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D E C I S I O N
of 6 April 2005

Case Number: T 0835/02 - 3.3.1

Application Number: 96307323.4

Publication Number: 0769486

IPC: C07C 53/08

Language of the proceedings: EN

Title of invention:
Process for the production of acetic acid by the carbonylation of dimethyl ether

Patentee:
BP Chemicals Limited

Opponent:
Haldor Topsoe A/S

Headword:
Acetic acid/BP CHEMICALS

Relevant legal provisions:
EPC Art. 54, 111(1)

Keyword:
"Novelty (yes) - no unambiguous disclosure"
"Remittal for further prosecution (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0835/02 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 6 April 2005

Appellant: (Proprietor of the patent)
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Respondent: (Opponent)
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Representative:
-

Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 24 July 2002 revoking European patent No. 0769486 pursuant to Article 102(1) EPC.

Composition of the Board:

Chairman: P. P. Bracke
Members: P. F. Ranguis
S. C. Perryman

Summary of Facts and Submissions

I. The Appellant (Proprietor of the patent) lodged an appeal against the decision of the Opposition Division to revoke the European patent No. 0 769 486 (European application No. 96 307 323.4) in the form as granted.

II. The patent in suit was granted with a set of twelve claims, of which the correct version of Claim 1, the sole independent claim, read as follows (the printed version containing an error):

"1. A process for the production of acetic acid which process comprises reacting carbon monoxide with a carbonylatable reactant introduced to a reactor in which there is maintained at elevated temperature a liquid reaction composition comprising a Group VIII noble metal catalyst, methyl iodide promoter, an optional co-promoter, and at least a finite concentration of water characterised in that the carbonylatable reactant comprises greater than 10% by weight dimethyl ether and the concentration of water in the liquid reaction composition is maintained from 1 to 10% by weight."

III. Notice of opposition sought revocation of the patent in suit in its entirety on the grounds of lack of novelty and lack of inventive step under Article 100(a) EPC. The lack of novelty objection was supported *inter alia* by document:

(3) US-A-5 214 203.

In the course of the opposition proceedings the Opponent (now Respondent) submitted a partial translation in English of document

(3a) JP-A-3334/1972

referred to in document (3)

IV. In its decision, the Opposition Division held that the subject-matter of Claim 1 (cf. point II above) lacked novelty over document (3) for the following reasons:

Document (3) disclosed a process for producing carboxylic acids such as acetic acid by carbonylation in liquid phase of an alcohol or alcohol derivative in the presence of carbon monoxide. By reference in the description of document (3) to document (3a), dimethyl ether was unambiguously disclosed as a derivative of methyl alcohol suitable as a feedstock for such a process of making acetic acid. Furthermore, the feature of Claim 1 requiring that the concentration of water in the liquid reaction composition is **maintained** from 1 to 10% by weight could not distinguish the claimed subject-matter from document (3). Indeed, such a feature could only be understood in view of the description and the examples of the patent in suit in the sense that the liquid reaction composition fed into the reactor at the beginning of the process for the production of acetic acid should contain water in the range of 1 to 10% by weight **and** that the water concentration of the composition in the reactor at a time point from the beginning of the process should again contain water in the range of 1 to 10% by weight. However, the carbonylation reaction solution according

to document (3) contained "from about 1 mol to about 5 mols of water", i.e. about 1.8 to 9.0% by weight at the beginning of the process and there should also be a time point wherein the water concentration was still maintained in that specified range after or shortly after the beginning of the reaction.

The decision of the Opposition Division was completely silent about novelty over further cited documents and about the inventive step issue.

V. With the statement of grounds of appeal, the Appellant submitted a set of ten claims as auxiliary request. However, in view of the outcome of the decision, it is not necessary to give details concerning it.

VI. By a communication attached to the summons to oral proceedings, the Board had informed the parties that since the Opposition Division had revoked the patent under Article 54(2) EPC, and the contested decision was completely silent about the inventive step issue, should the Board come to the conclusion that the requirement of Article 54(2) EPC were met for one of the requests, it would be normal practice of the Boards of appeal of the EPO to remit the case to the first instance for further prosecution, thus avoiding that the parties be deprived of the possibility of having two instances of decision on other issues.

At the oral proceedings which took place on 6 April 2005, neither the Appellant nor the Respondent raised any objection to proceeding in this manner.

VII. The Appellant's arguments in the course of the written proceedings and during the oral proceedings may be summarized as follows:

Claim 1 of the patent as granted (cf. point II above) required that the water concentration had to be maintained throughout the course of the reaction within the defined range, i.e. from 1 to 10% by weight. This definition was consistent with the description of the patent in suit (see section [0013], page 3) along with the dictionary meaning of the word "maintain" as recited in document

(9) The Concise Oxford Dictionary of Current English, eighth edition, 1990, page 715.

The fact that the water concentration range had been restricted in Claim 1 as granted compared to Claim 1 as originally filed could only have an impact on whether some of the examples were still within the scope of Claim 1 as granted but could not change the meaning of the word "maintain".

By contrast, there was no disclosure in document (3) of the concept or the need to **maintain** the water concentration throughout the course of the reaction from 1 to 10% by weight.

Still less did document (3) disclose maintaining the required water concentration range in connection with a carbonylatable reactant comprising greater than 10% by weight dimethyl ether.

VIII. The Respondent's arguments in the course of the written proceedings and during the oral proceedings may be summarized as follows:

Document (3) disclosed in Claim 1 a process for producing carboxylic acids which required the maintenance of the water concentration throughout the reaction within a range of from about 1 mol to about 5 mols of water, i.e. about 1.8% to about 9% by weight.

Contrary to the Appellant's view, Claim 1 of document (3) did not refer to the initial water concentration in the reactor feed but disclosed the maintenance of the water concentration throughout the reaction within the defined range.

That finding emerged clearly from the bridging paragraph, columns 5 and 6, which disclosed that water was necessary to maintain ("keeping") a desired concentration of a water-soluble iodide in the reaction system. The amount of water required to maintain the concentration in iodide salts was generally at least 1 mol/l in methyl acetate, which however could be replaced by other alcohol derivatives such as dimethyl ether alone or in mixture as set out in document (3) or in document (3a) incorporated by reference in document (3). Example 21 also met this requirement.

Therefore, Claim 1 of document (3) disclosed the maintenance of the water concentration throughout the reaction within a range of about 1 mol to about 5 mols, i.e. 1.8 to 9%, in order to ensure that the concentration range of the iodide salt in the reaction mixture was kept within the indicated range.

The water concentration range of 1 to 10% by weight defined in Claim 1 of the patent in suit was moreover an arbitrary selection versus a purposive selection and, therefore, could not confer novelty according to the Jurisprudence of the Boards of Appeal.

Furthermore, there was no indication in the patent in suit as to how the water concentration should be maintained within 1% to 10% by weight throughout the reaction. Examples 1 and 5 showed that the water concentration decreased below the lower limit of said range. Therefore, the term "maintained" as used in Claim 1 had the meaning set forth in the decision of the Opposition Division.

IX. The Appellant requested that the decision under appeal be set aside and that the case be remitted to the first instance for further prosecution on the basis of the claims as granted or of the claims of the auxiliary request submitted on 20 November 2002.

The Respondent requested that the appeal be dismissed.

X. At the end of the oral proceedings the decision of the Board was announced.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. Authentic text of Claim 1 of the patent as granted.

2.1 The characterizing part of Claim 1 attached to the communication under Rule 51(4) EPC dated 1 July 1999 read:

"characterised in that the carbonylatable reactant comprises greater than 10% by weight dimethyl ether and the concentration of water in the liquid reaction composition is from 1 to 10% by weight."

2.2 The Applicant requested by a letter dated 29 October 1999 that Claim 1 be amended to insert the word "maintained" before the word "from".

2.3 The communication under Rule 51(6) EPC dated 23 November 1999 stated that the Examining Division had accepted the proposed amendment (see point 2.2 above).

2.4 In view of the above, the Board acknowledges that the correct version of Claim 1 on which the decision to grant is based is that recited in point II above, and not that appearing in the printed text of the patent.

3. *Article 54 EPC - Novelty*

3.1 Document (3) discloses a process for producing carboxylic acids such as acetic acid by a liquid phase carbonylation reaction of an alcohol or its derivative with carbon monoxide carried out in the presence of a catalyst system containing rhodium component, an alkyl halide which is an alkyl iodide or bromide, water and

an iodide salt (see col. 1, lines 9 to 10 and col. 2, lines 42 to 51). Alkyl iodide is, in particular, methyl iodide (see col. 2, lines 66 to 68 and examples). The reaction temperature is in the range of 50°C to 300°C, preferably 100°C to 240°C (see col. 6, lines 62 to 63).

3.2 From the above, the Board concurs with the parties that the sole question to be decided is whether or not document (3) unambiguously discloses that the carbonylatable reactant comprises greater than 10% by weight dimethyl ether and the concentration of water in the liquid reaction composition is maintained from 1 to 10% by weight.

3.3 The parties have expressed divergent views concerning the meaning of the word "maintained" in Claim 1 (see point II above).

The words used in a claim must be given their ordinary meaning even if this means that some described embodiments do not fall within the claim. It is not legitimate to "interpret" the words of a claim in a way which contradicts their ordinary meaning by reliance on an embodiment. Claims are frequently amended during prosecution such that some embodiments no longer fall thereunder. In the present case, the ordinary meaning, consistent with the dictionary definition of "maintained", of the expression "the concentration of water in the liquid reaction composition is maintained from 1 to 10% by weight" is that the water concentration has to be maintained throughout the course of the reaction within the defined range, i.e. from 1 to 10% by weight.

The Respondent's objections regarding the absence of an indication in the patent in suit as to how to maintain the water concentration within 1 to 10% by weight and that examples 1 and 5 are no longer within the scope of Claim 1 due to the restriction during the Examining proceedings of the water concentration range are not an objection under Article 100(a) EPC and consequently are not relevant for assessing novelty.

3.4 In support of his contention that the water concentration being maintained within 1 to 10% by weight was not a distinguishing feature, the Respondent relied on Claim 1 of document (3) which recites a process for producing carboxylic acid involving the carbonylation of an alcohol or reactive derivative wherein the carbonylation reaction solution contains about 1 mol to about 5 mols of water (see col. 12, lines 49 to 50) which amounts to about 1.8% to about 9% by weight.

Although the disclosure of Claim 1 of document (3) is silent about the need to **maintain** the water concentration within the range defined in Claim 1 of the patent in suit, the Respondent was nevertheless of the opinion that this was not in itself sufficient for there to be novelty of the claimed subject-matter, since information not set out explicitly might nevertheless be implicit in the sense that the skilled reader inevitably derives such information from the document.

The Respondent relied in that respect upon the description of document (3) arguing that keeping a desired concentration of water-soluble iodide in the

reaction system necessarily implied maintaining the water concentration. However, although the Board concurs with the Respondent that water must be present throughout the reaction, nowhere can it be found in document (3) that the water concentration must be maintained within the range defined in Claim 1 of the patent in suit. Rather, most of the examples of document (3) provide evidence to the contrary since the water concentration after completion of the reaction varies in a wide range extending well above the defined range. It follows that Document (3) does not unambiguously disclose **maintaining** the water concentration within the range defined in Claim 1 of the patent in suit and for this reason already does not anticipate the claimed subject-matter.

Another reason for acknowledging novelty is the requirement that the carbonylatable reactant comprises greater than 10% by weight dimethyl ether. While Claim 1 of document (3) relates to an alcohol or reactive derivative, it does not point unambiguously to the carbonylating reactant defined in Claim 1 of the patent in suit.

The Board does not ignore that a non limitative list of alcohol derivatives disclosed in document (3) includes alkyl esters, alkyl ethers and alkyl halides and that dimethyl ether is explicitly mentioned as an ether (see col. 1, lines 32 to 42). This, however, cannot constitute an unambiguous disclosure of a process involving the use of a carbonylatable reactant comprising greater than 10% by weight dimethyl ether **while** maintaining the water concentration within the range defined in Claim 1.

3.5 Nor can reference to document (3a) cited in document (3) alter this conclusion since the passage which the Respondent refers to ("when acetic acid is a desired product, the feed stock is made of methyl alcohol; the derivative thereof such as dimethyl ether, methyl acetate, etc.; and/or the mixture thereof") does not point unambiguously to the carbonylatable reactant defined in Claim 1 of the patent in suit.

3.6 In view of the above the Board comes to the conclusion that document (3) does not disclose unambiguously a process for producing acetic acid wherein the carbonylatable reactant comprises greater than 10% by weight dimethyl ether and the concentration of water in the liquid reaction composition is maintained from 1 to 10% by weight.

Thus, document (3) does not destroy the novelty of Claim 1 of the patent in suit. Claims 2 to 12 depend on Claim 1, and thus must likewise be considered novel.

4. In view of the outcome of the decision there is no need to deal with the auxiliary request (see point V above).

5. *Remittal to the first instance - Article 111(1) EPC*

5.1 The Board has come to the conclusion that the subject-matter of Claim 1 of the patent in suit as granted was not anticipated by the disclosure of document (3) overcoming, therefore, the sole reason for revoking the European Patent relied on by the first instance.

5.2 However, in addition to the objection of lack of novelty over document (3), the opposition sought revocation of the patent in suit for lack of novelty over further documents and for lack of inventive step.

5.3 Given that the decision of the first instance was completely silent regarding novelty over further documents cited and the inventive step issue, that the function of the Boards of Appeal is primarily to give a judicial decision upon the correctness of the earlier decision taken by the first instance and that neither the Appellant nor the Respondent raised any objection against the proposed remittal to the first instance for further prosecution which had been foreshadowed in the Board's preliminary communication, the Board exercises its discretion under Article 111(1) EPC to remit the case to the first instance for further prosecution.

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 the claims as granted.

The Registrar: The Chairman:

N. Maslin P. P. Bracke