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**Datasheet for the decision
of 8 June 2011**

Case Number: T 1114/07 - 3.3.07

Application Number: 99400837.3

Publication Number: 0948997

IPC: B01J 20/26

Language of the proceedings: EN

Title of invention:

Manufacturing method of absorbent resin

Patentee:

NIPPON SHOKUBAI CO., LTD.

Opponent:

BASF SE

Headword:

-

Relevant legal provisions:

EPC Art. 56, 123

EPC R. 80

RPBA Art. 13

Relevant legal provisions (EPC 1973):

EPC Art. 54(1)(2), 84

Keyword:

"Novelty (no) - Main Request"

"Admissibility (yes) - First Auxiliary Request"

"Amendments - Allowable (yes) - First Auxiliary Request"

"Novelty (yes) - First Auxiliary Request"

"Inventive step (no) - Obvious solution - First Auxiliary
Request "

Decisions cited:

T 0197/86, T 1168/00

Catchword:

-



Case Number: T 1114/07 - 3.3.07

D E C I S I O N
of the Technical Board of Appeal 3.3.07
of 8 June 2011

Appellants: BASF SE
(Opponents) D-67056 Ludwigshafen (DE)

Representative: -

Respondents: NIPPON SHOKUBAI CO., LTD.
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
on 27 April 2007 maintaining European patent
No. 0948997 in amended form.

Composition of the Board:

Chairman: J. Riolo
Members: G. Santavicca
D. Keeling

Summary of Facts and Submissions

I. The appeal by the opponents lies from a decision rejecting their opposition against European patent n° 0 948 997.

II. The patent was granted on European application n° 99 400 837.3 and comprised 10 claims, Claim 1 reading as follows:

"1. A manufacturing method of an absorbent resin comprising
a drying step of drying hydrogel of a crosslinked polymer to obtain a product;
a pulverizing step of pulverizing said product, characterized by further comprising
a separating step which is selected from the group consisting of:
(a) when an agglomerating type dryer is used in the drying step, disintegrating aggregates of the product and then separating out those particles having a particle size exceeding 50 mm, preferably a particle size exceeding 5 mm, as an incompletely dried material; and
(b) when a non-agglomerating type dryer is used in the drying step, separating the product so as to separate out those particles having a particle size exceeding 50 mm, preferably a particle size exceeding 5 mm, as an incompletely dried material."

III. The patent was opposed on the grounds that its claimed subject-matter was insufficiently disclosed (Article 100(b) EPC) and lacked novelty and an

inventive step (Article 100(a) EPC) having regard to the following documents:

- D1: EP-A-0 497 623;
- D2: Cassella AG, "Genehmigungsantrag" of 30 October 1991 (including copy from "Staatsanzeiger für das Land Hessen", 08/1992, published on 24 February 1992");
- D3: Research Disclosure, RD 38942 (publication 09/1996);
- D4: "Modern Superabsorbent Polymer Technology", ISBN 0-471-19411-5, pages 45, 87-89, 92-93, 141-143, Wiley-VCH (Including confirmation by Wiley&Sons of 29 September 2004, concerning the publication date of D4, i.e. 11 November 1997);
- D5: JP-A-05 310 806 (including an English translation).

IV. According to the decision under appeal:

- (a) Since Claim 1 as granted did not specify exactly when in the context of the drying process the separation step took place, Claim 7 was a true dependent claim of Claim 1. There were several modes for the separation step, the pneumatic dryer representing one of them, in which a disperser was to be included if the material agglomerated, or agglomeration should be prevented by adding a surfactant. In any case, the insufficiently dried particles would not clog the pulveriser. Thus, the separation step took place either before (alternative (a)) or during (alternative (b)) the pulverisation step. Therefore, the ground under Article 100(b) EPC failed.
- (b) As regards novelty of the subject-matter of Claim 1, the mention in D1 that a removal step of

the undried particles was not necessary, because the method of D1 produced particles being uniformly dried for the purpose of pulverisation, was not a disclosure of the presence of a separation step. Thus, the arguments relating to the inherent particle size of the particles of D1, which were incompletely dried and thus needed to be separated, were irrelevant. As to D4, Section 3.2.6 dealt with handling of already dried material, so that the separation of incompletely dried material was not disclosed. Finally, D2 represented only a partial disclosure, as not all the drawings had been provided, let alone any information about the functioning of the operational units to which reference was made, from which it could not be concluded that a process involving a separation of dried from incompletely dried material of a given size was disclosed. Therefore, the claimed subject-matter was novel.

- (c) As to inventive step, D2 and D3 were the only documents describing classification of dried material, although none of them described the separation of the incompletely dried material from the dried material. D2, which belonged to the same field of the patent in suit (manufacturing of SuperAbsorbentPolymers), rather than D3 (which did not mention SAPs), was the closer prior art document. The problem to be solved was to efficiently dry and pulverise SAPs such that the final product had certain given qualities. The solution, consisting in separating out the incompletely dried material, could not be found in any of the further documents cited. D1 taught away

from separation altogether, D4 described treatment of dried material and D5 dealt with reducing the residual monomer fraction whilst making available particles of uniform size. Thus, the claimed solution was regarded as being non-obvious.

(d) Therefore, none of the grounds of insufficiency of the disclosure, lack of novelty and lack of an inventive step prejudiced the maintenance of the patent as granted.

V. In their statement setting out the grounds of appeal, the appellants enclosed a more complete copy of D2 as well as a copy of a further document (D6) (DIN 28004 Teil 4, Ausgabe Mai 1977). Also, they raised the objection that the decision under appeal was based on reasons that had neither been brought to the attention of the opponents nor discussed during the oral proceedings before the Opposition Division, i.e. on which the opponents had had no possibility of being heard, so that a substantial procedural violation pursuant to Rule 103(2) EPC, which deserved the reimbursement of the appeal fee, underlay the decision.

VI. The patent proprietors (respondents) countered the objections raised in the statement setting out the grounds for appeal by letter of 7 March 2008.

VII. In response to a communication of the Board in preparation for the oral proceedings, in which the issues to be debated and decided had been indicated:

(a) the appellants maintained their requests and submitted further arguments in support of the lack of an inventive step over D2, D3, D1 and EP-A-0 508 810 (D0) (letter of 2 May 2011);

(b) the respondents enclosed a set of amended claims as their First Auxiliary Request, to deal with the ground of lack of novelty over D4 (letter of 4 May 2011).

VIII. Oral proceedings were held on 8 June 2011. After the debate on the novelty of the method of Claim 1 as granted (Main Request) over D4, the respondents filed a fresh First Auxiliary Request, to replace that filed with letter of 4 May 2011. Then, the admissibility and the allowability, *inter alia* the inventive step of the method of Claim 1, of the fresh First Auxiliary Request was debated. The appellants withdrew their request for reimbursement of the appeal fee. At the end of the oral proceedings, the decision was announced.

IX. Claim 1 of the First Auxiliary Request filed during the oral proceedings read as follows (compared to Claim 1 as granted, added features are indicated in bold and deleted features in strike-through):

"1. A manufacturing method of an absorbent resin comprising
a drying step of drying hydrogel of a crosslinked polymer to obtain a product;
a separating step of separating from said product incompletely dried product contained in the product and whose water content exceeds 15 wt.%; and
a pulverizing step of pulverizing said product, **from which the incompletely dried product was separated,**
~~characterized by further comprising~~
~~a~~ **the** separating step ~~which is~~ **being** selected from the group consisting of:

- (a) when an agglomerating type dryer is used in the drying step, disintegrating aggregates of the product and then separating out those particles having a particle size exceeding 50 mm, preferably a particle size exceeding 5 mm, as an incompletely dried material; and
- (b) when a non-agglomerating type dryer is used in the drying step, separating the product so as to separate out those particles having a particle size exceeding 50 mm, preferably a particle size exceeding 5 mm, as an incompletely dried material."

X. The appellants essentially argued as follows:

Main Request (Patent as granted)

Lack of Novelty

- (a) Claim 1 as granted did not specify the order of the steps of the claimed manufacturing method, so that the separating step could be carried out as desired. This fact, on which the dependency of Claim 7 on Claim 1 was based, had been confirmed in writing in the opposition as well as in the appeal proceedings by the respondents themselves. Hence, the method of Claim 1 encompassed any order of the steps therein defined and was based on the known fact that coarser particles did not dry as quickly as smaller particles. That the fact was known could be gathered from D4, which dealt with manufacturing of SAPs and *inter alia* disclosed that even after the drying step the water content of the particles was as high as up to 5 wt.%, so that the feature of Claim 1 "incompletely dried" was not distinguishing.

Also, since the final product of D4 should have a particle size of from about 200 to 800 micrometers, a combination of drying (with final product breaker), pulverizing and screening steps was disclosed, whereby the oversize particles, i.e. those coarser than 800 micrometers, were separated and recycled. The separation of the particles coarser than 800 micrometers meant that also the particles of 5 and 50 mm size were separated. On the other hand, in the examples of the patent in suit, the respondents did nothing more than what was described in D4, e.g. separation of particles on sieves of 10 mm and 0.85 micrometers. Therefore, the manufacturing method defined in Claim 1 as granted was not novel over that described in D4.

First Auxiliary Request

Non admissibility of the respondents' amended case

- (b) The First Auxiliary Request submitted during the oral proceedings before the Board was too late filed. D4 had been extensively analysed in the statement setting out the grounds of appeal and dealt with in the communication by the Board in preparation for oral proceedings, in reaction to which the proprietors filed the previous First Auxiliary Request. The fresh First Auxiliary Request furthermore contained features taken from the description and it was not apparent that it was clearly allowable. Therefore, the fresh request should not be admitted into the proceedings.

Amendments

- (c) The basis for the order of the steps as defined in Claim 1 of the First Auxiliary Request was not apparent (Article 123(2) EPC). Nevertheless, the appellants refrained from raising further objections in order to arrive at the discussion of inventive step.

Novelty

- (d) No objections were raised.

Closest prior art

- (e) D1 described the closest prior art, as it belonged to the same applicants and dealt with the same technical field, i.e. manufacturing of SAPs. In particular, also D1 mentioned that particles coarser than 10 mm could not pulverized and should either be removed or dried longer. Hence, D1 like the patent in suit addressed the problem of preventing stoppage of the pulverizer.

Problem solved

- (f) No improvement over D1 had ever been shown by evidence. Also, the manufacturing method of D1 aimed at improving the manufacturing methods as defined in Claim 1 in suit, which included a separation step. That the extruder of D1 was energy consuming was not contested, as were however also the operations of longer drying or separation.

Consequently, the problem solved was to provide a further manufacturing method.

Obviousness of the solution

- (g) It was apparent from the results of examples and comparative examples (controls) of D1, summarized in Table 1 of D1, that a longer drying of the coarser particles led to disadvantages, such as an increased amount of fines. Hence, for the skilled person, the choice of separation of coarser particles, specifically mentioned in D1, was an obvious alternative.

XI. The respondents argued essentially as follows:

Main Request

Novelty

- (a) Whatever order of the steps for the manufacturing method was defined in Claim 1 as granted, D4 concerned the treatment of dried material, not the separation of incompletely dried material from dried material. In Claim 1 as granted the size of the particles to be separated was identified because it was related to the water content, i.e. coarser particles had a higher amount of water. As mentioned in the patent in suit, the purpose of the separation step was to prevent the stoppage of the pulverizer by adhesion of the incompletely dried particles, which cannot occur with completely dried particles, so that a separating step for dried particles was not contemplated by Claim 1.

Therefore, D4 had nothing to do with the claimed manufacturing method, and could not be novelty destroying.

First Auxiliary Request

Admissibility of the respondents' amended case

- (b) The First Auxiliary Request submitted during the oral proceedings was based on the First Auxiliary Request filed before the oral proceedings in response to the communication by the Board, so that it was not completely new nor surprising. The request was filed in reaction to the decision of the Board on novelty over D4. Therefore, the late filing was justified and the request should be admitted into the proceedings.

Amendments

- (c) Claim 1 of the First Auxiliary Request had a basis in the application as filed, both for the definition of the water content of the incompletely dried material and the new order of the steps. As regards the definition of the incompletely dried material, it was taken from the description but concerned the most general and unambiguous definition of that term, something which would have been considered by any judges in case of proceedings before courts.
- (d) Claim 1 clearly defined the order of the steps and the water content of the incompletely dried material, so that the distinctions over D4 became

apparent. Dependent Claims 2 and 3 no longer depended on Claim 1 and should be considered as cancelled.

Novelty

- (e) At least in view of the separating step after the drying step, the method of Claim was novel over D4. The incompletely dried material having the specific water content was a further difference. Hence, the claimed method was novel.

Closest prior art

- (f) It was not contested that D1 described the closer prior art.

Problem solved

- (g) In general, the patent aimed at optimising production and product obtained. In particular, having regard to D1, although no analysis had been made before, since it was apparent that the extruder required more energy than separation, the problem could be formulated as the optimisation of the energy balance of the manufacturing method. The problem had been solved, as an extrusion step, which consumed more energy, was no longer required.

Non obviousness of the solution

- (h) D1 proposes the use of an extrusion step for obtaining a product with a narrower particle size distribution, which could be dried completely

(0 wt.% of undried particles in the examples of D1). In its comparative examples, D1 merely suggests to dry for a longer time any undried particles. There is no suggestion whatsoever in D1 to separate undried from dried particles. Nor was it obvious from D1 that steps which were considered not interesting by D1 (separation of undried particles) in fact led to a more interesting energy balance of the manufacturing method.

XII. The appellants (opponents) requested that the decision under appeal be set aside and the patent be revoked.

XIII. The respondents (patent proprietors) requested that the appeal be dismissed or, in the alternative, that the decision under appeal be set aside and the patent be maintained on the basis of the First Auxiliary Request filed during the oral proceedings on 8 June 2011.

Reasons for the Decision

1. The appeal is admissible.

Main Request (patent as granted)

Novelty

2. D4 summarizes the modern superabsorbent polymer technology, and *inter alia* mentions a method of the type disclosed by D1 (page 87, lines 16-21), so that it indisputably has to do with manufacturing methods of absorbent resins (SuperAbsorbentPolymers or SAPs).

- 2.1 D4 describes the unit operations used in the manufacturing methods of SAPs, such as the chopping/grinding of the formed polymer gel (Point 3.2.4), the drying (Point 3.2.5) and the particle sizing thereof (e.g. comminuting or milling, which amounts to pulverizing according to the patent in suit) (Point 3.2.6). Therefore, D4 discloses all of the features of the preamble of Claim 1 as granted.
- 2.2 D4 (Point 3.2.6) also discloses that "after drying, the superabsorbent product would not usually be in the correct particle size for a particular application", so that "if a two-stage dryer is not used, some means of breaking up the sheet of material exiting the dryer must be provided before attempting to feed the product to the particle sizing step. Dryer manufacturers often supply this equipment as part of the dryer". Figure 3.6.(a) shows a band dryer with such "Product Breaker". Hence, D4 discloses that the dried particles as such cannot always be sent directly to the particle sizing step. In particular, those coming out from band dryers as shown in Figure 3.6.(a) are disintegrated by a product breaker.
- 2.3 In order to obtain the particle size distribution of the final product, i.e. a particle size distribution ranging from about 200 to 800 μm , D4 discloses (Point 3.2.6, page 93, lines 31 to 38) a combination of comminuting (milling) (= pulverizing) and screening steps, e.g. two-stage milling and product screening, and recycling of the oversize stream back to the grinding step (i.e. before the drying step), wherein e.g. the first stage of sizing prepares the polymer for the second stage and narrows the overall distribution

- of particle sizes fed to the second sizing step (idem, lines 40 to 41). Hence, D4 discloses a method including drying, pulverizing and separating step (product screening).
- 2.4 In the context of D4, the purpose of the separating step is the recycling of the oversized particles to the grinding step. "Oversize" is any material whose size exceeds 800 μm , in particular material in the mm range size, as is implicit from the recycling to the grinding step, which in the context of D4 (Page 87) precedes the drying step in order to produce finely ground material in the mm range. Hence, D4 discloses a manufacturing method including a step which inevitably separates particles exceeding 50 mm for recycling to the grinding step.
- 2.5 Claim 1 as granted merely requires that material having a size exceeding 50 mm be separated out, as incompletely dried material. Since the material to be separated is defined by its size only (50 mm), the rest of the definition ("as incompletely dried material") is a mere label, having a relative meaning (how much water is still contained in the incompletely dried material?), thus not suitable to impart any distinction over the material separated in D4, which in any case can contain up to 5 wt.% water (D4, Point 3.2.5, third sentence).
- 2.6 Also, Claim 1 as granted does not specify the size of the sifting device but the size of the particles that should be separated. However, a particle of 50 mm can be sifted on any devices having apertures any smaller than 50 mm (e.g. ≤ 50 mm such as even 1 mm), so that no requirement is imposed on the size of the sifting

apparatus used by the method of Claim 1. This is also apparent from Claim 1 mentioning "preferably a particle size exceeding 5 mm", which confirms that the sifting device may be much smaller than 50 mm, such as 5 mm.

2.7 Since the method of D4 includes the separation of any material whose size exceeds 800 μm , in order to grind it again, it inevitably includes the separation of particles exceeding 50 mm, which is "incompletely dried material", so that also the particle size requirement of Claim 1 is disclosed by D4.

2.8 Since D4 discloses all of the features of Claim 1, its claimed method is not novel (Article 54(1)(2) EPC 1973) over the method of D4.

2.9 It follows from the foregoing that a ground of opposition (lack of novelty) prejudices the maintenance of the patent in suit in the form as granted.

First Auxiliary Request

Admissibility

3. The fresh First Auxiliary Request submitted during the oral proceedings constitutes an amendment to the respondents' case that falls under Article 13 of the Rules of Procedure of the Boards of Appeal of the EPO (RPBA) (OJ 2007, 536), so that its admission and consideration is at the Board's discretion.

3.1 The fresh request is a modification of the First Auxiliary Request submitted with letter of 4 May 2011, which was submitted in reaction of the Board's

communication in preparation for oral proceedings, in which the relevance of D4 was addressed.

3.2 The order of the steps and the meaning of the expression "incompletely dried product" have been discussed throughout the opposition and appeal proceedings. Although the feature "and whose water content exceeds 15 wt.%" has been taken from the description, it constitutes the most general definition of the feature "incompletely dried product", so that the new subject-matter has not become more complex. Hence, the filing of the amendments was a *bona fide* attempt to overcome the objections raised.

3.3 The need for a remittal of the case did not arise, as the appellants have been in a position to argue their case, so that procedural economy has not been affected.

3.4 Therefore, the First Auxiliary Request is admissible for consideration by the Board.

Amendments

4. Compared to Claim 1 as granted, Claim 1 of the First Auxiliary Request is drawn up in the one-part form (i.e. the feature "characterized by further comprising", consequently the two-part form, has been cancelled) in order to rearrange the order of the drying, separating and pulverizing steps.

4.1 Moreover, Claim 1 includes further amendments such as:

- (a) the order of the steps, e.g. the separating step takes place after the drying step;

- (b) the precision that "incompletely dried material" is that whose water content exceeds 15 wt.%; and,
- (c) the specification of the product which is pulverized.

4.2 The new order of the steps has a basis in Paragraph [0091] of the application as filed, where it is stated that "the incompletely dried product of the hydrogel is separated from the powdery dried product of the hydrogel obtained in the disintegrating step or coarse-pulverizing step conducted after the drying step" (Article 123(2) EPC).

4.3 The basis for the insertion of the precision about the water content of the incompletely dried material is in Claim 6 and in Paragraph [0029] of the application as originally filed (Article 123(2) EPC). In any case, this precision is the most general definition given in the application as filed and concerns a term having a relative meaning "incompletely dried particles", which was present in the claims as filed and as granted.

4.4 The specification of the product to be pulverized is a necessary clarification, because the presence of the expression "said product" in both the separating and the pulverizing steps did not make clear what previously mentioned product was thereby meant, the dried, the incompletely dried and separated or the remaining dried product? (Article 84 EPC 1973).

4.5 The amendments restrict the scope of the claims (Article 123(3) EPC) and aim at overcoming a ground of opposition, such as the lack of novelty over D4, so that the requirements of Rule 80 EPC are fulfilled too.

4.6 As regards the dependent claims, Claims 2 and 3, which cannot depend on Claim 1 (Article 84 EPC 1973), because the separation is carried out only after the coarse pulverization, have to be considered as deleted, as requested by the respondents, so that only Claims 4 to 9 remain, which are not objected to.

4.7 Consequently, the so amended First Auxiliary Request is formally allowable for further consideration.

Novelty

5. The appellants have not raised any objections of lack of novelty. Having regard to D4, the claimed method has a separating step after the drying step, so that already for that reason it is novel over D4. Also, the incompletely dried product has a water content which is not disclosed by D4. Since the First Auxiliary Request fails for lack of an inventive step, it need not be detailed further why the claimed subject-matter is novel (Article 54(1)(2) EPC 1973).

Inventive step

6. The patent in suit concerns a manufacturing method of absorbent resin.

Closest prior art

6.1 It is not contested that D1 represents the closest prior art.

6.2 D1, belonging to the proprietors of the patent in suit, concerns a method for producing in high yields a particulate hydrated gel polymer and an absorbent resin both having a high absorption ratio and a small water-soluble component by a simple process without requiring any special device (page 3, lines 18-20). D1 belongs thus to the same technical field of the patent in suit.

6.3 D1 discloses a method for the production of an absorbent resin, which comprises heating a hydrated gel polymer possessed of a cross-linked structure to a temperature in the range of from 45° to 90°C, extruding the resultant hot hydrated gel polymer through a perforated plate containing holes of a diameter in the range of from 6.5 to 18 mm thereby obtaining a particulate hydrated gel polymer, and drying said particulate hydrated gel polymer (Claim 11).

6.4 The method of D1 can further comprise disintegrating or pulverizing the dried particulate hydrated gel polymer (Claim 17), wherein said disintegrating or pulverizing is carried out with a roll mill (Claim 18).

6.5 Therefore, the method of D1 comprises the steps of drying and pulverizing as defined in Claim 1 of the First Auxiliary Request.

Problem and solution

7. The application as originally filed, and on which the patent in suit has been granted, aimed at providing a manufacturing method of absorbent resin having excellent absorbing rate and absorbing capacity by effectively drying and pulverizing aggregates of

hydrogel of a cross-linked polymer having good viscosity and elasticity (Paragraph [0015]) (which corresponds to Paragraph [0016] in the patent in suit).

7.1 D1 is not acknowledged in the application as originally filed, and on which the patent in suit has been granted, so that the problem to be solved as formulated in the application as originally filed did not take D1 into account.

7.2 During the oral proceedings, questioned by the Board, the respondents argued that the problem solved over D1 was the optimisation of the energy balance of the method while obtaining an optimal absorbent. In particular, the patent in suit, belonging to the applicants of D1 and being a newer patent application compared to D1, improved the preceding method of D1, e.g. because the extrusion step, which required more energy, was no longer necessary.

7.3 However, Claim 1, as regards the steps, is openly formulated ("comprising" means including what is specified without excluding what is not specified, unless otherwise specified), so that an extrusion step of the hydrogel polymer is not excluded.

7.4 Furthermore, as established in the Case Law of the Boards of Appeal of the EPO (6th edition 2010, I.D.4.4, particularly T 1188/00), new findings (e.g. better energy balance) can be used to reformulate the problem solved only if

- (a) they are derivable from the problem mentioned in the application as originally filed;

- (b) they are convincingly shown to have their origin in the feature distinguishing the claimed method from that of D1 (T 197/86, OJ EPO 1989, 371, Point 6.1.3 of the Reasons); and,
- (c) it is plausible that they are attained over the whole breadth of the claims.

7.5 It is not apparent that e.g. a better energy balance is derivable from the problem to be solved as mentioned in the application as originally filed, let alone from the examples of the patent in suit. Already for that reason the argument of the respondent is not convincing.

7.6 Also, no comparative tests over D1 have ever been submitted, showing that a better energy balance is actually achieved over the whole breadth of the claim, e.g. that a separation step as claimed requires less energy than the extruder of D1.

7.7 Consequently, no "better energy balance" can be acknowledged for the claimed process over that of D1.

7.8 As regards the final product, no comparative tests have ever been submitted showing that the absorbent resin obtained by the claimed method is equivalent or superior to that of D1.

7.9 The examples of the patent in suit show that if the dried hydrogel is sifted through a 10 mm sieve and pulverized by a particular roll mill, the inconveniences caused by the incompletely dried hydrogel can be efficiently avoided, i.e. pulverization can be carried out in a satisfactory manner, and the

pulverized product classified with a 0.85 mm sieve is high-grade absorbent resin having good properties.

7.10 However, Claim 1 merely requires a separation of particles exceeding 50 mm, so that particles of e.g. 10 to 50 mm can still be present in the stream sent to the pulverizing step, which are much coarser than those illustrated in the examples of the patent in suit, hence even less dried. It has not been shown that if particles of 10 to 50 mm are present the inconveniences in the pulverizer are prevented as desired, nor that the physical properties of the absorbent are not deteriorated.

7.11 So does the method D1, which, as demonstrated by its examples and controls, allows production of an absorbent resin having a high absorption ratio and a small water soluble component, whereby the method of D1 affords these products in high yields by a simple process without requiring any special device (Page 3, lines 35-38). In particular, when the hydrogel polymer produced by the method of D1 is dried, a uniformly dried product is obtained, which can be pulverized under mild conditions such as by a roll mill (Page 3, lines 39-41). Since the uniformly dried product of D1 can be efficiently pulverized by e.g. a roll mill, the method of D1 does not require a step of removal of undried portion (D1, Page 5, lines 29-35), let alone a step of further drying (Examples and Controls), and nevertheless prevents the inconveniences in the pulverizer (Examples and Controls).

7.12 Consequently, the problem effectively solved over D1 was merely to provide a further manufacturing method of absorbent resin.

Obviousness of the solution

8. D1 teaches that by extruding the hot hydrated gel polymer through the perforated plate containing holes of the given diameter, in particular raw hydrated gel polymer having an average particle diameter in the range of from 0.5 to 3 mm, a particulate hydrogel polymer of highly uniform particle size can be obtained. When this hydrogel polymer is dried and pulverized, it dries with high efficiency and pulverizes with the emission of fine dust repressed to a very small amount, while giving an absorbent resin excellent in quality (Page 4, lines 14-18).

8.1 In particular, D1 teaches that the pulverization is possible "without a step of removal of undried portion", so the method of D1 does not include any such removal.

8.2 The meaning of "undried portion" is apparent from the Examples and Controls (e.g. Example 1, page 7, lines 26-27; Control 1, page 7, lines 46-49; Table 1), i.e. particles of 10 mm diameter which neither dry evenly nor wholly and which cannot be pulverized.

8.3 More particularly, Control 1 discloses an additional drying step of 35 minutes to obtain a dry product. So does Control 4 (30 minutes). The effects of this additional drying step are apparent from table 1, such as an amount of fine powder of 6 wt.%, compared to 2 wt.% for Example 1.

- 8.4 Summing up, D1 discloses a method that does not require a separation of the incompletely dried material, i.e. because the production of incompletely dried material is prevented by the extrusion that leads to a narrow and uniform particle size for the material to be dried.
- 8.5 Also, D1 shows that additionally drying incompletely dried material, if present, is not advantageous. In this respect, the Board notes that, having regard to D1, it has never been argued nor shown that the specification for the incompletely dried material of a water content exceeding 15 wt.%, as now defined in Claim 1, is of any importance whatsoever.
- 8.6 The method of Claim 1 of the First Auxiliary Request includes or encompasses all of the steps of D1 and additionally requires the removal of the incompletely dried material, which is mentioned but not sought-for by D1, so that the claimed method corresponds to an embodiment forming the basis on which the method of D1 was developed.
- 8.7 However, for the skilled person merely aiming at a further manufacturing method for an absorbent resin over D1, any step conventional for that manufacturing method (e.g. the removal of an undried portion, or the additional drying of an undried portion) represented an equally obvious suggestion for solving the problem. Hence, the act of choosing the removal of the undried portion for providing a further method over D1 was devoid of any inventive character (Case Law of the Boards of Appeal, 6th edition, 2010, I.D.8.19.6).

8.8 As regards the fact that D1 does not prefer the removal of undried portions, the disadvantages deriving thereby, if any, are foreseeable and it has never been shown that they are compensated by any further unexpected advantage, so that the modification of the method of D1 by an apparently disadvantageous option mentioned in it does not involve an inventive step (Case Law, *supra*, I.D.8.5).

Conclusion

9. A ground of opposition prejudices the maintenance of the patent as granted (Main Request) and the First Auxiliary Request does not fulfil the requirements of the EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

S. Fabiani

J. Riolo