DECISION
of 26 February 1997

Case Number: T 0334/93 - 3.3.3
Application Number: 88201805.4
Publication Number: 0307027
IPC: C08G 67/02

Language of the proceedings: EN

Title of invention:
Preparation of polymers of carbon monoxide with one or more olefinically unsaturated compounds

Applicant:
SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 84

Keyword:
"Claims - clarity (no) - support by description (no)"

Decisions cited:
-

Catchword:
-
Case Number: T 0334/93 - 3.3.3

DECISION
of the Technical Board of Appeal 3.3.3
of 26 February 1997

Appellant:
SHELL INTERNATIONALE RESEARCH
MAATSCHAPPIJ B.V.
Carel van Bylandtlaan 30
2596 HR Den Haag (NL)

Representative:

Decision under appeal:
Decision of the Examining Division of the
European Patent Office posted 16 November 1992
refusing European patent application
No. 88 201 005.4 pursuant to Article 97(1) EPC.

Composition of the Board:
Chairman: C. R. J. Gérardin
Members: H. H. R. Fessel
A. C. G. Lindqvist
Summary of Facts and Submissions

I. This appeal lies from the decision of the Examining Division 2.1.02.012 refusing European patent application No. 88 201 805.4 (publication No. 0 307 027), filed in the name of SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V. on 24 August 1988 and claiming a NL priority of 25 August 1987 (NL 87(1981)).

That application was published with a set of 9 claims of which the only independent Claims 1 and 9 read as follows:

"1. A process for the preparation of polymers of carbon monoxide with one or more olefinically unsaturated compounds, characterized in that carbon monoxide containing sulphur as sulphidic sulphur and/or iron as iron carbonyls is subjected to one or more purifying treatments by which the sulphur and/or iron contents are decreased, and in that the carbon monoxide thus purified is polymerized together with one or more olefinically unsaturated compounds by contacting the mixture with a palladium-containing catalytic composition.

9. Shaped objects, characterized in that they consist at least partly of polymers prepared by the process of claim 1."

II. The decision to refuse the application was announced orally at the end of oral proceedings held on 15 October 1992 and issued in writing on 16 November 1992. It was based on a set of 7 claims submitted during these oral proceedings. The only independent Claim 1 reads as follows (emphasis by the Board):
"A process for the preparation of polymers of carbon monoxide with one or more olefinically unsaturated compounds comprising polymerizing carbon monoxide together with one or more olefinically unsaturated compounds by contacting the mixture with a palladium-containing catalytic composition, characterized in that carbon monoxide containing sulphur as sulphidic sulphur and/or iron as iron carbonyls is subjected to one or more purifying treatments by which the sulphur and/or iron contents are decreased so that the carbon monoxide thus purified contains such a quantity of sulphur and/or such a quantity of iron that the relation \( X + \frac{1}{9} Y < \frac{3}{10} Z \) is met, in which \( X \) represents the quantity of sulphur as sulphidic sulphur and \( Y \) the quantity of iron as iron carbonyls, expressed in ppmw, calculated on carbon monoxide and \( Z \) represents the quantity of palladium present in the catalyst composition, expressed in ppmw, calculated on the quantity of polymer to be prepared, and that the carbon monoxide thus purified is used in the polymerisation process."

Claims 2 to 7 relate to elaborations of the process of Claim 1.

The Examining Division held the subject-matter of Claim 1 to meet the requirements of Articles 54 and 123(2) EPC (see points 2 and 4 of the decision under appeal), but not those of Article 84 EPC (see point 3 of the decision under appeal) and not to involve an inventive step (see point 5 of the decision under appeal) over documents:


III. On 11 January 1993 a Notice of Appeal was filed together with payment of the prescribed fee. In the Statement of Grounds of Appeal, filed on 15 March 1993 the Appellant disputed the findings of the Examining Division and argued that Claim 1 clearly set out the process for operating the invention and was consistent with the description.

IV. During oral proceedings before the Board of Appeal held on 26 February 1997 the Appellants in order to overcome the objection of lack of clarity submitted two additional sets of claims as first and second auxiliary requests, of which the second part of Claim 1 of the main request after "decreased", was amended to read as follows:

First auxiliary request.

"and that the carbon monoxide thus purified is used in the polymerization process, wherein the purification is carried out to such an extent that the reaction rate achieved in the polymerization process is at least 50% of the maximum rate which can be achieved when using ultrapure carbon monoxide, instead of using the purified carbon monoxide, and using otherwise the same catalytic composition and polymerization conditions." (emphasis by the Board)

Second auxiliary request.

"so that the carbon monoxide thus purified contains such a quantity of sulphur and/or such a quantity of iron that the relation $X + \frac{1}{9} Y < 4.44$ (i.e. $40/9$) is met, in which $X$ represents the quantity of sulphur as
sulphidic sulphur and \( Y \) the quantity of iron as iron carbonyls, expressed in ppmw, calculated on carbon monoxide, and that the carbon monoxide thus purified is used in the polymerization process. (emphasis by the Board)

V. The Appellants requested that the decision under appeal be set aside and that a patent be granted on the basis of the Claims 1 to 7 submitted on 15 October 1992 as main request, or alternatively on the basis of any of the two sets of claims filed during the oral proceedings as first and second auxiliary requests, or on the basis of the original claims as third auxiliary request.

Reasons for the Decision

1. The appeal is admissible.

2. Claim 1 of the main request

2.1 Claim 1 is a combination of Claims 1 and 2 as originally filed and does thus not offend Article 123(2) EPC, as already stated by the Examining Division.

2.2 The quantity of palladium 'Z' is defined in terms of the quantity of polymer to be prepared. That means, since impurities act as poison of the palladium catalyst, that the purity grade of CO, which can be used in the process, is defined by reference to the amount of polymer that is desired. Since the purity grade of the CO is selected according to Claim 1 so as to fulfil the condition imposed by the inequality "\( X + 1/9 Y < 3/10 Z \)", and since \( Z \) is unspecified, any CO with any contents of sulphide and/or iron carbonyl
contaminants can be used. Moreover in the Board's view the wording of Claim 1 is not consistent since it combines requirements concerning carbon monoxide, which is a starting compound, with a condition concerning the amount of polymer, which is the final product, which renders the process unclear. In particular, this wording is such that the process has to be carried out first in order to determine whether in view of the amount of polymer obtained the catalytic impurities are compatible with the requirements of Claim 1.

Since Claim 1 does not define the matter for which protection is sought in a clear manner the provisions of Article 84 EPC are not met.

3. Claim 1 of the first auxiliary request

3.1 The definition of the extent of purification by reference to the maximum rate achievable with ultrapure carbon monoxide was disclosed in the passage bridging the pages 2/3 of the original files (column 2, line 44 to column 3, line 8 of the published application).

3.2 In that amended version of the process claim the purity of CO is no longer directly dependent on the amount of polymer that is desired but to the extent that the reaction rate achieved in the polymerization process is at least 50% of the maximum rate which would be achieved when using an ultrapure carbon monoxide.

As shown in column 2, line 51 to column 3, line 8 of the published patent application, a decrease of the average reaction rate to less than 50% of the maximum rate can only be achieved when a CO is used, which is purified to a level indicated by the inequality
specified in Claim 1 of the main request. A CO not satisfying the relation of that inequality has to be subjected to one or more purifying treatments to meet that critical condition (see column 3, lines 9 to 32).

From the description of the present application it is thus evident that it is essential to meet that inequality to carry out the process as claimed; thus the absence of that mandatory feature in Claim 1 offends Article 84 EPC in that the definition of the matter for which protection is sought given in Claim 1 is not supported by the description.

4. Claim 1 of the second auxiliary request

In the present case the Appellants alleged the amendment to be supported by Example 11 of the application as filed.

However, as specified in the patent application (column 9, lines 13 to 16), only Example 13 is within the scope of the invention, which means that the process as defined in this request is based on what must be regarded as a comparative example, e. g. on an embodiment which is outside the scope of the invention. There is thus no adequate support in the description for the claimed subject-matter, which offends Article 84 EPC.

5. Third auxiliary request

This request concerns the original claims. In its first communication the Examining Division raised a number of objections against these claims.

First, it was stated that the claimed subject-matter was not novel with respect to EP-A-301 664 (D1) and D2 (cf. communication, points 2 to 4). Secondly, the
Examining division held the wording of Claims 1-3 to be confusing and thus not allowable under Article 84 EPC (cf. communication, point 5). The Board fully concurs with the finding of the Examining division, which means that in these two respects Claim 1 does not meet the provisions of the EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:  The Chairman:

[Signature]

E. Gorgmaner

C. Gérardin

C. Gérardin