

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen
(D) No distribution

**Datasheet for the decision
of 20 November 2007**

Case Number: T 1121/05 - 3.3.03

Application Number: 98906691.5

Publication Number: 0963382

IPC: C08F 4/60

Language of the proceedings: EN

Title of invention:

POLYMERIZATION CATALYST SYSTEMS COMPRISING HETEROCYCLIC FUSED
CYCLOPENTADIENIDE LIGANDS

Patentee:

ExxonMobil Chemical Patents Inc.

Opponent:

Basell Polyolefine GmbH

Headword:

-

Relevant legal provisions:

-

Relevant legal provisions (EPC 1973):

EPC Art. 54(3)(4), 123(2), 123(3)

Keyword:

"Extension of scope of protection (no)"

"Novelty (yes)"

Decisions cited:

G 0009/91, G 0001/03, T 0219/83, T 0793/93, T 0355/99,
T 1018/02

Catchword:

-



Case Number: T 1121/05 - 3.3.03

DECISION
of the Technical Board of Appeal 3.3.03
of 20 November 2007

Appellant: Basell Polyolefine GmbH
(Opponent) Brühler Straße 60
D-50389 Wesseling (DE)

Representative: Colucci, Guisepppe
Basell Poliolefine Italia S.r.l.
Intellectual Property
P.le Privato G. Donegani, 12
Casella Postale 19
I-44100 Ferrara (IT)

Respondent: ExxonMobil Chemical Patents Inc.
(Patent Proprietor) 5200 Bayway Drive
Baytown, TX 77520-5200 (US)

Respondent: UEXKÜLL & STOLBERG
Patentanwälte
Beselerstraße 4
D-22607 Hamburg (DE)

Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office dated
8 June 2005 posted 5 July 2007 concerning
maintenance of European patent No. 0963382 in
amended form.

Composition of the Board:

Chairman: R. Young
Members: C. Idez
H. Preglau

Summary of Facts and Submissions

- I. The grant of the European patent No. 0 963 382 in the name of ExxonMobil Chemicals Patents Inc. in respect of European patent application No. 98 906 691.5 filed on 24 February 1998 and claiming priority from the US patent applications US 806181 and US 999214 respectively filed on 25 February 1997 and on 29 December 1997, was announced on 14 November 2001 (Bulletin 2001/46) on the basis of 8 claims.

Independent Claims 1 and 8 read as follows:

"1. A polymerization catalyst system comprising a catalytic complex formed by activating a transition metal compound represented by the formula:



wherein:

M is a transition metal selected from the group consisting of Group 3, 4, 5 and 6 metals;

L is a cyclopentadienide-containing ligand which may be the same as or different from any other L, but at least one L is a group 13, 15, or 16 heterocyclic fused cyclopentadienide ligand;

A is a monatomic or polyatomic ligand, other than a cyclopentadienide-containing ligand, which bears a formal negative charge and can be the same as or different from any other A;

D' is an optional donor ligand which may or may not be present;

m is an integer which has a value of 1, 2, or 3;

n is an integer which has a value of 1, 2, or 3; and
o is an integer representing the number of optional
donor ligands D'.

8. A polymerization process comprising contacting,
under gas-phase, slurry, or solution polymerization
conditions:

- a) a monomer containing olefinically or acetylenically
unsaturated units;
- b) optionally, one or more comonomers having
olefinically or acetylenically unsaturated units; and
- c) the catalyst system of claim 1, 2, 6, or 7."

Claims 2 to 7 were dependent claims.

II. A Notice of Opposition was filed against the patent by
Basell Polyolefine GmbH on 14 August 2002 on the
grounds of lack of novelty (Article 100(a) EPC) in
which revocation of the patent in its entirety was
requested.

The objection was supported *inter alia* by the following
documents:

- D1: WO-A-98/22 486;
- D2: EP 96 118 369.6 (priority document of D1), as well
the later filed documents:
- D5: O. Meth-Cohn et al "Thiophene Analogues of
Indenes"; Acta Chemica Scandinavica, No. 20, 1966,
pages 1577-1587;
- D6: H. Volz et al. "The 5-Methyl-1-Thiapentalenyl
Anion"; Tetrahedron letters, No. 48, 1976,
pages 4375 to 4376; and

D8: Result of Search for Chemical Abstracts Registry Numbers of the metallocene compounds of document D1.

III. According to the interlocutory decision of the Opposition Division announced orally on 8 June 2005 and issued in writing on 5 July 2005, account being taken of the amendments made by the Patent Proprietor during the opposition proceedings, the patent and the invention to which it related were found to meet the requirements of the EPC.

The decision of the Opposition Division was based on Claims 1 to 8 submitted as main request at the oral proceedings of 8 June 2005.

Claim 1 of the main request differed from Claim 1 as granted in that the following disclaimer had been introduced therein:

"with the proviso that the catalytic complex is not formed by isopropylidene[cyclopentadienyl-(7-cyclopentadithiophene)] zirconium dichloride activated by methylalumoxane".

Claims 2 to 8 of the main request corresponded to Claims 2 to 8 as granted.

According to the decision, this set of Claims 1 to 8 met the requirements of Article 123(2) and 123(3) EPC. Concerning novelty, the Opposition Division took the view that the subject-matter of the claims was novel over document D1 since several selections had to be made from the general disclosure of D1 to arrive at the general formula according to Claim 1 of the patent in suit, and since the catalyst disclosed in Example 7 of

D1 had been disclaimed. In its decision, the Opposition Division further considered that the catalysts disclosed in Examples 2, 3 and 5 did not contain cyclic ligands and, hence did not anticipate the subject-matter of Claim 1 of the patent in suit.

IV. A Notice of Appeal was filed on 2 September 2005 by the Appellant (Opponent) with simultaneous payment of the prescribed fee.

In the Statement of Grounds of Appeal filed on 4 November 2005, the Appellant argued essentially as follows:

(i) Concerning novelty:

(i.1) D1 (pages 13 to 14) related to metallocene compounds having the formula:



(i.2) Starting from the preferred embodiments for the variables Y, j, Rⁱ, Z, jj, Me, Q, k, P, and l described in D1 for the transition metal compound of formula (I), there was not the need to make any selection in order to achieve the catalyst system according to Claim 1 of the patent in suit.

(i.3) According to D1(page 11, lines 13-15), the ligand Y including a central six π electron radical having an associated radical containing at least one heteroatom was called "HCy".

(i.4) The preferred meaning of HCy was reported on the second paragraph on page 45 of D1 to be mono heteroatom and diheteroatom containing fluorenes, mono heteroatom and diheteroatom containing indenenes, including thia and aza pentalene type systems or heterocyclic compounds including thia, dithia, aza, diaza and thiaaza systems, having three fused five member rings.

(i.5) Furthermore, preferred Y ligands containing heterocyclic fused ring systems were the structures reported on pages 36-38 of D1.

(i.6) Thus, the definition of L in Claim 1 of the patent in suit was anticipated by the preferred meaning of Y.

(i.7) It was also clear in view of D1 (paragraph bridging pages 54 and 55) that the preferred metals Me were titanium, zirconium and hafnium, i.e. metals belonging to Group 4.

(i.8) When the group P was present in formula (I), this corresponded to a catalyst system formed by activating the transition metal catalyst according to Claim 1 of the patent in suit.

(i.9) The definition of Z in D1 (page 12) overlapped with the definition of A and D in Claim 1 of the patent in suit. The definition of Q in D1 was fully comprised in the definition of A.

(i.10) Furthermore Examples 2, 3 and 5 of D1 would be novelty destroying for the subject-matter of Claim 1 of the patent in suit.

(i.11) In Example 1 of D1 the metallocene compound was the same as the one exemplified in Synthesis Example 2 of the patent in suit.

(i.12) It was evident that there was clerical error in the title of Example 1 i.e. "synthesis of bis(2-methylthiapentenyl)zirconium dichloride".

(i.13) In view also of document D6, it was clear that the synthesis of Example 1 would lead to a 5-methyl-1-thiapentalenyl compound.

(i.14) This was also clear from step d of the Example 1 which referred to the lithium salt of 5-methyl-1-thiapentalene.

(i.15) It was further evident that the compound of Example 1 was used in the catalyst composition of Examples 2, 3 and 5 of D1.

(ii) Concerning Article 123(3) EPC:

(ii.1) The difference between the set of claims as granted and set of claims as amended during the oral proceedings before the Opposition Division was that a disclaimer on the catalyst system formed by contacting isopropylidene[cyclopentadienyl(7-cyclopentadithiophene)] zirconium dichloride and methylalumoxane had been introduced.

(ii.2) Since Claim 1 as granted did not however encompass the presence of a bridging group in the transition metal compound of formula (1), by

disclaiming a bridged compound, this extended the protection conferred by granted Claim 1 by including bridged compounds.

(ii.3) Consequently, Claim 1 of the set of claims as amended infringed Article 123(3) EPC.

(ii.4) Although the Appellant was fully aware of the fact that grounds of opposition submitted for the first time in appeal proceedings could be introduced only with the consent of the other party, it was submitted that this objection was so relevant that it should be dealt by the Board.

V. With its letter dated 23 March 2006, the Respondent submitted four auxiliary requests.

It also argued essentially as follows:

(i) Concerning Article 123(3) EPC:

(i.1) As evidenced by the minutes of the oral proceedings before the Opposition Division (paragraph III.1), the Appellant agreed to the formal admissibility of Claim 1 of the main request.

(i.2) Thus, the Appellant should be barred from raising the issue of Article 123(3) EPC on appeal.

(i.3) In any case, the description of the patent-in-suit clearly showed that the formula according to Claim 1 of the patent in suit covered either or both of

transition metal compounds bearing substituents and bridging groups on ligands L.

(i.4) Paragraph [0024] at lines 14 to 23 on page 5 of the patent-in-suit described that bridging groups may be present in at least two modes. Those modes were then set out in detail in paragraph [0024] itself and subsequent paragraphs on pages 5 and 6.

(i.5) Thus, the objection under Article 123(3) EPC would also be unfounded.

(ii) Concerning novelty:

(ii.1) D1 was published after the priority date of the patent in suit. In order to be citable as prior art under Article 54(3) EPC, the respective disclosure of D1 must be entitled to the priority date of 15 November 1996 of document D2.

(ii.2) However, the novelty attack on the basis of Formula (I) as defined on pages 13 and 14 of D1 already had to fail because that disclosure of D1 was not entitled of the priority of D2.

(ii.3) Even if it would be considered that that disclosure of D1 was entitled to the priority of D2, it did not represent a novelty destroying disclosure, since the metallocene of D1 could be used without activators and since the definition of the ligand Y in D1 was more general than the definition of the ligand L in the patent in suit.

(ii.4) D1 provided a long list of alternatives for the various radicals of formula (I) from which a number of selections had to be made in order to arrive at the subject-matter of Claim 1.

(ii.5) Examples 9 to 18 of D1 had no basis in D2.

(ii.6) Examples 1 and 4 did not relate to a catalytic complex formed by activation.

(ii.7) The disclosure of Examples 7 and 8 had been disclaimed.

(ii.8) Concerning Examples 2 and 3, there was no link between the metallocene compound prepared in Example 1 and those used in Examples 2 and 3.

(ii.9) The 2-methylthiapentenyl ligand used in Examples 2, 3 and 5 did not comprise a cyclopentadienide radical.

(ii.10) The argument of the Appellant that "methylthiapentenyl" should read "methylthiapentalenyl" was insufficient since doubt remained as the exact structure of the metallocene compound in Examples 1 to 5.

VI. Oral proceedings were held before the Board on 20 November 2007.

(i) At the oral proceedings, the discussion firstly focussed on the question as to whether Claim 1 of the main request was open to an objection under

Article 123(3) EPC. The submissions made by the Parties in that respect might be summarized as follows:

(i.1) By the Respondent:

(i.1.1) At the oral proceedings before the Opposition Division, the Appellant had agreed that Claim 1 of the main request met the requirements of Article 123(2) and 123(3) EPC.

(i.1.2) This was corroborated by the minutes of the oral proceedings (Point III thereof).

(i.1.3) Thus, the Appellant was not adversely affected by the decision of the Opposition Division in that respect. Consequently, the objection under Article 123(3) EPC raised by the Appellant should not be considered in the appeal proceedings.

(i.2) By the Appellant:

(i.2.1) The allowability of Claim 1 under Article 123(3) EPC had not been discussed at the oral proceedings before the Opposition Division.

(i.2.2) There had hence been no agreement in that respect.

(ii) The Board, after deliberation, informed the Parties that the objection under Article 123(3) EPC would be considered in the appeal. The substantive submissions made in that respect by the Parties may be summarized as follows:

(ii.1) By the Appellant:

(ii.1.1) Claim 1 as granted did not encompass bridged compounds.

(ii.1.2) There was no indication in Claim 1 as granted of the possibility of connecting the ligands.

(ii.1.3) Paragraph [0024] of the patent in suit defined a bridging group, as a moiety that was not contained in the definition of the ligand L. It stated that a bridging group might be present in order to connect two or more L.

(ii.1.4) Paragraph [0025] disclosed further compounds of formula (I) containing both a bridging group T and a group L. The same definition of T was also to be found in formula (3) (cf. paragraph [0033]), in formula (4) (paragraph [0037]), and in formula (5) (paragraph [0038]).

(ii.1.5) Claim 1 as granted did not however mention the presence of such T group.

(ii.1.6) While the optional presence of substituents on the ligands could be considered as intrinsic in Claim 1 as granted, the feature that the ligands could be bridged should have been explicitly mentioned in Claim 1 as granted.

(ii.2) By the Respondent:

(ii.2.1) Claim 1 as granted contained the essential features of the inventive compounds. There was hence no need to indicate optional features such as the presence of substituents on the ligands or the possibility for the ligands to be bridged.

(ii.2.2) The description of the patent in suit should be used to interpret the claims.

(ii.2.3) Paragraph [00024] indicated that bridging groups might be present in the inventive transition metal compounds in at least two modes.

(ii.2.4) Paragraph [0021] indicated that the Group 13, 15 or 16 heterocyclic fused cyclopentadienide ligand might be substituted.

(ii.2.5) Paragraphs [0024] and [0021] belonged to the detailed description of the invention, while paragraph [0012], which referred to the general disclosure of the invention defined the inventive transition metal compounds in the same terms as granted Claim 1.

(iii) The Board having, after deliberation, informed the Parties that Claim 1 of the main request met the requirements of Article 123(3) EPC, the discussion moved to the assessment of novelty of the subject-matter of the main request. While essentially relying on the arguments presented in the written phase of the appeal, the Parties made additional submissions which may be summarized as follows:

(iii.1) By the Respondent:

(iii.1.1) The process used in step (d) of Example 1 of D1 was similar to the process used in Synthesis Example 2 of the patent in suit (cf. paragraph [0071]).

(iii.1.2) It was hence evident that the zirconium compound obtained in Example 1 of D1 fell under the definition of the transition metal compound according to Claim 1 of the patent in suit.

(iii.1.3) There was however errors in the name given to that compound in D1, i.e. bis(2-methylthiapentenyl) zirconium dichloride.

(iii.1.4) The fact that Example 1 of D1 led to a compound falling under the definition of the transition metal compound according to Claim 1 was demonstrated by document D8 which showed the registry number given by Chemical Abstracts to the compound of Example 1 of D1 and its right name.

(iii.1.5) Document D8 had been resubmitted with the Statements of Grounds of Appeal. It was further referred to in the letter of 8 April 2005 submitted during the opposition proceedings and resubmitted with the Statement of Grounds of Appeal. Thus, D8 was part of the appeal proceedings.

(iii.1.6) It was further clear that the zirconium compound prepared in Example 1 of D1 was used in the catalyst system comprising an alumoxane activator for the polymerization of ethylene in Example 2 and the polymerization of propylene in Example 3 of D1.

(iii.1.7) Thus, Examples 2 to 3 of D1 were novelty destroying for the subject-matter of Claim 1 of the main request.

(iii.1.8) D1 would also be novelty destroying in view of its general description.

(iii.1.9) The preferred Y groups in the formula (1) of the metallocene compound according to D1 (cf. page 35 to page 38; page 45 of D1) corresponded to the group L according to Claim 1 of the patent in suit.

(iii.1.10) According to D1 (page 54, last paragraph), the preferred metals in formula (I) were metals of the Group 4 or 5.

(iii.1.11) P was an optional group since l could be 0, 1 or 2.

(iii.1.12) P could be an anion of a Lewis acid. Such cationic metallocene compound would be obtained by reacting neutral metallocene with a Lewis acid.

(iii.1.13) Lewis acid belonged to the activators according to the patent in suit (cf. paragraph [0051]).

(iii.1.14) Thus, if l was 1 or 2, the metallocene compound according to the formula (1) of D1 would have been formed by reacting a neutral metallocene with an activator.

(iii.1.15) If however l was 0, the metallocene had to be activated in order to be used as catalyst (cf. D1, page 68, last paragraph).

(iii.1.16) Thus, there was no need to make several selections in terms of activation or in terms of ligand Y in D1 to come to catalyst system according to Claim 1 of the main request.

(iii. 2) By the Respondent:

(iii.2.1) Document D8 did not form part of the appeal proceedings. In the reasoning presented in the Statement of Grounds of the Appellant, there was no mention of document D8.

(iii.2.2) D8 was a post published document. Furthermore, the content of D8 was not clear since it was a "cut and paste" document since it directly jumped from statement "L2" to Statement "L9".

(iii.2.3) D8 should, hence, not be admitted into the proceedings.

(iii.2.4) It was not clear which compound had in fact been prepared in Example 1 of D1, since the name of the compound indicated in the title of the Example did not correspond to compound which might have been obtained according to step d of that example.

(iii.2.5) Even if one would consider that D8 indicated the right name of the metallocene compound produced in Example 1 of D1, the metallocene compound of Example 1 had in any case not been activated, since there was no link between Example 1 and Examples 2 to 3.

(iii.2.6) There was no indication that the name of the metallocene compound used in Examples 2 and 3 was wrong, since metallocenes having a linear pentenyl radical were also considered in D1.

(iii.2.7) Concerning the general description of D1, it was maintained that several selections were necessary to come to the claimed catalyst system according to Claim 1.

(iii.2.8) If a P group was present in formula (1) of D1, this did not imply that the neutral metallocene had been reacted with an activator. An anion such as PF_6^- mentioned in D1 (page 55) would not be considered as having activating properties.

(iii.2.9) Furthermore, neutral metallocenes such those based on scandium did not require activators to be used in polymerization reactions.

(iii.2.10) Thus, even if one would consider the preferred Y groups of D1, there would still remain a need of selection in terms of activation to come to a catalyst system according to Claim 1 of the main request.

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, or in the alternative to set aside the decision under appeal and to maintain the patent on the basis of one

of the auxiliary requests 1 to 4 submitted with the letter dated 23 March 2006.

Reasons for the Decision

1. The appeal is admissible.

Procedural matters

2. As appears from the Summary of Facts and Submissions (cf. Section VI above), the Board was faced with procedural issues concerning (i) the admissibility of the objection under Article 123(3) EPC raised by the Appellant against Claim 1 of the set of claims on the basis of which the Opposition Division intended to maintain the patent in suit, and (ii) and the question as to whether document D8 formed part of the appeal proceedings.

2.1 Concerning point (i):

- 2.1.1 As indicated above in Section III, the Opposition Division had considered that the patent could be maintained in amended form on the basis of the main request submitted at the oral proceedings of 8 June 2005.
- 2.1.2 As can be deduced from the decision of the Opposition Division (cf. points 2 and 4 of the Reasons for the Decision), this disclaimer had been incorporated in granted Claim 1 in order to overcome an objection of lack of novelty in respect of Example 7 of document D1 which is a document belonging to the state of the art

according Article 54(3) and (4) EPC. This amendment had been considered as meeting the requirements of Article 123(2) EPC by the Opposition Division.

- 2.1.3 In that context the Board notes, on the one hand, that in its Statement of Grounds of Appeal, the Appellant, while raising an objection under Article 123(3) EPC against amended Claim 1, took the view, however, that this objection would represent a new ground of opposition and that its admission would hence be subject to the consent of the Patent Proprietor.
- 2.1.4 On the other hand, the Board observes that the Patent Proprietor had argued at the oral proceedings before the Board, that the Appellant had agreed to the amendments made in granted Claim 1 at the oral proceedings before the Opposition Division, and that, hence, it was not adversely affected by the decision of the Opposition Division to consider the amendment made as allowable under Article 123(2) and (3) EPC. Consequently, in the Respondent's view, the Appellant should be barred from raising this objection in appeal.
- 2.1.5 While it is true that new grounds of opposition could only be introduced in the appeal with the consent of the Patent Proprietor (cf. decision G 9/91, OJ EPO 1993, 408), it has been stated in the decision G 9/91 that "in order to avoid any misunderstanding, it should finally be confirmed that in case of amendments of the claims or other parts of a patent in the course of opposition or appeal proceedings, such amendments are to be fully examined as to their compatibility with the requirements of the EPC (e.g. with regard to the

provisions of Article 123(2) and (3) EPC) (Reasons for the decision point 19).

2.1.6 It thus follows from this statement that the Board has the obligation to check whether the amendments made in the course of the opposition proceedings, i.e. in the present case the introduction of the disclaimer, meet the requirements of Article 123(2) and 123(3) EPC, so that neither the considerations made by the Appellant in the Statement of Grounds of Appeal, nor the arguments submitted by the Respondent at the oral proceedings, could prevent the Board from checking the allowability of the introduction of the disclaimer under Article 123(3) EPC.

2.1.7 Consequently, the allowability of the introduction of the disclaimer in Claim 1 under Article 123(3) is to be dealt with by the Board.

2.2 Concerning point (ii):

2.2.1 The Board firstly notes that document D8 has been submitted by the Appellant (Opponent) during the opposition proceedings with its letter dated 8 April 2005.

2.2.2 Document D8 was cited in paragraph 8 of that letter which dealt with the interpretation of Example 1 of D1 and in particular in view of the name of the compound "bis(2- methylthiapentenyl) zirconium dichloride" and the synthesis of that compound in the light of the teachings of documents D5 and D6.

- 2.2.3 The Board notes that the Appellant has filed with its Statement of Grounds of Appeal copies of documents D1 to D8 and of its letter dated 8 April 2005.
- 2.2.4 The Board further observes that on page 10, last paragraph of the Statement of Grounds of Appeal, the Appellant had indisputably made reference to the arguments presented in the letter of 8 April 2005 concerning the synthesis of the compound of Example 1 of D1.
- 2.2.5 Taking into account that, as indicated above, document D8 was an element in this argumentation, and that the intention of the Appellant to rely from the beginning of the appeal proceedings on this document is, in the Board's view, clearly underlined by the fact that the Appellant has resubmitted D8 and the letter of 8 April 2005 with its Statement of Grounds of Appeal, the Board can only come to the conclusion that D8 is clearly part of the case presented by the Appellant with its Statement of Grounds of Appeal.
- 2.2.6 Consequently, the Board comes to the conclusion that document D8 forms part of the appeal proceedings.

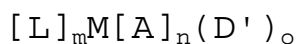
Main request

3. *Wording of the claims*

- 3.1 As indicated above in Section III, Claim 1 of the main request differs from Claim 1 as granted in that a disclaimer over Example 7 of document D1 had been incorporated therein.

- 3.2 Document D1 has been published on 28 May 1998, i.e. after the filing date of the patent in suit. Document D1 however claims the priority of the European patent application No. 96 118 369.6 (referred to as document D2) filed on 15 November 1996, i.e. earlier than the first priority claimed by the patent in suit (i.e. US patent application 08/806181 filed on 25 February 1997).
- 3.3 Thus, in order to be citable as prior art under Article 54(3) and (4) EPC, the relevant passages of D1 must be entitled to the priority of document D2, in other words they must have their counterpart in D2.
- 3.4 In that respect, it is immediately evident that Example 7 of D1 has its counterpart in the priority document of D1 (i.e. document D2; cf. pages 51 and 52 thereof).
- 3.5 It is also clear that neither this disclaimer nor the subject-matter excluded by it from the scope of granted Claim 1 have a basis in the application as originally filed.
- 3.6 Nevertheless, as stated in decision G 1/03 (OJ EPO 2004, 413) such a disclaimer may be allowable under Article 123(2) EPC in order to restore novelty by delimiting a claim against state of the art under Article 54(3) and (4) EPC.
- 3.7 Thus, the question of the allowability under Article 123(2) EPC of the disclaimer introduced in Claim 1 boils down to the question whether Example 7 of D1 was indeed novelty destroying for the subject-matter of granted Claim 1.

3.7.1 In that respect, the Board observes that granted Claim 1 was directed to a catalyst system comprising a catalytic complex formed by activating a transition metal of formula:



wherein:

M is a transition metal selected from the group consisting of Group 3, 4, 5 and 6 metals;

L is a cyclopentadienide-containing ligand which may be the same as or different from any other L, but at least one L is a group 13, 15, or 16 heterocyclic fused cyclopentadienide ligand;

A is a monatomic or polyatomic ligand, other than a cyclopentadienide-containing ligand, which bears a formal negative charge and can be the same as or different from any other A;

D' is an optional donor ligand which may or may not be present;

m is an integer which has a value of 1, 2, or 3;

n is an integer which has a value of 1, 2, or 3; and

o is an integer representing the number of optional donor ligands D'.

3.7.2 Example 7 of D1 relates to the polymerization of ethylene in presence of a metallocene compound i.e. isopropylidene[(cyclopentadienyl-(7-cyclopentadithiophene))] zirconium dichloride, and a methylalumoxane (MAO).

- 3.7.3 In this connection, it cannot firstly be disputed that methylalumoxane would act as an activator for this metallocene compound (cf. also D1, page 68, last line to page 69, line 11).
- 3.7.4 Concerning the metallocene compound used in Example 7, it cannot further be denied that zirconium is a metal belonging to the Group 4 of the Periodic Table, that chlorine falls under the definition of the group A as indicated in granted Claim 1, and that the presence of two chlorine atoms would also comply with the requirement in granted Claim 1 for the value of n.
- 3.7.5 The metallocene compound used in Example 7 of D1 comprises a ligand **containing** a cyclopentadienyl group fused with two heterocyclic rings groups containing a heteroatom of the Group 16 of the Periodic Table (emphasis by the Board).
- 3.7.6 In that respect, the Board observes that according to granted Claim 1, the ligand L is merely defined as a cyclopentadienide group **containing** ligand, at least one L being a Group 13, 15, or 16 heterocyclic fused cyclopentadienide ligand. In other words, the definition of L in Claim 1 contains no limitation either in terms of functionality of the ligand (monodentate, bidentate (e.g. bridged)), or in terms of substituents on the rings.
- 3.7.7 It thus follows that this broad definition of L has to be interpreted as encompassing the ligand of the metallocene compound of Example 7 of D1, which indisputably contains a Group 16 heterocyclic fused cyclopentadienide radical.

- 3.7.8 In that respect, the Board observes that this broad definition of ligand L in Claim 1 is also supported by the relevant introductory paragraph [0021] of the description of the patent in suit. Furthermore, this interpretation of Claim 1 is in itself, in the Board's view, not illogical and makes technical sense.
- 3.7.9 While it could have been considered in view of the subordinate paragraphs concerning the detailed disclosure of the invention (i.e. paragraphs [0024], [0025], [0033], [0037] or [0038] that bridged ligands might constitute a distinct class of ligand L from the one encompassed by the definition given in granted Claim 1, the description cannot be used to give a different meaning to a claimed feature (here the definition of L) in Claim 1), which feature in itself imparts a clear credible teaching to the skilled reader (cf. decision T 1018/02 of 9 December 2003, not published in OJ EPO, Reasons point 3.8).
- 3.7.10 Since Example 7 of D1 has its counterpart in the priority document of D1 (i.e. document D2; cf. pages 51 and 52 thereof), it must be considered as novelty destroying for the subject-matter of Claim 1 as granted (Article 54(3)(4) EPC).
- 3.7.11 It thus follows that the disclaimer introduced in Claim 1 of the main request is allowable under Article 123(2) EPC.
- 3.8 Since the disclaimer is allowable under Article 123(2) EPC, this inevitably implies that its introduction in Claim 1 leads *de facto* to a restriction of the scope of

protection in respect to the scope of protection conferred by Claim 1 as granted. Consequently, Claim 1 of the main request meets the requirement of Article 123(3) EPC.

3.9 No objection under Article 84 EPC has been raised by the Appellant in respect of the introduction of the disclaimer in Claim 1. The Board is also satisfied that the requirements of that article are met.

4. *Novelty*

4.1 Lack of novelty has been alleged by the Appellant against Claim 1 of the main request in view of Examples 1, 2, 3 and 5 as well as in view of the general description of D1.

4.2 In that context the Board observes firstly that Examples 1 to 5 of D1 have their counterparts in document D2 (cf. pages 46 to 50), so that they represent prior art belonging to Article 54(3) and (4) EPC.

4.3 The Board notes that Example 1 of D1 is, on the one hand said to refer to the synthesis of bis(2-methylthiapentenyl) zirconium dichloride (cf. page 78, line 6 ; cf also page 80, line 5) but that, on the other hand, it would appear to refer to the synthesis of product resulting from the reaction of 5-methyl-1-thiapentalenyl lithium salt with zirconium tetrachloride (page 80, lines 6 to 14), i.e. a zirconium compound which, according to the Appellant, would fall under the scope of the formula set out in

Claim 1 of the main request for the transition metal compound.

- 4.4 While the evident discrepancy between the name of the zirconium compound (i.e. containing a **2-methylthiapentenyl** radical) at page 78, line 6 and page 80, line 5 and the starting compound containing a **5-methyl-1-thiapentalenyl** radical inevitably casts a doubt on the exact disclosure of Example 1 of D1, it can nevertheless be discerned that no activator has been used in that example in combination with the zirconium compound, so that, at least for this reason, Example 1 cannot be considered as destroying the novelty of the subject-matter of Claim 1 of the main request.
- 4.5 Under these circumstances, it is hence not relevant for the assessment of novelty of the subject-matter of Claim 1 that the nature of the zirconium compound of Example 1 might have been registered in the databank Chemical Abstracts under the registration number 208464-19-1 corresponding to the compound zirconium, dichlorobis[3a,4,5,6,6a-η]5-methyl-3aH-cyclopenta[b]thien-3a-yl] (cf. D8, Statements L2 and L9), i.e. a compound which would fall under the scope of the formula indicated in Claim 1 of the main request for the transition metal compound.
- 4.6 Concerning Examples 2 and 3, they refer to the polymerization of ethylene (Example 2) or of propylene (Example 3) in presence of bis(2-methylthiapentenyl) zirconium dichloride and a methyl alumoxane (MAO).

4.7 In that respect it has been submitted by the Appellant that the fact that the same (wrong) name has been used for the zirconium compound mentioned in Example 1 (cf. page 78, line 6 ; cf also page 80, line 5) as in Examples 2 and 3 would imply that the same zirconium compound has been used in these examples. Thus, according to the Appellant, it was therefore a zirconium compound falling under the definition of formula of Claim 1, i.e. the compound having the registry number 208464-19-1, which has been used in Examples 2 and 3, and hence Examples 2 and 3 would be novelty destroying for the subject-matter of Claim 1 of the main request.

4.8 However, as stated in the decision T 793/93 of 27 September 1995 (not published in OJ EPO, Reasons point 2.1) in deciding what is or is not the inevitable outcome of an express literal disclosure in a particular prior art document, a standard of proof much stricter than the balance of probability, to wit "beyond all reasonable doubt" needs to be applied. It follows that if any reasonable doubt exists as to what might or might not be the result of carrying out the literal disclosure and instructions of a prior art document, in other words if there remains a "grey area" then the case on anticipation based on such a document must fail.

4.8.1 In this connection, the Board notes that the name of the zirconium compound used in Examples 2 and 3 would *prima facie* suggest that this compound is a zirconium compound having a sulphur containing linear pentenyl radical, instead of sulphur containing heterocyclic fused cyclopentadienide radical as required by Claim 1

of the main request. This possibility is, in the Board's view also corroborated by the fact that open chain ligands are also envisaged in D1 (page 11, line 10 to page 12, line 8; cf. also D2, page 10, line 9 to page 11, line 1).

- 4.8.2 Thus, while it could be accepted that the name of the zirconium compound indicated at pages 78 and 80 of Example 1 could not comply with the zirconium compound obtained by the reaction mentioned in step d of Example 1, the Board is, however, unable to discern an internal discrepancy within Examples 2 and 3 which consistently deal with a catalyst system comprising bis(2-methylthiapentenyl) zirconium dichloride and a methyl alumoxane (MAO).
- 4.8.3 Thus, taking further into account the absence of an explicit mention in Examples 2 and 3 that it was the zirconium compound synthesized according step d of Example 1 which had been used in these examples, it is not unthinkable, in the Board's view, that the name of the zirconium compound in Examples 2 and 3, i.e. bis(2-methylthiapentenyl) zirconium dichloride could indeed reflect the true nature of the zirconium compound used in these examples.
- 4.8.4 Consequently, in accordance with the principles set out in T 793/93, the objection of lack of novelty of the subject-matter of Claim 1 in view of Examples 2 and 3 must fail.

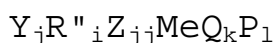
- 4.9 Example 5 of D1 refers to the polymerization of propylene in the presence of dimethylsilylbis(2-methylthiapentenyl)zirconium dichloride and methyl alumoxane.
- 4.9.1 In the Board's view, the mention of the **(2-methylthiapentenyl)** as ligand in the zirconium compound of Example 5 *prima facie* suggests, as in the case of Examples 2 and 3, that this compound does not comprise a sulphur containing heterocyclic fused cyclopentadienide radical as required by Claim 1 of the main request.
- 4.9.2 While the reference made to the use of 5-methyl-1-thiapentalene in step b of the preparation of the zirconium compound of Example 4 might on its own suggest that the final zirconium compound of Example 4 would contain an heterocyclic ligand as required by Claim 1 of the main request, it is noted by the Board that the zirconium compound prepared at the last step of Example 4 (step c) is said to have been obtained by treating the reaction product of dimethylsilylbis(**2-methylthiapentenyl**) with methyl lithium and with zirconium tetrachloride (emphasis by the Board).
- 4.9.3 Thus, even if one would consider that the zirconium compound used in Example 5 was the one synthesized in Example 4, although there is no explicit reference in that respect in Example 5, there would in any case remain doubts concerning the formula of the zirconium compound prepared in Example 4.

4.9.4 There is hence, in the Board's view, no reason for excluding the possibility that the name of the zirconium compound in Example 5 i.e. dimethylsilylbis(2-methylthiapentenyl)zirconium dichloride indeed reflects the true nature of the zirconium compound used in this example.

4.9.5 Consequently, in accordance with the principles set out in T 793/93, the objection of lack of novelty of the subject-matter of Claim 1 in view of Example 5 must also fail.

4.10 As indicated above in paragraph 4.1 lack of novelty of Claim 1 has also be alleged in view of the general description of document D1.

4.10.1 D1 refers to metallocenes compounds of formula (I):



where Y is a coordinating group containing a six π electron central radical directly coordinating Me, to which are associated one or more radicals containing at least one non carbon atom selected from B, N, O, Al, Si, P, S, Ga, Ge, As, Se, In, Sn, Sb and Te;
R'' is a divalent bridge between the Y and Z groups;
Z is a coordinating group having the same meanings as Y or is an open pentadienyl containing group, a cyclopentadienyl containing group, a heterocyclic cyclopentadienyl containing group, a nitrogen containing group, a phosphorous containing group, an oxygen containing group or a sulfur containing group;
Me is an element belonging to Group 3, 4, 5, 6 or to the lanthanide or actinide series of the Periodic Table of Elements;

Q is a linear or branched, saturated or unsaturated alkyl radical, aryl radical, alkylaryl radical, arylalkyl radical or a halogen atom;

P is a stable non-coordinating or pseudo noncoordinating counterion;

i is an integer having a value of 0 or 1;

j is an integer having a value from 1 to 3;

jj is an integer having a value from 0 to 2;

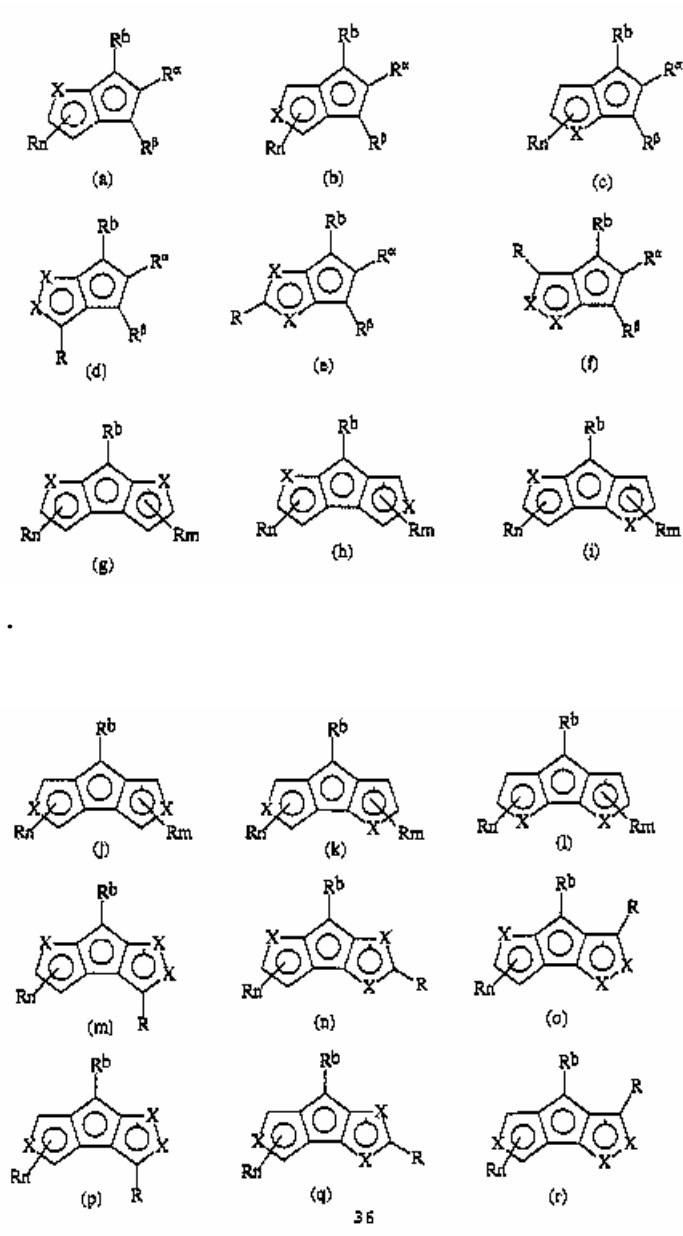
k is an integer having a value from 1 to 3; and

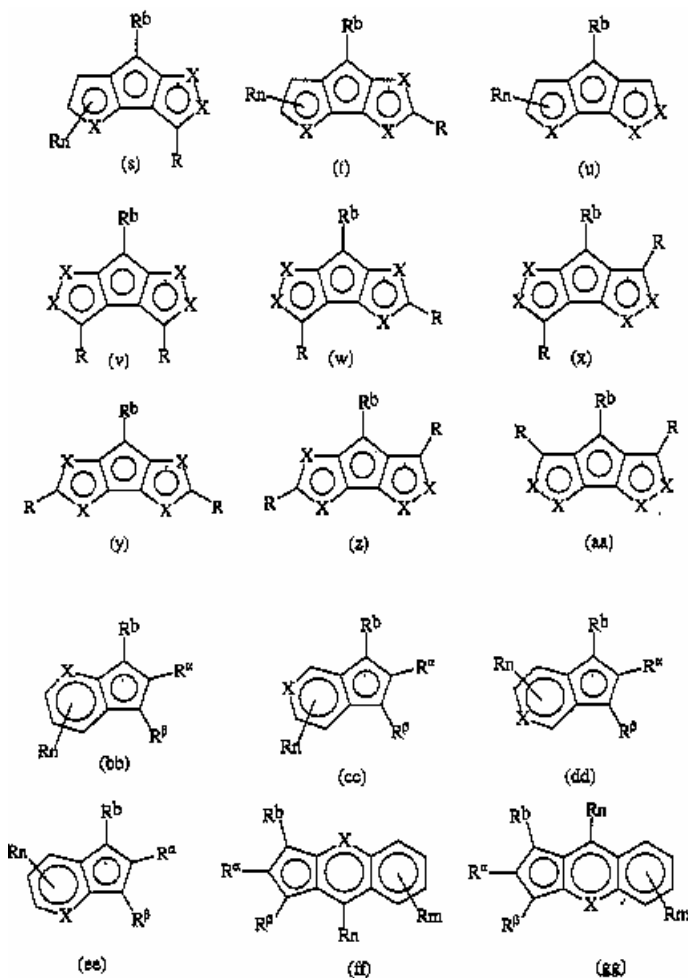
l is an integer having a value from 0 to 2 (page 8, line 6 to page 9, line 10; cf. also D2, page 8)).

4.10.2 According to D1, the formula (I) also describes cationic metallocenes where $l=1$ or 2 , which can be prepared by reacting an ion-pair or a strong Lewis acid compound with a neutral metallocene (i.e., $l=0$) to form a cationic metallocene (page 9, lines 11 to 14; cf. also D2, page 9, lines 8 to 12).

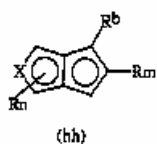
4.10.3 According to D1, associated groups containing at least one heteroatom include the following classes of rings radicals: (i) the heteroatom(s) is contained in a cyclic substituent linked to one of the atoms of the central radical; (ii) the heteroatom(s) is contained in a ring fused to the central radical, but is not an endocyclic member of the central radical; or (iii) the heteroatoms are contained in both a cyclic substituent linked to the central radical and in a ring fused to the central radical. The rings fused to the central radical can be aromatic, non-aromatic, unsaturated and/or unsaturated ring or ring systems. Furthermore, the central radical can include the phosphino-boratabenzene radicals (page 43, line 19 to page 44, line 10; cf. D2, page 23, lines 11 to 19).

4.11 According to D1 (pages 36 to 38) the preferred Y groups are represented by the following formulae:





or



in which, in particular, the X atoms, the same or different from each other, can be N, P, NR^g or PR^g, O or S; when a fused ring has two heteroatoms, then one X can be O or S and the other X can be N, P, NR^g or PR^g, or one can be N or P and the other can be NR^g, the radicals R^g, R, R^a, R^b, and R^b being as defined from page 38, line 10 to page 39, line 23). The definition of such preferred Y groups in which R^b is hydrogen

overlap with the definition of the preferred Y groups given in D2 starting from page 16, line 5 to page 20, line 10.

4.11.1 While it is true, as submitted by the Appellant, that such preferred groups Y would fall under the definition given in Claim 1 of the main request for the ligand L, it still remains indisputable that D1 also discloses Y groups which would not fall under the scope of L, at least for one of the following reasons:

(i) because they do not contain a cyclopentadienyl group (page 8, lines 10 to 14; page 11, lines 13 to 15; page 12, lines 7 to 8; page 44, lines 9 to 10);

(ii) because they do not contain hetero atoms belonging to the Groups 13, 14, or 15 but only atoms such as Si, Ge, or Sn (page 8, lines 10 to 14), or

(iii) because, even containing a heterocycle with at least one heteroatom belonging to the Groups 13, 14 or 15, this heterocycle is merely linked to one of the atoms of the central radical (page 43, last line to page 44, line 1) and not fused therewith.

4.11.2 Consequently, the Board can only come to the conclusion that the radical Y in D1 can be selected from a list of radicals, some members of which fall under the scope of the definition of ligand L according to Claim 1 of the main request and some of which do not.

4.11.3 The Board also observes that, according to D1 (page 68, line 27 to page 69, line 5; cf. also D2, page 37, lines 7 to 12), the metallocene compounds can be

activated upon addition of various cocatalysts such as organoaluminum compounds.

4.11.4 In that respect, the Board notes that it has been submitted by the Appellant, that for neutral metallocenes according to D1 (i.e. those in which l is 0 in the formula set out on page 8 of D1), an activator must in any case be used in combination with the neutral metallocene in a polymerization catalyst system, and that for cationic metallocenes (i.e. those in which l is 1 or 2), they result from the reaction of a neutral metallocene with an activator such as a Lewis acid. Thus, according to the Appellant, an activated catalyst system in the sense of Claim 1 of the patent in suit is inevitably disclosed in D1, independently of the value of l .

4.11.5 The Board however notes that the Respondent has submitted, on the one hand, that neutral metallocenes such as those containing scandium could be used without activator in a polymerization catalyst system, and that, on the other hand, reaction product of neutral metallocenes with Lewis acid containing $[PF_6]^-$ anion (cf. D1, page 55, line 21; cf. D2, page 32, line 1) would not be activated and would require an activator to be used in a polymerization catalyst system. In other words, there is in D1, according to the Respondent, the alternative of using or not using an activator in combination with the metallocenes disclosed therein.

4.11.6 Since the Parties have made contrary assertions concerning the use of an activator in combination with the metallocenes disclosed in D1, and since the Board is unable to establish this fact on its own motion, in

accordance with the principles set out in decision T 219/83 (OJ EPO 1986, 211; Reasons point 12) the Respondent (Patent Proprietor) is given the benefit of the doubt in that respect.

- 4.12 In this connection the Board observes that Claim 1 of the main request requires that the polymerization catalyst system comprises a catalytic complex formed by activating a transition metal compound having the formula set out in that claim in which the ligand L is a cyclopentadienide containing ligand which may be the same as or different from any other L, but at least one L is a group 13, 15, or 16 heterocyclic fused cyclopentadienide ligand.
- 4.13 According to the decision T 355/99 of 30 July 2002 (not published in OJ EPO), it is not sufficient for a finding of lack of novelty that the claimed features could have been derived from a prior art document, there must have been a clear and unmistakable teaching of the claimed features (Reasons, point 2.2.4).
- 4.14 As indicated above (cf. paragraph 4.11.2) the ligand Y in the metallocene compounds according to D1 can be selected from a list including as members only some ligands falling under the definition of L in Claim of the main request, and, that, for the reasons indicated above in paragraph 4.11.6, it must be considered that, in D1, the metallocene compounds may or may not be activated.
- 4.15 Under these circumstances, the Board can only come to the conclusion that there is no clear and unmistakable teaching in the disclosure of D1 which is entitled to

the priority of D2, except for the catalyst system disclosed in Example 7, which catalyst system has been disclaimed in Claim 1 of the main request, of the combination of features mentioned above in paragraph 4.12 in terms of activation and of nature of the ligand L.

4.16 Consequently, the argument of the Appellant of lack of novelty of Claim 1 of the main request in view of the general disclosure of D1 cannot succeed.

4.17 It thus follows that the subject-matter of Claim 1 of the main request must be considered as novel. The conclusion applies to dependent Claim 2 to 7 and to independent Claim 8 which refers to a polymerization process in the presence of a catalyst system according to Claim 1.

5. Therefore, the main request of the Respondent is allowable, and the appeal must hence be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Young