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**Datasheet for the decision
of 3 February 2010**

Case Number: T 0646/07 - 3.3.08

Application Number: 95303356.0

Publication Number: 0695941

IPC: G01N 33/543

Language of the proceedings: EN

Title of invention:

Method and apparatus for packaging a chip

Patentee:

Affymetrix, Inc.

Opponent:

Combimatrix Corporation

Headword:

Packaging a substrate/AFFYMETRIX

Relevant legal provisions:

-

Relevant legal provisions (EPC 1973):

EPC Art. 54, 56, 100(a)(b)(c), 113(1)

Keyword:

"Claims as granted"
"Added matter (no)"
"Novelty (yes)"
"Inventive step (yes)"
"Sufficiency of disclosure (yes)"

Decisions cited:

T 0523/89, T 0079/96

Catchword:

-



Case Number: T 0646/07 - 3.3.08

DECISION
of the Technical Board of Appeal 3.3.08
of 3 February 2010

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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
5 February 2007 concerning maintenance of the
European patent No. 0695941 in amended form.

Composition of the Board:

Chairman: L. Galligani
Members: M. R. Vega Laso
C. Rennie-Smith

Summary of Facts and Submissions

I. European patent No. 0 695 941 with the title "Method and apparatus for packaging a chip" was granted on European patent application No. 95 303 356.0 with 46 claims.

II. Independent claims 1, 22 and 38 as granted read as follows:

"1. A method of making probe chips comprising the steps of:

forming a plurality of probe arrays on the substrate (100);
separating said substrate into a plurality of chips (120), each of said chips comprising at least one probe array (110) thereon; and
mating at least one of said chips to a package, said package comprising a reaction chamber (310, 1720, 2710), said reaction chamber comprising inlets (350, 360, 1730, 1740, 2750, 2751) for flowing fluid therein, said at least one probe array in fluid communication with said reaction chamber.

22. An apparatus for packaging a substrate, said apparatus comprising:

a substrate having a first surface (110) and a second surface (120), said first surface comprising a probe array;

a body having a mounting surface with a fluid cavity, said second surface attached to said cavity; and
a cover attached to said mounting surface for sealing said cavity;

wherein said cavity comprises an inlet port and an outlet port, said inlet and outlet ports permitting fluids to circulate into and through said cavity.

38. A method of evaluating probe chips comprising the steps of:

forming a plurality of probe arrays on a substrate;
separating said substrate into a plurality of chips, each of said chips comprising at least one probe array thereon;
mating at least one of said chips to a package, said package comprising a reaction chamber, said reaction chamber in fluid communication with an inlet and outlet, said at least one probe array in fluid communication with said reaction chamber;
and
flowing labeled target molecules into said reaction chamber, said labeled target molecules reacting with said at least one probe array."

Dependent claims 2 to 21 concern methods of making probe chips comprising the steps of the method of claim 1. Dependent claims 23 to 37 relate to particular embodiments of the apparatus of claim 22, and claims 39 to 46 relate to further methods of evaluating probe chips comprising the steps specified in claim 38.

- III. The patent was opposed on the grounds mentioned in Article 100(a), (b) and (c) EPC 1973, in particular that the claimed subject-matter lacked novelty (Article 54 EPC 1973) and inventive step (Article 56 EPC 1973), and also extended beyond the content of the application as filed, and that the invention was not sufficiently disclosed in the patent.
- IV. In an interlocutory decision posted on 5 February 2007, the opposition division decided that the patent could not be maintained in the granted form because the subject-matter of claim 22 as granted lacked novelty in view of documents (1), (2) and (4) (see section XI below). Furthermore, the subject-matter of claim 22 of each of the first to third auxiliary requests and of claim 1 of the third auxiliary request was found to lack an inventive step (Article 56 EPC 1973), and claim 1 according to the fourth auxiliary request was held to offend against Article 84 EPC 1973. Finally, the set of claims according to the fifth auxiliary request and the invention to which they related were considered to meet the requirements of the EPC. Consequently, the opposition division decided that the patent could be maintained on the basis of this request.
- V. The patent proprietor (appellant I) and the opponent (appellant II) each lodged an appeal against the interlocutory decision of the opposition division. Appellant I maintained its requests in opposition proceedings (main request and first to fifth auxiliary requests) and filed, together with its statement of grounds of appeal, an additional set of claims as sixth auxiliary request, and further documentary evidence. Both parties requested oral proceedings under

Article 116 EPC 1973 if the board did not intend to grant their respective requests.

- VI. Each appellant submitted comments on the grounds of appeal of the other appellant. In its submission, appellant II requested that the set of claims and the fresh evidence filed by appellant I not be admitted into the proceedings.
- VII. The parties were summoned to oral proceedings. In a communication under Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA) attached to the summons, the board expressed its provisional opinion on some of the issues to be discussed during the oral proceedings, in particular issues concerning claim construction, novelty, inventive step and sufficiency of disclosure.
- VIII. The oral proceedings were re-scheduled upon request by appellant I, which also replied to the board's communication and submitted further arguments.
- IX. Appellant II did not file any reply, but advised the board with letter dated 20 January 2010 that it had decided not to be represented at the oral proceedings.
- X. Thus, at the oral proceedings, which were held on 3 February 2010, only appellant I was represented.
- XI. The following documents are referred to in the present decision:

(1): WO 90/15070, published on 13 December 1990;

- (2): WO 92/10587, published on 25 June 1992;
- (3): WO 92/10588, published on 25 June 1992;
- (4): WO 92/10092, published on 25 June 1992;
- (5): WO 93/09668, published on 27 May 1993;
- (6): WO 93/22053, published on 11 November 1993;
- (7): EP 0 378 968 A2, published on 25 July 1990;
- (8): US 3,690,836, published on 12 September 1972;
- (9): WO 93/22058, published on 11 November 1993.

XII. The submissions made by appellant I, as far as they are relevant to this decision, may be summarized as follows:

Main request (claims as granted)

Article 54 EPC 1973 - Novelty

Claim 22

Documents (1), (2), and (4)

The opposition division's finding that the subject-matter of claim 22 lacked novelty over documents (1), (2) and (4) was incorrect, because it did not take into account the opening words of claim 22, namely "An *apparatus for packaging a substrate...*". None of documents (1), (2), and (4) disclosed an apparatus for *packaging* a substrate, a phrase which had to be

understood in the sense in which it was used in the patent.

The use of the word "packaging" meant that the apparatus had an independent existence from a machine with which it interacted; in other words it was like a cartridge. The very use of the word "package" in the patent implied that the item was portable and movable, ie. it was not permanently mounted in a scanner, but rather could be moved to the scanner, from a fluidics station, after hybridisation had taken place. The statements in paragraphs [0026], [0040], and [0065] to [0069] of the patent supported this interpretation.

The device depicted in Figure 8A and described in the passage beginning at page 29, line 11 of document (1) was a piece of equipment which was not independent. Thus, document (1) did not prejudice the novelty of the apparatus according to claim 22. Nor did the arrangement depicted in Figure 11 of document (2), which was not a substrate package like a cartridge, but an integrated system. The flow cell of the arrangement in Figure 3 of document (4) was an integral part of a device for preparing polymer arrays and did not have an independent existence as a package. Hence, document (4) likewise did not destroy the novelty of the claimed apparatus.

Article 56 EPC 1973 - Inventive step

Claim 22

In the decision under appeal this issue was not decided in relation to the main request. However, the

opposition division did not acknowledge an inventive step with respect to the subject-matter of claim 22 according to the first auxiliary request, the scope of which was narrower than that of the corresponding claim of the main request.

The opposition division wrongly chose document (2) as the closest state of the art. While the purpose of the claimed invention was the provision of a substrate package which enabled the convenient use of a probe array on the substrate, document (2) related to the manufacture of probe arrays on substrates, but not to their use. In particular, this document was concerned with sequencing in parallel a large number of different biological polymers which had been laid down on a substrate. The movement of the probe array from the fluidics station to the scanner, which was made readily feasible by the packaged substrates of the invention, was neither needed nor realistically possible in the sequencing methodology disclosed in document (2). Thus, document (2) was not concerned with the same purpose or effect as the claimed invention. Nor were documents (1), (4) and (5), which described the *preparation* of a polymer array on a substrate such a glass microscope slide or cover slip, rather than its *use*. Hence, none of these documents was a suitable starting point for assessing inventive step.

Document (3), in contrast, related to the use of probe arrays, specifically for sequencing by hybridisation, as well as fingerprinting, mapping and general screening. The arrangement described in document (3) was not in itself a permanent installation in a larger piece of equipment, but could be moved as desired from

one beaker to another for effecting hybridisation and rinsing, and could then be transported to a scanner for analysis. Since the purpose of the described arrangement was the same as that of the claimed invention, a probe array on a microscope slide used as in document (3) should be considered to be the closest state of the art for the apparatus of claim 22.

The problem to be solved could be formulated as how to provide an improved apparatus for analysing (ie. evaluating) a probe array. The solution provided by the patent was apparent from the common features of the independent claims 1, 22 and 38, in particular (a) a probe array; (b) a cavity or reaction chamber for reacting fluid with the probe array (ie. the entire probe array); and (c) the probe array and the cavity/reaction chamber being presented as a package.

This solution had a number of advantages. The unit was straightforward and economical to manufacture. Moreover, it was also convenient to handle, permitting portability between processing stations and being automatable. Additionally, it protected the probe array in use, and could be configured to prevent misuse.

The solution embodied in the apparatus defined in claim 22 was not obvious, either in view of the microscope slide disclosed in any of documents (1), (3) and (4) or any of the flow cell documents (6) to (9). There was no reason or motivation for the skilled person to reconfigure the microscope slide arrangement known in the art as a package. First, the skilled person would have been concerned about the effect of the high temperatures usually required for

hybridisation on a packaged probe array. Second, effectively removing unbound samples without removing properly bound samples would have seemed to be more difficult in a packaged environment. And third, the skilled person would be concerned that scanning could not be conducted as accurately as with a conventional glass slide. These potential difficulties in hybridising, rinsing and scanning would have deterred the skilled person from trying to depart from the normal practices of a biologist at the priority date, who was used to working with arrays on glass slides and processing them with large volumes of liquids (for washing, rinsing etc.).

None of the flow cell documents (6) to (9) suggested the solution offered by the invention. Not only was there a lack of motivation to combine the flow channel arrangement of document (6) with the microscope slides of documents (1), (3) and (4), it was also difficult to see how the structures actually *could* be combined, given how different they were. Document (9) had a similar disclosure to document (6), but was specifically adapted for polymerase chain reactions. The flow cell described in document (7) was designed for a specialist application, namely measuring the kinetics of a reaction/process occurring at a solid/liquid interface. Only with hindsight would these documents have been selected as a source of inspiration for the skilled person.

Document (8) related to a reaction chamber device comprising two plastic sheets welded together with an adsorbent or porous support sandwiched between them. If an attempt were made to combine this device with the

microscope slide probe array of documents (1), (3) or (4), presumably there would have to be an array of miniature reaction chambers to go with the different absorbent sheets. This was quite remote from the invention.

Article 100(b) EPC 1973 - Sufficiency of disclosure

The opposition division correctly held that the invention claimed according to the fifth auxiliary request was sufficiently described in the patent. It was not believed that the issues for the main request were any different.

XIII. The submissions made by appellant II in writing, as far as they are relevant to this decision, may be summarized as follows:

Main request (claims as granted)

Article 54 EPC 1973 - Novelty

Claim 22

Documents (1), (2), and (4)

The opposition division was correct in finding that the subject-matter of claim 22 lacked novelty. All the features of claim 22 were disclosed in document (2). A comparison of Figure 11 in document (2) and Figure 6 in the opposed patent revealed that the two embodiments were *identical*.

There were a number of difficulties with appellant I's approach to rely on the phrase "*apparatus for packaging a substrate*" as the feature distinguishing the claimed apparatus and the apparatus depicted in Figure 11 of document (2). First, the phrase "*for packaging a substrate*" was not defined anywhere in the opposed patent. Therefore, in accordance with decision T 79/96 of 20 October 1998 (not published in the OJ EPO), for the assessment of novelty this phrase had to be given its broadest meaning. Second, it was not understandable why, or how, the embodiment in Figure 11 of document (2) was not "*suitable for packaging an apparatus*". It was clear that in Figure 11 the depicted item contained, i.e. packaged the chip. Third, contrary to appellant I's view, "packaging" did not necessarily imply "an independent existence from a machine in which it interacts". Even if this meaning of the term "packaging" were accepted, the same would apply to the device in Figure 11 of document (2) which was separate from the detection system. Claim 22 did not refer to a "portable and movable package", but in any case the item depicted in document (2) was portable and movable. Fourth, claim 22 was an open claim in which the apparatus for packaging was defined as "comprising" (not "consisting of") various components, all of which were described in document (2). Even if it were determined that the package in document (2) was integral to the scanning machine, there was no reason why the scanning apparatus, including the "contained-chip-chamber-item" described in document (2) could not be considered an "apparatus for packaging".

Likewise, the apparatus defined in claim 22 was anticipated by document (1). It was irrelevant that

this document disclosed a "piece of equipment for photochemically preparing a probe array on a substrate", since that piece of equipment produced a probe array which was contained in an apparatus falling within the terms of claim 22. Both Figure 8A and the passage from page 29, line 11 to page 30, line 11 of document (1) were relevant.

Also Figure 3 of document (4) showed an apparatus having all the features of claim 22. As for document (1), the context in which the depicted apparatus was being used was irrelevant to a product *per se* claim. Contrary to appellant I's view, it seemed that the flow cell in Figure 3 of document (4) was removable from the apparatus, and was suitable for packaging an array, since the array was safely nested in it, regardless of the fact that the flow cell was *additionally* positioned within a larger apparatus. Thus, the subject-matter of claim 22 lacked novelty over document (4).

Documents (6), (7) and (8)

In Figures 1 and 5 of document (6), Figure 1 of document (7) and Figure 27 of document (8), an apparatus for packaging a substrate having the features specified in claim 22 was depicted. Reference was made further to the passage in column 7, lines 46 to 67, in particular lines 56 to 58 of document (8).

Article 56 EPC 1973 - Inventive step

Claim 22

Document (2) as the closest state of the art

Document (2) was, if not novelty destroying, then a mere hair's breadth from the claims as granted. Appellant I's arguments as to why this document was not the closest state of the art were based on a mischaracterisation of its content. Document (2) did indeed discuss the use of arrays in addition to their production. Already the title of the document referred to a use of the probe array, namely sequencing. Moreover, numerous passages of the description and several claims all expressly related to the use of arrays.

In any case, claim 22 was a product *per se* claim and, therefore, the closest prior art document had to be a document which disclosed such products, irrespective of their possible downstream use. Document (2) clearly disclosed an item that had all of the structural features of the apparatus claimed in claim 22 of the patent in suit, and also related to the same purpose, namely the production and use of probe arrays. It was obvious to a person skilled in the art to remove the item disclosed in Figure 11 of document (2) and to use it as a separate entity.

Further documents cited as the closest state of the art

Taking any of documents (1), (3) or (4) as a starting point for the assessment of inventive step, the claimed

subject-matter was to be considered obvious. There could be nothing inventive in taking a probe array from any of the "probe array" documents (1) to (5) and fitting it into a container that had an inlet and an outlet and a reaction chamber. Applying common general knowledge or combining any of documents (1) to (5) with one of the flow cell documents (6) to (8), a person skilled in the art would arrive at the claimed apparatus without applying any inventive skills.

Having a probe array in his/her hand, and wishing to improve the process (eg. for better handling, use of fewer reagents, automation, or protection of the array, all of which were well within the routine ambit of the person skilled in the art), he/she would turn to known flow cells. The skilled person would be well aware that he/she was looking only for a reaction chamber, and needed not to worry about the purpose of the assay taking place therein. He/she would turn to, for example, document (7) or (8). The next step would be to remove the existing substrate from these flow cells and replace it with the probe array. Replacing one substrate with another did not involve any inventive activity.

Claims 1 and 38

When assessing inventive step in connection with the third auxiliary request, the opposition division correctly concluded that subject-matter as claimed in granted claim 1 lacked an inventive step over document (2). This document was directed to precisely the same purpose as claim 1 and therefore had to be taken as the closest prior art. The sole difference

between the method described in document (2) and the claimed method was that the probe arrays were first synthesised on the substrate and then divided for mating to the package. It was obvious and a matter of routine to synthesize small chips on a substrate on a larger scale, and then divide the substrate into the smaller chips ready for sale. Thus, the subject-matter of claim 1 lacked an inventive step over document (2) and the common general knowledge, or over document (2) in combination with any of the "flow cell" documents (6), (7) and (8).

The same reasons as for claim 1 applied in respect of the method of evaluating probe chips as claimed in claim 38. Thus, also this method lacked an inventive step.

Article 100(c) EPC 1973

The objections of lack of sufficiency raised in the notice of opposition were maintained.

- XIV. Appellant I (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained as granted or on the basis of the first to fifth auxiliary requests filed on 9 March 2006 or the sixth auxiliary request filed with the statement of grounds of appeal.
- XV. Appellant II (opponent) requested in writing that the appeal of the patent proprietor be dismissed, and that the decision under appeal be set aside and the patent revoked. Additionally, appellant II requested that the documents filed by appellant I together with its

statement of grounds of appeal not be admitted into the proceedings and, if they were admitted, that the costs incurred for their review be apportioned in its favour.

Reasons for the Decision

Main request (claims as granted)

Article 100(b) EPC 1973

1. In the interlocutory decision under appeal, the subject-matter of claims 35 and 36 as granted was regarded as not extending beyond the content of the application as filed. Hence, the opposition division found that the maintenance of the patent as granted was not prejudiced by the ground for opposition mentioned in Article 100(b) EPC 1973.
2. This finding was not contested by appellant II. Nor has the board any reason of its own to question it.

Articles 100(a) and 54 EPC 1973 - Novelty

Claim 22

Documents (1), (2) and (4)

3. The opposition division found that the devices depicted in Figure 8a of document (1), Figure 11 of document (2) and Figure 3 of document (4) comprised all the individual elements of the apparatus defined in claim 22 as granted, and that, consequently, the subject-matter of this claim lacked novelty.

4. The board does not share the view of the opposition division. While it is true that each of the structural elements of the apparatus specified in claim 22 (ie. a substrate, a body and a cover) is present in the devices described in documents (1), (2) and (4), the board notes that, in its reasoning for the finding of lack of novelty in respect of the subject-matter of claim 22, the opposition division failed to take into account the feature "*for packaging a substrate*" characterising the claimed apparatus. In the board's view, this feature introduces a limitation concerning the purpose of the claimed apparatus which distinguishes it from the devices known in the art at the relevant date.

5. According to the jurisprudence of the Boards of Appeal (see T 523/89 of 1 August 1990 as well as further decisions cited in "Case Law of the Boards of Appeal of the European Patent Office", 5th edition 2006, chapter I.C.5.3.3), a statement of purpose made in a claim in respect of a product is to be interpreted as meaning that the claimed product is **suitable for** the stated purpose. Thus, a product known in the art at the relevant date having all the structural features specified in the claim at issue **and** being suitable for the same purpose as the claimed product, is considered to destroy novelty.

6. Applying the principles established by the Boards of Appeal to the present case, the feature "*for packaging a substrate*" in respect of the apparatus of claim 22 must be construed as meaning "suitable for packaging a substrate". While neither appellant disagreed with this interpretation, two issues were subject of dispute

between the parties: (a) what the expression "*for packaging*" means, and (b) whether or not the devices depicted in documents (1), (2) and (4) can be regarded as suitable for packaging a substrate.

Meaning of the expression "for packaging"

7. Since the feature "*for packaging a substrate*" is not expressly defined in the patent specification - a circumstance that appellant I did not deny -, it was argued by appellant II that, when assessing novelty of the claimed apparatus, the expression "*for packaging*" should be given its broadest meaning. This is, in fact, the approach consistently taken by the Boards of Appeal, though with the reservation that the chosen meaning not only must make sense from the technical point of view in the context of the claimed invention, but also must not be in contradiction with the description and the drawings.

8. Generally, the verb "to package" has the following meanings:

- (i) to make or put into a package;
- (ii) to design and manufacture a package for a product or series of related products;
- (iii) to group or combine (a series of related parts) into a single unit;
- (iv) to combine the various elements of (a tour, entertainment, etc.) for sale as a unit.

[**package**. Dictionary.com. *Dictionary.com Unabridged* (v 1.1). Random House, Inc.

<http://dictionary.reference.com/browse/package>
(accessed: July 30, 2009)]

In the same reference dictionary, the noun "package" is similarly defined as "a finished product contained in a unit that is suitable for immediate installation and operation, as a power or heating unit".

9. Among the meanings of the verb "to package" quoted above, the board regards the meaning under (iii) ("to group or combine (a series of related parts) into a single unit") as the broadest meaning which also makes technical sense in the context of the present invention. Accordingly, the feature "*for packaging a substrate*" in claim 22 is interpreted as meaning that the claimed apparatus is suitable for combining a substrate with a body and a cover to form a unit, this unit being suitable for immediate installation and operation. This interpretation is in line with the statements in the description and the drawings of the patent in suit (see *inter alia* paragraph [0026] which refers to Figure 3, paragraph [0040] which refers to Figure 7, and paragraphs [0068] to [0072] which refer to Figures 16a, 16b, 17a and 17b).

10. In spite of the fact that the wording of claim 22 appears, at first sight, unclear due to the use of the term "apparatus", having regard to the patent specification as a whole the board is persuaded that, what is actually claimed in claim 22 is a self-contained unit, ie. a "cartridge-like" unit containing the substrate, as maintained by appellant I.

Suitability of the devices in documents (1), (2) and (4) for packaging a substrate

11. A further question to be decided with respect to the issue of novelty *vis-à-vis* documents (1), (2) and (4) is whether or not the devices depicted in these documents are apparatuses suitable for packaging a substrate within the meaning of claim 22, ie. self-contained, "cartridge-like" units comprising a body **and** a substrate.
12. The board is not persuaded that this is the case. There is no clear indication in any of the documents cited by appellant II that the body and the substrate may form a "cartridge-like" unit. Rather, the figures on which appellant II relies seem to show a flow cell to which a substrate has been attached temporarily.
13. This is particularly apparent from the passage on page 50 of document (2) in which the apparatus depicted in Figure 11 of the same document is described. It is stated in this passage that "[T]*the present invention provides a new use for an apparatus comprising a reaction chamber and a scanning apparatus which can scan a substrate material exposed to the chamber. Figure 11 illustrates a system and a schematized reaction chamber **to which is attached** a silicon or glass substrate*" (see page 50, lines 2 to 7 of document (2); emphasis added by the board). In the board's view, the substrate is not described in this passage as an integral part of the apparatus, but rather as a separate item which needs to be attached to the reaction chamber for operation.

14. Similarly, in the reactor system illustrated in Figure 8A of document (1), which includes a body with a cavity, in order for the desired polymers to be synthesized on a prepared substrate, the substrate has to be mounted above the cavity of the reactor system (see page 29, lines 26 and 27). Similar statements are found on page 19, lines 3 to 4 of document (4).
15. In view of the above, the board concludes that none of documents (1), (2) and (4) describes an apparatus for packaging a substrate as defined in claim 22. Thus, novelty of the claimed apparatus *vis-à-vis* these documents is acknowledged.

Documents (6), (7) and (8)

16. The objection of lack of novelty relying on documents (6), (7) and (8), which had been raised in the notice of opposition, was not dealt with by the opposition division in the interlocutory decision under appeal, as the subject-matter of claim 22 was found to lack novelty in view of other documents. Appellant II maintained this objection on appeal.
17. The board considers that the objection is not justified. The analytical device depicted in Figure 1 of document (6) includes a body and a cover, but the sole structure described in this document which could - possibly - be regarded as a probe array (see Example 6) seems to be located in a so-called "analyte detection region" on the body itself (see page 5, second paragraph of document (6)), rather than on a separate substrate as required by claim 22. The analytical device shown in Figure 5 nested within an

appliance appears to be identical to the device of Figure 1.

18. Document (7) describes a flow cell for the measurement of the kinetics of chemical processes, and document (8) a device for studying chemical and biological reactions which consists of a sandwich of two plastic sheets having at least one sheet of porous water-absorbent material such as filter paper interposed therebetween (see Abstract). Neither of these devices includes a probe array. In the passage of document (8) indicated by appellant II (see column 7, lines 56 to 58) it is merely stated that "... *the sheet 142 can be conveniently impregnated with the indicating reagent prior to its assembly with the sheets of plastic material.*". The board is unable to see in this passage a disclosure of a probe array, as contended by appellant II.

19. The board thus concludes that, contrary to the finding of the opposition division in the decision under appeal, the ground for opposition mentioned in Article 100(a) in conjunction with Article 54 EPC 1973 does not prejudice the maintenance of the patent as granted.

Article 56 EPC 1973 - Inventive step

Claim 22

Document (2) as the closest state of the art

20. The opposition division did not decide on inventive step in connection with the main request. However, for the assessment whether or not the subject-matter of an

amended claim 22 in the first auxiliary request involved an inventive step, the opposition division regarded document (2) as the closest state of the art. On appeal, appellant II relied on the same document as the starting point for its line of argument on inventive step.

21. Document (2) relates to the simultaneous determination of the sequences of polymers immobilized on a substrate (see page 1, lines 7 and 8). The methods described in this document are based on the ability to perform a stepwise series of reactions which either extend (synthetic method, see chapter starting on the top of page 40) or degrade (chain degradation method, see chapter starting on page 45, line 30) a polymer by defined units. The purpose of the methods and the apparatus described in document (2) is "*... the preparation and use of a substrate having a plurality of polymers with various sequences where each small defined contiguous area defines a small cluster of homogeneous polymer sequences.*" (see page 9, lines 39 to 43).

22. In the chapter entitled "Apparatus" starting at the top of page 50, a system depicted in Figure 7 is described. The system consists of a reaction chamber having tubes with valves which control the entry and exit of the reagents involved in the stepwise reaction, and a detection system. When a (silicon or glass) substrate is attached to the reaction chamber, which is held at a constant temperature by a temperature block, the chamber is sealed.

23. Contrary to appellant I's view, the purpose of the apparatus described in document (2) is, at least in part, identical to that of the apparatus of claim 22, namely the use of a substrate having a probe array thereon for the analysis of biological probes. However, these two apparatuses differ in that, whereas in the apparatus of document (2) the body having a reaction chamber and the substrate are, in principle, independent from each other and attached only temporarily for the chemical reactions to take place, in the apparatus according to claim 22 the body and the substrate are permanently attached to each other forming a package, ie. a self-contained unit like a cartridge.
24. The technical problem to be solved can be formulated as providing an improved apparatus which allows the use of substrates having a probe array thereon in a more efficient manner.
25. The board is satisfied that this problem is solved by the apparatus for packaging a substrate defined in claim 22. This apparatus makes the handling of substrates having a probe array thereon much easier, as it protects the array when in use or storage. Moreover, the apparatus is suitable for use in high-throughput automated methods and can be manufactured easily and economically.
26. The board is also persuaded that, having regard to the closest state of the art as described in document (2), it was not obvious to a person skilled in the art seeking to improve the existing apparatus, to combine a substrate having a probe array and a body having a

reaction chamber to form a package, ie. a self-contained unit like a cartridge.

27. Contrary to appellant II's view, document (2) neither describes an apparatus for packaging a substrate, nor gives the skilled person any hint in this direction. Removing the device depicted in Figure 11 of document (2) from the system and using it as a separate entity - as appellant II maintained a skilled person would do - would not result in an apparatus for packaging a substrate as claimed either.
28. It is, thus, concluded that, having regard to content of document (2), the subject-matter of claim 22 involves an inventive step.

Further documents cited as the closest state of the art

29. Appellant II raised further objections of lack of inventive step against claim 22 relying on any of documents (1) to (5) supplemented with the common general knowledge or combined with any of documents (6) to (8).
30. In its communication under Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA) in preparation for the oral proceedings, the board observed that, in the absence of any arguments as to what would motivate a person skilled in the art to combine the teachings of particular documents, a sweeping attack based on twelve different combinations of documents and an undefined common general knowledge was unlikely to succeed. The board also remarked that, when a party relied on common general knowledge, it

must at least indicate which specific piece of information was not provided in a particular document or combination of documents, but was, arguably, part of the general knowledge of a person skilled in the technical field. Under certain circumstances, evidence that the piece of information missing in the document(s) was part of the common general knowledge at the relevant date may also be required. However, appellant II neither replied to the board's communication nor attended the oral proceedings.

31. As it was the case with regard to document (2) (see paragraph 27 above), the board is unable find in any of documents (1) and (3) to (5), which describe synthesis and different uses of polymer or oligonucleotide arrays, as well as devices similar to that disclosed in document (2), a hint in the direction of the claimed apparatus for packaging a substrate.

32. Nor is the board able to find in appellant II's submissions any convincing argument as to why a person skilled in the art seeking to improve the handling of probe arrays, would turn to known flow cells, in particular those described in documents (7) or (8). Since the flow cell described in document (7) is designed for a very specific purpose, namely measuring the kinetics of processes occurring at a solid-liquid interface using electrodes (see column 3, first full paragraph of document (7)), the board believes that a person skilled in the art would not have considered that such a flow cell could be combined with any substrate having a probe array thereon. As concerns document (8), which was published in 1972 and describes a device for studying chemical or biological reactions

which is formed by assembling and welding together two sheets of plastic material with a porous material such as filter paper interposed therebetween, the board strongly believes that, not knowing the invention disclosed in the present patent, a person skilled in the art had no reason to consider this specific teaching, let alone to combine it with the teaching of any of documents (1) to (5).

33. Having considered the arguments put forward by the parties, the board is satisfied that the subject-matter of claim 22 involves an inventive step within the meaning of Article 56 EPC 1973.

Claims 1 and 38

34. Claims 1 and 38 are directed to, respectively, a method of making probe chips and a method of evaluating probe chips. Appellant II raised an objection of lack of inventive step against both claims relying on a combination of document (2) with either the common general knowledge or any of documents (6), (7) and (8). In its view, the sole difference between the methods described in document (2) and those of claims 1 and 38 was that, in the latter, several probe arrays were synthesised on a substrate which was then divided into a plurality of chips, each chip comprising at least one probe array thereon.

35. The board disagrees with this view. As stated above in connection with claim 22, document (2) does not describe or suggest an apparatus **for packaging** a substrate having a probe array thereon. Nor does this document disclose or suggest, either a method of making

- probe chips in which one or more chips are mated to a **package** comprising a reaction chamber, or a method of evaluating the packaged chips.
36. Appellant II's argument that the methods according to claims 1 and 38 were obvious in view of the content of document (2) supplemented with the general knowledge of a person skilled in the art at the relevant date cannot be accepted. In the board's view, the idea of mating a chip with a probe array thereon to a package comprising a reaction chamber could not be derived from the common general knowledge in the pertinent technical field. In spite of the remarks made by the board in its communication under Article 15(1) RPBA (see paragraph 30 above), no evidence supporting the alleged common general knowledge was filed by appellant II.
37. As regards the combination of document (2) with either document (7) or document (8), the reasons given in connection with claim 22 (see paragraph 32 above) apply *mutatis mutandis*. In the board's view, without previous knowledge of the invention a person skilled in the art seeking to improve the existing methods would not have considered these documents, let alone combined their teaching with that of document (2).
38. Finally, appellant II maintained that the claimed methods were obvious in view of a combination of documents (2) and (6); however, no arguments whatsoever were put forward in support of this allegation. The board is unable to see why a person skilled in the art would have considered document (6) when seeking to improve the methods described in document (2). Document (6) describes modules comprising a solid

substrate microfabricated to define a sample inlet and a mesoscale flow system which includes a sample flow channel, extending from the inlet port, and an analyte detection region in fluid communication with the flow channel (see page 5, first and second paragraph). The device has no outlet port because the flow system is designed for introducing the sample to be analysed into the module, rather than to add any reagents or rinse any probes. Thus, if a skilled person had considered this document, he/she would not have been able to combine its teaching with the teaching of document (2) in a straightforward manner to arrive at the methods of claims 1 and 38.

39. Summarising the above, the board concludes that, in view of the arguments put forward by appellant II, its objection of lack of inventive step against claims 1 and 38 is not justified. Hence, the ground for opposition mentioned in Article 100(a) in conjunction with Article 56 EPC 1973 does not prejudice the maintenance of the patent as granted.

Article 83 EPC 1973 - Sufficiency of disclosure

40. In the interlocutory decision under appeal, the issue of sufficiency of disclosure was decided by the opposition division only in relation to the invention as claimed in the fifth auxiliary request, which was regarded as to be disclosed in the patent in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.
41. On appeal, appellant II maintained the objections to the claims as granted raised in the notice of

opposition, but did not put forward any arguments beyond those provided in the notice of opposition. As concerns the terms "probe chips" in claims 1 and 38 and "probe array" in claim 22, it had been contended in opposition proceedings that, in the absence of a definition of these terms in the description of the patent specification, a person skilled in the art was unable to determine the limits of the claim and to work the claim over the entirety of its indetermined scope.

42. The board observes that, even though a possible ambiguity of the terms "probe chips" and "probe array" may, in principle, be relevant when novelty or inventive step is assessed, lack of clarity is not a ground for opposition mentioned in Article 100 EPC 1973. Since appellant II failed to specify any particular aspect of the claimed invention which could not be carried out by a person skilled in the art because of the alleged ambiguity, the objection in respect of the terms "probe chips" and "probe array" cannot be accepted.
43. Appellant II's further argument that "... *the application does not demonstrate that such probe chips or probe arrays have actually been (i) made, (ii) packaged or (iii) evaluated*" is unconvincing. There is no requirement in the EPC for an applicant to demonstrate that an invention for which protection is sought has been put into practice, nor can an opposition to a granted patent be based on such a ground.
44. As regards appellant II's contention that the patent did not disclose how the chip was physically moved and

positioned in the package, the board notes that paragraphs [0045] to [0077] of the patent describe not only the attachment of the chip to the other elements of the package, including the alignment of the chip, but also the assembly of the chip package.

45. The board thus concludes that none of the objections raised by appellant II under Article 100(b) EPC 1973 prejudices the maintenance of the patent as granted.

Article 113(1) EPC 1973 - Right to be heard

46. In its communication under Article 15(1) RPBA sent in preparation for the oral proceedings, the board expressed a provisional opinion on some of the issues to be discussed and gave the parties the opportunity to present their comments. Appellant II did not reply to the board's communication and, although duly summoned, did not attend the oral proceedings. Even though the present decision differs to a certain extent from the provisional opinion expressed by the board in its communication, the board believes that the grounds and evidence on which the decision is based were known to the parties concerned, and that they had ample opportunity to file any observations they wished the board to consider.

Request for apportionment of costs

47. The present decision has not been based on documentary evidence filed by appellant I together with its statement of grounds of appeal. Thus, a decision on appellant II's request for apportionment of costs (see paragraph XV above) is not deemed necessary.

Conclusion

48. For the reasons given above, the grounds for opposition mentioned in Article 100 EPC 1973 do not prejudice the maintenance of the patent as granted.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is maintained as granted.

The Registrar:

The Chairman:

A. Wolinski

L. Galligani