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D E C I S I O N
of 16 June 2005

Case Number: T 0471/04 - 3.2.6

Application Number: 98109576.3

Publication Number: 0884037

IPC: A61F 13/15

Language of the proceedings: EN

Title of invention:
Absorbent article

Applicant:
Nippon Shokubai Co., Ltd.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 123(3), 84, 83, 54(2), 56

Keyword:
"Amendments - allowable"
"Clarity (yes)"
"Sufficiency of disclosure (yes)"
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0471/04 - 3.2.6

D E C I S I O N
of the Technical Board of Appeal 3.2.6
of 16 June 2005

Appellant: (Applicant)
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 28 August 2003 refusing European application No. 98109576.3 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: P. Alting van Geusau
Members: G. Pricolo
R. T. Menapace

Summary of Facts and Submissions

I. European patent application No. 98 109 576.3 published under No. 0 884 037 was refused by the Examining Division by decision posted on 28 August 2003.

II. The Examining Division held that the subject-matter of claim 1 according to the appellant's main request was not allowable under Article 123(2) EPC because the feature according to which the ratio by weight α of the water-absorbent resin was "less than 1" could not be found in the application as filed. Furthermore, the subject-matter of claim 1 according to the auxiliary request did not involve an inventive step in the light of the prior art known from

D1: EP-A-0 761 241.

In particular the provision of a concentration absorption index of 35 or greater was held not to provide any surprising effects over the prior art. Moreover, the value 33.4 obtained for a known absorbent article "Pampers Sara Sara Care" as specified in table 4 of the application could well correspond to an effective value of 35 as the standard deviation of the method for measuring the concentration absorption index was not known. Thus the contribution to the prior art could only be seen in indicating appropriate amounts of resin to be put into an absorbent article. The resins used in the application were already known from the prior art and the choice of an appropriate amount of such resins did not involve an inventive step. In fact, the skilled person knew that in order to obtain a higher absorbency of the absorbent article a higher

amount of resin should be used. Moreover, claim 1 was not clear, contrary to Article 84 EPC, because it should not be directed to an absorbent article but to a method of determining the most appropriate amount of resin for an absorbent material. Finally, the claim did not include the essential feature of the invention that the content of the water absorbent resin per sheet of the absorbent article was 8 g or more.

III. On 23 October 2003 the appellant (applicant) lodged an appeal against this decision and paid the prescribed appeal fee on the same day. With the statement setting out the grounds of appeal, received on 7 January 2004, the appellant filed a revised set of claims and requested the grant of a patent on the basis thereof.

IV. In a first communication dated 23 June 2004, the Board informed the applicant that although the amendments did not give rise to objections under Article 123(2) EPC, it appeared that the remark of the Examining Division according to which the standard deviation of the method for measuring the concentration absorption index was not known was linked with the requirements of Article 83 EPC: if the measurements of the absorption capacity were subject to large variations, then the repeatability of such measurements were in doubt and therefore it was doubtful whether the skilled person could reliably determine, when trying to work out the claimed invention, whether he was working within the area defined by the claims or not. Furthermore, the Board expressed its view that although in D1 and in

D2: EP-A-761 241,

the parameters "absorption capacity under no load" and "absorption capacity under a load" were both measured using a physiological solution and the latter under a load of 20 g/cm^2 rather than using artificial urine and a load of 50 g/cm^2 as in the present application, it appeared that the different measurement conditions were not such as to result in substantial differences, so that it could be concluded that also D1 and D2 disclosed resins having parameters A and B of at least 30 and 10 g/g, respectively. In order to solve the technical problem stated in the application, i.e. to increase "the absorption amount in the use form very near to practical use of the absorbent article", the skilled person would regard it as obvious to select resins having values of the parameters absorbency without load and absorbency under load as high as possible, in particular resins for which both the parameters A and B referred to in claim 1 were above 35, in which case the concentration absorption index would necessarily by above 35 independently from the value of the ratio by weight α of the resin, thereby directly arriving in an obvious manner to the subject-matter of claim 1.

V. In its letter of reply dated 19 October 2004, the applicant stated that based on its experience the standard deviation σ for the parameters A and B was 0.2, independently from the type of resin used. Since it was known that $\pm 4\ \sigma$ covered 99,937% of an experimental error range, the experimental error ranges for A and B could be estimated with 0.8, respectively. This meant that the standard deviation range for the concentration absorption index value could be estimated with ± 0.8. Thus the concentration absorption index value of 33.4

measured with the prior art absorbent article "Pampers Sara Sara Care" was clearly different from the claimed value of 35 or more. Moreover, at the priority date of the application it was not possible to obtain a water-absorbent resin for which both parameters A and B were above 35. In fact, such resins were disclosed by the present application for the first time.

VI. In a further communication dated 20 January 2005, which was annexed to the summons for oral proceedings, the Board drew the applicant's attention again to the fact that D1 and D2 appeared to disclose resins having a parameter A of at least 30 g/g and a parameter B of at least 10 g/g. The Board then argued that the skilled person would arrive at the claimed subject-matter by the obvious selection of a resin from those known from D1 and a ratio by weight α corresponding to the preferred rations disclosed in D1.

VII. With telefax received on the afternoon of 15 June 2005, the day before the scheduled date for oral proceedings, the appellant submitted in reply to the Board's objections arguments and evidence in form of the following documents:

R1: US-A-5 264 495;

R2: US-A-5 624 967;

R3: US-A-5 147 343;

R4: US-A-5 601 542;

R5: US-A-5 672 633;

together with a modified main request. The appellant essentially submitted that the absorption capacity under no load A and the absorption capacity under a load B greatly varied with the salt concentration of a liquid to be absorbed, the parameter B also greatly varying depending on the load applied, the density of polymer per unit area and the direction of diffusion of liquid. Therefore, the absorption capacity under no load A and the absorption capacity under a load B measured in accordance with the present application could not be compared with those measured in accordance with D1 or D2.

VIII. Oral proceedings took place on 16 June 2005.

After having slightly modified the wording of claims 1, 5 and 6 of the main request on file in response to an objection raised by the Board, and having adapted the description to the amended claims, the applicant requested that the decision under appeal be set aside and that a patent be granted on the basis of the description and claims as filed during oral proceedings together with the figures as originally filed.

IX. Claim 1 reads as follows:

"1. An absorbent article, comprising an absorbent layer, a liquid-permeable surface sheet, and a liquid-impermeable back sheet, wherein the absorbent layer includes an absorbent matter having a water-absorbent resin and a fibrous material, wherein a ratio by weight "α" of said water-absorbent resin, based on the total of the water-absorbent resin and the fibrous material,

is in the range of 0.4 to 0.9, wherein the water-absorbent resin is a water-absorbent resin obtainable by thermally treating a water-absorbent resin precursor in the presence of a surface-crosslinking agent, wherein the water-absorbent resin precursor is obtainable by polymerizing or copolymerizing at least one monomer selected from the group consisting of (meth)acrylic acid and neutralized products thereof and has an average particle diameter in the range of 100 to 600 μm and a proportion of particles, with a particle diameter less than 106 μm, of not more than 10% by weight, wherein the content of the water-absorbent resin per sheet of the absorbent article is 8 g or more: characterized in that the water-absorbent resin in the absorbent article has a concentration absorption index of 35 or more as shown by the following equation (1): concentration absorption index = $A(1-\alpha)+B\alpha \geq 35$ (1) wherein A (g/g) is an absorption capacity of the resin for an artificial urine under no load over a period of 60 minutes determined in accordance with the measurement described herein, and B (g/g) is an absorption capacity of the resin for the artificial urine under a load of 50 g/cm^2 over a period of 60 minutes determined in accordance with the measurement described herein, provided that the parameter A is at least 30 (g/g) and the parameter B is at least 20 (g/g), wherein the artificial urine is an aqueous solution having a composition of sodium sulphate of 0.2 weight %, potassium chloride of 0.2 weight %, magnesium chloride hexahydrate of 0.05 weight %, calcium chloride dihydrate of 0.025 weight %, ammonium dihydrogen phosphate of 0.085 weight %, and diammonium phosphate of 0.015 weight %."

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

2.1 The combination of features of claim 1 is based upon the content of the application as originally filed. The text of the claim followed, within parentheses, by the relevant passages in the application as filed is repeated hereinafter:

An absorbent article, comprising an absorbent layer, a liquid-permeable surface sheet, and a liquid-impermeable back sheet, wherein the absorbent layer includes an absorbent matter having a water-absorbent resin and a fibrous material, wherein a ratio by weight, "α" of said water-absorbent resin based on the total of the water-absorbent resin and the fibrous material (see claim 7);
is in the range of 0.4 to 0.9 (see claim 7 and page 9, line 1);
wherein the water-absorbent resin is a water-absorbent resin obtainable by thermally treating a water-absorbent resin precursor in the presence of a surface-crosslinking agent (see page 14, lines 25 to 27 and page 19, line 3 for the term "thermally"),
wherein the water-absorbent resin precursor is obtainable by polymerizing or copolymerizing at least one monomer selected from the group consisting of (meth)acrylic acid and neutralized products thereof (see page 15, lines 20 to 25);

and has an average particle diameter in the range of 100 to 600 μm and a proportion of particles, with a particle diameter less than 106 μm, of not more than 10% by weight (see page 15, lines 2 to 5);
wherein the content of the water-absorbent resin per sheet of the absorbent article is 8 g or more (claim 8 and page 12, line 15);
the water-absorbent resin in the absorbent article has a concentration absorption index of 35 or more as shown by the following equation : concentration absorption index = $A(1-\alpha)+B\alpha \geq 35$ (see claim 7);
wherein A (g/g) is an absorption capacity of the resin for an artificial urine under no load over a period of 60 minutes (see claim 1 and page 27, lines 4 to 11);
B (g/g) is an absorption capacity of the resin for the artificial urine under a load of 50 g/cm^2 over a period of 60 minutes (see claim 7, page 7, lines 23 to 26 and page 29, line 15);
provided that the parameter A is at least 30 g/g and the parameter B is at least 20 g/g (see page 24, lines 5 to 15);
wherein the artificial urine is an aqueous solution having a composition of sodium sulphate of 0.2 weight %, potassium chloride of 0.2 weight %, magnesium chloride hexahydrate of 0.05 weight %, calcium chloride dihydrate of 0.025 weight %, ammonium dihydrogen phosphate of 0.085 weight %, and diammonium phosphate of 0.015 weight % (see page 27, lines 7 to 11).

2.2 Claim 1 includes references to the description and figures ("determined in accordance with the measurement described herein") which in the present case are absolutely necessary within the meaning of Rule 29(6)

EPC. In fact, the parameters A and B referred to in claim 1 can only be those measured as a result of applying the measurement procedures described in the description and figures of the application (see pages 27 to 29 and figure 1 of the application as filed). If such references would not be included, claim 1 could be interpreted as encompassing absorption capacities measured in accordance with other measurements procedures which would lead, for a same resin, to different results. Moreover, it would not be appropriate, for reasons of conciseness, to include in the claim the parts of the description relating to the measurement procedures as well as a description of the relevant drawings.

2.3 The Board notes that the amendments made to claim 1 overcome the objections under points 1, 3c (last sentence) and 4 of the Section "Auxiliary request" of the decision under appeal, since equation (1) is written as suggested by the Division, the kind of resin is defined, and the claim is limited to a resin content of 8 g or more.

2.4 Claims 3 to 6 correspond to original claims 9 to 12. Claims 5 and 6 include references to the description and drawings which, analogously as claim 1, are absolutely necessary within the meaning of Rule 29(6) EPC.

Basis for claims 2 and 7 is found on page 9, line 24 and on page 10, line 11.

2.5 Finally, the description has been amended to take into account the relevant state of the art (document D1) and has been adapted to the new claims.

2.6 Therefore, the amendments made do not give rise to objections under Article 123(2) EPC.

2.7 The Examining Division argued that claim 1 was not clear, contrary to Article 84 EPC, because it should not be directed to an absorbent article but to a method of determining the most appropriate amount of resin for an absorbent material.

The Board cannot follow this view because claim 1 clearly defines structural limitations for the absorbent article. In fact, the parameters A and B referred to in claim 1 are indicative of the absorption capacity of a given resin under different conditions and thus are indicative of intrinsic characteristics thereof. The ratio by weight α is indicative of the relative amount of fibres and resin within the absorbent. Thus, all these parameters reflect structural limitations for the absorbent article. Also the requirement of claim 1 that the concentration absorption index is 35 or more reflects structural limitations, since it is calculated from equation (1) on the basis of the parameters A and B and the ratio by weight α.

3. *Sufficiency of disclosure (Article 83 EPC)*

An objection under Article 83 EPC was raised by the Board in the communication dated 23 June based on the remark of the Examining Division according to which the

standard deviation of the method for measuring the concentration absorption index was not known.

In its letter of reply dated 19 October 2004, the applicant stated that based on its experience the standard deviation range for the concentration absorption index value could be estimated with ±0.8. Since the Board has no reason to put in doubt the appellant's assertion and considering that such standard deviation range corresponds to measurement errors falling within normal ranges for the skilled person in the technical field in question relating to absorbent articles, the above mentioned objection can no longer be upheld. Moreover, since the Examining Division did not indicate further elements that could give rise to objections under Article 83 EPC, nor have any such elements been identified by the Board, the Board takes the view that the European patent application discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

4. *Novelty*

4.1 As agreed by the appellant, D1 discloses an absorbent article according to the preamble of claim 1. D1 further discloses (see Table 1) the values of absorption capacity under no load (absorbency; see page 12, lines 35 to 57) and absorption capacity under a load (diffusing absorbency under pressure; see page 13, line 1 ff.) over a period of 60 minutes for various resins. However, these parameters are determined using as a liquid of reference a physiological saline solution (page 12, line 38) rather

than an artificial urine as specified by claim 1 of the present application. Moreover, for the second parameter, the load is 20 g/cm^2 (page 13, line 21) rather than 50 g/cm^2 as in claim 1.

On the basis of the evidence and arguments submitted by the appellant with the telefax received on 15 June 2005, the Board accepts the appellant's view that due to the different conditions under which the absorption capacity under no load and the absorption capacity under load are measured in D1 with respect to those under which they are measured in the present application, the values shown in Table 1 of D1 of absorbency and diffusing absorbency under load are not directly comparable with the values of absorption capacity referred to in claim 1 of the present application. In particular, it is apparent from the cited references R1 and R3 that different results for the absorption capacity are obtained depending on whether a physiological salt solution or ion-exchanged water is used as the liquid of reference (see R1, table 1) and depending on the load applied to the resin (see R3, table B). Accordingly the Board, also considering that D1 is a previous patent application in the name of the appellant, follows the appellant's view that D1 does not disclose the characterizing features of claim 1.

4.2 Since D2 discloses to measure the absorption capacity under no load (see page 13, last paragraph) and the absorption capacity under a load (see page 14, second paragraph) essentially under the same conditions as in D1 (using as a liquid of reference a physiological saline solution and a load of 20 g/cm^2), it also does

not disclose the features defined in the characterizing portion of claim 1.

4.3 Finally, the characterizing features of claim 1 are not disclosed by the remaining available prior art documents. Accordingly, it is found that the subject-matter of claim 1 is novel (Article 52(1), 54(2) EPC).

5. *Inventive step*

5.1 The object underlying the application is to increase "the absorption amount in the use form very near to practical use of the absorbent article" (see page 5, line 16, 17 of the application as filed), in other words, to produce absorbent articles which in use involve as little leakage as possible (see page 3, lines 19 to 24).

In accordance with the definition of claim 1, these problem is solved by the selection of a resin having specific intrinsic characteristics in terms of absorbency, namely a parameter A which is at least 30 g/g and a parameter B which is at least 20 g/g, in combination with the selection of a relative amount of resin to fibrous material, in terms of the ratio by weight "α" of resin, such that a concentration absorption index of 35 or more is obtained.

5.2 The objection of lack of inventive step raised in the Board's communication dated 23 June 2004 was based on the assumption that it was obvious to use resins having parameters A and B as high as possible, in particular resins having both A and B above 35, in which case the value of the concentration index would be above 35 (see

the formula in claim 1) independently of the ratio by weight "α" of resin. The appellant has however submitted that prior to the relevant date of the present application such resins with both A and B above 35 (such as the resin 1 in table 1 of the application) were not available. In the absence of any evidence as to the contrary, and considering that there is no reason to doubt of the correctness of the appellant's relevant submissions, the Board accepts this fact.

5.3 Since no resins with both A and B above 35 were available prior to the relevant date of the present application, the skilled person could not have forcibly arrived at the claimed subject-matter by the selection of a resin having both A and B above 35 g/g. The question arises of whether the skilled person would arrive at a concentration absorption index greater than or equal to 35 with the available resins. D1 and D2 teach (see D1 page 11, lines 13 to 15 and D2, page 12, line 19 and line 57 ff.) that it is desirable to increase the amount of resin to be above 40% (D1) or 50% (D2). Therefore, in order to solve the above-mentioned problem of reducing leakage, the skilled person would consider to provide an increase of the amount of resin, i.e. an increase of the ratio "α", as also argued by the Examining Division in the decision under appeal (page 5, 2nd paragraph). However, considering that

- the absorption capacity under no load A and the absorption capacity under load B are generally in a contradicting relation (see D2, page 2, lines 48, 49 and page 12, lines 43 to 45);
- the parameter B is always lower than the parameter A;
- no resins are known with both A and B above 35;

it follows that the skilled person would not arrive at a value of the concentration absorption index above or equal to 35 by a mere increase of the ratio "α", but only by a particular selection of a resin and amount thereof, for which, however, there is no suggestion in the prior art. Since also the other documents on file do not contain any indication leading the skilled person towards such a particular selection, it is found that the subject-matter of claim 1 was not obvious to a skilled person.

5.4 It follows that the subject-matter of claim 1, and of claims 2 to 7 dependent therefrom, involves an inventive step (Article 56 EPC).

6. *Procedural matters*

It is apparent from the above that the evidence, facts and arguments filed by the appellant on the afternoon of the day before oral proceedings were essential in reaching a decision favourable to the appellant. It is only because the Board was available on that day and because such submissions, although lengthy, could still be effectively examined on the same day, that they have been taken into account, despite having been filed at a very late stage of the proceedings without any proper justification. Under other circumstances, such submissions filed shortly before oral proceedings might have been disregarded (see Article 10b of the Rules of procedure of the Boards of Appeal, OJ 3, 2003), irrespective of their relevance to the outcome of the case.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent in the following version:

Description: pages 1 to 63 filed during the oral proceedings held on 16 June 2005;

Claims: 1 to 3 filed during the oral proceedings held on 16 June 2005;

Drawings: sheets 1/3 to 3/3 as originally filed.

The Registrar: The Chairman:

M. Patin P. Alting van Geusau