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Datasheet for the decision of 12 June 2019

Case Number: T 1261/16 - 3.3.03

Application Number: 10795677.3

Publication Number: 2387590

IPC: C08F10/02

Language of the proceedings: EN

Title of invention:
METHOD FOR REPLACING COMPATIBLE ETHYLENE POLYMERIZATION CATALYSTS

Patent Proprietor:
TOTAL RESEARCH & TECHNOLOGY FELUY

Opponent:
INEOS Europe AG

Relevant legal provisions:
EPC Art. 113(1), 56
EPC R. 103(1)(a)

Keyword:
Reimbursement of appeal fee - (no)
Inventive step - (yes)

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Case Number: T 1261/16 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 12 June 2019

Appellant: (Opponent)	INEOS Europe AG Avenue des Uttins 3 Rolle CH-1180 Vaud (CH)
Representative:	King, Alex Mathisen & Macara LLP Communications House South Street Staines-upon-Thames, Middx TW18 4PR (GB)
Respondent: (Patent Proprietor)	TOTAL RESEARCH & TECHNOLOGY FELUY Zone Industrielle C 7181 Seneffe (BE)
Representative:	Raboin, Jean-Christophe Total Research & Technology Feluy Zone Industrielle C 7181 Seneffe (BE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 24 March 2016 concerning maintenance of the European Patent No. 2387590 in amended form.**

Composition of the Board:

Chairman	M. C. Gordon
Members:	D. Marquis
	W. Ungler

Summary of Facts and Submissions

I. The appeal lies against the decision of the opposition division posted on 24 March 2016 concerning the maintenance of European patent 2 387 590 in amended form.

II. The European patent was opposed on the grounds that its subject matter lacked novelty and inventive step and was not sufficiently disclosed. The decision of the opposition division to maintain the patent in amended form was announced at the oral proceedings on 24 February 2016. The decision was based on a main request (claims as granted) and on a first auxiliary request filed during the oral proceedings before the opposition division.

III. Claim 1 of the first auxiliary request that was maintained by the opposition division and which forms the main request in appeal read as follows:

"1. Method for optimizing the sequential feeding of at least two ethylene polymerization catalysts to an ethylene polymerization reactor, comprising:
- transferring to a mixing vessel a first ethylene polymerization catalyst and a first diluent,
- decreasing the concentration of said first ethylene polymerization catalyst in said mixing vessel,
- transferring to said mixing vessel a second ethylene polymerization catalyst and a second diluent,
- progressively replacing said first ethylene polymerization catalyst by said second ethylene polymerization catalyst and said first diluent by said second diluent,
- increasing the concentration of said second ethylene polymerization catalyst in said mixing vessel,

sequentially transferring said first ethylene polymerization catalyst and said second ethylene polymerization catalyst from said mixing vessel to an ethylene polymerization reactor,
wherein said first ethylene polymerization catalyst and said second ethylene polymerization catalyst are selected from a list consisting of a metallocene catalyst, a Ziegler-Natta catalyst and a chromium catalyst, and whereby said first ethylene polymerization catalyst is different from said second polymerization catalyst."

IV. D1 (WO 2005/077522 A1) was *inter alia* cited in opposition and is also the document on which the appeal was based.

V. The decision of the opposition division, as far as relevant for the present communication, can be summarized as follows:

(a) Claim 1 of the main request lacked novelty over the disclosure in figure 1 of D1 read in combination with the passages of its pages 15 and 21.

(b) Since D1 did not disclose a method of sequential feeding of two different catalysts with the apparatus shown in its Figure 1, the claims of the first auxiliary request satisfied the requirements of Article 54 EPC.

(c) As to the assessment of inventive step, none of the prior art documents D1-D3 cited in opposition were in fact suitable as closest prior art. The most appropriate starting point was the disclosure referring to the state of the art found in paragraphs 9 and 14 of the description of the

patent itself.

(d) The method according to the first auxiliary request allowed for a transition between two catalysts without the need to shut down the reactor. The problem solved was thus the provision of an improved method for the transition between two different catalysts in an ethylene polymerization process.

(e) Even starting from D1 as the closest prior art, which did not disclose the sequential feeding of two different ethylene polymerization catalysts, the method of the first auxiliary request was inventive. The problem to be solved starting from D1 was the provision of an alternative use or application for the method and apparatus described in D1. There was no incentive in the prior art to use the apparatus depicted in Figure 1 in D1 for the transition from one ethylene polymerization catalyst to a different one. The passage on page 13, lines 29-33 of D1 where it was stated that two or more apparatuses according to the invention could be supplied or a catalyst blend could be prepared and supplied if two or more (different) catalysts needed to be fed to the reactor did not teach the claimed method since the use of a second apparatus as described was merely presented as an option. That passage did not provide an incentive to use the apparatus shown in Figure 1 for two different catalysts. Moreover, said passage appeared to refer to a situation wherein two different catalysts were fed together to the polymerization reactor. This was different from the patent in suit where the transition from a first

catalyst to a second different one was desired.

(f) Also, since no evidence was provided by the opponent as to fouling of the reactor from the use of two incompatible catalysts, the argument that an effect was not present over the whole scope of the claims did not convince. The first auxiliary request was thus inventive.

VI. The opponent (appellant) lodged an appeal against that decision.

VII. The patent proprietor (respondent) submitted a reply to the statement setting out the grounds of appeal.

VIII. The appellant filed further arguments in a letter of 12 April 2019.

IX. In a communication sent in preparation of oral proceedings, the Board summarised the points to be dealt with and provided a preliminary view on the disputed issues.

X. Oral proceedings were held on 12 June 2019.

XI. The arguments of the appellant, insofar as relevant to the present decision, can be summarised as follows:

Reimbursement of the appeal fee

(a) The contested decision invoked a passage of the patent in suit as the closest prior art. That choice of closest prior art had never been discussed during the proceedings. In fact, D1 was the document that had always been considered as the document representing the closest prior art by the

opposition division up to the oral proceedings, as could be seen in the summons issued by the opposition division, and was also the document that was discussed during the oral proceedings. The opposition division did not give the opponent any indication that D1 was no longer considered to be the closest prior art and did not allow the opponent any opportunity to explain why D1 should be considered the closest prior art nor to comment on the closest prior art based on the description of the patent in suit chosen by the opposition division. Also, the reasons given by the opposition division as to why D1 was not the closest prior art in the contested decision were flawed and had not been discussed at any point during the proceedings.

(b) The opponent therefore had been deprived of an opportunity to comment on the choice of the closest prior art. This constituted a violation of the right to be heard justifying the reimbursement of the appeal fee.

Main request

Inventive step

(c) The method of claim 1 differed from that disclosed in the closest prior art D1 in that it required the sequential feeding of catalysts. The use of the apparatus for feeding catalysts sequentially in the polymerization reactor was not explicitly disclosed in D1.

(d) The problem solved by the claimed subject matter was to optimize the sequential feeding for a continuous process. The alleged reduction in

reactor downtime and the production of less waste material by comparison to the process of D1 was not demonstrated in the patent in suit.

(e) The transitioning between two catalysts in the course of the claimed type of continuous polymerization process was well known in the art. Furthermore, the apparatus disclosed in Figure 1 of D1 already contained two storage vessels that could be used to effect transitioning between the two catalysts by stopping the feed of the first catalyst before beginning to feed the second catalyst in the mixing vessel.

(f) The claimed process was obvious in view of D1 itself as switching catalysts was suggested throughout the description of D1, in particular in the first paragraph of page 4, page 10 lines 14-22, page 13, lines 29-33 and page 21, line 25. D1 also taught that any catalyst could be used in the polymerization process. Furthermore, the passage on page 13 taught that two catalysts could be used in the process and fed to the reactor either by using two feeding apparatuses or as a blend by using a single apparatus, pointing to a transitioning of the catalysts.

(g) Contrary to the view of the respondent, the teaching of D1 was not to transfer the second catalyst from the second storage vessel to the mixing vessel in a single step. In particular, it was apparent from the passage on pages 16 and 17 of D1 that there was a repeated feeding of the catalysts to the mixing vessel to replace the catalyst added to the reactor. D1 therefore did not teach away from a gradual transitioning between the

two catalysts.

(h) When operating the apparatus of Figure 1 of D1 in a continuous mode with two catalysts the skilled person would have considered adding the catalysts from the two different storage vessels and would have switched between the two catalysts in a continuous manner, arriving at the claimed subject matter. Claim 1 of the main request thus lacked an inventive step over D1.

XII. The arguments of the respondent, insofar as relevant to the present decision, can be summarised as follows:

Reimbursement of the appeal fee

(a) No arguments were provided by the respondent with respect to the reimbursement of the appeal fee.

Main request

Inventive step

(b) D1 was only concerned with diluting a concentrated slurry of catalyst in a mixing vessel prior to introducing the diluted slurry at a suitable concentration and flow rate to the polymerization reactor. Figure 1 disclosed two storage vessels but, as described on page 15 of D1, the vessels contained the same catalyst slurry. D1 did not disclose the transitioning between two different catalysts as claimed. To the extent that two catalysts were used in D1, these were handled with two apparatuses or were added as a prepared blend using one apparatus. That did not constitute a transitioning between two different catalyst as

required according to claim 1 of the main request.

(c) The transitioning as claimed in the main request allowed to optimize the transition time between the catalysts, it reduced the reactor downtime, lost capacity and minimized the production of waste material.

(d) The problem solved was thus to provide a process of optimizing the sequential feeding of two catalysts in a continuous process without interrupting the process and reducing the reactor downtime and waste material.

(e) D1 did not provide any teaching towards the transitioning of two catalysts. Also, no further document showed a transitioning of catalysts as claimed. Claim 1 of the main request was inventive over D1.

XIII. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked. Furthermore they requested that the appeal fee be reimbursed on the basis of a substantial procedural violation by the opposition division, and that the auxiliary requests on file be not admitted into the proceedings.

XIV. The respondent (patent proprietor) requested that the appeal be dismissed (main request) or that the patent be maintained on the basis of any one of the first to fifth auxiliary request filed with the reply to the statement setting out the grounds of appeal.

Reasons for the Decision

1. Reimbursement of the appeal fee

1.1 The opponent requested the reimbursement of the appeal fee on the grounds that a substantial procedural violation occurred on the because the opposition division did not give the opponent any indication that D1 was no longer considered as closest prior art, did not allow the opponent to explain why D1 should be considered the closest prior art and did not allow the opponent to comment on the identified closest prior art from the description of the patent in suit (last paragraph on page 3 of the statement setting out the grounds of appeal).

1.2 The opposition division had indeed indicated in the summons to attend oral proceedings dated 28 April 2015 with respect to the auxiliary requests 2, 3, 5 and 6 that the method claimed in these requests was considered obvious in view of the teaching of D1 (penultimate paragraph on page 3), that statement is however not to be read in isolation from the sentence on page 1 of the same summons which clearly set out that the content of the summons constituted a provisional non-binding opinion of the opposition division. Such provisional opinions of the opposition division are per definition non-binding for the conduct of the following procedure. In that respect, the opposition division was not under an obligation to give a prior indication to the parties that they did not consider D1 as the closest prior art. All the more so as the decision not to consider D1 as the closest prior art, as will be explained in the following, can be seen

as a direct consequence of the findings of the opposition division with respect to novelty which in turn followed directly from the discussion of that document between the parties at the oral proceedings.

1.3 The appellant further submitted that the key factor as to why the opposition division considered that D1 was not the closest prior art was that D1 did not disclose the sequential feeding of two different ethylene polymerization catalysts (first paragraph on page 4 of the statement setting out the grounds of appeal) and that the opponent was not given an opportunity to comment on that point. It is however apparent from the contested decision and from the minutes of the oral proceedings that the presence of that feature in D1 was discussed between the parties during the discussion of novelty over D1 (paragraph 3 on page 10 of the contested decision and from the the passage bridging pages 2 and 3 of the minutes of the oral proceedings).

1.4 Furthermore, it is also apparent that the sequential feeding of two different types of ethylene polymerization catalysts within D1 had been addressed by both parties in their written submissions prior to the oral proceedings. It was first addressed by the appellant in the notice of opposition with respect to inventive step (last four paragraphs on page 5), it was contested by the patent proprietor in the reply to the notice of opposition (page 3, point 5.1.2) and in the letter of the patent proprietor dated 21 December 2015 (page 4, point 4.2).

1.5 Notwithstanding that the dismissal of D1 as the closest prior art as a result of the conclusion of the opposition division on novelty with regard to this distinguishing feature might not have been expected by

the appellant, the Board is nevertheless satisfied that the conclusion of the opposition division regarding the choice of the closest prior art was a direct, logical and cogent consequence of the conclusion with respect to novelty, which - it is emphasised - was discussed between the parties at the oral proceedings.

1.6 It can thus be concluded from the above cited passages of the notice of opposition, the minutes of the oral proceedings and the contested decision that the parties were given an opportunity before the opposition division to comment on the matter of whether D1 was the document representing the closest prior art. Also, according to the minutes the parties were further heard on the inventive step objection based on D1 and the objection was dealt with by the opposition division in its decision. Consequently, in that regard there was no violation of the opponent's right to be heard.

1.7 Also, notwithstanding the rejection of D1 as closest prior art on page 11 of the contested decision, it is apparent to the Board that the opposition division nonetheless provided a separate and full inventive step analysis starting from D1 as the closest prior art, coming to the same conclusion on inventive step as that reached starting from the description of the patent in suit as closest prior art (page 12 of the contested decision). In that respect the contested decision shows that even if D1 had been accepted as the document representing the closest prior art, the claimed subject matter would still have been considered to involve an inventive step.

1.8 As to point (ii) mentioned above, the Board does not find in the official communications of the opposition division, the minutes of the oral proceedings or in the

contested decision an indication that the opponent was given an opportunity to comment on the prior art referred to in the description of the patent in suit which was chosen as closest prior art by the opposition division. While that as such constitutes a violation of the right to be heard of the opponent, it is to be noted that neither in writing nor in the oral proceedings before the Board did the appellant advance any substantive argument as to why the opposition division should have arrived at any other conclusion on inventive step should the opponent have been heard on the issue of suitability of that prior art as representing the closest prior art or on the inventive step objection based on that prior art. In the absence of any substantive argument in that regard the Board finds that a reimbursement of the appeal fee pursuant to Rule 103(1)(a) EPC would not be equitable in view of the specific circumstances of this case.

Main request

2. Inventive step

2.1 Both parties in appeal considered that document D1 represented the closest prior art rather than the reference to the general prior art found in the patent in suit and relied on in the contested decision. D1 concerns a method and apparatus for preparing and optimizing catalyst feeding to a polymerisation reactor (page 1, lines 5-10). D1 is in the same field as the patent in suit, it discloses the same apparatus as the patent in suit (Figure 1) and also aims at producing polyethylene with the same catalysts (page 10, lines 14-22) that are used in the patent in suit.

2.2 Even if D1 does not mention the same problem of optimizing the sequential feeding of at least two ethylene polymerization catalysts to an ethylene polymerization reactor (patent in suit, paragraph 22), it is apparent that its subject matter was also conceived for the same general purpose of providing a method of feeding catalysts to an ethylene polymerization reactor as in the patent in suit and on that ground, D1 does not appear to be an unreasonable or unrealistic starting point for the assessment of inventive step of the main request.

2.3 Figure 1 of D1 was seen as the most relevant starting point as it describes an apparatus for supplying a catalyst slurry to a polymerization reactor. That apparatus was acknowledged by both parties to be the same apparatus as that disclosed in Figure 1 of the patent in suit. It is used to optimize the supply of a catalyst slurry to a polyethylene polymerisation reactor in the general method disclosed on pages 15 to 19 of D1 and in claim 15, which is essentially based on feeding a concentrated catalyst slurry to a storage vessel followed by a dilution of that concentrated catalyst slurry in order to obtain a suitable concentration of the catalyst slurry for use in a polymerisation reaction, whereby said catalyst slurry is diluted while being transferred from said storage vessel to a mixing vessel before being pumped to the polymerization reactor.

2.4 Claim 1 of the main request by contrast pertains to a method for optimizing the sequential feeding of at least two ethylene polymerization catalysts to an ethylene polymerization reactor which method is defined by a number of steps in the form of a list, among which

are:

- transferring to a mixing vessel a first ethylene polymerization catalyst and a first diluent,
- decreasing the concentration of said first ethylene polymerization catalyst in said mixing vessel,
- transferring to said mixing vessel a second ethylene polymerization catalyst and a second diluent,
- progressively replacing said first ethylene polymerization catalyst by said second ethylene polymerization catalyst and said first diluent by said second diluent,
- increasing the concentration of said second ethylene polymerization catalyst in said mixing vessel,

as a succession of steps forming part of what is called "transitioning" in the patent in suit (paragraphs 12 and 13).

2.5 The respondent considered that the wording of these steps in claim 1 of the main request required that the steps be carried out successively, meaning that the concentration in the first ethylene polymerization catalyst had to be decreased before the second ethylene polymerization catalyst could be added to the mixing vessel.

2.6 It is however apparent from the above list of steps and from the wording used to define these steps in claim 1 of the main request that all the steps may be performed at the same time since the transfer of the second ethylene polymerization catalyst and second diluent to the mixing vessel containing the first ethylene polymerization catalyst would inevitably result in a

decrease of the concentration of first ethylene polymerization catalyst. As to the progressive replacement of the first ethylene polymerization catalyst by the second ethylene polymerization catalyst defined in claim 1, it only implies that the second ethylene polymerization catalyst slurry must be added to the mixing vessel at a higher and continuously increasing rate with respect to the first ethylene polymerization catalyst slurry. That is what can be seen as transitioning by sequentially feeding the two ethylene polymerization catalysts to the polymerization reactor according to claim 1 of the main request. That feature is the essential feature distinguishing the main request from the method of D1.

2.7 The respondent argued that the method according to claim 1 of the main request resulted in a polymerization process with reduced reactor downtime and reduced production of waste material as compared to the method carried out in D1. While the patent in suit does not contain examples that could provide a meaningful comparison between the claimed method and the method described in D1, the description of the patent in suit makes it plausible that the transitioning of the catalysts according to claim 1 of the main request would necessarily result in a reduced reactor downtime compared with the method of D1 since the transitioning of the catalysts avoids having to kill the existing polymerization reaction, empty the reactor, recharge and start again with a new catalyst and that several hours will not have to be spent building up the desired solid levels inside a reactor not having received polymerization catalyst for several hours (paragraphs 34 and 46). With regard to the production of waste material during the transitioning between the two catalysts however, the patent in suit

does not make plausible that it will be reduced over the method of D1 since the production of waste material arises during the transitioning between the catalysts and it was not shown that those waste materials were observed in the operation of the method disclosed in D1.

2.8 Under these circumstances, the problem solved over the closest prior art D1 can be formulated as the provision of a method for optimizing the sequential feeding of at least two ethylene polymerization catalysts to an ethylene polymerization reactor in order to reduce the reactor downtime. The solution to that problem is the transitioning between the two catalysts according to claim 1 of the main request.

2.9 It remains to be decided whether the solution according to claim 1 of the main request was obvious over the closest prior art D1.

2.10 The apparatus shown in Figure 1 of D1 contains two storage vessels 2, intended to contain the slurry of a metallocene catalyst and isobutane as a diluent before being delivered to the mixing vessel 3 wherein the slurry is diluted to a suitable concentration for use in a polymerisation reaction as described in the first full paragraph on page 15 of D1. The passage describing the operation of the apparatus according to Figure 1 of D1 starting on page 16 to the first paragraph of page 18, and in particular the passage at page 16 lines 15 to 23 further shows that the two storage vessels 2 present in the apparatus- and containing the same catalyst were actually intended to provide redundancy i.e. a form of back-up system in case one of the feeding lines to the reactor were interrupted. In that respect, the description of the operation of the

apparatus of Figure 1 in D1 does not explicitly show a situation where the two storage vessels each contained a different catalyst to be transferred to the mixing vessel.

2.11 Also the general purpose of the method disclosed in D1, which is to provide a controlled flow rate of the catalyst to the mixing vessel where its concentration is kept at a substantially constant level (page 17, lines 28-33), with contingency measures in the case of failure of one of the feeding systems (page 16, lines 15-23) does not relate to the transitioning between two different catalysts. While the passage on page 13, lines 29-33 of D1 discloses that two (different) catalysts could be used in the method of D1, it suggests in that case that two complete apparatuses be used to feed the catalysts to the reactor or alternatively that one apparatus be used but that the catalysts be in the form of a blend. The Board does not find that the two alternative operations of the method disclosed in D1 disclosed in that passage imply a transitioning between two different catalysts according to claim 1 of the main request.

2.12 Nor does the Board find in the other passages of D1 cited by the appellant the solution of the posed technical problem. The first paragraph on page 4, which refers to switching catalyst type, only concerns unspecified known processes of the prior art and is not a description of the invention shown in D1 nor concerns the specific process or apparatus of D1. That passage thus cannot be read in the context of the process of D1 and in particular not in the context of a possible use of a blend of catalysts as found on page 13, line 32. The passage on page 10, third paragraph concerns the definition of the catalysts according to the method of

D1 but it does not relate to the feeding of these catalysts in the apparatus and thus does not suggest the transitioning between two different catalysts. With regard to the passage on page 21, fourth paragraph, the reference to a batch of catalyst does not imply that two different catalysts could be used and that passage does not relate to the feeding as such of the catalyst to the mixing vessel during the operation of the apparatus.

2.13 Finally, it was argued by the appellant that it could not be disputed that the transitioning between two catalysts was well known in the art, as stated in the patent in suit itself (paragraphs 9 and 14), and that the operation of the apparatus and method shown in D1 would inevitably result in a method according to claim 1 of the main request. There is however nowhere on file a document showing a transitioning performed in a mixing vessel and comprising the steps according to claim 1 of the main request. While "transitioning" between two catalysts may be known in the art, paragraph 14 of the patent in suit shows that said term of the prior art covers a wide range of operations, including stopping the polymerization process, emptying the reactor, recharging and then introducing the second catalyst into the reactor. That type of transitioning does however not correspond to the subject matter of claim 1 of the main request. Whether the transitioning described in the patent in suit was generally known in the art remains unproven in view of the documents made available in appeal and can therefore not be taken into account in the assessment of the inventive merit of the main request.

2.14 The Board concludes from the above that claim 1 of the main request fulfils the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

2. The request for reimbursement of the appeal fee is refused.

The Registrar: The Chairman:

B. ter Heijden M. C. Gordon

Decision electronically authenticated