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**Datasheet for the decision
of 6 May 2010**

Case Number: T 1397/07 - 3.3.10

Application Number: 99660161.3

Publication Number: 0994088

IPC: C07C 2/08

Language of the proceedings: EN

Title of invention:

Process for producing a fuel component

Patentee:

Neste Oil Oyj

Opponent:

Catalytic Distillation Technologies
Saipem S.p.A.

Headword:

Dimerisation process/NESTLE OIL OYJ

Relevant legal provisions:

EPC Art. 54, 56, 123(2)
RPBA Art. 13(1)

Keyword:

"Main request: Novelty (no)"
"Auxiliary request I: Novelty (yes) - no implicit disclosure,
inventive step (no) - arbitrary selection - no deterrent"
"Auxiliary request II (not admitted): late-filed - not clearly
allowable - added subject-matter"

Decisions cited:

T 0024/81, T 0153/85, T 0249/88, T 0939/92, T 0351/93,
T 1053/93, T 0645/94, T 0823/96, T 0113/00

Catchword:

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Case Number: T 1397/07 - 3.3.10

D E C I S I O N
of the Technical Board of Appeal 3.3.10
of 6 May 2010

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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
18 June 2007 concerning maintenance of European
patent No. 0994088 in amended form.

Composition of the Board:

Chairman: R. Freimuth
Members: J. Mercey
F. Blumer

Summary of Facts and Submissions

- I. The Appellant I (Patent proprietor) and Appellant II (Opponent II) lodged appeals on 17 August 2007 and 8 August 2007, respectively, against the interlocutory decision of the Opposition Division posted on 18 June 2007 which found that European patent No. 994 088 in amended form met the requirements of the EPC.
- II. Notice of Opposition had been filed by Appellant II and the party as of right (Opponent I) requesting revocation of the patent as granted in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC), insufficient disclosure (Article 100(b) EPC), and of extending the subject-matter of the patent in suit beyond the content of the application as filed (Article 100(c) EPC). *Inter alia* the following documents were submitted in opposition proceedings:
- (6) US-A-4 375 576 and
(10) GB-A-2 325 237.
- III. The decision under appeal was based on the patent as granted and on the patent as amended according to auxiliary request I.

Claim 1 of the patent as granted read as follows:

"A process for dimerizing olefinic hydrocarbon feedstock, comprising

- feeding fresh olefinic hydrocarbon feedstock (F1) to a reaction zone of a system including at least one reaction zone and at least one distillation

zone, said at least one reaction zone comprising at least one reactor (1; 11; 21-23; 31-33; 41-43; 51, 52; 61, 62; 71, 72; 81, 82) and said at least one distillation zone comprising at least one distillation column (5; 15; 25; 35-37; 55, 56; 65; 75-77; 85, 86),

- contacting said olefinic hydrocarbon feedstock with an acidic ion exchange resin in the presence of an oxygenate at conditions in which at least a part of the olefins dimerizes,
- conducting the effluent from said reaction zone to said distillation zone, where dimerized reaction product is separated from said effluent,
- withdrawing at least one flow (R1) comprising oxygenate from the side of at least one distillation column (5; 15; 25; 36; 56; 65; 76; 85) and circulating said flow from said distillation zone back to dimerization, and
- recovering the reaction mixture (B1) and, optionally, hydrogenating said reaction mixture to form a parafinic reaction product."

Claim 1 of auxiliary request I differed from claim 1 as granted in that it was specified that the at least one flow comprising oxygenate was withdrawn from the side of at least one distillation column "from a plate higher than the feed plate".

IV. The Opposition Division held that the claims of the then pending main request, namely the patent as granted, fulfilled the requirements of Article 100(c) EPC, that the invention was sufficiently disclosed, but that the subject-matter thereof was not novel over the disclosure of document (6). It further held that the

amendments made to the claims of the then pending auxiliary request I satisfied the requirements of Article 123(2) and (3) EPC and that the subject-matter thereof was novel over the disclosure of document (6). None of the claims of this request were considered to validly claim priority from FI 982250, such that document (10) was state of the art pursuant to Article 54(2) EPC. Starting from this document as closest prior art, the Opposition Division found the invention to involve an inventive step.

- V. At the oral proceedings before the Board, held on 6 May 2010, Appellant I filed an auxiliary request II, and thereby withdrew previous auxiliary requests II to IV which had been filed with a letter dated 12 April 2010. Claim 1 of auxiliary request II read as follows:

"A process for dimerizing an olefinic hydrocarbon feedstock containing isobutene, the process comprising

- feeding fresh olefinic hydrocarbon feedstock (F1) to a reaction zone of a system including at least one reaction zone and at least one distillation zone, said at least one reaction zone comprising at least one reactor (1; 11; 21-23; 31-33; 41-43; 51, 52; 61, 62; 71, 72; 81, 82) and said at least one distillation zone comprising at least one distillation column (5; 15; 25; 35-37; 55, 56; 65; 75-77; 85, 86),
- contacting said olefinic hydrocarbon feedstock with an acidic ion exchange resin in the presence of oxygenates at conditions in which at least a part of the isobutene dimerizes to iso-octene,

- conducting the effluent from said reaction zone to said distillation zone, where iso-octene is separated from said effluent,
- withdrawing at least one flow (R1) comprising said oxygenates from the side of at least one distillation column (5; 15; 25; 36; 56; 65; 76; 85) from a plate higher than the feed plate and circulating said flow from said distillation zone back to dimerization, and
- recovering the obtained iso-octene (B1) and, optionally, hydrogenating further to iso-octane, wherein
 - said oxygenates are water and tertiary butanol formed in a reaction between water and isobutene."

VI. Appellant I submitted that document (6) was not novelty destroying for the subject-matter of any of the requests, since in the passage at column 2, lines 41 to 61, the **recycling** of the intermediate draw **stream** to the oligomerisation reaction did not correspond to **circulating** the **flow** from the side of the distillation column **back** to the reaction according to the present invention. Furthermore, in view of the term "which" in the wording "to recover a stream high in MTBE and containing some oligomer which can be recycled to the oligomerization reaction" (MTBE being methyl tertiary butyl ether), it was not clear which substance in document (6) was in fact recycled to the reaction.

With regard to auxiliary request I, there was no disclosure in document (6) that the side stream was withdrawn from a plate higher than the feed plate. On the contrary, since the intermediate draw stream of document (6) should also contain some oligomer,

oligomers being defined therein as having greater than 8 carbon atoms, such oligomers being practically non-existent in the column section above the feed plate under any reasonable conditions, it was in fact mandatory to take said side stream from a plate below the feed plate.

The Appellant I submitted that the subject-matter of auxiliary request I was inventive and that document (10) represented the closest prior art, since it was more modern than document (6), but conceded that document (6) had more technical features in common with the claimed invention. In the light of document (6), the problem to be solved by the patent in suit was the provision of a more versatile process in order to make more oxygenates available for the process. The solution comprised locating the point of withdrawal of the side stream at a plate higher than the feed plate. The skilled person would have been deterred from locating the side stream above the feed plate, there being no pointers in document (6) to placing the side draw above, but rather strong pointers to placing it below the feed. Even if the skilled person could have located the side draw above the feed, he would not have necessarily have done so. In addition, the secondary indicium of commercial success supported the presence of an inventive step.

With regard to auxiliary request II filed during the oral proceedings, basis for the amendments to claim 1 was claims 19, 25 and 27, together with page 13, lines 4 to 7 and Examples 4 and 6 as originally filed. Since said claim thus fulfilled the requirements of Article 123(2) EPC and was clear, it should be admitted into the proceedings.

VII. Appellant II had no objections under Article 100(c) or Article 123(2) EPC to the amendments made to claim 1 of either the main request or the auxiliary request I.

Appellant II objected to the novelty of the subject-matter of the main request on the basis of the passage at column 2, lines 41 to 61 and column 3, lines 60 to 61 of document (6), which disclosed an oligomerisation process wherein a feed containing isobutene and MTBE was fed to a reactor containing a fixed bed acidic cation ion exchange resin. The resultant product stream, which contained the isobutene dimers oligomers product, unreacted C₄'s and some MTBE, was fractionated, e.g. by distillation, to recover the unreacted C₄'s as an overhead fraction and the oligomer and MTBE as a bottoms. Said distillation could be carried out with an intermediate draw stream in the distillation column to recover a stream high in MTBE and containing some oligomer which could be recycled to the oligomerization reaction.

Appellant II also objected to the novelty of the subject-matter of auxiliary request I on the basis of the same passage of document (6), the additional feature of this request that the side flow be withdrawn from a plate higher than the feed plate being implicitly disclosed in document (6) by virtue of the described aim of said withdrawal, namely to recover a stream high in MTBE. In view of the various boiling points of the C₄-starting materials, MTBE, dimers and trimers, which were low, intermediate, high and highest, respectively, and the common general knowledge regarding the location of side draws in distillation

columns, it was mandatory for the skilled person to locate the side draw above the feed tray in order to minimise the low boilers, namely the C₄ components, in the side stream and thus maximise the higher boiling MTBE.

In the assessment of inventive step, Appellant II argued that the subject-matter of auxiliary request I was not inventive over the teaching of document (6). It argued that there was no technical effect associated with the only possible distinguishing feature of the claimed invention, namely the location of the side draw, such that the objective technical problem to be solved was merely to provide an alternative process for dimerising olefin feedstocks. Since there were only two possibilities for the location of a side draw in a distillation column, namely above or below the feed plate, the mere selection of one of these possibilities was arbitrary. In addition, the skilled person had an incentive to locate the side draw above the feed plate, for the same reasons already outlined in the discussion of novelty of this request. Any arguments of the Appellant I based on commercial success of the claimed process were irrelevant, since the process was clearly not inventive on the basis of the objective "problem-solution-approach".

At the oral proceedings before the Board, Appellant II no longer maintained that the invention was insufficiently disclosed.

The Appellant II submitted that auxiliary request II was late filed and should not be admitted into the proceedings, since the amendments made to claim 1

offended against the provisions of Article 123(2) EPC. More particularly, Examples 4 and 6 of the application as filed could not be generalised, as the former used the specific apparatus according to Figure 8 and the latter used C₅-hydrocarbons as feedstock, whereas claim 1 of auxiliary request II now related to the dimerisation of feedstocks containing isobutene. The passage at page 13 merely disclosed that water could react with various olefins in the feedstock to give alcohols, but did not describe the recycling step at all.

VIII. The Party as of right did not file any submissions.

IX. The Appellant I requested that the decision under appeal be set aside and the patent be maintained on the basis of the main request, namely the patent as granted, or, subsidiarily, on the basis of auxiliary request I as maintained by the Opposition Division, or on the basis of auxiliary request II as filed during oral proceedings before the Board.

The Appellant II requested that the decision under appeal be set aside and the patent be revoked. The Party as of right filed no requests.

X. Oral proceedings were held in the absence of the Party as of right, who, after having been duly summoned, did not attend. At the end of the oral proceedings, the decision of the Board was announced.

Reasons for the Decision

1. The appeals are admissible.

Main request

2. *Amendments (Article 100(c) EPC)*

In the appealed decision, Claim 1 of the main request was found not to contain subject-matter extending beyond the application as filed, nor was said claim ever objected to under this ground by the Appellant II, nor does the Board see any reason to question its allowability under Article 100(c) EPC of its own motion.

3. *Sufficiency of Disclosure (Article 100(b) EPC)*

In the appealed decision, it was found the invention to be sufficiently disclosed (cf. point IV above). Sufficiency of disclosure was no longer contested during the appeal proceedings, nor does the Board see any reason to take a different view to the Opposition Division. Hence, it is unnecessary to go into more detail in this respect.

4. *Novelty*

- 4.1 Document (6) (see col. 2, lines 41 to 61) discloses a process wherein the inclusion of a small amount of MTBE in a feed containing isobutene to a reactor containing a fixed bed cation ion exchange resin which contains sulphonic acid groups (see col. 3, lines 60 to 61) for reacting the isobutene to form oligomers enhances the dimerization of isobutene while suppressing the further

reaction of isobutene to form higher oligomers or polymers. The resultant product stream, which contains the isobutene dimers oligomers product, unreacted C₄'s and some MTBE, is fractionated, e.g. by distillation, to recover the unreacted C₄'s as an overhead fraction and the oligomer and MTBE as a bottoms. If the presence of MTBE is not desired in the oligomer fraction, the distillation may be carried out with an intermediate draw stream in the distillation column to recover a stream high in MTBE and containing some oligomer which may be recycled to the oligomerization reaction. Consequently this specific disclosure in document (6) discloses all the features indicated in present claim 1 and, thus, destroys the novelty of the subject-matter claimed.

4.2 For the following reasons, the Board is not convinced by the Appellant I's submissions in support of novelty.

4.2.1 The Appellant I argued that the **recycling** of the intermediate draw **stream** to the oligomerisation reaction disclosed in document (6) did not correspond to **circulating the flow** from the side of the distillation column **back** to the reaction according to the present invention, said circulating of the flow implying that the reaction was continuous, which the reaction according to document (6) was not.

However, the terms "recycling of the stream" and "circulating the flow back" have technically the same meaning, namely to feed the product stream back to the reaction, and therefore indicate the same technical feature. Thus the process claimed cannot be rendered novel simply by virtue of using different terms

defining the same feature. With regard to the Appellant I's view that the process of document (6) was not continuous due to the use of the term "recycling of the stream", since the process of present claim 1 is not specified as being continuous, it is irrelevant in the assessment of novelty whether the process disclosed in document (6) is continuous or not.

- 4.2.2 The Appellant I also argued that it was not clear which substance in document (6) was recycled to the reaction, it being ambiguous from the wording "to recover a stream high in MTBE and containing some oligomer which can be recycled to the oligomerization reaction" whether the entire, MTBE-containing stream, or merely the oligomer, should be recycled.

However, document (6) clearly discloses the circulating of the MTBE- and oligomer-containing stream back to the dimerisation reaction. In order to recycle only the oligomer, an intermediate separation step would have been required to separate the oligomers from the rest of the MTBE-containing stream, such a step not being disclosed in document (6). In any case, recycling of only the oligomer to an oligomerisation reaction makes no technical sense.

- 4.3 Thus, the Board concludes that document (6) discloses a process according to claim 1 of the main request.

- 4.4 As a result, the Appellant I's main request is not allowable as the subject-matter of claim 1 lacks novelty within the meaning of Articles 52(1) and 54(1) and (2) EPC.

Auxiliary request I

5. *Amendments (Article 123(2) and (3) EPC)*

Claim 1 is based on granted claim 1, together with claim 2 as originally filed. The amendments restrict the scope of the granted claims, such that the requirements of both Article 123(2) and (3) EPC are satisfied.

6. *Novelty*

6.1 The subject-matter of claim 1 of this request differs from that of claim 1 of the main request in that the at least one flow comprising oxygenate is withdrawn from the side of at least one distillation column from a plate higher than the feed plate.

6.2 The Appellant II also challenged the novelty of the subject-matter of this request with regard to document (6), the relevant disclosure of which is indicated in point 4.1 above. The Appellant II conceded that the feature of this request that the side flow be withdrawn from a plate higher than the feed plate was not explicitly disclosed in document (6), but submitted that this feature was nonetheless implicitly disclosed therein by virtue of the described aim of said withdrawal, namely "to recover a stream high in MTBE and containing some oligomer". In order to achieve this aim, the skilled person would have located the side stream away from the bottom of the column in order to minimise recycling of the desired dimer product, and this meant locating the side stream above the feed.

6.3 The Board observes that it is a generally applied principle that for concluding lack of novelty, there must be a direct and unambiguous disclosure, either explicit or implicit, in the state of the art which would inevitably lead the skilled person to subject-matter falling within the scope of what is claimed. In this context "implicit disclosure" means disclosure which any person skilled in the art would objectively consider as necessarily implied in the explicit content, e.g. in view of general scientific laws. In this respect, the term "implicit disclosure" should not be construed to mean matter that does not belong to the content of the technical information provided by a document but may be rendered obvious on the basis of that content. Whilst common general knowledge must be taken into account in deciding what is clearly and unambiguously implied by the explicit disclosure of a document, the question of what may be rendered obvious by that disclosure in the light of common general knowledge is not relevant to the assessment of what is implied by the disclosure of that document. The implicit disclosure means no more than the clear and unambiguous consequence of what is explicitly mentioned (see T 823/96, point 4.5 of the reasons, not published in OJ EPO).

6.4 In the present case, the disclosure in document (6) of carrying out the distillation with an intermediate draw stream in the distillation column to recover a stream high in MTBE and containing some oligomer does not implicitly mean that said intermediate draw is above the feed, since as argued by the Appellant I, and eventually conceded by the Appellant II, it is also possible to obtain a stream high in MTBE and containing

some oligomer when locating the intermediate draw stream below the feed.

6.5 Thus, since the feature that the oxygenate-containing flow is withdrawn from the side of at least one distillation column from a plate higher than the feed plate is not specifically disclosed in document (6), neither explicitly nor implicitly, the Board concludes that the subject-matter of the auxiliary request I is novel within the meaning of Article 54 EPC.

7. *Inventive step*

7.1 According to the established jurisprudence of the Boards of Appeal it is necessary, in order to assess inventive step, to establish the closest state of the art, to determine in the light thereof the technical problem which the invention addresses and successfully solves, and to examine the obviousness of the claimed solution to this problem in view of the state of the art. This "problem-solution approach" ensures assessing inventive step on an objective basis and avoids an *ex post facto* analysis. The closest prior art is normally a prior art document disclosing subject-matter aiming at the same objective as the claimed invention and having the most relevant technical features in common.

7.2 The patent in suit is directed to a process for dimerising an olefinic feedstock with high selectivity to the dimer (see patent in suit, paragraph [0023]). A similar process already belongs to the state of the art in that document (6) discloses a process for dimerising isobutene having all the features of present claim 1 apart from the location of the side draw (see points

4.1 and 6.1 to 6.5 above), wherein said dimerisation is enhanced and further oligomerisation is suppressed (see col. 2, lines 20 to 29 and 48 to 50).

7.2.1 The Appellant I submitted that document (10) represented the closest prior art, since it was more recent than document (6), but conceded that in view of the absence of a side draw in any distillation column disclosed in document (10), document (6) had more technical features in common with the claimed invention. The Board notes, however, that Article 56 EPC requires the assessment of inventive step to be made "having regard to the state of the art", Article 54(2) EPC defining the state of the art "to comprise everything made available to the public", without addressing any time frame (see T 113/00, point 3.7 of the reasons, not published in OJ EPO). As a consequence, there is no legal basis in the EPC to preclude a particular state of the art, in the present case document (6), from being taken into account when assessing inventive step, merely because of being published some years earlier than another one. Furthermore, no technical reason has been submitted as to why the skilled person would disregard document (6) for the only reason that its publication date lies further in the past than that of document (10).

7.2.2 Thus, the Board considers, in agreement with the Appellant II, that in the present case the process of document (6), as outlined in point 4.1 above, represents the closest state of the art and, hence, takes it as the starting point when assessing inventive step.

- 7.3 In view of this state of the art, the Appellant I submitted that the problem underlying the patent in suit was the provision of a more versatile process in order to make more oxygenates available for the process.
- 7.4 As the solution to this problem, the patent in suit according to the auxiliary request I proposes that the at least one flow comprising oxygenate is withdrawn from the side of at least one distillation column from a plate higher than the feed plate.
- 7.5 Said solution thus covers processes wherein MTBE is the oxygenate. However, MTBE is the oxygenate used in the process according to the closest document (6). Thus, at least insofar as the oxygenate is MTBE, the claimed process cannot be more versatile than that of document (6), with the consequence that the purported improvement cannot be achieved for this embodiment.
- 7.6 Since in the present case the alleged advantage, i.e. improved versatility of the process with respect to the oxygenate, is not achieved throughout the entire ambit of the claimed subject matter, the technical problem as defined above (see point 7.3 above) needs to be redefined in a less ambitious way. In view of the teaching of document (6), and as conceded by Appellant I in the oral proceedings before the Board, it can merely be seen in the provision of an alternative process for dimerising olefin feedstocks (see T 939/92, OJ EPO 1996, 309, point 2.5.4 of the reasons).
- 7.7 Finally, it remains to be decided whether or not the proposed solution to the problem underlying the

disputed patent is obvious in view of the cited prior art.

7.7.1 Document (6) embraces merely two possibilities for the positioning of the side draw in the distillation column, namely above or below the feed plate, there being no other conceivable configuration, as agreed by both parties. Hence, withdrawing the side stream at a plate above the feed plate is neither critical nor a purposive choice from within the teaching of document (6) for solving the objective problem underlying the patent in suit, since no unexpected effect has been shown to be associated with this position of withdrawal *vis-à-vis* the only other possibility. The act of positioning the side draw above the feed plate is thus within the routine activity of the skilled person faced with the mere problem of providing an alternative process for dimerising olefin feedstocks. Therefore, the arbitrary choice of withdrawing the oxygenate-containing side stream from a plate higher than the feed plate cannot provide the claimed process with any inventive ingenuity.

7.8 For the following reasons the Board cannot accept the Appellant I's arguments designed for supporting inventive step.

7.8.1 The Appellant I submitted that the skilled person would have been deterred from locating the side stream above the feed plate, there being no pointers in document (6) to placing the side draw above, but rather strong pointers to placing it below the feed. More particularly, there was no teaching in document (6) that MTBE could be present in the distillation column

above the feed. On the contrary, since it was indicated at column 2, line 55 that the MTBE and oligomers were withdrawn as a bottoms product, and in claim 12 that a diisobutene fraction containing MTBE was recycled to the reactor, dimers/oligomers being heavy products, the skilled person, wishing to recycle a stream high in MTBE and containing some oligomers would have placed the side draw towards the bottom of the column, and thus, below the feed plate, in order to be sure of withdrawing an MTBE-containing stream.

However, there is no specific teaching in document (6) regarding the positioning of the side draw with respect to the feed plate, the lack of a specific positive teaching to place the side draw above the feed plate not being tantamount to a deterrent. Indeed such a teaching, had it been present, would have rendered said document novelty destroying for the presently claimed process. The skilled person thus takes the teaching of document (6) at face value, which means that he would have expected that all processes described specifically therein, as well as those processes falling within the general teaching thereof, would have been suitable for dimerising an olefin feedstock. Thus even if there had been a hint in another document discouraging the skilled person from positioning the side draw above the feed, the skilled person would still have expected all processes within the teaching of document (6), including that of positioning the side draw above the feed, to successfully dimerise an olefinic feedstock. Nothing was submitted by the Appellant I from which the Board could reasonably conclude that the skilled person has been deterred from following the straight teaching

of that document, such that the Appellant I's arguments do not convince the Board.

With regard to there being no teaching in document (6) that MTBE could be present in the distillation column above the feed, when assessing inventive step it is not necessary to establish that the success of an envisaged solution of a technical problem was predictable with certainty. In order to render a solution obvious it is sufficient to establish that the skilled person would have followed the teaching of the prior art with a reasonable expectation of success (see decisions T 249/88, point 8 of the reasons; T 1053/93, point 5.14 of the reasons; neither published in OJ EPO).

In the present case, the Board cannot agree with the Appellant I's argument that due to some purported uncertainty about the predictability of success, the skilled person would not have contemplated locating the side draw above the feed plate in order to merely provide an alternative process for dimerising olefin feedstocks, particularly when said alternative falls within the teaching of document (6). It was only necessary for him to confirm experimentally by routine work that placing the side draw above the feed plate in that process embodiment of document (6) outlined in point 4.1 above indeed resulted in a successful process for dimerising olefin feedstocks, thus arriving at the claimed invention without inventive ingenuity.

Finally, with regard to the alleged pointers toward placing the side draw below the feed, the two passages in document (6) referred to by the Appellant I, namely column 2, line 55 and claim 12, do not describe the

embodiment in this document which is the closest to the presently claimed process, namely that process described in point 4.1 above, wherein it is specified that the first distillation may be carried out with an intermediate draw stream in the distillation column which can be recycled to the oligomerisation reaction. In both passages referred to by the Appellant I, this first distillation is carried out without withdrawal and recycling of a side stream, such that any teaching which may be derived therefrom is not relevant to the closest prior art embodiment which is the starting point in the assessment of inventive step.

7.8.2 The Appellant I also submitted that although the skilled person could have adapted the process according to document (6) and thereby arrived at something falling within the terms of the claims, he would not necessarily have done so.

However, if the problem is merely the provision of an alternative process, the skilled person would modify the process according to document (6) in any way that he could, particularly, when, as in the present case, said modification lies within the general teaching of said document (see point 7.7.1 above).

7.8.3 Finally, the Appellant I submitted that the commercial success of the claimed process as witnessed by the significantly lower investment costs required therefor supported the presence of an inventive step.

However, according to established case law commercial success alone is not to be regarded as indicative of inventive step. Such secondary indicia are no

substitute for the assessment of inventive step *vis-à-vis* the state of the art on an objective basis following the "problem-solution approach". Secondary indicia represent auxiliary considerations for the assessment of inventive step and are only relevant in cases of doubt when the objective evaluation of the prior art has not provided a clear picture (see decisions T 24/81, OJ EPO 1983, 133, point 15 of the reasons; T 351/93, point 5.6 of the reasons; T 645/94, point 4.7 of the reasons; neither published in OJ EPO). In the present case, however, there are no doubts as to the absence of an inventive step, since the objective evaluation of the state of the art following the "problem-solution-approach" gives a clear picture, albeit a negative one (cf. points 7.1 to 7.7 above). In any case, it has not been shown that any purported economical advantages of the claimed process are causally linked to the distinguishing feature of the invention, namely the specific location of the side draw and for that reason too, this argument is not convincing.

- 7.9 For these reasons, the solution proposed in claim 1 to the problem underlying the patent in suit is obvious in the light of the prior art.
8. As a result, the Appellant's auxiliary request I is not allowable for lack of inventive step pursuant to Article 56 EPC.

Auxiliary request II

9. *Admissibility*

9.1 The auxiliary request II was filed very late in the oral proceedings before the Board. According to the Rules of Procedure of the Boards of Appeal (RPBA), any amendment to a party's case after it has filed its grounds of appeal may be admitted and considered at the Board's discretion and is not a matter as of right (Article 13(1) RPBA). For exercising due discretion in respect of the admission of such a late filed request, it is established case law of the Boards of Appeal that one crucial criterion is whether the amended claims of this request are clearly allowable (see for example T 153/85, OJ EPO 1988, 1, points 2.1 and 2.2 of the reasons), otherwise violating the principle of procedural economy.

9.2 Claim 1 of the auxiliary request II has been amended *vis-à-vis* claim 1 of auxiliary request I *inter alia* in that it is specified that said oxygenates are water and tertiary butanol formed in a reaction between water and isobutene. According to the Appellant I, said feature found a basis in claims 25 and 27, page 13, lines 4 to 7, together with Example 4 (page 26, lines 10 to 12) and Example 6 (page 29, lines 5 to 7) as originally filed.

However, claim 25 merely discloses that the oxygenate is water and claim 27 that the oxygenate is the alcohol formed in the reaction between the olefin and water. Thus, neither of these claims discloses the presence of oxygenates (in the plural), let alone that these are

simultaneously water and tertiary butanol. The passage on page 13, line 4ff relates merely to the nature of the oxygenate which is fed to the reactor, namely water, and describes the reaction thereof in the reactor, *inter alia* its reaction with isobutene to give tertiary butanol. Said passage is, however, silent with regard to the nature of the oxygenate to be recycled, such that this passage cannot provide a basis for the circulating back of a flow comprising water and tertiary butanol to the dimerisation. Finally, Examples 4 and 6 cannot provide a basis for the amendment, since, in the Board's judgement, the skilled person derives from these examples nothing more than the bare disclosure of the specific characteristics of these processes, Example 4 using the specific process configuration according to Figure 8 and Example 6 using mainly C₅-hydrocarbons as feedstock, whereas claim 1 of the auxiliary request II is primarily directed to the dimerisation of isobutene. Therefore, the original disclosure of two specific processes according to these two examples cannot support the generalisation indicated in claim 1.

As a consequence the fresh amendment to claim 1 results in the generation of subject-matter which does not clearly fulfil the requirements of Article 123(2) EPC.

- 9.3 Therefore, claim 1 is not clearly allowable with the consequence that in view of the very late state of the proceedings at which said request was filed, the Board exercises its discretion not to admit auxiliary request II into the proceedings for reasons of procedural economy (Article 13(1) RPBA).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

C. Rodríguez Rodríguez

R. Freimuth