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**Datasheet for the decision  
of 22 January 2019**

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**IPC:** B01J20/26, A61F13/53,  
A61L15/18, A61L15/60

**Language of the proceedings:** EN

**Title of invention:**

WATER-ABSORBING AGENT, MANUFACTURE METHOD THEREOF, AND  
ABSORBENT AND ABSORBENT ARTICLE MADE THEREFROM

**Patent Proprietor:**

Nippon Shokubai Co.,Ltd.

**Opponent:**

Evonik Degussa GmbH

**Headword:**

WATER-ABSORBING AGENT/Nippon Shokubai

**Relevant legal provisions:**

EPC Art. 83, 54, 56

**Keyword:**

(Main Request and Auxiliary Requests 1 to 11) Inventive step -  
no - obvious alternative

(Auxiliary Request 12) Inventive step - yes

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
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Case Number: T 1392/15 - 3.3.06

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.06**  
**of 22 January 2019**

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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
8 May 2015 maintaining European Patent  
No. 1701786 in amended form.**

**Composition of the Board:**

**Chairman** J.-M. Schwaller  
**Members:** P. Ammendola  
J. Hoppe

## Summary of Facts and Submissions

I. The appeal was filed by the opponent (as from now "the appellant") against the interlocutory decision of the opposition division maintaining the patent in suit in amended form according to the then pending Main Request, claim 1 of which read as follows:

*"1. A water-absorbing agent, comprising a water-absorbing resin having a crosslinking structure constructed by polymerization of an unsaturated monomer component, wherein the water-absorbing agent is surface-treated, and the water-absorbing agent meets all of properties (1) through (4):*

*(1) heat retention indicator 1 (maximum temperature decrease per minute 5 to 10 minutes after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) is from 0 to 3.0°C/min;*

*(2) a centrifuge retention capacity in a 0.90 wt. % aqueous solution of sodium chloride (30 minute value) is 34 g/g or less;*

*(3) an absorbency in a 0.90 wt. % aqueous solution of sodium chloride against a pressure of 2.0 kPa (60 minute value) is less than 30 g/g; and*

*(4) a saline flow conductivity (SFC) for a 0.69 wt. % aqueous solution of sodium chloride is less than  $20 \times 10^{-7} \text{ cm}^3 \text{ sec/g}$ ."*

II. During the opposition proceedings the patent proprietor (as from now "the respondent") had filed nine sets of amended claims as Auxiliary Requests 1 to 9. Among others, the following documents were referred to:

E3 = WO 02/053198 A1

E5 = WO 02/100451 A2.

III. With its statement of grounds of appeal, the appellant submitted E8 (US 6,143,821 A) and E8A (Experimental Report reproducing Comparative Example 1 of E8) and argued, *inter alia*, that the subject-matter as maintained was insufficiently disclosed, lacked novelty over Comparative Example 1 of E8 and inventive step vis-à-vis E3 or E5, in particular example 16.

IV. With its reply of 28 January 2016 the respondent filed nine claim sets as Auxiliary Requests 1 to 9, identical to those already pending before the opposition division.

In each of the **Auxiliary Requests 1 and 3-9** the wording of claim 1 is identical to that of claim 1 as maintained.

Claim 1 of **Auxiliary Request 2** only differs from maintained claim 1 for the following amendment:

"1. *A water-absorbing agent, comprising a water-absorbing resin having a crosslinking structure constructed by polymerization of an unsaturated monomer component and water-insoluble inorganic fine particles at 0.0001 to 10 wt. % relative to the water-absorbing agent, wherein...*".

V. The respondent filed with letter of 14 December 2016 two further claim sets as Auxiliary Requests 10 and 11.

Claim 1 of **Auxiliary Request 10** results from appending the following wording (corresponding to claim 2 as maintained) at the end of claim 1 as maintained:

*"wherein the water-absorbing agent is particles, and*

*the water-absorbing agent meets following conditions:  
particles having diameters from 600 to 300  $\mu\text{m}$  as specified by sieve classification account for 60 wt. % or more, and those less than 150  $\mu\text{m}$  account for 3 wt. % or less; and  
a standard deviation of logarithm ( $\sigma\zeta$ ) of particle size distribution is from 0.250 to 0.400."*

Claim 1 of **Auxiliary Request 11** only differs from maintained claim 1 for the following amendment:

*"1. A water-absorbing agent, comprising a water-absorbing resin having a crosslinking structure constructed by polymerization of an unsaturated monomer component, wherein  
the water-absorbing agent is surface-treated,  
further comprises water-insoluble inorganic fine particles, besides the water-absorbing resin, and  
the water-absorbing agent meets ...."*

VI. In a communication, the board expressed its preliminary opinion, *inter alia*, that:

- the patent suggested that the successful solution of the addressed technical problem required the water-absorbing agent of the invention to possess the whole set of seven features only recited in the version of claim 1 of the Auxiliary Request 10;
- E8 and E8a did not appear to be novelty-destroying for the subject-matter of claim 1 as maintained;
- E5 appeared to represent the closest prior art in respect of the water-absorbing agent of claim 1 as maintained.

VII. At the oral proceedings, held on 22 January 2019 in the absence of the appellant, in particular inventive step

was discussed starting from E5 as representing the closest prior art. The board drew in particular the respondent's attention to the fact that the patent suggested that the successful solution of the technical problem underlying the invention required the water-absorbing agent to possess the whole set of eight features recited *inter alia*, in [0001]. The respondent filed a new set of claims labelled Auxiliary Request 12, claim 1 of which reads as follows:

- "1. A water-absorbing agent, comprising a water-absorbing resin having a crosslinking structure constructed by polymerization of an unsaturated monomer component, wherein the water-absorbing agent is surface-treated, and the water-absorbing agent meets all of properties (1) through (4):
- (1) heat retention indicator 1 (maximum temperature decrease per minute 5 to 10 minutes after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) is from 0 to 3.0°C/min;
  - (2) a centrifuge retention capacity in a 0.90 wt. % aqueous solution of sodium chloride (30 minute value) is 34 g/g or less;
  - (3) an absorbency in a 0.90 wt. % aqueous solution of sodium chloride against a pressure of 2.0 kPa (60 minute value) is less than 30 g/g; and
  - (4) a saline flow conductivity (SFC) for a 0.69 wt. % aqueous solution of sodium chloride is less than  $20 \times 10^{-7} \text{ cm}^3 \text{ sec/g}$ ,
- wherein the water-absorbing agent is particles, and the water-absorbing agent meets following conditions:
- particles having diameters from 600 to 300  $\mu\text{m}$  as specified by sieve classification account for 60

*wt. % or more, and those less than 150  $\mu\text{m}$  account for 3 wt. % or less;  
a standard deviation of logarithm ( $\sigma\zeta$ ) of particle size distribution is from 0.250 to 0.400; and  
a mass-average particle diameter (specified by sieve classification) is from 400 to 600  $\mu\text{m}$ ."*

Dependent claims 2 to 5 define preferred embodiments of the water-absorbing agent of claim 1, claim 6 defines an absorbent comprising the water-absorbing agent of claims 1 to 5 and claim 7 defines an absorbent article comprising the absorbent of claim 6.

VIII. At the end of the oral proceedings, the chairman established the final requests of the parties to be as follows:

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

The respondent requested that the appeal be dismissed (Main Request), or auxiliary, that the patent be maintained on the basis of one of the following requests in numerical order:

- Auxiliary Request 1 to 9 filed with letter dated 28 January 2016,
- Auxiliary Request 10 or 11, filed with letter dated 14 December 2016, or
- Auxiliary Request 12 filed in the oral proceedings of 22 January 2019.

## **Reasons for the Decision**

1. *Main Request - Inventive step of claim 1*



1.1 The alleged invention

The patent relates to water-absorbing agents to be used in absorbing articles such as diapers. In each of paragraphs [0001], [0022], [0023] and [0026], the specification describes the water-absorbing agent to include the following group of eight specific properties (referred to as **features (a) to (h)** in this decision):

- (a) heat retention indicator 1 (**H.R.I.1**) "*from 0 to 3.0 °C/min*";
- (b) centrifuge retention capacity (**CRC**) of "*34 g/g or less*";
- (c) absorbency against pressure of "*less than 30 g/g*";
- (d) saline flow conductivity (**SFC**) of "*less than  $20 \times 10^{-7} \text{ cm}^3 \text{ sec/g}$* ";
- (e) particles having diameters from 600  $\mu\text{m}$  to 300  $\mu\text{m}$  "*account for 60 wt. % or more*";
- (f) particles having diameters less than 150  $\mu\text{m}$  "*account for 3 wt. % or less*";
- (g) standard deviation of logarithm of particle size distribution ( **$\sigma\zeta$** ) "*from 0.250 to 0.400*", and
- (h) mass-average (weight-average) particle diameter (**D50**) "*from 400  $\mu\text{m}$  to 600  $\mu\text{m}$* ".

1.2 The closest prior art

1.2.1 The board finds that the water-absorbing resin with high absorption capacity suitable as constituent of sanitary materials that is disclosed in Example 16 of E5 (page 77, line 21 to page 78, line 9; in combination with page 77, lines 1 to 12; page 67, lines 10 to 20; page 66, lines 2 to 13 and Table 2) represents the closest prior art for the subject-matter of claim 1.

1.2.2 The board stresses that this prior art resin is structurally very close to those in the examples in the patent, in particular because it is prepared by:

- (i) copolymerising sodium acrylate with polyethylene glycol diacrylate copolymer with  $n=9$  and then pulverising and sieving the obtained product, thereby producing an (intermediate) resin powder "(D)" that is extremely similar to those intermediate resins used in the examples of the patent in suit (compare the preparation of resin powder (D) described on page 67, lines 10 to 20, and page 66, lines 2 to 13 of E5 with [0127] and [0129] of the patent in suit), and then
- (ii) superficially crosslinking such resin powder (D) with polyols (as described in E5 by the combination of from page 77, line 21 to page 78, line 9, with page 77, lines 1 to 12), i.e. a superficial crosslinking very similar to that used in the Examples 1 to 3 of the patent (see from [0131] to [0143]).

Table 2 of E5 also explicitly describes that the superficially crosslinked resin fulfill features (b) and (c) of claim 1 as maintained.

The board considers it appropriate to also mention the undisputed fact that the disclosure of the preparation of the resin powder (D) in E5 implicitly ensures that the final resin also possesses above features (e), (f) and (h): on page 67, lines 10 to 20, D5 discloses that the preparation of resin powder (D) includes sieving out all particles outside the range 600-300  $\mu\text{m}$  (thereby also ensuring the absence of particles  $< 150 \mu\text{m}$ ) and that the obtained particulate have a D50 of 450  $\mu\text{m}$ .

- 1.2.3 The SFC value reported in Table 2 for Example 16 is however  $50 \times 10^{-7} \text{ cm}^3\text{sec/g}$  (i.e. higher than in feature (d) of claim 1) and, of course, E5 does not disclose feature (a), since the parameter H.R.I.1 has been defined for the first time in the patent in suit). Moreover, no  $\sigma\zeta$  value (i.e. feature (g) above) is disclosed in E5.
- 1.2.4 The water-absorbing agent of E3 proposed by the appellant as closest prior art to claim 1 as maintained (i.e. that disclosed in claim 1, page 7, lines 35 to 37, as well as page 4, lines 20 to 34) is instead found to only possess one of the features of claim 1, namely feature (b)). Moreover the minimum SFC value disclosed for E3 is  $80 \times 10^{-7} \text{ cm}^3\text{sec/g}$  (which is more distant than Example 16 of E5 from feature (d) of claim 1). Hence, this prior art is manifestly more remote than that disclosed in E5.
- 1.3 The technical problem addressed in the patent in suit
  - 1.3.1 From paragraphs [0013], [0018] and [0019], it is apparent that the technical problem addressed in the patent is the provision of water-absorbing agent with improved "*heat retention*" but retaining "*a required level of absorption performance*", so as to reduce the discomfort (felt by the wearer of absorbent-containing articles) that is due in particular to the "*the feel of cold gel*" and to "*stickiness due to seeping liquid*".
  - 1.3.2 However, in the conviction of the board, it is self-evident to the skilled person that the skin of the wearer of e.g. an incontinence pad might also be in prolonged direct contact with the fluid (for example, liquid leaking out from the absorbent). Therefore, it is apparent that the "*cool feel*" perceived by the

wearer may not necessarily be limited to that caused by the contact of the wearer's skin with the "cold gel", but rather also possibly (or even mostly) be the "cool feel" caused by the prolonged skin's contact with liquid that seeps/leaks out from the gel or that is not yet absorbed (e.g. in case the absorption rate is very slow).

- 1.3.3 That this also is the kind of wearer's discomfort that the patent in suit states to have reduced is evident from the patent itself, since:
- according to the test results reported in Table 2, the highest level of discomfort ("*Evaluation levels*" 1 or 2) is observed for absorbing agents that showed "*leaks*" and/or were "*wet*", thereby also implicitly confirming the impossibility for the wearer to separately evaluate the "*feel of cold gel*" from the "*cool feel*" caused by the skin's direct contact with unabsorbed liquid (leaking/seeping out from the gel or not yet absorbed);
  - also the description of the wearer's discomfort in [0012] refers explicitly to "*the 'cool feel'*" of the wearer in general (rather than exclusively to the "*feel of cold gel*" as in [0019]), and
  - as indicated above, the description of the advantages of the invention in [0013] explicitly mentions the importance to also obtain (in addition to "*high heat retention*") "*a required level of absorption performance*".

- 1.3.4 The board therefore concludes that the skilled reader of the patent immediately understands that the discomfort that the alleged invention aims to reduce is also that due to the "cool feel" of the wearer, as mentioned in [0012], i.e. the "cool feel" that can result from the contact of the wearer's skin with the

"cold gel" as well as with unabsorbed liquid (e.g. in case of seeping/leaking out from the absorbing agent or too slow absorption).

1.3.5 For the board, it follows that the technical problem underlying the patent is to provide a water-absorbing agent for absorbent articles that reduces in particular the "cool feel" that causes discomfort to the wearer.

1.4 The proposed solution

According to claim 1 as maintained, the solution to this problem is a water-absorbing agent comprising a crosslinked water-absorbing resin obtained by polymerisation of an unsaturated monomer and displaying the features (a) to (d).

1.5 Lack of success of the proposed solution

1.5.1 The respondent argued that the wording of claim 1, as well as the teachings in the patent relating to the achieved high heat retention and even the experimental data reported in Table 2 of the patent rendered apparent that the technical problem was indeed solved across the whole scope of claim 1, because all embodiments of the claimed absorbing agent were required to possess the low H.R.I.1 value indicated in feature (a).

1.5.2 The board notes however that in this reasoning the respondent is only convincing for the aspect of the technical problem relating to the reduction of the "*feel of cold gel*". Indeed, the new parameter H.R.I.1 of this feature results from the measurement under certain conditions of the (superficial) heat retention of the gel formed when (a certain amount of) warm water

is absorbed by (a certain amount of) the resin and then rapidly cooled (see [0120] to [0123] and Figure 1 of the patent).

Instead, as discussed above, it is self-evident that the reduction of wearer's discomfort that the patent attributes to the water-absorbing agent of the alleged invention is that provided by reducing in general the wearer's "cold feel" and, thus, requires to also reduce (in addition to the "feel of cold gel") the possible presence of liquid leaking out from the gel or which is too slowly adsorbed.

Hence, it is also of particular relevance that the patent, on the one hand, repeatedly defines the water-absorbing resin of the invention in terms of the whole group of the eight features (a) to (h) and, on the other hand, also explicitly describes (in addition to the teachings focusing on the heat retention and the H.R.I.1 parameter) how the features (b), (c) and (e) to (h) (also) contribute in limiting leaks and/or a too slow liquid absorption (see e.g. the passages in [0082] and [0083] defining as "not suitable" the drop in absorption rate caused by particle sizes and their distribution not in accordance with features (e) to (h); the mention at the end of [0085] that liquid may leak from the absorbent if the CRC is above the maximum value of 34 g/g set in feature (b); the passage in [0087] also linking feature (c) to the prevention of leaks). Also the data in Table 2 implicitly confirm that the perceived wearer's discomfort does not correlate exclusively to the measured H.R.I.1 value. For instance, the two comparative examples 12 and 15, despite being based on absorbents displaying the same H.R.I.1 value (C.ex.3 and C.ex6 of Table 1), are perceived as offering substantially different levels of

discomfort, and symmetrically, the comparative examples 12 and 16 are perceived as offering substantially similar levels of discomfort although being prepared from absorbents with substantially different H.R.I.1 (C.ex.3 and C.ex.7 of Table 1).

1.5.3 Accordingly, the skilled person reading the whole patent specification finds described therein that the water-absorbing agent of the invention possessing the whole set of eight features (a) to (h) not only displays a low heat retention of the gel, but also achieves a level of absorption performance sufficient at preventing leaks and a too slow liquid absorption, and, therefore, also allow to reduce (all possible sources of) the "cool feel" producing discomfort to the wearer of absorbent articles.

1.5.4 However, claim 1 at stake only recites the four features (a) to (d). This contradiction between claim 1 and the patent specification renders unplausible that already the combination of features (a) to (d) only, (as recited in claim 1) or even just feature (a) *per se* (as argued by the respondent), might be sufficient at ensuring that all embodiments of the water-absorbing agent of claim 1 as maintained might successfully solve the posed technical problem. In other words, the patent itself confirms that the subject-matter of claim 1 at issue encompasses water-absorbing agent which, despite possessing features (a) to (d), do not provide any reduction of the cool feel perceivable by the wearer's skin (because of the presence of unabsorbed liquid e.g. leaking out from the already cold gel or cooling down before or being absorbed).

1.5.5 Accordingly, the board concludes that the technical problem is not plausibly solved across the whole ambit

of claim 1 as maintained; therefore it should be reformulated.

1.6 Redefinition of the technical problem underlying the alleged invention

Even upon considering that the actual nature of the measuring protocol created by the inventors of the patent in suit for determining the H.R.I.1 value renders it plausible that feature (a) of claim 1 also necessarily implies that a water-absorbing agent with that feature must also be able to display a certain minimum level of absorption, still this latter cannot possibly be expected to be comparable to (not to mention better than) that of the closest prior art. Moreover, it is undisputable that, as stressed by the appellant, all the other features of claim 1 (i.e. features (b) to (d)) only imply limitations as to the maximum of absorption and not as to its minimum. Hence, the only technical problem vis-à-vis the closest prior art that can plausibly be solved across the whole scope of claim 1 is the provision of further water-absorbing agent, i.e. the provision of an alternative to the prior art, even possibly displaying a level of absorption substantially worse than that of Example 16 of E5.

1.7 Obviousness of the solution

1.7.1 It is apparent to the board that a skilled person is familiar with the steps of polymerising acrylic monomers and then pulverising, possibly sieving and finally superficially crosslinking the obtained acrylic resin, that are conventionally used in the preparation of water-absorbing agents. These also are the



preparatory steps used in E5 for producing the water-absorbing agent of Example 16.

The board finds therefore that the skilled person can predict or rapidly identify (with a very limited amount of experimental work) many limited modifications of the method used in the preparation of Example 16 of E5 that result in a further water-absorbing agent and, therefore, represent manifestly obvious solutions to the problem of providing an alternative to the prior art.

- 1.7.2 It is evident from the whole patent disclosure that the four features of the water-absorbing agent of claim 1 also are the result of an appropriate selection of the starting ingredients and the conditions of polymerisation, crushing/pulverisation and possible sieving (used for producing the intermediate resin) as well as of the kind of superficial crosslinking and the extent of this latter (which on its turn also depends on the particle dimensions and their distribution in the intermediate resin).

The board stresses that it is not even alleged, let alone proven, in the patent that any of the steps required for producing the subject-matter of claim 1 requires totally new or unconventional operational conditions.

The patent also does not qualify the features (b) to (d) of claim 1 (i.e. those relating to parameters already conventionally used for characterising water-absorbing agents) as a combination of features that is new or particularly difficult to obtain.

Therefore, the board, considering the similarity between the preparation of Example 16 of E5 and that used for preparing the examples of the invention in the patent in suit, is convinced that limited modifications of the method used to prepare this prior art are also sufficient for obtaining resins which possess all the features (a) to (d).

In this respect, the respondent has presented no argument possibly implying the contrary.

- 1.7.3 The board notes in addition that even the teaching of E5 (see page 7, lines 23 to 24) pointing at a minimum of SFC of not less than  $20 \times 10^{-7} \text{cm}^3 \text{sec/g}$  - whereas feature (d) of claim 1 requires precisely "*less than  $20 \times 10^{-7} \text{cm}^3 \text{sec/g}$* " - does not lead away from the limited modifications of the method used in the preparation of Example 16 of E5 that result in the subject-matter of claim 1. Indeed, while the prior art in E5 clearly aims at achieving a high absorption performance, the subject-matter of claim 1 at stake does not aim at keeping such high absorption performance. Hence, the teaching in E5 as to a minimum SFC will be disregarded by the skilled person only aiming at solving the redefined technical problem.
- 1.7.4 Hence, to solve the redefined technical problem so as to arrive at the subject-matter of claim 1 only implies an arbitrary selection (deprived of any inventive merit) among all the (equally) obvious modifications of the method used in E5 for preparing Example 16.
- 1.7.5 The board concludes therefore that no inventive step is required from the skilled person - who is starting from Example 16 of E5 and aims at solving the (reformulated) technical problem of providing further water-absorbing

agents even with low absorption performance - to arrive at the limited modifications of the prior art resulting in the subject-matter of claim 1.

- 1.8 The board concludes that the subject-matter of claim 1 as maintained represents an obvious alternative to the prior art and, therefore, does not involve an inventive step (Article 56 EPC). Accordingly, the Main Request must be refused.

2. *Auxiliary Requests 1 to 11*

2.1 Admissibility

As these requests underlie the appealed decision (see point IV above), they were already part of the opposition proceedings.

As regards the admissibility of auxiliary requests 10 and 11, which has not been objected by the appellant, the board is of the opinion that since the amendments carried out in these requests do not increase the complexity of the case, they are admitted into the proceedings under Article 13(1) RPBA.

2.2 Auxiliary Requests 1 and 3 to 9: inventive step

In each of these requests the wording of claim 1 being identical to that of claim 1 as maintained, the above reasoning as to why the Main Request is found to contravene Article 56 EPC applies identically to each of these requests, which therefore are refused either.

3. Auxiliary Request 2, 10 and 11: inventive step

3.1 The technical problem solved

The versions of claim 1 in Auxiliary Requests 2, 10 and 11 provide definitions of the water-absorbing agent that are different from that given in claim 1 as maintained. However, in none of these requests, the subject-matter of claim 1 is required to possess all the eight features (a) to (h) mentioned above. Hence, for each of these three requests there exists the same contradiction (between the teaching of the patent description and the claim features) that the board has already found rendering unplausible the successful solution of the technical problem across the whole ambit of claim 1 as maintained.

Thus, the subject-matter of each version of claim 1 of of the Auxiliary Requests 2, 10 and 11 is found to only have plausibly solved the same redefined technical problem already identified above, i.e. the provision of an alternative to the prior art.

3.2 Obviousness of the solutions offered in claim 1 of Auxiliary Requests 2, 10 and 11

The solutions to the redefined technical problem proposed in each of these three versions of claim 1 are obvious for substantially the same reasons given above for claim 1 as maintained when additionally considering the following arguments:

3.2.1 As to claim 1 of Auxiliary Requests 2 and 11, these two versions of claim 1 differ from claim 1 as maintained essentially because each of the former requires the additional mandatory presence of water-insoluble inorganic fine particles. However, a limited presence of water-insoluble inorganic fine particles is conventional in the water-absorbing agents of the prior art, as already apparent from the fact that the patent

itself does not consider it necessary to provide any indication as to the nature of such water-insoluble inorganic fine particles (that are only briefly mentioned in the granted patent as optional ingredients in [0023], [0026] and [0091]). Moreover, E5 (paragraph bridging pages 39 and 40) itself mentions explicitly the presence of water-insoluble inorganic fine particles in an amount of up to 10 wt.% of the absorbing agent.

3.2.2 Hence, also the addition to the closest prior art of such conventional ingredients, also in the specific amounts described claim 1 of the Auxiliary Request 2, only implies a further arbitrary choice among the conventional options available to the skilled reader of E5 for providing an alternative to the prior art of departure. Hence, no inventive step is required to arrive at the additional presence of water-insoluble inorganic fine particles as required in claim 1 of Auxiliary Request 2 or 11.

3.2.3 As to claim 1 of Auxiliary Request 10, this claim results from the combination of claims 1 and 2 as maintained and thus, differs from claim 1 as maintained (which already contained features (a) to (d)) in that it additionally requires the claimed water-absorbing agent to display features (e) to (g) (i.e. those relating to the particle dimensions and their distribution).

Hence, the assessment of inventive step for claim 1 of Auxiliary Request 10 differs from that already discussed for claim 1 as maintained, essentially because the modifications of the prior art necessary in order to arrive at the subject-matter of claim 1 under

consideration are those that results in the seven features (a) to (g).

However, the board stresses again that many limited modifications of the method used in the preparation of Example 16 of E5 may be predicted to result in a further water-absorbing agent and, therefore, represent manifestly obvious solutions to the problem of providing an alternative to the prior art.

Moreover, in the absence of any teaching in the patent (or even any argument of the respondent) implying the contrary, the similarity between the preparation of Example 16 of E5 (which as discussed above possesses already at least features (b), (c), (e), (f)) renders plausible that limited modifications of the operational conditions used to prepare this prior art are also sufficient to produce a water-absorbing resin with the features (a) to (g).

Hence, also to solve the redefined technical problem so as to arrive at the subject-matter of claim 1 of Auxiliary Request 10 only implies an arbitrary selection (deprived of any inventive merit) among all the (equally) obvious ways to solve the redefined technical problem by limited modifications of the method used in E5 for preparing Example 16.

The board finds therefore that no inventive step is required to the skilled person - who is starting from Example 16 of E5 and aims at solving the (reformulated) technical problem of providing further water-absorbing agents even with low absorption performance - to arrive at the limited modifications of the prior art resulting in the subject-matter of claim 1 of Auxiliary Request 10.

3.3 The board concludes therefore that the subject-matter of claim 1 of Auxiliary Requests 2, 10 and 11 represent obvious alternatives to the closest prior art and, therefore, do not involve an inventive step (Article 56 EPC). Auxiliary Requests 2, 10 and 11 must therefore be refused either.

#### 4. *Auxiliary Request 12*

##### 4.1 Admissibility

This request was filed at the oral proceedings in reaction to the consideration by the board at the hearing that the patent specification suggested that the successful solution of the posed technical problem required the water-absorbing agent of the invention to possess the whole set of eight features (a) to (h).

As claim 1 of this request results from the combination of granted claim 1 with granted claims 2 and 6 (dependent on claims 1 and 2), and recites the required eight features (a) to (h), the amendments made to auxiliary request 12 clearly overcome the objection raised by the board at the hearing without raising further issues, therefore it is admitted into the proceedings under Article 13(3) RPBA.

##### 4.2 Sufficiency of disclosure (Article 83 EPC)

4.2.1 From the two objections, listed as "i)" and "ii)" on page 6 of the statement of grounds of appeal, only objection "i)" is still of relevance for the subject-matter of claim 1 of Auxiliary Request 12. Objection ii) concerned a process no longer claimed.

- 4.2.2 According to objection i), the patent at most enabled the skilled person to prepare water-absorbing agents having a H.R.I.1 from 2.2 to 3.0 °C/min and, thus, it lacked information how to obtain a water-absorbing agent with a H.R.I.1 of from 0 to less than 2.2 °C/min. In the appellant's opinion, as long as the claim encompassed the impossible value for H.R.I.1 of 0 °C/min, there was an insufficient disclosure of claimed subject-matter. Moreover, the data in Table 1 of the patent would allow to predict the impossibility of preparing water-adsorbing resins with H.R.I.1 of less than 2.2°C/min (see also the grounds of appeal, from the lower half of page 9 to the top of page 11).
- 4.2.3 For the board, the impossibility of reproducing a water-absorbing agent with an H.R.I.1 of 0 °C/min is self-evident to the skilled reader since such a value is impossible to achieve (already because the measure of this parameter is made on a water-adsorbing resin swollen with water, and thus on an aggregation of matter that inevitably exchanges heat). As it is self-evident that such water-absorbing agents do not exist, insufficiency of disclosure cannot be an issue for the skilled person.
- 4.2.4 As to the alleged impossibility of reproducing other water-absorbing agents with a H.R.I.1 of less than 2.2 °C/min (this is the lowest H.R.I.1 value reported in Table 1 of the patent), the board stresses that an objection of insufficiency of disclosure needs to be based on serious grounds supported by verifiable facts. In the present case no evidence of failed attempts in reproducing embodiments with a H.R.I.1 of less than 2.2 °C/min have been submitted.



4.2.5 Instead, the board is convinced from the examples or the disclosure in par. [0021] and [0080] to [0086] of the patent, that also the H.R.I.1 value, similarly to the other parameters of features (b) to (h), depends essentially on the particle size distribution and the extent of superficial crosslinking. As already mentioned above the steps of polymerising acrylic monomers and then pulverising, possibly sieving and finally superficially crosslinking the obtained acrylic resin, are conventionally used in the preparation of water-absorbing agents suitable e.g. for diapers. Hence, it is not only of relevance the guidance as to how to carry out the crushing, sieving and crosslinking steps provided by the patent in suit, but also that deriving from the common general knowledge on the conventional preparation methods of this kind of water-adsorbing resins. Thus, the board sees no reason to expect that an undue amount of experimental work is necessary to identify further modifications of the operational conditions used in the crushing, sieving and crosslinking steps of e.g. example 3 of the patent in suit that result in a further substantial reduction of the H.R.I.1 value.

4.2.6 The board therefore concludes that the above objection is not convincing. The claims of Auxiliary Request 12 are therefore found to comply with Article 83 EPC.

#### 4.3 Novelty (Article 54 EPC)

The appellant only objected to the novelty of the subject-matter of claim 1 as maintained on the basis of the experimental report E8A for a sample prepared in accordance with Comparative Example 1 of E8.

However, since neither E8 nor E8A disclose the features (e), (g) and (h), mandatory in claim 1 of Auxiliary Request 12, its subject-matter - and by the same token that of claims 2 to 7 which depend on claim 1 - is novel over the known prior art, and thus meets the requirements of Article 54 EPC.

#### 4.4 Inventive step (Article 56 EPC)

4.4.1 The reasons given above (points 1.2 and 1.3) in respect of claim 1 as maintained that justify the conclusions that Example 16 of E5 represents the closest prior art and that the technical problem is that identified at point 1.3.5 apply identically to claim 1 of this request.

#### 4.4.2 The proposed solution

According to claim 1 at stake, the solution to said technical problem is a water-absorbing agent comprising a crosslinked water-absorbing resin obtained by polymerisation of an unsaturated monomer and displaying the features (a) to (h).

#### 4.4.3 Success of the solution

As the breadth of claim 1 of this request corresponds to the teaching of the patent description that the whole set of eight features (a) to (h) have been found to contribute to the solution of the posed technical problem, the board has no reason to expect that this latter is not solved across the whole ambit of claim 1.

#### 4.4.4 Obviousness of the proposed solution

Neither in the decision under appeal nor in the grounds of appeal is identified any prior art dealing with said technical problem. Hence, there exists no prior art suggesting to the skilled person the possibility to solve such a problem by modifying the preparation conditions used in Example 16 of E5 so as to obtain a water-absorbing resin possessing all the features (a) to (h) required in claim 1 under consideration. Hence, the available prior art does not render obvious the solution as described in claim 1 at issue.

Therefore it is concluded that the subject-matter of claim 1 of Auxiliary Request 12 - and by the same token that of claims 2 to 7 which depend on claim 1 - involves an inventive step (Article 56 EPC).

4.5 Hence, the set of claims 1 to 7 according to the Auxiliary Request 12 is found to comply with the EPC.

## 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 in amended form on the basis of claims 1 to 7 of auxiliary request 12 filed during the oral proceedings of 22 January 2019 and a description to be adapted where appropriate.

The Registrar:

The Chairman:



D. Magliano

J.-M. Schwaller

Decision electronically authenticated