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D E C I S I O N
of 3 March 2005

Case Number: T 0183/04 - 3.2.7

Application Number: 97934054.4

Publication Number: 0856070

IPC: C23C 16/44

Language of the proceedings: EN

Title of invention:

Plasma Chamber with separate process gas and cleaning gas injection ports

Applicant:

LAM RESEARCH CORPORATION

Opponent:

-

Headword:

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Relevant legal provisions:

EPC Art. 84, 111(1), 123(2)

Keyword:

"Extension beyond content of application as filed (no, after amendment)"

"Claim - formulation to include all essential features (yes, after amendment)"

"Remittal to first instance for further prosecution"

Decisions cited:

G 0010/93, G 0001/97, T 0796/02, J 0006/98

Catchword:

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Case Number: T 0183/04 - 3.2.7

D E C I S I O N
of the Technical Board of Appeal 3.2.7
of 3 March 2005

Appellant:

LAM RESEARCH CORPORATION
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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 30 September 2003
refusing European application No. 97934054.4
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: H. Meinders
Members: H. E. Hahn
E. Lachacinski

Summary of Facts and Submissions

- I. The applicant lodged an appeal against the decision of the Examining Division to refuse the European patent application No. 97 934 054.4.

Claim 11 as filed reads: "A method of unclogging jet screw ports in a chamber, the jet screw ports injecting process gas into the chamber, the method comprising the steps of:

terminating injection of the process gas into the chamber;

injecting cleaning gas into the chamber through openings separate from the jet screw ports to equalize pressure of the cleaning gas within the jet screw ports with pressure of the cleaning gas within the chamber."

Claim 1 forming the basis of the decision under appeal reads: "A method of cleaning a vacuum processing chamber between workpiece processing operations wherein the workpiece processing is performed by supplying processing gas to the chamber via a first port while the chamber is *in vacuo*, the processing gas having a tendency to leave a clogging residue in the first port, the chamber including a second port separate from the first port, the method including introducing a cleaning gas into the chamber via the second port without opening the chamber while (a) the processing gas is not supplied to the chamber and (b) r.f. plasma excitation power is applied to the structure in the chamber including the first port so that pressure is equalized at the first port and the cleaning gas cleans the first port of the clogging residue as well as the remainder of the chamber."

The Examining Division held that the amendment in claim 1 to "r.f. plasma excitation power is applied to the structure in the chamber including the first port" resulted in subject-matter extending beyond the content of the application as filed since the only embodiment revealing such a structure was the specific ECR CVD apparatus according to figures 3 and 4. This conclusion applied to both the main request and the auxiliary request on file which contained the identical wording in this respect.

II. With a communication dated 8 December 2004 and annexed to the summons to oral proceedings the Board presented its preliminary opinion with respect to the requests underlying the appealed decision, namely claim 1 of the main request filed on 22 January 2002 with letter of 18 January 2002 and claim 1 of the auxiliary request filed by fax on 30 July 2003. The claims 1 of these two requests were considered to contravene Article 123(2) EPC and, additionally, did not meet the requirements of Article 84 EPC. Furthermore, the Board stated that it only intended to deal with these two issues in the oral proceedings set. It was finally remarked that, in the event a set of claims fulfilling the requirements of Articles 84 and 123(2) EPC would be submitted, the Board intended to remit the case to the first instance under Article 111(1) EPC for further prosecution.

III. With letter submitted by fax on 3 February 2005 the appellant argued that having regard to the appellant's right to two instances it would be inappropriate for the current Board of Appeal to consider Article 123(2) EPC objections other than the one raised in the

decision under appeal, like the objection concerning the feature "*in vacuo*". The appeal had been filed only in relation to the second Article 123(2) EPC objection (i.e. concerning the "r.f. plasma excitation power ... applied to the structure"). The appellant asked for a confirmation that only the reasoning which led to the actual decision being appealed would be discussed at the oral proceedings before the Board.

- IV. With letter submitted by fax on 15 February 2005 the appellant repeated his request for such a confirmation.

- V. With letter of 1 March 2005 submitted by fax the Board informed the appellant that it intended to discuss all matters under Articles 123(2) and 84 EPC as set out in the summons at the oral proceedings and that it saw no reason to restrict the discussion to the Article 123(2) objection of the decision under appeal as requested by the appellant.

- VI. Oral proceedings before the Board of Appeal were held on 3 March 2005.

The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the following claims:

claim 1 as filed during the oral proceedings on 3 March 2005

claims 2 to 8 and 9 (part) as filed on 22 January 2002 and

claim 9 (part), and 10 to 13 as filed on 15 December 2000

VII. The independent claim 1 of the single request under consideration reads as follows:

"1. A method of *in situ* cleaning a vacuum processing chamber between workpiece processing operations wherein the workpiece processing is performed by supplying processing gas to the chamber via a first port, the processing gas having a tendency to leave a clogging residue in the first port due to it being treated in a plasma, the chamber including a second port separate from the first port, the method including introducing a cleaning gas into the chamber via the second port without opening the chamber while (a) the processing gas is not supplied to the chamber and (b) r.f. plasma excitation power is applied to a structure of the chamber including the first port which is arranged to be located in the plasma, and so that pressure is equalized at the first port and the cleaning gas cleans the first port of the clogging residue as well as the remainder of the chamber."

VIII. The appellant argued essentially as follows:

The amendments to claim 1 were based on page 3, line 28 to page 4, line 3; page 4, lines 24 to 31 of the specification as filed (=WO-A-98/01601), in combination with the general teaching which was derivable for the skilled person from the specific embodiments disclosed at page 7, line 22 to page 9, line 7 in the context of the figures 3 and 4 and taking into account the fact that the application was neither limited to the said ECR embodiments according to figures 3 and 4 nor to the specific gases as stated on page 10, lines 13 to 21 of the description as filed. Therefore claim 1 met the

requirements of Article 123(2) EPC. Since claim 1 now included all essential features it also met the requirements of Article 84 EPC.

Reasons for the Decision

Allowability of amendments (Article 123(2) EPC)

- 1.1 Claim 1 of the appellant's single request is based on claim 11 as filed and the further features added to it can be derived explicitly from the specification as originally filed (claims 1 and page 3, line 1; page 6, lines 9 to 12; page 9, line 27 to page 10, line 5; page 4, lines 24 to 31 and claims 1, 7; page 2, lines 34 to 36 and page 7, line 36 to page 8, line 1).

- 1.2 From the description of said figures 3 and 4 in combination with the statements at page 10, lines 1 to 5 and 13 to 21, where it is stated that the invention can be carried out by applying only RF power to the plasma chamber and is not limited to the exemplary gases or embodiments such as the ECR CVD system shown in figures 3 and 4, the skilled person can derive the present broader teaching of RF plasma excitation power. According to this teaching it is essential that the process gas injection ports - which are coated or partly clogged with a clogging residue, resulting from the reaction of the processing gas with a plasma during a processing or deposition step (see page 1, lines 11 to 25; page 2, lines 33 to 36; page 7, line 28 to page 8, line 5) - have to be located in that area of a structure in the chamber, where by applying RF plasma excitation power the plasma for cleaning is formed, in

order to be suitable to remove the clogging residue from said first port (see page 10, lines 1 to 3; and figures 3 and 4). It is also clear to the skilled person that the second port for introducing the cleaning gas need not be located within the area of the RF cleaning plasma. The present wording of claim 1 takes account of all these facts.

- 1.3 Consequently, the intermediate generalisation in claim 1 relating to the application of RF excitation power to a structure in the chamber instead of the very specific cleaning process employing an ECR CVD system as required by the Examining Division in its decision under appeal is considered to be derivable for the skilled person from the specification as originally filed. Hence the subject-matter of claim 1 is considered not to extend beyond the content of the application as originally filed. Consequently, claim 1 meets the requirements of Article 123(2) EPC.

Clarity (Article 84 EPC)

- 1.4 Claim 1 of the single request has been amended to additionally define that the process is an "***in situ*** cleaning" process which is considered to represent the essence of the present invention (see also page 1, line 27 to page 2, line 3; page 3, line 28 to page 4, line 3 and lines 11 to 20; page 8, line 34 to page 9, line 2 and lines 14 to 22). This feature implies that the processing chamber is not only closed during the cleaning step - as was the case in claim 1 forming the basis of the decision under appeal - but that it has also to be closed during the deposition or processing

steps before and after the plasma cleaning step so that the described effects are actually achieved.

1.5 Furthermore, by incorporating the feature "the processing gas having a tendency to leave a clogging residue in the first port due to it being treated in a plasma" into claim 1 it is implicit that the workpiece processing operation of the claimed process includes "**CVD plasma processing**" which is considered to represent another essential feature since the technical problem underlying the application appears to be based on the *in situ* cleaning of **a plasma chamber of a CVD processing system** (see page 1, lines 2 to 5 and line 11 to page 2, line 7; page 3, lines 25 to 27; page 10, lines 13 to 18).

1.6 Hence claim 1 involves the features essential to the invention and is therefore considered to meet the requirements of Article 84 EPC.

Remittal to the first instance

1.7 Having regard to its right to two instances the appellant requested that only the reasoning which led to the decision being appealed was to be discussed in the oral proceedings before the Board and that, in the case of a positive outcome in that respect, the case be remitted to the first instance.

1.7.1 The Board notes with respect to the established case law that there is no absolute "right to two instances" in the sense that a party in all circumstances is entitled to have every aspect of its case examined by two instances (see e.g. T 796/02, unpublished, point 12

of the reasons, making reference to J 6/98, unpublished, point 4 of the reasons, and to G 1/97, OJ EPO 2000, 322, point 2a of the reasons). To the contrary, it is within the discretion of the Board under Article 111(1) EPC to exercise any power within the competence of the department which was responsible for the decision appealed or to remit the case to that department taking account of the circumstances of each individual case.

Thus in *ex parte* proceedings the Board has the power to examine whether the application or the invention to which it relates meets the requirements of the EPC and this also holds good for requirements or objections the Examining Division has not considered in the examination proceedings or has regarded as fulfilled (see G 10/93, OJ EPO 1995, 172, points 3 to 5 of the reasons). The Board thus can, where appropriate, decide either to rule on the case itself or send it back to the first instance.

The present application was filed on 9 July 1997 and the examination procedure has lasted already more than three years to now reach the point that **one** issue of allowability of amendments would be finally resolved.

Taking account of this circumstance and in the interest of efficiency the Board exercised its discretion under Article 111(1) EPC and decided to deal with all formal issues under Articles 84 and 123(2) EPC in the oral proceedings in respect of claim 1 (see points 1.3 and 2.3 above), so that the case could be remitted to the first instance for further prosecution with regard to the substantive issues of novelty and inventive step.

Thereby the appellant has the opportunity to have its application examined with respect to patentability without loss of an instance.

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 for further prosecution on the basis of:

claim 1 as filed at the oral proceedings
claims 2 to 8 and 9 (part) as filed on 22 January 2002
and
claims 9 (part), and 10 to 13 as filed on 15 December
2000.

The Registrar:

The Chairman:

G. Nachtigall

H. Meinders