BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [ ] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 28 August 2009

Case Number: T 1733/06 - 3.3.03

Application Number: 91920770.4

Publication Number: 0513380

IPC: C08F 10/00

Language of the proceedings: EN

Title of invention:
Process for producing olefinic polymer

Patentee:
IDEMITSU KOSAN COMPANY LIMITED

Opponent:
Basell Polyolefine GmbH
Univation Technologies, LLC

Headword:
-

Relevant legal provisions:
EPC Art. 56, 100(a), 123(2)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Amendments - added subject-matter (no)"
"Amendments - correction of errors (yes)"
"Inventive step - ex post facto analysis"

Decisions cited:
T 0615/95, T 0050/97, T 0948/02

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1733/06 **-** 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 28 August 2009

Appellant: (Opponent 01)
Basell Polyolefine GmbH
Patentstelle E 413
Industriepark Höchst
D-65926 Frankfurt (DE)

Representative:
-

Respondent: (Patent Proprietor)
IDEMITSU KOSAN COMPANY LIMITED
1-1, Marunouchi 3-chome
Chiyoda-ku
Tokyo 100-0005 (JP)

Representative:
Gille Hrabal Struck Neidlein Prop Roos
Patentanwälte
Brucknerstrasse 20
D-40593 Düsseldorf (DE)

Other Party: (Opponent 02)
Univation Technologies, LLC
5555 San Felipe, Suite 1950
Houston, Texas 77056 (US)

Representative:
Ricker, Mathias
Patent- und Rechtsanwälte Bardehle .
Pagenberg . Dost . Altenburg . Geissler
Postfach 86 06 20
D-81633 München (DE)

Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office of 6 September 2006, posted 18 September 2006 concerning maintenance of European patent No. 0513380 in amended form.

Composition of the Board:

Chairman: R. Young
Members: A. Däweritz
H. Preglau

Summary of Facts and Submissions

I. The grant of European patent No. 0 513 380 in respect of European patent application No. 91 920 770.4, filed on 29 November 1991 as International patent application No. PCT/JP91/01658 and claiming the priorities of two earlier applications filed in Japan (329539/90 and 103754/91) of 30 November 1990 and 9 April 1991, respectively, was announced on 1 October 1997 (Bulletin 1997/40). The patent was granted with eight claims. Independent Claim 1 read as follows:

> **1.** A process for producing an olefin based polymer in which homopolymerization of an alpha-olefin or copolymerization only of two or more of alpha-olefins of the formula (XIII) R^{13}-CH = CH_2 (XIII) wherein R^{13} represents a hydrogen atom or an alkyl group having 1 to 28 carbon atoms is carried out in the presence of a catalyst comprising as main components the following compounds (A), (B) and (C):
>
> (A) a transition metal compound;
> (B) a compound capable of forming an ionic complex when reacted with said transition metal compound (A); and
> (C) an organoaluminum compound.

The remaining process claims 2 to 8 were all dependent.

In this decision, any reference to passages in the patent in suit as granted will be given underlined in squared brackets, eg [Claim 1] or [0001]. References in underlined italics concern passages in the English translation of the application as filed, eg *page 1, lines 8 to 11*. "EPC" refers to the revised text of the EPC 2000, the previous version is identified as "EPC 1973".

II. On 29 and 30 June 1998, respectively, two Notices of Opposition by Opponents O-01 and O-02 were filed, in each of which revocation of the patent in its entirety was requested. Both Opponents asserted lack of novelty and lack of inventive step, whereby O-01 invoked Articles 54 and 56 EPC 1973 and O-02 Articles 100(a) and 52 to 57 EPC 1973. The oppositions relied on altogether ten documents, including

D1: WO-A-91/14713

D3: EP-A-0 277 004,

D4: EP-A-0 260 130 and

D7: EP-A-0 287 666.

(1) On 6 September 2006, oral proceedings were held before the Opposition Division on the basis of a Main and ten Auxiliary Requests of the Patent Proprietor.

(2) The Main Request was directed to the maintenance of the patent in suit as granted. New sets of claims according to Auxiliary Requests 1 to 6 and further amended Auxiliary Request 8 were filed during the oral proceedings, whereas the sets of claims according to Auxiliary Requests 7, 9 and 10 had already been submitted with a letter dated 12 August 2005. Only Auxiliary Request 8 played a role in the appeal proceedings before this Board. Its (sole) Claim 1 as amended at those oral proceedings read as follows:

"*A process for producing an olefin based polymer in which is carried out a homopolymerization of an α-olefin or a copolymerization of two or more α-olefins of the formula (XIII)*

$$R^{13}\text{-}CH{=}CH_2 \quad (XIII)$$

wherein R^{13} *represents a hydrogen atom or an alkyl group having 1 to 28 carbon atoms;*
the process is carried out in the presence of a catalyst comprising as main components the following components (A), (B) and (C):
(A) a transition metal compound of formulas (I) to (IV)

$$CpM^1R_a^1R_b^2R_c^3 \quad (I)$$
$$Cp_2M^1R_a^1R_b^2 \quad (II)$$
$$(Cp\text{-}A_e\text{-}Cp)M^1R_a^1R_b^2 \quad (III)$$
$$M^1R_a^1R_b^2R_c^3R_d^4 \quad (IV),$$

wherein M^1 *is a Ti, Zr or Hf atom; Cp is a group selected from a cyclopentadienyl group, methylcyclopentadienyl group, ethylcyclopentadienyl group, isopropylcyclopentadienyl group, 1,2-dimethylcyclopentadienyl group, tetramethylcyclopentadienyl group, 1,3-dimethylcyclopentadienyl group, 1,2,3-trimethylcyclopentadienyl group, 1,2,4-trimethylcyclopentadienyl group, trimethylsilylcyclopentadienyl group, indenyl group, substituted indenyl group, tetrahydro-*

indenyl group, substituted tetrahydroindenyl group, fluorenyl group or substituted fluorenyl group; for compounds of formula (I), (II), (III) and (IV) R^1, R^2, R^3 and R^4 are independently a hydrogen atom, oxygen atom, C_{1-20} alkyl group, C_{1-20} alkoxy group, C_{6-20} aryl group, alkylaryl group or arylalkyl group, C_{1-20} acyloxy group, allyl group, substituted allyl group, a substituent containing a silicon atom, an acetylacetonato group or substituted acetylacetonato group; A is a bridge based on a covalent bond; a , b and c represent independently in formula (I) an integer of 0 to below 4, a and b represent independently in formulas (II) and (III) an integer of 0 to 2; in formula (IV) a, b, c and d are independently an integer of 0 to 4; e is an integer of 0 to 6; and two or more of R^1, R^2, R^3 and R^4 may form a ring, and in formulas (II) and (III) two Cp may be the same as or different from each other;

(B) is a compound of formulas (VIII) or (IX)

$$([L^1\text{-}R7]^{k+})_p([M^3Z^1Z^2....Z^n]^{(n-m)-})_q \quad (VIII)$$ [*sic*]

$$([L^2]^{k+})_p([M^4Z^1Z^2...Z^n]^{(n-m)-})_q \quad (IX)$$

wherein L^2 is M^5, $R^8R^9M^6$, $R^{10}{}_3C$ or $R^{11}M^6$; L^1 is a Lewis base; M^3 and M^4 are independently an element selected from the groups IIIA, IVA and VA of the Periodic Table; M^5 and M^6 are independently an element selected from the groups IIIB, IVB, VB, VIB, VIIB, VIII, IA, IB, IIA, IIB and VIIA of the Periodic Table; Z^1 to Z^n are independently a hydrogen atom, dialkylamino group, C_{1-20} alkoxy group, C_{6-20} aryloxy group, C_{1-20} alkyl group, C_{6-20} aryl group, alkylaryl group or arylalkyl group, C_{1-20} halogenated hydrocarbon group, C_{1-20} acyloxy group, organometalloid group or halogen atom; two or more of Z^1 to Z^n may form a ring; R^7 is C_{1-20} alkyl group, C_{6-20} aryl group, alkylaryl group or arylalkyl group; R^8 and R^9 are independently a cyclopentadienyl group, substituted cyclopentadienyl group, indenyl group or fluorenyl group; R^{10} is a C_{1-20} alkyl group, aryl group, alkylaryl group or arylalkyl group; R^{11} is tetraphenylporphyrin or phthalocyanine; m is a valency of M^3 and M^4 and is an integer of 1 to 7; n is an integer of 2 to 8; k is an ion value number of $[L^1\text{-}R^7]$ and $[L^2]$, and n is an integer of 1 to 7; and p is an integer of at least 1; and q is specified by the formula $q=(p \times k)/(n-m)$;

or said compound (B) being selected from the group consisting of tris(pentafluorophenyl)boron, tris(3,5-di(trifluoromethyl)phenyl) boron and triphenylboron;

(C) triisobutylaluminium."

III. In the interlocutory decision announced at the end of the oral proceedings, the Main Request was refused, because the subject-matter of Claim 1 was found to lack novelty over each of Examples 4 and 11 of document D1. Moreover, each of Auxiliary Requests 1 to 7 was held not to comply with the requirements of Article 123(2) EPC, because each Claim 1 contained a disclaimer not being in line with the ruling in the Decisions of the Enlarged Board of Appeal G 1/03 and G 2/03 (in both cases: points 2.6.5 and 3 of the reasons).

(1) By contrast, the subject-matter of the sole claim of amended Auxiliary Request 8, (section II(2), above, "Annexes 9.1 and 9.2" to the above decision) was, according to Nos. 4.1 to 4.3 of the reasons for the decision, based on the deletion of part of the definitions of compounds (A) and (B) initially contained in the *application* and a combination of these limited components with the selection of compound (C) from two preferred compounds. The Opposition Division held that these limitations did not amount to forming a new invention in comparison with the subject-matter as originally claimed, and that, therefore, the requirements of Article 123(2) EPC were met. Nor did the Opposition Division see any reasons for raising an objection under Article 84 EPC.

(2) Document D3, EP-A-0 277 004, was considered as being the closest piece of prior art, because it taught all features of Claim 1 except for the use of compound (C), ie tri-isobutyl aluminium (TIBA).

Neither D4 nor D7 mentioned or suggested, according to the decision, that TIBA was the preferred trialkyl aluminium scavenger for removing traces of oxygen or moisture from the polymerisation mixture, or related to

the problem of increasing the activity of a catalyst comprising compounds as used in D3, corresponding to (A) and (B) of Claim 1 according to Auxiliary Request 8.

(3) A comparison between [Example 16], according to the claimed subject-matter, and [Example 17], being outside the claimed subject-matter, showed, according to the decision under appeal, that the use of TIBA as component (C) of the catalyst system led to an unexpected improvement of the catalyst activity.

Consequently, the Opposition Division acknowledged that the subject-matter of Claim 1 of Auxiliary Request 8 was based on an inventive step.

(4) According to the minutes of the oral proceedings, the Patent Proprietor was given the opportunity, after the announcement that Auxiliary Request fulfilled the requirement of Article 56 EPC, to adapt the description to this request, and the description thus amended was then further discussed and modified.

(5) Finally, the Opposition Division decided that "Account being taken of the amendments made by the patent proprietor during the opposition proceedings, the patent and the invention to which it relates are found to meet the requirements of the Convention." The reasons for this interlocutory decision were issued in writing on 18 September 2006.

IV. On 17 November 2006, an unsigned Notice of Appeal was received from Opponent O-01. A signed version thereof was, however, received from this party, referred to herein below as Appellant/O-01, on 10 January 2007, ie within the time limit set in a Communication dated 22 November 2006. Appellant/O-01 requested that the patent in suit be revoked in its entirety.

(1) In its Statement of Grounds of Appeal (SGA) received on 24 January 2007, Appellant/O-01 raised objections (i) of lack of inventive step (Article 56 EPC 1973) on the basis of D3 (as the closest piece of prior art) and D7 and (ii) under Article 123(2) EPC 1973 with regard (ii.a) to the restrictions in the denomination of "*Cp*" (methylcyclopentadienyl allegedly missing from the list of possible compounds) and of R^1 to R^4 (where "*halogen*" and "*Lewis base*" were asserted to be missing from the list of possible compounds) in component (A) and (ii.b) to the additional definition of "n" being an "*integer of 1 to 7*" (apparently meaning the definition of component (B)). This latter amendment would, moreover, contradict Article 83 EPC 1973.

(2) Document D3 would disclose all features of the operative claim except for feature (C). Thus, the definitions of components (A) and (B), respectively, in the patent in suit would most largely correspond to the definitions of the corresponding catalyst components in Claim 1 of D3. Moreover, the known catalysts would also serve the polymerisation of α-olefins, and, although there was no explicit reference to a third catalyst component, D3 (when talking of "*a catalyst prepared by combining at least two components*") would nevertheless give the hint, that a third component could be useful. Furthermore, D3 would explain that the activity of the catalyst could be impaired by oxygen and moisture.

(3) In the Appellant's opinion, D7 taught, that the catalyst activity could considerably be improved by adding aluminium alkyl compounds. Thus, D7 referred to a number of catalyst components (C) not being n-alkyl aluminium compounds, and it referred explicitly to TIBA. Moreover, there were hints that branched alkylaluminium

compounds and, in particular, trialkylaluminium were particularly preferred. TIBA was exemplary for this, and it was used in most of the examples of D7. Comparative Example 3 of D7 demonstrated, according to the Appellant, in comparison with Example 1 of the document, that the addition of triethylaluminium (TEAL) resulted in significantly lower polymer yields than the addition of TIBA. Therefore, it was deemed obvious by the Appellant to improve the yield achieved in D3 by adding TIBA in accordance with the teaching of D7.

V. On 28 November 2006, the Patent Proprietor also filed an appeal requesting that the patent in suit be maintained as granted. This appeal was, however, withdrawn at oral proceedings on 28 August 2009. Therefore, the Patent Proprietor will be referred to herein below as "Respondent/P".

(1) In its then SGA received on 8 January 2007, the Respondent/P dealt with the question of whether the appeal of Appellant/O-01 would be deemed to have been filed or not, and with regard to its own appeal it stated that "*We will therefore file detailed requests and grounds therefor as soon as we know the arguments upon which the appeal is based.*".

(2) Moreover, it requested, even if the appeal of Appellant/O-01 was deemed not to have been filed, "*to reintroduce some specific passages of the description, which were deleted during oral proceedings on September 18, 2006*" and submitted, to this end, an amended version of pages 3, 6 and 7 of the specification. This new version was to replace the previous version as referred to in section III(4), above. In support of this request, Rule 139 EPC was invoked in a further letter dated 11 August 2009 (section IX, below).

VI. In its rejoinder dated 23 May 2007 to the appeal of Appellant/O-01, Respondent/P requested that the patent be maintained with a new claim filed therewith on the basis of Auxiliary Request 8 (section II(2), above), in which solely the definition of component (B) had further been amended to read as follows:

"*(B) is a compound of formulas (VIII) or (IX)*

$([L^1\text{-}R7]^{k+})_p([M^3Z^1Z^2....Z^n]^{(n-m)-})_q$ *(VIII)* [*sic*]

$([L^2]^{k+})_p([M^4Z^1Z^2...Z^n]^{(n-m)-})_q$ *(IX)*

wherein L^2 *is* M^5, $R^8R^9M^6$, $R^{10}{}_3C$ *or* $R^{11}M^6$; L^1 *is a Lewis base;* M^3 *and* M^4 *are independently an element selected from the groups IIIA, IVA and VA of the Periodic Table;* M^5 *and* M^6 *are independently an element selected from the groups IIIB, IVB, VB, VIB, VIIB, VIII, IA, IB, IIA, IIB and VIIA of the Periodic Table;* Z^1 *to* Z^n *are independently a hydrogen atom, dialkylamino group,* C_{1-20} *alkoxy group,* C_{6-20} *aryloxy group,* C_{1-20} *alkyl group,* C_{6-20} *aryl group, alkylaryl group or arylalkyl group,* C_{1-20} *halogenated hydrocarbon group,* C_{1-20} *acyloxy group, organometalloid group or halogen atom; two or more of* Z^1 *to* Z^n *may form a ring;* R^7 *is* C_{1-20} *alkyl group,* C_{6-20} *aryl group, alkylaryl group or arylalkyl group;* R^8 *and* R^9 *are independently a cyclopentadienyl group, substituted cyclopentadienyl group, indenyl group or fluorenyl group;* R^{10} *is a* C_{1-20} *alkyl group, aryl group, alkylaryl group or arylalkyl group;* R^{11} *is tetraphenylporphyrin or phthalocyanine; m is a valency of* M^3 *and* M^4 *and is an integer of 1 to 7; n is an integer of 2 to 8; k is an ion value number of* $[L^1\text{-}R^7]$ *and* $[L^2]$, *and is an integer of 1 to 7; and p is an integer of at least 1; and q is specified by the formula* $q=(p \times k)/(n-m)$;

or said compound (B) being selected from the group consisting of tris(pentafluorophenyl)boron, tris(3,5-di(trifluoromethyl)phenyl) boron and triphenylboron;".

Furthermore Respondent/P disputed the arguments in the SGA of Appellant/O-01 (sections IV(1) to IV(3), above) and requested that the patent in suit be maintained on the basis of the above new version of the claim, wherein "*an obvious error has been corrected*".

VII. In an annex to summons to oral proceedings, sent out on 11 May 2009, the parties were informed by the Board

about the issues presumably to be discussed at the oral proceedings, including the admissibility of the appeals.

VIII. In letters dated 6 July and 17 July 2009, respectively, Appellant/O-01 and Respondent/O-02 informed the Board that they would neither attend, nor be represented, respectively, at the oral proceedings.

IX. In the further letter dated 11 August 2009 (already mentioned in section V(2), above), Respondent/P repeated its request that the patent in suit be maintained on the basis of the claim in its version of 23 May 2007 (section VI, above) or, in case the Board would not allow the new request ("... *should intend to revoke the patent following the request of Appellant I*", ie Appellant/O-01), Respondent/P requested that the case be remitted to the Opposition Division for further prosecution of the case on the basis of Auxiliary Requests 9 and 10, as annexed to the decision under appeal (Annexes 10/1 to 11/2).

X. On 28 August 2009, oral proceedings were held. At the outset of the hearing, the Board established that the parties had duly been summoned and announced that the proceedings were continued in the absence of Appellant/O-01 and of Respondent/O-02, who had announced this (section VIII, above; Rule 115(2) EPC).

(1) Then the Board informed the attending Respondent/P about the reservations which the Board had with regard to the Respondent's appeal (Articles 107 and 108 EPC) and its request for amendment of pages 3, 6 and 7 of the specification (section V(2), above) under Rules 80 and 139 EPC).

(2) In view of these reservations, the Respondent/P withdrew its appeal and its above request for

replacement of the previous version of pages 3, 6 and 7 (cf. sections V and III(4)/V(2), above, respectively).

(3) However, a question had arisen with regard to page 8 of the version of the amended specification as annexed to the decision under appeal, because it contained, as replacement for the definitions on [page 8, lines 23 to 33], amended explanations in handwriting which extended to the right margin of the sheet and some of which were crippled in the official (electronic) file as available to the Board. The Respondent was therefore asked to verify that the text written by hand, but reproduced incorrectly (starting at line 22 after "... $R^{11}M^{6}$") was to read:

"*, and wherein* L^{1}, R^{7}, M^{3}, M^{4}, Z^{1}, Z^{2} *to* Z^{n}, M^{5}, M^{6}, R^{8}, R^{9}, R^{10}, R^{11}, *n, m and q are each defined as in claim 1.*"

(4) As a confirmation for this verified text, the Respondent submitted a new copy of page 8, corrected accordingly.

(5) Then the Board indicated to the Respondent/P that it saw neither a problem in respect of the suggested correction of the sole claim (as identified in section VI, above), nor a reason for raising an objection of lack of inventive step.

(6) Since the Respondent did not intend to give further comments, the Chairman closed the debate and interrupted the oral proceedings for the final deliberation of the Board.

XI. At this moment, the status of the requests was as follows:

Appellant/O-01 had requested, according to its submission in its Statement of Grounds of Appeal, dated

24 January 2007 and received on the same day, that the decision under appeal be set aside and the patent in suit be revoked in its entirety.

Respondent/P requested that the appeal be dismissed subject to the correction of the claim according to the version filed with the letter dated 23 May 2007. In the alternative, it requested that the case be remitted to the Opposition Division, if the Board intended to revoke the patent in suit following the request of Appellant/O-01, or that the patent be maintained on the basis of Auxiliary Requests 9 or 10 as annexed to the decision under appeal.

Respondent/O-02 had neither commented in substance on the content of the file, nor submitted any requests during these appeal proceedings.

Reasons for the Decision

1. The appeal of the Opponent O-01 is admissible, since the missing signature was provided by this Appellant within the time limit set in the Communication dated 22 November 2006 (Rule 36(3) EPC 1973).

Main Request

2. *Wording of the claim*

The sole Claim 1 of Auxiliary Request 8 as accepted in the decision under appeal to comply with the requirements of the EPC 1973 had been the result of amendments of [Claim 1] filed during the opposition proceedings (cf. sections I and II(2), above).

2.1 These amendments resulted in a wording of the claim, wherein each main component of the catalyst had been

defined in terms of a chemical formula, ie formulae (I) to (IV), (VIII) and (IX), respectively, each of which contained symbols. The different meanings of each of these symbols intended to be encompassed by the claim were provided in lists of considerable lengths.

2.2 As noted by Appellant/O-01 in its SGA (section IV(1), above), some meanings of "*Cp*" and of "R^1 *to* R^4" in component (A) had been deleted. Moreover, the claim of Auxiliary Request 8 contained a further passage concerning "*n*" being an *"integer of 1 to 7"*, constituting, in its opinion, a violation of the requirements of Article 123(2) EPC 1973 and, additionally, of Article 83.

2.2.1 Besides the feature "*n is an integer of 2 to 8*" (originating from *page 16, last line to page 17, line 1*), this definition of "*n is an integer of 1 to 7*" had already been contained in Claim 1 of the first version of Auxiliary Request 8 as filed with a letter dated 12 August 2005 (in both versions at the end of the first paragraph defining component (B)), thereby rendering the claim inconsistent in itself. It is, however, clear for the Board from *page 16, last line to page 17, line 2*, that the above second definition of "*n is an integer of 1 to 7*" was the result of a transcription error, as made evident by the fact that the numerical definition of "k" being 1 to 7 had, at the same time, disappeared from the wording of both versions of that claim. It follows therefrom that the wording of the claim of both versions of Auxiliary Request 8 was defective, so that the last two objections of Appellant/O-01 in its SGA (section IV(1), above, item (ii.b)) had, at that time, been relevant.

These inconsistencies have, however, now been removed from the operative sole claim and the wording of this claim now complies with the original disclosure on from *page 16, line 11 to page 17, line 3* (corresponding to "*page 7, line 51 to page 8, line 11 of EP 0 513 380 A1*" as referred to by Respondent/P in its above letter of 12 August 2005, page 4, second paragraph, in support of the first version of Auxiliary Request 8).

Therefore, the Board is satisfied that this amendment of the claim in its version of 23 May 2007 complies with the requirements of Rule 139 EPC, sentence 2 and also those of Article 123(2) EPC.

2.2.2 As far as the few deletions from the definitions of "*Cp*" and "R^1 *to* R^4" are concerned, the Board takes the view that the present situation largely corresponds to the situation as considered in case T 615/95 of 16 December 1997, but differs significantly from the circumstances in the case of T 948/02 of 5 April 2005 (neither published in OJ EPO). In the case underlying T 615/95, the deletions from the two lists of definitions did not, in the Board's view, "*result in singling out any hitherto not specifically mentioned individual compound or group of compounds, but maintains the remaining subject-matter as a generic group of compounds differing from the original group only by its smaller size. Such shrinking of the generic group of chemical compounds is not objectionable if these deletions do not lead to a particular combination of specific meanings of the respective residues which was not disclosed originally, or, in other words, do not generate another invention (see no. 6 of the Reasons for the Decision)*" (Catchword of T 615/95). In the present case, the few deletions concerning

component (A) of the operative claim are, in the Board's opinion, also far from creating a new invention by singling out an hitherto not specifically mentioned individual compound or group of compounds.

The *ratio decidendi* of T 615/95 was followed in a number of further decisions, including T 50/97 of 20 January 2000 (not published in OJ EPO, No. 2.1 of the reasons), which, like T 615/95, had been mentioned by the Respondent/P in its rejoinder (page 3, paragraph 3).

2.2.3 Another invention had, in the Board's view, however been generated in the second case (concerning telomers) in T 948/02, mentioned in section 2.2.2, above, wherein not only the definitions of a significant number of the symbols used in its Claim 1 to define the claimed compound had been restricted to a great extent (cf. Nos. 2.1 to 2.4.6 of the reasons in T 948/02), but additionally a shift of the core of the claimed invention had occurred from the importance of the modification of telogens to that of the modification of taxogens (cf. Nos. 2.4.7 to 2.4.10 of those reasons).

2.2.4 Considering the Boards' views in the above cases, the present Board has come to the conclusion that the above assessment in the case of T 615/95 is also valid for the present situation and that the above amendments concerning components (A) and (B) of the claim of the present case do not contravene Article 123(2) EPC.

2.2.5 With regard to the restriction of component (C) in the claim, the situation is not comparable with the above amendments. Whilst in *Claim 1* and in [Claim 1], mention was made of "*an organoaluminium compound*" in general, the sole operative claim requires the use of TIBA. This

limitation is, however, clearly derivable from the *application text*. Apart from the fact, that except for [Example 18] (referring to the use of an aluminoxane) all examples concerning subject-matter as claimed are based on the use of TIBA (cf. the Respondent/P's letter of 23 May 2007, page 2, lines 17 to 19), TIBA has clearly been identified on *page 21, lines 13 to 17* as one of two particularly preferred species of component (C). Moreover, in the introduction of the description (namely on *page 2, lines 6 to 22*), the problems and difficulties encountered by the skilled person when using aluminoxanes as activator for transition metal catalysts in olefin polymerisation are clearly addressed, which in the Board's view make it clear that TIBA is more preferred than aluminoxanes. Reference has additionally to be made in this respect to *page 3, penultimate paragraph* pointing out that "*a great amount of an aluminum compound*" should be avoided. In view of these statements in the *application*, the Board does not, therefore, see any reason to raise an objection under Article 123(2) EPC in this respect.

2.2.6 Therefore, the requirements of Article 123(2) and Rule 139 EPC are met by the operative sole claim. Since the above restrictions further limit the scope of the claim, Article 123(3) EPC is also complied with.

Moreover, the Board sees no basis for objections under Articles 83 and 84 EPC, respectively.

3. *Problem and solution*

3.1 The patent in suit concerns a process for producing homo- or copolymers of olefins carried out in the presence of a catalyst system comprising as main components a transition metal compound according to

component (A), a compound (B) capable of forming an ionic complex when reacted with the transition metal compound (A) and an organoaluminium compound (C). The patent aims at a high catalyst activity (cf. [page 10, lines 12 to 13 and 30 to 32]).

3.2 In its SGA, Appellant/O-01 based its objection under Article 56 EPC on D3, which it considered as being the closest prior art, as also agreed to by Respondent/P and the Opposition Division, in combination with D7.

3.2.1 Document D3 relates (page 3, last paragraph of D3), on the one hand, to (i) a method for preparing a catalyst (Claims 1 to 10), (ii) the catalyst as such (Claim 12) and (iii) a "composition of matter" on the basis of a zirconium compound having a peralkyl-substituted cyclo-pentadienyl ligand (Claims 14 to 17). On the other hand, it also relates to (iv) a method for polymerising one or more unsaturated monomers including α-olefins, diolefins and/or acetylenically unsaturated monomers (page 3, lines 20 and 21; and in particular, Claim 11) and (v) the polymeric product of this method (Claim 13).

Since, according to page 2, line 45 of D3, previous catalyst systems referred to in the Background of the Invention had had the problem, besides other disadvantages (eg the risk of fire because of metal alkyls being used as the cocatalyst), of not being highly active, the document aimed at an improved catalyst system which avoided the disadvantages of those previous systems (D3, page 3, lines 6 to 12 and 19 to 21).

3.2.2 More particularly, the active catalyst system of D3 is based on the product of the reaction between a bis-(cyclopentadienyl)metal compound (metallocene) and a

compound, which is converted in this reaction to an anion, which is bulky, labile and capable of stabilising the metal cation derived, at the same time, from the above metallocene (Claim 1). It has not been disputed that these two components of the catalyst system of D3 correspond to components (A) and (B) of the patent in suit.

However, as admitted by Appellant/O-01, D3 is silent about the addition of the present component (C) (TIBA) to the catalyst according to its claimed subject-matter (section IV(2), above).

3.2.3 Aluminium compounds are mentioned in D3 as cocatalysts in the context of conventional catalysts of the state of the art (page 1, lines 11 to 44). Moreover, the document points out that these metal alkyl cocatalysts are highly pyrophoric and, as a result, hazardous to use (line 44). Otherwise, aluminium is only mentioned on page 10, line 38 to 42 as being an impurity for the polymer which, like Mg and chloride, should rather be avoided with regard to the range of applicability of the polymer product. Therefore, one object mentioned on page 3, lines 32/33 of D3 was to provide polymeric products "*which are free of certain metal impurities*".

3.3 In view of the above findings and of the results of the examples as addressed in the decision under appeal (section III(3), above), the Board has no reason to deviate from the decision under appeal in that (i) D3 is the closest prior art (sections III(2)and IV(3) (last sentence), above, and the rejoinder, page 4, paragraph 3), (ii) the problem to be solved with regard to D3 can be seen in an increase of the activity of a catalyst comprising components (A) and (B) (No. 7.7 of

the reasons), and (iii) this problem has credibly been solved.

Inventive step

4. It remains to be decided whether the solution of this problem, as claimed, derives in an obvious way from the cited documents.

4.1 Whilst admitting that D3 did not mention the addition of TIBA to its catalyst comprising components (A) and (B) (section 3.2.2, above), the Appellant asserted, however, that D3 would indicate on its page 9, lines 52 to 56, that oxygen or moisture might inactivate the catalyst and that the reference on its page 3, line 41 to the use of a catalyst prepared by combining *at least two* components would provide hints that the use of a third catalyst component might be useful (section IV(2), above).

As pointed out by Respondent/P in its rejoinder (page 5, third last paragraph), the problem concerning the presence of oxygen and moisture can be avoided or solved by setting the ratio of the metallocene component (A) to the second component (B) to a certain range (D3, page 9, lines 52 to 57). Moreover, Respondent/P referred there additionally to the disadvantages of an addition of further components to the catalyst system, such as fire hazards (cf. section 3.2.3, above) and concluded therefrom that D3 taught away from the claimed subject-matter.

These arguments of Respondent/P in its rejoinder of 23 May 2007 remained undisputed.

4.2 It follows therefrom that D3 by itself does not provide an incentive to solve the above problem, let alone by the addition of TIBA, an trialkylaluminium.

4.3 Document D7 discloses a process for polymerising olefins by means of a catalyst having much higher activity than hitherto known catalyst systems (page 5, lines 26 to 28 of D7). This new catalyst requires three mandatory components (A), (B) and (C) to form the polymerisation catalyst. Component (A) is a solid component composed of a Group IVB transition metal compound supported on an inorganic carrier, (B) an aluminoxane (pages 20 to 23) and (C) an organoalkyl aluminium compound (page 23) having a hydrocarbon group other than n-alkyl (Claim 1). According to Claim 9, the organic group of the organoaluminium compound of component (C) is a branched alkyl, cycloalkyl or aryl group.

4.3.1 The transition metal compound (metallocene) containing at least one cycloalkadienyl ligand and up to three aryl, alkyl, cycloalkyl and aralkyl groups, halogen and hydrogen atoms, or groups of the formulae $-OR^a$, $-SR^b$ or $-NR^c_2$ is not particularly restricted and overlaps with component (A), but does not refer specifically to the use of those compounds of component (A) as defined in the operative claim. The metallocenes used in the examples of D7 contained one or two cyclopentadienyl, substituted cyclopentadienyl or indenyl ligands, respectively, and at least one chloride ligand, in particular, bis(cyclopentadienyl)zirconium dichloride (Examples 1 to 17, 19 to 27, 41 and 42), ethylene-bis(indenyl)zirconium dichloride (Example 18), and a number of bis(cyclopentadienyl)zirconium monochloride compounds, each additionally containing one of phenoxy,

phenylthio, ethoxy and butoxy groups (Examples 28 to 40 as shown in Table 7 and Example 43) were used in the examples of D7.

4.3.2 The list of suitable compounds for component (C) includes 17 individual compounds, amongst which TIBA (page 23, lines 12/13) is mentioned. The Respondent/P pointed in its rejoinder to the fact that in the examples of D7 TIBA had been used besides various other aluminium compounds, eg tri(2-methylpentyl)aluminium, tri(2-ethylhexyl)aluminium and isoprenylaluminium (each one in combination with aluminoxane), but that "*D7 does not disclose any particular advantage or effect of TIBA. To the contrary, this document teaches the use of a different component (B) than the present invention, namely an aluminoxane, which has to be avoided according to the present invention.*" (rejoinder, page 6, paragraph 1). This argument has not been refuted or disputed by the Appellant/O-01.

4.3.3 The document aims at the production of polymers having a narrow molecular weight distribution or at copolymers having a narrow molecular weight distribution and a narrow composition distribution with excellent polymerisation activity (D3, page 8, line 4 *et seq.*).

4.3.4 As already mentioned in section 3.1, above, the patent in suit aims not only at a high catalyst activity, but aims to increase the catalyst activity in comparison with a catalyst system free of component (C) (section 3.3, above), as demonstrated by [Example 16] in comparison with [Examples 17] (which was based on the addition of triethylaluminium) and as acknowledged in the decision under appeal (cf. section III(2), above) or by [Example 1] in comparison with the same procedure

using the same catalyst but (like D3) without any alkylaluminium compound [Comparative Example 1].

4.3.5 As addressed above, the catalyst of D7 is derived from the composition of three mandatory components, two of which are aluminium compounds.

4.3.6 In view of these facts the Board takes the view that, contrary to the Appellant's opinion, D7 does not provide an incentive to modify the process of D3 by applying one of the two aluminium compounds, but to omit the other, let alone to add TIBA (which would be contrary to the teaching in D3 to avoid any addition of further metal compounds, even in traces), in particular since D3 itself provides a different solution for the problem of reduced catalyst activity caused by oxygen or moisture (cf. section 4.1, above second paragraph).

4.4 The finding that there was no incentive to combine the teachings of D3 and D7 can even be seen in more general terms, irrespective of the question of which document was to be the starting point, because the teachings of these two documents point in different directions. On the one hand, as shown above, D3 clearly teaches away from using a catalyst system comprising aluminium compounds for a number of reasons, such as hazards caused by its use (cf. D3, page 2, line 43/44) and/or the reduced applicability of the product (D3, page 10, lines 38 to 42), whilst, on the other hand, D7 clearly requires the presence of two different aluminium components (aluminoxane and an organoaluminium compound having a hydrocarbon groups other than n-alkyl groups).

These divergences between the disclosures of D3 and D7 rather demonstrate that the suggestion to combine their teachings can only be based on an interpretation of

each of D3 and D7 in the knowledge of the subject-matter of the patent in suit, which in the case of D3 would go contrary to its teaching to avoid the presence of "certain metal traces such as aluminium ..." (D3, page 10, lines 38 to 40) or in the case of D7 would even require the omission of one of three mandatory components of its catalyst system, namely the aluminoxane. Nor would the skilled reader of these documents have expected that the catalyst activity would be improved when going against the teaching of either document.

4.5 It follows therefrom that, irrespective of whether D3 or D7 would be considered as the closest prior art, the subject-matter of the operative sole claim cannot be considered as being derivable in an obvious way from the cited prior art. Consequently, the Board has come to the conclusion that the subject-matter of this claim is based on an inventive step (Article 56 EPC).

Auxiliary Requests

5. In view of this outcome there is no need further to consider the further auxiliary requests of the Respondent/P.

Order

For these reasons it is decided that:

The appeal is dismissed subject to the correction of Claim 1 according to the version filed with the letter dated 23 May 2007 and the verified version of page 8 of the patent specification.

The Registrar: The Chairman:

E. Görgmaier R. Young