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**Datasheet for the decision
of 7 November 2019**

Case Number: T 1248/17 - 3.3.06

Application Number: 05108718.7

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IPC: B01J20/26, G01N5/00, A61L15/60,
A61F13/15, C08F20/00

Language of the proceedings: EN

Title of invention:

Water-absorbing agent, its production process and use

Applicant:

NIPPON SHOKUBAI CO., LTD.

Headword:

Water-absorbing agent / NIPPON SHOKUBAI

Relevant legal provisions:

EPC Art. 84, 123(2)

Keyword:

Amendments - extension beyond the content of the application
as filed (yes) - clarity (no) - all requests

Decisions cited:

Catchword:



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Case Number: T 1248/17 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 7 November 2019

Appellant: NIPPON SHOKUBAI CO., LTD.
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 20 December
2016 refusing European patent application No.
05108718.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman J.-M. Schwaller
Members: G. Santavicca
C. Brandt

Summary of Facts and Submissions

- I. This appeal lies from the decision of the Examining Division to refuse European patent application No. 05 108 718.7 on the grounds that the sole request then on file did not meet the requirements of Articles 123(2), 84, 83 and 56 EPC.

Claims 1, 8 and 9 of this request (**main request** in these appeal proceedings) read as follows:

"1. A process for producing a water-absorbing agent comprising the steps of:

- a) polymerising and crosslinking monomers of which main component is acrylic acid and/or a salt (neutralized product) thereof in the presence of an internal-crosslinking agent having 2 or more polymerisable unsaturated groups or 2 or more reactive groups per molecule to obtain a water-absorbent resin having a carboxyl group; and*
- b) uniformly mixing an ion-blocking agent and a surface-crosslinking agent which is reactable upon a carboxyl group, with the water-absorbent resin having a carboxyl group and surface-crosslinking the water-absorbent resin to obtain a surface-crosslinked water-absorbent resin;*

wherein the amount of the ion-blocking agent is 0.0001 to 10 parts by weight based on 100 parts by weight of the solid content of the water-absorbing resin, wherein the ion-blocking agent is at least one member selected from the group consisting of diethylenetriaminepentaacetate, triethylenetetraaminehexaacetate, cyclohexane-1,2-diaminetetraacetate, N-hydroxy-ethylethylenediaminetriacetate, and their salts."

"8. A water-absorbing agent obtained by the process according to any one of claims 1 to 7."

"9. The water-absorbing agent according to claim 8, having a substantial absorption capacity (2) of 20 (g/g) or more under a load in accordance with the measurement described herein."

II. According to the contested decision, the parameter "substantial absorption capacity (2) under load" as defined in claim 9 was always disclosed in combination with another parameter, namely the "substantial absorption capacity under no load", in the application as filed. Furthermore this parameter was measured with a particular and unusual method not defined in claim 9, so that the requirements of Articles 123(2) and 84 EPC were not met for this claim.

III. With its grounds of appeal dated 27 April 2017, the appellant requested to set aside the decision and to grant a patent on the basis of the claims underlying the decision (main request) or alternatively, on the basis of one of auxiliary requests 1 to 15 enclosed with said statement. Auxiliarily, it requested oral proceedings.

Auxiliary requests 1 to 12 include the same claims 8 and 9 as the main request.

Claim 1 of **auxiliary request 13** reads (amendments with respect to claim 1 of the main request made apparent by the board):

"1. A process for producing a water-absorbing agent comprising the steps of:

a) polymerising and crosslinking monomers of which main component is acrylic acid and/or a salt (neutralized product) thereof in the presence of an internal-crosslinking agent having 2 or more polymerisable unsaturated groups or 2 or more reactive groups per molecule to obtain a water-absorbent resin having a carboxyl group; and

b) uniformly mixing in a mixing apparatus selected from the group consisting of double-wall cone type mixers, high-speed agitation type mixers, V-character-shaped mixers, ribbon type mixers, screw type mixers, fluidized-furnace rotary disk type mixers, gas current type mixers, rotary mixers, and screw type extruders, an ion-blocking agent and a surface-crosslinking agent which is reactable upon a carboxyl group, with the water-absorbent resin having a carboxyl group in such a way that the ion-blocking agent is put in the neighborhood of the surface of the water-absorbent resin and surface-crosslinking the water-absorbent resin by further carrying out a heat treatment to obtain a surface-crosslinked water-absorbent resin;
wherein the amount of the ion-blocking agent is 0.0001 to 10 parts by weight based on 100 parts by weight of the solid content of the water-absorbing resin, wherein the ion-blocking agent is at least one member selected from the group consisting of diethylenetriaminepentaacetate, triethylenetetraaminehexaacetate, cyclohexane-1,2-diaminetetraacetate, ~~N-hydroxy ethylethylenediaminetriacetate,~~ and their salts."

Claim 1 of **auxiliary request 14** reads (amendments with respect to claim 1 of the main request made apparent by the board):

"1. A process for producing a water-absorbing agent comprising the steps of:

a) polymerising and crosslinking monomers of which main component is acrylic acid and/or a salt (neutralized product) thereof in the presence of an internal-crosslinking agent having 2 or more polymerisable unsaturated groups or 2 or more reactive groups per molecule to obtain a water-absorbent resin having a carboxyl group; and

b) uniformly mixing in a mixing apparatus selected from the group consisting of double-wall cone type mixers, high-speed agitation type mixers, V-character-shaped mixers, ribbon type mixers, screw type mixers, fluidized-furnace rotary disk type mixers, gas current type mixers, rotary mixers, and screw type extruders, an aqueous solution comprising an ion-blocking agent and a surface-crosslinking agent which is reactable upon a carboxyl group, with the water-absorbent resin having a carboxyl group and then spraying and dropping a surface-crosslinking agent which is reactable upon a carboxyl group, including water and/or a hydrophilic organic agent, to the resultant mixture and surface-crosslinking the water-absorbent resin by further carrying out a heat treatment to obtain a surface-crosslinked water-absorbent resin;

wherein the amount of the ion-blocking agent is 0.0001 to 10 parts by weight based on 100 parts by weight of the solid content of the water-absorbing resin, wherein the ion-blocking agent is at least one member selected from the group consisting of diethylenetriaminepentaacetate, triethylenetetraaminehexaacetate, cyclohexane-1,2-diaminetetraacetate, ~~N-hydroxy-ethylethylenediaminetriacetate~~, and their salts."

Claim 1 of **auxiliary request 15** reads (amendments made with respect to claim 1 of the main request made apparent by the board):

"1. A process for producing a water-absorbing agent comprising the steps of:

a) polymerising and crosslinking monomers of which main component is acrylic acid and/or a salt (neutralized product) thereof in the presence of an internal-crosslinking agent having 2 or more polymerisable unsaturated groups or 2 or more reactive groups per molecule to obtain a water-absorbent resin having a carboxyl group; and

b) uniformly mixing an ion-blocking agent and in a mixing apparatus selected from the group consisting of double-wall cone type mixers, high-speed agitation type mixers, V-character-shaped mixers, ribbon type mixers, screw type mixers, fluidized-furnace rotary disk type mixers, gas current type mixers, rotary mixers, and screw type extruders, a surface-crosslinking agent which is reactable upon a carboxyl group, including water and/or a hydrophilic organic solvent with the water-absorbent resin having a carboxyl group and then mixing the resultant mixture with an ion-blocking agent or its aqueous solution and surface-crosslinking the water-absorbent resin by further carrying out a heat treatment to obtain a surface-crosslinked water-absorbent resin;

wherein the amount of the ion-blocking agent is 0.0001 to 10 parts by weight based on 100 parts by weight of the solid content of the water-absorbing resin, wherein the ion-blocking agent is at least one member selected from the group consisting of diethylenetriaminepentaacetate, triethylenetetraaminehexaacetate, cyclohexane-1,2-diaminetetraacetate, ~~N-hydroxy-ethylethylenediaminetriacetate,~~ and their salts."

The wording of **claim 8 of auxiliary requests 13 to 15** is identical with that of claim 8 of the main request.

Claim 9 of each of auxiliary requests 13 to 15 reads as follows (amendments made apparent by the Board):

"9. The water-absorbing agent according to claim 8, having a substantial absorption capacity (2) of 20 (g/g) or more under a load in accordance with the measurement described herein **and an absorption capacity of 30 (g/g) or more under no load in accordance with the measurement described herein.**"

- IV. In response to the summons to oral proceedings, the appellant withdrew its request for oral proceedings and requested the board to come to a decision based on its written arguments.

Reasons for the Decision

1. Main request - Article 123(2) EPC
 - 1.1 The Board sees no reason to deviate from the finding in the decision under appeal (reasons, 1) that claim 9 according to the main request does not comply with the requirement of Article 123(2) EPC, in particular because its subject-matter was not directly and unambiguously disclosed on page 25, lines 19-26 of the application as filed, as invoked by the appellant.
 - 1.2 For the Board, the main request is further objectionable under Article 123(2) EPC because there is no basis for the product per se as it is presently defined in "product-by process" claim 9.

1.2.1 For the Board, the sole basis in the application as filed for a product-by-process is claim 5. However, the process defined in the latter requires that the ion-blocking agent be mixed with the already crosslinked resin, while according to claim 9 at issue (itself dependent on claim 8) the ion-blocking agent is mixed with the resin before its crosslinking, so that the process for preparing the product according to claim 8 or 9 is different from the one leading to the product according to claim 5 as originally filed.

As there is no direct and unambiguous disclosure in the application as filed that the product obtained by the process defined in claim 5 is identical with the one obtained with the process according to either of claim 8 or 9, claim 5 as filed cannot be the basis for the subject-matter of claim 8 or 9 at issue.

1.2.2 It is furthermore noted that the application as filed discloses a multitude of passages (in particular at page 8, lines 1 to 10; page 11, lines 1 to 6; page 13, lines 23-26; page 14, line 25-27; page 16, line 1-3, page 17, lines 2-5 and 18-21, page 18, lines 1-3; page 20, lines 22-25; page 21, lines 11-14; etc.) in which the product of the invention is characterised by **two parameters**, namely:

- (a) an absorption capacity under no load of 30 (g/g) or more, **and** either
 - (i) a static deterioration absorption capacity of 20 (g/g) or more under a load,
 - (ii) a dynamic deterioration absorption capacity of 20 (g/g) or more under a load,
 - (iii) a deterioration absorption index under load of 20 (g/g) or more under a load, or
 - (iv) a substantial absorption capacity of 20 (g/g) or more under load,

and so, as concluded by the examining division in the contested decision (reasons, 1), there is no basis in the application as filed for the product per se defined in claim 9 at issue, which is characterised by only one of these parameters.

1.2.3 The appellant argued that the above conclusions were wrong because the application as filed disclosed in the passage from page 23, line 7 to page 24, line 15 that the inventors had found that the parameter "substantial absorption capacity under a load" was an excellent parameter for characterising the absorption ability of a water-absorbent resin in practical use. Furthermore there was no teaching in said passage that a water-absorbing agent showing a substantial absorption capacity under load necessarily also had to be characterised by the additional parameter "substantial absorption capacity under no load".

1.2.4 For the board the missing teaching in said passage of the parameter "substantial absorption capacity under no load" does not mean that the latter parameter is not essential for the performance of the invention. On the contrary, as indicated in point 1.2.2 above, the parameter "substantial absorption capacity under no load" is always cited in combination with another essential parameter, namely the one defined in claim 1 at issue. The application as filed even emphasises that "where the absorption capacity under no load is less than 30 (g/g), the absorption capabilities are **insufficient**" (see in particular page 24 (the one quoted above by the appellant), lines 23 and 24; page 13, lines 26-27; page 15, lines 1 and 2; page 16, lines 3 and 4, and so on), which directly and unambiguously means for the skilled person that this feature is inextricably linked to the product of the invention (as

defined e.g. in claim 9), and thus this parameter cannot be omitted from the claimed subject-matter without infringing the requirements of Article 123(2) EPC.

2. Auxiliary requests 1 to 12 - Article 123(2) EPC

As all of these requests include the same claims 8 and 9 as the main request, the reasons given for the latter likewise apply likewise to these requests, which therefore are not allowable under Article 123(2) EPC either.

3. Auxiliary request 13 - Amendments (Article 123(2) EPC)

3.1 Claim 9 of this request has the following wording (amendments made apparent by the Board):

*"9. The water-absorbing agent according to claim 8, having a substantial absorption capacity (2) of 20 (g/g) or more under a load in accordance with the measurement described herein - **and an absorption capacity of 30 (g/g) or more under no load in accordance with the measurement described herein.**"*

It thus includes the parameter objected to above as missing, and so this claim is no longer objectionable under Article 123(2) EPC.

3.2 However, in view of the still present feature "**with the measurement described herein**", the Board sees no reason to deviate from the finding of lack of clarity in the decision under appeal (reasons, 2a).

3.3 Moreover, the objection previously raised under Article 123(2) EPC against claim 9 applies similarly to **claim 8**

of this request, which defines a product-by-process without any of its physical parameters.

However, as explained in point 1.2.1 above, the sole "product-by-process" claim disclosed in the application as filed, namely claim 5, cannot serve as a basis for the product-by-process claim 8, since the two parameters defined as inextricably linked to the product of the invention - as taught in the passages cited in point 1.2.2 above - are missing from the definition of the product given in claim 8 at issue. This is contrary to the requirements of Article 123(2) EPC, since claim 8 at issue defines a product which is not directly and unambiguously disclosed as such in the application as filed, and so also for this reason auxiliary request 13 is not allowable.

3.4 For the sake of completeness, the board further holds claim 1 of this request also to infringe Article 123(2) EPC because the amendment that the "mixing apparatus [is] selected from the group consisting of double-wall cone type mixers, high-speed agitation type mixers, V-character-shaped mixers, ribbon type mixers, screw type mixers, fluidized-furnace rotary disk type mixers, gas current type mixers, rotary mixers, and screw type extruders" is, as such, not directly and unambiguously disclosed in the application as filed.

3.4.1 Indeed, the individual apparatuses defined in claim 1 at issue can be found in the passage at page 41, lines 5 to 12 of the application as filed, however among a list of apparatuses which is more exhaustive as the one defined in claim 1 at issue, since it **further** includes internal mixers, pulverizing type kneaders, and double-arm type kneaders, with the **double-arm type kneader being the one which is explicitly used in examples 1**

and 2 for preparing the product of the invention

disclosed in the application as originally filed, and so the most preferred among the mixers disclosed in this passage.

- 3.4.2 There is however no basis in the application as filed for the exclusion from the claimed subject-matter of this particularly preferred type of mixer, with the consequence that the subject-matter of claim 1 of this request does not derive directly and unambiguously from the application as filed.
4. Auxiliary requests 14 and 15 - Allowability of the amendments
 - 4.1 As claim 9 according to each of these requests still includes the feature "**with the measurement described herein**", the Board sees no reason to deviate from the finding of lack of clarity in the decision under appeal (reasons, 2a).
 - 4.2 Moreover, as the respective claim 1 of these requests includes the same list of mixing apparatuses and as these requests include the same claim 8 as auxiliary request 13, the non-compliance with Article 123(2) EPC reasons apply likewise to these requests, which are therefore not allowable under Article 123(2) either.
5. As none of the sets of claims underlying the maintained claim requests meets the requirements of the EPC, the decision to reject the application must be confirmed, and the appeal cannot succeed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Pinna

J.-M. Schwaller

Decision electronically authenticated