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**Datasheet for the decision  
of 18 October 2011**

**Case Number:** T 0236/09 - 3.3.10

**Application Number:** 00925720.5

**Publication Number:** 1187640

**IPC:** A61L 15/00

**Language of the proceedings:** EN

**Title of invention:**

Water-absorbent resin compound and processing

**Applicant:**

LG Chem, Ltd.

**Opponent:**

Nippon Shokubai Co., Ltd.

**Headword:**

Water-absorbent resin/NIPPON SHOKUBAI

**Relevant legal provisions:**

EPC Art. 56, 123(2)

**Keyword:**

"Main and auxiliary requests 1 and 4: inventive step (no)-  
experimental report not reproducible - purported improvement  
not shown - obvious alternative"

"Auxiliary requests 2 and 3: added subject-matter (yes) -  
undue generalisation of a particular embodiment from an  
example"

**Decisions cited:**

T 0020/81, T 0288/92, T 0680/93, T 0494/99

**Catchword:**

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Case Number: T 0236/09 - 3.3.10

**DECISION**  
of the Technical Board of Appeal 3.3.10  
of 18 October 2011

**Appellant:** LG Chem, Ltd.  
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**Respondent:** Nippon Shokubai Co., Ltd.  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 24 November 2008  
revoking European patent No. 1187640 pursuant  
to Article 101(3)(b) EPC.

**Composition of the Board:**

**Chairman:** P. Gryczka  
**Members:** J. Mercey  
F. Blumer

## Summary of Facts and Submissions

- I. The Appellant (Proprietor of the Patent) lodged an appeal against the decision of the Opposition Division revoking European patent No. 1 187 640.
- II. Notice of Opposition had been filed by the Respondent (Opponent) requesting revocation of the patent in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC) and insufficient disclosure of the invention (Article 100(b) EPC). *Inter alia* the following documents were submitted in opposition proceedings:
- (2a) JP-A-63-105064, English translation  
(7a) JP-A-09-248454, English translation and  
(8a) JP-A-09-108317, partial English translation.
- III. The Opposition Division held that the subject-matter of the claims according to the then pending main request was sufficiently disclosed and novel over the disclosure of document (7a), but did not, however, involve an inventive step in view of document (8a) in combination with document (2a). The subject-matter of claim 1 of the auxiliary request extended beyond the content of the application as filed (Article 123(2) EPC), the amendments being unallowable generalisations of the examples.
- IV. With letter dated 18 August 2011, the Appellant filed five sets of claims as a main request and auxiliary requests 1 to 4. Claim 1 of the main request read as follows:

"A resin compound comprising

- (a) water-absorbent resin,
- (b) a monomer having a carboxyl radical being one or more kinds of acids, and
- (c) a filler of fumed silica,

wherein the amount of component (b) is 0.1-30 weight parts and the amount of the filler (c) is up to 10 weight parts, relative to 100 weight parts of the water-absorbent resin, wherein said one or more kinds of acids are selected from acetic acid, lactic acid, citric acid, tartaric acid, succinic acid, lauric acid, myristic acid, palmitic acid, behenic acid, oleic acid, linolenic acid, arachidic acid, ricinoleic acid, ascorbic acid, benzoic acid, pyruvic acid, fumaric acid, maleic acid, propionic acid, butyric acid, caproic acid, alginic acid, ethoxyacetic acid, glucuronic acid, salicylic acid, cinnamic acid, deoxycholic acid and allofuranoic acid."

Claim 1 of auxiliary request 1 differed from claim 1 of the main request in that lactic, citric, tartaric and succinic acid were deleted from the one or more kinds of acids (b).

Claim 1 of auxiliary request 2 differed from claim 1 of auxiliary request 1 by virtue of the insertion of a lower limit for the amount of filler of fumed silica (c) of 0.2 weight parts.

Claim 1 of auxiliary request 3 differed from claim 1 of auxiliary request 2 in that the one or more kinds of acids (b) were selected from

- (i) amino acid and cinnamic acid,

- (ii) succinic acid,
- (iii) ascorbic acid and tartaric acid, and
- (iv) maleic acid and fumaric acid.

Claim 1 of auxiliary request 4 read as follows:

"A resin compound comprising

- (a) water-absorbent resin,
- (b) a monomer having a carboxyl radical being one or more kinds of acids selected from

- (i) 1 weight part of amino acid and 2 weight parts of cinnamic acid,

- (ii) 2 weight parts of succinic acid,

- (iii) 1 weight part of ascorbic acid and 2 weight parts of tartaric acid, and

- (iv) 2 weight parts of maleic acid and 2 weight parts of fumaric acid, and

- (c) a filler of fumed silica,

wherein the amount of the filler (c) is 5 weight parts for component (b)(i), 0.2 weight parts for component (b)(ii), 1 weight part for component (b)(iii), 0.5 weight parts for component (b)(iv), respectively, relative to 100 weight parts of the water-absorbent resin."

- V. The Appellant submitted that all requests fulfilled the requirements of Article 123(2) EPC, more particularly the lower limit of 0.2 weight parts for the filler of fumed silica (c) in auxiliary requests 2 and 3 finding a basis in Example 2, and the specific acids of auxiliary request 3, together with their relative amounts in auxiliary request 4, finding a basis in Examples 1 to 4 of the application as filed. The subject-matter of all requests was inventive in the

light of document (8a) in combination with document (2a), since there was an improvement of the malodorproofing effect caused by an unexpected synergistic effect of component (b), i.e. the acids, with component (c), i.e. the filler of fumed silica. In support hereof, the Appellant filed an experimental report with letter dated 26 May 2009 showing this effect for maleic acid and fumed silica in the gas and in the solution phase. In contrast thereto, fumed silica alone provided a substantial malodorproofing effect in the gas phase only, whereas the acid alone provided a substantial malodorproofing effect in the solution phase only.

VI. The Respondent submitted that auxiliary requests 2 to 4 contained subject-matter extending beyond the content of the application as filed, since the amendments made thereto were based on features to be found only in the Examples, such that the lower limit of 0.2 weight parts for the filler (c) in auxiliary requests 2 and 3, and the specific acids of auxiliary request 3, together with their relative amounts in auxiliary request 4, were inadmissible intermediate generalisations of features taken from the Examples. The Respondent maintained its objections regarding novelty *vis-à-vis* document (7a) and insufficiency of disclosure. With regard to inventive step, the Respondent argued that an improved malodorproofing effect had not been shown, let alone a synergistic one, since the Appellant's experimental report was not convincing, neither in form nor content, the experimental methods being described only very briefly, rendering it difficult to comprehend the results and impossible to reproduce them. Hence, the problem to be solved by the invention could be

formulated merely as the provision of further malodorproofing water-absorbent resins. Since document (8a) already disclosed a deodorizable water-absorbent resin comprising maleic, succinic, fumaric, benzoic or salicylic acid, the only effect of adding the fumed silica was to increase the flowability of the resin, such an effect being well-known and being taught by *inter alia* documents (2a) and (7a). The subject-matter of all requests was thus not inventive.

VII. With letter 20 September 2011, the Appellant informed the Board that it did not intend to attend oral proceedings and requested a decision on the basis of the requests on file.

VIII. The Appellant requested in writing that the decision under appeal be set aside and the patent be maintained on the basis of the main request or, subsidiarily, on the basis of any of auxiliary requests 1 to 4, all requests filed with letter dated 18 August 2011.

The Respondent requested that the appeal be dismissed.

IX. At the end of the oral proceedings, held on 18 October 2011 in the absence of the Appellant, the decision of the Board was announced.

## **Reasons for the Decision**

1. The appeal is admissible.

*All requests*

2. *Novelty and Sufficiency of Disclosure*

The Respondent submitted that the invention was insufficiently disclosed and that the claimed subject-matter was not novel over the disclosure of document (7a). In view of the negative conclusion in respect of inventive step starting from document (8a) as closest prior art, as set out in points 4, 5 and 7 below, a decision of the Board on these issues is unnecessary.

*Main and auxiliary request 1*

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

The Respondent had no objections to the claims of either the main request or the auxiliary request 1 under Article 123(2) EPC, nor does the Board see any reason to question their allowability under this article of its own motion.

*Main request*

4. *Inventive step (Article 56 EPC)*

- 4.1 Independent claim 1 of the main request is directed to a water-absorbent resin comprising one or more kinds of acids (b) selected from acetic acid, lactic acid, citric acid, tartaric acid, succinic acid, lauric acid, myristic acid, palmitic acid, behenic acid, oleic acid, linolenic acid, arachidic acid, ricinoleic acid, ascorbic acid, benzoic acid, pyruvic acid, fumaric acid, maleic acid, propionic acid, butyric acid, caproic acid,



alginic acid, ethoxyacetic acid, glucuronic acid, salicylic acid, cinnamic acid, deoxycholic acid and allofuranoic acid, together with a filler of fumed silica (c), said resin having malodorproofing properties.

A similar water-absorbent resin already belongs to the state of the art in that document (8a) describes a deodorizable water-absorbent resin comprising *inter alia* maleic, succinic, fumaric, benzoic or salicylic acid (see claims 1 and 2). Example 1 discloses water-absorbent resins comprising 1 or 5 weight parts of succinic acid and Example 2 discloses water-absorbent resins comprising 1 or 5 weight parts of maleic acid.

Therefore, the Board considers, in agreement with the Appellant, the Respondent and the Opposition Division, that the disclosure of document (8a) specified above represents the closest state of the art and starting point in the assessment of inventive step.

4.2 In view of this state of the art the problem underlying the patent in suit, as formulated by the Appellant in its letter dated 24 March 2009, consists in providing a water-absorbent resin with an improved malodorproofing effect in the gas and solution phase.

4.3 As the solution to this problem the patent in suit proposes a water-absorbent resin comprising *inter alia* succinic, benzoic, fumaric, maleic and/or salicylic acid, characterised in that it comprises up to 10 weight parts of fumed silica, relative to 100 weight parts of the water-absorbent resin.

4.4 The Appellant and the Respondent were divided as to whether or not the evidence presented convincingly showed the successful solution of the problem defined in point 4.2 above *vis-à-vis* the closest prior art. To demonstrate that the water-absorbent resin achieves the alleged improvements, the Appellant relied on the experimental report filed with letter dated 26 May 2009. This report allegedly showed a synergistic malodorproofing effect for the combination of maleic acid and fumed silica with respect to ammonia in the gas and in the solution phase, ammonia being one of the main sources of malodor in sanitary materials. The Appellant did not rely on the Comparative Examples in the patent in suit, since these do not represent the closest prior art, as the comparison is with a water-absorbent resin without the acid (b).

However, to be relevant for demonstrating that a technical improvement is achieved in comparison with the closest state of the art, any comparative test presented for that purpose must be reproducible on the basis of the information thus provided, thereby rendering the results of such tests directly verifiable (see T 494/99, point 5.2 of the reasons, not published in OJ EPO). That requirement implies, in particular, that the procedure to perform the test relies on qualitative and quantitative information enabling the person skilled in the art to reliably and validly reproduce it. Vague and imprecise operating instructions render the test inappropriate for that purpose and thus irrelevant.

The Experimental Method is described on page 2 of the experimental report as follows:

"Measuring the effect of removing malodor that is in gas phase

Leaving sample and 37% ammonia water 5 µl in 1L flask for 2 hours at 40°C, then measuring the effect by using a measuring tube."

The effect in the solution phase is also described as being measured "by using a measuring tube".

With regard to the nature of the "sample", page 1 of the experimental report merely refers to fumed silica, maleic acid and a "resin", but does not specify the nature of this resin.

The Board considers that the failure to disclose the nature of the water-absorbent resin used in the tests renders them for this reason alone non-reproducible. The nature of the resin is crucial to the result, different resins having differing numbers of free acid groups, depending on their level of neutralisation (see paragraph [0029] of the patent in suit), such that the resin alone, by virtue of its potential to react with ammonia, has a certain malodorproofing effect. In addition, it is not even specified in the report whether the flask was sealed before being left for 2 hours, nor is the measuring method sufficiently defined, "measuring the effect by using a measuring tube" being vague in the absence of more concrete operating instructions. None of these experiments is thus reproducible and hence verifiable by third parties. It follows that the results of the Appellant's experimental report are irrelevant to the assessment of inventive step in the present case.

- 4.5 According to the jurisprudence of the Boards of Appeal, alleged but unsupported advantages cannot be taken into

consideration in respect of the determination of the problem underlying the invention (see e.g. decision T 20/81, OJ EPO 1982, 217, point 3, last paragraph of the reasons). Since in the present case the alleged advantage, i.e. improved malodorproofing effect, lacks the required experimental support, the technical problem as defined in point 4.2 above needs reformulation in a less ambitious way.

4.6 Consequently, the objective problem underlying the patent in suit in the light of the teaching of document (8a) is merely the provision of a further malodorproofing water-absorbent resin.

4.7 Finally, it remains to decide whether or not the proposed solution to the objective problem underlying the patent in suit is obvious in view of the state of the art.

4.7.1 When starting from the deodorizing water-absorbent resin known from document (8a), it is a matter of course that the person skilled in the art seeking to provide a further deodorizing water-absorbent resin would turn his attention to that prior art addressing other water-absorbent resins, for example, document (2a). Said document (see claim 1, page 3, lines 48 to 50 and page 4, line 42) is concerned with water-absorbent resins comprising stearic acid and 0.1 to 10 weight parts of an inorganic powder which may be silica, said silica contributing to powder fluidity, which is the same effect attributed to the silica in the patent in suit (see page 4, lines 31 to 32), i.e. increasing the flowability of the resin. In addition, document (7a) describes a water-absorbent resin comprising a

quaternary ammonium organic acid salt and silica (see claims 1 and 5 and page 7, lines 22 to 29) having excellent powder handling and malodorproofing properties (see page 7, lines 10 to 12, page 9, lines 16 to 29 and Table 3). It is within the ambit of the skilled person, seeking to solve the objective problem underlying the patent in suit of providing merely a further deodorizing water-absorbent resin, to consider routinely any conceivable modification of the closest prior art resin, including the addition of silica described in documents (2a) and (7a), in particular since document (2a) teaches that the addition thereof leads to enhanced powder fluidity. Thus, the person skilled in the art, following the avenue indicated in the state of the art, would incorporate up to 10 weight parts of silica known from document (2a) into the resin of document (8a) without exercising any inventive ingenuity. For these reasons, the subject-matter of claim 1 is obvious.

4.8 All of the Appellant's submissions in support of the presence of an inventive step are based on the alleged synergistic effect between the acid (b) and the filler of fumed silica (c) leading to an improved malodorproofing effect in the gas and solution phase. Said effect has, however, not been convincingly shown (see points 4.4 and 4.5 above), such that the Board must reject all these arguments.

4.9 As a result the Appellant's main request is not allowable for lack of inventive step pursuant to Article 56 EPC.

*Auxiliary request 1*

5. *Inventive step (Article 56 EPC)*

5.1 Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that lactic, citric, tartaric and succinic acid have been deleted from the one or more kinds of acids (b). However, the acid (b) may still include *inter alia* benzoic, fumaric, maleic and salicylic acid, which are disclosed in the closest prior art document (8a), such that the considerations having regard to inventive step given in points 4.1 to 4.8 *supra* and the conclusion drawn in point 4.9 *supra* with respect to the main request apply also to the auxiliary request 1, i.e. the subject-matter claimed does not involve an inventive step.

*Auxiliary requests 2 and 3*

6. *Amendments (Article 123(2) EPC)*

6.1 Claim 1 of auxiliary requests 2 and 3 differs from claim 1 of the main request *inter alia* by virtue of the insertion of a lower limit for the amount of filler of fumed silica (c) of 0.2 weight parts.

6.2 In order to determine whether or not the subject-matter of a claim in a patent extends beyond the content of the application as filed it has to be examined whether that claim comprises technical information which a skilled person would not have objectively and unambiguously derived from the application as filed (see decisions T 288/92, point 3.1 of the reasons;

T 680/93, point 2 of the reasons; neither published in OJ EPO).

- 6.3 The Appellant referred to Example 2 of the application as filed as forming the basis for the lower limit of 0.2 weight parts of fumed silica (c), this example indeed illustrating a water-absorbent resin comprising 0.2 weight parts of fumed silica. However, in Example 2, this amount of fumed silica is disclosed in combination with a particular acid in a specific amount, namely 2 weight parts of succinic acid, which is not even one of the kinds of acids (b) defined in claim 1 of auxiliary request 2, and does not feature in any of the acid combinations (i), (iii) or (iv) in claim 1 of auxiliary request 3. Furthermore, Example 2 discloses succinic acid in combination with a particular water-absorbent resin, namely a starch acrylate water-absorbent resin.
- 6.4 In the Board's judgement, the skilled person derives from this example nothing more than the bare disclosure of the specific characteristics of this resin compound, namely the combination of a particular water-absorbent resin (a) with a specific amount of a particular acid (b) and a specific amount of fumed silica (c).
- 6.5 Therefore, the original disclosure of one specific example cannot support the generalisation indicated in claim 1 of either of auxiliary requests 2 or 3 which results in covering this specific amount of fumed silica together with 0.1 to 30 weight parts of, for example, maleic and fumaric acid together with any water-absorbent resin. Hence, in the context of claim 1 of both requests the feature that the amount of filler of fumed silica (c) is 0.2 weight parts is an undue

generalisation of a particular embodiment of a specific example which generates fresh subject-matter.

- 6.6 For these reasons, the Board concludes that amended claim 1 of auxiliary requests 2 and 3 extends the subject-matter claimed beyond the content of the application as filed, thus contravening the provisions of Article 123(2) EPC.

*Auxiliary request 4*

7. *Amendments (Article 123(2) EPC)*

The Respondent submitted that claim 1 contained subject-matter extending beyond the content of the application as filed. In view, however, of the negative conclusion in respect of the claimed invention for lack of inventive step as set out in point 8 below, a decision of the Board on this issue is unnecessary.

8. *Inventive step (Article 56 EPC)*

- 8.1 Claim 1 of auxiliary request 4 differs from claim 1 of the main request in that *inter alia* the acid (b) is (ii) 2 weight parts of succinic acid, and the amount of fumed silica (c) is 0.2 weight parts.

- 8.2 However, the closest prior art document (8a) already discloses that the acid may be succinic acid in an amount of 1 or 5 weight parts (see Example 1), such that the skilled person would thus also expect an intermediate amount of 2 weight parts to be an effective deodorizing amount. Furthermore, document (2a) teaches a water-absorbent resin comprising 0.1 to 10



weight parts of an inorganic powder which may be silica. Thus neither this specific acid, nor these specific amounts of the acid (b) and fumed silica (c), can contribute to inventiveness of the subject-matter of claim 1 of auxiliary request 4 *vis-à-vis* these documents, nor has the Appellant ever argued along these lines. Therefore, the considerations having regard to the assessment of inventive step given in points 4.1 to 4.8 above and the conclusion drawn in point 4.9 above with respect to claim 1 of the main request apply also to claim 1 of auxiliary request 4.

8.3 Thus, the auxiliary request 4 is also not allowable for lack of inventive step pursuant to Article 56 EPC.

## **Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

C. Rodríguez Rodríguez

P. Gryczka