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D E C I S I O N
of 31 May 2005

Case Number: T 0025/04 - 3.3.3

Application Number: 94914901.7

Publication Number: 0696293

IPC: C08F 10/00

Language of the proceedings: EN

Title of invention:
Process for polymerizing monomers in fluidized beds

Patentee:
ExxonMobil Chemical Patents Inc.

Opponent:
Basell Polyolefine GmbH
BP Chemicals Ltd

Headword:
-

Relevant legal provisions:
EPC Art. 54(3)(4), 84, 87(4), 107, 123(2), 123(3)
EPC R. 65(1)

Keyword:
"Appeal filed by opponent (inadmissible) - not adversely affected"
"Validity of priority (yes)"
"Novelty (yes)"

Decisions cited:
T 0156/90, T 0833/90, T 0118/95, T 0355/99

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0025/04 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 31 May 2005

Appellant: (Proprietor of the patent)
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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office dated 10 September 2003 and posted 20 October 2003 concerning maintenance of the European patent No. 0696293 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. 0 696 293 in the name of Exxon Chemical Patents Inc. (later ExxonMobil Chemical Patents Inc.) in respect of European patent application No. 94 914 901.7 filed on 25 April 1994 and claiming priority of the International patent application WO PCT/US93/03946 filed on 26 April 1993 and of the US patent application No. 65250 filed on 20 May 1993 was announced on 24 May 2000 (Bulletin 2000/21) on the basis of 19 claims.

Claims 1 to 5, 13 to 15, and 17 read as follows:

"1. A continuous gas phase polymerization process for polymerizing alpha-olefin(s) utilizing a metallocene catalyst in a gas phase fluidized bed reactor wherein a recycle stream having a liquid and a gas phase is introduced to the reactor such that the weight percent of liquid based on the total weight of the recycle stream is greater than 2.0 weight percent, and the recycle stream comprises a dew point increasing component in an amount greater than 2.0 mole percent.

2. The process in accordance with claim 1 wherein a recycle stream passing through a fluidized bed in said reactor comprises a dew point increasing component in an amount of 5 to 60 mole percent, said component having at least one carbon atom less than the highest alpha-olefin in the stream.

3. The process in accordance with claim 2 wherein said recycle composition contains a comonomer and is maintained at a ratio of C_x /C_y of less than 0.2. where C_x and C_y are the mole percent of comonomer and monomer and comprises from 5 to 40 mole percent of the dew point increasing component.

4. The process in accordance with claim 3 wherein the recycle stream further comprises hydrogen (H_2) in a mole of ratio H_2/C_y of less than 0.01, in an amount of from 10 mole ppm to 10,000 ppm.

5. The process in accordance with claims 3 and 4 wherein the composition of said recycle stream is at a ratio of (C_x + H_2) of less than 0.2, preferably less than 0.1.

13. The process in accordance to claim 1 for the polymerization of ethylene and at least one copolymerizable alpha-olefin comonomer having from 3 to 15 carbon atoms in the gas phase fluidizationd [sic] bed reactor operating in a condensed mode, said process comprising the steps of:
a) passing the recycle stream through a fluidized bed in said reactor, at a ratio of C_x/C_2 of less than 0.2, preferably less than 0.1, with the dew point increasing component in an amount greater than 2.0 mole percent and optionally non-condensable inerts making the balance of said recycle stream, where C_x and C_2 are the mole percent respectively of comonomer and ethylene;
b) introducing the metallocene catalyst under reactive conditions into said reactor to

polymerize said recycle stream into a polymer product;
c) withdrawing said recycle stream containing unreacted monomers from the reactor;
d) introducing into said recycle stream additional monomers to replace monomers polymerized to maintain said ratio in said recycle stream;
e) re-introducing said recycle stream into said reactor; and
f) withdrawing said polymer from said reactor.

14. The process in accordance with claim 13 wherein said metallocene catalyst is used with an alumoxane [sic] or an ionic activated complex.

15. The process in accordance with claims 13 or 14 wherein the comonomer is hexene-1 and the reactivity ratio is less than 2, the density of the polymer product is in the range of of [sic] 0.88 g/cm^3 to 0.970 g/cm^3 or wherein the comonomer is octene-1 and the reactivity ratio is less than 1, the density of the polymer product is in the range of 0.88 g/cm^3 to 0.97 g/cm^3 and a melt index of 0.1 to 1000 dg/min.

17. The process in accordance to claim 1 for the polymerization of ethylene and at least one copolymerizable alpha-olefin comonomer having from 3 to 15 carbon atoms in the gas phase fluidized bed reactor, said process comprising the steps of:

a) passing the recycle stream through said reactor at a ratio of $(C_x+H_2)/C_2$ of less than 0.2, with a dew point increasing component in an amount

greater than 2.0 mole percent and non-condensable inerts making up the balance of said recycle stream, where C_x, H_2 and C_2 are the mole percent respectively of comonomer, hydrogen and ethylene;

b) introducing the metallocene catalyst under reactive conditions into said reactor to polymerize said recycle stream into a polymer product;

c) withdrawing said recycle stream containing unreacted monomers from the reactor;

d) compressing and cooling said recycle stream to form a liquid phase and a gas phase such that the weight percent of liquid based on the total weight of liquid in the recycle stream is greater than 2.0 and re-introducing said recycle stream into said reactor;

e) introducing into said recycle stream additional monomers to replace monomers polymerized to maintain said ratio of said recycle stream, and

f) withdrawing said polymer from said reactor."

Claims 6 to 12, 16, and 18 to 19 were dependent claims.

II. Notices of Opposition were filed against the patent:

(i) by Basell Polyolefine GmbH (Opponent I), on 20 February 2001, on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC);

(ii) by Borealis Technology OY (Opponent II) on 23 February 2001, on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC), on the ground of insufficient disclosure (Article 100(b) EPC), and on the ground of extension of subject-matter (Article 100(c)); and

(iii) by BP Chemicals Limited (Opponent III) on 23 February 2001, on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC), and on the ground of insufficient disclosure (Article 100(b)).

The Opponents requested the revocation of the patent as a whole.

The oppositions were supported *inter alia* by the following documents:

D2: US-A-4 588 790;

D8: WO-A-94/25495 (published form of the WO application PCT/US93/03946);

D13: US patent application US 08/065250 of 20 May 1993;

D14: US patent application 07/854041 of 19 March 1993; and

D15: US-A-5 352 749.

With its letter dated 21 May 2001, Opponent II withdrew its opposition.

III. By a decision announced orally on 10 September 2003 and issued in writing on 20 October 2003 the Opposition Division held that the grounds of opposition did not prejudice the maintenance of the patent in amended form.

IV. The decision of the Opposition Division was based on Claims 1 to 19 as submitted with letter dated 15 November 2001 as main request and on Claims 1 to 16 as submitted during the oral proceedings of 10 September 2003 as first auxiliary request.

Claims 1 to 19 of the main request differed from Claims 1 to 19 as granted , in that in Claim 5 the expression "$(C_x + H_2)$" had been replaced by the expression "$(C_x + H_2)/C_y$", in that in Claim 15 the expression "and a melt index of 0.1 to 1000 dg/min" had been incorporated after the indication of the range of density of the polymer with hexene-1 as comonomer; and in that the weight percent of liquid in step d) of the process of Claim 17 had been defined as being greater than 10 instead of greater than 2.0.

Claim 1 of the auxiliary request read as follows:

"A continuous gas phase polymerization process for polymerizing alpha-olefin(s) utilizing a metallocene catalyst in a gas phase fluidized bed reactor wherein a recycle stream having a liquid and a gas phase is introduced to the reactor such that the weight percent of liquid based on the total weight of the recycle stream is greater than 2.0 weight percent, and the recycle stream comprises a dew point increasing component in an amount of 5 to 40 mole percent, said component having at least one carbon atom less than the

highest alpha-olefin in the stream, wherein said recycle composition contains a comonomer and is maintained at a ratio of C_x/C_y of less than 0.2. where C_x and C_y are the mole percent of comonomer and monomer, and wherein the recycle stream further comprises hydrogen (H_2) in a mole of ratio H_2/C_y of less than 0.01, in an amount of from 10 mole ppm to 10,000 ppm."

Concerning the main request, the Opposition Division considered in its decision that Claim 1 was to be seen as based on the two priority documents (i.e. PCT/US93/03946 published as document D8 and D13) and that the amendments made in Claims 5, 15, and 17 of the main request were supported by the application documents as originally filed. In respect of the opposition ground under Article 100(b) EPC, the Opposition Division held in its decision that the Opponents had not shown that the process would not work if very high liquid content (i.e. over 60%) was used. It was further held in the decision that document D15 claimed the priority of D14 which had been filed earlier than the priority date of the patent in suit. According to the decision, D14 was considered as disclosing a gas polymerization process in condensed mode using different catalysts and especially metallocene catalysts wherein preferably the amount of dew point increasing compound (DPIC) was at least 2 mole% together with a liquid amount in the recycle stream of more than 2% by weight since such amount was considered, in view of D2, as a minimum in order to stabilize such polymerization process.

Thus, the Opposition Division came to the conclusion that Claim 1 of the main request was entitled neither

to the priority of the international patent application PCT/US93/03946 nor to the priority of D13 with regard to Article 87(4) EPC.

Consequently, document D8 became relevant to assess novelty according Article 54(3)and (4) EPC. The Opposition Division thus came to the conclusion that D8 disclosed all the features of Claim 1.

Concerning the first auxiliary request, the decision held that it met the requirements of Articles 123 and 84 EPC. According to the decision, Opponent I had had no objections to make with regard of Claim 1 of this request.

The decision further stated that the combination of the following features:

(a) content of liquid in the recycle stream (at least 2% by weight);

(b) amount of DPIC (from 5 to 40 mole%);

(c) nature of DPIC (1 carbon less than the highest monomer);

(d) monomer/comonomer composition i.e. ratio Cx/Cy less than 0.2 and

(e) relative and absolute amount of hydrogen (H_2/Cy less than 0.01 and between 10 and 10 000 ppm),

was not disclosed in the cited prior art and that it was not derivable from any of the cited prior art taken alone or in combination.

Thus, the Opposition Division came to the conclusion that the first auxiliary request met the requirements of Articles 52-57 EPC.

V. Notices of Appeal were filed on the 22 December 2003 by both the Patentee and the Opponent I. The prescribed fees were paid on the same day.

VI. With the Statement of Grounds of Appeal filed on 26 February 2004, the Patentee requested that the decision under appeal be set aside and the case be remitted to the first instance for further examination of inventive step on the basis of Claims 1 to 19 as submitted with letter dated 15 November 2001 as main request.

It argued essentially as follows:

(i) Concerning novelty:

(i.1) Even if the patent in suit would not be entitled to a priority of 26 April 1993, document D8 would only be prior art according to Article 54(3)(4) EPC.

(i.2) Claim 1 of the main request contained the following features:

(a) a continuous gas phase polymerization process,

(b) for polymerizing olefins,

(c) utilizing a metallocene catalyst,

(d) in a gas phase fluidized bed reactor,

(e) wherein a recycle stream having a liquid and a gas phase was introduced to the reactor;

(f) such that the weight percent of liquid based on the total weight of the recycle stream was greater than 2.0 weight percent,

(g) and the recycle stream comprised a dew point increasing component in an amount greater than 2.0 mole percent.

(i.3) The combination of features (a), (e) and (f) implied that the process was run in a condensed mode.

(i.4) The dew point increasing component did not encompass polymerizable monomers (patent in suit, page 5, lines 55-58).

(i.5) Contrary to the statements of the Opposition Division, in particular in view of document D2, it could not be considered that the features (f) and (g) would be inevitably fulfilled by a gas phase polymerization process run in condensed mode.

(i.6) The skilled person would not have replaced the specific Ziegler Natta catalyst used in Example 1 of D8 by the metallocene catalysts mentioned in the description of D8.

(i.7) The skilled person would have been aware that metallocene catalysts were soluble in inert hydrocarbons such as isopentane. Thus, the skilled person would have expected operability problems when replacing the Ziegler Natta catalyst with a metallocene catalyst (cf. also declaration of Mr Joseph C. Floyd dated 21 March 2000, submitted with letter dated 4 July 2003).

(i.8) Furthermore, in accordance with the teaching of D8, the skilled person would have considered the use of metallocene catalyst only in the case where no dew point increasing components of the type of those used in the examples of D8 were present.

(i.9) The process disclosed in D8 was based on a different concept than the process according to the patent in suit. It used variations in the fluidized bulk density to optimize the process conditions.

(i.10) Consequently, D8 did not disclose the combination of features (c), (f) and (g). Thus, the claimed subject-matter was novel over D8.

(ii) Priority:

(ii.1) In its decision the Opposition Division had considered that the priority applications were not first applications since the invention had been already disclosed in D14 which had left rights outstanding in form of a CIP (continuation-in-part) application which was then issued as D15.

(ii.2) Claim 10 of D14 was the claim which was the closest to the subject-matter of the patent in suit, but it did not disclose the nature of the catalyst, the nature of the inert condensible fluid or the amount thereof.

(ii.3) Claim 12 of D14 only referred to the use of isopentane but did not define its amount in the recycle stream.

(ii.4) In the examples of D14 a specific Ziegler Natta catalyst was used.

(ii.5) Thus, D14 did not allow the skilled person to derive directly and unambiguously from D14 the subject-matter of Claim 1 of the patent in suit. Thus D14 was not an earlier application in the sense of Article 87(4) EPC.

(ii.6) As indicated in paragraph 2.2 of the decision of the Opposition Division, the subject-matter of Claim 1 of the patent in suit was supported by D13.

(ii.7) Thus, the priority claim of D13 was valid.

VII. In the Statement of Grounds of Appeal filed on 1 March 2004, the Opponent I contested the validity of the priority of Claim 1 of the set of claims on the basis of which the Opposition Division intended to maintain the patent, and submitted arguments concerning inventive step in relation to the subject-matter of that set of claims.

VIII. With its letter dated 18 November 2004, the Patentee submitted two sets of claims representing its new main request (Set A) and its first auxiliary request (Set B) as well as the following documents:

Document D25A: Annotated version of the declaration of Mr Joseph C Floyd dated 21 March 2000;

D26: A. Munõz-Escalona et al., "Supported Metallocene Catalysts and Produced Polyethylenes", Proceedings of 5th International Congress on Metallocene Polymers, 31 March-1 April 1998, Düsseldorf, Germany; pages 73-87; Fig. 1 to 17;

D27: W. Kaminsky et al., "Polymerisation and Copolymerisation of α-Olefins with soluble Ziegler-Natta Catalysts of extremely high activity", IUPAC Macro Florence 1980; Preprints, Vol.3, pages 1-4;

D28: "Advances in Organometallic Chemistry", edited by F.G.A. Stone and R. West, Academic Press 1980, Volume 18, pages 123-149;

D29: W. Kaminsky et al., "Homogeneous and High Active Ziegler-Natta-Catalysts with Aluminoxane as Component"; Paper presented at the 26th IUPACMeeting, University of Massachusetts, Amhurst, Massachusetts, July 12-16, 1982; and

D30: Peter J.T. Tait et al., "Some Recent Advances in Supported Metallocene Catalysts"; Paper prepared for presentation at MetCon'96, June 12-13, 1996, Houston Texas, USA.

It also presented arguments concerning the validity of the priority of D13 concerning the subject-matter Claim 1 of Set A and concerning novelty and inventive step of the subject-matter of Claim 1 of Set B.

IX. With its letter dated 29 April 2005, the Opponent I filed a new document:

D31: EP-A-0 367 597

It also presented arguments concerning the novelty and inventive step of the subject-matter of the respective claims 1 of Set A and Set B.

X. With its letter dated 13 May 2005, Opponent III, informed the Board that it would not attend the oral proceedings set for 31 May 2005.

XI. Oral proceedings before the Board were held on 31 May 2005 in the absence of Opponent III.

(a) At the beginning of the oral proceedings, the Board made preliminary observations concerning the admissibility of the appeal filed by the Opponent I in view of the statements made in the decision under appeal (cf. page 6, point 9) according to which Opponent I had no objections to make with regard to Claim 1 of the first auxiliary request (i.e. the set of claims on the basis of which the Opposition Division decided that the patent could be maintained) and, in view of the statements in the other hand, in the minutes of the oral proceedings before the Opposition Division according to which the Opponent indicated that

it did not have any comments to make under Article 123 EPC or Article 84 EPC concerning the claims of the first auxiliary request, that it withdrew its objection under Article 83 EPC raised against this auxiliary request, and that it did not have any objection regarding novelty or inventive step concerning this set of claims.

The arguments presented by the Parties in that respect may be summarized as follows:

(a.i) By the Patentee:

(a.i.1) The minutes of the oral proceedings correctly reflected the submissions made by the Opponent I in respect of the first auxiliary request.

(a.i.2) Opponent I had not requested a correction of the minutes.

(a.i.3) Both parties had not realized the consequences of such submissions, but this should not have a retroactive effect on the approval thereby expressed.

(a.i.4) The auxiliary request had been filed near to the end of the oral proceedings before the Opposition Division. It was, however, only in respect of the main request that the revocation of the patent had been requested by the Opponent I.

(a.ii) By the Opponent I:

(a.ii.1) The statements made in the decision under appeal and in the minutes of the oral proceedings

before the Opposition Division would appear as not being in line with the request of revocation of the patent in suit made by the Opponent I.

(a.ii.2) Thus, there was a doubt concerning the consent of the Opponent I to the set of claims of the first auxiliary request on the basis of which the Opposition Division decided to maintain the patent in suit.

(a.ii.3) Thus, the benefit of the doubt should be given to the Opponent, and, consequently, the Board should decide in favour of the admissibility of the appeal filed by the Opponent I.

(b) The Board, after deliberation, having informed the Parties that the appeal filed by the Opponent I would be considered as inadmissible, the Patent Proprietor submitted a new set Claims 1 to 19 referred to as Set A' as new main request.

Claim 1 thereof reads as follows:

"A continuous gas phase polymerization process for polymerizing alpha-olefin(s) utilizing a metallocene catalyst supported on a particulate material in a gas phase fluidized bed reactor wherein a recycle stream having a liquid and a gas phase is introduced to the reactor such that the weight percent of liquid based on the total weight of the recycle stream is greater than 2.0 weight percent, and the recycle stream comprises a dew point increasing component in an amount greater than 2.0 mole percent."

Claims 2 to 19 corresponded to Claims 2 to 19 of the set of claims submitted as main request with the letter of 15 November 2001 of the Patentee.

The Opponent I having indicated that it had neither objections against the admission of this request into the proceedings nor objections under Article 84 EPC or 123 EPC regarding this set of claims, and the Patentee having indicated that it no longer relied on the international patent application WO PCT/US93/03946 filed on 26 April 1993 as priority document, the discussion then focussed (i) on the novelty of the subject-matter of the claims of the main request in view of document D8 and (ii) on the validity of the priority of document D13 for the subject-matter of Claim 1 thereof.

The arguments presented by the Parties in these respects may be summarized as follows:

(b.i) Concerning novelty:

(b.i.1) While essentially relying on the arguments presented in the written phase of the appeal procedure (cf. point VI (i) above) the Patentee made, in substance, the following additional submissions:

(b.i.1.1) Document D8, in contrast to the patent in suit, gave a different definition of the dew point increasing component.

(b.i.1.2) D8 disclosed several possibilities for increasing the dew point of the recycle stream (page 9, lines 26-30).

(b.i.1.3) D8 did not teach to use at least 2% mole of a dew point increasing component as defined in the patent in suit in the recycle stream. As shown in D2 (Example 2) the polymerization process could be carried in a condensed mode while using less than 2% by mole of isopentane in the recycle stream.

(b.i.1.4) D8 was focussed on operating conditions related to the density of the fluidized bed (ratio between bulk density and settled density) which allowed the polymerization process to remain stable (Claim 1).

(b.i.1.5) In the examples of D8, a Ziegler Natta catalyst was used (page 18, lines 3-5). Metallocene catalyst could not be seen as a replacement of Ziegler Natta catalyst. It was evident that the process conditions needed to be changed in case of change of the catalyst (page 2, lines 18-19).

(b.i.1.6) The combination of the examples of D8 with the reference to the other catalysts in the passage from page 8, line 35 to page 9, line 5 amounted to an internal mosaic.

(b.i.1.7) Furthermore, D8 did not mention the use of supported metallocene catalysts.

(b.i.1.8) Thus, D8 did not disclose directly and unambiguously all the features of Claim 1 of Set A'.

(b.i.2) By the Opponent I:

(b.i.2.1) Document D8 put specific emphasis on metallocene catalysts. It was however conceded that D8 did not expressly disclose supported metallocene catalysts.

(b.i.2.2) Saturated hydrocarbons were highly preferred as condensable fluids for the process of D8.

(b.i.2.3) According to D8 levels of liquids well over 15% or even 25% in the recycle stream were used (page 5, line 35 to page 6, line 2). At such levels of liquid a condensable saturated hydrocarbon fluid would inevitably be present in an amount of greater than 2% by mole.

(b.i.2.4) When carrying out the process of D8 in presence of metallocene catalysts, and taking into account the lower amount of comonomer used in that case due to their better incorporation in presence of metallocene catalysts, it was implicit that that condensable saturated hydrocarbon fluids would inevitably be present in amount greater than 2% by mole.

(b.ii) Concerning priority:

(b.ii.1) By the Patentee:

(b.ii.1.1) Claim 1 of Set A' was clearly supported by D13. Reference was made to Claims 1, 2 and 4; page 6, line 29; page 2, lines 2-6.

(b.ii.1.2) D14 which had been considered in the decision of the Opposition Division as the first application disclosing the claimed invention of the

patent in suit, had a very similar content as document D8.

(b.ii.1.3) Thus, the subject-matter of Claim 1 of Set A' could not be anticipated by D14. Consequently D14 did not disclose the same invention as Claim 1 of Set A'.

(b.ii.2) By the Opponent I

(b.ii.2.1) While D14 had a similar content as D8, it nevertheless made it clearer that the use of an inert condensible fluid was preferred (page 9, lines 23-26).

(b.ii.2.2) Furthermore, D14 clearly highlighted the use of metallocene catalysts (page 7, lines 20-21).

(b.ii.2.3) Thus, the subject-matter of Claim 1 of Set A' was disclosed in D14.

XII. The Appellant (Patentee) requested that the decision under appeal be set aside to the extent that the proprietor is adversely affected by it and the case be remitted to the Opposition Division for further prosecution with the finding that the claims according to set A' as filed during the oral proceedings are novel over D8 and that Claim 1 of the claims of Set A' is entitled to priority from D13.

The Respondent (Opponent I) requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal of the Patentee is admissible.

2. *Admissibility of the appeal filed by the Opponent I*

2.1 According to Article 107 EPC, any party to proceedings adversely affected by a decision may appeal. It thus follows that the Board has to decide whether the Opponent I was adversely affected by the appealed decision within the meaning of that provision as interpreted by the jurisprudence of the boards of appeal.

2.2 In this connection, the Board, in view of the minutes of the oral proceedings before the Opposition Division, firstly notes that the request of the Opponent I was that the main request based on the set of Claims filed on 18 November 2001 by the Patentee be refused and the patent be revoked, but that there was no request from side of the Opponent I that the first auxiliary request of the Patentee filed at the oral proceedings be refused.

2.3 Indeed the minutes of the first instance oral proceedings record:

(i) that the Opponent I, when asked by the Chairman of the Opposition Division, whether it had objection under Articles 84 and 123 EPC concerning the first auxiliary request, stated that it did not have any comment to make;

(ii) that the Opponent I, when asked by the Chairman of the Opposition Division, whether it had any objection under Article 83 EPC concerning the first auxiliary request, initially raised an objection under this article, but then, however, explicitly withdrew this objection after explanations of the Chairman of the Opposition Division in that respect, and

(iii) that the Opponent I, when asked by the Chairman of the Opposition Division, whether it had objections under Articles 54 and 56 EPC concerning the first auxiliary request, said that it did not have any objection either regarding novelty or inventive step.

2.4 The Board further notes that the decision under appeal (point 9 thereof) clearly states that the Opponent I had no objections with regard to Claim 1 of the auxiliary request.

2.5 The Board also observes that the Opponent I in the written phase of the appeal proceedings neither alleged that the minutes of the oral proceedings were wrong nor requested them to be corrected and that the Opponent I did not contest the statement made under point 9 of the decision under appeal. The Board further observes that the Patentee has confirmed that the minutes of the oral proceedings correctly reflected the submissions made by the Opponent I in respect of the first auxiliary request (cf. Section XI (a.i.1) above).

2.6 Thus, the Board can only come to the conclusion that the consistent behaviour of the Opponent I before the Opposition Division is to be interpreted as a consent to the claims of the first auxiliary request.

2.7 This conclusion cannot be altered by the submissions of the Opponent I made at the oral proceedings before the Board that the statements recorded in the minutes of the oral proceedings should be put into perspective with its main request for revocation of the patent as a whole, so that this casts a doubt as to whether consent was indeed given to the first auxiliary request.

2.7.1 While in the case forming the subject of the decision T 833/90 of 19 May 1994 (not published in OJ EPO), the admissibility of the appeal was accepted because some doubt remained whether the Opponent had agreed (Reasons, point 1), the Board cannot see any doubt in the present case.

2.7.2 This is because the first auxiliary request, as recorded in the minutes of the oral proceedings, was filed after the debate concerning the main request was closed, so that it cannot be argued that the request for revocation of the patent in suit automatically extended to the first auxiliary request. On the contrary, in view of the undisputable distinction made in the minutes between the debates concerning the main request and the first auxiliary request, it is evident that the Opponent I had, ultimately, no objections against the first auxiliary request, i.e. that it implicitly gave its consent to the first auxiliary request.

2.8 Since the decision which the Opponent I now appeals was to refuse the main request of the Patentee and to grant first auxiliary request of the latter, it must be

considered that the decision effectively granted the Opponent I's request in full.

2.9 Thus, it follows from the above that the Opponent I was not adversely affected by the decision under appeal within the meaning of Article 107 EPC (cf. also T 156/90 of 9 September 1991 and T 118/95 of 4 February 1999, both not published in OJ EPO).

2.10 Consequently, the appeal of the Opponent I does not comply with Article 107 EPC, and it has to be rejected as inadmissible in accordance with Rule 65(1) EPC.

3. *Wording of the claims ((Set A')*

3.1 No objections under Article 84, 123(2) and 123(3) EPC have been raised by the Opponent I in view of Claims 1 to 19 of set A'.

3.2 The Board is also satisfied that the requirements of these articles are satisfied by all the claims.

4. *Novelty over document D8*

4.1 As indicated above in Section XI (b) above, the Patentee no longer relied on the WO application PCT/US93/03946 filed on 26 April 1993 as priority document for the subject-matter of Claim 1 of Set A' and it claimed priority only from document D13 filed on 20 May 1993 in that respect.

4.2 The WO application PCT/US93/03946 has been published under the publication number WO 94/25495 (referred to above as D8) on 10 November 1994, i.e. after the filing

date (i.e. 25 April 1994) of the patent in suit. This international application had been supplied to EPO in one of its official languages and the requested national fee had been paid on 24 November 1995. Thus, document D8 belongs to the prior art according to Article 54(3)(4) EPC (Article 158(1)(2) EPC).

4.3 Document D8 relates to methods for determining stable operating zones for gas fluidized bed polymerization and to a process for gas phase polymerization, i.e. to a polymerization process in which a bed of polymer particles is cooled, fluidized and agitated by a passing stream of gas which includes monomer, with or without additional mechanical agitation of the bed (page 1, lines 5-10).

4.4 According to D8, variations in the fluidized bulk density (FBD) for a given grade of polymer and/or catalyst composition can be used to optimize process conditions and plant design. D8 provides a method for determining stable operating conditions in a fluidized bed polymerization process which comprises the steps of passing a gaseous stream comprising monomer through a fluidized bed reactor in the presence of catalyst under reactive conditions to produce polymeric product and a stream comprising unreacted monomer gases, of compressing and cooling said stream, of mixing said stream with feed components and of returning a gas and liquid phase to said reactor. This method comprises: (a) observing fluidized bulk density changes in the reactor associated with changes in the composition of the fluidizing medium; and (b) increasing the cooling capacity of the recycle stream by changing the composition without exceeding the level at which a

reduction in the fluidized bulk density or a parameter indicative thereof becomes irreversible. According to D8, a reduction in the ratio of fluidized bulk density (FBD)to settled bulk density (SBD) to less than 0.59 may involve risk of fluidized bed disruption and is to be avoided (page 3, lines 32 to page 4, line 16).

4.5 According to D8, as the concentration of condensable component is increased in the gaseous stream flowing through the bed, an identifiable point may be reached beyond which there is danger of catastrophic failure of the process if the concentration is further increased (page 4, lines 22-25).

4.6 The gas condensable fluid concentrations at which decreases in fluidized bulk density occur depend upon the type of polymer being produced and other process conditions. They may be identified by monitoring the fluidized bulk density as condensable fluid concentrations in the gas are increased for a given type of polymer and other process conditions (page 4, line 33 to page 5, line 2).

4.7 The process of D8 is not limited to any particular type or kind of polymerization reaction but is particularly well suited to the polymerization reactions involving the polymerization of one or more of the monomers, for example olefin monomers of ethylene, propylene, butene-1, pentene-1, 4-methylpentene-l, hexene-l, octene-l and styrene, polar vinyl, conjugated and non-conjugated dienes, acetylene and aldehyde monomers (page 8, lines 28-34).

4.8 The catalysts employed in the process of D8 can include coordinated anionic catalysts, cationic catalysts, free-radical catalysts, anionic catalysts and include a transition metal component or a metallocene component including single or multiple cyclopentadienyl components reacted with either a metal alkyl or alkoxy component or an ionic compound component. These catalysts include partially and fully activated precursor compositions and those catalysts modified by prepolymerization or encapsulation (page 8, line 35 to page 9, line 5). In the Examples 1 to 3 of D8, the catalyst used is a complex of tetrahydrofuran, magnesium chloride and titanium chloride reduced with diethyl aluminium chloride (diethyl aluminium chloride to tetrahydrofuran molar ratio of 0.50) and tri-n-hexyl aluminium (tri-n-hexyl aluminium to tetrahydrofuran molar ratio of 0.30) impregnated on triethyl aluminium treated silicon dioxide and the activator is triethyl aluminium (TEAL) (page 18, lines 2-8).

4.9 As indicated in D8, for higher cooling capacities and so higher reactor productivity it may be desirable to raise the dew point of the recycle stream to permit a larger increase in the heat removed from the fluidized bed. According to D8, the dew point of the recycle stream can be increased by increasing the operating pressure of the reaction/recycle system and/or increasing the percentage of condensable fluids and decreasing the percentage of non-condensable gases in the recycle stream. The condensable fluid may be inert to the catalyst, reactants and the polymer product produced and may also include comonomers. Examples of suitable inert condensable fluids are readily volatile liquid hydrocarbons, which may be selected from

saturated hydrocarbons containing from 2 to 8 carbon atoms. Some suitable saturated hydrocarbons are propane, n-butane, isobutane, n-pentane, isopentane, neopentane, n-hexane, isohexane, and other saturated C_6 hydrocarbons, n-heptane, n-octane and other saturated C_7 and C_8 hydrocarbons or mixtures thereof. The preferred inert condensable hydrocarbons are C_5 and C_6 saturated hydrocarbons. The condensable fluids may also include polymerizable condensable comonomers such as olefins, diolefins or mixtures thereof including some of the above mentioned monomers which may be partially or entirely incorporated in the polymer product (page 9, line 24 to page 10, line 7). As further indicated in D8, at higher reactor productivities and staying within the boundaries defined by the fluidized bed changes, levels of condensed liquid well over 15%, 20% or even 25% can be accommodated whilst avoiding significant levels of chunking or sheeting resulting from fluidized bed disruption (page 5, line 35 to page 6, line 2).

4.10 In this connection, the Board notes that Claim 1 of Set A', explicitly, relates to

(a) a continuous gas phase polymerization process,

(b) for polymerizing olefins,

(c) utilizing a metallocene catalyst supported on a particulate material,

(d) in a gas phase fluidized bed reactor,

(e) wherein a recycle stream having a liquid and a gas phase is introduced to the reactor;

(f) such that the weight percent of liquid based on the total weight of the recycle stream is greater than 2.0 weight percent,

(g) and the recycle stream comprises a dew point increasing component in an amount greater than 2.0 mole percent.

4.11 In this context, it is immediately evident that D8, although mentioning the use of metallocene catalyst (cf. point 4.8 above), does not disclose the use of a metallocene catalyst supported on a particulate material.

4.12 Although for this reason alone D8 cannot destroy the novelty of the subject-matter of Claim 1 of Set A', the Board deems it appropriate to deal with the further arguments presented by the Opponent I in support of its objection of lack of novelty:

4.12.1 While it is true, as submitted by the Opponent I, that in all the examples of D8 (cf. Tables 1 to 3), the recycle stream contains a liquid phase in an amount greater than 2% by weight and that a saturated hydrocarbon is used as a condensable fluid in an amount of greater than 2 mol % in that recycle stream, it is indisputable that in all the examples of D8 a Ziegler-Natta catalyst is used.

4.12.2 In that respect, the argument of the Opponent I that the operating conditions disclosed in these examples for a Ziegler Natta catalyst would be as such applicable for a process in presence of a metallocene

catalyst is not convincing, since, D8, on the contrary, clearly indicates that operation changes in the process would lead to consequential changes elsewhere (page 2, lines 18-19; cf. also point 4.6 above).

4.12.3 The further arguments of the Opponent I that D8 puts a specific emphasis on the use metallocene catalysts, that the use of condensable saturated hydrocarbon is highly preferred in D8, and that the amount of liquid in the recycle stream is preferably greater than 15% are even less convincing for the following reasons:

(i) Firstly, it is more than questionable whether metallocene catalysts are indeed the preferred ones according to D8, since in the examples, which generally illustrate the most preferred modes of a claimed invention, only a Ziegler-Natta catalyst is used;

(ii) secondly, the use of an amount of greater than 15% by weight of liquid in the recycle stream is presented as only a possibility under specific operating conditions and not as essential requirement of the process of D8 (cf. point 4.9 above); and

(iii) thirdly, in view of the general disclosure of D8 and of the multiple options offered in D8 for the choice of catalyst, for the different ways of increasing the dew point of the recycle stream, and for the choice of the condensable fluids (cf. points 4.8 and 4.9 above), it cannot be concluded that, in the case where the process of D8 is conducted in presence of a metallocene catalyst, the amount of liquid in the recycle stream would inevitably be greater than 2% by weight, and even if it were, that the amount of

condensable liquids other than condensable monomers would be inevitably greater than 2 mol % in that recycle stream.

4.13 In other words, D8 does not contain a clear and unmistakable teaching of a fluidized bed gas polymerization process in the presence of metallocene catalyst (let alone a metallocene catalyst supported on a particulate material) carried out in a condensed mode in which the recycle stream contains more than 2% by weight of liquid and more than 2% by mole of a dew point increasing component as defined in the patent in suit (cf. T 355/99 of 30 July 2002; not published in OJ EPO; Reasons, point 2.2.4).

4.14 Consequently, the subject-matter of Claim 1 and by the same token that of dependent Claims 2 to 19 of Set A' must be regarded as novel over D8 (Article 54(3)(4) EPC).

5. *Priority*

5.1 The validity of the priority of D13 for the subject-matter of Claim 1 of Set A' presupposes firstly that all the features of that claim are to be found in document D13.

5.2 In view of Claim 1 of D13 read in combination with Claims 2 and 4 thereof, and with the passages of the description at page 2, lines 2 to 6, and at page 6, lines 29 to 30, the Board is satisfied that Claim 1 of Set A' finds its support in D13.

5.3 However, the validity of the priority of D13 has been further challenged by the Opponent I on the grounds that document D14, which has been filed well before (i.e. on 19 March 1992) the filing date of D13 (i.e. 20 May 1993) discloses all the features of the claimed invention, and that D13 hence cannot be considered as a first application in the sense of Article 87(4) EPC.

5.4 In this connection, the Board, however, notes that the disclosure of D14 is very similar to that of D8. It also relates to a process for polymerizing monomers in fluidized bed in a condensed mode, and is, like D8, totally silent (cf. D14, page 7, lines 16 to 26) on the use of a metallocene catalyst supported on a particulate material. Since this feature is an essential feature of Claim 1 of Set A', D14, for this reason at least, cannot be considered as disclosing the same invention as claimed in Claim 1 of Set A', and hence, as a previous application in the sense of Article 87(4) EPC.

5.5 The Board further notes that D14 cannot have been used, contrary to the submissions made in the decision under appeal (point 4.3 thereof), as a priority document for document D15, since D15 has been filed more than one year after the filing date of D14. Furthermore, since D14 was abandoned at the filing date of D15 (i.e. 26 April 1993), it is in any case D15 and not D14, which might eventually have been considered as a previous application in the sense of Article 87(4) EPC. Since D15 (cf. column 5, line 63 to column 6, line 4), like D14, is totally silent on the use of a metallocene catalyst supported on a particulate material, however, it does not disclose the same invention as claimed in

Claim 1 of Set A', and hence cannot be considered as a previous application in the sense of Article 87(4) EPC.

5.6 Thus, in view of the above the Board comes to the conclusion that Claim 1 of Set A' is entitled to claim the priority of D13 (Article 87(1) EPC).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The appeal of Opponent I is rejected as inadmissible.

3. The case is remitted to the first instance for further prosecution on the basis of Claims 1-19 of Set A' as filed during the oral proceedings.

The Registrar: The Chairman:

E. Görgmaier R. Young