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Datasheet for the decision of 13 August 2009

Case Number: T 0719/07 - 3.4.02

Application Number: 00948839.6

Publication Number: 1221038

IPC: G01N 21/64

Language of the proceedings: EN

Title of invention:
Luminescence detection workstation

Applicant:
Applera Corporation

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54

Relevant legal provisions (EPC 1973):
-

Keyword:
-

Decisions cited:
-

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0719/07 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 13 August 2009

Appellant: Applera Corporation
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 15 December 2006 refusing European application No. 00948839.6 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: A. G. Klein
Members: F. Maaswinkel
C. Rennie-Smith

Summary of Facts and Submissions

I. European patent application No. 00948839.6 relating to a luminometer was refused in a decision, dispatched on 15 December 2006, of the examining division on the ground that the subject-matter of independent claims 1 and 8 of the main request then on file lacked novelty (Articles 52(1) and 54 EPC) in view of the disclosure in document D1 (WO99/60381) and that the subject-matter of claims 1 and 8 of the auxiliary request was objectionable under Article 123(2) EPC. In the decision reference was also made to document D2 (US-A-5 656 493) which was explicitly referred to in D1. According to the examining division, the priority claimed in the patent application from the "provisional application for patent" US-60/144,891 was not valid, because that application did not disclose the claimed invention. In consequence document D1, published on 25 November 1999, i.e. before the filing date of the present patent application (21 July 2000), represented prior art within the meaning of Articles 54(1) and (2) EPC.

II. Against this decision the applicant (appellant) lodged an appeal which was received on 6 February 2007 and paid the fee for the appeal on the next day. With the statement setting out the grounds of appeal filed on 13 April 2007 the appellant filed new claims replacing the previous sets of claims. In this statement the appellant filed arguments against that part of the decision in which the patentability of the claimed subject-matter had been denied but not that part which found the claimed priority invalid. The appellant requested that the decision under appeal be set aside

and the newly filed claims be allowed or, alternatively, that oral proceedings be held.

III. The wording of claim 1 reads as follows:

"A luminometer for analyzing a plurality of luminescent samples, comprising:
a visible light-impervious chamber containing:
a charge coupled device (CCD);
a shuttle for supporting a sample well plate comprising a plurality of wells, each of said wells containing a single one of said plurality of luminescent samples;
a collimator, positioned between said sample well plate and said CCD;
a Fresnel lens, positioned between said collimator and said CCD; and
a camera lens positioned between said Fresnel lens and said CCD".

The wording of claim 8 reads as follows:

" A method for analysing a plurality of luminescent samples in a luminometer,
comprising:
placing said plurality of luminescent samples in a respective plurality of sample wells in a sample well plate;
placing said sample well plate in a visible light-impervious chamber containing an optical system comprising a charge coupled device (CCD);
a collimator between said sample well plate and said CCD;
a Fresnel lens between said collimator and said CCD;
a camera lens between said Fresnel lens and said CCD;

and
detecting light from said luminescent samples with the CCD".

Claims 2 to 7 and claims 9 and 10 are dependent claims.

IV. In support of its request the appellant developed the following arguments in its grounds of appeal:

Claims 1 to 4 and 8 have been amended in order to address the objections under Article 123(2) EPC raised by the examining division in the decision under appeal. Specifically, claims 1 and 8 have been amended to recite a visible light-impervious chamber, as present in the original claim set, while claim 1 has been further amended to reintroduce the shuttle for supporting a sample well plate. Claim 2 has been amended to refer to a central processing unit, as in original claim 3, while claims 3 and 4 now refer to an injector, as in the original claim set. It is believed that these claims are now in accordance with Article 123(2) EPC.

The patent application relates to a luminometer for analysing luminescent samples (for example, biological samples), the luminometer comprising a CCD camera and a shuttle for supporting a sample tray, with a collimator positioned between the sample tray and the CCD camera, and a Fresnel lens positioned between the collimator and the CCD camera. The invention allows the analysis of multiple samples simultaneously which, as noted on page 3 of the specification, requires that the light emission from each sample be isolated from the samples being analyzed concurrently, else the measurement is

subject to the phenomenon known as "crosstalk". The fundamental features of the invention as claimed which serve to reduce crosstalk are the Fresnel lens and the collimator. As described on page 6 of the specification, "the apparatus of this invention employs a Fresnel lens arrangement, with a vertical collimator above the well plate, with dimensions to match the number of wells. Thus, a 1,536-well plate will employ a dark collimator above the plate with 1,536 cells in registry with the wells of the plate. Fixed above the collimator is a Fresnel lens, which refracts the light such that the view above the lens appears to be looking straight down into each well, regardless of its position on the plate, even at the edges". Thus, the CCD camera is able to take a single image of the entire sample plate, but still reliably distinguish signals from individual wells since the collimator reduces spread of signal from each well, while the Fresnel lens ensures that the collimated signal is efficiently focused onto the camera. The arrangement means that the image from each well is distinct and there is a corresponding reduction in crosstalk.

The decision refers to the prior art documents D1 and D2. Document D1 describes a device for monitoring PCR replication of DNA using fluorescence imaging. As illustrated in its Figure 1, the device includes a CCD camera (10), a Fresnel lens (3), and a platen (2). Document D2 describes a device for performing PCR. There is no mention of the use of optical detection of the reaction, or of CCD cameras, Fresnel lenses, or collimators. With respect to the issue of novelty document D1 does not explicitly describe a collimator; instead reference is made to a platen. The decision

under appeal takes the position that the platen acts as a collimator: "The examining division is convinced that the skilled person directly and unambiguously understands from D1 that the aluminium platen prevents the emission of stray light from the sample wells because it only permits parallel and semi-parallel light rays to exit the sample wells. Furthermore, since the lenses mounted on the platen of D1 have their respective focus approximately centred in the suspension of the well (cf. page 7, lines 9 and 10) they shape the emitted light into parallel rays. In summary, D1 directly and unambiguously discloses to the skilled person that the platen 2 with or without each vial lens works as a collimator, irrespective of whether or not the term 'collimator' is used in D1". The appellant maintains its argument that the platen of D1 does not in fact act as a collimator. The description of the platen in D1 is as follows: "In the bottom of the instrument a platen rests over the vial caps or, if none, directly over the vials. The platen, advantageously aluminium has an array of holes 2a there through aligned with the vials, each hole having a diameter about the same as the vial top diameter. Above each of the vials is a lens 2b positioned for its focal point to be approximately centred in the suspension in the vial". The description of D1 goes on to note that the excitation beam is focused by the vial lenses into the centre of the vials, and the emission beams are then reflected from a folding mirror 5 to a beam splitter 6 and thence to the detector 10. There is no further description of the role of the platen 2, the holes 2a, or the vial lenses 2b. It is of note that D1 describes the lenses 2b only as focusing the excitation beams to the centre of the vials; no reference is made

to focusing of the emission beams. The decision suggests that the lenses will shape the emitted light into parallel rays. This is only the case for light emitted from the focal point of the lens in the centre of the suspension of the well. However, the excitation beam will have the effect of exciting fluorescence essentially throughout the vial, both along the direct path of the beams and elsewhere in the vial as a result of light scattering from the walls of the vial. Further, emitted light will also scatter from the walls of the vial, and so much of the emissions from the focal point will also not travel directly to the lens. Such emissions, even if they were to pass through the lens, will not be focused into parallel rays; a significant proportion of the emitted light will therefore not be parallel and will be subject to crosstalk. The decision further suggests that the aluminium platen will further restrict emitted light only to parallel or semi-parallel rays. This is not the case. As noted in the description, the holes 2a are of a similar diameter to that of the vial top; for a typical 96-well plate (as referred to on page 6 of the description of D1) this diameter is greater than 6 mm. Such a diameter is simply too large to restrict emitted light to parallel or semi-parallel rays; emitted light from the sample which has passed through the holes 2a will continue to be emitted in all directions. Furthermore, the walls of the holes 2a will reflect emitted light to some degree, so further reducing any limitation to parallel rays. The arrangement shown in Figure 1 of D1 is also indicative that the emitted rays are not collimated; as the platen is located before the lenses 2b emitted light has more opportunity to be reflected from the sides of the vials or the holes, thereby reducing the

likelihood that light passing through the lenses originates at the focal point of the lenses. Finally, page 8 of the description notes that "the vial lenses may be omitted so that the focusing means consists only of an objective lens in the field lens position to focus the individual emission beams on the detector"; this further indicates that the generation of parallel rays of light is not contemplated by the disclosure of D1. Accordingly, the platen of D1, with or without the lenses, does not act as a collimator, and accordingly claim 1 is novel over this disclosure.

With respect to the issue of inventive step it is to be examined whether the skilled person would consider it obvious, starting with the disclosure of D1, to incorporate a collimator into the device. There is no mention of collimation in D1, nor in any of the other cited art. Further, as noted above, D1 does not make it an object of the platen to obtain parallel light rays; the possible omission of the lenses which will result in the use of a field lens "to focus the individual emission beams on the detector" makes it clear that obtaining parallel emission beams would not be considered by the skilled person when reading D1. The problem of mechanically reducing crosstalk by suitable use of optics is not recognised in D1, nor in any of the other cited art. Accordingly, the appellant submits that claim 1 is inventive over the cited art.

V. In a communication pursuant to Article 15(1) RPBA, dated 23 March 2009 and accompanying the summons to oral proceedings on 11 August 2009, the board expressed the following provisional opinion:

"1. *Article 87 EPC*

The board notices that the appellant in its Grounds of Appeal does not pursue the issue of priority which, in points 4 - 5.3 of the Decision, had been denied by the examining division. In this respect reference is made to Article 12(2) RPBA.

2. *Patentability, document D1*

2.1 In the Decision (see points 5.1 - 5.3 and point 6) it was objected that claims 1 and 8 did not comply with the requirements of Art. 52(1) in combination with Art. 54(1) and (2) EPC.

2.2 With respect to claim 1:-

2.2.1 Document D1 discloses an instrument to measure fluorescence of a dye (see Abstract). According to a common definition (see, for instance, the definition in "Scienceworld.wolfram.com" annexed to this Communication, see also Wikipedia) "luminescence" is the general concept of cold body radiation and includes, as particular mechanisms, photoluminescence (excitation by incident light, e.g. fluorescence) and chemoluminescence (light emission as a result of chemical or biological reactions). Therefore the apparatus in D1 is a type of "luminometer".

2.2.2 The apparatus includes a "visible-light impervious chamber", see Fig. 2, housing 32 with a "closing side plate 47";

2.2.3 a CCD (Fig. 1, CCD 78);

2.2.4 a "shuttle": this is a vague term, but the description of the patent application may be used for interpreting it (Art.84 EPC), see p.8, l.17 "…a shuttle or tray to carry a microplate". Such a tray is disclosed on p.6, l.21 of D1 "a plastic unitary tray containing a plurality of vials" (=well plates);

2.2.5 A collimator, positioned between the well plate and the CCD: see Fig.1, platen 2 with array of holes 2a aligned with the vials (p.7, l.1), and in addition, above each vial lenses 2b "positioned for its focal point to be approximately centred in the suspension in the vial" (p.7, l.9). In this respect the board concurs with the examining division in point 9.2 of the Decision that these features are tantamount to a collimator. It is observed that in the Grounds of Appeal the appellant disagrees with this position. However, necessarily the platen 2 with the centred array of holes shown in Fig.1 of D1 must restrict the solid angle of radiation being emitted from the vials, which therefore results in a "collimating" effect (=render the emitted beam more parallel). In any case it is noted that claim 1 does not define any restrictions on the quality of collimation, merely defining a generic "collimator". The same, even more, applies to the lenses 2b in this Figure, which (the origin of emission being located in the lens' focal point) provide a strong collimating effect;

2.2.6 Document D1, Fig. 1 also shows a Fresnel lens 3 (see p.7, l. 9) with the same function as the lens of the patent application, namely a field lens (D1, p.7, l.10, compared to p.10, l.12 of the published patent application);

2.2.7 Finally this apparatus comprises a camera lens 10 positioned between the Fresnel lens and the CCD.

2.3 It is therefore concluded that the instrument shown in Fig. 1 of D1 anticipates the apparatus of claim 1. This similarly applies to independent claim 8.

2.4 *The dependent claims*

2.4.1 Document D1 also comprises a processor unit, see Figure 1, processor 14 (claim 2).

2.4.2 With respect to the features of claim 3, in document D1, p. 5, l. 18 - 23, for the details of "reaction apparatus B" (schematically shown in Figs.1 and 2) explicit reference is made to the reaction apparatuses in US-A-5,475,610 and US-A-5,656,493, the latter document having been cited as D2. The reaction apparatus shown in more detail in Fig. 10 of D2 comprises a liquid handler for injecting liquid reagents.

2.4.3 In the apparatus disclosed in D1 a reagent including a fluorescent dye is inserted in the wells, see p. 2, l. 18 - 22 (claim 4).

2.4.4 In claim 5 it is defined that the apparatus includes a "robot". This is, as such, an indefinite concept, and is construed as an (electro-, or opto-) mechanical entity, possibly under computer control, which automatically may carry out a predefined task. Within this meaning such a "robot" is also included in the apparatus of D2, which as reaction apparatus "B"

being incorporated in the instrument of D1, see the "automatic loading" of the starting materials by the liquid handler under computer control described in col. 20, l. 7 - 16.

2.4.5 The apparatus of D1 also includes a filter 8 positioned between the Fresnel lens and the CCD, see Fig. 1 (claims 6 and 9).

2.4.6 This apparatus equally includes defogging means, see p. 7, l.5 (claim 7), which, clearly, also prevents condensation of the Fresnel lens.

2.5 It is added that, even if the priority of the present patent application should be valid, document D1 would still be prior art under Art. 54(3) EPC for the following reason:

2.5.1 According to Article 54(3) EPC the content of European patent applications as filed, the dates of filing of which are prior to the date referred to in paragraph (2) of the Article and which were published on or after that date shall be considered as comprised in the state of the art. Document D1 (WO99/60381) was filed on 17 May 1999 as European patent application 99924365.2 and was published on 25 November 1999. This patent application validly claims the priorities US60/085,765 of 16 May 1998 and US60/092,784 of 14 July 1998. In document D1 the same contract states are designated as in the present patent application. Therefore this document meets the requirements of Article 54(3) and (4) EPC 1973.

2.5.2 Hence, the same objections of points 2.2. - 2.4 supra arise with respect to document D1.

3. As a further document reference is made to document D6 (DE-A-197 48 211) which discloses in its Fig.1 an instrument for measuring luminescence (col. 2, l. 31) and in its Fig.2 a further embodiment for reading fluorescence (col.2, l.31, in this case including an illumination system 9). It is noted that the apparatus in Fig.1 of D6 does not include a collimator, but the samples 110, 120 and 130 in the object array 11, 12, 13 are imaged by the "mini-lens array" 21, 22, 23 onto the intermediate image plane in which aperture plate 3 is positioned. This has the same purpose as the "collimator" (a plate with longish and small holes) in the patent application, namely to suppress any cross-talk of adjacent cells. In contrast, in the fluorescence instrument in Fig. 2 of D6 the mini-lens array has a collimating effect (see col. 2, l.40)."

VI. In a letter of 24 July 2009 the appellant announced that it would not attend the scheduled oral proceedings and withdrew in a subsequent letter of 28 July 2009 its request for oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

2. In the communication of the board, the appellant was informed in detail of the reasons that the prior art in document D1 anticipated the subject-matter of claim 1.

3. The appellant made no substantive response to the board's communication. Having again considered its own reasoned objections as set out in that communication and making express reference thereto, the board sees no reason to deviate from the examining division's conclusion and from its own earlier assessment. Consequently, the appellant's request must be refused.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl A. G. Klein