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**Datasheet for the decision
of 10 December 2019**

Case Number: T 2246/16 - 3.3.10

Application Number: 06851350.6

Publication Number: 1924545

IPC: C07C51/42, C07C63/26

Language of the proceedings: EN

Title of invention:

A PROCESS TO ENRICH A CARBOXYLIC ACID COMPOSITION

Applicant:

GRUPO PETROTEMEX, S.A. DE C.V.

Headword:

PROCESS TO ENRICH A CARBOXYLIC ACID COMPOSITION/ Grupo
Petromex

Relevant legal provisions:

RPBA Art. 12(4), 13(3)

Keyword:

Late-filed requests - admitted (no)

Decisions cited:

Catchword:



Beschwerdekammern
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Case Number: T 2246/16 - 3.3.10

D E C I S I O N
of Technical Board of Appeal 3.3.10
of 10 December 2019

Appellant:
(Applicant)

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Decision under appeal:

**Decision of the Examining Division of the
European Patent Office posted on 6 May 2016
refusing European patent application No.
06851350.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman P. Gryczka
Members: J.-C. Schmid
F. Blumer

Summary of Facts and Submissions

- I. The appeal lies from the decision of the Examining Division refusing European patent application No. 06 851 350.6. Claim 1 of the sole pending request before the examining division reads as follows:

"1. A process of maximizing the concentration of by-products in terephthalic acid to the extent that the terephthalic acid remains useful in making poly(ethylene terephthalate) polymer and articles therefrom, such as a film, container or fiber, said terephthalic acid being obtained by oxidation of para-xylene in a primary oxidation zone (20), said process comprising:

contacting at least one stream selected from the group consisting of a cooled terephthalic acid composition (170), a crystallized terephthalic acid slurry composition (160), a terephthalic acid slurry composition (70), and a crude terephthalic acid composition (30); with an enrichment feed (220) in an enrichment zone (210) to form an enriched terephthalic acid composition (240); wherein said enrichment feed (220) comprises at least one compound selected from the group consisting of terephthalic acid, isophthalic acid, phthalic acid, benzene-tricarboxylic acid isomers, benzoic acid, hydroxy benzoic acid isomers, hydroxymethylbenzoic acid isomers, dicarboxybiphenyl isomers, dicarboxystilbene isomers, tricarboxybiphenyl isomers, tricarboxybenzophenone isomers, dicarboxybenzophenone isomers, dicarboxybenzil isomers, form-acethydroxybenzoic acid isomers, acet-hydroxymethylbenzoic acid isomers, a-bromotoluic acid isomers, bromo-benzoic acid, bromo-acetic acid, tolualdehyde isomers, benzyl alcohol isomers, methyl benzyl alcohol isomers, and phthaldehyde isomers;

wherein at least one of said compounds is enriched in said terephthalic acid composition (240)."

- II. With the statement of grounds of appeal dated 5 September 2016, the Appellant filed a new main request, whose claim 1 differed from claim 1 refused by the examining division only in that terephthalic acid was removed from the list of compounds comprised in the enrichment feed (220). The appellant furthermore filed two auxiliary requests.

Claim 1 of the first auxiliary request read as follows:

"1. A process to produce an enriched composition (240), said process comprising subjecting at least one stream (200) selected from the group consisting of a cooled terephthalic acid composition, a crystallized slurry composition, a slurry composition, and a crude therephthalic acid composition; and an enrichment feed (220) to an enrichment zone (210) to form said enriched composition (240); wherein said enrichment feed (220) comprises at least one compound selected from the group consisting of isophthalic acid, phthalic acid, benzene-tricarboxylic acid isomers, benzoic acid, hydroxy benzoic acid isomers, hydroxymethylbenzoic acid isomers, dicarboxybiphenyl isomers, dicarboxystilbene isomers, tricarboxybiphenyl isomers, tricarboxybenzophenone isomers, dicarboxybenzophenone isomers, dicarboxybenzil isomers, form-acethydroxybenzoic acid isomers, acet-hydroxymethylbenzoic acid isomers, a-bromotoluic acid isomers, bromo-benzoic acid, bromo-acetic acid, tolualdehyde isomers, benzyl alcohol isomers, methyl benzyl alcohol isomers, and phthaldehyde isomers; wherein at least one of said compounds is enriched,

wherein said enriched composition (200) is used to produce a dried terephthalic acid composition (280), and said dried terephthalic acid composition (280) comprises:

(1) carboxylic acid in an amount greater than 50 percent by weight, or greater than 60 percent by weight, or greater than 70 percent by weight, or greater than 80 percent by weight, or greater than 90 percent by weight, or greater than 95 percent by weight, or greater than 97 percent, or greater than 98 percent, or greater than 98.5 percent, or greater than 99 percent, or greater than 99.5 percent by weight; and optionally,

(2) (a) carboxybenzaldehyde (CBA) isomers in an amount ranging from 1 ppm to 1000 ppm, or ranging from 1 ppm to 500 ppm, or ranging from 1 ppm to 250 ppm, or ranging from 1 ppm to 125 ppm; or

(b) toluic acid (TA) isomers in an amount ranging from 1 ppm to 1000 ppm, or ranging from 1 ppm to 500 ppm, or ranging from 1 ppm to 250 ppm, or ranging from 1 ppm to 125 ppm; or

(c) both of the following:

(i) carboxybenzaldehyde isomers in an amount ranging from 1 ppm to 1000 ppm, or ranging from 1 ppm to 500 ppm, or ranging from 1 ppm to 250 ppm or ranging from 1 ppm to 125 ppm;

(ii) toluic acid isomers in an amount ranging from 1 ppm to 500 ppm, or ranging from 1 ppm to 250 ppm, or ranging from 1 ppm to 125 ppm;

wherein the total concentration of carboxybenzaldehyde and toluic acid isomers ranges from 1 ppm to 2000 ppm, 1 ppm to 1000 ppm, or from 1 ppm to 500 ppm, or from 1 ppm to 250 ppm, or from 1 ppm to 125 ppm;

and

(3) at least one, or at least two, or at least three, or at least four, or at least five, or at least six, or at least seven, or at least eight, or at least nine, or at least ten, or at least eleven, or at least twelve, or at least thirteen, or at least fourteen, or at least fifteen, or at least sixteen, or at least seventeen, or at least eighteen, or all of the following:

- (a) isophthalic acid in an amount at least 50 ppm, or ranging from 50 ppm to 2000 ppm, or ranging from 75 ppm to 1500 ppm, or ranging from 100 ppm to 1000 ppm, or ranging from 150 ppm to 500 ppm;
- (b) phthalic acid in an amount of at least 20 ppm, or at least 50 ppm, or at least 100 ppm, or ranging from 20 ppm to 1000 ppm, or ranging from 50 ppm to 750 ppm, or ranging from 100 ppm to 500 ppm;
- (c) benzene-tricarboxylic acid isomers in an amount of at least 125 ppm, or ranging from 125 ppm to 1000 ppm, or ranging from 150 ppm to 750 ppm, or ranging from 175 ppm to 500 ppm;
- (d) benzoic acid in an amount of at least 50 ppm, or at least 75 ppm, or at least 100 ppm; or ranging from 50 ppm to 500 ppm, or ranging from 75 ppm to 400 ppm, or ranging from 100 ppm to 300 ppm;
- (e) hydroxybenzoic acid isomers in an amount of at least 3 ppm, at least 5 ppm, or at least 20 ppm, or ranging from 3 ppm to 200 ppm, or ranging from 5 ppm to 175 ppm, or ranging from 20 ppm to 150 ppm;
- (f) hydroxymethylbenzoic acid isomers in an amount of at least 40 ppm, or at least 80 ppm, or at least 100 ppm, or ranging from 40 ppm to 200

- ppm, or ranging from 80 ppm to 180, or ranging from 100 ppm to 160 ppm;
- (g) dicarboxybiphenyl isomers in an amount ranging from 20 ppm to 150 ppm, or ranging from 25 ppm to 100 ppm, or ranging from 25 ppm to 75 ppm;
 - (h) dicarboxystilbene isomers in an amount ranging from greater than 7 ppm; or greater than 10 ppm;
 - (i) tricarboxybiphenyl isomers in an amount ranging from 8 ppm to 100 ppm, or ranging from 9 ppm to 50 ppm, or ranging from 10 ppm to 25 ppm;
 - (j) tricarboxybenzophenone isomers in an amount ranging from 5 ppm to 100 ppm, or ranging from 6 ppm to 75 ppm, or ranging from 7 ppm to 60 ppm;
 - (k) dicarboxybenzophenone isomers in an amount ranging from 10 ppm to 150 ppm, or ranging from 12 ppm to 100 ppm, or ranging from 15 ppm to 75 ppm;
 - (l) dicarboxybenzil isomers in an amount ranging from 1 ppm to 30 ppm, or ranging from 2 ppm to 20 ppm, or ranging from 3 ppm to 10 ppm;
 - (m) form-acet-hydroxybenzoic acid isomers in an amount ranging from 1 ppm to 20 ppm, or ranging from 2 ppm to 15 ppm, or ranging from 3 ppm to 10 ppm;
 - (n) acet-hydroxymethylbenzoic acid isomers in an amount ranging from 1 ppm to 30 ppm, or ranging from 2 ppm to 20 ppm, or ranging from 3 ppm to 15 ppm;
 - (o) a-bromo-toluic acid isomers in an amount ranging from 1 ppm to 100 ppm, or ranging from 2 ppm to 50 ppm, or ranging from 5 ppm to 25 ppm; (
 - (p) bromo-benzoic acid in an amount ranging from 5 ppm to 50 ppm, or ranging from 10 ppm to 40 ppm, or ranging from 15 ppm to 35 ppm;
 - (q) bromo-acetic acid in an amount ranging from 1 ppm to 10 ppm;

- (r) *tolualdehyde isomers in an amount ranging from 7 ppm to 50 ppm, or ranging from 8 ppm to 25 ppm, or ranging from 9 ppm to 20 ppm;*
- (s) *phthaldehyde isomers in an amount ranging from 0.25 ppm to 10 ppm, or ranging from 0.5 ppm to 5 ppm, or ranging from 0.75 ppm to 2 ppm;*
wherein the compound or compounds selected in (3) are different than the compound or compounds selected in (1) and (2);
and optionally,

(4) *at least one, or at least two, or at least three, or at least four, or at least five or at least six, or at least seven, or all of the following:*

- (a) *isophthalic acid in an amount of at least 1 ppm, or ranging from 1 ppm to 5000 ppm, or ranging from 5 ppm to 2500 ppm, or ranging from 10 ppm to 2000 ppm, or ranging from 15 ppm to 1000 ppm, or ranging from 20 ppm to 500 ppm;*
- (b) *phthalic acid in an amount of at least 1 ppm, or ranging from 1 ppm to 3000 ppm, or ranging from 2 ppm to 2000 ppm, or ranging from 3 ppm to 1000 ppm, or ranging from 4 ppm to 500 ppm;*
- (c) *benzene-tricarboxylic acid isomers in an amount of at least 1 ppm, or ranging from 1 ppm to 3000 ppm, or ranging from 5 ppm to 2000 ppm, or ranging from 10 ppm to 1000 ppm, or ranging from 20 ppm to 500 ppm;*
- (d) *benzoic acid in an amount of at least 1 ppm, or ranging from 1 ppm to 3000 ppm, or ranging from 5 ppm to 2000 ppm, or ranging from 10 ppm to 1000 ppm, or ranging from 20 ppm to 500 ppm;*
- (e) *hydroxybenzoic acid isomers in an amount of at least 1 ppm, or ranging from 1 ppm to 500 ppm, or ranging from 5 ppm to 400 ppm, or ranging from 10 ppm to 200 ppm;*

- (f) *hydroxymethylbenzoic acid isomers in an amount of at least 1 ppm, or ranging from 1 ppm to 500 ppm, or ranging from 5 ppm to 400 ppm, or ranging from 10 ppm to 200 ppm;*
- (g) *dicarboxybiphenyl isomers in an amount of at least 1 ppm, or ranging from 1 ppm to 500 ppm, or ranging from 5 ppm to 400 ppm, or ranging from 10 ppm to 200 ppm;*

wherein the compound or compounds selected in (4) are different than the compound or compounds selected in (3)."

Claim 1 of auxiliary request 2 differed from claim 1 of auxiliary request 1 in that the wording "and wherein at least three compounds are enriched" was added at the end of the claim.

- III. With a communication accompanying the summons dated 19 December 2018, the Board informed the applicant that claim 1 of auxiliary requests 1 and 2 did not meet the requirement of conciseness (Article 84 EPC) and that its subject-matter lacked an inventive step.
- IV. With a letter dated 4 November 2019, the Appellant withdrew the main request and auxiliary requests 1 and 2 and filed a new main request.

Claim 1 of the new main request reads as follows:

"1. A process to produce an enriched terephthalic acid composition (240), the process comprising steps (a) to (i):

- (a) *oxidizing an aromatic feedstock (10) in a primary oxidation zone (20) to form a crude terephthalic acid composition (30), wherein the*

- aromatic feedstock comprises at least one oxidizable compound, at least one solvent, and at least one catalyst; wherein the oxidizable compound is para-xylene; the at least one solvent comprises acetic acid; and the catalyst comprises cobalt, bromine, and manganese;*
- (b) optionally removing at least a portion of oxidation by-products from said crude terephthalic acid composition (30) in a liquid displacement zone (40) to form a slurry composition (70);*
 - (c) optionally oxidizing the slurry composition (70) or the crude terephthalic acid composition (30) in a staged oxidation zone (80) to form a staged oxidation composition (110);*
 - (d) optionally crystallizing the slurry composition (70) or the crude terephthalic acid composition (30) or the staged oxidation composition (110) in a crystallization zone (120) to form a crystallized slurry composition (160);*
 - (e) optionally cooling the crystallized slurry composition (160) or the staged oxidation composition (110) or the slurry composition (70) or the crude terephthalic acid composition (30) in a cooling zone to form a cooled carboxylic acid composition (170);*
 - (f) contacting the cooled terephthalic acid composition (170) or the crystallized slurry composition (160) or the staged oxidation composition (110) or the slurry composition (70) or the crude terephthalic acid composition (30) with a wash feed (175) and optionally an enrichment feed (220) in a catalyst removal zone (180) to form a catalyst rich liquor (185) comprising solvent, catalyst and oxidation by-product(s), a wash liquor stream (62), an*

optional depleted enrichment liquor stream (230), and a post catalyst removal composition (200);

- (g) *contacting the post catalyst removal composition (200) with an enrichment feed (220) in an enrichment zone (210) to form a depleted enrichment stream (230) and an enriched terephthalic acid composition (240), wherein the enriched terephthalic acid composition (240) comprises one or more compounds selected from the group consisting of isophthalic acid, phthalic acid, trimellitic acid, hydroxymethylbenzoic acid isomers, hydroxybenzoic acid isomers, benzoic acid, and toluic acid isomers and wherein at least one of the compounds is enriched above the concentration of the post catalyst removal composition (200); or the enriched terephthalic acid composition (240) comprises one or more compounds selected from the group consisting of 4-hydroxy benzoic acid, 4-hydroxymethylbenzoic acid, 4,4'-dicarboxybiphenyl, 2,6-dicarboxyanthraquinone, 4,4'-dicarboxystilbene, 2,5,4'-tricarboxybiphenyl, 2,5,4'-tricarboxybenzophenone, 4,4'-dicarboxybenzophenone, 4,4'-dicarboxybenzil, form-acet-hydroxybenzoic acid, acethydroxymethylbenzoic acid, a-bromo-p-toluic acid, bromo-benzoic acid, bromo-acetic acid, p-tolualdehyde and terephthaldehyde;*
- (h) *optionally dewatering the enriched terephthalic acid composition (240) in a dewatering zone (250) to form a dewatered post catalyst removal composition (260);*

(i) *filtering and optionally drying the enriched terephthalic acid composition (240) or the dewatered post catalyst removal composition (260) in a filtration and drying zone (270) to remove a portion of the solvent from the enriched terephthalic acid composition (240) or the dewatered post catalyst removal composition (260) to produce a dried terephthalic acid composition (280);*

wherein at least a portion of the catalyst rich liquor (185) obtained in step (f) is fed to a cooling and/or concentration zone (300) to generate a concentrated mother liquor stream (310) and a solvent stream (311), wherein a portion of the concentrated mother liquor stream (310) and an extraction solvent stream (323) is fed to an extraction zone (320) to generate a catalyst rich stream (324) and a catalyst depleted stream (350), wherein the balance of the concentrated mother liquor stream (310) and a wash stream (331) is fed to a solid-liquid separation zone (330) generating a wet cake stream (340) and a wash liquor stream (332), comprising mother liquor and wash liquor, wherein the wet cake stream (340) is used as enrichment feed (220)."

V. With a letter dated 9 December 2019, the appellant filed auxiliary requests 1 and 2.

Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that the optional steps are removed from the process.

Claim 1 of auxiliary request 2 differs from claim 1 of the main request in that the optional steps are compulsory and a portion of the wet cake stream (340)

is sent to the product filler or product dryer to enrich the product stream with at least a portion of the contents of the wet cake stream (340).

VI. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the new main request filed with the letter dated 4 November 2019 or, subsidiarily, on the basis of auxiliary requests 1 and 2, both filed with the letter dated 9 December 2019.

VII. At the end of the oral proceedings held on 10 December 2019, the decision of the Board was announced.

Reasons for the Decision

1. The appeal is admissible.
2. According to Article 12(4) RPBA 2007, the Board has the discretion to hold inadmissible requests filed during appeal proceedings which could have been presented in the first instance proceedings.
3. Claim 1 of the then pending main request submitted with the statement of the grounds of appeal was identical to claim 1 refused by the examining division, except for one amendment relating to the removal of terephthalic acid. This amendment had already been discussed before the examining division, but was considered not to be sufficient to overcome the reasons to refuse the application (see applicant's statement of the grounds of appeal, page 1, last paragraph).
4. Therefore, the appellant was well aware of the objections against the claims of the main request filed with the statement of the grounds of appeal from the

examining proceedings. The Appellant did not file other requests before the examining division to overcome these outstanding objections, but instead requested a decision on the basis of these claims (see the letter dated 6 April 2016).

5. In appeal proceedings, the appellant is primarily expected to defend the grant of the patent on the basis of the claims on which it had requested a decision from the first instance, unless there are compelling reasons not to do so.

On 4 November 2019, however, the appellant withdrew the requests filed with the statement of the grounds of appeal and filed a new main request. Claim 1 of the new main request relates to a process to produce an enriched terephthalic acid composition. It is characterized *inter alia* by comprising process-steps (a) to (i). Steps (a) to (i) are features taken from the description of the application as filed (see the applicant's letter of 4 November 2019, page 2). Claim 1 of the then pending main request filed with the statement of grounds of appeal was directed to a process of maximizing the concentration of by-product to the extent that the terephthalic acid remains useful in making poly(ethylene terephthalate) polymer.

Thus, the subject-matter of claim 1 of the new main request is far remote from that of claim 1 of the main request filed with the statement of grounds of appeal and from claim 1 refused by the examining division.

The Appellant did not give any good reasons why it had awaited the stage of the appeal proceedings to remedy the examining division's objections by filing fundamentally different amended claims. If the Board

were to admit the main request into the appeal proceedings, this would run counter to the main purpose of appeal proceedings which is primarily to examine the correctness of the first instance decision. It would also substantially lengthen the proceedings and thus be contrary to procedural efficiency.

6. Under the present circumstances, the Board decided not to admit the main request into the appeal proceedings (Article 12(4) RPBA) 2007).

For the same reasons, the auxiliary requests filed on 9 December 2019, which are derived from the main request by removing or making compulsory optional steps of the process of claim 1 of the main request are not admitted into the appeal proceedings.

7. According to Article 13(1) RPBA 2007 any amendment to a appellant's case after it has filed the statement of the grounds of appeal may be admitted and considered at the Board's discretion, which should be exercised in view of the current state of the proceedings and the need for procedural economy. Furthermore, for requests filed after oral proceedings have been arranged, Article 13(3) RPBA 2007 also applies. Such requests shall not be admitted if they cannot be easily and promptly assessed as to their patentability by the board.

8. With the communication dated 19 December 2018 accompanying the summons for oral proceedings to be held on 10 December 2019, the Board informed the appellant that the claims of the auxiliary requests filed with the statement of the grounds of appeal did not meet the requirement of Article 84 EPC and 56 EPC.

9. In response to this communication of 19 December 2018, the appellant filed on 4 November 2019 a new main request and on 9 December 2019 two auxiliary requests. Oral proceedings were held on 10 December 2019.

The main request was filed one month before the oral proceedings before the Board. Auxiliary requests 1 and 2 were filed one day before the oral proceedings. The admission of these late-filed requests is therefore a matter for the Board's discretion which should be exercised in view of the current state of the proceedings and the need for procedural economy (Article 13(1) RPBA 2007). Furthermore, these requests were filed after oral proceedings have been arranged, so that Article 13(3) RPBA 2007 also applies.

The appellant was well aware of the objection against claim 1 of the main request filed with the grounds of appeal and from the reasons for refusing the application in the decision under appeal. It was also aware of the objections of the Board as regards the then pending auxiliary requests filed with the statement of the grounds of appeal about a year before the date of the oral proceedings.

The Board deems that the new main request filed about one month before the oral proceedings and auxiliary requests 1 and 2 filed only one day before the oral proceeding raises patentability issues which the Board cannot be reasonably expected to deal with at this very late stage of the proceedings.

10. Under these circumstances, these requests cannot be admitted under Article 13(3) RPBA 2007.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



C. Rodríguez Rodríguez

P. Gryczka

Decision electronically authenticated