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Datasheet for the decision of 11 February 2026

Case Number: T 0192/24 - 3.3.09

Application Number: 15845662.4

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Language of the proceedings: EN

Title of invention:
WATER-ABSORBABLE RESIN POWDER, AND METHOD FOR DETERMINING ELASTIC MODULUS OF WATER-ABSORBABLE RESIN POWDER

Patent Proprietor:
Nippon Shokubai Co., Ltd.

Opponent:
Evonik Superabsorber GmbH

Headword:
Water-absorbable resin powder/NIPPON SHOKUBAI

Relevant legal provisions:
EPC Art. 54, 56, 100(a)

Keyword:
Novelty - main request (yes)
Inventive step - main request (yes)

Decisions cited:

Catchword:

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Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0192/24 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 11 February 2026

Appellant: (Opponent)	Evonik Superabsorber GmbH Rellinghauserstraße 1-11 45128 Essen (DE)
Representative:	Godemeyer Blum Lenze Patentanwälte Partnerschaft mbB - werkpatent An den Gärten 7 51491 Overath (DE)
Respondent: (Patent Proprietor)	Nippon Shokubai Co., Ltd. 1-1, Koraibashi 4-chome Chuo-ku Osaka-shi, Osaka 541-0043 (JP)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 4 January 2024 concerning maintenance of the European Patent No. 3202823 in amended form.**

Composition of the Board:

Chairman	A. Haderlein
Members:	M. Ansorge
	A. Jimenez

Summary of Facts and Submissions

I. The opponent (appellant) lodged an appeal against the opposition division's interlocutory decision holding the main request allowable.

II. With its notice of opposition, the opponent had requested that the patent be revoked on the grounds for opposition under Article 100(a) EPC (lack of novelty and lack of inventive step) and Article 100(b) EPC.

III. The opposition division decided that the main request was allowable, concluding that the claimed subject-matter was novel over D1 and the alleged prior use and involved an inventive step over D4 as the closest prior art. The opposition division considered D1 to be an unsuitable starting point in the assessment of inventive step.

IV. Claim 1 of the main request reads as follows:

"Water absorbent resin powder comprising:

a polyacrylic acid (salt)-based water-absorbing resin as a main component,

said water absorbent resin powder being surface-crosslinked and satisfying

(1) a proportion of the water absorbent resin powder having a particle size of not less than 150 μm and less than 850 μm of not less than 90 weight%;

characterized in that said water absorbent resin powder satisfies

(2) a water absorption time according to a vortex method of not more than 42 seconds; and

(3) an elastic modulus index (600-500) of not less than 5500;

(4) an elastic modulus index (500-425) of not less than 4500;

(a) a proportion of the water-absorbing resin powder having a particle size of not less than 150 µm and less than 300 µm is 5 weight% to 50 weight%;

(b) a proportion of the water-absorbing resin powder having a particle size of not less than 300 µm and less than 425 µm is 10 weight% to 60 weight%;

(c) a proportion of the water-absorbing resin powder having a particle size of not less than 425 µm and less than 500 µm is 5 weight% to 50 weight%;

(d) a proportion of the water-absorbing resin powder having a particle size of not less than 500 µm and less than 600 µm is 5 weight% to 50 weight%; and

(e) a proportion of the water-absorbing resin powder having a particle size of not less than 600 µm and less than 850 µm is 0.1 weight% to 50 weight%,

wherein the 'water absorbent resin powder having a particle size of not less than 150 µm and less than 850 µm' refers to water absorbent resin powder which passes through a JIS standard sieve having a mesh size of 850 µm but which does not pass through a JIS standard sieve having a mesh size of 150 µm;

the water absorption time according to the vortex method is measured in conformity with the 'Testing Method for Water Absorption Rate of Super Absorbent Polymers' described in JIS K7224; and

wherein the elastic modulus index (600-500) is measured in accordance with the method specified in the description;

wherein the elastic modulus index (500-425) is measured in accordance with the method specified in the description;

wherein a total proportion of the water-absorbing resin powder having particle sizes, each of which is defined in (a) to (e) above, is 90 weight% to 100 weight%; and

wherein a distribution of the particle sizes of the water-absorbing resin powder is measured in conformity with the EDANA method ERT420.2-02."

Claims 2 to 6 of the main request are claims dependent on claim 1. Claims 7 to 9 of the main request are independent claims comprising the powder according to any one of claims 1 to 6.

The wording of the claims of the auxiliary request is not relevant for this appeal case.

V. The following documents have been cited in the case in hand:

D1: US 6,143,821
D2: Experimental report submitted by the appellant
D2a: Supplemental experimental report submitted by the

appellant
D4: WO 2006/101271 A1
D13: WO 2011/126079 A1
D14: Statement by KLK Oleo
D15: Declaration submitted by the appellant

VI. Requests

The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The patent proprietor (respondent) requested that the appeal be dismissed (main request) or, as an auxiliary measure, that the patent be maintained on the basis of the auxiliary request, filed with the reply to the statement of grounds of appeal.

Reasons for the Decision

1. Novelty

1.1 The appellant argued that the subject-matter of claim 1 of the main request was not novel over D1. While D1 did not explicitly describe a specific particle size distribution, elastic modulus values, elastic modulus index values or a vortex measurement of the water-absorbent resin powder, the appellant submitted documents D2, D2a, D14 and D15, which included an experimental rework of example 17 and comparative example 2 of D1, to demonstrate that the claimed particle size distribution (hereinafter "PSD"), elastic modulus index (hereinafter "EMI") (600-500), EMI (500-425) and water absorption time according to a vortex method (hereinafter "vortex parameter") were

implicitly disclosed by example 17 or comparative example 2 of D1.

1.2 As outlined below, the board comes to a different conclusion.

1.2.1 D1 discloses a water-absorbent resin powder. The method for producing it comprises the steps of mincing, drying, grinding and screening to a grain fraction of 150 µm to 850 µm, and a secondary crosslinking of the ground polymer screened out to 150 µm to 800 µm (see example 17 and comparative example 2; col. 10, line 59 to col. 12, line 37 of D1). However, there is no indication in D1 of which kind of mesh was used in the screening step or of which kind of grinding device was used. In other words, D1 only provides generic disclosure as far as the screening and grinding of the water-absorbent polymer are concerned.

1.2.2 To further explain the influence of the screening and grinding on the properties of a final polymer powder, in particular on the claimed EMI ranges and the vortex parameter, reference is made to examples 1 and 2 and embodiments 1 and 2 of the patent.

1.2.3 In example 1 of the patent, both a screening step was carried out, using a JIS standard sieve (having mesh sizes of 710 µm and 500 µm), and an additional specific sieving step was also carried out, using a sieve provided with a ton-cap metal gauze having rectangular mesh openings with a 728-µm long side and a 335-µm short side, which effectively removed flake-shaped particles.

1.2.4 In example 2 of the patent, a specific gel grinding device is used which has specific modifications by

comparison with a typically used grinding device (e.g. modifications with respect to the screw and the barrel).

1.2.5 As can be taken from Table 3 and the graphical representation in Figure 13 of the patent, both such measures, i.e. removing flake-shaped particles and using a specific gel grinding device, are suitable for achieving an EMI (600-500) of above 5500 while at the same time obtaining a vortex parameter of no more than 42 s, as required in claim 1. By contrast, comparative examples 1 and 2 of the patent, which do not have these specific measures, do not achieve a powder that has the claimed EMI (600-500) and at the same time fulfils the claimed vortex parameter. In comparative examples 1 and 2 of the patent, either the EMI (600-500) is outside the claimed range (see comparative example 1) or the claimed vortex parameter is not achieved (see comparative example 2).

1.2.6 Like examples 1 and 2 of the patent, embodiments 1 and 2 of the patent (see paragraphs [0114] to [0168] of the patent) explain the importance of the additional specific screening step, which removes flake-shaped particles, and the use of a specific grinding device to achieve desired absorption properties. These embodiments 1 and 2 relate to methods for controlling particle shapes so that a water-absorbent resin powder having an excellent diffusion absorbency property (DAP) is obtained.

1.2.7 In embodiment 1, the flake-shaped particles are removed by the additional step of using a specific sieve having rectangular mesh openings, as in example 1. In embodiment 2, a specific grinding device is used which, by grain-refining a crosslinked hydrogel polymer, leads

to a crosslinked hydrogel polymer having a desired shape, as in example 2.

1.2.8 D1 does not describe any details concerning the mesh geometry used in the screening step or the type of grinding device to be used in the grinding step. In the absence of any such details, it is not possible to exactly rework the method for producing a water-absorbent resin powder of D1. D2, D2a, D14 and D15 also fail to provide any such details. For this reason alone, D2, D2a, D14 and D15 are not suitable for demonstrating that example 17 or comparative example 2 of D1 implicitly fulfils the claimed combination of PSD, vortex parameter, EMI (600-500) and EMI (500-425). In this context, it is noted that specific details concerning the screening and grinding – which are known to the inventors of D1 but not unambiguously disclosed in D1 – cannot be used to supplement the disclosure of D1, which has to be taken as it is.

1.2.9 In this context, the respondent argued that the values of the average elastic modulus G' shown in the table on page 2 of the experimental report D2 are unrealistically high. The board agrees with the respondent's line of argument in this respect.

As can be taken from the experimental report D2, the values for the average elastic modulus G' of comparative example 2 and example 17 of D1 are orders of magnitude higher than a commercial sample (see the table on page 2 of D2). D2 does not give any details on how the average elastic modulus G' was exactly measured and how EMI was exactly calculated; it is merely indicated that "EMI calculations were performed as specified in the patent application". This does not allow the board or the respondent to check what exactly

has been done in D2 or where the average elastic modulus G' values came from. As a consequence, the experimental report D2 cannot support the appellant's assumptions.

1.2.10 Under these circumstances, the experimental reports submitted by the appellant are not suitable for demonstrating that example 17 or comparative example 2 of D1 (as reworked in D2 and D2a) unambiguously implicitly fulfils the claimed EMI ranges in combination with the claimed vortex parameter.

1.2.11 The appellant also argued that the EMI (600-500) and EMI (500-425) are unusual parameters which cannot be considered to limit the scope of claim 1.

The board does not agree. While it is correct that the EMI can be considered an unusual parameter and is not described in the cited prior-art documents, it is noted that a detailed method for determining it is described in the patent (see paragraphs [0277] to [0299]).

The formula for determining EMI is the following (see paragraph [0290] of the patent):

EMI = Elastic modulus G' / (theoretical surface area (TGS) of swollen gel particles) x CRC ... Formula (3)

A detailed method for measuring the elastic modulus G' is set out in paragraphs [0277] to [0289] of the patent. The theoretical surface area (TGS) of swollen gel particles is determined by the method defined in paragraphs [0292] to [0299] of the patent. While the TGS is called "theoretical surface area", it is noted that it is determined on the basis of standard parameters which can be readily measured (i.e. CRCdw,

mesh size (H) of upper sieve for classification, mesh size (I) of lower sieve for classification and weight (E) of water-absorbent resin powder). The method for determining CRC is set out in paragraphs [0310] to [0313] of the patent.

Accordingly, the claimed EMI parameters can be determined on the basis of the instructions given in the patent.

For the reasons given above, it cannot be concluded that the claimed EMI parameters in combination with the claimed vortex parameter are implicitly fulfilled in D1.

In view of the above, the subject-matter of claim 1 of the main request is novel over D1. The same applies to claims 2 to 9.

2. Inventive step

2.1 The appellant argued that the subject-matter of claim 1 of the main request did not involve an inventive step in view of D1, D4 or D13 as the closest prior art.

2.2 As outlined below, the board concludes that the claimed water-absorbent resin powder involves an inventive step over D1, D4 or D13 as the closest prior art.

2.3 Contrary to what was held in the decision under appeal, the board is of the opinion that each of documents D1, D4 and D13 is suitable as the closest prior art, i.e. a realistic starting point, in the case in hand. None of these documents is so remote from the subjective technical problem mentioned in the patent and its intended use or purpose that it might be considered an

unsuitable or unrealistic starting point in the discussion of inventive step. The board shares the appellant's opinion that D1 cannot be considered unsuitable as a closest prior-art document for the mere fact that, unlike D4, it does not mention a vortex parameter. D1 and D4 are in the same technical field as the patent and relate to a similar purpose, so they are both suitable as the closest prior art. Both parties agreed that D13 is a suitable starting point in the case in hand.

2.4 D1 as the closest prior art

2.4.1 For the reasons set out above when assessing novelty, the subject-matter of claim 1 of the main request differs from D1 on account of the EMI (600-500), the EMI (500-425) and the vortex parameter.

2.4.2 The parties' opinions differed on whether there was an effect resulting from the differences over D1.

2.4.3 The respondent argued that an improvement, i.e. a significantly reduced DAP, could be derived from comparing example 1 of the patent (which fulfilled all the requirements of claim 1 of the main request) with comparative example 1 of the patent (which was carried out according to production example 1 and example 1 of D13). In this context, reference was made to Table 3 and Figure 13 of the patent. In the respondent's opinion, although this comparative example 1 reworked the powder of D13, this improvement was also representative of and credibly existed over the powders of D1 and D4.

2.4.4 As outlined below, the board shares the respondent's view in this respect.

2.4.5 The water-absorbent resin powders of example 1 and comparative example 1 of the patent (in line with D13) are produced by substantially the same method and using substantially the same ingredients, except that in example 1 the particles having respective particle sizes of no less than 500 µm and less than 710 µm were additionally classified by using a sieve provided with a ton-cap metal gauze having rectangular mesh openings with a 728-µm long side and a 335-µm short side, thereby removing about 17 wt% of flake-shaped particles, relative to the weight of the particles. In this context, it is noted that the PSDs of the powders of example 1 and comparative example 1 are very close to each other (see the table on page 3 of the respondent's letter dated 27 January 2026). The significantly different properties of the powder cannot be attributed to this minor difference in the PSD. In addition, as can be taken from Table 3 of the patent, the vortex parameter is identical between these two examples.

2.4.6 However, despite the above similarities between example 1 and comparative example 1 as far as the PSD and vortex parameter are concerned, the EMI (600-500) is significantly different (5213 in comparative example 1 vs 6793 in example 1). As can be taken from Table 3 and Figure 13 of the patent, where the vortex parameter and the EMI (600-500) are both in the claimed range, a significantly improved, i.e. reduced, DAP is achieved (105 s in comparative example 1 vs 86 s in example 1).

2.4.7 While example 1 was obtained by a specific sieving method (see points 2.4.5 and 2.4.6 above), the claimed combination of vortex parameter and EMI (600-500) can

similarly be achieved by applying a specific gel grinding device (see example 2), whereas a typical gel grinding device (see comparative example 2, in which a similar operation to comparative example 1 was applied) fails to achieve this desired result. Moreover, this specific way of producing a powder leads to a significantly improved DAP (118 s for comparative example 2 vs 84 s for example 2).

2.4.8 Accordingly, there is evidence in the patent that a significantly reduced DAP is achieved when the vortex parameter and the EMI (600-500) are in the claimed range at the same time.

2.4.9 In this context, the appellant argued that it could be taken from Table 3 of the patent that a higher EMI (600-500) did not necessarily lead to a reduced DAP.

2.4.10 While it is correct that, as outlined above, there is no such general correlation between these two parameters alone, it is evident that there is a clear correlation between a significantly reduced DAP and the situation where the vortex parameter is no more than 42 s and – at the same time – the EMI (600-500) is no less than 5500. This correlation, which represents a requirement of claim 1, is clearly shown in Table 3 and the graphical representation in Figure 13 of the patent.

2.4.11 It is correct that comparative example 1 follows the operation carried out in D13. Thus, at first glance there might be doubts about whether the improvement demonstrated over D13 can also be acknowledged over D1.

2.4.12 As outlined below, however, the board shares the respondent's opinion that – under the specific

circumstances of the case in hand – it is credible that the improved DAP also exists over the powder disclosed in D1. As outlined above, in examples 1 and 2 of the patent, either a specific additional sieving step is carried out in which flake-shaped particles are removed, or a specific gel grinding device is used which achieves a desired shape by grain-refining a crosslinked hydrogel polymer. There is no indication in D1 (or D13) that any such specific measures have been taken. Under these circumstances, it is credible that the powder produced according to the operation of D1 does not lead to an EMI (600-500) in the claimed range while at the same time fulfilling the vortex parameter. Accordingly, it is credible that the DAP is also reduced by comparison with the powder of D1.

2.4.13 For the above reasons, the effect resulting from the differences over D1 is a reduced DAP.

2.4.14 The objective technical problem is to provide a water-absorbent resin powder having a reduced DAP.

2.4.15 With respect to the question of obviousness, the board comments as follows.

There is simply no teaching in D1 or any other document on file concerning the measures which are suitable for achieving a reduced DAP. As a consequence, a skilled person is not taught how the problem could be solved as suggested in claim 1. A skilled person would not arrive at the claimed combination of features in an obvious manner.

In view of the above, the subject-matter of claim 1 of the main request involves an inventive step over D1 as

the closest prior art. The same applies to claims 2 to 9.

2.5 D4 as the closest prior art

2.5.1 There was agreement among the parties that the subject-matter of claim 1 differed from D4 on account of the claimed ranges of EMI (600-500) and EMI (500-425). Unlike D1, D4 does disclose the vortex parameter (see the examples in Table 1 of D4).

2.5.2 With respect to the question of whether there is an effect resulting from these differences, the board concludes that the reduced DAP is credibly demonstrated over not only D13 and D1 but also D4.

2.5.3 Comparing example 1 with comparative example 1 of the patent, it can be seen that they differ from each other only on account of the EMI (600-500) (5213 in comparative example 1 vs 6793 in example 1). This is also the case for the powder of D4. Said comparison of comparative example 1 and example 1 of the patent shows that a significantly reduced DAP (105 s in comparative example 1 vs 86 s in example 1) is achieved when both the vortex parameter and the EMI (600-500) are in the claimed range. The board is of the opinion that Table 3 demonstrates that this improvement is due to the difference in EMI (600-500). Under the circumstances of the case in hand, it is acknowledged that the improvement of a reduced DAP also exists over the powder of D4.

2.5.4 In the same way as outlined above for D1 as the starting point, the objective technical problem is to provide a water-absorbent resin powder having a reduced DAP.

2.5.5 With respect to the question of obviousness, the board is again of the opinion that there is no teaching in D4 or any other document on file concerning the measures which are suitable for achieving a reduced DAP. As a consequence, neither D4 nor any other document on file teaches a skilled person how the problem could be solved; they would not arrive at the claimed combination of features in an obvious manner.

In view of the above, the subject-matter of claim 1 of the main request involves an inventive step over D4 as the closest prior art. The same applies to claims 2 to 9.

2.6 D13 as the closest prior art

The subject-matter of claim 1 differs from the powder disclosed in D13 at least on account of the EMI (600-500) (see comparative example 1 reworking D13 disclosed in the patent). As outlined above, comparing example 1 of the patent (in line with claim 1 of the main request) with comparative example 1 of the patent (which was carried out according to production example 1 and example 1 of D13) shows a significantly reduced DAP. For the same reasons as outlined above for claim 1 of the main request over D1 and D4 as the starting point in the assessment of inventive step, the claimed subject-matter is not obvious over D13 as the closest prior art.

In view of the above, the subject-matter of claim 1 of the main request also involves an inventive step over D13 as the closest prior art. The same applies to claims 2 to 9.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

K. Götz-Wein A. Haderlein

Decision electronically authenticated