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**Datasheet for the decision
of 28 September 2011**

Case Number: T 1808/08 - 3.3.03
Application Number: 97928992.3
Publication Number: 906343
IPC: C08F 4/70, C08F 10/00
Language of the proceedings: EN

Title of invention:

Mixed transition metal catalyst systems for olefin polymerization

Applicant:

ExxonMobil Chemical Patents Inc.

Opponent:

E.I. DU PONT DE NEMOURS AND COMPANY

Headword:

-

Relevant legal provisions:

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

Relevant legal provisions (EPC 1973):

-

Keyword:

"Amendments- added subject-matter - (yes) - (main request, first-fourth, sixth-eighth auxiliary requests)."

"Amendments- extension of protection conferred - (yes) - (main request, first-fifth auxiliary requests)"

Decisions cited:

-

Catchword:

-



Case Number: T 1808/08 - 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 28 September 2011

Appellant: ExxonMobil Chemical Patents Inc.
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office, dated 18 June 2008 and
posted 8 July 2008 revoking European patent
No. 906343 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman: B. ter Laan
Members: M. C. Gordon
C.-P. Brandt

Summary of Facts and Submissions

I. The appeal by the patent proprietor lies against the decision of the opposition division dated 18 June 2008 and posted 8 July 2008 revoking European Patent number EP-B1-0 906 343 for lack of compliance with the requirements of Articles 84, 123(2) and 123(3) EPC.

II. In the application as originally filed independent claims 1 and 20 read as follows:

"1. A mixed transition metal olefin polymerization catalyst system suitable for the polymerization of olefin monomers comprising one late transition metal catalyst system and at least one different catalyst system selected from the group consisting of late transition metal catalyst systems, transition metal metallocene catalyst systems or Ziegler-Natta catalyst systems".

"20. A polymerization process for polymerizing olefinically unsaturated monomers comprising contacting one or more of ethylene, C₃-C₂₀ α -olefin, C₄-C₂₀ gem-substituted olefins, C₈-C₂₀ aromatic substituted α -olefin, C₄-C₂₀ cyclic olefin, C₄-C₂₀ non-conjugated diolefin, or C₂₀-C₁₀₀₀ vinyl and vinylidene terminated macromers with the catalyst system of claim 1 to produce a polymer".

The corresponding independent claims 1 and 16 of the patent as granted read as follows, additions compared to the originally filed claims being indicated in **bold underline**, deletions by ~~striketrough~~:

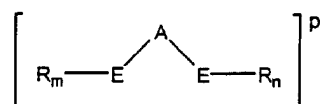
"1. A mixed transition metal olefin polymerization

catalyst system suitable for the polymerization of olefin monomers comprising at least one late transition metal catalyst system and at least one different catalyst system selected from the group consisting of late transition metal catalyst systems, transition metal metallocene catalyst systems and Ziegler-Natta catalyst systems,

the late transition metal compound of the formula:



wherein M is a group 9, 10 or 11 metal; L is a bidentate ligand defined by the formula:



wherein A is a bridging group containing a Group 13-15 element; each E is independently a Group 15 or 16 element bonded to M; each R is independently a C₁-C₃₀ containing radical or diradical group which is a hydrocarbyl, substituted hydrocarbyl, halocarbyl, substituted halocarbyl, hydrocarbyl-substituted organometalloid, halocarbyl-substituted organometalloid, m and n are independently 1 or 2 depending on the valency of E; and p is the charge on the bidentate ligand such that the oxidation state of MX_r is satisfied;
each X is, independently, a hydride radical, a hydrocarbyl radical, a substituted hydrocarbyl radical, a halocarbyl radical, a substituted halocarbyl radical, hydrocarbyl-substituted organometalloid radical or halocarbyl-substituted organometalloid radical; or two X's are joined and bound to the metal atom to form a metallacycle ring containing from 3 to 20 carbon atoms; a neutral hydrocarbyl containing donor ligand; a halogen, an alkoxide, an aryloxy, an amide, a phosphide, or other univalent anionic ligand; or two X's are joined to form an anionic chelating ligand; or a neutral non-hydrocarbyl atom containing donor ligand; and r is 1, 2 or 3;

the transition metal metallocene catalyst system is a Group 4, 5, 6, 9 or 10 transition metal compound having a mono- or bis-substituted cyclopentadienyl ligand; and the Ziegler-Natta transition metal catalyst system comprising a Group 4, 5 or 6 transition metal halide or oxyhalide activated for olefin polymerization by a Ziegler co-catalyst."

"16. A polymerization process for polymerizing olefinically unsaturated monomers comprising contacting one or more of ethylene, C₃-C₂₀ α-olefin, C₄-C₂₀ gem-substituted olefins, C₈-C₂₀ aromatic substituted α-olefin, C₄-C₂₀ cyclic olefin, C₄-C₂₀ non-conjugated diolefin, or C₂₀-C₁₀₀₀ vinyl and vinylidene terminated macromers with the mixed transition metal catalyst system of any one of claims 1 to 15 to produce a polymer".

III. A notice of opposition against the patent was filed on 16 January 2002 in which the revocation of the patent in its entirety was requested on the grounds of Article 100 (a) EPC (lack of novelty as well as lack of an inventive step), Article 100 (b) EPC and Article 100(c).

IV. The decision under appeal was based on amended claims that had been filed with letter of 2 February 2004 as a main and two auxiliary requests. In its decision announced at the end of the oral proceedings the opposition division held that the claims according to the main request, which contained a disclaimer, did not comply with the requirements of Articles 84 EPC and 123(2) EPC and that in the two auxiliary requests the added term "derived from" contravened Article 123(3) EPC.

V. On 16 September 2008 the patent proprietor lodged an appeal against the decision, the prescribed fee being paid on the same day.

VI. Together with the statement of grounds of appeal, dated 14 November 2008, the patent proprietor - now the appellant - filed amended sets of claims as follows:

(a) Main request: Set H(1) for the contracting states DE, FR, GB, IT and NL; Set H(2) for the contracting states BE, ES and SE, each set consisting of 8 claims.

Claims 1 and 4 were independent claims whereby claim 4 was based on a combination of claims 1 and 16 as granted. The amendments made become evident from the following scan of the text as submitted:

4. 16. A polymerization process for polymerizing olefinically unsaturated monomers comprising contacting one or more of ethylene, C₃-C₂₀ α-olefin, C₂-C₂₀ gem-substituted olefins, C₆-C₂₀ aromatic substituted α-olefin, C₄-C₂₀ cyclic olefin, C₄-C₂₀ non-conjugated diolefin, or C₂₀-C₁₀₀₀ vinyl and vinylidene terminated macromers with the mixed transition metal catalyst system of any one of claims 1 to 15 to produce a polymer, For
Ta

Said mixed transition metal catalyst system

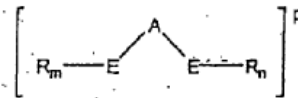
comprising at least one late transition metal catalyst system and at least one different catalyst system selected from the group consisting of late transition metal catalyst systems ^{and} transition metal metallocene catalyst systems, and Ziegler-Natta catalyst systems.

wherein said late transition metal catalyst system comprises

the late transition metal compound of the formula:



wherein M is a Group 9, 10 or 11 metal; L is a bidentate ligand defined by the formula:



wherein A is a bridging group containing a Group 13-15 element; each E is independently a Group 15 or 16 element bonded to M; each R is independently a C₁-C₃₀ containing radical or diradical group which is a hydrocarbyl, substituted hydrocarbyl, halocarbyl, substituted halocarbyl, hydrocarbyl-substituted organometaloid, halocarbyl-substituted organometaloid, m and n are independently 1 or 2 depending on the valency of E; and p is the charge on the bidentate ligand such that the oxidation state of MX_p is satisfied;

each X is, independently, a hydride radical, a hydrocarbyl radical, a substituted hydrocarbyl radical, a halocarbyl radical, a substituted halocarbyl radical, hydrocarbyl-substituted organometaloid radical or halocarbyl-substituted organometaloid radical; or two X's are joined and bound to the metal atom to form a metallacycle ring containing from 3 to 20 carbon atoms; a neutral hydrocarbyl containing donor ligand; a halogen, an alkoxide, an aryloxide, an amide, a phosphide, or other univalent anionic ligand; or two X's are joined to form an anionic chelating ligand; or a neutral non-hydrocarbyl atom containing donor ligand; and r is 1, 2 or 3;

with the proviso that when Lewis-acid activators which are capable of donating an X ligand to the transition metal compound are used, one or more X may additionally independently be selected from the group consisting of <--->; and

the transition metal metallocene catalyst system comprises a Group 4, 5, 6, 9, or 10 transition metal compound having a mono- or bis-substituted cyclopentadienyl ligand;

said contacting being conducted under gas phase polymerization conditions at temperatures from 40°C to 120°C and pressures from 690 kPa to 2415 kPa in a continuous process using a supported catalyst, a fluidized bed and a recycle stream as the fluidizing medium.

(b) First auxiliary request: Set I(1) for the contracting states DE, FR, GB, IT and NL; Set I(2) for the contracting states BE, ES and SE, each set

consisting of 8 claims.

Independent claim 4 of each of these sets was identical to claim 4 of the main request.

- (c) Second auxiliary request: Set K(1) for the contracting states DE, FR, GB, IT and NL; Set K(2) for the contracting states BE, ES and SE, each set consisting of 8 claims.
Independent claim 4 of each of these sets was identical to claim 4 of the main request.
- (d) Third auxiliary request: Set L for all designated contracting states, consisting of 5 claims whereby claim 1 was based on claim 4 of the main request but differed therefrom in that the late transition metal catalyst system was specified as "is derived from" [the late transition metal compound of the formula: LMX_r ...] rather than "comprises".
- (e) Fourth auxiliary request: Set M for all designated contracting states, consisting of 5 claims.
Claim 1 of this request was identical to claim 4 of the main request, i.e. employed the "comprises" language.
- (f) Fifth auxiliary request: Set N for all designated contracting states, consisting of 5 claims.
Claim 1 of this request corresponded to claim 4 of the main request but reinstated Ziegler-Natta catalysts as a permissible component of the mixed transition metal catalyst system.
Thus the corresponding part of this claim read:
"said mixed transition metal catalyst system comprising at least one late transition metal

catalyst system and at least one different catalyst system selected from the group consisting of late transition metal catalyst systems, transition metal metallocene catalyst systems and Ziegler-Natta catalyst systems,".

This claim further differed from claim 4 of the main request in that the penultimate block, i.e. that beginning with "with the proviso that" contained an additional phrase which read: "*...said late transition metal compound being activated for olefin polymerization catalysis in a manner sufficient to allow coordination polymerization;*".

- (g) Sixth auxiliary request: Set O for all designated contracting states, consisting of a single claim. This claim differed from claim 4 of the main request in that the mixed transition metal catalyst system was specified as: "*said mixed transition metal catalyst system comprising at least two different late transition metal catalyst systems derived from...*".

The penultimate passage of the claim defining the transition metal metallocene catalyst system was consequently deleted.

- (h) Seventh auxiliary request: Set P for all designated contracting states, consisting of a single claim. This claim differed from that of the sixth auxiliary request in that in the definition of the mixed transition metal catalyst system the term "**comprising**" was employed in place of "**derived**

from", with the consequence that the corresponding part of the claim read as follows:

"said mixed transition metal catalyst system comprising at least two different late transition metal catalyst systems comprising..."

- (i) Eighth auxiliary request: Set Q for all designated contracting states, consisting of a single claim which corresponded to the sole claim of the sixth auxiliary request with the further amendment that the penultimate block, i.e. that containing the "proviso" contained the same additional phrase as in the fifth auxiliary request.

VII. The opponent, now the respondent, replied with a letter dated 14 April 2009 raising objections under Articles 123(2) and/or 123(3) EPC against all requests in view of new combinations of features and changes of terminology.

VIII. On 28 April 2011 the Board issued a summons to attend oral proceedings.

IX. In a letter dated 28 July 2011 the respondent/opponent stated that it would not be represented at the oral proceedings.

X. In a letter dated 26 August 2011 the appellant/patent proprietor withdrew its request for oral proceedings, stated that it would not be represented at the oral proceedings and requested a decision on the basis of the written submissions.

XI. Oral proceedings were held on 28 September 2011. As previously notified, neither party attended (See sections IX and X, above).

XII. In its written submissions the appellant had presented arguments concerning:

- The allowability of the respective claim 1 of claims sets H(1), I(1) and K(1) i.e. of the main and first and second auxiliary requests, which all contained a disclaimer. Detailed consideration of the findings of decision G 1/03 (OJ EPO 2004, 413) were advanced;
- The allowability pursuant to Art. 123(2) EPC of respective independent claim 1 of sets H(1), H(2) (main request), L (third auxiliary request) and O (sixth auxiliary request) in which the mixed transition metal catalyst system was defined as being "derived from" the late transition metal compound of the given formula LMX_r rather than "comprising" this, as specified in the claims of the application as filed;
- Correspondingly submissions were made concerning the allowability of the alternatively proposed wording "comprising" as employed in the independent claims of sets I(1) and (2) (first auxiliary request), K(1) and (2) (second auxiliary request), P (seventh auxiliary request), and Q (eighth auxiliary request) or "comprises" as employed in claim set M (fourth auxiliary request), claim set N (fifth auxiliary

request);

- At no point in the proceedings did the appellant advance arguments to take account of the matters raised by the respondent in its letter of 14 April 2009.

XIII. The arguments of the respondent that are relevant for this decision may be summarised as follows:

(a) Main request (sets H(1) and H(2)):

Claim 4 of the main request did not meet the requirements of Art 123(2) EPC since:

- The restriction of the list of olefinic monomers produced a new subset of olefinic monomers which did not have a basis in the application as originally filed;
- A further selection had been made in combination with this first selection in that the option "Ziegler-Natta catalyst system" had been deleted;
- Consequently claim 4 of the main request related to a combination arising from a selection from two separate lists. The resulting combination did not have a clear and unambiguous basis in the application as filed.

Furthermore, claim 4 of the main request did not meet the requirements of Art. 123(3) EPC since:

- In the definition of the transition metal metallocene catalyst system the terminology had been altered by replacing "is" by

"comprises" (see recitation of claim 1 of the patent as granted in section (II), above) and the reproduction of claim 4 of the main request in section VI.(a), above);

- The term "comprises" allowed for the possibility that components other than those recited were present in the system, which possibility was not covered by the granted claim;
- Thus the scope of the claim had been extended contrary to Art. 123(3) EPC.

(b) One or both of these objections applied to the claims of all sets of auxiliary requests.

XIV. The appellant/patent proprietor had requested in writing that the decision under appeal be set aside and that the case be remitted to the opposition division for further examination on the basis of one of the sets of claims submitted, i.e. main request or first to eighth auxiliary requests as filed with the statement of grounds of appeal.

XV. The respondent/opponent had requested in writing that the appeal be dismissed, i.e. that the patent be revoked. In the event that one of the requests would be found to satisfy the requirements of Article 123(2), 123(3) and 84 EPC, it was requested that the case be remitted to the opposition division for consideration of sufficiency, novelty and inventive step.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request - Sets H(1) and H(2)*
 - 2.1 *Art. 123(2) EPC.*

Claim 4 is an independent claim, incorporating subject matter *inter alia* from claims 1 and 20 as originally filed (see sections II and VI.(a), above).

The present definition of olefinically unsaturated monomers is the result of a limitation of the set of monomers disclosed in claim 20 and at page 17 lines 2-5 of the application as filed. Specifically certain members of the originally disclosed list have been excised, namely C₄₋₂₀ *gem*-substituted olefins, C₈₋₂₀ aromatic substituted α -olefins, C₂₀₋₁₀₀₀ vinyl and vinylidene terminated macromers (see text of claim 4 of the main request reproduced in section VI.(a), above).

A further restriction has been made compared to the subject matter of claim 1 of the application as filed in that the embodiment "Ziegler-Natta catalyst systems" has been excised from the list of "at least one different catalyst system".

The effect of the these two restrictions is to generate a constellation of subject matter - a selection - which was not part of the subject matter of the application as filed.

Accordingly, the Board can concur with the -
uncontested - submissions of the respondent (see
section XIII.(a), above) that this subject matter
extends beyond the content of the application as filed
contrary to the requirements of Art. 123(2) EPC.

2.2 *Art. 123(3) EPC*

The penultimate phrase of - independent - claim 4
specifies that the transition metal metallocene
catalyst system "[...] **comprises** a group 4,5,6,9 or 10
transition metal compound[...]" (Board's emphasis- see
section VI.(a), above).

The corresponding part of claim 1 as granted however,
specified that the transition metal metallocene
catalyst system "...**is** a group 4,5,6,9 or 10 transition
metal compound [...]" (Board's emphasis - see section II,
above).

The term "is" as employed in the claims of the patent
as granted restricts the component to those embodiments
explicitly recited and consequently excludes the
presence of any other materials, for example compounds
of other transition metals.

The term "comprises", employed in claim 4 of the main
request however merely requires the presence - in
undefined proportions - of the recited transition metal
compounds but does not exclude the presence of other
materials, including compounds of other transition
metals.

Consequently to the extent that this part of
independent claim 4 employs the term "comprises"
instead of "is" the scope of protection conferred by

the claim has been extended compared to that of claim 1 of the patent as granted.

Therefore the Board can concur with the - also uncontested - arguments of the respondent that as a consequence of this amendment the requirements of Art. 123(3) EPC are not satisfied.

2.3 In view of the above, the main request (claim sets H(1) and H(2)) has to be refused.

3. *First and Second Auxiliary Requests- Set I(1) and I(2), K(1) and K(2)*

Claim 4 of each of these requests is identical to claim 4 of the main request. Accordingly the objections pursuant to Art. 123(2) and (3) EPC apply to these claims as well.

The first and second auxiliary requests have therefore to be refused.

4. *Third auxiliary request- Set L*

Claim 1 of this request differs from claim 4 of the main request as noted in section VI.(d), above. However in all other respects this claim is identical to claim 4 of the main request. Accordingly the objections pursuant to Art. 123(2) and (3) EPC apply *mutatis mutandis* to this claim.

The third auxiliary request has to be refused.

5. *Fourth auxiliary request- Set M*

Claim 1 of this request is identical to claim 4 of the main request. Accordingly the objections pursuant to Art. 123(2) and (3) EPC apply to this claim as well.

As a consequence, the fourth auxiliary request has to be refused.

6. *Fifth auxiliary request - Set N*

As explained in section VI.(f) above, Claim 1 of this request differs from claim 4 of the main request in that Ziegler-Natta catalysts are included. Consequently the objection pursuant to Art. 123(2) EPC resulting from a two-fold selection does not apply.

However the definition of the transition metal metallocene catalyst system - employing the term "comprises" instead of "is" has been retained. Accordingly the objection pursuant to Art. 123(3) EPC raised in respect of claim 4 of the main request applies to this claim as well.

Hence the fifth auxiliary request has to be refused.

7. *Sixth auxiliary request- Set O*

As explained in section VI.(g) above, claim 1 of this request specified the catalyst system as "comprising at least two different late transition metal catalyst systems". Compared to claim 4 of the main request, this definition thus entails a further restriction in respect of the transition metal catalyst systems, which

restriction, as in the case of the main request (see section 2.1, above) in combination with the restriction of the olefin monomers results in a non-disclosed selection compared to the subject matter of the application as filed.

Thus for the same reasons as indicated for claim 4 of the main request claim 1 of the sixth auxiliary request contains subject matter extending beyond the content of the application as filed, contrary to the requirements of Art. 123(2) EPC

The sixth auxiliary request is refused.

8. *Seventh and Eighth auxiliary request - Set P and Q*

As claim 1 of each of these requests contains the same restriction as the sixth auxiliary request in respect of the transition metal catalyst system, the objections pursuant to Art. 123(2) indicated for the sixth auxiliary request apply *mutatis mutandis*.

Therefore the seventh and eighth auxiliary requests are refused.

9. Consequently none of the requests submitted by letter of 14 November 2008 i.e. the statement of grounds of appeal, meet the requirements of Art. 123(2) EPC and/or Art. 123(3) EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

B. ter Laan