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Datasheet for the decision of 19 September 2017

Case Number: T 0428/13 - 3.2.03

Application Number: 01274938.8

Publication Number: 1454998

IPC: C23C8/30, C23C8/34

Language of the proceedings: EN

Title of invention:
VACUUM CARBO-NITRIDING METHOD

Patent Proprietor:
Koyo Thermo Systems Co., Ltd.

Opponent:
ALD Vacuum Technologies GmbH

Headword:

Relevant legal provisions:
EPC Art. 54, 56
RPBA Art. 13(1), 13(3), 12(4)

Keyword:
Novelty - (yes) - availability to the public (no)
Late-filed document - justification for late filing (no)
Inventive step - (yes)

Decisions cited:
T 1212/97

Catchword:

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Case Number: T 0428/13 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 19 September 2017

Appellant: (Opponent)	ALD Vacuum Technologies GmbH Otto-von-Guericke-Platz 1 63457 Hanau (DE)
Representative:	Plate, Jürgen Plate Schweitzer Zounek Patentanwälte Rheingaustrasse 196 65203 Wiesbaden (DE)
Respondent: (Patent Proprietor)	Koyo Thermo Systems Co., Ltd. 229, Kabata-cho Tenri-shi, Nara 632-0084 (JP)
Representative:	Ter Meer Steinmeister & Partner Patentanwälte mbB Nymphenburger Straße 4 80335 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 December 2012 rejecting the opposition filed against European patent No. 1454998 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	G. Ashley
Members:	B. Miller
	M.-B. Tardo-Dino

Summary of Facts and Submissions

I. European patent No. 1 454 998 relates to a vacuum carbo-nitriding method.

II. Claim 1 according to the main request (claims as granted) reads as follows:

"A vacuum carbonitriding method comprising:
performing a vacuum carburizing process on an object to be treated in a heat treating furnace under reduced pressures by supplying a carburizing gas into the furnace that has been heated to a predetermined carburizing temperature;
stopping supply of the carburizing gas while keeping the carburizing temperature so as to diffuse carbon in the object to be treated under reduced pressures; and
performing a nitriding process on the object to be treated by supplying a nitriding gas into the furnace under reduced pressures after lowering the furnace temperature."

Claims 2 to 3 of the main request relate to preferred embodiments of the method according to claim 1.

III. An opposition was filed against the patent based on Article 100(a) together with Articles 54 and 56 EPC. The opposition was rejected by the opposition division. The appellant filed an appeal against this decision.

IV. State of the art

In the statement setting out the grounds of appeal and in the reply to it the parties relied on the following documents, which were filed in the opposition proceedings and were cited in the decision under appeal:

D1: WO 99/55928
D1a: DE 69902169 corresponding to D1
D2: DE 19909694
D5: DE 4110114

In addition, the appellant relied on the following documents filed with the grounds of appeal:

D7: oral disclosure of Mr. Altena at the 57th Hardening Colloquium on 10 October 2001
D8: Affidavit by Mr. Altena including Annex A1 (power point slides) and Annex A2 (presenter notes)
D9: H. Altena and F. Schrank: Niederdruck-Aufkohlung mit Hochdruck-Gasabschreckung, HTM Journal of Heat Treatment and Materials, 57, 2002, Volume 4, page 247
D10: colloquium report of the 57th Hardening Colloquium, 2001, Volume 6, page 423

With a letter dated 21 August 2017 the appellant further filed the following documents:

D11: EP 0 818 555 A1
D12: JP H11-158601 A
D12a: English translation of D12

V. The appellant (opponent) requested that the decision under appeal be set aside and the patent be revoked.

VI. The respondent (proprietor) requested that the appeal be dismissed. Alternatively it requested that a patent be maintained on the basis of an auxiliary request filed on 9 September 2013 with the reply to the grounds of appeal. Furthermore it requested not to admit documents D7 to D10 and D11, D12 and D12a into the proceedings.

VII. With the summons to oral proceedings, the Board sent a communication pursuant to Articles 15(1) and 17(2) of the Rules of Procedure of the Boards of Appeal (RPBA) indicating its preliminary, non-binding opinion of the case.

VIII. Oral proceedings were held on 19 September 2017.

IX. The appellant's arguments can be summarised as follows.

The method of claim 1 was not novel, since a corresponding method had been presented by Mr. Altena at the 57th Hardening Colloquium. The conference was open to the public. D9 and D10 confirmed that the presentation was held.

The subject-matter of claim 1 lacked novelty in view of D1/D1a, in particular when considering the teaching on page 4, first full paragraph.

In case the subject-matter of claim 1 was found to be novel, it lacked an inventive step in view of D1/D1a as the closest prior art. The contested patent did not disclose any unexpected effect related to a method as defined in claim 1. Performing the nitriding step at a lower temperature than the carburizing step was obvious when taking into account the teaching of D5.

D11 and D12/D12a were highly relevant documents which reflected the general knowledge of the skilled person. D12 had already been cited in the International Search Report of the application underlying the contested patent. Therefore the respondent had to be aware of its teaching.
The documents were filed late, because the representative only became aware of their relevance once it had taken over the case during the appeal proceedings. D11 and D12/D12a therefore should be admitted into the proceedings.

X. The respondent's arguments can be summarised as follows.

D8 did not prove what had been orally disclosed in detail by Mr. Altena during a presentation at the 57th Hardening Colloquium.
Therefore D7 and D8 on their own were not relevant for claim 1 of the contested patent.

D9 and D10 were published after the filing date of the contested patent and therefore were not relevant.

Thus, the late filed evidence D7 to D10 should not be admitted into the proceedings due to their lack of prima facie relevance.

D1/D1a did not disclose a process wherein the nitriding was performed after a diffusion step at a temperature lower than the preceding carburizing step.

Moreover, the method according to claim 1 of the contested patent was not obvious when starting from D1/D1a, since neither D1/D1a nor D5 suggested to perform

the nitriding step after the diffusion step and at a lower temperature than the carburizing and diffusion steps.

Documents D11 and D12/D12a were irrelevant and filed late by the appellant. Therefore these documents should not be admitted into the proceedings.

Reasons for the Decision

1. Admissibility of evidence D7 to D10

1.1 Together with the statement setting out the grounds of appeal, the appellant submitted new evidence D7 to D10, the admissibility of which is governed by Article 12(4) RPBA.

It is noted by the Board that the opposition division did not admit the late filed document D6 (EP1247875) into the proceedings, since it did not constitute prior art under Article 54(3) EPC. Furthermore two sheets of paper showing slides and text from the inventors named in D6 which had supposedly been presented at a conference held in Wiesbaden in October 2001 were also not admitted into the proceedings, since none of these late filed sheets contained a date of publication (see point 10.2 of the decision).

1.2 Affidavit D8, concerning the alleged oral disclosure D7 at the conference held in Wiesbaden in October 2001, was submitted with the grounds of appeal, which was the first opportunity of the appellant to address the conclusions reached in the previous proceedings.

According to the established case law, a filing made with the statement of grounds of appeal should not be considered inadmissible if it is an appropriate and immediate reaction to developments in the previous proceedings (Case Law of the Boards of Appeal of the European Patent Office, Chapter IV.C.1.3.14 a), 8th Edition, 2016). The filing of D7 to D10 also appears to fall within the limits of a normal submission that an appellant, looking for the reversal of the appealed decision, is entitled to present.

In the light of the above, the Board concludes that documents D7 to D10 are not to be held inadmissible under Article 12(4) RPBA.

2. Admissibility of documents D11 and D12/D12a

2.1 Documents D11 and D12/D12a were filed with a letter dated 21 August 2017 after oral proceedings had been appointed.

For the Board, independently of the content of D11 and D12/D12a, the filing of documents at this very late stage of the proceedings is acceptable only in exceptional circumstances. In the present case the claims as granted forming the main request served as a basis for discussion in opposition proceedings and the contested decision and consequently also for the arguments presented in the statement setting out the grounds of appeal. Thus the appellant had ample opportunities to file relevant evidence for the claims as granted at a much earlier stage of the proceedings.

2.2 Regarding document D12, this was cited in the International Search Report of the application underlying the contested patent.
Documents cited in the prosecution of a patent application can be expected to be considered by an opponent when filing an opposition. Even the translation D12a of document D12 had been available since August 2005, as indicated on page 1 of D12a. Therefore these could have been filed earlier, either in the opposition proceedings or at least with the statement setting out the grounds of appeal.

2.3 The fact that a change of representation took place during the appeal proceedings does not change this situation, since it is the appellant rather than the representative which is a party to the proceedings and which is thus responsible to file the relevant evidence (see case law cited in Case Law of the Boards of Appeal, 8th edition, 2016, Chapter IV.C.1.3.18).

2.4 As no justification can be seen for filing documents D11 and D12/D12a at such a late stage, the Board finds it appropriate to exercise its discretion under Article 13(1) RPBA by not admitting documents D11 and D12/D12a into the proceedings.

3. Novelty

3.1 Novelty in view of D7 supported by D8 to D10

3.1.1 The oral disclosure D7 of Mr. Altena took place at the 57th Hardening Colloquium on 10. October 2001.

In the Affidavit D8, Mr. Altena describes what in his view has been presented at the conference by referring to Annex A1 (power point slides, which allegedly had

been shown during the conference) and Annex A2 (representing preparation notes which allegedly reproduce the content of the talk held by Mr. Altena).

3.1.2 Concerning the content of an oral disclosure it is generally accepted case law, that a single declaration of the presenter of a lecture does not give sufficient proof of the content which has been disclosed orally or has been presented on slides prepared for the lecture (Case Law of the Boards of Appeal, Chapter I.C.3.2.2, see in particular T1212/97).

Following this generally accepted principle, the Affidavit of Mr. Altena (D8) on its own is not sufficient to give proof what had actually been disclosed orally when presenting the slides of Annex A1.

D9 and D10, which are a publication and a colloquium report on the same topic as the presentation D7, demonstrate that the content of the presentation of Mr. Altena was open to the public and that the presentation had taken place. However, these documents alone are not evidence of what had been disclosed orally. Furthermore, they are not prior art under Article 54(2) EPC themselves, since they have not been disclosed before the filing date of the contested patent.

Therefore it has not been demonstrated by the appellant to a sufficient standard what was orally made available to the public during the 57th Hardening Colloquium.

3.1.3 Thus, the Board concludes that it has not been shown that the subject-matter of claim 1 of the main request was orally made available at the conference in 2001.

3.2 Novelty in view of D1/D1a

3.2.1 D1a is a family member of D1 which has an identical teaching as D1. Both parties refer to D1a. Therefore the Board will also refer to D1a in the following.

3.2.2 The appellant confirms that a process according to claim 1 of the contested patent is not explicitly disclosed in D1a as indicated on page 7, second paragraph of the grounds of appeal. However, it argues that the process step of performing the nitriding at a lower temperature is implicitly disclosed on page 4, first full paragraph of D1a, according to which a desired degree of enrichment in carbon and nitrogen can be achieved by selecting the amount of ethylene and ammonia, the temperature, and the duration of the treatment.

3.2.3 In the Boards view D1a proposes on page 4, lines 3 to 9 in general terms the possibility of adapting the duration and temperature of the carburizing and nitriding steps for a given alloy.
However, this general statement does not disclose a specific order of steps or a specific temperature profile, and in particular not a specific process as defined in claim 1 of the main request.

D1a describes in more detail on page 4, lines 25 to 29 that a vacuum diffusion treatment can be performed after the work pieces had been subjected to both carburizing and nitriding gas.
Therefore, the specific teaching in D1a discloses a process which does not follow the order of steps defined in claim 1.

Concerning the temperature profile, D1a describes on page 2, lines 26 to 32 that a metal alloy is treated by the action of a carburizing gas and of a nitriding gas, both at a temperature of about 750 to about 1050°C. This general concept is supported by the examples of D1a (cf. lines 24 to 29 on page 7 and Table 2 on page 10 of D1a) which disclose that the step of carburizing and nitriding treatment is performed at the same temperature of 850°C.

The subject-matter of claim 1 of the main request therefore differs from the disclosure of D1a in that the nitriding step has to be performed subsequent to and at a lower temperature than the carburizing and diffusion steps.

3.3 In summary the Board concludes that the subject-matter of the claims main request fulfils the requirements of Article 54 EPC.

4. Inventive step

4.1 The Board agrees with the appellant that D1a forms a suitable starting point for the assessment of inventive step.

The Board observes that D1a discloses in the examples that the carburizing step and the nitriding step take place at a temperature of 850°C either simultaneously (examples 1 to 4, 7 to 16) or subsequently (examples 5 and 6).

The appellant identified examples 5 and 6 as the most suitable starting point for the assessment of inventive step. However, these examples do not disclose that a further diffusion step takes place.

A further diffusion step is described only in the context of examples 1 to 2 and 7 to 9 (D1a: table 2; page 8, lines 3 to 6 and 13 to 16) .

This teaching of the examples of D1a is consistent with the general disclosure on page 4, lines 25 to 29, where it is indicated that a vacuum diffusion treatment is an optional process step which can take place after the work pieces have been subjected to both carburizing and nitriding gas.

4.2 The subject-matter of claim 1 of the main request therefore differs from the specific disclosure of examples 5 and 6 of D1a in that a diffusion step takes place at the same temperature as the carburizing step before nitriding, and in that nitriding takes place subsequently at a lower temperature than the carburizing and diffusion steps.

4.3 Paragraph [0031] and figures 4 to 7 of the contested patent disclose that a process according to claim 1 used in examples 1 to 3 provides a deeper surface hardening effect compared to a process wherein the carburizing and nitriding take place at the same time (see the comparative example). Furthermore less austenite and cementite is formed when using the process of claim 1 of the main request (paragraph [0032]).

The process used for the comparative example of the contested patent corresponds to that proposed by examples 10 to 16 of D1a, where a simultaneous carburizing and nitriding step is used.

D1a teaches at page 6, line 26 to page 7, line 7 that the carbo-nitriding can equally be performed

simultaneously or in separate steps. This general teaching is confirmed by the examples, since D1a does not disclose that certain examples, in particular examples 5 and 6 which make use of subsequent carburizing and nitriding steps, provide an object having improved hardness properties compared to objects prepared by the process used for the remaining examples. Hence the skilled person would have no reason to distinguish examples 5 and 6 from the remaining examples of D1a and to use preferably these two examples as a starting point for further development when having no knowledge of the claimed process.

Therefore the comparative example of the contested patent reflecting the teaching of examples 10 to 16 of D1a can be considered as fairly representing the teaching of D1a.

4.4 The objective technical problem can be regarded as providing a carbo-nitriding process leading to better surface hardness.

4.5 D1a does not provide any hint that the order of process steps or the claimed temperature profile might have an effect on the hardness of the objects treated.

4.5.1 Concerning the temperature applied during carburizing and nitriding, D1a teaches in very general terms on page 4, first paragraph of D1a that the temperature and duration of the carburizing and nitriding steps can be adapted as a function of the metal alloy.

A hint to perform carburizing and diffusion at a higher temperature than the nitriding step is not given by D1a.

4.5.2 Concerning the diffusion step, D1a (page 4, lines 25 to 29) explicitly states that it can take place after the work pieces have been subjected to both carburizing and nitriding gas. D1a does not give any hint that the diffusion step can take place before the nitriding.

4.5.3 Hence a process as defined by claim 1 of the main request is not rendered obvious by D1a on its own.

4.6 The appellant argued that the skilled person is taught by D5 that the carburizing and nitriding can take place at different temperatures.

Indeed D5 discloses a process whereby the carburizing takes place at temperatures between 900°C and 950°C (column 3, line 64 to column 4, line 7) whereas the nitriding takes place at about 820°C to 840°C (column 4, lines 1 to 6).

However, no pointer can be found in D5 that the surface hardness of the treated objects can be improved by using the temperature profile disclosed in D5 in a method as disclosed in D1a.

Furthermore, no hint can be found in D5 to modify the method of D1a by carrying out a further diffusion step at the same temperature as the carburizing before the nitriding step.

Therefore the subject-matter of claim 1 is not obvious when starting from D1a as the closest prior art and taking into account the teaching of D5. Therefore the requirements of Article 56 EPC are fulfilled by claim 1 of the main request.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. H. A. Patin G. Ashley

Decision electronically authenticated