B and 3C) having the characteristics of the two claimed plots, but the document does not disclose the claimed features relating to displaying to a user the two claimed plots together with the steps of receiving a user-selected integration time interval based on a user-selected portion of a user-selected one of the first plot and the second plot, integrating the raw data based on the user-selected integration time interval, and providing a response based on the processing.

According to a line of argument presented by the appellant during the appeal proceedings, these features would solve the problem of improving the quantification of the analytes present in the sample considered in document D4 and the claimed method would be rendered obvious when considering the teaching of document D5.

- 4.2.2 Document D5 discloses the features of a software used in performing analysis of data measured with an electrochemistry apparatus incorporating, among other electrochemical techniques, cyclic voltammetry, linear sweep voltammetry, and chronoamperometry (title, and page 1, left column, second paragraph). These techniques involve implicitly analysing and displaying data received from electrochemical analysis previously performed by applying a voltage to analytes according to the corresponding technique, measuring the current, and receiving, storing and displaying the corresponding measurement data. In particular, the figure on page 1 of document D5 shows the output of cyclic voltammetry represented as a voltammogram, i.e. a plot of current versus voltage, and the figure on page 4 shows the output of chronoamperometry represented as a plot of current versus time.

4.2.3 According to the appellant, the skilled person would be aware that the square-wave voltammetry technique referred to in document D4 was a development of linear sweep voltammetry (see document D10), i.e. of one of the voltammetry techniques referred to in document D5 and disclosed in the document as the first portion of a cyclic voltammogram (page 3, right column, second paragraph). In addition, document D5 disclosed the selection of a portion of the cyclic voltammogram and the integration of the same to calculate the charge (page 3, first sentence), and according to the appellant this disclosure would suggest the skilled person to improve in document D4 the quantification of the analytes by integration of the data as a function of an integration time interval that had to be previously selected in the voltammogram. The appellant also made reference to the chronoamperometry technique disclosed in document D5 (paragraphs bridging pages 3 and 4) in which the data is a function of time (see chronoamperometry display on page 4).

However, as submitted by the respondent, the cyclic voltammetry and the chronoamperometry techniques referred to in document D5 are disclosed in the document as two different techniques, and these techniques are also different from the square-wave voltammetry technique disclosed in document D4. In addition, the integration in cyclic voltammetry disclosed in document D5 involves integration in a plot of current vs. voltage, and it does not involve integration as claimed, let alone the selection of an integration time interval. In any case, neither document D4, nor document D5, nor a combination of them would suggest the skilled person to display to a user two plots as claimed and to give the user the possibility to first select one of two plots and then

to select, within the selected plot, an integration time interval on the basis of which a response processed by integration is then obtained.

4.3 Document D5 in combination with document D4

According to the appellant, the method of claim 1 would differ from the disclosure of document D5 (see points 4.2.2 and 4.2.3 above) only in the display of the raw data in a second, three-dimensional plot, and in the selection by the user of one of the plots and the selection, within the selected plot, of an integration time interval on the basis of which the data is then integrated. In addition, the effect of these distinguishing features would be, as held by the opposition division in its decision, the improvement of the processing of the raw data, and the application of the teaching of document D4 relating to the improved qualitative and quantitative information obtained with the approach disclosed in connection with Fig. 3B and 3C (see document D4, page 1471, left column, last paragraph) to the disclosure of document D5 would then result in the claimed method.

The board, however, is not convinced by this line of argument. As already noted in point 4.1.2 above, second paragraph, document D4 emphasises the improved qualitative and quantitative information content in the SWV measurements as represented in the three-dimensional plots of Fig. 3B and 3C, respectively (page 1471, left column, last paragraph, third sentence). This teaching, however, relates specifically to the representation of SWV measurements as a function of the elution time (see Fig. 3B and 3C). In addition, neither the voltammogram nor the chronoamperometry plot of document D5 (see, respectively, the plots shown on

pages 1 and 4) involve the elution time of the sample. Therefore, even assuming that the skilled person would consider the application of the teaching of document D4 to an appropriate one of the different electrochemical techniques disclosed in document D5 and referred to by the appellant, he would then consider using a three-dimensional representation of the raw data as shown in Fig. 3B or 3C, but, as submitted by the respondent, he would not arrive at the claimed method requiring displaying two plots and offering a user the possibility of selecting one of the two plots and then selecting, within the selected plot, an integration time interval for reasons analogous to those already given above in points 4.1.1 and 4.1.2 in respect of document D4 and the common general knowledge.

4.4 Document D5 alone, under consideration of decision T 1741/08

According to a further line of argument submitted by the appellant during the appeal proceedings, the effect of the distinguishing features of claim 1 over the disclosure of document D5 (see point 4.3 above, first paragraph) would be the improvement of the processing of the raw data. However, the display of the two claimed plots would only have an effect on the mind of the user and the improvement of the processing of the raw data would only be achieved by the cognitive capacity of the user. Consequently, according to the appellant, following decision T 1741/08, the effect would not be technical and would not contribute to an inventive step within the meaning of Article 56 EPC 1973.

The respondent has contested this line of argument and has submitted that displaying the raw data in two

different plots as claimed was not about psychological effects, but about providing all information necessary to allow the user to properly select the integration time interval.

The board notes that in decision T 1741/08 the corresponding board held in the context of GUI layouts that lowering the cognitive burden of a user was not of itself a technical effect (reasons for the decision, point 2.1.6). In the present case, however, the display of the two plots as claimed goes in the claimed context beyond a mere improved presentation of information because it involves the presentation of complex technical information in a specific way that enables the identification of relevant data for further processing and, more particularly, enables an improved selection of an appropriate integration time interval on the basis of which the integration of the raw data is subsequently carried out. In addition, even in the event that the user would select an arbitrary integration time interval, for instance an interval not associated with a particular one of the analytes of the sample, the response obtained with the claimed method would still have a technical significance, so that, contrary to the appellant's submissions, the result of the claimed method cannot only be attributed to the cognitive capacity of the user. Therefore, in the opinion of the board the effect of the display of the raw data in two different plots as claimed goes beyond a mere lowering of the cognitive burden of the user and constitutes a technical effect to be taken into account in the assessment of inventive step (see, in this respect, decision T 1741/08, point 2.1.17 of the reasons, and also decision T 1715/11, point 3.7 of the reasons).

In addition, as also submitted by the respondent, document D5 does not disclose or suggest the claimed step of receiving a user-selected integration time interval based on a user-selected portion of a user-selected one of the two plots.

In view of all these considerations, also this line of argument of the appellant fails to convince the board.

4.5 Document D12 in combination with document D5

Document D12 discloses the electrochemical HPLC detection of analytes using scanning voltammetry (see title). The detection involves receiving and storing the raw data representative of the current measured while carrying out differential pulse voltammetry (page 566, right column, last paragraph), and displaying the raw data in a first plot as a function of time (Fig. 3) and in a second plot as a three-dimensional representation (Fig. 2).

The appellant has submitted that, while document D4 did not contain an express indication that Fig. 3A and Fig. 3B or 3C were to be used in the same analysis, document D12 made clear that the analysis was to be carried out using both the plot shown in Fig. 2 and the plot shown in Fig. 3 of the document, and that the problem solved by the distinguishing features of the claimed method was the improvement of the quantification of the analytes discernible in both Fig. 2 and Fig. 3. In addition, according to the appellant, the skilled person was aware that the differential pulse voltammetry technique considered in document D12 is a derivation of the linear sweep voltammetry technique considered in document D5 (see document D11). For the rest, the line of argument based

on document D12 as closest state of the art in combination with the teaching of document D5 was the same as that already submitted in respect of document D4 as closest state of the art in combination with the teaching of document D5.

However, as noted by the respondent, there is no indication in document D12 of offering a user the possibility of selecting an integration time interval. In addition, even assuming that the skilled person would, in view of the teaching of document D5, consider integration of the raw data, it would not be obvious for the skilled person to consider offering to the user first the possibility of selecting one of the plots of Fig. 2 and Fig. 3 shown in document D12, and then selecting in the selected plot an integration time interval for reasons similar to those already given in point 4.2.3 above, second paragraph, in respect of the combination of document D4 with document D5.

- 4.6 In view of the above considerations, none of the lines of argument of the appellant convince the board that the claimed method would be obvious in view of the prior art under consideration. Therefore, the board concludes that the subject-matter of claim 1 involves an inventive step (Article 56 EPC 1973).

Independent claims 17 and 18 and dependent claims 2 to 16 and 19 to 21 all refer directly or indirectly to the method defined in claim 1. Consequently, the same conclusion above also applies to these claims.

5. Since none of the grounds for opposition raised by the appellant in respect of the patent as granted is found persuasive, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



M. Kiehl

R. Bekkering

Decision electronically authenticated