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Datasheet for the decision of 5 March 2008

Case Number: T 0201/05 - 3.3.10

Application Number: 97934647.5

Publication Number: 0877727

IPC: C07C 53/08

Language of the proceedings: EN

Title of invention:
Integrated process for the production of vinyl acetate and/or acetic acid

Patentee:
BP Chemicals Limited

Opponent:
CELANESE LIMITED

Headword:
Process for production of vinyl acetate/BP CHEMICALS LTD

Relevant legal provisions:
EPC Art. 100(c)

Keyword:
"Amendments (not allowable) - not directly and unambiguously derivable from application as filed"

Decisions cited:
T 0680/93

Catchword:
-

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Case Number: T 0201/05 - 3.3.10

D E C I S I O N
of the Technical Board of Appeal 3.3.10
of 5 March 2008

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 14 December 2004 rejecting the opposition filed against European patent No. 0877727 pursuant to Article 102(2) EPC 1973.

Composition of the Board:

Chairman: P. Gryczka
Members: J. Mercey
P. Schmitz

Summary of Facts and Submissions

I. The Appellant (Opponent) lodged an appeal on 9 February 2005 against the decision of the Opposition Division of 14 December 2004 rejecting the opposition against European patent No. 877 727 which was granted on the basis of fifteen claims, claim 1 of which reading as follows:

"An integrated process for the production of acetic acid and/or vinyl acetate which comprises the steps:
(a) contacting in a first reaction zone a gaseous feedstock comprising ethylene and/or ethane and optionally steam with a molecular oxygen-containing gas in the presence of a catalyst active for the oxidation of ethylene to acetic acid and/or ethane to acetic acid and ethylene to produce a first gaseous product stream comprising carbon monoxide, acetic acid, water and ethylene (either as unreacted ethylene and/or as co-produced ethylene) and optionally also ethane carbon dioxide and/or nitrogen;
(b) contacting in a second reaction zone in the presence or absence of additional ethylene and/or acetic acid at least a portion of the first gaseous product stream comprising at least carbon monoxide, acetic acid and ethylene and optionally also one or more of water, ethane carbon dioxide and/or nitrogen with a molecular oxygen-containing gas in the presence of a catalyst active for the production of vinyl acetate to produce a second product stream comprising vinyl acetate, water, acetic acid and optionally ethylene, the contacting in said second reaction zone being carried out heterogeneously with ethylene, acetic acid and molecular oxygen-containing gas being present

in the gas phase; the catalyst used in the second reaction zone being a palladium-containing catalyst comprising palladium, an alkali metal acetate promoter and an optional co-promoter on a catalyst support and carbon monoxide from the first reaction zone being consumed in the presence of oxygen and the palladium-cantaining catalyst

(c) separating the product stream from step (b) by distillation into an overhead azeotrope fraction comprising vinyl acetate and water and a base fraction comprising acetic acid;

(d) either (i) recovering acetic acid from the base fraction separated in step (c) and optionally recycling the azeotrope fraction separated in step (c) after partial or complete separation of the water therefrom to step (c),

or (ii) recovering vinyl acetate from the azeotrope fraction separated in step (c) and optionally recycling the base fraction separated in step (c) to step (b),

or (iii) recovering acetic acid from the base fi-action separated in step (c) and recovering vinyl acetate from the overhead azeotrope fraction recovered in step (c)."

II. Notice of Opposition had been filed by the Appellant requesting revocation of the patent as granted in its entirety on the grounds of *inter alia* added subject-matter (Article 100(c) EPC).

III. The Opposition Division held that the subject-matter claimed did not extend beyond the content of the application as filed.

IV. In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal, the Board informed the parties that the question arose whether or not the subject-matter of *inter alia* claim 1 as granted extended beyond the content of the application as filed.

V. The Appellant submitted that the subject-matter of granted claim 1 extended beyond the content of the application as filed, more particularly that there was no basis for the following features:

(a) carbon monoxide being present in the first gaseous product stream and in the portion of the first product stream which is contacted in the second reaction zone;
(b) the contacting in said second reaction zone being carried out heterogeneously with ethylene, acetic acid and molecular oxygen-containing gas being present in the gas phase;
(c) the palladium-containing catalyst in the second reaction zone comprising palladium, an alkali metal acetate promoter and an optional co-promoter on a catalyst support and carbon monoxide from the first reaction zone being consumed in the presence of this catalyst;
(d) let alone the *combination* of these features.

The Appellant argued in particular with regard to feature (c), that the only catalyst disclosed in the application as filed for use in combination with carbon monoxide was "a palladium-containing catalyst", referring to original claim 14 and page 10, lines 10 to 13 as filed in this respect. However, there was no basis in the application as filed for this "palladium-

containing catalyst" comprising, as required by granted claim 1, palladium, an alkali metal acetate promoter and an optional co-promoter on a catalyst support. In fact the catalyst defined in claim 1 as granted was disclosed only on page 1, lines 21 to 23 of the application as filed in the acknowledgement of the prior art, namely as a suitable catalyst for the commercial production of vinyl acetate. Furthermore, the only specific catalysts active for the production of vinyl acetate disclosed in the application as filed, namely those from page 9, line 24 to page 10, line 9, were much more specifically defined than those of claim 1 of the patent in suit, since, *inter alia*, these specific catalysts contained gold.

VI. The Respondent (Proprietor of the patent) submitted that all amendments found support in the application as filed. More particularly, the palladium-containing catalyst defined in original claim 14 was a catalyst active for the production of vinyl acetate, which according to page 9, lines 21 to 23 as filed, comprised "any suitable catalyst known in the art". Page 1, lines 19 to 23 of the application as filed indicated that suitable catalysts known in the art comprised palladium, an alkali metal acetate promoter and an optional co-promoter on a catalyst support. Furthermore, the only specific catalysts active for the production of vinyl acetate disclosed in the application as filed, namely those from page 9, line 24 to page 10, line 9, fell under the disputed definition, as did the only palladium catalysts for the production of vinyl acetate which were commercially available at the priority date of the patent in suit. The skilled person had thus every reason to seriously contemplate using a catalyst

as described on page 1, lines 19 to 23 of the application as filed in the production of vinyl acetate in the presence of carbon monoxide.

VII. The Appellant requested that the decision under appeal be set aside and the patent be revoked.

The Respondent requested that the appeal be dismissed.

VIII. At the end of the oral proceedings held on 5 March 2008 the decision of the Board was announced.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments (Article 100(c) EPC)*

2.1 The Appellant opposed the patent in suit on the ground that the subject-matter of that patent extended beyond the content of the application as filed. Consequently, the Board must examine whether or not this objection is well founded.

2.2 Claim 1 of the patent in suit is directed to an integrated process for the production of acetic acid and/or vinyl acetate, wherein *inter alia* the following features had been introduced into claim 1 of the application as filed, namely that the gaseous stream fed to the second reaction zone comprises carbon monoxide as mandatory component, the catalyst used in the second reaction zone is a palladium-containing catalyst comprising palladium, an alkali metal acetate

promoter and an optional co-promoter on a catalyst support, and carbon monoxide from the first reaction zone is consumed in the presence of oxygen and the palladium-containing catalyst. The Appellant objected to these features as generating subject-matter extending beyond the content of the application as filed.

2.3 In order to determine whether an amendment generates subject-matter extending beyond the content of the application as filed, it has to be examined whether technical information has been introduced which a skilled person would not have directly and unambiguously derived from the application as filed (see decision T 680/93, point 2 of the reasons, not published in OJ EPO).

2.4 In support of these features, the Respondent referred to original claim 14, together with page 9, lines 21 to 23 and page 1, lines 19 to 23 of the application as filed.

Original claim 14 indicates that "a palladium-containing catalyst is used in the second reaction zone and carbon monoxide from the first reaction zone is consumed by reaction therewith". However, the palladium-containing catalyst is not further defined, such that this claim alone cannot provide a basis for the catalyst in step (b) of claim 1 comprising palladium, an alkali metal acetate promoter and an optional co-promoter on a catalyst support. The only reference in the description to a palladium-containing catalyst being used in the presence of carbon monoxide is at page 10, lines 10 to 13 of the application as

filed, said passage also not providing any further definition of said palladium-containing catalyst.

The passage at page 9, lines 21 to 23, to which the Respondent referred, states that the catalyst active for the production of vinyl acetate which is used in step (b) may comprise any suitable catalyst known in the art, for example as described in GB 1 559 540 and US 5,185,308. The catalysts of these two patent specifications are then further defined from page 9, line 24 to page 10, line 9. However, firstly, this passage does not disclose the use of these catalysts in step (b) of the claimed process in the presence of carbon monoxide such that this passage cannot be combined with the disclosure of original claim 14. Secondly, these catalysts, although falling under the disputed catalyst definition, namely comprised of palladium, an alkali metal acetate promoter and an optional co-promoter on a catalyst support, are more specifically defined than the catalyst in claim 1 of the patent in suit, since, *inter alia*, they additionally contain gold, such that these catalysts cannot provide support for the more general definition in disputed claim 1.

The passage at page 1, lines 19 to 23, to which the Respondent also referred, indicates that vinyl acetate is generally prepared commercially by contacting acetic acid and ethylene with molecular oxygen in the presence of a catalyst active for the production of vinyl acetate, where suitably the catalyst may comprise palladium, an alkali metal acetate promoter and an optional co-promoter on a catalyst support. This passage, however, forms part of the description of the

prior art, said description beginning at page 1, line 6 and continuing until page 2, line 32 of the application as filed. There is no indication in the application as filed that this particular catalyst described on page 1, lines 19 to 23 should be used in the claimed integrated process, let alone when step (b) thereof is carried out in the presence of carbon monoxide.

The Respondent argued that this passage on page 1, lines 19 to 23 should be read in combination with the passage on page 9, lines 21 to 23, this latter passage referring to step (b) being carried out with "any suitable catalyst known in the art", such that the skilled person would seriously contemplate using the prior art catalyst described on page 1, lines 19 to 23, particularly since the only palladium catalysts for the production of vinyl acetate which were commercially available at the priority date of the patent in suit fell under this catalyst definition. However, as already addressed above, this passage on page 9, lines 21 to 23 does not relate to step (b) being carried out in the presence of carbon monoxide, such that even if this passage could be combined with the aforementioned passage on page 1, it cannot provide a basis for a catalyst for use in the claimed process in the presence of carbon monoxide.

2.5 Thus original claim 14 in combination with the passages on page 9, lines 21 to 23 and page 1, lines 19 to 23 of the application as filed cannot provide a basis, neither explicitly not implicitly, for the amendment to claim 1 requiring that the catalyst used in the second reaction zone in the presence of carbon monoxide is a palladium-containing catalyst comprising palladium, an

alkali metal acetate promoter and an optional co-promoter on a catalyst support. Nor can the Board find any other basis in the application as filed for this amendment.

2.6 For the reasons given above, the Board concludes that claim 1 of the patent in suit extends the subject-matter claimed beyond the content of the application as filed, thus justifying the ground for opposition pursuant to Article 100(c) EPC. In these circumstances, the Respondent's sole request must be refused.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

P. Cremona P. Gryczka