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D E C I S I O N
of 21 October 2003

Case Number: T 0360/01 - 3.3.3

Application Number: 93301665.1

Publication Number: 0559476

IPC: C08F 220/04

Language of the proceedings: EN

Title of invention:
Method for the production of absorbent resin

Patentee:
NIPPON SHOKUBAI CO., LTD.

Opponent:
Stockhausen GmbH & Co. KG

Headword:
-

Relevant legal provisions:
EPC Art. 54, 84, 111(1), 114(1), 114(2), 123(2), 123(3)
EPC R. 57a

Keyword:
"Main request - novelty (yes)"

Decisions cited:
T 0572/88, T 0279/89, T 0666/89, T 0355/99

Catchword:
-

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Case Number: T 0360/01 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 21 October 2003

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 5 February 2001 revoking European patent No. 0559476 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: R. Young
Members: C. Idez
R. Moufang

Summary of Facts and Submissions

I. The grant of the European patent No. 0 559 476 in the name of Nippon Shokubai Co., Ltd. in respect of European patent application No. 93 301 665.1, filed on 4 March 1993 and claiming priority of the JP patent application No. 48321/92 filed on 5 March 1992 was announced on 16 July 1997 (Bulletin 1997/29) on the basis of 11 claims.

Independent Claim 1 read as follows:

"A method for producing an absorbent resin by polymerizing a water-soluble monoethylenically unsaturated monomer in the presence of a cross-linking agent and heat-treating the resultant polymer, which method of production is characterized by the fact that said cross-linking agent is a cross-linking agent possessing at least two polymerizable unsaturated groups and further possessing between said two polymerizable unsaturated groups at least one unit represented by the formula I:

$$-(-CH_2CH_2OR^1O-)- \quad (I)$$

wherein R^1 is an alkylene group of 2 to 4 carbon atoms, said cross-linking agent is used in a proportion in the range of from 0,01 to 0,3 mol% based on the amount of said water-soluble monoethylenically unsaturated monomer, and the heat treatment is carried out at a temperature in the range of from 160°C to 230°C."

Claims 2 to 11 were dependent claims.

II. On 11 April 1998, a Notice of Opposition was filed by Stockhausen GmbH & Co. KG, in which revocation of the patent in its entirety was requested on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC).

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

G2: EP-A-0 372 981; and

G9: US-A-4 286 082.

III. By a decision announced orally on 18 January 2001 and issued in writing on 5 February 2001, the Opposition Division revoked the patent.

IV. The decision of the Opposition Division was based on Claims 1 to 10 as submitted with letter dated 24 September 1998.

Independent Claim 1 read as follows:

"A method for producing an absorbent resin by polymerizing a water-soluble monoethylenically unsaturated monomer in the presence of cross-linking agent and heat-treating the resultant polymer, which method of production is characterized by the fact that said cross-linking agent is a cross-linking agent possessing at least two polymerizable unsaturated groups and further possessing between said two polymerizable unsaturated groups at least one unit represented by the formula I:

$$-(-CH_2CH_2OR^1O-)- \quad (I)$$

wherein R^1 is an alkylene group of 2 to 4 carbon atoms, said cross-linking agent is used in a proportion in the range of from 0,01 to 0,3 mol% based on the amount of said water-soluble monoethylenically unsaturated monomer, and the heat treatment is carried out in the presence of another cross-linking agent possessing at least two reacting groups capable of reacting with the functional group possessed by said polymer at a temperature in the range of from 160°C to 230°C."

Claims 2 to 10 were dependent claims.

The Opposition Division revoked the patent on the grounds that Claim 1 lacked novelty in view of document G2.

According to the decision, the general description of document G2 disclosed all the features of Claim 1, i.e. the compounds used as first crosslinking agent, temperature range of 40°C to 250°C, preferably 90°C to 220°C for the heat-treatment in presence of the second crosslinking agent.

Examples 16 and 17 of G2, although not disclosing the entire combination of features according to the contested patent, were particularly relevant for the novelty of the claimed subject-matter. Example 16 disclosed all the features of the method according to Claim 1, except that the temperature of 130°C for the heat treatment was outside the claimed range of 160°C to 230°C.

According to the decision, the temperature range of 160°C to 230°C did not represent a selection out of a broad range since the selected range was not narrow and not sufficiently removed from the preferred part of the range known in G2. Furthermore, having regard to the fact that in Example 17 the heat treatment was carried out at a temperature of 200°C in presence of glycerine which was the cross-linking agent used at a temperature of 180 °C in the only example (Example 6) falling under the scope of Claim 1 of the patent in suit, and to the fact that G2 indicated that the temperature of the heat treatment was dependent on the cross-linking agent used, the person skilled in the art would have seriously contemplated using the temperature for the heat treatment in the range of overlap. Reference was made to the decisions T 666/89 (OJ EPO 1993, 495) and T 279/89 of 3 July 1991 (not published in OJ EPO).

Thus, the Opposition Division came to the conclusion that Claim 1 was not novel over G2.

V. A Notice of Appeal was filed on the 26 March 2001 by the Appellant (Patent Proprietor). The prescribed fee was paid on the same day. With the Statement of Grounds of Appeal filed on 5 June 2001, the Appellant submitted a new main request and a first auxiliary request as well as an experimental report.

Claim 1 of the main request read as follows:

"A method for producing an absorbent resin by polymerizing at least one water-soluble monoethylenically unsaturated monomer selected from an acid group-containing monomer, a metal salt, an

ammonium salt and an amine salt of said acid group-containing monomer, a nonion group-containing monomer, an amino group-containing monomer and a quaternary compound of said amino group-containing monomer in the presence of cross-linking agent and heat-treating the resultant polymer, which method of production is characterised by the fact that said cross-linking agent is a cross-linking agent possessing at least two polymerizable unsaturated groups and further possessing between said two polymerizable unsaturated groups at least one unit represented by the formula I:

$$-(-CH_2CH_2OR^1O-)- \quad (I)$$

wherein R^1 is an alkylene group of 2 to 4 carbon atoms, said cross-linking agent is used in a proportion in the range of from 0,01 to 0,3 mol% based on the amount of said water-soluble monoethylenically unsaturated monomer, the first heat treatment of the polymer is carried out under the conditions of hydrogel at a temperature in the range of from 160°C to 230°C, and the second heat treatment is carried out in the presence of a surface cross-linking agent having at least two reactive groups capable of reacting with the functional groups of the polymer at a temperature in the range of from 160°C to 230°C."

Claims 2 to 13 were dependent claims.

Claim 1 of the first auxiliary request read as follows:

" A method for producing an absorbent resin by polymerizing at least one water-soluble monoethylenically unsaturated monomer selected from an

acid group-containing monomer, a metal salt, an ammonium salt and an amine salt of said acid group-containing monomer, a nonion group-containing monomer, an amino group-containing monomer and a quaternary compound of said amino group-containing monomer in the presence of cross-linking agent and heat-treating the resultant polymer, which method of production is characterized by the fact that, in order to increase the absorption ratio: said monomer contains at least 50% by weight of one member selected from acrylic acid and an alkali metal salt, ammonium salt or an amine salt thereof and is subjected to an aqueous solution polymerization as an aqueous solution in concentration of at least 20% by weight at a temperature of 0°C to 150°C and said cross-linking agent is a cross-linking agent possessing at least two polymerizable unsaturated groups, further possessing between said two polymerizable unsaturated groups at least one unit represented by the formula I:

$$-(-CH_2CH_2OR^1O-)- \qquad (I)$$

wherein R^1 is an alkylene group of 2 to 4 carbon atoms and possesses a molecular weight of 6000 or less, said cross-linking agent is used in a proportion in the range of from 0,01 to 0,3 mol% based on the amount of said water-soluble monoethylenically unsaturated monomer, and the first heat treatment of the polymer is carried out under the conditions of hydrogel at a temperature in the range of from 160°C to 230°C, the polymer is pulverized and classified, and the second heat treatment is carried out in the presence of a surface cross-linking agent having at least two reactive groups capable of reacting with the functional

group of the polymer at a temperature in the range of from 160°C to 230°C."

Claims 2 to 11 were dependent claims.

The Appellant argued essentially as follows:

(i) Concerning novelty:

(i.1) Document G2 did not disclose all the features of the claimed process in combination.

(i.2) Thus, the main request and, by consequence, the first auxiliary request which had been further restricted were novel in view of G2.

(ii) Concerning inventive step:

(ii.1) Example 16 of G2 would represent the closest prior art.

(ii.2) Claim 1 of the main request included a selection of a particular type of second crosslinking agent and the selection of heat treatment temperature.

(ii.3) This combination of features led to a significant improvement of the absorption ratio. This effect was further illustrated by the accompanying experimental data. This could not be obvious to a person skilled in the art.

(ii.4) It thus followed that the main request, and for the same reasons, the first auxiliary request involved an inventive step.

VI. In its response dated 20 December 2001, the Respondent (Opponent) argued essentially as follows:

(i) Claim 1 of both the main request and the first auxiliary request submitted with the Statement of Grounds of Appeal contravened Article 84 EPC, since the features "hydrophilic", "first heat treatment", "second heat treatment" and "at a temperature in the range of from 160°C to 130°C (sic)" were not supported by the description.

(ii) Concerning novelty:

It was clear from the comparison between the features of Claim 1 of both the main request and the first auxiliary request and document G2, that G2 directly disclosed all the features of these claims (cf. G2, page 2, lines 1 to 3; page 3, lines 24 to 27; page 4, line 22, lines 29 to 33, and lines 37 to 41; page 5, lines 21 to 22; Examples 1, 5, 7, and 12).

(iii) Concerning inventive step:

Even if one would consider that the subject-matter of these Claims might be novel over G2, it would not involve an inventive step, since the change over G2 would come within the scope of the customary practice followed by persons skilled in the art.

VII. With its letter filed on 13 August 2002, the Appellant submitted an amended version of its main request and its first auxiliary request, in which a typographical

error (nonion should have read nonionic) had been corrected in Claim 1 of both requests.

It also argued essentially as follows:

(i) Concerning the admissibility of requests.

(i.1) The heat treatment of the polymer disclosed at page 5, lines 27 to 33 of the patent was the first heat treatment.

(i.2) This was implicit, since page 6, lines 2 to 8 made reference to a further or second heat treatment.

(i.3) Thus, the claims of the main and the auxiliary requests met the requirements of Article 123(2) and 84 EPC.

(ii) Concerning novelty:

(ii.1) There was no clear and unambiguous disclosure of all the features of Claim 1 of both requests.

(ii.2) The Opponent had constructed an argument with regard to lack of novelty based on a combination of features from a large number of potential combinations.

(ii.3) The skilled person could not reasonably make such selections from the considerable number of possible combinations in G2.

(iii) Concerning inventive step:

(iii.1) There was no suggestion that the combination of features set out in Claim 1 could lead to the manufacture of absorbent resin having high absorption capacity, low water soluble content and excellent stability on standing of the gel.

(iii.2) The comparative experiments submitted with the Statement of Grounds of Appeal showed that the method claimed provided an absorption capacity increase by heating at specific conditions and adopting the specific crosslinking agent.

(iii.4) Thus, the subject-matter of the main request involved an inventive step.

VIII. In a communication dated 4 July 2003 and annexed to a summons to Oral Proceedings the Board presented its provisional view concerning the allowability under Article 123(2)EPC and 84 EPC, the novelty, and the inventive step of the main and the auxiliary request then on file.

IX. In its letter dated 19 September 2003, the Respondent argued essentially as follows:

(i) Concerning Article 84 and 123(2) EPC:

(i.1) In the contested patent reference was only made to the heat treatment. In that respect the heat treatment disclosed on page 6, line 2 could not be different from the heat treatment on page 5.

(i.2) It thus followed that the contested patent referred to only one heat treatment.

(i.3) Thus, the requirements of Article 123(2) and 84 EPC were not fulfilled by the main and the auxiliary request submitted with letter of 13 August 2002 of the Appellant.

(ii) Concerning novelty and inventive step:

The Respondent agreed with the provisional opinion expressed in the communication of the Board dated 4 July 2003.

X. With its letter dated 19 September 2003, the Appellant filed six sets of claims representing a new main request and five new auxiliary requests. It also submitted further experimental data.

Claim 1 of the main request read as follows:

"A method for producing an absorbent resin by polymerizing a water-soluble monoethylenically unsaturated monomer selected from the group consisting of an acid group-containing monomer, a metal salt, an ammonium salt and an amine salt of said acid group-containing monomer, a nonionic hydrophilic group-containing monomer, an amino group-containing monomer and a quaternary compound of said amino group-containing monomer in an aqueous solution in the presence of cross-linking agent and heat-treating the resultant polymer, which method of production is characterised by the fact that said cross-linking agent during polymerization is a cross-linking agent

possessing at least two polymerizable unsaturated groups and further possessing between said two polymerizable unsaturated groups at least one unit represented by the formula I:

$$-(-CH_2CH_2OR^1O-)- \quad (I)$$

wherein R^1 is an alkylene group of 2 to 4 carbon atoms, and possesses a molecular weight of 6000 or less, said cross-linking agent is used in a proportion in the range of from 0,01 to 0,3 mol% based on the amount of said water-soluble monoethylenically unsaturated monomer, further after polymerization, another cross-linking agent having at least two reactive groups capable of reacting with the functional groups of the polymer is mixed, and then the heat treatment and reaction are carried out at the same time at a temperature in the range of from 160°C to 230°C to increase the cross linked density of the polymer particle."

Claims 2 to 9 were dependent Claims.

With regard to the main request, it argued essentially as follows:

(i) Amendments:

(i.1) Claim 1 had been further amended to indicate that, after polymerisation, a further crosslinking agent was mixed with the polymer and subjected to heat treatment and reaction at the same time at the defined temperature. This was based on the passage from page 5, line 53 to page 6, line 1 of the published application.

(i.2) It was also clear from the passage at page 6, lines 13 to 14 of the published application that the additional cross-linking might occur before or after the heat treatment performed on the initial polymer.

(ii) Novelty:

(ii.1) Example 2 of document G9, referred to in the communication of the Board, did not disclose the mixing of a further cross linking agent.

(ii.2) Examples 7, 8, and 10 of document G2 did not disclose that the heat treatment was carried out in presence of a further cross-linking agent.

(ii.3) In Example 16 of G2 the temperature of the heat treatment was outside the claimed range.

(ii.4) Thus, novelty was given over G2 and G9.

(iii) Inventive step:

(iii.1) According to the invention it was necessary to use a specific cross-linking agent I in specific amounts, to use a further cross-linking agent III having at least two functional groups capable of reacting with the functional groups of the polymer and to heat treat and to react with at the same time at a specific temperature.

(iii.2) This combination of features allowed absorbent polymers with high absorption capacity, low water soluble and gel stability to be obtained. This was

clearly shown by the comparative Examples 1 to 24 submitted with the letter of 19 September 2003.

(iii.3) Even if such conditions were known separately from G2, this document did not suggest the selected combination.

(iii.4) Furthermore G2 clearly taught to use a chain transfer agent in order to increase the durability of the gel and did not teach to heat treat the gel like polymer at a temperature of 160°C to 230°C to increase the absorption capacity.

(iii.5) Thus, the claims of the main request were based on an inventive step.

Arguments were also submitted concerning the allowability of the first to fifth auxiliary request.

XI. With a letter dated 17 October 2003, the Appellant submitted a further set of 9 Claims representing its sixth auxiliary request.

XII. Oral proceedings were held on 21 October 2003.

At the beginning of the oral proceedings, and after having heard the Parties, the Board indicated that it would take into consideration the requests submitted by the Appellant with its letter of 19 September 2003, as well as the experimental report annexed to this letter.

Following observations under Article 123(2) and 84 EPC from the Board concerning the main request, the Appellant submitted an amended version thereof which

was further revised as a response to further objections under Article 123(2) EPC raised by both the Board and the Respondent.

Claim 1 of the revised main request differed from Claim 1 of the main request submitted with letter of 19 September 2003 only in that the expression "to increase the crosslinked density of the polymer particle" had been deleted.

Claims 2 to 9 are dependent Claims and correspond to Claims 2 to 9 of the main request filed with the letter of 19 September 2003, apart from an amendment made in Claim 4 in the definition of the cross-linking agent of formula VI.

(i) The arguments presented by the Respondent during the oral proceedings may be summarized as follows:

(i.1) The requests presented by the Appellant with its letter of 19 September 2003, the request filed with the letter of 17 October 2003 of the Appellant, as well as the requests submitted by the Appellant during oral proceedings were late filed. Thus, the Respondent had not sufficient time to study these requests and to prepare its line of argumentation in view of these requests. These requests should therefore not be introduced in the proceedings.

(i.2) The Respondent had not enough time to carry out its own experiments in reply to the Appellant’s experimental report submitted with the letter of 19 September 2003. Thus, this experimental report by the Appellant should also be disregarded.

(i.3) The Respondent submitted that it was not clear which was indeed the revised version of the Claims of the new main request submitted during the oral proceedings, since the documents presented by the Appellant in fact comprised two sets of 9 Claims, which differed in the wording of their respective Claim 1, since the article "a" between the expression "in presence of" and the word "cross-linking" was missing in Claim 1 of one of these sets.

(i.4) Concerning novelty, while relying on its previous submissions made in its letter of 20 December 2001, it further argued as follows:

(i.4.1) On page 3, lines 32 to 37, document G2 disclosed the general procedure for obtaining an absorbent resin.

(i.4.2) This procedure was further specified by defining the most preferred range of concentration of the first cross-linking agent (i.e. 0.02 to 0.4% mol%; cf. page 4, line 52), and the most preferred temperature range for the heat treatment in presence of the surface cross-linking agent (i.e. 90°C to 220°C; cf. page 9, lines 9 to 12).

(i.4.3) Furthermore Example 17 of G2 showed that the heat treatment in presence of the surface cross-linking agent was carried out at 200°C, i.e. in the range claimed for the heat treatment according to the patent in suit.

(i.4.4) Thus, document G2 unambiguously disclosed all the features of the method according to Claim 1 of the patent in suit.

(ii) The Appellant argued essentially as follows:

(ii.1) The requests and the experimental report submitted with the letter of 19 September 2003 had been filed at least one month before the oral proceedings. This was in accordance with the deadline set out in the communication of the Board dated 4 July 2003 for the filing of new submissions.

(ii.2) Furthermore, the experimental report had been filed in response to the considerations under Article 56 EPC mentioned in the communication of the Board of 4 July 2003.

(ii.3) Concerning novelty:

(ii.3.1) The present invention represented a selection from the teaching of document G2, in that one had to select a specific cross-linking agent, to use it in a specific amount to crosslink the polymer, and to select a temperature range for carrying out the heat treatment in the presence of the further cross-linking agent.

(ii.3.2) This combination of features was, as such, not disclosed in G2.

(ii.3.3) Thus, the subject-matter of Claim 1 was novel over G2.

XIII. The Appellant requested that the decision under appeal be set aside, and the patent be maintained on the basis of Claims 1 to 9 of the main request (revised) filed during the oral proceedings or, in the alternative, on the basis of the 1st to the 5th auxiliary request each filed with the letter dated 19 September 2003, or on the basis of the 6th auxiliary request filed with letter dated 17th October 2003.

The Respondent requested that the appeal be dismissed or, in the alternative, that the case be remitted back to the first instance.

Reasons for the Decision

1. The appeal is admissible.

Procedural matters

2. The Board has been confronted at a late stage of the proceedings with

(a) the filing by the Appellant of several sets of amended claims

and

(b) the submission by the Appellant of an experimental report in its letter of 19 September 2003.

2.1 The filing of amended claims in opposition proceedings is governed by Article 123 and Rule 57a EPC, which do not contain a time limit for the filing of amendments.

2.2 The Board therefore holds, in agreement with the case law, that it has at least the discretion to accept amended claims at any stage of the appeal opposition proceedings, i.e. also during oral proceedings.

2.3 In this connection, it is, however, evident that it should be ascertained that the procedural fairness would not be jeopardized by the admission into the proceedings of amended claims filed at a late stage of the appeal opposition proceedings, i.e. that the Opponent could properly deal with these late filed requests if admitted.

2.4 In the present case, the main request and the five auxiliary requests filed with the letter of 19 September 2003, have been submitted one month prior to oral proceedings, so that, in the Board’s view, the Respondent (Opponent) was given enough time to study them.

2.5 Claim 1 of the revised main request submitted during oral proceedings differs from Claim 1 of the main request submitted on 19 September 2003 only by the deletion of the expression "to increase the cross linked density of the polymer particle" and this amendment has been carried out in response to an objection under Article 123(2) EPC raised by the Respondent in respect of the main request submitted with letter of 19 September 2003. Thus, this cannot represent an undue burden for the Respondent to deal properly with this request.

2.6 Thus, the Board decides to introduce the main request (revised) submitted at the oral proceedings as well as

the five auxiliary requests submitted with letter of 19 September 2003 into the proceedings.

2.7 According to Article 114(2) EPC facts and evidence which are not submitted in due time by the Party concerned may be disregarded.

2.8 In the present case, an experimental report has been submitted by the Appellant in its letter of 19 September 2003, i.e. one month prior to the oral proceedings, i.e. before the deadline set out in the communication of the Board of 4 July 2003 for the filing of further submissions.

2.9 On the one hand, it is clear, in the Board’s view, that the filing of this experimental report represents a response to the observations made by the Board under Article 56 EPC in its communication dated 4 July 2003.

2.10 On the other hand, it is also clear in view of the comparative tests carried out in this report (cf. in particular, page 14 of the letter of 19 September 2003; paragraph "Additional comparative Examples") that this report has been made in response to the tests submitted by the Respondent (Opponent) with its letter dated 20 November 2000 during proceedings before the Opposition Division.

2.11 Furthermore, it could have been reasonably expected, in view of the communication of the Board of 4 July 2003, that comparative data aiming to show the effect (Appellant) or the absence of effect (Respondent) of the choice of both the temperature for the heat-

treatment and the first cross-linking agent might be of high relevance for the assessment of inventive step.

2.12 In this connection, the Respondent was thus free either to submit its own tests before the deadline set out in the communication of the Board, or to prepare itself in order to be able to submit counter examples in a short period (one month), or to rely on its own previous tests submitted with its letter of 20 November 2001.

2.13 It thus follows, in the Board's view, that the filing of the experimental report by the Appellant on the 19 September 2003 does not represent unfair behaviour but, on the contrary, corresponds to a diligent and foreseeable defence.

2.14 Taking further into account that these comparative tests appear *prima facie* highly relevant for the outcome of the proceedings, the Board decides to introduce the experimental report submitted by the Appellant with its letter of 19 September 2003 in the proceedings (Article 114(1) EPC).

Main request

3. *Preliminary remark*

Although, when invited by the Board to submit the written form of its revised new main request, the Appellant submitted 6 pages comprising two sets of claims, it is perfectly clear to the Board that the pages numbered 1 to 3 thereof represent indeed the text of its revised new main request and that the pages numbered 11 and 12 and the page headed "inserts to

claims of the main request" are merely of explanatory nature in order to show the amendments made in the claims.

4. *Wording of the Claims*

4.1 Article 123(2) EPC

No objection under Article 123(2) EPC has been raised by the Respondent against the claims. The Board is also satisfied that the claims meet the requirements of Article 123(2) EPC, since Claim 1 is supported by Claim 1 of the application as originally filed read in combination with original Claims 2 and 11 and the following passages of the original description (cf. European application as published):
page 3, lines 4 to 13;
page 4, lines 43 to 46; and
page 5, lines 53 to 55;

and since an adequate support for dependent Claims 2 to 9 can be found in the application as filed (cf. European application as published, Claims 3, 4; page 4, lines 2 to 22; Claims 6, 7, 8, and 9; page 6, lines 3 to 6).

4.2 Article 123(3) EPC

It is evident that the amendments carried out in Claim 1 amount to restrictions in comparison to Claim 1 as granted. It thus follows that Claim 1 and by way of consequence dependent Claims 2 to 9 meet the requirements of Article 123(3) EPC.

5. *Article 84 EPC*

The Board is satisfied that the requirements of Article 84 EPC are met by Claims 1 to 9.

6. Novelty

6.1 Document G2 is the only document on the basis of which lack of novelty of the subject-matter of Claim 1 has been alleged by the Respondent.

6.2 Document G2 relates to a method for the production of an absorbent resin (F), which comprises polymerising 30% by weight to saturated concentration of (A) an aqueous water-soluble ethylenically unsaturated monomer solution containing (B) 0.005 to 5 mol% of a cross-linking agent and (C) 0.001 to 1 mol% of **a water-soluble chain transfer agent**, both based on the amount of monomer (A), thereby preparing an absorbent resin (D), and cross-linking the surface region of the absorbent resin with (E) a hydrophilic cross-linking agent capable of reacting with the functional group of the absorbent resin. This cross-linking reaction is effected by mixing 100 parts by weight of the absorbent resin (D) obtained by the polymerisation of (A) the monomer, in the presence of 0 to 20 parts by weight of water and 0 to 20 parts by weight of a hydrophilic organic solvent (G), with 0.005 to 5 parts by weight of (E) and heating the resultant mixture to a temperature in the range of 40°C to 250°C, preferably 90°C to 220°C (cf. page 3, lines 22 to 28; page 8, lines 9 to 15; page 9, lines 4 to 12).

6.3 According to G2, the compounds which are usable as a monomer (A) include acrylic acid, methacrylic acid, maleic acid, fumaric acid, crotonic acid, itaconic acid, and alkali metal salts and ammonium salts of such acids, acrylamide, methacrylamide, 2-hydroxyethyl (meth)acrylates, methoxypolyethyleneglycol (meth)acrylates, N,N-dimethylaminoethyl(meth)acrylates, N,N-diethylaminopropyl(meth)acrylates, N,N-diethylaminopropyl(meth)acrylamides, and quaternary salts thereof. The compounds useful as the cross-linking agent (B) are compounds possessing at least two polymerically unsaturated groups or reactively functional groups in the molecular unit thereof. The compounds possessing at least two polymerically unsaturated groups in the molecular unit thereof and usable as the cross-linking agent (B) include N,N'-methylenebisacrylamide, (poly)ethylene glycol di(meth)acrylates, (poly)propylene glycol di(meth)acrylates, glycerol tri(meth)acrylates, glycerol acrylate methacrylate, polyvalent metal salts of (meth)acrylic acids, trimethylol propane tri(meth)acrylates, triallylamine, triallyl cyanurate, triallyl isocyanurate, and triallyl phosphate. While G2 further mentions that those which possess at least two polymerically unsaturated groups in the molecular unit thereof are said to be particularly preferable, it does not indicate a molecular weight limit for the cross-linking agent to be used. The amount of the cross-linking agent (B) to be used is in the range of 0.005 to 5 mol%, preferably 0.02 to 0.4 mol%, more preferably 0.04 to 0.2 mol% based on the amount of the monomer (A) (cf. G2, page 4, lines 11 to 52).

6.4 More specifically G2 discloses in its Example 16 the manufacture of an absorbent resin by further cross-linking a resin obtained while using 0.2 mole % based on the monomer of a polyethylene glycol (polymerization degree n=8) diacrylate (i.e. having a molecular weight well below 6000), at a temperature of 130°C (i.e. outside the range defined for the heat-treatment in the patent in suit) with ethylene glycol diglycidyl ether. Document G2 also discloses in its Example 17, the further cross-linking with glycerine of an absorbent resin at a temperature of 200°C, the absorbent resin having been prepared while using N ,N'-methylene-bisacrylamide as first cross-linking agent (i.e. a component not falling under the formula I given for the first cross-linking agent in the patent in suit).

6.5 It is thus clear from paragraph 6.2 above that the claimed process according to the patent in suit cannot be considered, contrary to the submissions of the Appellant (cf. paragraph XII. (ii.3.1) above) as a selection from the teaching of G2, since the claimed method does not require the presence of a chain transfer agent. It thus follows that the decision T 279/89, referred to in the decision under appeal, which deals with the criteria for selection inventions is not relevant in the present case.

6.6 It is, however, clear that the claimed method is characterized by the combination of the use of a specific first cross-linking agent having a specific molecular weight and the application of heat treatment in the presence of a second cross-linking agent in a specific temperature range.

6.7 In that respect, the present case also differs from that of the decision T 666/89 (also referred to in the decision under appeal) where the novelty of a composition defined by continuous ranges of amounts of ingredients was at stake, firstly in that it refers to a process and secondly in that this process is defined by the combination of a specific starting component and a specific process variant (i.e. temperature of the heat treatment).

6.8 According to the decision T 355/99 of 30 July 2002 (not published in OJ EPO), it is not sufficient for a finding of lack of novelty that the claimed features could have been derived from a prior art document, there must have been a clear and unmistakable teaching of the claimed features (Reasons, point 2.2.4). Furthermore, according to the decision T 572/88 of 27 February 1991 (not published in OJ EPO), assessment of novelty should be strictly distinguished from that of inventive step (Reasons, point 4).

6.9 Thus, the question boils down as to whether there is in G2 a clear and unmistakable teaching of the combination of features mentioned above taking into account that the enabling disclosure of a document is not restricted to its worked examples.

6.10 In this connection, it is firstly evident (cf. paragraph 6.4 above) that Examples 16 and 17 of G2 cannot destroy the novelty of the subject-matter of Claim 1, since the methods disclosed therein differ from that of Claim 1 in that a too low temperature is used for the heat treatment (Ex.16) or in that a different first cross-linking agent is used (Ex.17).

6.11 Secondly, it is clear that the method disclosed in G2 comprises at least the following options:

- choosing a first cross-linking agent having at least two unsaturated group instead of a cross-linking agent having functional groups capable of reacting with the monomer,

- further choosing the first cross-linking agent having at least two unsaturated groups from the list thereof, and

  choosing the heat temperature for carrying out the reaction with the hydrophilic cross-linking agent.

6.12 While it is true that G2 generally mentions that the heat treatment could be carried out at a temperature preferably in the range from 90°C to 220°C in the presence of the second cross-linking agent, this does not, however, imply that the heat treatment is inevitably carried out in the range between 160°C and 220°C when the first cross-linking agent is a polyethylene glycol di(meth)acrylate (cf. G2, page 4, line 30), which is the only cross-linking agent among the cross-linking agents having at least two unsaturated groups of the list mentioned at page 4, lines 8 to 33 of G2 which would fall under the formula set out in present Claim 1 for this component, without, however, specifying its molecular weight. On the contrary, Example 16 shows that the heat treatment, although carried out at a temperature (130°C) belonging to the preferred range mentioned in G2, is effected at a temperature well outside the range of overlap (i.e.

160 to 220°C) with the range defined in Claim 1 of the patent in suit.

6.13 Consequently, the Board comes to the conclusion that G2 does not directly and unambiguously disclose the method of Claim 1 of the main request and that the subject-matter of Claim 1 and, by the same token, that of dependent Claims 2 to 9 meets the requirements of Article 54 EPC.

7. In view of the above findings, the objection of lack of novelty which led to the revocation of the patent in suit according to the decision under appeal has been met. It is therefore necessary for the decision under appeal to be set aside.

8. Consequently, the Board has not considered it appropriate to deal with the merits of the first to the fifth auxiliary requests, although these have been introduced into the proceedings, even less with those of the sixth auxiliary request, upon which no decision was taken on the question of its admissibility into the proceedings.

9. Taking into consideration the relevance of the experimental report submitted by the Appellant in its letter of 19 September 2003 for the assessment of inventive step of the subject-matter of Claims 1 to 9 of the main request, which, in the Board’s view, results in the case acquiring a new evidential aspect, and having regard to the request of the Respondent for remittal to the first instance, the Board, in order not to deprive the Parties of one instance of examination,

makes use of its powers under Article 111(1) EPC to refer the case back to the first instance.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance for further prosecution.

The Registrar: The Chairman:

E. Görgmaier R. Young