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**Datasheet for the decision  
of 23 October 2018**

**Case Number:** T 1291/14 - 3.3.09  
**Application Number:** 04021015.5  
**Publication Number:** 1512712  
**IPC:** C08J3/24, C08K3/34, A61L15/60  
**Language of the proceedings:** EN

**Title of invention:**

Method of producing particle-shape water-absorbing resin material

**Patent Proprietor:**

NIPPON SHOKUBAI CO., LTD.

**Opponent:**

Evonik Degussa GmbH

**Headword:**

**Relevant legal provisions:**

RPBA Art. 12(2), 12(4), 13(1)  
EPC Art. 84, 100(a), 54(2), 56, 100(b), 100(c)

**Keyword:**

Main request: Clarity (No)

First auxiliary request: Added matter (No); Sufficiency of disclosure (Yes); Novelty (Yes); Inventive step (Yes)

**Decisions cited:**

T 2001/12

**Catchword:**



**Beschwerdekammern**

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Case Number: T 1291/14 - 3.3.09

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.09**  
**of 23 October 2018**

**Appellant:**

(Opponent)

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**Decision under appeal:**

**Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
10 April 2014 concerning maintenance of the  
European Patent No. 1512712 in amended form.**

**Composition of the Board:**

**Chairman**

W. Sieber

**Members:**

A. Veronese

E. Kossonakou

## Summary of Facts and Submissions

- I. This decision concerns the appeal filed by the opponent against the interlocutory decision of the opposition division finding that European patent No. 1 512 712 as amended meets the requirements of the EPC.
- II. With its notice of opposition the opponent had requested the revocation of the patent in its entirety on the grounds under Article 100(a) EPC (lack of novelty and lack of inventive step), Article 100(b) and 100(c) EPC.
- III. The documents submitted during the opposition proceedings included:
- E1: WO 01/74913 A1
  - E2: WO 03/002623 A1
  - E3: EP 0 629 411 A1
  - E4: EP 1 113 037 A2
  - E5: EP 1 072 630 A1
  - E6: EP WO 2004/018005 A1
  - E10: EP 0 493 011 A2
  - E13: WO 02/060983 A2
  - E14: English translation of JP 07-053884 A
  - E15: English translation of JP 07-113048 A
  - E16 US 5,096,944 A
  - A2\*: plot of the SFC values indicated in example 1 of the patent; filed by the opponent during the oral proceedings before the opposition division
  - A6: representation of the opponent's understanding of variants of the claimed process
  - B1b: English version of the Japanese Industrial Standard (JIS Z 8703)

B2: English translation of an excerpt from Wikipedia defining "normal temperature".; filed by the proprietor with the letter dated 30 November 2011

IV. The opposition division decided that the proprietor's main request, based on a set of claims filed on 9 January 2014, was allowable. Claims 1, 2, 6, 18 and 20 of this request read as follows:

*"1. A method of producing a particulate water-absorbing resin material, comprising the steps of:*

*(A) performing surface treatment in which surfaces of water-absorbing resin particles are cross-linked by using a cross-linking agent;*

*B) performing a particle-size regulating treatment for the surface-treated particles;*

*C) adding an additive to the surface-treated water-absorbing resin particles; and*

*D) mixing the additive and the surface-treated particles,*

*the method characterized in that:*

*the step (B) is performed by using a rotary particle-size regulating apparatus or a rotary continuous size particle controlling apparatus;*

*and the step (B) and the step (D) are performed within 10 minutes in total".*

*"2. A method of producing a particulate water-absorbing resin material, comprising the steps of:*

*(A) performing surface treatment in which surfaces of water-absorbing resin particles are cross-linked by using a cross-linking agent;*

*(B) performing a particle-size regulating treatment for the surface-treated particles;*

*(C) adding an additive to the surface-treated water-absorbing resin particles; and*

*(D) mixing the additive and the surface-treated particles,  
the method characterized in that:  
agglomerated water-absorbing resin particles are pulverized and classified in the step (B);  
and the step (B) and the step (D) are performed within 10 minutes in total."*

*"6. A method of producing a particulate water-absorbing resin material, comprising the steps of:*

*(A) performing surface treatment in which surfaces of water-absorbing resin particles are cross-linked by using a cross-linking agent;  
(B) performing a particle-size regulating treatment for the surface-treated particles;  
(C) adding an additive to the surface-treated water-absorbing resin particles; and  
(D) mixing the additive and surface-treated particles, the method characterized in that:  
the step (C) is performed at a same time with the step (B); and the step (D) is performed in the step (B)."*

*"18. The method as set forth in any one of claims 1 to 17, wherein: the additive is in a powder form at normal temperature."*

*"20. The method as set forth in any one of claims 1 to 19, wherein: the step (C) includes adding the additive, which is in a powder form at normal temperature, to the surface-treated particles until an amount of the additive is in a range of 0.0001 parts to 100 parts by weight with respect to 100 parts by weight of the surface-treated water-absorbing particles."*

V. The decision of the opposition division can be summarised as follows.

The amendment of the term "room temperature" to "normal temperature" in claims 18 and 20 did not infringe the requirements of Articles 123(2) and 123(3) EPC. The term "normal temperature" was clear (Article 84 EPC).

The feature requiring steps (B) and (D) to be performed within 10 minutes was not so ill-defined as to prevent the skilled person from carrying out the invention. The skilled person would not have contemplated embodiments of the claims which were clearly not feasible and technically meaningless. The same applied to the feature relating to a production rate of "100kg/hr or more". Thus, the claimed invention was sufficiently disclosed.

None of the available documents, and in particular not E1, disclosed a method where steps (B) and (D) were performed within 10 minutes, as required by claims 1 and 2, or where step (D) was performed within step (B) and step (C) at the same time as step (B), as required by claim 6. Thus, the claimed subject-matter was novel.

Starting from the teaching of E1 as the closest prior art, the underlying technical problem was the provision of water-absorbing particles having improved anticaking properties. The experiments reported in the patent showed that this effect was obtained when steps (B) and (D) were carried out within 10 minutes or simultaneously. There was nothing in the prior art hinting at performing these steps in the manner specified in the claims. Thus, the claimed subject-matter involved an inventive step.

VI. The opponent (hereafter "the appellant") lodged an appeal and requested that the decision under appeal be set aside and that the patent be revoked. With the statement setting out the grounds of appeal it filed two new documents:

A8: Wikipedia excerpt relating to "Standard conditions for temperature and pressure"

A9: Experimental report reproducing the tests reported on page 27 of E1.

VII. By letter of 16 October 2014, the appellant presented further arguments and two further documents:

A10: US 2007/0225160 A1

A11: Praxiswissen Verfahrenstechnik; edition M.H. Pahl, 1989, 9 pages.

VIII. By letter of 5 January 2015, the proprietor (hereafter "the respondent") requested that the appeal be dismissed or, alternatively, that the patent be maintained on the basis of one of auxiliary requests 1 to 21 filed with that letter. It further requested that the appellant's letter dated 16 October 2014 and documents A10 and A11 not be admitted into the proceedings. Furthermore, the following documents were filed:

Excerpts 1 to 6: abstracts from various dictionaries

Excerpt 7: Modern Superabsorbent Polymer Technology, ed. F.L. Buchholz *et al.*, WILEY-VCH, 1998, 9 pages.

IX. The set of claims of auxiliary request 1 differs from that of the main request in that claim 18 of the main request has been deleted, and the wording "which is in



a powder form at normal temperature" has been excised from claim 20 (renumbered as claim 19). The remaining claims were renumbered accordingly.

- X. In a communication issued in preparation for the oral proceedings, the board drew the parties' attention to the points to be discussed.
- XI. By letter of 13 September 2018, the respondent presented additional arguments rebutting the appellant's attacks and requested that A8 and A9 not be admitted into the appeal proceedings.
- XII. On 23 October 2018, oral proceedings took place before the board. In the course of the oral proceedings the appellant requested that auxiliary requests 3 to 21 not be admitted into the appeal proceedings. It also stated that it did not intend to pursue any attack based on documents E2-E6 and E10. The respondent confirmed its request not to admit documents A8-A11 into the proceedings, but no longer requested that the appellant's letter of 16 October 2018 be not admitted. At the end of the debate the chairman announced the board's decision.
- XIII. The appellant's arguments, where relevant for the present decision, may be summarised as follows:

The expression "normal temperature" used in claims 18 and 20 of the main request introduced new subject-matter. Furthermore, although this term was used to refer to a standard room temperature, different standards existed, envisaging temperatures spanning from 5 to 35 °C. This fact, proven by A8, B1b and B2, rendered the scope of the claims unclear. Besides that,

an additive could occur in both the powder and the liquid state within such a temperature range.

Claim 19 of the first auxiliary request introduced new subject-matter because it referred to "surface-treated water-absorbing particles" whereas page 63, proposed as basis, defined only "water-absorbing particles".

The feature requiring steps (B) and (D) to be performed within 10 minutes in total was ill-defined. Since the precise nature of these steps was unspecified, it was impossible to determine unequivocally when the 10-minute period was started and completed. Any process causing a change in particle size or particle mixing triggered the start and the end of the 10-minute period. For example, as taught by A10 and A11, pneumatic transportation, used in the process of example 1 of the patent, involved mixing. Furthermore, as shown in A6, the claims encompassed a number of alternative embodiments in which steps (B) and (D) were carried out simultaneously or sequentially. Different approaches could be adopted to establish whether these embodiments fell within the scope of the claims. The patent did not teach how to deal with them. The examples in the patent were also insufficient to prove that the invention could be carried out over the entire time period claimed. The exemplified processes were much shorter in time than the claimed 10-minute period and the observed decrease in saline flow conductivity (SFC) was achieved only in the first few seconds. There was also no evidence that the claimed process could be scaled up industrially, to 100 Kg/h or more, as required by claim 15. Thus, the claimed invention was insufficiently disclosed.

Being ill-defined, the requirement that steps (B) and (D) be performed within 10 minutes did not limit the claimed matter from the teaching of E1. Even if it were considered limiting, the subject-matter of claims 1, 2 and 6 lacked novelty over the process described in the examples on page 27 of E1. Although the duration of this process was not explicitly mentioned in the examples, a mixing step lasting 1 minute was disclosed in pages 11 and 17, where reference was made to mixing times ranging from 1 to 120 minutes. Furthermore A9, which reproduced the process described in the examples of E1 showed that, when superabsorbent particles were mixed with an additive, an initial increase, followed by a decrease in particle size occurred. These changes in particle size amounted to particle-size regulation steps. Thus, when the process described in the examples of A9 was carried out, a mixing step and a size-regulation step occurred simultaneously and within 10 minutes, as required by claims 1, 2 and 6. Furthermore, A9 proved that the claimed process was inevitably performed when a mixing step lasting 1 minute, as defined on pages 11 and 17 of E1, was carried out.

The appellant did not contest the opposition division's decision to select E1 as the closest prior art and to consider the underlying problem as the provision of water-absorbing particles with improved anticaking/ antiblocking properties. In its opinion pages 11 and 17 of E1, which referred to a minimum mixing time of one minute, would have prompted the skilled person to carry out the mixing step within 10 minutes. Particle-size regulation would inevitably have occurred upon mixing. Page 3 of E1 taught that the disclosed product had increased gel permeability. This implied that such a product was less prone to blocking, because a reduction

in blocking was necessarily associated with an improvement in gel-permeation. Thus, the skilled person had an incentive to carry out the invention described in E1 in order to improve the anticaking/antiblocking properties of the water-absorbing particles.

Furthermore, the experiments of the patent did not prove that the claimed matter was inventive over the whole scope. The results of example 10 indicated that the SFC decreased sharply after a few seconds of mixing, but did not change substantially afterwards. Although the blocking rate continued to increase, a combined improvement of gel permeability and anticaking properties was achieved only within a few seconds, but not over the entire 10-minute period. Concerning claim 6, the opponent considered that, since it was evident from A9 that the steps (B), (C) and (D) occurred simultaneously when carrying out the process described in E1, the combination of these steps was also obvious.

XIV. The respondent's arguments, where relevant for the present decision, may be summarised as follows:

The feature "normal temperature" used in claims 18 and 20 of the main request was clear, being equivalent to the wording "room temperature", which meant a temperature of from 20 to 23 °C. Several excerpts from dictionaries (excerpts 1-5) supported this interpretation.

Claim 19 of the first auxiliary request was based on page 63 as filed. It was evident from the teaching of the entire application as filed, that the particles mentioned on this page were "surface-treated".

Relying on the description of the patent, e.g. on paragraphs [0022] and [0088], and on common general

knowledge, the skilled person would have been able to carry out steps (B) and (D) and to determine whether they were performed within 10 minutes. This requirement was not ill-defined. The wording "performed", used in the claims, meant that the steps had to be started and also completed within the given period. This was confirmed by excerpt 6. The skilled person would not have considered illogical constructions of the claims when computing the 10-minute period. In particular, he would not have considered the constructions proposed by the appellant, which were visualised in A6. A 10-minute period could be measured easily using standard means. Pneumatic transportation was extremely rapid. Thus, the process described in example 1 of the patent could not last more than 10 minutes in total. There was no evidence that the claimed process could not be carried out industrially on a scale of 100 Kg/hr or more. Example 1 of the patent and excerpt 7 proved the contrary. There was also no evidence that the claimed process could not be put into practice for a period of 10 minutes. Finally, A2\* revealed that the SFC continued to decrease after expiry of the relevant 10-minute period.

The processes described on page 27 of E1 did not anticipate the claimed subject-matter, the time frame of the two steps of mixing and particle-size regulation not being specified. This time frame could also not be derived from pages 11 and 17 of E1, which referred to a mixing step, but not to a particle-size regulation step. Furthermore, pages 11 and 17 referred to a mixing step lasting from 1 to 120 minutes. There was no suggestion in E1 to combine the teaching of the examples with that on pages 11 and 17, let alone with a selected mixing step lasting 1 minute. The experimental evidence presented by the appellant in A9 was

irrelevant for assessing novelty over E1, representing an *ex-post-facto* analysis based on the knowledge disclosed in the patent. E1 failed to specify the time frame of the experiments described on page 27, as well as the average particle size, the stirring time, the stirring speed and the duration of the addition step. Moreover, the particles used for the tests reported in A9 were not necessarily the same as those which were used in the examples of E1. The duration of the second step disclosed in the examples, which was performed on a rolling bench, was also not taken into account. Beside that, the building up and breaking down of agglomerates occurring upon mixing, which was reported in A9, could not be seen as a step of particle-size regulation. Thus, neither the subject-matter of claims 1 and 2, requiring the steps (B) and (D) to be carried out within 10 minutes, nor of claim 6, requiring the steps (B), (C) and (D) to be carried out simultaneously, was anticipated by E1.

The respondent did not dispute that E1 could be selected as the closest prior art. However, it argued that nothing in the prior art hinted at the concept underlying the claimed invention, namely at reducing the time spent for size-regulating the surface cross-linked particles and mixing them with an additive. The teaching of E1, as well as that of other available prior art documents, was to apply long mixing times, in order to improve the homogeneity of the mixture. This was confirmed by several passages in E1 (e.g. on pages 8, 10, 11, 17, and 32) and in E13-E16. The only example in E1 explicitly mentioning the duration of the mixing step, specified a time of one hour. Thus, the finding reported in the patent that the liquid permeability and anti-blocking properties of the particles could be improved by performing the

size-regulation and mixing steps simultaneously or within 10 minutes was surprising. The changes in SFC and anticaking properties reported in the examples of the patent provided, globally, a clear evidence that the claimed invention prevented damage to the surface of cross-linked particles. Thus, the claimed subject-matter involved an inventive step.

## **Reasons for the Decision**

### *Admission of documents A8-A11 into the proceedings*

1. Documents A8 and A9 were filed by the appellant with the statement setting out the grounds of appeal. Accordingly, they are part of that party's case under Article 12(2) RPBA. A8 is an extract from Wikipedia relating to standard conditions for temperature and pressure. This document was filed to rebut the opposition division's finding that the term "normal" temperature has a clear meaning. A9 is an experimental report aimed at reproducing some tests described in E1. This document was filed to dispute the finding in the appealed decision, that the claimed subject-matter is novel over the teaching of E1.

Since both A8 and A9 were filed as a direct reaction to the decision of the opposition division, the board does not see any reason to exercise its discretion under Article 12(4) RPBA to hold them inadmissible. The fact that A8 was late-published does not change these conclusions, this document merely summarising facts which were well-known before the relevant date.

- 1.1 A10 and A11 were filed by the appellant after the filing of the statement setting out the grounds of

appeal to further substantiate previously presented arguments with regard to sufficiency of disclosure. These documents describe aspects of the physical mechanisms occurring during pneumatic transportation. Since they merely provide information on known technical principles, are not complex in nature, and were filed nearly four months before the respondent's reply to the appeal, the board decided to admit them into the appeal proceedings (Article 13(1) RPBA). Taking into account that A10 was merely filed to point out generally known principles of process technology, the fact that this document was late-published is irrelevant.

*Documents E2 to E6 and E10*

- 1.2 In the statement of grounds of appeal the appellant made a passing reference to documents E1-E6 and E10 which, in its opinion, prejudiced the novelty of the claimed invention. Yet, no explanation as to their relevance was given. These documents were referred to in the course of the opposition proceedings, but the opposition division found that they did not anticipate the claimed subject-matter. Neither in its statement setting out the grounds of appeal nor later during the appeal proceedings did the appellant present reasons why the conclusions of the opposition division were wrong. For these reasons, the board considers that the attacks based on these documents have not been substantiated. Therefore, these attacks, as well as the documents on which they are based, are not part of the appeal case within the meaning of Article 12(2) RPBA and the board does not need to take them into account.



## MAIN REQUEST

### *Clarity*

2. Claims 18 and 20 of the granted patent require that the additive is in a powder form at room temperature. In view of an objection under Article 100(c) EPC, the term "room temperature" was substituted by the original term "normal temperature". According to the respondent, the skilled person equated normal (ordinary) temperature with room temperature, which was usually taken as being around 20°C, typically 20 to 23 °C. Thus, the term "normal temperature" was clear, and the skilled person was able to assess whether an additive was in powder form at that temperature. The excerpts from some dictionaries (excerpts 1-5), as well as the Japanese Industrial Standard supported this view.
- 2.1 The board does not agree. Although the aforementioned excerpts appear to suggest that the terms "room temperature" and "normal (ordinary) temperature" are used synonymously, B1b (Japanese Industrial Standard (JIS) relating to standard atmospheric conditions for testing) and B2 envisage temperatures spanning from 5 to 35 °C, i.e.  $\pm 25^{\circ}\text{C}$ , for performing measurements (page 7 of B1b). B1b and B2 show that normal/ordinary temperature is not necessarily synonymous to a room temperature around 20°C, so that the actual meaning of this term is unclear. Consequently, the introduction of the wording "normal temperature" in claims 18 and 20 of the main request renders the scope of the claimed matter unclear (Article 84 EPC). This request is therefore not allowable.

**FIRST AUXILIARY REQUEST**

3. Auxiliary request 1 differs from the main request in that claim 18 was deleted and in that the expression "...which is in a powder form at normal temperature..." was excised from claim 20 (which was renumbered as claim 19).

***Added matter***

4. Claim 19 of auxiliary request 1 indicates the amount of additive to be added in process step (C). It no longer requires that the additive is in powder form at normal/room temperature as in claim 20 of the main request or claim 20 as granted, respectively. The more general subject-matter of claim 19 derives from page 63 of the application as filed. It is true that, as noted by the appellant, claim 19 refers to "surface-treated water-absorbing particles", whereas page 63 refers to "water-absorbing particles". Yet, it is clear from the teaching of the application as filed that the only particles which are mixed with an additive in order to carry out the invention, are surface-treated water-absorbing particles. Reference is made to page 2, 1<sup>st</sup> paragraph, page 10 last paragraph, claims 1, 2, 6 and the examples described in the application as filed. Accordingly, when reading the application as a whole the skilled person would understand that the particles mentioned on page 63 are surface-treated particles. Thus, claim 19 does not contain subject-matter extending beyond the content of the application as filed (Article 100(c) EPC).

***Sufficiency of disclosure***

*Ill-defined parameter*

5. According to claims 1 and 2 of auxiliary request 1, the steps of particle-size regulation (step B) and mixing (step D) are performed within 10 minutes in the claimed processes. The appellant considered that this requirement was so ill-defined that the skilled person would not have been able to carry out the invention. In fact, the skilled person would not have been in the position to establish what triggered the start and the termination of these steps and how to compute the 10-minute period. Annex A6 proved that different approaches could be envisaged for determining whether the steps were carried out within the required period.
- 5.1 The board cannot agree. Relying on the technical information disclosed e.g. in paragraphs [0022], [0088], in the examples and on common general knowledge, a person with ordinary skills in the art would identify without difficulties which technical steps have to be performed to regulate the size of surface-treated particles and to mix them with an additive. Accordingly, that person would also be able to determine when these steps are initiated and terminated.
- 5.2 Taking into account the idea underlying the claimed invention, which is to minimise the mechanical damage occurring when steps (B) and (D) are performed, that same person would promptly recognise that claims 1-2 require that:

- both steps (B) and (D) have to be started and terminated within 10 minutes, and that the 10-minute period defines the total duration of said steps, and that
- processes in which only a part of the mixing and size-regulation steps occur within a time period of 10 minutes are not foreseen, and that
- if the steps are performed sequentially, any time period possibly elapsing between the end of the first step and the start of the second is not taken into account, and that
- if the two steps are carried out simultaneously, the time in which these steps are performed is counted only once.

5.3 For these reasons, the board considers that the claim interpretation proposed by the appellant, encompassing process variants in which the aforementioned requirements are not fulfilled (depicted e.g. in A6), is far-fetched and illogic.

5.4 The appellant noted that pneumatic transportation was used in some of the tests described in the patent to transport particles through a hopper. Since particle mixing inevitably occurred during transportation and the duration of this step was not specified, it was not clear whether the exemplified processes were performed within the 10-minute period specified in the claims. This also generated uncertainty as to how the invention has to be carried out.

5.5 The board disagrees. Pneumatic transportation is a very fast process, involving gas velocities of about 20 to

40 m/s (see A11). Thus, transportation through the depicted hopper cannot have lasted more than few seconds, and the total duration of the exemplified process cannot have taken more than 10 minutes. The board also considers that, since pneumatic transportation is a well-known technique (discussed e.g. in A10 and A11), the skilled person would take the transportation time into account for computing the relevant 10-minute period when mixing occurs during an actual transportation step.

*Carrying out the process over a time period spanning over 10 minutes*

- 5.6 According to the appellant the patent did not prove that the invention can be carried out over the whole scope claimed, because in the exemplified process the mixing and the particle-size regulation steps lasted only a few seconds, whereas the claims envisage a period of up to 10 minutes. The data reported in A2\* also revealed that a dramatic decrease in saline flow conductivity (SFC) was observed within the first few seconds of mixing, whereas minor changes were observed during the following minutes. This indicated that no effect was attained over the entire time period claimed.
- 5.7 These arguments cannot be followed. As set out in paragraph [0157] of the patent, performing the mixing step (D) and the particle-size regulating step (B) within 10 minutes is found to be a compromise between the wishes of attaining a very uniform mixing (by prolonging the mixing time) and preventing deterioration of the particle properties induced by mixing. There is no evidence on file and the board sees no plausible reason why the steps of mixing and

particle-size regulation cannot not be carried out over a period up to 10 minutes.

- 5.8 As far as the effect on the SFC property is concerned, the board observes that the claims do not require the achievement of any particular technical effect and that lack of sufficiency cannot be questioned on the only ground that a non-claimed technical effect is not achieved (see T 2001/12). Accordingly, these arguments do not prove that the invention cannot be carried out over the whole scope.

*Process on industrial scale*

- 5.9 Lastly, the appellant considered that the patent did not provide sufficient technical information as to how to carry out the invention on an industrial scale, e.g. for processing 100 kg/hr of product or more, as indicated in claim 15. However, as noted by the respondent, the process described in example 1 of the patent is carried out on such a scale. Reference is made to paragraph [0137], referring to a processing rate of 100 kg/hr. The appellant's allegation is therefore unfounded.

- 5.10 For these reasons, the board concludes that the skilled person would be able to carry out the invention and that the requirement of sufficiency of disclosure is fulfilled (Article 100(b) EPC).

**Novelty**

6. As already concluded above in the context of sufficiency of disclosure, the feature requiring "the step (B) and the step (D) to be performed within 10 minutes in total" is not ill-defined. Accordingly, this

feature has to be taken into account when assessing whether the claimed subject-matter is novel over the prior art.

- 6.1 The appellant considered that the process described in the examples on page 27 of E1 anticipated the subject-matter of claims 1 and 2, requiring the step of size regulation (B) and the step of mixing (D) to be carried out within 10 minutes, as well as of claim 6, requiring the step (C) of adding an additive to the particles to be performed at the same time with step (B), as well as the step (D) to be performed within the step (B).
- 6.2 The examples on page 27 of E1 describe a process where:
- 1) a solution of trivalent cations (i.e. an "additive") is added to and mixed with surface-treated superabsorbent particles in powder form, and
  - 2) the resulting mixture is slowly mixed on a rolling bench to break down agglomerates.
- 6.3 The time spent to perform these steps is not specified in the examples. However, relying on A9, a report aimed at reproducing the first step of the process described in E1, the appellant argued that the claimed subject-matter was implicitly anticipated by the process described in this prior art document. The figures in A9 indicated that, after the addition of the additive to the particles and upon mixing for 10 minutes, an initial increase followed by a decrease in the average particle size occurred. According to the appellant, these changes in particle size qualified as "particle-size regulation" steps. Since these steps occurred within 10 minutes and simultaneously with a

mixing step, the process exemplified in E1 fell within the scope of the claims.

6.4 The board has several reasons not to follow the appellant's conclusions. Firstly, the tests reported in A9 were designed with hindsight. The mixing step was in fact purposively conducted for 10 minutes, a time frame which did not necessarily correspond to that which was employed when the experiments described in E1 were carried out. Secondly, in the experiments reported in A9, the additive was added within 5 seconds. Yet, the first measurement which allegedly reveals an increase in particle size was performed after around 30 seconds. Hence, A9 does not clearly and unambiguously prove that a change in particle size had already occurred within the first 5 seconds in which the additive was added. Consequently, it can also not be concluded that the addition step (C) was performed at the same time as the particle-size regulation step (C), as required by claim 6.

6.5 Moreover, neither E1 nor A9 specify the precise nature of the surface-treated particles used for the respective tests. In particular, E1 is silent as to the chemical nature, size and aggregation state of the particles before and after the mixing step. Thus, it is not possible to assume that the phenomena reported in A9 necessarily occurred when the tests of E1 were carried out. In this context, the board also finds it difficult to consider the transient change in particle size reported in A9 as a "particle-size regulation step" as defined in the claims of the opposed patent. The only step disclosed in E1 which could possibly qualify as a particle-size regulation step is the process step, where the mixture obtained after the addition of the additive is slowly mixed on a rolling



bench. This step is separated from the first one and its duration is not specified.

6.6 The appellant also argued that the teaching of the examples described on page 27 of E1 could be combined with that on page 11 (1<sup>st</sup> paragraph) and page 17 (2<sup>nd</sup> paragraph) which refer to mixing times spanning from 1 to 120 minutes. This combination would result in the disclosure of a mixing step lasting 1 minute including, inherently, also the particle-size regulation step revealed in A9. The board cannot follow this reasoning. The teaching of these specific examples cannot, in fact, be freely combined with other specific features (here a mixing time of 1 minute) selected from a separate section of E1 which generally describes how the invention may be carried out. By selecting a time of 1 minute from the range of from 1 to 120 minutes and combining it with the teaching of the examples, a new embodiment is de facto created, which was not clearly and unambiguously disclosed in E1. Furthermore, to follow this line of argument the appellant is still relying on A9 and on assumptions which the board has already refuted as incorrect. Thus, the appellant's conclusions cannot hold true.

For the very same reasons, the passages in the aforementioned pages 11 and 17, mentioning a mixing time of 1 minute cannot, on their own, as suggested by the appellant, anticipate the claimed matter.

6.7 In view of the foregoing, the board concludes that the subject-matter of claims 1, 2 and 6 of auxiliary request 1 is novel over the teaching of E1. Since the remaining claims depend on claims 1, 2, and 6 and define more restricted embodiments, the subject-matter of these claims is also novel (Articles 100(a) and 54(2) EPC).

***Inventive step***

*The gist of the invention and the results reported in the patent*

7. The opposed patent relates to a method for producing a water-absorbing resin material in a particle-shape. The method includes "(B) performing a size regulating step of surface-treated (surface cross-linked) water-absorbing resin particles" and "(D) mixing that particles with an additive". The claimed invention is based on the finding that the surface of the particles is damaged in the course of these manufacturing steps. In order to minimise said damage, the patent proposes to operate the mixing step (D) and the size regulation step (B) within a period of time of 10 minutes (claims 1-2) or simultaneously (claim 6). The patent reports different experiments aimed at demonstrating that the proposed solution is effective.
- 7.1 In example 1 surface cross-linked water-absorbing resin particles and silica particles (an additive) were subjected for 5 seconds to a treatment inducing simultaneous particle-size regulation and mixing. In comparative example 1 the surface cross-linked water-absorbing resin particles were subjected to the particle-size regulation step alone. After the addition of silica particles both types of particles were mixed in a following separate step. A comparison of the results reveals that the product obtained according to the claimed process has improved properties over the product obtained in comparative example 1. The product of comparative example 1 has indeed a lower saline flow conductivity (SFC) and a higher blocking ratio (reflecting caking). The board considers it credible that the observed decrease in SFC and the increase in

blocking ratio are both related to the damage of the surface of the particles, occurring during the mixing and particle-size regulation steps. Accordingly, comparing the observed results the board also considers it credible that particle damage can be minimised by carrying out said steps simultaneously.

- 7.2 In example 10 the surface-treated particles were subjected to a particle-size regulation step (5 seconds). Then silica particles were added and the resulting composition was mixed by rotary stirring mixing. SFC and blocking ratio were determined after 0.2, 1, 3, 10 and 30 minutes of mixing. The results indicate that the SFC progressively decreases and the blocking ratio increases over time.
- 7.3 Relying on annex A2\*, which plots the data from example 10, the appellant observed that the SFC decreases dramatically in the first seconds, but very slowly in the following 30 minutes. In its view, this indicated that the alleged technical advantages cannot be achieved over the whole scope claimed. This argument is not convincing. From annex A2\* it is in fact apparent that the SFC at 30 minutes is significantly lower than that at 10 minutes. This means that stopping mixing at 10 minutes prevents further damages to the particles. Accordingly, the selection of a 10 minutes time frame cannot be considered an arbitrary choice devoid of any technical significance, as suggested by the appellant. Nor demonstrate the data of example 10 that the technical effect is not achieved over the whole scope of the claim. For these reasons, the board considers it credible, that damage to the particles can be minimised carrying out steps (B) and (D) within 10 minutes.

*The closest prior art*

7.4 As the opposed patent, E1 addresses the problem of protecting the surface of water absorbent surface cross-linked particles from damages caused by mechanical stress during manufacturing processes (page 3, paragraphs 3-4 and page 4, paragraph 1). To overcome this problem, E1 proposes to treat the particles with a solution comprising trivalent cations (page 4, second paragraph, the examples and the claims). According to page 4, 3rd paragraph, this process improves the gel permeability and the anticaking properties of the particles.

7.5 Both parties agreed that E1 represented the closest prior art and was a suitable starting point for assessing inventive step. The board does not have any reason to deviate from this choice. The subject-matter of the claims of the first auxiliary request differs from the teaching of E1, in that the aforementioned steps (B) and (D) have to be carried out within 10 minutes or simultaneously.

*The underlying technical problem and non-obviousness of its solution*

7.6 Starting from the teaching of document E1 and taking into account the results discussed above, the technical problem underlying the patent in suit can be formulated as the provision of an alternative method for producing a water-absorbing material in particle form which minimises the damage of the surface of the particles and avoids deteriorations of their properties. For the same reasons already presented in paragraphs 5.1-5.9, 7.1-7.3 above, the board considers that the experiments reported in the patent provide credible evidence that

this problem has been solved over the claimed scope. What needs to be determined is whether the proposed solution, namely carrying out the particle-size regulating and the mixing steps within a limited time or simultaneously, involves an inventive step.

7.7 The board concurs with the respondent that there is nothing in the available prior-art documents hinting at the aforementioned solution. As far as E1 is concerned, mixing times are foreseen of from 1 to 120 minutes. Preferred is a time of "under one hour" (pages 11 and 17). However, at the same time E1 stresses the importance of prolonging the mixing step, in order to maximise the homogeneity of the product (page 8, last paragraph; page 10, last paragraph; page 17, first paragraph). The only example reporting the duration of the mixing step specifies a mixing time of 1 hour (page 32). The other available documents which describe the preparation of water absorbent resins in particle form including mixing with an additive, refer to mixing times of 30 minutes: E13, page 17, example 1; E14, paragraph 22; E15, paragraph 29 and E16, column 8. Furthermore, none of the available prior art documents, let alone E1, contains the slightest suggestion that the duration of the mixing and/or of the particle-size regulation step, is associated with damage to the particles. Consequently, the skilled person seeking a solution to the underlying technical problem would have had no reason to decrease the duration of the mixing and/or of the particle-size regulation step or to carry out these steps simultaneously, in order to limit the time in which the particles are subjected to mechanical stress.

7.8 For these reasons, the board arrives at the conclusion that the skilled person confronted with the underlying

technical problem would not have arrived at the solution defined in claims 1, 2 and 6 of auxiliary request 1. Consequently, the subject-matter of these claims, as well as that of the corresponding dependent claims, involves an inventive step (Articles 100(a) and 56 EPC).

8. In view of these conclusions, the question of whether auxiliary requests 3-21 are to be admitted in the proceedings becomes moot.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of:

-claims 1 to 25 of auxiliary request 1, filed on 05 January 2015,

-description pages 2-23 and figures 1-3 of the patent specification.

The Registrar:

The Chairman:



M. Cañueto Carbajo

W. Sieber

Decision electronically authenticated