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**Datasheet for the decision  
of 8 February 2019**

**Case Number:** T 1808/14 - 3.4.02

**Application Number:** 05768305.4

**Publication Number:** 1779098

**IPC:** G01N23/225

**Language of the proceedings:** EN

**Title of invention:**

DATA ANALYSIS

**Patent Proprietor:**

FEI Company

**Opponent:**

Carl Zeiss Microscopy GmbH

**Headword:**

**Relevant legal provisions:**

RPBA Art. 13(1)

EPC Art. 123(2)

EPC 1973 Art. 54(2), 56, 84

**Keyword:**

Late-filed request - admitted (yes)  
Amendments - added subject-matter (no)  
Claims - clarity (yes)  
Novelty (yes)  
Inventive step (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
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Case Number: T 1808/14 - 3.4.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.02**  
**of 8 February 2019**

**Appellant:** Carl Zeiss Microscopy GmbH  
(Opponent) Carl-Zeiss-Promenade 10  
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**Representative:** Gnatzig, Klaus  
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**Respondent:** FEI Company  
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**Representative:** Stellbrink & Partner Patentanwälte mbB  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 23 June 2014  
rejecting the opposition filed against European  
patent No. 1779098 pursuant to Article 101(2)  
EPC.**

**Composition of the Board:**

**Chairman** R. Bekkering  
**Members:** H. von Gronau  
G. Decker

## Summary of Facts and Submissions

- I. The appeal of the opponent is directed against the decision of the opposition division to reject the opposition filed against European patent No. 1779098 according to Article 101(2), second sentence, EPC.
- II. With the statement setting out the grounds of appeal, the appellant (opponent) requested that the decision of the opposition division be set aside and that the patent be revoked.
- III. The respondent (proprietor) requested that the decision of the opposition division be maintained, i.e. the appeal be dismissed.
- IV. Both parties requested to hold oral proceedings.
- V. In a communication annexed to summons to oral proceedings the board expressed its provisional opinion that *inter alia* the subject-matter of the patent did not extend beyond the content of the application as filed and that the subject-matter of claim 1 was new and involved an inventive step in view of documents

D7: P. Gottlieb et al.: "Using quantitative electron microscopy for process mineralogy applications", JOM, vol. 52, no. 4, 1 April 2000, pages 24-25

and

D4: Kenneth Pye et al.: "Forensic Geoscience: Principles, Techniques and Applications - Programme and Abstracts", The Geological Society, London, 3 & 4 March 2003, page 1-55.

VI. Oral proceedings took place on 8 February 2019.

During the oral proceedings the respondent filed among others an "Auxiliary Request 1 15:20" and withdrew its main request (to dismiss the appeal and maintain the patent as granted) and other requests so that "Auxiliary Request 1 15:20" constituted its sole request.

The parties confirmed their final requests as follows:

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

The respondent (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained as amended in the following version:

Claims: Nos. 1 to 33 of the sole request filed as "Auxiliary Request 1 15:20" at the oral proceedings of 8 February 2019;

Description: Pages 2 to 10 of the patent as granted;

Drawings: Figures 1 to 8 of the patent as granted.

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

VII. Claim 1 of the sole request filed during the oral proceedings before the board as "Auxiliary Request 1 15:20" reads as follows, wherein the feature labelling a)-e) used by the parties during the proceedings is added to the claim wording by the board:

"a) A method of analysing spectroscopic data, the method comprising

b) collecting spatially resolved measurement spectroscopic data of a sample for a series of measurements spots (208) by a data collecting unit,

characterized by

c1) assigning the measurement spots (208) into a predefined set of spectral categories,

c2) based on characteristics of the spectroscopic data of the respective measurement spots (208) by a processor unit,

d1) identifying groupings of the measurement spots (208) as particle entities (210)

d2) based on their respective spectral categories and their spatial relationships by the processor unit,

d3) a particle entity representing spots (208) belonging to the same physical particle (202, 204, 206) of the sample, and

e) representing in data each particle entity (210) as a fundamental sample unit data object by the processor unit."

Independent claim 17 of the sole request reads as follows:

"A system for analysing spectroscopic data, the system comprising a data collection unit for collecting spatially resolved measurement spectroscopic data of a

sample for a series of measurements spots (208),  
characterized by the system further comprising  
a processor unit  
assigning the measurement spots (208) into a predefined  
set of spectral categories, based on characteristics of  
the spectroscopic data of the respective measurement  
spots (208),  
identifying groupings of the measurement spots (208) as  
particle entities (210) based on their respective  
spectral categories and their spatial relationships, a  
particle entity (210) representing spots belonging to  
the same physical particle (202, 204, 206) of the  
sample, and  
representing in data each particle entity (210) as a  
fundamental sample unit data object."

Independent claim 33 of the sole request reads as  
follows:

"A computer readable data storage medium having stored  
thereon program code means for instructing a computer  
to execute a method of analysing spectroscopic data,  
the method comprising  
collecting spatially resolved measurement spectroscopic  
data of a sample for a series of measurements spots  
(208),  
the method further characterized by  
assigning the measurement spots (208) into a predefined  
set of spectral categories, based on characteristics of  
the spectroscopic data of the respective measurement  
spots (208),  
identifying groupings of the measurement spots (208) as  
particle entities (210) based on their respective  
spectral categories and their spatial relationships, a  
particle entity representing spots belonging to the  
same physical particle (202, 204, 206) of the sample,

and  
representing in data each particle entity (210) as a  
fundamental sample unit data object."

## **Reasons for the Decision**

### 1. Admissibility of the sole request (Article 13(1) RPBA)

The claims of the sole request were filed during the oral proceedings before the board after a discussion whether features d1) to d3) and e) of granted claim 1 were technical features or had an interaction with technical features of the claim. In the present method claim 1 it is specified that in particular features d1) to d3) and e) are performed by a processor unit so that these features have a technical character and cannot be considered as pure mental acts. This amendment in method claims 1 to 16 is in line with the corresponding system claims 17 to 32 and clearly overcomes the raised objection.

The board therefore exercised its discretion under Article 13(1) RPBA admitting the sole request.

### 2. Subject-matter of claim 1 extending beyond the content of the application as filed (Article 123(2) EPC)

#### 2.1 The appellant argued that the amendments in features d1) to d3) and e) of claim 1 extended beyond the originally filed application (cf. point 1 of the grounds of appeal). The word "cluster" in relation to the measurements implied that these were similar things that occurred next to each other. However, the term "grouping" - unlike the term "cluster" - contained no



information about the local context in which the measuring points were located. In the oral proceedings, the appellant emphasised that, according to the original description, a cluster contained a neighbouring, spatial arrangement of measuring points, which was not disclosed for a particle entity. This particular spatial arrangement could not be inferred from claim 1 where spatial relationship of the measurement spots could also define a spatial relationship other than a neighbouring relationship. Thus claim 1 was broader than the original disclosure.

- 2.2 The respondent explained why in its view the subject-matter of claim 1 did not extend beyond the content of the application as originally filed (cf. points 4 and 5 of the reply dated 20 March 2015). The respondent referred in the oral proceedings to page 10, lines 17 to 24 of the original description, where it was disclosed that a particle entity was created for each cluster, so that it was clear from the description that cluster and particle entity were the same. Furthermore, the data collection unit and the processor unit, added to claim 1, were disclosed in system claim 17 as originally filed.

The board is of the opinion that granted independent claim 1 differs from the originally filed independent claim 1 essentially in that the groupings of the measurement spots are labelled "particle entities". This is only a name given to the groupings after their identification and does not entail any different technical teaching for the method claimed. The expression "particle entities" is also disclosed in the originally filed description (cf. page 10, lines 22 to 24). There the expression "particle entity" is used to identify a cluster of measured spots identified as

belonging to one physical particle. From page 10, lines 17 to 20 ("*measurements are made and grouped into clusters that correspond to the physical particles*") it becomes evident that groupings of measurement spots and clusters of measured spots are the same.

The additional feature d3) in claim 1 introduces the limitation disclosed in combination with the expression "particle entity" and is therefore also disclosed in the original application (cf. page 10, lines 22 to 24: "*A particle entity is created for each cluster ... of measured spots ... identified as belonging to one physical particle*"). The disclosure that the particle entity is created for a cluster (i.e. a group) of measured spots identified as belonging to one physical particle corresponds to the definition in the claim that the particle entity represents spots belonging to the same physical particle of the sample.

With respect to feature e) the board is convinced, as already explained above, that the expression "particle entity" is another name for the expression "grouping of measurement spots" including the limitation to those measured spots that belong to one physical particle. The amendment of the wording from "*assigning each [particle entity] to a fundamental sample unit data object*" to the wording "*representing in data each particle entity as a fundamental sample unit data object*" does not change the technical teaching. In both cases a link is created between the particle entity and the fundamental sample unit data object. On page 10, lines 27 and 28 it is disclosed that the data representation of each particle entity functions as a fundamental sample unit. The formulation used in feature e) of the claim is an equivalent definition which does not include technical teaching which is not disclosed in the application as filed.

The data collection unit and the processor unit which were added to claim 1 of the sole request filed during the oral proceedings are disclosed in originally filed system claim 17.

2.3 The board therefore concludes that the subject-matter of independent claim 1 meets the requirements of Article 123(2) EPC.

3. Claim 1 - clarity (Article 84 EPC 1973)

3.1 The appellant argued in the oral proceedings that in feature e) of claim 1 it was not clear how a processor unit could represent in data each particle entity as a fundamental sample unit data object and what could be achieved thereby.

3.2 The respondent argued that clarity was not an issue because the same formulation was already used in granted system claim 17. In addition, this wording of the claim was clear for a person skilled in the art because it knew how a processor unit could generate a representation in data of a particle entity as a fundamental sample unit data object.

3.3 The board does not share the view that clarity is not an issue, because the corresponding wording of claim 1 and granted claim 17 is not identical, but it concurs with the reasoning of the respondent why the wording of the claim is sufficiently clear.

A lack of clarity is therefore not introduced by the feature that step e) is performed by the processor unit.

4. Subject-matter of claim 1 - novelty (Article 54(2) EPC 1973)
  - 4.1 The appellant put forward in the appeal proceedings that document D7 disclosed all the features of claim 1 (cf. point 2 of the grounds of appeal).  
The appellant took in particular the view that features d1) to d3) and e) were also disclosed in document D7. Document D7 revealed the need to obtain both spatially and chemically resolved data for mineralogical analysis (see page 25, section "Measurement Integrity"). Thus, characteristic d2) was disclosed in document D7. In addition, document D7 described that the identified species were grouped based on spectral categories and their spatial relationships (see page 24, section "System Design", last sentence). For the person skilled in the art, it was clear that a particle was to be understood as a unit of several mineral grains. A mineral group was thus a particle unit. Characteristics d1) to d3) were thus disclosed in document D7. Document D7 also revealed that each particle unit was represented in data as a data object, as defined in feature e) of claim 1, because it described that the identified species represented individual minerals or mineral groups and that these mineral groups were suitable for further interpretation (see page 24, fourth paragraph, last sentence).
  - 4.2 The respondent explained in its reply dated 20 March 2015, point 6, that document D7 did not disclose features d1) to d3) and e).
  - 4.3 Both parties did not put forward further arguments with respect to novelty in the oral proceedings.

4.4 The board follows the arguments of the respondent with respect to document D7. Document D7 discloses a method of analysing spectroscopic data by collecting spatially resolved measurement spectroscopic data of a sample for a series of measurement spots (cf. page 24, second paragraph where it is disclosed that the system acquires energy dispersive x-ray spectra, and page 24, last paragraph where it is disclosed that data of measuring spots are collected in linear scans). The measuring spots are assigned into a predefined set of spectral categories based on characteristics of the spectroscopic data of the respective measurement spots (cf. page 24, third and fourth paragraphs, where it is disclosed that minerals are identified based on characteristics of the spectroscopic data that are compared with elements in a database and classified correspondingly). Therefore features a), b), c1) and c2) are known from document D7.

Document D7 does not disclose features d1) to d3) and e). In document D7, the measurements spots are identified as species and then condensed into mineral groupings (see page 24, fourth paragraph, last 3 lines). Document D7 discloses two different modes. The BMA (Bulk Mineralogical Analysis) mode is a scanning mode that determines mineral association (see sentence bridging pages 24 and 25) but little explanation is given how the gained data is analysed. However, this mode does not disclose identifying groupings of measurement spots as particle entities based on their respective spectral categories and their spatial relationships, a particle entity representing spots belonging to the same physical particle. The PMA (Particle Mineralogical Analysis) mode (see page 25, second paragraph) identifies the mineral and analyzes the statistics in the same way as the BMA mode

for each particle. A backscatter electronic image is obtained for each field-of-view and analysed to determine each particle-section perimeter, area and location within a guard frame. This mode does not disclose either identifying groupings of measurement spots as particle entities based on their respective spectral categories and their spatial relationships, a particle entity representing spots belonging to the same physical particle. It does not disclose details about how the measurement spots are grouped and whether the corresponding data is represented as data object for further processing.

The board therefore concludes that document D7 does not disclose features d1) to d3) and e).

Accordingly, the subject-matter of claim 1 is new over document D7.

4.5 Document D4, page 38, discloses a method of analysing spectroscopic data (see title, first and second paragraphs). Spatially resolved measurement spectroscopic data for a series of measurement spots are collected and the spectra are compared against a database of known spectra and a mineral name is assigned to each pixel (see first paragraph, lines 7 to 10). Features a), b), c1) and c2) are thus known from document D4.

However, document D4 does not disclose identifying groupings of measurement spots as particle entities based on the respective spectral categories of the measurement spots and their spatial relationships, a particle entity representing spots belonging to the same physical particle. Document D4 discloses that particles are identified and, in addition to providing a surface chemical analysis, mineral assignment for

each particle is provided (see page 38, second paragraph, first sentence), but document D4 is silent about how the particles are identified.

The board therefore concludes that document D4 does not disclose features d1) to d3) and e) of claim 1.

The board therefore considers the subject-matter of claim 1 to be new over document D4.

5. Subject-matter of claim 1 - inventive step (Article 56 EPC 1973)

5.1 The appellant argued that features d1) to d3) and e) did not make a technical contribution to inventive step. These features comprised merely mental acts and needed not to be considered for inventive step. Without these features the subject-matter of claim 1 was obvious in view of D7 (cf. point 3.1 of the grounds of appeal).

But even with these features d1) to d3) and e) the subject-matter of claim 1 did not involve an inventive step in view of document D7 in combination with the teaching of document D4. Document D7 already disclosed a computing system with a processor unit that allowed to group measurement spots based on their respective spectral categories. The differing feature was therefore feature e) which was disclosed in document D4, first paragraph, lines 10 to 12 where it was disclosed that each particle was systematically mapped and assigned to a mineral name, i.e. it represented a data object that could be stored and retrieved. Starting from document D7 and with the problem to prepare the particle data such that it could be retrieved easily the person skilled in the art would

apply the teaching of document D4 to provide a solution.

The appellant declared at the oral proceedings that, for the objection of lack of inventive step, it did not rely on any further document.

- 5.2 The respondent argued in the oral proceedings that in particular the reference to the processor unit in features d1) to d3) and e) made clear that these features did not comprise merely mental acts, but were steps performed by a technical unit. Therefore these steps had technical character.
- Furthermore, document D7 did not provide hints that the spectroscopic data might be used to group measurement spots per particle, that backscatter measurements were not required to locate the particles, and that a particle entity might be used as the fundamental sample unit data object (cf. point 9 of the reply to the appeal).
- The same applied with respect to document D4 (cf. point 10 of the reply).
- The respondent in the oral proceedings was of the opinion that D7 could be regarded as the closest prior-art document and that it did not disclose features d1) to d3) and e). The person skilled in the art would not combine documents D7 and D4, and even if one were to combine these documents one would not arrive at the claimed solution, because document D4 also did not disclose features d1) to d3) and e).
- Furthermore, the problem-solution-approach of the appellant was based on hindsight. Document D7 disclosed in the last sentence of the fourth paragraph on page 24 mineral groupings which were not identical to particles. Furthermore, the last sentence of the second paragraph on page 24 referred only to species



representing individual mineral groups but not to particles. Document D7 did therefore not disclose features d1) to d3).

Document D4, page 38, first paragraph, last sentence, did not disclose either identifying groupings of measurement spots as particle entities, a particle entity representing spots belonging to the same physical particle as defined in claim 1.

- 5.3 The board concurs with the opinion of the respondent that features d1) to d3) and e) have technical character and therefore have to be considered for the assessment of inventive step, because they are performed by a processor unit and cannot be considered as pure mental acts.

The board does not share the view of the appellant that features d1) to d3) are disclosed in document D7. Document D7 merely discloses to create groups of minerals with similar chemical compositions, but it does not suggest to identify groupings of the measurement spots as particle entities based on their respective spectral categories and their spatial relationships, a particle entity representing spots belonging to the same physical particle. Particles in the particle mineralogical analysis are determined only by analysing the backscatter electronic image.

Document D4 does not disclose or suggest features d1) to d3) either. It discloses to provide a surface chemical analysis and mineralogical assignment for each particle and data on particle size, particle shape, particle density etc. (see page 38, second paragraph, first sentence), but document D4 is silent on how particles are identified and does not suggest that groupings of measurement spots are identified as

particle entities based on their respective spectral categories and their spatial relationships.

- 5.4 The board concludes therefore that the subject-matter of independent claim 1 involves an inventive step.
6. Independent claim 17 relates to a system for analysing spectroscopic data with features corresponding to the method features of claim 1 and independent claim 33 relates to a computer readable data storage medium having stored thereon program code means for instructing a computer to execute a method that corresponds to the method of claim 1. The subject-matter of these claims therefore also meets the requirements of novelty and inventive step for the same reasons as the subject-matter of claim 1. Claims 2 to 16 and 18 to 32 are dependent on claims 1 and 17 respectively and therefore also meet the novelty and inventive step requirements of the EPC.
7. The board concludes that the documents according to the sole request satisfy the requirements of the EPC.

## **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 with the order to maintain the patent as amended in the following version:

Claims: Nos. 1 to 33 of the sole request filed as "Auxiliary Request 1 15:20" at the oral proceedings of 8 February 2019;

Description: Pages 2 to 10 of the patent as granted;

Drawings: Figures 1 to 8 of the patent as granted.

The Registrar:

The Chairman:



M. Kiehl

R. Bekkering

Decision electronically authenticated