

**Internal distribution code:**

- (A) [ ] Publication in OJ  
(B) [ ] To Chairmen and Members  
(C) [X] To Chairmen

**D E C I S I O N**  
of 11 January 1999

**Case Number:** T 0546/96 - 3.3.1  
**Application Number:** 91201838.9  
**Publication Number:** 0470655  
**IPC:** C07C 41/06

**Language of the proceedings:** EN

**Title of invention:**  
Process for preparing tertiary alkyl ethers and apparatus for  
reactive distillation

**Applicant/Patentee:**  
ENIRICERCHE S.p.A., et al

**Opponent:**  
-

**Headword:**  
Fixed catalytic beds/ENIRICERCHE et al

**Relevant legal provisions:**  
EPC Art. 123(2), 111(1)

**Keyword:**  
"Amendments - added subject matter (no) - insertion of a  
feature unmistakably derivable from drawings"

**Decisions cited:**  
-

**Catchword:**  
-



Europäisches  
Patentamt

European  
Patent Office

Office européen  
des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number: T 0546/96 - 3.3.1

D E C I S I O N  
of the Technical Board of Appeal 3.3.1  
of 11 January 1999

Appellant: ENIRICERCHE S.p.A. et al  
Corso Venezia 16  
IT - 20121 Milano (IT)

Representative: Fusina, Gerolamo  
Ing. Barzanò & Zanardo Milano S.p.A.  
Via Borgonuovo, 10  
IT - 20121 Milano (IT)

Decision under appeal: Decision of the Examining Division of the  
European Patent Office posted 4 January 1996 ;  
refusing European patent application  
No. 91 201 838.9 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. J. Nuss  
Members: P. P. Bracke  
S. C. Perryman

## Summary of facts and submissions

I. The appeal lies from the Examining Division's decision, dispatched on 4 January 1996, refusing European patent application No. 91 201 838.9, published as EP-A-0 470 655, since the application as amended during the examination proceedings contravened Article 123(2) EPC.

II. The decision was based on Claims 1 to 4 filed with letter of 5 May 1994 (received 9 May 1994) with the amendments in Claim 1 filed with letter of 3 August 1995 (received 8 August 1995); pages 1 and 5 to 9 as originally filed and pages 2 to 4 filed with letter of 3 August 1995 (received 8 August 1995) of the description; and Figures 1 to 12 as originally filed.

The only independent claim read:

"1. Process for preparing tertiary alkyl ethers, in particular methyl-tert.-butyl-ether (MTBE) from isoolefins and aliphatic alcohols, comprising the following steps:

- feeding a feedstock containing the iso-olefin and, possibly, a portion of the aliphatic alcohol to a fractionation tower fitted with trays, wherein some of said trays are equipped with catalyst beds;
- feeding at least a portion of the aliphatic alcohol, alone, at a point near of the head of the fractionation tower;

- reacting said iso-olefin with said alcohol on the catalyst bed bearing trays, with said catalyst beds being submerged in the reactant mixture, to form a tert.-alkyl-ether product;
- separating the tert.-alkyl-ether product from any unreacted hydrocarbon, unreacted alcohol and azeotropic mixtures of alcohol and hydrocarbon as substantially pure ether obtained as a bottom product stream;
- and obtaining any unreacted hydrocarbons, unreacted alcohol, and azeotropic mixtures as an overhead stream, said formation of tert.-alkyl-ether and separation thereof from accompanying hydrocarbon and compounds being carried out at a pressure comprised within the range of from 200 to 3000 kPa, at a temperature comprised within the range of from room temperature to 200°C,

characterized in that in said tray-fitted fractionation tower the liquid reactant mixture flows through **fixed catalytic beds** in the catalytic trays in the cross direction relative to the axis of the fractionation tower." (emphasis added)

III. The Examining Division found that the insertion of the term "**fixed**" for specifying the catalytic beds in Claims 1 to 3 (see the emphasised part of Claim 1) was not allowable since it was not disclosed in the application as filed. As one of the reasons why the Examining Division was of the opinion that fixed catalytic beds were not disclosed in the application as filed it was said in the appealed decision that "the argumentation based on the figures 3, 4, 7, 8, 11 and 12, whereby the gas does not pass upwardly in the bed and therefore fixed beds are used is not clear and does

not convince, since figures 1, 2, 5, 6, 9 and 10 shows that for the same kind of drawings the gas phase does pass upwardly".

IV. The Appellant argued that fixed catalytic beds were disclosed in figures 3, 4, 7, 8, 11 and 12 of the application as filed, since (i) the formation of a fluidised bed required necessarily an upstream direction of the gaseous flow through the catalytic bed, as may be derived from document

(4) D. Geldart, Gas Fluidization technology, 1986, page 1,

(ii) a skilled person would acknowledge that those figures represent a fixed-bed catalyst and (iii) those figures, thus, disclosed fixed catalytic beds.

V. The Appellant stated that the decision of 4 January 1996 was appealed.

### Reasons for the decision

1. The appeal is admissible.

2. Article 123(2) EPC

The contested decision concerned only the allowability of the insertion of the feature "**fixed** catalytic beds" into the wording of the set of claims and the adapted description underlying the appealed decision.

2.1 In the application as filed catalytic beds are mentioned, which generally consist of particles (page 3, lines 14 to 16; page 4, line 1 and lines 24 to

30; and page 5, lines 23 to 29) and on page 6, lines 3 to 9, it is said that the accompanying figures relate to different shapes of the catalytic regions of the fractionation tower. Since it is nowhere specified in the description or the claims whether in the claimed process the catalytic beds are fluidised or fixed, any information thereabout could only be found in the accompanying figures 1 to 12.

2.2 The Board considers in line with the case law of the Boards of Appeal of the EPO that drawings are to be regarded as an integral part of the application as filed and that the EPC does not exclude features disclosed only in the drawings from being included in a claim, provided that the structure and the function of such feature can be unmistakably and fully derived from the drawings and the other parts of the application as filed are not contradicted (see Case Law of the Boards of Appeal of the EPO, 1996 edition, part III.A.1.3).

2.3 In the present case, it is clear from figures 3, 4, 7, 8, 11 and 12 that the bottom portion of the catalyst tray is only perforated in the regions not carrying a catalytic bed and that, consequently, the fluid in the upstream direction bypasses the catalytic beds (see also page 7, lines 25 to 30, of the application as filed) without passing upwards through the catalytic bed. Therefore, the downward flowing liquid reactant mixture necessarily passes through **fixed** catalytic beds.

2.4 The Examining Division has never contested that the figures 3, 4, 7, 8, 11 and 12 are schematical representations of configurations of the catalytic zones in the fractionating tower wherein an upstream direction of the gaseous flow through the catalytic bed is not possible and it has also never contested that a fluidised bed can only be formed by passing a fluid,

usually a gas, upwards through a bed of particles (see document (4), page 1, first sentence) and that the catalytic beds in figures 3, 4, 7, 8, 11 and 12, due to the absence of an upstream flow through the catalytic bed, are fixed catalyst beds.

Therefore, a skilled person could fully and unmistakably derive the structure and the function of the catalytic beds according to the configurations of the catalytic zones in the fractionating tower in figures 3, 4, 7, 8, 11 and 12, namely that the catalytic beds through which the liquid reaction mixture flows are fixed catalytic beds.

2.5 Since the configurations of the catalytic zones of the fractionating tower in the figures 1, 2, 5, 6, 9 and 10 are such that an upstream flow through the catalytic bed occurs, the Examining Division was of the opinion that a skilled person would not have acknowledged that in the claimed process fixed catalytic beds may be used.

2.6 It is true that, according to the configurations of the catalytic zones in the fractionating tower in figures 1, 2, 5, 6, 9 and 10 the bottom portion of the catalyst tray is perforated in the regions carrying a catalytic bed and, consequently, the fluid passes upwards through a bed of catalyst particles and the liquid reaction mixture flows through a catalytic bed, which may be a fixed or a fluidised catalytic bed, depending on the flow of the upward fluid.

However, the teaching a skilled person could derive from the figures 1, 2, 5, 6, 9 and 10, namely that the catalytic beds may be fixed- or fluidised catalytic beds, is not in contradiction with the teaching from the figures 3, 4, 7, 8, 11 and 12, unmistakably disclosing the use of fixed catalytic beds.

- 2.7 Therefore, the insertion of the feature that the liquid reactant mixture flows through fixed catalytic beds in Claims 1 to 3 and in the corresponding text of the description does not contravene Art. 123(2) EPC, which only requires that no subject-matter extending beyond the content of the application as filed is added to a European patent or patent application.
3. For answering the question whether in the present case the European patent application meets all the requirements of the EPC, it remains to be decided whether the content of the complete application as amended meets the requirement of Art. 123(2) EPC and whether the substantive requirements of patentability are also met. In order to give the Appellant the possibility of having his case examined and decided by two instances, the Board invokes its discretionary power under Article 111(1) EPC and remits the case to the Examining Division for further prosecution.

## Order

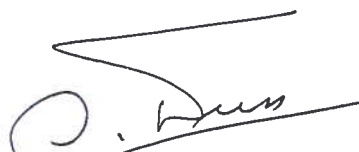
**For these reasons it is decided that:**

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division for further prosecution.

The Registrar:

  
E. Gorgmayer

The Chairman:

  
A. Nuss