

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 June 2011**

Case Number: T 0395/09 - 3.4.02

Application Number: 04754043.0

Publication Number: 1634058

IPC: G01N21/27

Language of the proceedings: EN

Title of invention:
LIGHT SOURCE WAVELENGTH CORRECTION

Applicant:
Siemens Healthcare Diagnostics Inc.

Relevant legal provisions:
EPC 1973 Art. 83, 84

Keyword:
"Clarity and sufficiency of disclosure (fourth auxiliary
request: yes; higher ranking requests: no)"
"Remittal for further prosecution"



Case Number: T0395/09 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 21 June 2011

Appellant: Siemens Healthcare Diagnostics Inc.
(Applicant) 511 Benedict Avenue
Tarrytown, NY 10591
US

Representative: Storz, Ulrich
Michalski Hüttermann & Partner
Patentanwälte
Neuer Zollhof 2
40221 Düsseldorf
DE

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 22 September 2008
refusing European patent application No.
04754043.0 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: A. G. Klein
Members: F. J. Narganes-Quijano
B. Müller

Summary of Facts and Submissions

- I. The appellant (applicant) lodged an appeal against the decision of the examining division refusing European patent application No. 04754043.0 based on the International Application No. PCT/US2004/017340 (published with the International Publication No. WO 2004/109261).
- II. In its decision the examining division held by reference to a previous communication that the subject-matter of the independent claims of the request then on file was not clear in several respects (Article 84 EPC 1973) and that the invention defined in the claims did not satisfy the requirements of sufficiency of disclosure set forth in Article 83 EPC 1973.
- III. With the statement setting out the grounds of appeal the appellant filed four sets of claims amended according to a main and first to third auxiliary requests.
- IV. Oral proceedings were appointed as requested by the appellant on an auxiliary basis. In a communication annexed to the summons to attend oral proceedings the Board gave a preliminary assessment of the case with respect to the requirements of Articles 83 and 84 EPC 1973.

More particularly, the communication contained a series of objections raised under Article 84 EPC 1973 and several comments on the issue of sufficiency of disclosure of the claimed invention in the light of the technical disclosure in different passages of the description (Article 83 EPC 1973). Among the objections raised under Article 84 EPC 1973 in the aforementioned

communication, the following are considered pertinent for the present decision:

- a) "Independent claims 1 and 7 of the main request are primarily directed to the correction of measurements of the reflectance R to give account, among others, of the deviations of the actual value of the centre wavelength of the light source(s) from the corresponding nominal value (paragraphs [0010], [0011], [0037] and [0041] of the description) and, apart from defining the parameters underlying the measurement of the reflectance and having an influence on the measured values of the reflectance (such as the nominal and the actual spectral distributions of the measurement light intensity " L^* " and " L " and data relating to the spectral response of the detectors " D " and to the reagents " r "), the claims merely specify that the correction of the reflectance R is carried out multiplicatively ($R^* = R \cdot c(R)$) in terms of a correction factor $c(R)$ which depends on the aforementioned underlying measurement parameters " L^* ", " L ", " D " and " r ", without however specifying how this factor is determined. Therefore, both claims 1 and 7 of the main request merely define a problem (the correction of the measured reflectance in terms of a correction factor) without specifying how the problem is actually solved (i.e. without specifying how the correction factor is to be determined in terms of the underlying measurement parameters). [...] Accordingly, the subject-matter of claims 1 and 7 is not clear [...] within the meaning of Article 84 EPC 1973."

- b) "Independent claims 1 and 7 amended according to the first auxiliary request overcome in part the objections raised in [paragraph a)] above with respect to claims 1 and 7 of the main request in that each of the claims specify the determination of the correction factor according to equation (5) of the description [...]. However, the corresponding subject-matter remains unclear in that the claims themselves do not specify the equation (see in this respect Rule 29(6) EPC 1973) and, more importantly, in that the equation is expressed in terms of a set of - in principle previously known - values r_i called "high resolution reflectance values" and it is unclear in the technical context of the claims what is meant by these values and how they are defined or determined (Article 84 EPC 1973)."
- c) "Independent claims 1 and 7 amended according to the second auxiliary request [...] do not overcome the objections raised in [paragraph b)] above with respect to claims 1 and 7 of the first auxiliary request."
- d) "It is unclear in the independent claims of all the requests whether there is a one-to-one correspondence between the set of detectors and/or the light sources and/or the measured reflectance values and/or the reference wavelengths and/or the reflected signals. More particularly, it is unclear whether each reflectance value is measured at a corresponding one of the centre wavelengths of the light sources or at one of the respective wavelengths associated with the reflected signals or at one of the set of reference wavelengths (see paragraph [0042] of the application), or whether

the reflectance values refer to integrated reflectance values over each of the corresponding wavelength ranges of emission of the light sources (paragraph [0047]) or over each of the wavelength ranges of detection of the detectors. [...] It is even unclear in the formulation of the claims whether the correction factor $c(R)$ is a single, common correction factor for all the different reflectance values within the measurement wavelength range or within the wavelength range associated with a light source or with a reflected signal, or whether each of these reflectance values requires the determination of its own correction factor."

V. Oral proceedings were held on 21 June 2011.

The appellant filed a set of claims amended according to a fourth auxiliary request and requested that the decision under appeal be set aside and to remand the case back to the examining division for further prosecution on the basis of the main or one of the first to fourth auxiliary requests.

At the end of the oral proceedings the Board gave its decision.

VI. The wording of claim 1 amended according to the main request reads as follows:

"1. A method of correcting one or more reflectance values in a reflectance based system containing a set of detectors, said set of detectors comprising at least one detector when a center wavelength of one or more light sources used to generate corresponding light signals is different from a specified center wavelength

for the one or more light sources, the method comprising the steps of:

- A. defining, for each of the one or more light sources, a reference spectral distribution $\{L^*\}$ that is characteristic of the one or more light sources and comprised of reference light intensity values over a set of reference wavelengths;
- B. defining, for each of the one or more light sources, a spectral distribution $\{L\}$ comprising actual light intensity values over the set of wavelengths;
- C. determining the actual reflectance R of a set of reflected signals;
- D. defining a set of detector sensitivity data $\{D\}$ corresponding to the set of detectors receiving the set of reflected signals;
- E. determining high resolution reflectance values $\{r\}$;
- F. determining a correction factor $c(R)$ as a function of $\{L\}$, $\{L^*\}$, $\{r\}$ and $\{D\}$; and
- G. applying the correction factor to R to determine R^* such that $R^*=R \cdot c(R)$."

The wording of claim 1 amended according to the first auxiliary request differs from that of claim 1 of the main request in that the claim further reads as follows:

"wherein the correction factor is determined according to equation (5), where L_i are the elements of array $\{L\}$, r_i are the elements of an array $\{r\}$ of high resolution reflectance values for a specific reagent at a specific concentration, and D_i are elements of the array $\{D\}$ of detector sensitivities and where L^*_i are the elements of array $\{L^*\}$."

The wording of claim 1 amended according to the second auxiliary request differs from that of claim 1 of the first auxiliary request in that the claim further reads as follows:

"and wherein the values of {r} are reference reflectance values for specific analyte concentrations."

The wording of claim 1 amended according to the third auxiliary request differs from that of claim 1 of the second auxiliary request in that the claim further reads as follows:

"and wherein the values of {r} are determined at wavelength intervals of 1 nm or less."

Each of the sets of claims amended according to the main and the first to third auxiliary requests includes an independent claim 7 directed to "[a] center wavelength correction system" comprising means essentially arranged to carry out the steps of the reflectance correction method defined in the respective claim 1.

The set of claims amended according to the fourth auxiliary request includes independent claims 1 and 5 worded as follows:

"1. A method of correcting one or more reflectance values in a reflectance based system containing a set of detectors, said set of detectors comprising at least one detector when a center wavelength of one or more light sources used to generate corresponding light signals is different from a specified center wavelength

for the one or more light sources, the method comprising the steps of:

- A. defining, for each of the one or more light sources, a reference spectral distribution {L*} that is characteristic of the one or more light sources and comprised of reference light intensity values over a set of reference wavelengths;
- B. defining, for each of the one or more light sources, a spectral distribution {L} comprising actual light intensity values over the set of wavelengths;
- C. determining the actual reflectance R of a set of reflected signals;
- D. defining a set of detector sensitivity data {D} corresponding to the set of detectors receiving the set of reflected signals;
- E. determining high resolution reflectance values {r};
- F. determining a correction factor c(R) for at least one light source as a function of {L}, {L*}, {r} and {D}; and
- G. applying the correction factor to R to determine R* such that R*=R • c(R),

wherein the correction factor is determined according to the following equation:

$$c(R) = \frac{\left(\frac{\sum L^*_i r_i D_i}{\sum L^*_i D_i} \right)}{\left(\frac{\sum L_i r_i D_i}{\sum L_i D_i} \right)}$$

(equation (5))

where

- L_i are the elements of array {L}, which comprises the light intensity values of the at least one light source at different wavelengths,

- r_i are the elements of an array $\{r\}$ of high resolution reflectance values for a specific reagent at a specific concentration, at one of the said wavelengths,
- D_i are elements of the array $\{D\}$ of detector sensitivities at one of the said wavelengths, and
- L^*_i are the elements of the array $\{L^*\}$, which comprises the light intensity values of the at least one reference light source at one of the said wavelengths."

"5. A center wavelength correction system configured to correct one or more reflectance values, said system being a reflectance based system and containing a set of detectors, said set of detectors comprising at least one detector when a center wavelength of one or more light sources used to generate corresponding light signals is different from a specified center wavelength for the one or more light sources, the system comprising:

- A. a spectral distribution module configured to determine, for each of the one or more light sources, a spectral distribution $\{L\}$ comprising actual light intensity values over the set of wavelengths;
- B. a reflectance module configured to determine actual reflectance R from a set of reflected signals;
- C. at least one storage device comprising:
 - 1) for each of the one or more light sources, a reference spectral distribution $\{L^*\}$ that is characteristic of the one or more light sources and comprised of reference light intensity values over a set of reference wavelengths;
 - 2) high resolution reflectance values $\{r\}$; and

3) detector sensitivity data {D} corresponding to the set of detectors receiving the set of reflected signals;

D. a correction function module configured to determine a correction factor $c(R)$ for at least one light source as a function of {L}, {L*}, {r} and {D} and to apply the correction factor to R to determine R^* such that $R^* = R \cdot c(R)$,

wherein the correction factor is determined according to the following equation:

$$c(R) = \frac{\left(\frac{\sum L^*_i r_i D_i}{\sum L^*_i D_i} \right)}{\left(\frac{\sum L_i r_i D_i}{\sum L_i D_i} \right)}$$

(equation (5))

where

- L_i are the elements of array {L}, which comprises the light intensity values of the at least one light source at different wavelengths,
- r_i are the elements of an array {r} of high resolution reflectance values for a specific reagent at a specific concentration, at one of the said wavelengths,
- D_i are elements of the array {D} of detector sensitivities at one of the said wavelengths, and
- L^*_i are the elements of the array {L*}, which comprises the light intensity values of the at least one reference light source at one of the said wavelengths."

The set of claims of the fourth auxiliary request also includes dependent claims 2 to 4 and 6 to 9.

VII. The arguments of the appellant in the statement of grounds of appeal in support of the main and the first to third auxiliary requests pre-date, and have no bearing on, the issues subsequently raised by the Board in the communication annexed to the summons.

During the oral proceedings the appellant declined to comment on the issues raised by the Board with regard to the main and the first to third auxiliary requests.

The arguments submitted by the appellant during the oral proceedings in support of the fourth auxiliary request and pertinent for the present decision are essentially the following:

The correction factor $c(R)$ is not a function of wavelength, but is defined for a predetermined light source having a central wavelength of emission, i.e. the correction factor is common to the emission spectra range of the light source and gives account of the deviations of the wavelength of emission of the light source from the nominal one. The description discloses in paragraph [0047] how the values r_i to be used in the equation specified in the claims are to be determined, and the skilled person knows that they can be previously determined at high resolution by measurements using calibrated standard solutions of the reagent. The reference in paragraph [0051] to the values r_i providing reference reflectance values of the reagent "for specific analyte concentrations" is erroneous, and should rather read "for a specific reagent at a specific concentration" as stated in paragraph [0047]. The determination of the high resolution reflectance values r_i with reference to the infrared region disclosed in paragraphs [0045] and [0046] of the description does not pertain to the high

resolution reflectance values r_i considered in the subject-matter of the amended claims, and the previous dependent claims directed to the corresponding features have been deleted in the fourth auxiliary request; the disclosure of the description relating to other arrays of high resolution reflectance values required for the determination of correction factors at different predetermined wavelengths does not pertain either to the invention now claimed.

Reasons for the Decision

1. The appeal is admissible.
2. *Main and first to third auxiliary requests*

In the communication annexed to the summons to oral proceedings the Board explained in detail why in its preliminary opinion the claims of the main and the first to third auxiliary requests do not satisfy the requirements of Article 84 EPC 1973 (see paragraphs a) to d) of point IV above). In essence, the objections raised in the communication further elaborated on the objections already raised by the examining division during the first-instance proceedings and on the basis of which the application was subsequently refused.

During the oral proceedings the appellant expressly declined to make observations in reply to the objections raised under Article 84 EPC 1973 by the Board in the aforementioned communication.

After consideration of the reasons advanced in the communication and in the absence of any attempt by the

appellant to refute the objections mentioned above, the Board saw no reason during the oral proceedings to depart from the preliminary opinion expressed in the communication. Accordingly, the Board concluded during the oral proceedings that the claims of the main and the first to third auxiliary requests did not comply with the requirements of clarity of Article 84 EPC 1973 and that consequently these claim requests were not allowable for the reasons reproduced in paragraphs a) to d) of point V above.

In addition, as the amended sets of claims of the main and first to third auxiliary requests are not allowable, the Board does not see any reason for considering the remittal of the case on the basis of these sets of claims as requested by the appellant.

3. *Fourth auxiliary request*

3.1 *Clarity*

Claim 1 of the fourth auxiliary request directed to a method of correcting reflectance values has been amended so as to overcome the objections of clarity previously raised with respect to the independent claims of the main and the first to third auxiliary requests and referred to in point 2 above. In particular:

- (a) Claim 1 has been amended to specify that the correction factor $c(R)$ is determined "for at least one light source" as a function of $\{L\}$, $\{L^*\}$, $\{r\}$ and $\{D\}$ and that the elements L_i and L^*_i of the arrays $\{L\}$ and $\{L^*\}$ correspond to the light intensity values of the at least one light source and of the at least one reference light source at

different wavelengths. These amendments are based on paragraphs [0043] and [0039] of the description of the application as published and clarify the correspondence between the different means (the detectors and the light sources) and the different values (the correction factor, the reflectance values, the reference wavelengths and the reflected signals) previously objected to with regard to the main and the first to third auxiliary request (paragraph d) of point IV above). Indeed, claim 1 now requires a correction factor $c(R)$ for at least one of the light sources, i.e. for the wavelength range of emission associated with one of the light sources, and therefore a common correction factor for the corresponding reflectance values. In addition, the arrays of values $\{L\}$ and $\{L^*\}$ are defined now in the claim as the array of light intensity values at different wavelengths of the at least one light source and of the at least one reference light source. The skilled reader would therefore understand that in the amended claim 1, for at least one of the light sources emitting within a predetermined range of wavelengths, the reflectance value of reflected signals measured by the set of detectors at the different wavelengths within said range are corrected according to a common correction factor $c(R)$, and the amendments overcome the objections of lack of clarity raised in paragraph d) of point IV above with respect to claim 1 of the main and the first to third auxiliary requests.

- (b) Claim 1 has also been amended so as to specify explicitly the equation in terms of which the correction factor $c(R)$ is to be calculated as a

function of the values $\{L\}$, $\{L^*\}$, $\{r\}$ and $\{D\}$, and also to specify that the elements r_i of the array $\{r\}$ correspond to the "high resolution reflectance values for a specific reagent at a specific concentration, at one of the said wavelengths". These amended features are based on paragraphs [0047] and [0048] of the description of the application as published and overcome the objections raised in paragraphs a), b) and c) of point IV above with respect to claim 1 of the main and the first to third auxiliary requests.

The corresponding amendments have also been made in the wording of independent claim 5 directed to a center wavelength correction system configured to correct reflectance values and therefore they also overcome the objections raised in paragraphs a) to d) of point IV above with respect to independent claim 7 of the main and the first to third auxiliary requests.

The Board is therefore satisfied that the subject-matter defined in the set of claims amended according to the fourth auxiliary request is sufficiently clear within the meaning of Article 84 EPC 1973.

3.2 *Sufficiency of disclosure*

The Board is also satisfied that the invention as presently defined in the claims amended according to the fourth auxiliary request is sufficiently disclosed in the application within the meaning of Article 83 EPC 1973. In particular, the claimed invention is directed to the correction of reflectance values in terms of correction factors that take into account, among other parameters having an influence on the measured reflectance values, the deviations of the actual centre

wavelength of emission of the light sources from the nominal or expected one, and the correction is carried out in terms of a correction factor $c(R)$ determined according to the algebraic expression specified in the claims on the basis of, among other values, the array $\{r\}$ of "high resolution reflectance values". These values are defined in each of the independent claims as the "high resolution reflectance values for a specific reagent at a specific concentration, at one of the said wavelengths" and its determination appears to be sufficiently disclosed in the application. More specifically, the description of the application discloses in paragraph [0047] that the measured reflectance can be expressed as $R = \frac{\sum L_i r_i D_i}{\sum L_i D_i}$ and from the technical meaning of this algebraic expression in which the values r_i play the role of spectral weighting factors and from the characterization in the cited paragraph of the array $\{r\}$ as "high resolution reference reagent spectrum" and of the values r_i as "high resolution reflectance values for a specific reagent at a specific concentration", the skilled person working in this field would understand that the array of values $\{r\}$ gives account of the different response of the reagent to light having different wavelengths (see paragraph [0037] of the description) and can be previously determined - as submitted by the appellant - by evaluation of reflectance measurements at the different wavelengths using calibrated standard solutions of the reagent.

The Board notes that - as explained in detail in the communication annexed to the summons and referred to in point IV above - the description of the application contains other passages that appear to be inconsistent or at least not in conformity with the technical features of the high resolution reflectance values r_i as

indicated above, i.e. as presently defined in the amended claims and disclosed in paragraph [0047] of the description. During the oral proceedings, however, the appellant submitted (see point VII above) that

- the passages of the description disclosing the determination of the high resolution reflectance values r_i with reference to "specific analyte concentrations" (see paragraph [0051]) appear to be erroneous, and
- neither the passages of the description relating to the determination of the high resolution reflectance values r_i with reference to reflectance readings in the infrared region (see paragraphs [0045] and [0046] and previous dependent claims now absent in the amended set of claims of the fourth auxiliary request), nor the disclosure of the description relating to other k -indexed, multidimensional arrays of high resolution reflectance values required for the determination of correction factors at different predetermined wavelengths (see for instance paragraphs [0052] to [0054] and [0057] to [0062]) appear to pertain to the invention as defined in the claims as presently amended.

The Board therefore concludes that, disregarding the aforementioned passages of the description, the application discloses the invention defined in the set of claims amended according to the fourth auxiliary request in a manner sufficiently clear and complete for it to be carried out by a skilled person within the meaning of Article 83 EPC 1973. Other issues, such as the technical significance of the correction proposed by the claimed invention and the possible technical effects associated therewith, pertain by their very nature to the examination of patentability under

Article 52(1) EPC 1973 which has not yet been considered by the examining division.

4. *Description*

The Board notes that the description would require, already at this stage of the procedure, amendments pursuant to Article 84 EPC 1973, second sentence, in order to bring it into conformity with the subject-matter of the claims amended according to the fourth auxiliary request, and also in order to give account of some deficiencies in the description since, as noted in point 3 above, the description contains disclosures that presumably contain errors and also passages that are not in conformity with the claimed invention and/or no longer pertain to the claimed invention (see in particular the second paragraph of point 3.2 above). In the Board's view, however, it would be premature to make at this stage the appropriate amendments of the description since the further examination of the application, and in particular the examination of the issues of novelty and inventive step of the claimed subject-matter, may raise further issues that would subsequently require additional amendments to the description. In these circumstances, the Board considers it more economical and appropriate to postpone the amendments to the description until a full examination of the claimed invention is carried out.

5. *Further prosecution - Remittal*

In view of the foregoing and of the fact that other issues (such as the issues of novelty and inventive step of the invention defined in the set of claims of the fourth auxiliary request) have not yet been considered by the examining division, the Board

considers it appropriate in the circumstances of the case to make use of its discretionary powers under Article 111(1) EPC 1973 and - in agreement with the request for remittal formulated by the appellant - to remit the case to the examining division for further prosecution on the basis of the set of claims amended according to the fourth auxiliary request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance for further prosecution on the basis of the fourth auxiliary request filed during the oral proceedings.

The Registrar:

The Chairman:

M. Kiehl

A. G. Klein