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# Datasheet for the decision of 3 March 2020

**Case Number:** T 2069/17 - 3.4.02

**Application Number:** 09743421.1

**Publication Number:** 2274596

**IPC:** G01N21/05, G01N21/64, G02B21/00

**Language of the proceedings:** EN

**Title of invention:**
COMPENSATOR FOR MULTIPLE SURFACE IMAGING

**Applicant:**
Illumina, Inc.

**Headword:**

**Relevant legal provisions:**
EPC Art. 56, 123(2)
RPBA Art. 13(1)

**Keyword:**
Main request - inventive step (no)
Late-filed first auxiliary request - admitted (no)
Late-filed second auxiliary request - justification for late filing (yes) - admitted (yes) - inventive step (no)

**Decisions cited:**

**Catchword:**

Europäisches Patentamt
European Patent Office
Office européen des brevets

**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

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

**Case Number: T 2069/17 - 3.4.02**

# D E C I S I O N
# of Technical Board of Appeal 3.4.02
# of 3 March 2020

| | |
|---|---|
| **Appellant:** (Applicant) | Illumina, Inc.<br>5200 Illumina Way<br>San Diego, CA 92122 (US) |
| **Representative:** | Grünecker Patent- und Rechtsanwälte<br>PartG mbB<br>Leopoldstraße 4<br>80802 München (DE) |
| **Decision under appeal:** | **Decision of the Examining Division of the European Patent Office posted on 13 April 2017 refusing European patent application No. 09743421.1 pursuant to Article 97(2) EPC.** |

**Composition of the Board:**

| | |
|---|---|
| **Chairman** | R. Bekkering |
| **Members:** | C. Kallinger |
| | B. Müller |

## Summary of Facts and Submissions

I. The appellant lodged an appeal against the decision of the examining division refusing European patent application number 09743421.1.

II. With the statement setting out the grounds of appeal, the appellant requested that the decision of the examining division be set aside and a patent be granted on the basis of the claims according to the main request as refused in the contested decision, and, in the alternative, on the basis of the set of claims according to the first or second auxiliary request filed with the statement of grounds of appeal. In addition, the applicant requested oral proceedings.

III. In a communication pursuant to Article 15 (1) RPBA the appellant was informed about the board's preliminary opinion with respect to Articles 56 and 123(2) EPC.

IV. In reply to this communication the appellant, with its letter dated 31 January 2020, submitted further arguments supporting inventive step and amended claims according to a new first and second auxiliary request.

V. Oral proceedings before the board were held on 3 March 2020.

VI. The appellant's final request were that the decision under appeal be set aside and that a patent be granted on the basis of the claims of

- the main request filed with the statement setting out the grounds of appeal dated 18 August 2017 or
- the first or second auxiliary requests, both filed with the letter dated 31 January 2020.

VII. Claim 1 of the main request reads as follows

*"1. A method for imaging a biological sample, comprising:*

*(a) detecting radiation emitted from a second emissive component (14) of a biological sample disposed on a second surface (20) of a flow cell using a detector (36), wherein the flow cell is mounted on an imaging station;*

*(b) removably inserting corrective optics (110; 114; 120; 122) between the detector (36) and the flow cell into an optical train comprising an objective (92) and imaging optics (30; 32);*

*(c) detecting radiation emitted from a first emissive component (12) of a biological sample disposed on a first surface (18) of the flow cell using the detector (36) and the corrective optics (110; 114; 120; 122), wherein the first (18) and second surfaces (20) are in an arrangement whereby the first surface (18) is disposed between the detector (36) and the second surface (20), wherein the corrective optics (110; 114; 120; 122) reduce spherical aberration of detection at the first surface (18) due to the arrangement; and*

*(d) repeating steps (a)-(c) while maintaining the flow cell on the imaging station;*

*wherein the corrective optics (110; 114; 120; 122) are either removably inserted between the objective (92) and the flow cell or between the detector (36) and the objective (92), wherein the objective (92) is disposed between the detector (36) and the flow cell."*

VIII. With respect to claim 1 of the main request claim 1 of the first auxiliary request comprises the additional feature

*"... wherein the corrective optics (110; 114; 120; 122) does not physically contact the flow cell or the objective (92)."*

IX. In comparison to the main request, the last feature of claim 1 of the second auxiliary reads as follows:

*"... wherein the corrective optics (110; 114; 120; 122) are removably inserted between the objective (92) and the flow cell, wherein the objective (92) is disposed between the detector (36) and the flow cell; and wherein the corrective optics (110; 114; 120; 122) does not physically contact the flow cell or the objective (92)."*

X. The present decision refers to the following documents:

D3 DE 100 14 204 A1
D6 US 4,563,062.

## Reasons for the Decision

1. Main request - Inventive Step - Article 56 EPC

1.1 Closest prior art

Document D3 represents the closest prior art and discloses a method for imaging a biological sample, where the biological sample comprises a flow cell (100) with a first biological sample (21) disposed on a first surface (20) and a second biological sample (11)

disposed on a second surface (10) of the flow cell, such that the first and second surfaces face each other (see paragraphs [0024] to [0026] and figures 1 and 3). The biological samples are excited by a radiation source and radiation emitted from the two surfaces is detected (see paragraphs [0012] *"Fluoreszenzmessungen"* and [0036] *"Fluoreszenzdetektion"*). According to D3, the fluorescence measurements are performed at the flow cell through the first surface (see paragraphs [0035]), i.e. the flow cell is mounted as a whole on an imaging station such that the first surface (20) is disposed between the detector and the second surface (10). This is confirmed by the statement that the measuring time is reduced due to fluorescence measurements at the first and second surfaces (see paragraph [0012]).

1.2 Difference

Document D3 fails to disclose the features relating to the corrective optics, i.e. that corrective optics are removably inserted between the detector and the flow cell into an optical train comprising an objective and imaging optics (inserted either between an objective and the flow cell or between a detector and the objective) such that the corrective optics reduce spherical aberration of detection at the first surface.

1.3 Technical effect and problem to be solved

The technical effect of this difference is that spherical aberration is compensated for and the problem to be solved is therefore to improve image quality.

1.4 Combination with document D6

With respect to the disclosure of document D6 the board agrees with the line of argument provided by the examining division (see section 2.1.5 and 2.1.6 of the appealed decision) and is of the opinion that the solution proposed in claim 1 cannot be considered to involve an inventive step (Articles 52(1) and 56 EPC).

The fluid medium between the sandwiched biomolecule arrays disclosed in D3 necessarily provokes a change in spherical aberration when imaging the first or the second emissive component at the first or second surface of the flow cell and therefore a change in image quality. The skilled person would be motivated to compensate for the change in spherical aberration. Document D6 discloses a microscope for imaging different layers of a sample in a sandwich configuration. D6 further identifies a change in optical medium as the cause for aberration (column 1, lines 42 to 55 and column 2, lines 60 to 63) and states that corrective optics are inserted to compensate spherical aberration due to a change in the optical medium (column 1, lines 10 to 15 and column 2, lines 60 to 63).

Therefore, corrective optics have been employed in document D6 for the same purpose as in claim 1. It would be obvious to the person skilled in the art, namely when the same result is to be achieved as in claim 1, to apply corrective optics with corresponding effect in the imaging method disclosed in document D3, thereby arriving at a method for imaging a biological sample according to claim 1.
The subject-matter of claim 1 therefore does not involve an inventive step (Articles 52(1) and 56 EPC).

1.5 Appellant's arguments

1.5.1 The appellant argued that D6 disclosed a specific type of microscope which recorded the track of cosmic rays. Thus, the technical fields of D6 and D3 differed significantly and the skilled person would not consult document D6 when starting from a sandwiched flow cell as disclosed in D3.

The board is of the opinion that document D6 relates to optical microscopes in general (see title and column 1, lines 10 to 16: *"Field of the Invention"*) and offers a solution (insertion of corrective optics) for the correction of spherical aberration that occurs due to imaging of layers at different levels (see claim 1, column 1, lines 42 to 55 and column 2, line 60 to column 3, line 16). Therefore, the skilled person would consider document D6 and apply its teachings in order to solve the objective technical problem.

1.5.2 The appellant further argued that D6 did not disclose the claimed arrangement because in D6 the corrective optics were inserted between lenses 15 and 16 of the objective.

The board is not convinced by this argument because D6 discloses that the objective can comprise only a single lens and that the corrective optics can be inserted on the image side of this lens (see column 7, lines 53 to 61). This arrangement is identical to the second alternative in feature (d) of claim 1, where the corrective optics is inserted between the detector and the objective.

1.5.3 The appellant argued further that the arrangement disclosed in document D6 differed from the claimed

arrangement in that the objective and the corrective optics were moved together (see column 4, lines 28 to 31).

The board is not persuaded by this argument because claim 1 only defines the geometrical arrangement of the corrective optics and the objective, but contains no restriction with regard to the mechanical connection of the two.

1.5.4 Finally, the appellant argued that the arrangement of document D6 was such that the corrective optics were inserted when the lower surface (2b) was observed (see column 4, lines 49 to 52), whereas the claim defined that the corrective optics were inserted when radiation from the upper (first) surface (18) was detected (see features (b) and (c)).

The board is of the opinion that the skilled person understands that the order in which the different layers are imaged is of no importance to the effect of correcting the aberration. Therefore the claimed order of imaging is an obvious alternative.

2. First auxiliary request - Admission

2.1 The first auxiliary request was filed with the reply to the communication from the board.
Claim 1 of the first auxiliary request comprises the additional features that *"the corrective optics (110; 114; 120; 122) does not physically contact the flow cell or the objective (92)."*

2.2 The appellant argued that the added features were based on paragraphs [0073], [0075] and figures 12 and 14 of

the application as originally filed. Furthermore, the support structure had to be interpreted as a flow cell (see paragraph [0036]).

2.3 Paragraph [0073], from which the added feature stems, describes the embodiment shown in figure 12, where the corrective optics are inserted between objective and detector. However, claim 1 still contains the arrangement shown in figure 14 in which the corrective optics are inserted between objective and flow cell. Paragraph [0075], which describes the embodiment of figure 14, does however not disclose the added feature. The claim therefore now encompasses an arrangement (corrective optics between objective and detector, where the corrective optics do not physically contact the objective), which *prima facie* is not directly and unambiguously derivable from the application as originally filed.

As this amendment therefore *prima facie* gives rise to a new objection under Article 123(2) EPC, the board exercises its discretion under Article 13(1) RPBA 2007in not admitting this request into the proceedings.

3. Second auxiliary request

3.1 Admission - Article 13(1) RPBA 2007

3.1.1 In comparison to claim 1 of the first auxiliary request, the alternative in which the corrective optics are inserted between the detector and the flow cell has been deleted.

3.1.2 The appellant argued that the added features were based on paragraph [0073] and figure 12 and that the support

structure had to be interpreted as a flow cell (see paragraph [0036]).
Furthermore, this amended claim was filed as a reaction to the board's preliminary opinion, in which, for the first time, document D3 was considered as closest prior art.

3.1.3 The board is of the opinion that the requirements of Article 123(2) EPC are met. In addition, the request was filed in response to the board's preliminary opinion.
Against this backdrop, the board exercises its discretion under Article 13(1) RPBA 2007 in admitting this request into the proceedings.

3.2 Inventive step - Article 56 EPC

3.2.1 The appellant argued that document D6 failed to disclose the claimed insertion of the corrective optics between the objective and the flow cell as well as the imaging of the upper (first) surface with the corrective optics inserted. These two differences had a synergistic effect and provided the advantage of a compact design.

Furthermore, D6 failed to disclose that the corrective optics did not touch the objective or the flow cell. This difference ensured that shaking of the objective or microscope was reduced when the corrective optics were inserted.

3.2.2 The board is not convinced by these arguments, because there is no evidence of a technical advantage of a positioning of the corrective optics between the objective and the flow-cell in comparison to the

insertion between the detector and the objective. Even the application lists these possibilities as being equivalent and having no specific advantages (see figures 10 to 14 and paragraphs [0070] to [0075]). The skilled person would simply choose the position of the corrective optics according to their needs. The board is therefore of the opinion that the claimed insertion of the corrective optics between the objective and the flow cell is a straightforward design choice and well within the skilled person's routine practice.

Furthermore, the skilled person would be well aware of the fact that shaking of the objective is avoided when the corrective optics do not touch the objective or the flow cell. Therefore, this difference cannot contribute to the presence of an inventive step either.

3.3 In conclusion, the board is of the opinion that the skilled person would regard it as a straightforward option to insert the corrective optics disclosed in D6 in the imaging method described in D3 to solve the problem posed, because document D6 describes the corrective optics as providing the same advantages as those disclosed in the present application. Furthermore, for a person skilled in the art, the claimed arrangement of the corrective optics is an obvious alternative.

The subject-matter of claim 1 of the second auxiliary request therefore lacks an inventive step within the meaning of Article 56 EPC.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar: The Chairman:

D. Magliano R. Bekkering

Decision electronically authenticated