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D E C I S I O N
of 12 September 2003

Case Number: T 0812/02 - 3.3.8

Application Number: 98965057.7

Publication Number: 1044375

IPC: G01N 33/543

Language of the proceedings: EN

Title of invention:

Method comprising capture molecule fixed on disc surface

Applicant:

Remacle, José

Opponent:

-

Headword:

Microanalysis of samples on disc/REMACLE

Relevant legal provisions:

EPC Art. 123(2), 84, 83, 54, 56

Keyword:

"Added subject-matter - no"

"Clarity, support in the description - yes"

"Sufficiency of disclosure - yes"

"Novelty - yes"

"Inventive step - yes"

Decisions cited:

T 0606/89

Catchword:

-



Case Number: T 0812/02 - 3.3.8

D E C I S I O N
of the Technical Board of Appeal 3.3.8
of 12 September 2003

Appellant: Remacle, José
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Representative: Vandersteen, P.
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 14 February 2002
refusing European application No. 98965057.7
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: L. Galligani
Members: F. L. Davison-Brunel
S. Perryman

Summary of Facts and Submissions

I. European patent application No. 98 965 057.7 published as WO 99/35499 with the title "Method comprising capture molecule fixed on disc surface" was refused by the Examining Division.

II. Claims 1, 17 and 25 of the set of claims then on file read as follows:

"1. Method for the detection and/or the quantification of a target molecule present in a sample, preferably a biological sample, comprising the steps of:

- allowing a binding between said target molecule and a capture molecule fixed upon a side of the surface of a solid support being a disc, comprising readable registered data, said binding resulting in a signal,

- allowing a detection and/or quantification of said signal with the proviso that said signal is not obtained through cleavage of capture molecule, and

that said signal is read in areas different from areas comprising said registered data."

"17. Disc, comprising registered data, characterized in that it further comprises, in dedicated areas different from areas comprising readable registered data, non-cleavable capture molecules that allow a binding with target molecules to be detected and/or quantified."

"25. Detection and/or reading device according to the claims 22 to 24, which comprises additional means for

the purification of the target molecule, the specific cleavage of the target molecule, and/or the genetic amplification of said target molecule within an integrated detection and/or reading device."

The Examining Division accepted novelty and inventive step. However, it concluded that the patent specification did not disclose the subject-matter of claim 1 in an enabling manner over its whole scope. In particular, it was found that there existed "no specific credible teaching that target or capture molecules outside of the class of molecules disclosed in the examples [*nucleic acid or proteins*] could be used in the method of claim 1 or that a disc as claimed in claim 17 could be produced" (point 2.1 of the decision).

In addition, claim 25 was considered as not being supported by the description (Article 84 EPC; point 2.2 of the decision).

- III. The Appellant (Applicant) lodged an appeal against this decision, paid the appeal fee and filed a statement of grounds of appeal together with a new main request and an auxiliary request.

- IV. A communication was sent by the Board in accordance with Article 11(1) of the Rules of Procedure of the Boards of Appeal setting out the Board's provisional, non-binding opinion on the appeal. In particular, the Appellant's attention was drawn to prior art document (1) (cf *infra* Section VII).

V. The Appellant answered the Board's communication and filed a new main request and five auxiliary requests.

VI. At oral proceedings on 12 September 2003, the Appellant filed one new main request. Claims 1 and 16 thereof read as follows:

"1. Method for the detection and/or the quantification of a target molecule present in a sample, comprising the steps of:

- allowing a binding between said target molecule and a capture molecule fixed **directly** upon a side of the surface of a solid support **consisting of a compact disc (CD) or DVD** comprising registered data that can be read with a CD reading device, said binding resulting in a signal,

- allowing a detection and/or quantification of said signal with the proviso that said signal is not obtained through cleavage of capture molecule, and

- that said signal is read in areas different from areas comprising said registered data **and wherein the capture and/or the target molecules are either nucleic acid molecules or proteins, characterized in that the capture molecule is located in a specific area of the disk which does not comprise any groove or registered data on either side of the disk.**"(emphasis added by the Board to show the differences to claim 1 of the previous main request).

"16. A **compact disk (CD) or DVD**, comprising registered data **that can be read by a CD reading device**,

characterized in that it further comprises, in dedicated areas, **which do not comprise any groove** or registered data **on either side of the disk** and different from areas comprising said readable registered data, **fixed directly upon a side of the surface of said compact disk**, non-cleavable capture molecules that allow a binding with target molecules to be detected and/or quantified and **wherein the capture molecules and the target molecules are either nucleic acids or proteins.**" (emphasis added by the Board to show the differences to claim 17 of the previous main request).

Claims 2 to 15 related to further embodiments of the method of claim 1 and claim 17 related to a further embodiment of the compact disk of claim 16. Claims 18 and 19 related to preparation processes of the compact disk. Claim 20 was directed to a diagnostic kit comprising the compact disk of claims 16 or 17. Claim 21 was directed to a detection and/or reading device comprising the compact disk of claims 16 or 17 or the kit according to claim 20. Claims 22 and 23 related to further features of the device of claim 21.

VII. The documents mentioned in the present decision are the following:

(1): WO 97/21090;

(2): WO 96/09548.

VIII. The Appellant's arguments in support of the patentability of the main request on file may be summarized as follows:

The subject-matter of claims 1 and 16 found a basis in the application as filed on page 12, lines 1 to 5, page 26, lines 16 and 17, page 28, lines 27 to 29 insofar as the characteristics of the binding of the target and capture molecules were concerned, and on page 18, lines 8 to 12, Figs. 4, 5 and 7 for the localisation of the capture molecule.

The subject-matter of claims 1 and 16 was novel over the teachings of document (1). The general disclosure of that document was that of microplatforms having the size of a CD, capable of rotating around an axis and which comprised a great variety of microelements such as microchannels, reservoirs, microvalves, filters, mixers etc..., all potentially useful for carrying out biochemical reactions. It was contemplated on page 11 that analytic or synthetic data to be processed could be written on the underside of the microplatform, opposite to the "chemistry" side. A specific microplatform was described on page 54 which was a disk onto the solid surface of which antibodies could be bound. Yet, no mention was made of said microplatform also carrying means for control programming on the underside. In contrast, the subject-matter of claims 16 or 1 related to /comprised the use of a compact disk with different areas, the capture molecules being directly bound to the CD per se in areas which did not comprise software information on either side. Neither the generic nor the specific disclosures were suited to destroy the novelty of said subject-matter.

The closest prior art was document (2). It disclosed a device whereby a CD-like disc served as a support to a

biological sample to be examined with optical means. A light source and a detector were mounted above the disc so that the entire useable surface of the disc could be scanned.

Starting from said prior art, the problem to be solved could be defined as providing improved methods and tools for the analysis of samples.

The solution given to this problem by the patent application as represented in the claims had numerous advantages. Contrary to the method and device of document (2) which involved measuring the quenching of the light which went through the disk, it avoided a negative detection of the properties of the sample to be tested. It allowed a much more efficient quantitation of much more diverse effects, and also the treatment of many more data at any one time.

The claimed support and method were also distinctly advantageous over the support and method described in document (1) since they permitted a direct attachment of the capture molecule to the support which also contained the software data (CD or DVD), and this in such a way that there could not be any interference between the chemistry and the electronics.

- IX. The Appellants requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request filed at the oral proceedings on 12 September 2003.

Reasons for the decision

Article 123(2) EPC; added subject-matter

1. The application as filed discloses a compact disc (CD or DVD) for the analysis of biological samples wherein:
 - the registered data are located in areas of the disc which are different from the areas where the capture molecules are located "in order to avoid any false positive which can be the result of a signal upon pre-registered information" (page 18, lines 9 to 12). This last information together with the Figures 4, 5 and 7 are taken by the Board as an implicit but unambiguous disclosure that there are no registered data overlapping the capture molecules **on either side** of the disk.
 - the non-cleavable capture molecules are fixed **directly** at the surface of the disk (page 4, lines 17 to 19, page 26, lines 16 and 17, page 28, lines 27 and 28).
 - the capture and target molecules are either **nucleic acids** or **proteins** (originally filed claim 9).

A method for the detection and for the quantification of a target molecule using such disc is disclosed on page 4, lines 14 to 16 and in Examples 1 and 3.

The subject-matter of claims 16 and 1 now on file, thus, finds a basis in the application as filed.

2. The amendments carried out in claims 9 and 20 (originally filed claims 8 and 23) of the set of claims considered by the Examining Division as not being disclosed in the application as filed are no longer present in claims 8 and 19 now on file. In fact, claims 2 to 14 correspond to originally filed claims 3 to 12, claims 15, 17 to 19 correspond to originally filed claims 15, 18, 22 and 23 respectively. Claims 20 to 23 correspond to originally filed claims 25 to 28 respectively.
3. The requirements of Article 123(2) EPC are fulfilled.

Article 84 EPC: support in the description, clarity

4. The clarity of the claims was never at stake and the amendments carried out in claims 1 and 16 are not of such a kind as to introduce unclarity. Claim 25 which the Examining Division found unallowable under Article 84 EPC for lack support in the description has been deleted. The requirements of Article 84 EPC are fulfilled.

Article 83 EPC: sufficiency of disclosure

5. The Examining Division decided that the description failed to give adequate instructions on how to reproduce the subject-matter of claims 16 and 1 over the whole scope of the claims comprising **any kind** of capture or target molecules. Present claims 16 and 1 differ from these earlier claims 16 and 1 in that the disc and method are now restricted to comprising/making use of, capture and target molecules which are **nucleic acids** or **proteins**. On pages 26 to 31 of the application,

five examples are provided to demonstrate that the claimed invention may be carried out with either of these. The Board has no reasons to doubt on the basis of the documents on file that this would not be the case. The requirements of Article 83 EPC are fulfilled.

Article 54 EPC; novelty

6. Document (1) is a 78-page document describing methods and apparatus for performing microanalytic and microsynthetic analyses and procedures (page 1, lines 12 and 13). It discloses how to carry out a wide variety of biological, biochemical and chemical analysis on a microplatform. Extensive information is given on each and every characteristic of this microplatform. For example, its physical parameters are discussed on page 11, lines 20 to 28, the dimensions of a compact disk or DVD being preferred. On pages 17 to 20, the disk possible coatings and compositions are explained in detail. It is envisaged that it may be made from inorganic, crystalline or amorphous material as well as from organic material. Under the heading "Disk related device and elements" (pages 21 to 30), the integral components of the disk where the reactions are to take place, are enumerated: temperature control elements, filters, mixers etc.. On pages 28 and 29, it is mentioned that the disc may comprise integrated electronic processing systems, these being situated on the surface of the disk opposite to the surface comprising the microcomponents necessary to carry out the reactions. A more specific embodiment of the platform is described on pages 53 and 54 in relation to carrying out immunoassays. There, the microplatform is said to comprise a solid surface on the disk to which a

ligand such as an antibody is attached, which ligand specifically binds one type of cells. The ligand and cells correspond to the capture and target molecules of claims 1 or 16 of the present application. However, it is not mentioned that the solid surface is one side of a disk which equally carries electronic processing systems. A fortiori, it is not disclosed that those areas where the reaction between the antibodies and the cells takes place are free from any registered data on either side of the disk. In fact, this latter specific setting is not a possibility which is envisaged in document (1) as a whole.

7. Thus, in the Board's judgment, document (1), albeit providing a wealth of information in the technical field of micromanipulation, does not teach a disk having the specific features of the disk of claim 16 at issue here. Said disk is novel as well as the method in which it is used (claim 1).
8. There are no further documents on file, the contents of which would be damaging to the novelty of the claimed subject-matter. The requirements of Article 54 EPC are fulfilled.

Article 56 EPC; inventive step

9. In accordance with the case law of the Boards of Appeal, the closest prior art is a document disclosing subject-matter conceived for the same purpose or aiming at the same objective as the claimed invention and having the most relevant technical features in common ie. requiring the minimum of structural modifications (see, for example, T 606/89 of 18 September 1990).

10. The Appellant identified the closest prior art as being document (2). This document describes an apparatus and method for carrying out the optical inspection of samples, which method comprises the steps of supporting the sample on a disk while a light source and detector are mounted on an arm for rotation in an arc crossing the surface of the disk. The light source and the detector are disposed in such a way that the optical properties of the sample can be automatically and rapidly inspected by analysing the output of the light detector. There is no mention of any reaction being carried on the disk per se and the system is limited to light detection. In contrast, document (1) teaches the analysis by a number of different means, of reactions carried out on the surface of a platform (disk) where said surface plays an active role. It also discloses the usefulness of having registered data linked to the platform, in particular, for the electronic processing of the results obtained on the disk.
11. In the Board's judgment and in accordance with the case law above mentioned, document (1) is to be considered as the closest prior art.
12. As already mentioned above (cf points 6 and 10, supra), document (1) discloses a disk on the solid surface of which a ligand is bound (capture molecule) which is used for identifying cells (target molecules) in a biological sample by specifically binding to them. It also discloses in a generic manner the possibility of having registered data linked to the disk for the treatment of the results obtained on the disk.

13. Starting from document (1), the problem to be solved may be described as providing simple, reliable and efficient tools and method for analysing the results of experiments involving the binding of a biological sample to a molecule which is itself bound to a solid surface.
14. The provided solution is a disk which serves at the same time for the direct binding of the capture molecule ie. for the reaction to take place, and as the support on which data for electronic processing are inscribed, both functions not overlapping with each other even if found on either side of the disk, as well as a method making use of such disk.
15. This specific structure of the disk is not one suggested in document (1) in spite of the very many variants which are mentioned. There is no other document on file which could provide such a suggestion. The structure adopted for the claimed disk is advantageous in that it ensures that there is no interference between the chemical and informatics parts of the settings, which parts are equally necessary for the method for the detection and/or quantification of a target molecule to be successfully carried out. Inventive step is, thus, acknowledged.
16. For the reasons given in points 1 to 15 above, the subject-matter of claims 1 and 16 and dependent claims thereof is considered to fulfil the requirements for patentability under 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 first instance with the order to grant a patent on the basis of the main request filed at the oral proceedings on 12 September 2003 and a description to be adapted.

The Registrar

The Chairman

A.Wolinski

L. Galligani