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**D E C I S I O N**  
**of 29 January 2002**

**Case Number:** W 0024/01 - 3.3.3

**Application Number:** PCT/US 00/34195

**Publication Number:** W00144324

**IPC:** C08F 10/00

**Language of the proceedings:** EN

**Title of invention:**  
Polymerization of Olefins

**Applicant:**  
E.I. Dupont de Nemours and Company

**Opponent:**

-

**Headword:**

-

**Relevant legal provisions:**  
EPC Art. 17(2)(3)(a)  
EPC R. 13.1, 13.2, 40.1, 40.2

**Keyword:**

"Lack of unity *a posteriori* - yes"  
"Definition of inventions different from invitation to pay  
additional search fees"  
"Reimbursement of some of the additional search fees"

**Decisions cited:**  
G 0001/89, G 0002/89, W 0004/93

**Catchword:**

-





**Case Number:** W 0024/01 - 3.3.3  
**International Application No.** PCT/US00/34195

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.3**  
**of 29 January 2002**

**Applicant:** E.I. DUPONT DE NEMOURS AND COMPANY  
1007 Market Street  
Wilmington  
Delaware 19898 (US)

**Representative:** -

**Subject of the Decision:** Protest according to Rule 40.2(c) of the Patent Cooperation Treaty made by the applicants against the invitation (payment of additional fee) of the European Patent Office (International Searching Authority) dated 3 May 2001.

**Composition of the Board:**

**Chairman:** R. Young  
**Members:** P. Kitzmantel  
B. Günzel

### Summary of Facts and Submissions

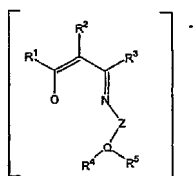
I. International application PCT/US 00/34195 entitled "Polymerization of olefins" comprising 17 claims was filed on 15 December 2000.

II. The independent Claims 1, 4 and 11 read as follows:

"1. An anion of the formula (I)

wherein:

R<sup>1</sup> is substituted hydrogen, substituted



hydrocarbyl or hydrocarbyl, and R<sup>2</sup> is hydrocarbyl or hydrocarbyl, and

provided that R<sup>1</sup> and R<sup>2</sup> taken together may be ortho-arylene or substituted ortho-arylene;

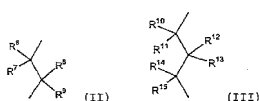
R<sup>3</sup> is hydrogen, hydrocarbyl, substituted hydrocarbyl or a functional group, provided that when R<sup>1</sup> and R<sup>2</sup> taken together are ortho-arylene or substituted ortho-arylene, R<sup>3</sup> may form a fused ring system therewith;

Q is nitrogen, oxygen, phosphorous or sulfur;

R<sup>4</sup> and R<sup>5</sup> are each independently hydrogen, hydrocarbyl, or substituted hydrocarbyl, provided that R<sup>4</sup> and R<sup>5</sup> taken together may form a ring, and further provided that when Q is oxygen or sulfur R<sup>5</sup> is not present;

Z is a bridging group of the formula (II) or (III)

R<sup>6</sup> is or substituted



hydrogen, hydrocarbyl hydrocarbyl, provided

that R<sup>3</sup> and R<sup>6</sup> together may form a ring;

R<sup>7</sup> is hydrogen, hydrocarbyl or substituted hydrocarbyl, provided that R<sup>3</sup>, R<sup>6</sup> and R<sup>7</sup> together may form an aromatic ring or R<sup>6</sup> and R<sup>7</sup> taken together may form a ring;

R<sup>8</sup> is hydrogen, hydrocarbyl or substituted hydrocarbyl;

R<sup>9</sup> is hydrogen, hydrocarbyl or substituted hydrocarbyl, provided that R<sup>4</sup> and R<sup>9</sup> taken together may be part of a double bond to an imino nitrogen atom, or R<sup>8</sup> and R<sup>9</sup> taken together may form a ring, or R<sup>4</sup>, R<sup>5</sup>, R<sup>8</sup> and R<sup>9</sup> taken together may form an aromatic ring, or R<sup>4</sup> and R<sup>9</sup> taken together may form a ring, or R<sup>4</sup>, R<sup>8</sup> and R<sup>9</sup> taken together may form a ring, or R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup> taken together may form a fused aromatic system;

R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup> and R<sup>13</sup> are each independently hydrogen, hydrocarbyl or substituted hydrocarbyl or R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup> and R<sup>13</sup> taken together are ortho-arylene;

R<sup>14</sup> is hydrogen, hydrocarbyl or substituted hydrocarbyl;

R<sup>4</sup> and R<sup>15</sup> together are part of a double bond to an imino nitrogen atom."

"4. A Group 3 to Group 10 transition metal complex of the anion of the formula (I) as set forth in claim 1."

"11. A process for the polymerization of olefins, comprising the step of contacting, at a temperature of about -100°C to about +200°C, one or more monomers selected from the group consisting of ethylene and an olefin of the formula H<sub>2</sub>C=CH(CH<sub>2</sub>)<sub>n</sub>G (XVII), with an active catalyst, characterized in that the active catalyst comprises a complex as set forth in any one of claims 4-9."

Claims 2 and 3 are dependent on Claim 1; Claims 5 to 10

are dependent on Claim 4; Claims 12 to 17 are dependent on Claim 11.

III. On 3 May 2001 the European Patent Office (EPO), acting as International Searching Authority (ISA), issued an "Invitation to pay Additional Search Fees" (hereinafter "Invitation") stating that the application did not comply with the requirement of unity of the invention stipulated in Articles 3(4)(iii) and 17(3)(a) PCT as well as in Rule 13 PCT and inviting the Applicant to pay, within a time limit of 45 days, eight additional search fees.

IV. This "Invitation" resulted from the EPO/ISA's conclusion that the subject-matters of Claims 1 to 17 were *a posteriori* deprived of a single general inventive concept and of a corresponding unifying technical feature, by document

EP-A-0 874 005 (hereinafter D1),

which disclosed the use of transition metal complexes comprising anions of the structure of present Claim 1 as catalysts for the polymerization of olefins.

(i) From that it followed, in the ISA's opinion, that the application disintegrated into the following nine groups of "inventions":

Group 1: The subject-matter of Claims 1-3;

Group 2: The subject-matter of Claims 4-17 insofar as they relate to complexes of Group 3 of the Periodic Table of Elements;

Group 3: The subject-matter of Claims 4-17 insofar as they relate to complexes of Group 4 of the Periodic Table of Elements;

Group 4: The subject-matter of Claims 4-17 insofar as they relate to complexes of Group 5 of the Periodic Table of Elements;

Group 5: The subject-matter of Claims 4-17 insofar as they relate to complexes of Group 6 of the Periodic Table of Elements;

Group 6: The subject-matter of Claims 4-17 insofar as they relate to complexes of Group 7 of the Periodic Table of Elements;

Group 7: The subject-matter of Claims 4-17 insofar as they relate to complexes of Group 8 of the Periodic Table of Elements;

Group 8: The subject-matter of Claims 4-17 insofar as they relate to complexes of Group 9 of the Periodic Table of Elements;

Group 9: The subject-matter of Claims 4-17 insofar as they relate to complexes of Group 10 of the Periodic Table of Elements;

(ii) Said "Invitation" furthermore indicated on its first page, box 3, that Claims 1 to 17 "have been found to be unsearchable under Article 17(2)(b) because of defects under Article 17(2)(a) and therefore have not been included with any invention."

With regard to the latter statement, page 4 of the "Invitation" set out that only a very small portion of compounds from the extremely large number comprised by the claimed invention were supported within the meaning of Article 6 PCT and/or were disclosed within the meaning of Article 5 PCT. Therefore, a meaningful search over the whole of the claimed scope was impossible and, consequently, only a limited search on the basis of formula VI of Claim 12 had been carried out.

Furthermore, the Applicant was warned that claims, or parts of claims, relating to inventions in respect of which no international search report had been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT).

- V. On 8 June 2001 the Applicant paid the additional eight search fees under protest and requested that the non-unity objection of the search examiner be reversed and that the additional search fees be refunded.

The Applicant stated on page 1, third paragraph of its submission "that this application complies with the requirement of unity of invention as set forth in Rule 13 PCT, or alternatively, that the ISA's suggestion of a 9-way unity of invention is a misapplication of the unity of invention rules and the purpose behind the unity of invention concept, and is clearly excessive under the circumstances".

Alternatively, the Applicant requested on page 3, second paragraph of its submission "that the ISA indicate that, to the extent that the application may not fully comply with such unity of invention



requirements, the relationship between the complying and non-complying elements are such that all subject-matter can be retained in a single application and thus searched and examined without additional fee, or otherwise apply the provisions set out in PCT International Search Guidelines, VII-12".

In its reasoning the Applicant argued as follows:

- (i) The ISA's objection of non-unity between Claims 1 to 3 and Claims 4 to 17 was incomprehensible because the ligand (I) anion according to Claim 1 of the application was common to all the claims.
- (ii) To the extent that document D1 affected the patentability of Claim 1 it would therefore equally affect the other claims.
- (iii) Since D1 appeared to disclose some species of the ligand (I) anion genus, this structure could not *a posteriori* provide unity of invention between the subject-matter of all of the claims.
- (iv) However, in the Applicant's opinion, this did not end the unity of invention inquiry because by delineating the claimed invention during the subsequent International Preliminary Examination phase, the Applicant would be able to re-establish unity by defining a special technical feature of the independent claims.
- (v) For the same reason, the position of the ISA that each of the eight groups of complexes of transition metals with the anion of Claim 1 comprised by Claims 4 to 17 defined a separate

invention was contrary to the "Markush Practice" set out in Annex B, Section (f) of the PCT Administrative Rules [correct: PCT Administrative Instructions], because "claim 1 can be amended to define patentable subject matter, which will then form the common structure as required by condition (B) [of said Section (f)] ..., and which ... will at least make this a border-line case within the meaning of decisions G 1/89 and G 2/89" (page 4, second paragraph)(cf. point (vii) below).

In the Applicant's view, by not applying the proper unity of invention analysis the ISA committed a substantial procedural error.

- (vi) Therefore, the ISA's conclusion of non-unity in the International Search phase was premature and severely prejudiced the Applicant's rights in the remainder of the International Phase and in the ensuing National/Regional Phase.
- (vii) In order to avoid such a situation, the Enlarged Board of Appeal in decision G1/89 (OJ EPO 1991, 155) and opinion G2/89 (OJ EPO 1991, 166) cautioned against the raising of a *posteriori* non-unity objections in borderline cases. The present case should be considered as a borderline case because, in spite of the anticipatory disclosure of D1, there was a potential for an inventive link between groups of claims.
- (vii) Furthermore, the Applicant argued that the ISA's refusal to search the entire invention was not covered by the provisions of Article 17(a)(ii)

PCT because the alleged violations of Articles 5 and 6 PCT were no grounds of refusal under this Article, and even if they were, the ISA had failed to substantiate their respective allegations to the standard set out in the PCT International Preliminary Examination Guidelines, III-6.3 and III-6.4.

VI. On 21 August 2001 the EPA/ISA issued its "Notification regarding review of justification for invitation to pay additional search fees" according to Rule 40.2(e) PCT (hereinafter "Notification").

Therein the Applicant was notified that the "Invitation" was deemed justified and was invited to pay a protest fee within one month.

With regard to its protest against the ISA's refusal to search the entire invention, the Applicant was informed that under Rule 40.2(e) PCT the review panel establishing the "Notification" had no competence to discuss such matters.

VII. The protest fee was paid by the Applicant on 20 September 2001.

In its submission of the same date the Applicant commented some aspects of the "Notification" and requested withdrawal of the unity of invention objections, and an indication that refusal to search under Article 17(a)(ii) PCT was improper.

The Applicant furthermore requested a refund of any additional search fees that have been paid to date, or which have otherwise been charged in accordance with

the Applicant's authorization.

Auxiliarily, the Applicant requested oral proceedings.

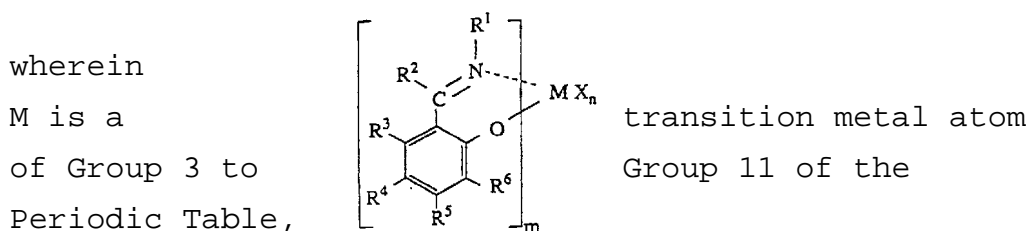
### **Reasons for the Decision**

1. The protest is admissible.
  
2. The Applicant's auxiliary request for holding oral proceedings is refused because such a procedural initiative is not provided for in the International Search phase. Neither is there any suggestion of a possible oral intervention in the general provisions of Article 17 PCT, nor in Rule 40 PCT which is particularly concerned with the procedural steps in the case of lack of unity of invention during the search phase.

Furthermore, the Applicant's attention is drawn in this respect to decision W 4/93 (OJ EPO 1994, 939; Reasons 9) where it was held that a right to formal oral proceedings is not foreseen in the PCT, even during the International Preliminary Examining phase.

3. The finding of a *posteriori* non-unity in the ISA's "Invitation" was based on the alleged anticipation by the disclosure of D1 of the general concept underlying the claims of the application, i.e. the synthesis and use of an olefin polymerisation catalyst by means of an anionic synthon depicted in formula (I) of Claim 1.
  
4. *Document D1*
  
- 4.1 Claim 1 of this document relates to an olefin

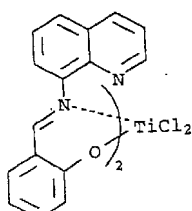
polymerisation catalyst which comprises *inter alia* (A) a transition metal compound of the following formula (I)



m is an integer of 1 to 6,  
 R<sup>1</sup> to R<sup>6</sup> may be the same or different, and are each a hydrogen atom, a halogen atom, a hydrocarbon group, a heterocyclic compound residue, an oxygen-, nitrogen-, boron-, sulfur-, phosphorus-, silicon-, germanium- or tin-containing group, and two or more of them may be bonded to each other to form a ring,  
 n is a number satisfying a valence of M, and  
 X is a hydrogen atom, a halogen atom, a hydrocarbon group, an oxygen-, sulfur-, nitrogen-, boron-, aluminum-, phosphorus-, halogen-, silicon-, germanium- or tin-containing group, or a heterocyclic compound residue.

4.2 In the first paragraph of page 2 of the "Invitation" the ISA refers to compound L33 on page 81 and to Example 65 on page 130 (erroneously pointing to lines 6 to 13; indeed Example 65 is described in lines 21 to 54 of page 130).

Example 65 discloses the following TiCl<sub>2</sub>-complex of compound L33:



4.3 A comparison of the structures of

compound L33 with formula (I) of present Claim 1 reveals that L33 is an embodiment of said formula wherein Z is a bridging group of formula (II), Q is nitrogen and R<sup>4</sup> to R<sup>9</sup> taken together with this nitrogen atom form a fused aromatic ring system, i.e. a 8-quinolinyl structure.

This structure is identical to the one of formula (XVII) according to Example 2 on page 29 of the present application.

5. It follows that the technical concept underlying formula (I) of Claim 1 of the application is anticipated by said disclosure of D1.
  
6. Since independent Claim 4 of the application relates to a Group 3 to Group 10 transition metal complex of formula (I) and since independent Claim 11 relates to a process for the polymerization of olefins using as catalyst a complex according to Claim 4, all the claims are similarly affected by the anticipating character of D1.

The anticipation of formula (I) does not, therefore, justify the conclusion that the subject-matter of Claim 1 (and of Claims 2 and 3 dependent thereupon) belongs to an "invention" which is different from that/those covered by Claims 4 and 11 (including their respectively dependent Claims 5 to 10 and 12 to 17).

7. Nor is there any reason for the conclusion that the subject-matter of Claims 4 to 17 should *a posteriori* be sub-divided into eight "inventions" in accordance with the group of the Periodical System of Elements to which the transition metal of the complex of anion (I) as specified in Claim 4 belongs.

8. Since compound L33 (cf. Section 4.3 supra) is the only structure disclosed in document D1 which anticipates formula (I) of present Claim 1 and since, as compared with the further disclosure of D1, the anticipating character of L33 resides in the 8-quinolinyl moiety, and more specifically in the presence of a nitrogen atom in the position Q of formula (I), any conclusion on the issue of unity must take account of the further meanings of said position Q according to formula (I) of Claim 1.

Such further meanings are: oxygen, phosphorus and sulfur.

9. It therefore appears that, given the anticipation by D1 of formula (I) with the meaning of Q being nitrogen, each one of these further variants of formula (I), comprising oxygen, phosphorus or sulfur, defines a structure which constitutes a "special technical feature" which provides a contribution over the prior art within the meaning of Rule 13.2 PCT and that, consequently, the subject-matter of Claims 1 to 17 must be attributed to the following four groups:

(i) The subject-matter of Claims 1 to 17 insofar as it relates to anions of formula (I) wherein Q is nitrogen, to Group 3 to Group 10 transition metal complexes of such anions or to processes for the polymerization of olefins wherein such complexes are used as catalysts.

(ii) The subject-matter of Claims 1 to 17 insofar as it relates to an anion of formula (I) wherein Q is oxygen, to Group 3 to Group 10 transition metal complexes of such anion or to processes for

the polymerization of olefins wherein such complexes are used as catalysts.

(iii) The subject-matter of Claims 1 to 17 insofar as it relates to anions of formula (I) wherein Q is phosphorous, to Group 3 to Group 10 transition metal complexes of such anions or to processes for the polymerization of olefins wherein such complexes are used as catalysts.

(iv) The subject-matter of Claims 1 to 17 insofar as it relates to anions of formula (I) wherein Q is sulfur, to Group 3 to Group 10 transition metal complexes of such anions or to processes for the polymerization of olefins wherein such complexes are used as catalysts.

10. The Applicant's opinion that the present case justifies the application of the approach advocated in Section 12 of Chapter VII of the PCT International Search Guidelines cannot be accepted.

10.1 This Section states: "Occasionally in cases of lack of unity of invention, especially in an "a posteriori" situation, the search examiner will be able to make a complete international search for more than one invention with negligible additional work, in particular, when the inventions are conceptually very close. In those cases, the search examiner may decide to complete the international search for the additional invention(s) together with that for the invention first mentioned. All results should then be included in the international search report without inviting the applicant to pay an additional search fee ..."



- 10.2 Whereas, in the present case all four inventions delineated in Section 8 supra are conceptually close, it is not possible for the search examiner to extend his/her search beyond the first invention with negligible additional work because the complexity of formula (I) of Claim 1 covers, for each of the inventions, a vast field of compounds.
11. Nor does the PCT foresee the possibility to withhold a ruling of non-unity in the International Search phase in view of a possible re-establishment of unity of invention in the ensuing International Preliminary Examining phase. Rather, Article 17(3)(a) PCT clearly states: "If the International Searching Authority considers that the international application does not comply with the requirement of unity of invention as set forth in the Regulations, it **shall** invite the applicant to pay additional fees." [emphasis by the Board].
12. In this respect, the Applicant's reliance on G 1/89 and G 2/89 is to no avail, because Section 8.2 of this decision/opinion of the Enlarged Board, wherein the ISA is requested to exercise restraint with respect to the charging of additional search fees in cases of a finding of lack of unity *a posteriori*, relates to borderline cases of novelty and/or inventive step. However, the anticipatory character of D1 for the subject-matter of present Claim 1 is not open to any doubt and was not even contested by the Applicant itself. Again, the possible later establishment of a borderline situation in the ensuing International Preliminary Examination phase, suggested by the Applicant, has no bearing on the invitation to pay additional search fees according to Article 17(3)(a)

PCT.

13. Similarly, the Applicant cannot gain anything from its reference to Part 6, Annex B, paragraph (f) of the Administrative Instructions Under the Patent Corporation Treaty which relates to the so-called "Markush Practice" and sets out that "[i]n this special situation, the requirement of a technical relationship and the same or corresponding special technical features as defined in Rule 13.2 PCT, shall be considered to be met when the alternatives are of a similar nature."

This must be concluded because the present case does not meet the requirements of the sub-paragraph (i) of paragraph (f) which reads:

"(i) When the Markush grouping is for alternatives of chemical compounds, they shall be regarded as being of similar nature where the following criteria are fulfilled:

- (A) all alternatives have a common property or activity, and
- (B)(1) a common structure is present, i.e. a significant structural element is shared by all of the alternatives, or
- (B)(2) in cases where the common structure cannot be the unifying criteria, all alternatives belong to a recognized class of chemical compounds in the art to which the invention pertains."

While it can be accepted that in the present case condition (A) is met, condition (B) is not: the *a posteriori* alternatives of formula (I) neither have a common (novel) structure, nor do the (novel) alternatives with different meanings of position Q (oxygen, phosphorus and sulfur) belong to a common recognized class of chemical compounds.

14. In summary, the finding of the "Invitation" of an *a posteriori* lack of unity of invention is upheld, albeit with the different consequence of a disintegration of the single *a priori* invention into four (in lieu of nine) *a posteriori* inventions.
15. In spite of the afore-mentioned different conclusion of the Board, the ISA did not, as the Applicant asserted, by its "Invitation" commit a substantial procedural error. Rather the different appreciation of the issue of unity amounts to an ordinary error of technical judgment.
16. With regard to the Applicant's complaint concerning the ISA's refusal under Article 17(2) PCT to search the entire claimed subject-matter, the Board is not in a position to deliver any judgment because it is not entitled thereto by Rule 40.2 PCT.

However, in the Board's view, because of the possible severe consequences for the Applicant of such a refusal, which are foreshadowed in the last paragraph of the "Invitation", such a measure should be restricted to very exceptional cases, e.g. to cases of a clear abuse for which no evidence exists in the present case.

17. Since the ISA's finding of lack of unity is upheld, the protest fee cannot be refunded although the protest is in part successful.

## **Order**

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

1. The protest is only partly justified.
2. Five additional search fees are to be reimbursed.
3. The protest fee shall not be refunded.

The Registrar:

The Chairman:

E. Görgmaier

R. Young