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**Datasheet for the decision
of 24 January 2014**

Case Number: T 1665/11 - 3.3.06
Application Number: 07251018.3
Publication Number: 1839726
IPC: B01D53/02, B01J20/18, B01J20/30
Language of the proceedings: EN

Title of invention:

Preparation of an ion exchanged nitrogen adsorbent which is polymer bound

Applicant:

Honeywell International Inc.

Headword:

Polymer bound adsorbent / HONEYWELL

Relevant legal provisions:

EPC Art. 84, 111(2), 113(2), 114(2)
EPC R. 111(2)
RPBA Art. 13(1), 13(3)

Keyword:

Inadequate reasoning of the decision under appeal -
substantial procedural violation : no
Remittal to the department of first instance : no
Clarity (main request and auxiliary requests 1 to 3) : no
Admissibility of late-filed (notional) requests 4 and 5: no -
no complete sets of claims submitted
Admissibility of late filed auxiliary request 6 : no - new
issues raised

Decisions cited:

T 1129/97, T 0728/98

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

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Case Number: T 1665/11 - 3.3.06

**D E C I S I O N
of Technical Board of Appeal 3.3.06
of 24 January 2014**

Appellant: Honeywell International Inc.
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Morristown, NJ 07960 (US)

Representative: Buckley, Guy Julian
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 3 March 2011
refusing European patent application No.
07251018.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: B. Czech
Members: L. Li Voti
J. Geschwind

Summary of Facts and Submissions

- I. This appeal lies from the decision of the Examining Division to refuse European patent application no. 07 251 018.3.
- II. As regards the then pending sets of claims submitted as main request and auxiliary requests 1 to 5 with letter of 13 January 2011, the Examining Division found that
- the subject-matter of the claims according to the main request and auxiliary requests 1 to 3 lacked an inventive step,
 - the respective claims 1 according to the auxiliary requests 2 and 3 lacked clarity, and
 - the amended claims according to auxiliary requests 4 and 5 contravened the requirements of Article 123(2) EPC.
- Moreover, all requests were found to be objectionable under Article 84 EPC since the description had not been adapted to the respective amended claims.

In particular, the Examining Division found in its decision the following:

- since all requests had been filed after the issuance of the summons to oral proceedings, the Applicant, who did not attend oral proceedings, had to expect a decision based on "objections which may arise against such requests in its absence";
- even though the Applicant considered in its letter of 13 January 2011 document D1 (US 6 425 940 B1) as closest prior art, its argumentation was directed to a process for preparing an adsorbent whilst the pending claims related instead to a method for ion exchange in an adsorbent;

- therefore, document D3 (US 5 203 887 A), disclosing a lithium exchange in an adsorbent in the temperature range of claim 1 had to be rather selected as closest prior art;

- the process disclosed in document D3 differed from the subject-matter of claim 1 according to the main request insofar as it did not disclose the steps (50) to (56) of claim 1 and in that it used a clay instead of an organic polymer as the binder;

- however, the process steps (50) to (56) were standard steps which could not support the inventiveness of the claimed subject-matter, which point had not been commented upon by the Applicant;

- moreover, the use of an organic polymer as binder for a zeolite adsorbent had no impact on the ion exchange;

- furthermore, even if the properties of the produced adsorbent were taken into consideration, the alleged effect concerning the improvement of the N₂ loading capacity of the adsorbent, which was supposed to be demonstrated by figure 4, could not be considered to be achievable with any organic polymer-bound zeolite prepared by a process disclosed in the claims, neither the amount of binder, which was a crucial feature in the Applicant's view, nor the properties of the organic polymer binder being indicated in the claims;

- therefore, the claimed subject-matter lacked an inventive step.

III. In its statement setting out the grounds of appeal dated 4 July 2011, the Appellant requested the Board "to reinstate" the application and, for reasons of

precaution, oral proceedings. It maintained the main claim request and the auxiliary claim requests 1 to 3 already filed before the Examining Division with letter of 13 January 2011, and expressly stated that its earlier auxiliary request 4 was not maintained. It re-filed copies of the amended claims according to the four maintained requests, together with some corresponding amended description pages, and submitted that

- the rejection of the main request on the ground of lack of inventive step had not been adequately reasoned by the Examining Division; therefore, the legitimate expectations of the Applicant had not been met;
- moreover, the further ground for refusal under Article 84 EPC, invoked on the basis that the description had not been adapted to the amended claims and that, consequently, there was an inconsistency between the description and the claims, had not been raised previously by the Examining Division even though the Division could have raised the objection before oral proceedings; therefore, the Examining Division did not act in good faith in this respect;
- the claimed subject-matter involved an inventive step starting from any of documents D1 or D3 as closest prior art.

Claim 1 according to the main request reads as follows:

"1. A method (10) for ion exchange in an adsorbent (20), the method comprising:

calcining (42) an organic polymer-bound zeolite adsorbent by thermal treatment to yield a calcined adsorbent;
controlling (44) the temperature of the calcined zeolite adsorbent to a temperature of 50°C to 100°C;
treating (46) the controlled temperature calcined adsorbent with a lithium salt to yield a treated adsorbent;
washing (48) the treated adsorbent with an aqueous base to yield a washed adsorbent;
air drying (50) the washed adsorbent to yield an air-dried adsorbent;
drying (52) the air-dried adsorbent in a vacuum to yield a vacuum-dried adsorbent;
packing (54) the vacuum dried adsorbent in a bed; and
flowing (56) preheated nitrogen through the adsorbent."

Claim 1 according to auxiliary request 1 differs from claim 1 according to the main request insofar as the zeolite is specified to be a "zeolite **13-x**".

Claim 1 according to auxiliary request 2 differs from claim 1 according to the main request insofar as the treated adsorbent of step (46) is further specified by the appended features "*wherein the treated adsorbent has **99% Li exchange***".

Claim 1 according to auxiliary request 3 differs from claim 1 according to auxiliary request 2 insofar as the used zeolite is specified to be a "zeolite **13-x**".

IV. In its communication dated 5 August 2013, which was allegedly not received by the Appellant and which was, therefore, posted a second time on 29 October 2013, the Board expressed its provisional opinion that the reasoning of the decision under appeal could certainly

be understood and could not be considered to be insufficient. Moreover, the Applicant could have expected that the Examining Division would address and consider at the oral proceedings all potential deficiencies of the amended requests, including possible deficiencies under Article 56 EPC in view of the prior art referred to previously, as well as deficiencies under Article 84 EPC, in particular when arising from the amendments.

In said communication, the Board raised itself further objections *inter alia* regarding the clarity (Article 84 EPC) of the amended claims according to all requests.

In particular, the Board remarked that the term "*calcining*" contained in one step of the method of claim 1 according to all requests was ambiguous. This term was usually understood in the context of zeolite chemistry as referring to a step wherein organic components present were combusted, as disclosed e.g. in document D1; claims 17 and 20. However, the description of the application as filed (page 2, lines 9 to 16) indicated that the organic polymer binder to be used should be stable up to temperatures of at least 340°C. Since claim 1 mentioned neither the calcining temperature nor the type of organic polymer to be used nor the purpose of the calcining step, the claims 1 at issue lacked clarity (Article 84 EPC).

The Board also informed the Appellant that any amended claims filed in order to overcome these objections had to reach the Board at least two weeks before the date of oral proceedings and that new requests in the form of amended claims and/or description pages might be disregarded by the Board (reference was made to Articles 12(4) and 13(1), (3) RPBA), even when filed

within the deadline set, if they raised further issues under Articles 84 and 123(2) EPC.

- V. In a letter dated 22 October 2013, the Appellant maintained that the reasoning given in the contested decision was incomplete, in particular in that the reasoning did not appear to follow the problem-solution-approach, and that there was a "duty of clarity" when dealing with parties to the proceedings before the EPO.

With a further letter dated 30 December 2013 the Appellant submitted a further set of amended claims as auxiliary request 6 as well as eleven amended description pages labelled "ALL REQUESTS", REQUESTS AUX 1,3,4", "REQUESTS AUX 5", "REQUEST AUX 6", "REQUEST AUX 1" or "REQUEST AUX 4,5,6", respectively.

Moreover, the Appellant informed the Board that it would not be attending the hearing scheduled for 24 January 2014 and invited the Board to take its decision based upon the current state of the file.

In said letter, the Appellant also maintained its view that the decision under appeal was not adequately reasoned and stated the following:

"The objection that the Decision was not adequately reasoned is not because the Decision did not incorporate the reasoning of the Summons, but that the reasoning of the summons incorporated by reference in the Decision is itself inadequate for the reasons previously provided. That the *"appellant was apparently able to understand the arguments contained in said annex"* is not the relevant measure as to whether a decision is correctly reasoned or not."

Moreover, the Appellant submitted that according to common general knowledge the term "calcination" did not necessarily imply the combustion of organic components and stated the following:

"Hence, the combustion (a complex gas-solid reaction) of organic components is not an inevitable requirement of calcining. The removal of a volatile fraction is sufficient. Since the claim merely provides an organic polymer-bound zeolite then there was no reason to believe that the end process that calcining anything other than an organic polymer-bound zeolite. The claim does not appear unclear to the skilled person given the above definition of calcination."

The Appellant requested also the Board "to consider a Sixth Auxiliary Request as enclosed herein along with an amended description text pages 1 to 9 to replace those pages currently on file as indicated in the bottom left hand corner of the pages."

VI. Claim 1 according to auxiliary request 6, submitted with said letter of 30 December 2013, reads as follows:

*"1. A method (10) of producing a polymer-bound immobilized zeolite 13X adsorbent (20) for nitrogen adsorption from air, the method comprising:
calcining (42) the adsorbent by thermal treatment at a temperature from 150°C to 400°C to yield a calcined adsorbent;
controlling (44) the temperature of the calcined adsorbent at 50°C to 100°C throughout a step of treating (46) the temperature-controlled calcined adsorbent with lithium chloride to yield a treated adsorbent;
washing (48) the treated adsorbent with an aqueous base to yield a washed adsorbent;*

*air drying (50) the washed adsorbent to yield an air-dried adsorbent;
drying (52) the air-dried adsorbent in a vacuum to yield a vacuum-dried adsorbent;
packing (54) the vacuum dried adsorbent into a bed prior to flowing (56) preheated nitrogen through the adsorbent."*

VII. The requests as formulated by the Appellant in its last written submission dated 30 December 2013 read as follows:

"It is requested that the present application be either allowed by the Board in any of its Requests or that the application be referred back to the Examining Division so that a proper, reasoned, decision may be provided."

VIII. Oral proceedings were held on 24 January 2014 in the absence of the Appellant, at the end of which the Board gave its decision.

Reasons for the Decision

Procedural issues

1. Alleged substantial procedural violation
 - 1.1 According to the Appellant, the finding concerning an alleged lack of inventive step contained in the decision under appeal had not been adequately reasoned.
 - 1.2 The Board, however, notes that the Examining Division (see contested decision, point 2.2.2 of the reasons), explained why it considered document D3 instead of document D1 to represent the closest prior art,

indicated the differences between the subject-matter disclosed in document D3 and claim 1 according to the main request, explained why these differences could not support the presence of inventive step and why the tests contained in the application, invoked as support for inventive step by the Applicant, could not be considered to be applicable across the whole scope of claim 1.

- 1.2.1 Therefore, in the Board's view, the decision under appeal contains an intelligible chain of arguments which makes it clear for which reasons the Examining Division decided to refuse the application. In any case the reasoning given is not so incomplete or deficient or erroneous as to be insufficient within the meaning of Rule 111(2) EPC, as for instance in the cases reported in the "Case Law of the Boards of Appeal of the EPO", 7th edition 2013, III.K.4.2.3.
- 1.3 The Appellant did not raise any objection against the Examining Division's complementary reasoning with respect to the issue of inventive step with regard to to auxiliary requests 1 to 3, the lack of clarity identified in respect of the claims 1 according to auxiliary requests 2 and 3, or the non-compliance with the requirements of Article 123(2) EPC of claim 1 according to auxiliary requests 4 and 5 also contained in the decision under appeal (see point II above). The Board finds also that these other grounds for refusal were sufficiently reasoned in the decision under appeal.
- 1.4 Therefore, in the Board's judgement, the reasoning of the decision under appeal complies with the requirements of Rule 111(2) EPC.

1.5 Since the application was refused on the ground of lack of inventive step and on the other grounds mentioned above, there is no need to address the issue of whether or not the Examining Division committed a procedural violation in adding, as a ground for the refusal under Article 84 EPC, also the missing adaptation of the description to the amended claims.

1.6 As regards the further Appellant's objection submitted in the letter of 30 December 2013 that *"The objection that the Decision was not adequately reasoned is not because the Decision did not incorporate the reasoning of the Summons, but that the reasoning of the summons incorporated by reference in the Decision is itself inadequate for the reasons previously provided."*, the Board remarks that the decision partly repeated the reasoning contained in said communication attached to the summons but it did not actually "incorporate it by reference".

Moreover, the Applicant had explained in its letter of 6 November 2009 why the claimed subject-matter had to be considered inventive starting from any of the cited documents, including document D3.

In the following summons to attend oral proceedings of 10 November 2010 the Examining Division dealt with and rebutted the Applicant's arguments in favour of inventive step over D1 and D3.

Although the inventive step objection based on D3 as the closest prior art had not been explained in full detail before the issuance of the decision under appeal, the elements of the reasoning (D3 closest prior art, teaching of figure 4 not applicable to any polymer-bound zeolite) were already clearly indicated

in the summons and concerned a document already discussed by the Applicant. That this objection, based on the mentioned elements, could be somewhat complemented in reaching the final decision at the oral proceedings that took place in the absence of the Applicant, is something that the latter could have reasonably expected.

- 1.7 Therefore, in the Board's judgement, the Examining division did not commit any substantial procedural violation justifying the requested remittal of the case to the Examining Division for further prosecution pursuant to Article 111(2) EPC, let alone a reimbursement of the appeal fee pursuant to Rule 103(1)a) EPC.

Main request and auxiliary requests 1 to 3

2. Lack of clarity (Article 84 EPC)
- 2.1 The respective claims 1 at issue all concern (emphasis added) a "*method (10) for ion exchange in an adsorbent (20)*" comprising a calcining step reading "***calcining (42) an organic polymer-bound zeolite adsorbent by thermal treatment to yield a calcined adsorbent***" (in claims 1 according to auxiliary requests 1 and 3 a zeolite is a zeolite 13X).
- 2.2 In reply to the objection raised by the Board in its communication dated 5 August 2013 concerning the ambiguity of the term "*calcining*", and hence the lack of clarity of claim 1 (see point IV *supra*), the Appellant submitted that the following (quoting from Wikipedia) was common general knowledge:
"Calcination (also referred to as calcining) is a thermal treatment process in presence of air or oxygen

applied to ores and other solid materials to bring about a thermal decomposition, phase transition, or removal of a volatile fraction. The calcination process normally takes place at temperatures below the melting point of the product materials. Calcination is not the same process as roasting. In roasting, more complex gas-solid reactions take place between the furnace atmosphere and the solids."

Therefore, in the Appellant's view, the combustion of organic components was "not an inevitable requirement of calcining" and that "the removal of a volatile fraction is sufficient". Considering that the claim "provides an organic polymer-bound zeolite", "interpretation that the polymer is not combusted during the calcining step" was in accord with the above definition of calcination. It would thus have been clear to the skilled person that the calcining process step according to claim 1 did not bring about a combustion of the polymer and did not lead to anything other than a calcined organic polymer-bound zeolite.

2.3 For the Board, it is however evident, on the one hand, from the definition of the term "*calcining*" submitted by the Appellant as well as, on the other hand, from the use of this term in document D1, relating to the preparation of a zeolite adsorbent comprising a calcining step, that "*calcining*" may or may not imply the combustion of organic matter present. Reference is made in particular to the following passages of D1: claims 17 and 20; column 3, lines 31 to 42; column 7, lines 31 to 37 and column 8, lines 41 to 44, the latter reading (emphasis added) "*The beads were **calcined** to convert kaolin into metakaolin. In those samples containing fibers the fibers were **combusted** or burned out to create cylindrical channels within the beads*").

2.3.1 The ambiguity addressed above is not lifted by the remaining wording of claims 1 at issue. More particularly, the Board notes that said claims 1 are directed to a method for ion-exchange in an adsorbent resulting from the calcination of a polymer-bound adsorbent and not to a method for producing a polymer-bound adsorbent, and the other process steps referred to are of no help in identifying whether or not the adsorbent product subjected to ion-exchange according to claim 1 is still polymer-bound.

2.3.2 The description of the present application contains no specific definition of the term "*calcining*" either and merely suggests in two instances that the polymer binder used should be stable up to temperatures of at least 340°C (page 2, lines 15 to 16) or stable at high temperature (page 5, lines 1 to 2), which feature is, however, not reflected in the wording of claim 1. In particular, the claims 1 at issue neither mention the calcining temperature nor the type of polymer to be used.

Since different calcining temperatures can lead to different calcined products depending on the combustibility of the organic polymers used and since, moreover, the purpose of the calcining step is not further specified in the claims 1 at issue, the extent and result of the calcining step required by said claims is ambiguous and hence unclear (Article 84 EPC).

2.3.3 The Appellant's understanding of the wording of said claims 1 (calcination mandatorily non-combusting) and its conclusion based thereon that said claims are clear cannot be accepted based on the following considerations:

It is established case law that a claim cannot be considered clear within the meaning of Article 84 EPC if it comprises an unclear technical feature for which no unequivocal generally accepted meaning existed in the relevant art (see e.g. T 728/98, OJ 2001, 319, point 3.1 of the reasons) and that a claim has to be clear in itself, without there being any need for the skilled person to refer to the description (see e.g. T 1129/97, OJ 2001, 273, point 2.1.2 of the reasons).

Moreover, any argument for a narrower scope of a claim (here: allegedly mandatory non-combusting calcination) must be based on the wording of the claim, and not on the basis of something appearing only in the description, considering the possibility available to an applicant to restrict the wording of the claims by suitable amendments to better reflect the intended meaning.

- 2.4 Therefore, the main request and the auxiliary requests 1 to 3 are not allowable.

Notional auxiliary requests 4 and 5

3. Admissibility of notional auxiliary requests 4 and 5 into the proceedings

- 3.1 In its statement of the grounds of appeal the Appellant stated explicitly that the auxiliary request 4 submitted before the Examining Division was not maintained and remained silent concerning the auxiliary request 5 submitted before the Examining Division. The Appellant did not subsequently submit written-out sets of claims to be considered as auxiliary requests 4 or 5. Neither do the Appellant's written submissions contain an indication concerning the written-out form

such requests should or could have. It merely noted (letter of 30 December 2013, page 2, last paragraph) that "Article 123 objections were not provided ... in the Decision (with the exception of the Fifth Auxiliary Request)".

3.2 Nevertheless, the Appellant submitted with letter of 30 December 2013, i.e. after having been summoned to oral proceedings, some amended description pages labelled (emphasis added) "ALL REQUESTS", "REQUESTS AUX 1,3,4", "REQUESTS AUX 5" "REQUEST AUX 4,5,6" (see point VI above).

3.3 In view of the Appellant's course of action, the Board was thus left to speculate

- concerning the question of whether or not auxiliary request/s 4 and/or 5 were implicitly submitted by virtue of said letter of 30 December 2013, and if yes
- concerning the respective complete set/s of claims on the basis of which the application should be granted.

3.4 Assuming, purely for the sake of argument, that the Appellant indeed submitted two requests to be considered as auxiliary request/s 4 and/or 5, the Board notes

- that these requests were filed surprisingly and at a very late stage of the proceedings, and
- that these requests are *prima facie* not clearly allowable since the Appellant did not unambiguously indicate the complete text (within the meaning of Article 113(2) EPC) including fully written out claims on which it requests that a patent be granted.

3.5 Consequently, even if deemed filed, the notional auxiliary requests 4 and 5 would not be admissible (Article 114(2) EPC and Articles 13(1), (3) RPBA).

Auxiliary request 6

4. Admissibility of the request into the proceedings
- 4.1 Auxiliary request 6 consists of amended claims and description pages and was submitted by the Appellant with letter of 30 December 2013, i.e. after having received the summons to oral proceedings but more than three weeks before the date of oral proceedings.
- 4.2 Article 13(1) RPBA stipulates that any amendment to a party's case after it has filed its grounds of appeal may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of *inter alia* the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy. Furthermore, Article 13(3) RPBA stipulates that amendments sought to be made after oral proceedings have been arranged shall not be admitted if they raise issues which the Board cannot reasonably be expected to deal with without adjournment of the oral proceedings.
- 4.3 In the present case the Board, in its communication dated 5 August 2013, informed the Appellant
 - that any amended claims filed in order to overcome the objections raised under Articles 123(2) and 84 EPC had to reach the Board at least two weeks before the date of oral proceedings, but
 - that new requests in the form of amended claims and/or description pages might be disregarded by the Board, even when filed within the deadline set, in view of the provisions of Articles 12(4) and 13(1), (3) RPBA .
- 4.4 Claim 1 at issue relates to (emphasis added) a "*method (10) of producing a polymer-bound immobilized zeolite*

13X **adsorbent** for nitrogen adsorption from air" comprising the step of "**calcining** (42) **the adsorbent** by thermal treatment at a temperature from 150°C to 400°C **to yield a calcined adsorbent**" (see point VIII above).

- 4.5 The Board acknowledges that this wording requires that a polymer-bound immobilized zeolite 13X adsorbent is produced by the claimed method. However, given the possible meaning of the term "*calcining*" (see points 2.2 to 2.3.2 *supra*), claim 1 at issue is ambiguous in that it does not specify whether said "*calcining*" step is to be applied to an already formed organic polymer-bound zeolite 13X or, for example, to a zeolite 13X adsorbent before its incorporation into a composite of organic polymer binder and zeolite. The remaining wording of claim 1 defining the other steps of the method does not clarify this issue.
- 4.5.1 Therefore, in the Board's judgement, claim 1 at issue is *prima facie* not clearly allowable under Article 84 EPC. Moreover, it raises a further issue not previously addressed regarding the compliance with the requirements of clarity, said issue arising from the amendments made.
- 4.6 Taking this into account, the Board decided not to admit auxiliary request 6 into the proceedings (Article 114(2) EPC and Articles 13(1), (3) RPBA).

Conclusion

5. None of the Appellant's requests is found to be admissible and allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



D. Magliano

B. Czech

Decision electronically authenticated