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**Datasheet for the decision
of 28 October 2019**

Case Number: T 1759/16 - 3.4.02

Application Number: 08867252.2

Publication Number: 2235578

IPC: G02B21/36, G01N21/00, G01B9/04,
G01B11/00

Language of the proceedings: EN

Title of invention:
SYSTEM, DEVICE, AND METHOD FOR LASER CAPTURE MICRODISSECTION

Applicant:
Carl Zeiss Microimaging Ais, Inc.

Relevant legal provisions:
EPC Art. 54(1), 56

Keyword:
Novelty and inventive step (yes)



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Case Number: T 1759/16 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 28 October 2019

Appellant: Carl Zeiss Microimaging Ais, Inc.
(Applicant) 31 Columbia
Aliso Viejo, CA 92656 (US)

Representative: Patentanwälte Geyer, Fehners & Partner mbB
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 8 January 2016
refusing European patent application No.
08867252.2 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman R. Bekkering
Members: F. J. Narganes-Quijano
T. Karamanli

Summary of Facts and Submissions

I. The appellant (applicant) lodged an appeal against the decision of the examining division refusing European patent application No. 08867252.2.

II. The following documents were considered during the first-instance proceedings:

D1: US 2007 0066967 A1

D2: WO 2004 025569 A2

D3: US 2006 0114456 A1.

In its decision the examining division held that the subject-matter of independent claims 1 and 3 of the main request then on file did not involve an inventive step (Article 56 EPC) over document D1 and the common general knowledge of the person skilled in the art. The same objection of lack of inventive step was raised, among other objections, in respect of the claims of the auxiliary request then on file.

III. In reply to a communication of the board pursuant to Rule 100(2) EPC, the appellant filed by letter dated 8 October 2019 amended claims 1 to 5 and amended pages 1 to 10 of the description of the application. With the same letter, the appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the following application documents:

- claims 1 to 5 filed with the letter dated 8 October 2019,
- pages 1 to 10 of the description filed with the letter dated 8 October 2019, and
- drawing sheets 1/6 to 6/6 as originally filed.

IV. Independent claims 1 and 3 of the sole request of the appellant read as follows:

"1. A system for designating and capturing targets of interest on a slide having a biological sample contained thereon, the system (200) comprising:

a microscope imaging unit (202) including a microscope (110) having a stage (177) for positioning the slide thereon, and an image capturing apparatus (118), wherein the image capturing apparatus (118) generates a digital image representation of at least a portion of the biological sample;

a visualization unit (206) including a computer having a display screen, the computer having a selection tool installed thereon, the selection tool being adapted to enable a user to select at least one area of interest from the digital image representation;

a laser capture microdissection unit (208) adapted to dissect a portion from the biological sample, and

a storage medium (204) comprising a remote server that is networked to the microscope imaging unit (202), the visualization unit (206) and the laser capture microdissection unit (208),

characterized in that

the microscope imaging unit (202) stores the digital image representation in a database on the remote server,

the visualization unit (206) is remote and separate from the microscope imaging unit (202) and the laser capture microdissection unit (208) and is usable to access and view the digital image representation stored in the database, and

wherein a first set of coordinates is generated and stored in the database on the remote server by the visualization unit (206) upon selection of the at least one area of interest, and wherein the first set of

coordinates is transformed to a second set of coordinates corresponding to positions on the slide and readable by the laser capture microdissection unit (208) such that the dissected portion of the biological sample corresponds to the at least one area of interest selected from the digital image representation."

"3. A method for designating and capturing targets of interest on a slide having a biological sample contained thereon, the method comprising:

- providing a slide having a biological sample thereon;

- generating a digital image representation of at least a portion of the biological sample (12) by using a microscope imaging unit (202);

- selecting at least one area of interest from the digital image representation (506, 14) by using a visualization unit (206), thereby generating a first set of coordinates;

- placing the slide having the biological sample thereon on a laser capture microdissection unit (208, 16) and

- dissecting a portion of the biological sample corresponding to the at least one area of interest selected from the digital image representation (20);

- wherein the method is characterized by

- providing the visualization unit (206) remote and separate from the microscope imaging unit (202) and the laser capture microdissection unit (208),

- selecting the at least one area of interest comprises

- storing the digital image representation to a remote server;

- accessing remotely the digital image

- representation stored on the remote server;

viewing the digital image representation on the visualization unit (206) at a location remote from the microscope imaging unit (202) and the laser capture microdissection unit (208); and

storing the first set of coordinates to the remote server; and

transforming the first set of coordinates to a second set of coordinates readable by the laser capture microdissection unit (208, 18)."

The present request also includes dependent claim 2 and dependent claims 4 and 5 referring back to independent claims 1 and 3, respectively.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

Claim 1 of the appellant's request on file is based on claims 1 to 3 as filed together with the passages on page 4, lines 12 to 22, and page 8, lines 2 to 5, of the description of the application as filed. Present independent claim 3 is based on claims 8 to 11 as filed together with the amendments made to present claim 1 and referred to above. Present dependent claims 2 and 4 are respectively based on claims 4 and 16 as filed together with the passage on page 8, lines 3 to 5, of the description of the application as filed, and

present dependent claim 5 is based on claims 14 and 15 as filed.

The amendments made to the description relate to the adaptation of some of its passages to the invention as defined in the present claims (Article 84 and Rule 42(1)(c) EPC) and to the acknowledgement of the pertinent state of the art (Rule 42(1)(b) EPC).

The board concludes that the application as amended according to the present request of the appellant complies with the requirements of Article 123(2) EPC.

3. *Claim 1 - Novelty*

- 3.1 Document D1 discloses a system for designating and capturing targets of interest on a slide having a biological sample contained thereon (abstract and Fig. 2 together with the corresponding description, in particular paragraphs [0006], and [0132] to [0141]). The system of document D1 comprises all the features of the preamble of present claim 1, and in particular
- a microscope imaging unit including a microscope (microscope 1 in Fig. 2) in which the slide is positioned (paragraphs [0008], [0133] and [0134]) and an image capturing apparatus (camera 17) generating a digital image of a portion of the biological sample (paragraphs [0009], [0030] and [0136]),
 - a visualization unit including a computer (computer 16) having a display screen (monitor 18) and a selection tool adapted to enable a user to select an area of interest from the digital image (paragraphs [0006], [0062], [0136] and [0171]),
 - a laser capture microdissection unit (laser 6 and laser scanning device 22) adapted to dissect a portion

from the biological sample (paragraphs [0135] to [0137] and [0141]), and

- a storage medium comprising a remote server networked via the computer to the microscope imaging unit, the visualization unit and the laser capture microdissection unit (paragraph [0015]).

- 3.1.1 In the decision under appeal, the examining division held in respect of claim 1 of the main request then on file - and directed to the same subject-matter of present claim 1 - that document D1 also anticipated all the features of the characterizing portion of the claim with the sole exception of the features relating to both the digital image generated by the microscope imaging unit and the first set of coordinates generated by the visualization unit being stored on the remote server. The board, however, cannot follow the examining division's finding in this respect for the following reasons:

The connection between the components of the system of document D1, and in particular between, on the one hand, the computer and, on the other hand, the monitor, the camera and the microscope imaging unit having integrated therein the laser capture microdissection unit (see Fig. 2), is carried out via unspecified communication channels which, as held by the examining division, may be implemented in the form of electrical and/or optical lines. However, contrary to the examining division's view, these communication channels do not render the visualization unit "remote and separate" from the microscope imaging unit and the laser capture microdissection unit as claimed because the system of document D1 constitutes an integral system (see Fig. 2), in which all the components are physically connected to each other and share a common

central computer (computer 16). In particular, the computer is not only an integral part of the visualization unit, but - as submitted by the appellant - also constitutes a component of the microscope imaging unit and of the laser capture microdissection unit (see paragraphs [0136] and [0141]), and already for this reason the visualization unit cannot be considered to be "remote and separate" from the microscope imaging unit and the laser capture microdissection unit within the meaning of claim 1. In addition, the claimed subject-matter also requires that the visualization unit is usable to access the digital image stored by the microscope imaging unit in the remote server, and this feature endows the visualization unit with a remote interconnection capability that enables its location at a remote and separate location beyond that derivable from the disclosure of document D1.

In addition, while in the claimed system the visualization system generates the first set of coordinates upon selection of the area of interest of the biological sample and stores it in the remote server and this first set of coordinates is then transformed to a second set of coordinates readable by the laser capture microdissection unit as claimed, in document D1 the generation of the first set of coordinates and its transformation into the second set of coordinates (paragraphs [0010] and [0085]) constitute operations all carried out by the computer shared by all the components of the system.

3.1.2 In view of the above considerations, the board concludes that the claimed system differs from the system disclosed in document D1 in the features of the

characterizing portion of claim 1, i.e. essentially in that

- the microscope imaging unit stores the digital image on the remote server,
- the visualization unit is remote and separate from the other components of the system and is usable to access the digital image stored in the remote server as claimed, and
- the first set of coordinates generated by the visualization unit are stored on the remote server and then transformed into the second set of coordinates readable by the laser capture microdissection unit as claimed.

3.2 Document D2 discloses a system comprising a microscope imaging unit, a visualization unit and a laser capture microdissection unit integrated into each other and coupled to a central processor (Figs. 1 to 3 and the corresponding description). In addition, the raw image data is stored in and retrieved from local and global training databases and is processed according to different classification protocols (abstract and Fig. 4 together with the corresponding description, in particular paragraphs [0059], [0062], [0063], [0067] and [0068]).

However, document D2 does not disclose, among other claimed features, arranging the visualization unit remote and separate from the microscope imaging unit and the laser capture microdissection unit.

3.3 Document D3 discloses an automated laser capture microdissection instrument (abstract and Figs. 1 and 2 together with the corresponding description) connected to a computer (paragraph [0044]) and to a display screen (paragraphs [0058] and [0059]) and having a

microscope, an image capturing unit and a laser capture microdissection unit integrated in the instrument (claim 1 together with paragraphs [0009] and [0022]).

Document D3 does not disclose, among other features, the provision of a remote server and the location of a distinct visualization unit in a remote and separate location as claimed.

3.4 The remaining documents on file are less relevant.

3.5 The subject-matter of claim 1 is therefore new over the available documents of the prior art (Article 54(1) EPC).

4. *Claim 1 - Inventive step*

4.1 As found by the examining division in its decision, the closest state of the art is represented by document D1.

4.2 In its decision, the examining division held that the objective problem solved by the system of claim 1 was the provision of a definitive data storage and/or backup scheme. The board, however, cannot accept this formulation of the objective problem, among other reasons because the distinguishing features identified in point 3.1.2 above go beyond a mere storage or backup of information shared by different components of the claimed system.

The appellant for its part has submitted that the objective problem is to increase the sample throughput. However, in the opinion of the board this formulation is neither congruent with, nor supported by the

distinguishing features identified in point 3.1.2 above.

According to the description of the application (page 2, lines 8 to 10), the technical effect of the claimed invention is to allow identification of the cells of interest to be performed independently and remotely from the laser capture microdissection unit. In addition, this technical effect is achieved over the system disclosed in document D1 by the claimed distinguishing features identified above. Accordingly, in the board's opinion the objective problem is to be formulated in terms of improving the flexibility of the operation with the visualization unit of the system disclosed in document D1.

- 4.3 In the decision under appeal, the examining division referred to the remote server of document D1 already used for data storage and to the common general knowledge relating to backup of data for security and/or redundancy purposes and held that it would be obvious for the skilled person to consider storing the digital images and the data relating to the coordinates on the remote server as well as locally.

However, the claimed invention goes beyond a mere storing on a backup server of image and coordinate data to be shared by the components of the system because it enables the transmission from the microscope imaging unit to the visualization unit and from the visualization unit to the laser capture microdissection unit of data generated by a first one of the units and required by a second one of the units for operation of the same, thus leading to a decentralized architecture of the system which allows a user to operate the visualization unit at a location remote and independent

from the location where the biological sample is imaged and subsequently cut according to the instructions of the user. For this reason, the examining division's argument based on the common general knowledge relating to the backup of data is not found persuasive.

In addition, there is no evidence of common general knowledge at the relevant date relating to the decentralisation via a server of a system as that disclosed in document D1 constituted by units closely operating with each other, let alone pointing towards specifically decentralising the visualization unit of document D1 constituted by a monitor and a computer which simultaneously allow the user to control the remaining components of the system.

4.4 It is also noted that document D1 discloses a network of a plurality of systems, each of the type described in point 3.1 above and each connected to a common database server (paragraph [0015]). However, in this network only the computer within each system is connected to the server, and there is no disclosure in the document suggesting connecting different ones of the components of a same system with the server. In addition, in document D1 the data stored in the server does not relate to a particular biological sample being imaged and subsequently cut, but relates to feature data records, i.e. to image recognition and classification metadata relating to characteristics of different features of different biological specimen (paragraphs [0013] and [0164] to [0166]) to be used in the selection of areas of interest in a particular biological sample.

4.5 The remaining documents on file do not render the claimed system obvious. In particular, none of

documents D2 and D3 (see points 3.2 and 3.3 above) addresses the problem of the flexibility of the operation of the visualization unit or suggest dissociating this visualization unit from the remaining components of the system and operating the visualization unit at a remote and separate location as claimed.

4.6 The board concludes that the system defined in claim 1 involves an inventive step within the meaning of Article 56 EPC.

5. *Claims 2 to 5*

Independent claim 3 is directed to a method for designating and capturing targets of interest on a slide having a biological sample contained thereon and the steps of the method are essentially in one-to-one correspondence with the functional features of the different structural means of the system defined in claim 1. Therefore, the claimed method is new and involves an inventive step for essentially the same reasons given in points 3 and 4 above in respect of the system defined in claim 1.

The same conclusion applies to dependent claim 2 and dependent claims 4 and 5 by virtue of their dependence on independent claims 1 and 3, respectively.

6. In view of the above considerations, the board concludes that the application documents amended according to the present sole request of the appellant meet 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 grant a patent on the basis of the following application documents:
 - claims: No. 1 to 5 filed with the letter dated 8 October 2019;
 - description: pages 1 to 10 filed with the letter dated 8 October 2019, and
 - drawings: sheets 1/6 to 6/6 as originally filed.

The Registrar:

The Chairman:



M. Kiehl

R. Bekkering

Decision electronically authenticated