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**Datasheet for the decision  
of 12 July 2012**

**Case Number:** T 0176/09 - 3.3.10

**Application Number:** 99103704.5

**Publication Number:** 940148

**IPC:** A61L 15/60, A61F 13/15,  
B01J 20/26, G01N 5/00,  
C08F 20/00

**Language of the proceedings:** EN

**Title of invention:**

Water-absorbing agent and its production process and use

**Patent Proprietor:**

NIPPON SHOKUBAI Co., LTD.

**Opponent:**

SUMITOMO SEIKA CHEMICALS CO., LTD.

**Headword:**

Water-absorbing agent/NIPPON SHOKUBAI

**Relevant legal provisions:**

EPC Art. 100(b), 123(2)

RPBA R. 13(1), (3)

**Keyword:**

"Main request, auxiliary requests 1, 2, 3, 4, 8, 9:  
insufficiency of disclosure of the invention (yes)"  
"Auxiliary requests 5, 6, 7: added subject-matter (yes)"  
"Auxiliary requests 10: not clearly allowable - not admitted  
into the proceedings"  
"Experimental report: late filed (yes) - not admitted into the  
proceedings"

**Decisions cited:**

T 0153/85, T 0409/91, T 0435/91

**Catchword:**

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Case Number: T 0176/09 - 3.3.10

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.10  
of 12 July 2012

**Appellant:** NIPPON SHOKUBAI CO., LTD.  
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**Respondent:** SUMITOMO SEIKA CHEMICALS CO., LTD.  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 4 December 2008  
revoking European patent No. 940148 pursuant to  
Article 101(3)(b) EPC.

**Composition of the Board:**

**Chairman:** P. Gryczka  
**Members:** C. Komenda  
D. S. Rogers

## Summary of Facts and Submissions

- I. The Appellant (Patentee) lodged an appeal against the decision of the Opposition Division which revoked the European patent No. 940 148.

Notice of Opposition had been filed by the Respondent (Opponent) requesting revocation of the patent in suit in its entirety based *inter alia* on the ground of insufficient disclosure of the invention pursuant to Article 100(b) EPC. The wording of claim 1 as granted was as follows:

"1. A water-absorbing agent, comprising a water-absorbent resin obtainable by a process comprising the steps of polymerizing a monomer solution containing acyclic acid and/or its salt as a main monomer component; mixing an amino polycarboxylic acid and a surface-crosslinking agent with the water-absorbent resin obtained, and then surface-crosslinking the resultant polymer, said water-absorbing agent having an absorption capacity of 30 (g/g) or more under no load and a static deterioration absorption capacity (1) of 20 (g/g) or more under a load, wherein static deterioration absorption capacity (1) under a load is an absorption capacity of the water-absorbing agent as determined by the following sequential steps of:

swelling a water-absorbing agent to 15 (g/g) with a physiological sodium chloride solution containing L-ascorbic acid in a concentration of 0.005 weight %;

leaving the water-absorbing agent in such a swollen state for 6 hours;

allowing the swollen water-absorbing agent to absorb a physiological sodium chloride solution for another 1 hour in a state where a load of 50 g/cm<sup>2</sup> is mounted on the swollen water-absorbing agent;  
and measuring the weight of the resultant swollen gel."

II. In the decision under appeal the Opposition Division held that the patent in suit did not disclose the invention as defined in the claims as granted and of the claims according to the then pending 1<sup>st</sup> to 14<sup>th</sup> auxiliary requests in a manner sufficiently clear and complete for it to be carried out by a skilled person. The decision referred *inter alia* to document

(8) Experimental Report dated 23 February 2007.

In all independent claims of all requests the water-absorbing agent was characterized by having a specific absorption capacity and a specific "static deterioration capacity under a load". In document (8) the Opponent demonstrated that with only the information given in the patent in suit he could not successfully rework the example of the patent in suit. The particular type of mixing, which according to the Patentee was necessary to achieve the desired properties of the water-absorbent agent as claimed in claim 1, was not indicated in the patent in suit and was also not within the general knowledge of the skilled person. Therefore, the patent in suit was regarded as not disclosing the invention as defined in the claims as granted in a manner sufficiently clear and complete for it to be carried out by a skilled

person. The further restrictions made to the claims according to any of the then pending auxiliary requests 1 to 14 did not serve to overcome this objection.

III. With its letter dated 8 April 2009 the Appellant filed a first to ninth auxiliary request and with letter of 11 June 2012 a tenth auxiliary request.

Claim 1 of the first auxiliary request was based on the wording of granted claim 1, wherein the water-absorbing agent comprising a water-absorbent resin was further characterized as comprising "an amino polycarboxylic acid of at least 10 in stability constant to FE ion".

Claim 1 of the second auxiliary request was based on the wording of granted claim 1, wherein the water-absorbing agent comprising a water-absorbent resin was further characterized as comprising "an amino polycarboxylic acid selected from the group consisting of diethylenetriaminepentaacetic acid, triethylenetereaminehexaacetic acid, cyclohexane-1,2-diamine-tetraacetic acid, N-hydroxyethyl-ethylenediaminetriacetic acid and their salts".

Claim 1 of the third auxiliary request was based on the wording of claim 1 of the second auxiliary request, wherein the process step of polymerizing a monomer solution containing acrylic acid and/or its salt as a main monomer component was effected "in the presence of an internal-crosslinking agent".

Claim 1 of the fourth auxiliary request was based on the wording of claim 1 of the third auxiliary request, wherein the internal-crosslinking agent was present "in

an amount of 0.005 to 2 mol% of the monomer component" and the mixing of the amino polycarboxylic acid with the water-absorbent resin is effected "wherein the amino polycarboxylic acid is used in an amount of 0.00001 to 10 weight parts per 100 weight parts of the solid content of the water-absorbent resin and wherein the surface-crosslinking agent is used in an amount of 0.005 to 10 weight parts per 100 weight parts of the water-absorbent resin standing in a dry state".

Claim 1 of the fifth auxiliary request is based on the wording of claim 1 of the second auxiliary request, wherein "said water-absorbent resin as obtained by the polymerization step and optional drying and pulverization steps before surface-crosslinking, [is] displaying an absorption capacity value of 30 (g/g) or more under no load".

Claim 1 of the sixth auxiliary request is based on the wording of claim 1 of the fifth auxiliary request, wherein the water-absorbent resin is "displaying an absorption capacity value of 35 (g/g) or more under no load".

Claim 1 of the seventh auxiliary request is based on the wording of claim 1 of the sixth auxiliary request, wherein said water-absorbent resin is additionally characterized as "having an uncrosslinked water-soluble content of 25 weight % or below".

Claim 1 of the eighth auxiliary request is directed to an absorbent matter comprising the water-absorbent agent is characterized as in claim 1. Thus, the wording

of this claim is based on a combined wording of claims 6 and 1 as granted.

Claim 1 of the ninth auxiliary request is based on the wording of claim 1 of the eighth auxiliary request, wherein the water-absorbent agent further "comprises an amino polycarboxylic acid selected from the group consisting of diethylenetriaminepentaacetic acid, triethylenetereaminehexaacetic acid, cyclohexane-1,2-diamine-tetraacetic acid, N-hydroxyethyl-ethylenediaminetriacetic acid and their salts".

Claim 1 of the tenth auxiliary request is based on the wording of claim 1 as granted wherein the water-absorbing agent is characterized as comprising "an internal-crosslinked and surface-crosslinked water-absorbent resin and an amino polycarboxylic acid selected from the group consisting of diethylenetriaminepentaacetic acid, triethylenetereaminehexaacetic acid, cyclohexane-1,2-diamine-tetraacetic acid, N-hydroxyethyl-ethylenediaminetriacetic acid and their salts, wherein the internal-crosslinked and surface-crosslinked water-absorbent resin has an absorption capacity of 23 (g/g) or more under a load" and wherein the step of polymerizing a monomer solution containing acrylic acid and/or its salt as a main monomer component was effected "in the presence of an internal-crosslinking agent".

IV. The Appellant stated that the invention was disclosed in a manner sufficiently clear and complete for it to be carried out by a skilled person. The failure of the experiments carried out by the Respondent and submitted



as Document (8) in the opposition proceedings were due to an insufficient mixing of the components. The skilled person, however, knew from his common general knowledge that in order to ensure uniform mixing of the components he had to apply particular mixing methods which generate the required "great mixing force" (cf. patent specification, page 10, lines 35-36). In support of his argumentation he filed *inter alia* document

(17) "Modern Superabsorbent Polymer Technology", Wiley-VCH, 1998, pages 97-98,

and under cover of a letter dated 11 June 2012 a new test report.

- V. The Respondent repeated that the claimed subject-matter could not be carried out by a skilled person, since the specification of the patent in suit did not contain the essential information, which enabled the skilled person to successfully prepare water absorbent agents showing the static deterioration absorption capacity under a load as claimed in the patent in suit. Further, he stated that when repeating the example of the patent in suit, submitted as document (8), the mixing of the components by spraying the liquid component to the solid resin under stirring was done as suggested in the patent in suit, paragraph [0071], method (1). Therefore, the mixing in document (8) also provided a uniform mixing of the components as required according to the patent in suit. He further objected to the Appellant's experimental report filed on 11 June 2012 as being late filed and requested that this report be not admitted into the proceedings before the Board.

VI. The Appellant requested that the decision under appeal be set aside and the case be remitted to the department of first instance for further prosecution upon the basis of the claims according to the main request, or alternatively, upon the basis of any of its first to ninth auxiliary requests, all submitted under cover of a letter dated 8 April 2009, or alternatively upon the basis of its tenth auxiliary request submitted under cover of a letter dated 11 June 2012.

The Respondent requested that the appeal be dismissed.

VII. At the end of oral proceedings taking place on 12 July 2012 before the Board the decision was announced.

### **Reasons for the Decision**

1. The appeal is admissible.
2. *Admissibility of late filed evidence*
  - 2.1 Under cover of a letter dated 11 June 2012, which was one month before the oral proceedings before the Board, the Appellant filed a new experimental report. This experimental report was objected to by the Respondent as being late filed and it was requested that this report should not be admitted into the proceedings.
  - 2.2 The Appellant argued that his experimental report was in reply to the experiments carried out by the Respondent (document (8)) in order to demonstrate that the failure to reproduce the claimed water-absorbing agent was due to insufficient mixing of the different

components. The means for mixing the amino polycarboxylic acid and the surface-crosslinking agent with the water-absorbent resin in the experiments of the Respondent were not according to the patent in suit and were insufficient for effecting the required uniform mixing of the components.

However, the experimental report, document (8), was already discussed in the opposition proceedings with regard to the objection of insufficiency of disclosure of the invention, which was also the ground for revocation of the patent in the decision under appeal. Therefore, filing an experimental report to counter the experiments presented in document (8) only one month before the oral proceedings before the Board cannot be regarded as being a response to anything brought forward during the appeal proceedings.

Further, by filing the experimental report at this late stage the Respondent was deprived of the opportunity to react adequately thereon, such as by further experiments of its own.

2.3 Since the Appellant's experimental report is not regarded as being in response to any new matter presented during the appeal proceedings and its admission into the proceedings at this late stage would not leave the Respondent enough time to adequately respond on it, the Board exercises its discretion under Rule 13(1) RPBA not to admit the experimental report filed under cover of the letter dated 11 June 2012 into the appeal proceedings.

*Main Request*

3. *Insufficiency of disclosure of the invention*  
*(Article 100(b) EPC)*

3.1 The Appellant challenged the finding of the Opposition Division that the subject-matter of claim 1 could be carried out by a person skilled in the art in particular because the water-absorbing agent was defined *inter alia* by means of functional features, namely that the water-absorbing agent has to have "an absorption capacity of 30 (g/g) or more under no load" and "a static deterioration absorption capacity of 20 (g/g) or more under a load".

3.2 It is the established jurisprudence of the Boards of Appeal that the requirements of sufficiency of disclosure are only met if the invention as defined in the claims can be performed by a person skilled in the art across the whole area claimed without undue burden, using common general knowledge and having regard to further information given in the patent in suit (see decisions T 409/91, OJ 1994, 653, point 3.5 of the reasons; T 435/91, OJ EPO 1995, 188, point 2.2.1 of the reasons). That principle applies to any invention irrespective of the way in which it is defined. The peculiarity of a functional definition of a technical feature resides in the fact that it is defined by means of the result to be achieved. That mode of definition comprises an indefinite and abstract host of possible alternatives, which is acceptable as long as the skilled person can determine without undue burden the technical characteristics of the alternatives which achieve the desired result. Therefore, it has to be

established whether or not the patent in suit discloses sufficient information to enable the skilled person to determine which are the claimed alternatives achieving the results defined in the claim.

3.3 In the present case, the patent in suit aims at providing a water-absorbent agent, which has excellent urine resistance and has absorption properties that are stable to any composition of urine and show little change with time (patent specification, paragraph [0013]). The means provided to achieve this aim are indicated in claim 1, which is directed to a water-absorbing agent comprising a water-absorbent resin, the latter being defined by way of product-by-process features. In addition thereto the water-absorbing agent has to have "an absorption capacity of 30 (g/g) or more under no load" and has to show "a static deterioration absorption capacity of 20 (g/g) or more under a load", which parameters relate to a specific behaviour of the water-absorbent resin.

3.4 The experimental report, document (8), which was filed by the Respondent (Opponent) during the Opposition Procedure, concerns a reproduction of Example 1 of the patent in suit. This is the only Example in the patent disclosing detailed process conditions for the preparation of the claimed water-absorbing agent. However, none of the experiments carried out in document (8) succeeded in providing a product displaying the characteristics of the claimed water-absorbent agent, such as the required absorption capacity of 30 (g/g) under no load and a static deterioration absorption capacity of 20 (g/g) or more under a load. It was accepted by both parties that all

technical features of Example 1 had been correctly reproduced in document (8), however, there were diverging opinions on whether or not the mixing of the surface-crosslinking agent and the water-absorbent resin in document (8) was carried out in accordance with the teaching of the patent in suit.

In the experimental report, document (8) the surface-crosslinking agent was sprayed onto the solid pulverized water-absorbent resin precursor whilst this was stirred, whereas Example 1 of the patent in suit refers only to the "surface-crosslinking agent [...] was mixed with 100 weight parts of water-absorbent resin precursor [...]". Thus, the mixing conditions applied in the Respondent's experimental report, document (8), fall within the mixing conditions as disclosed in Example 1 of the patent in suit.

However, the Appellant stated that the mixing conditions used in the Respondent's experimental report, document (8), resulted in an insufficient degree of mixing of the surface-crosslinking agent and the water-absorbent resin precursor, so that the required degree of uniform mixing of the components could not be achieved.

Assuming that in fact this was the reason for fault there is no indication in the patent in suit that in case of failure one particular method of mixing has to be applied. Even the reference in paragraphs [0071] and [0073] of the specification relates to several mixing methods in general, reciting in mixing method (1) the specific mixing process used in the Respondent's experiments reported in document (8). However, none of

the passages relating to the mixing step puts any emphasis on a particular mixing method or device to be used.

The Appellant held that from his common general knowledge the skilled person was aware of the fact that in order to ensure a uniform mixing of the water-absorbent resin and the surface-crosslinking agent in presence of the aminopolycarboxylic acid he had to use a mixing device which was able to generate a high mixing force, such as those disclosed in document (17).

However, this prior art document merely lists various devices, which are indicated as being blenders suitable for the addition of surface-crosslinking agents, but it does not restrict the mixing process to be carried out in these devices only (cf. page 98, paragraph 2).

Thus, neither the common general knowledge referred to in document (17) nor the patent in suit provides any technical guidance according to which a person skilled in the art could identify the water-absorbing agents meeting the parameters set out in claim 1. The essential information that a specific mixing system has to be applied in order to ensure a uniform mixing of the water-absorbent resin and the surface-crosslinking agent is missing and the skilled person does not have the information leading necessarily and directly towards success through the evaluation of initial failures. Thus, the definition of the water-absorbing agent given in claim 1 is no more than an invitation to perform a research program in order to find the suitable ones (cf. decision T 435/91, *loc. cit.*, point 2.2.1, last paragraph, of the reasons).

3.5 For these reasons the invention as defined in independent claim 1 cannot be performed by a person skilled in the art within the whole area claimed without undue burden.

4. In these circumstances, the Appellant's main request does not satisfy the requirements of Article 83 EPC.

*Auxiliary requests 1, 2, 3, 4, 8 and 9*

5. Irrespective of whether the formal requirements as regards the modifications made to the claims of the auxiliary requests 1, 2, 3, 4, 8, and 9 have been met or not, the restrictions basically concern either restrictions of the kind of polycarboxylic acid, the amounts thereof (auxiliary requests 1, 2, 3 and 4) or the water-absorbent agent being used in combination with fibres (auxiliary requests 8 and 9). All these more restricted features were already fulfilled in Example 1 of the patent in suit and in the experimental report, document (8), on which the discussion of insufficiency of disclosure for the Main request focussed. Therefore, the same argumentation and considerations as brought forward for the Main request also apply to the subject-matter of the Auxiliary requests 1, 2, 3, 4, 8 and 9, with the consequence that these Auxiliary requests also share the fate of the main request in that they do not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art pursuant to Article 100(b) EPC.



*Auxiliary requests 5, 6 and 7*

6. The wording of claim 1 of the auxiliary requests 5, 6 and 7 is based on the wording of granted claim 1 and contains *inter alia* the passage wherein "said water-absorbent resin as obtained by the polymerization step and optional drying and pulverization steps before surface-crosslinking, [is] displaying an absorption capacity value of 30 (g/g) or more under no load".

According to the Appellant the basis for this feature is to be found on page 34, lines 11 to 16 of the application documents. However, this passage does not disclose that the drying step may be optional.

The Appellant's reference to page 34, line 25, which discloses that the drying step may be optional cannot be generalized for the preparation of any water-absorbent resin, since the cited passage refers to a particular embodiment, wherein the water-absorbent resin is subject to an optional drying step when it is in the form of a hydrogel.

Therefore, the requirements of Article 123(2) EPC are not fulfilled for the amendments made to claim 1 of the auxiliary requests 5, 6 and 7.

*Auxiliary request 10*

7. Auxiliary request 10 had been filed under cover of a letter dated 11 June 2012, one month before the oral proceedings before the Board.

- 7.1 According to the Rules of Procedure of the Boards of Appeal, 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 its 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).
- 7.2 The amendments made to claim 1 of auxiliary request 10 vis-à-vis the claims as granted relate *inter alia* to a water-absorbing agent comprising a particular "internal-crosslinked and surface-crosslinked" water-absorbent resin which has "an absorption capacity of 23 (g/g) or more under a load". According to the Appellant, said features found a basis on page 27 of the application documents.
- 7.3 However, on page 27 of the application documents an absorption capacity of 23 (g/g) is mentioned only in combination with a different preparation process of the water-absorbent resin which is not indicated in the present amended claim. Thus, 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.
- 7.4 Since claim 1 of auxiliary request 10 is not clearly allowable and was filed at a very late state of the proceedings, the Board exercises its discretion not to

admit auxiliary request 10 into the proceedings for reasons of procedural economy (Article 13(1) RPBA).

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar

The Chairman

C. Rodríguez Rodríguez

P. Gryczka