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D E C I S I O N
of 8 April 1997

Case Number: T 0199/93 - 3.2.2

Application Number: 86850254.3

Publication Number: 0217766

IPC: A61F 13/15, A61L 15/00

Language of the proceedings: EN

Title of invention:
Absorption body intended for disposable articles such as diapers, sanitary napkins and the like

Patentee:
Mölnlycke AB

Opponent:
The Procter & Gamble Company

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 84, 123(2)
EPC R. 67

Keyword:
"Clarity - yes"
"Addition of subject-matter - no"
"Novelty - yes"
"Inventive step - no"
"Reimbursement of appeal fee - no"

Decisions cited:
-

Catchword:
-

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Case Number: T 0199/93 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 8 April 1997

Appellant: (Opponent)
The Procter & Gamble Company
One Procter & Gamble Plaza
Cincinnati, OH 45202 (US)

Representative:
Kyle, Diana
Elkington and Fife
Prospect House
8 Pembroke Road
Sevenoaks, Kent TN13 1XR (GB)

Respondent: (Proprietor of the patent)
Mölnlycke AB
405 03 Göteborg (SE)

Representative:
Hyltner, Jan-Olof
Noréns Patentbyra AB
Box 10198
100 55 Stockholm (SE)

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 23 December 1992 concerning maintenance of European patent No. 0 217 766 in amended form.**

Composition of the Board:

Chairman: H. Seidenschwarz
Members: S. Crane
C. Holtz

Summary of Facts and Submissions

1. European patent No. 0 217 766 was granted on 16 August 1990 on the basis of European patent application No. 86 850 254.3.

II. The patent was opposed by the present appellants in particular on the basis that its subject-matter lacked novelty and/or inventive step (Article 100(a) EPC).

The state of the art relied upon by the appellants included the following documents:

(D1) EP-A-0 202 125
(D2) EP-A-0 122 042
(D6) GB-A-2 089 214
(D7) EP-A-0 021 662

III. With its decision announced at oral proceedings on 27 November 1992 and posted on 23 December 1992 the Opposition Division held that the patent could be maintained in amended form on the basis of revised claims 1 to 5 and description submitted at the oral proceedings.

Claim 1 reads as follows:

"Absorption body intended for disposable articles such as diapers, sanitary napkins and the like and comprising a highly absorbent material, said absorption body comprising two layers, a first upper layer (1) which is intended to be placed against the wearer's body and which has a bulk exceeding 10 cm^3/g, preferably more than 13 cm^3/g, and at least one lower second layer (2) which is substantially more heavily compressed as compared to said first upper layer (1), the bulk of said at least one lower second layer is

less than 10 cm^3/g; and the highly absorbent material (3) is applied underneath the first layer and is distributed within the at least one substantially more heavily compressed second layer, characterised in that said first layer (1) is soft and has poor liquid distributing capacity."

Dependent claims 2 to 5 relate to preferred embodiments of the absorption body according to claim 1.

IV. An appeal against this decision was filed on 19 February 1993 and the fee for appeal paid at the same time. The Statement of Grounds of Appeal was filed on 30 April 1993.

The appellants requested that the decision under appeal be set aside and the patent revoked in its entirety. They also requested reimbursement of the appeal fee.

V. Oral proceedings before the Board were held on 8 April 1997.

At the oral proceedings the respondents (proprietors of the patent) made, in addition to their main request for dismissal of the appeal, an auxiliary request for maintenance of the patent in amended form on the basis of a new claim 1 submitted at the oral proceedings.

This new claim 1 is worded as follows:

"Absorption body intended for disposable articles such as diapers, sanitary napkins and the like comprising a highly absorbent material, said absorption body comprising two layers, a first soft upper layer (1) which is intended to be placed against the wearer's body and which have a bulk exceeding 10 cm^3/g, preferably more than 13 cm^3/g, and at least one lower second layer (2) directly underlying the upper layer,

which is substantially more heavily compressed, as compared to said first upper layer (1), the bulk of said at least one lower second layer is between 4-8 cm^3/g; and the highly absorbent material (3) is applied underneath the first layer and is distributed within the at least one substantially more heavily compressed second layer, wherein said first layer has poor liquid distributing capacity so that discharged urine will substantially fall right through this layer and down into the underlying, heavily compressed second layer (2)."

VI. The arguments put forward by the appellants can be summarised as follows:

Claim 1 as accepted by the Opposition Division was supposed to be distinguished from the state of the art according to document D2, on which the preamble of the claim was based, by the feature that the first layer was "soft" and had a "poor liquid-distributing capacity". These terms, which were not defined in the description and for which no exemplary values were given, were inherently unclear and thus could not provide a proper distinction over the prior art. In the context of claim 1 all that these terms could be seen as meaning was that the first layer was softer and had a lower "liquid-distributing capacity", by which was presumably meant a lower wicking rate, than the second (lower) layer. However, both of those qualities followed automatically from the requirement already contained in the preamble of the claim that the first layer had a lower density (higher bulk) than the second layer. These considerations therefore led to the conclusion that the subject-matter of claim 1 lacked novelty with respect to document D2. A similar situation arose with respect to document D1, which belonged to the state of the art according to Article 54(3) EPC. Any attempt to differentiate the

subject-matter of the claim from the prior art on the basis of the degree of "softness" or "liquid-distributing capacity" was barred by the requirements of Article 84 (clarity) and/or Article 123(2) EPC (addition of subject-matter).

If, however, the subject-matter of claim 1 according to the main request were held to be novel with respect to documents D1 and D2 then it was clearly obvious when account was taken of documents D6 and D7.

Both of these unequivocally proposed the use of a first (wearer-facing) layer that had "poor liquid-distributing capacity" with the purpose of keeping this layer substantially dry with the discharged liquid being substantially fully absorbed by the more highly compressed second (lower) layer.

All that was required to arrive at the claimed invention was to replace the second layer with that proposed in document D2.

All of the arguments raised against claim 1 according to the main request applied with substantially equal force to claim 1 according to the auxiliary request.

At the oral proceedings before the Opposition Division the appellants had been deprived of the right to argue their case on the basis of lack of inventive step taking into account the way the statement of problem had been amended by the respondents. This offended against Article 113(1) EPC and constituted a substantial procedural violation which justified reimbursement of the fee for appeal.

VII. In reply the respondents argued substantially as follows:

It was well known that the liquid-distributing capacity or wicking rate of the cellulose fluff pulp generally used for the manufacture of diapers or the like was dependent on a number of factors, not just the density. This could be seen for example from document D7. The skilled man would therefore understand the patent specification, and accordingly the respective claims 1 of the main and auxiliary requests, as requiring the use of a material for the first layer with such a low wicking rate that, as the patent specification specifically stated, "discharged urine will substantially fall right through this layer". It was apparent that neither document D1 nor document D2 disclosed the use of a first (wearer-facing) layer of this type.

With regard to the question of "softness" it was agreed that this feature should not be in the characterising clause of claim 1 according to the main request since it was implicit in document D2. On the other hand, the preamble of the claim included a feature, i.e. that the bulk of the first layer exceeded 10 cm^3/g, which was not disclosed there. Accordingly, claim 1 according to the auxiliary request had been drafted in one-part form to avoid these difficulties and also clarified the function of the first layer and that the first and second layers were in direct contact.

This latter feature was of importance when considering inventive step. It had previously been thought necessary to combine a layer containing highly absorbent material with a wicking layer in order to avoid problems associated with the phenomenon known as

gel blocking. The respondents had surprisingly found that when the highly absorbent material was distributed in a compressed fluff pulp layer there was no need for a wicking layer. It was therefore possible to use a wearer-facing layer with a low wicking rate to give more comfort to the wearer.

Reasons for the Decision

1. The appeal is admissible.

2. *Technological background; state of the art*

The use in an absorption body such as a diaper or sanitary napkin of "highly absorbent material", also commonly termed "superabsorbents" or "hydrogels", which can typically absorb 20 times their own weight in water has for self-evident reasons long been considered promising in principle. In practice however the performance of these relatively expensive materials was disappointing. One particular problem associated with their use was a phenomenon known as "gel blocking" which occurs as a result of the surface swelling of a particle of the highly absorbent material preventing liquid transmission to its interior as the material has a low wicking rate. This problem and various attempts to overcome it are discussed in the introductory description of the contested detail and, in more detail, in the introductory description of document D2.

This document proposes a solution to the problem in which an absorption body is formed by air-laying into a web a substantially homogeneous mixture of hydrophilic, e.g. wood pulp, fibres and particles of a hydrogel and then compressing the web to a density of from 0.15 to 1 g/cm^3, which corresponds to a bulk of 1 to 6.7 cm^3/g.

This absorption body can be used by itself between a backsheet and a topsheet to form a diaper or the like or can be placed between an upper layer of conventional wood pulp fibre and the backsheet.

Document D6 relates to a sanitary napkin having a two-layer absorbent body of cellulose fibre in which the upper (wearer-facing) layer has a density of 0.03 to 0.15 g/cm^3, i.e. a bulk of 6.7 to 33.3 cm^3/g and a lower layer with a density of 0.40 to 1.0 g/cm^3, i.e. a bulk of 1.0 to 2.5 cm^3/g. The combination of the relatively open pore structure represented by the upper layer and the comparatively dense lower layer provides for rapid liquid transport through the upper layer in a localised area and preferential absorption in the lower layer. This arrangement improves the comfort of the wearer by providing a substantially dry top surface to the napkin.

Document D7 discloses an absorbent body for diapers or the like which has an upper layer comprising an uncompressed batt of cellulosic fibres having a cationic debonding agent therein and a lower layer comprising a compressed batt of cellulosic fibres without a cationic debonding agent. As a consequence of this arrangement body fluids are received and passed through the upper layer in a relatively small area thereof and are wicked and spread out in a larger area of the lower layer. Again, this results in a top surface of the diaper which is drier to the wearer and thus more comfortable.

3. *The claimed invention; Article 84 EPC (clarity)*

As has been indicated above, the introductory description of the granted patent specification is largely concerned with the problem of realising the full potential of highly absorbent material when

incorporated into an absorption body. As explained in column 2, lines 7 to 15 the solution to this problem is to be seen in the way the grains of highly absorbent material are stably held in the relatively dense compressed layer. Nothing is said here about any effect the soft low density upper layer may have on the performance of the highly absorbent material and, indeed, no particular advantageous properties are ascribed to this layer at all. However, in the paragraph bridging columns 2 and 3 of the particular description it is explained that when the soft upper layer is first wetted in the so-called wetting point that "due to the poor liquid-distributing capacity" of this layer "discharged urine will substantially fall right through this layer and down into the underlying, heavily compressed second layer". It is then said that "owing to the extremely large liquid-transporting capacity of this layer" the urine will be distributed all over it so that the liquid-retaining potential of the highly absorbent powder is fully utilized.

In the light of the above-quoted passages of the description taken in conjunction with the knowledge of the person skilled in the art, as exemplified by documents D6 and D7, the Board is of the opinion that this person would recognise the patent specification as teaching the use, in the first layer of the absorption body to which it relates, not merely of a soft cellulose fluff pulp with a bulk exceeding 10 cm^3/g but in particular of such a material which by virtue of its nature (density, fibre type, degree of bonding, etc.) had, in a manner known *per se*, a low wicking rate, i.e. "poor liquid-distributing capacity". The Board cannot therefore accept the argument of the appellants that the introduction into claim 1 of this requirement for the material of the first layer makes the claim inherently unclear or in the alternative that the only meaning which can be given to it is that it has a lower

wicking rate than the underlying, more heavily compressed second layer. On the other hand it is however evident that the ability of this term to provide a proper distinction over the prior art, in the absence of any quantitative restrictions, is limited and will depend on how equivalent layers are described there.

4. *Article 123(2) EPC*

Since the features incorporated into the respective claims 1 according to both the main and the auxiliary request are disclosed in the same terms in the application as originally filed there can be no objection to them under Article 123(2) EPC. The objection raised by the appellants in this respect is concerned much more with the way that the re-drafting of the statement of problem has changed the emphasis of the claimed invention from the aspect of efficient use of the highly absorbent material to the way that discharged liquid will distribute itself between the layers. Since, however, this effect is clearly described in the original application the Board cannot see how this can offend against Article 123(2) EPC.

5. *Novelty*

5.1 Document D1, which belongs to the state of the art according to Article 54(3) EPC, discloses a two-layered core for a diaper or the like with an upper fluid acquisition distribution layer having a density of 0.05 to 0.25 g/cm^3, i.e. a bulk of 4 to 20 cm^3/g, and a lower fluid storage layer having a density of 0.06 to 0.3 g/cm^3, i.e. a bulk of 3.3 to 16.7 cm^3/g, and containing 9% to 60% by weight of hydrogel particles. In the paragraph bridging pages 7 and 8 it is stated that:

"One essential element of the absorbent core is an upper fluid acquisition/distribution layer which consists essentially of hydrophilic fibre material. This fluid acquisition/distribution layer serves to quickly collect and temporarily hold discharged body fluid. Since such fluid is discharged in gushes, the upper acquisition/distribution layer must be able to quickly acquire and transport fluid by wicking from the point of initial fluid contact to other parts of the acquisition/distribution layer."

In view of that it seems clear to the Board that the upper layer taught by document D1 has a essentially different nature and function to that of the upper (first) layer according to present claim 1 (main and auxiliary request) i.e. it is not a layer having "poor liquid-distributing capacity" as required by these claims.

5.2 The disclosure of document D2 has been summarised in point 2 above. It is not in dispute that this document discloses a two-layer absorbent core for a diaper wherein the lower layer comprises a compressed fibre layer with a bulk of less than 10 cm^3/g and containing highly absorbent therein. All that is said about the upper layer is however that is a conventional air-laid wood pulp fibre web. No specific density values for this upper layer are given. It is clear from the state of the art on file that the bulk of conventional wood pulp fibre layers to be found in diapers and the like extends to values significantly less than 10 cm^3/g. Document D2 does not therefore unambiguously disclose the required combination of a lower layer of bulk of less than 10 cm^3/g containing highly absorbent material with an upper layer of a bulk exceeding 10 cm^3/g.

It is to be noted in this context that the combination of these features in the preamble of claim 1 according to the main request is erroneous. This defect has been rectified in claim 1 according to the auxiliary request, which is in one-part form.

5.3 Having regard to the above the Board is of the opinion that the subject-matter of the respective claims 1 according to the main and the auxiliary requests is novel with respect to both documents D1 and D2.

6. *Inventive step*

The Board shares the view of the appellants that the most appropriate starting point for evaluating inventive step is the state of the art according to document D6. The absorption body disclosed there comprises a first, soft, upper layer with a bulk of 6.7 to 33.3 cm^3/g and a second, more heavily compressed, lower layer with a bulk of 1.0 to 2.5 cm^3/g. Moreover there can be no doubt from the explanations given in document D6, see point 2 above, that the first layer must be considered as having "poor liquid-distributing capacity" and that - in the terms of claim 1 according to the auxiliary request - "discharged urine will substantially fall right through this layer and down into the underlying, heavily compressed second layer."

It is therefore apparent that the subject-matter of claim 1 of the main request differs from what is disclosed in document D6 only in that the lower, more heavily compressed, layer of the state of the art does not contain any highly absorbent material. The subject-matter of claim 1 according to the auxiliary request includes the additional distinction that the bulk of the lower layer lies between 4 to 8 cm^3/g.

Document D2 on the other hand, as can be seen from points 2 and 5.2 above, teaches how such highly absorbent material can be advantageously distributed in a compressed wood pulp fibre web with a bulk of 1 to 6.7 cm^3/g and that such a web can be utilised as the lower layer in a two-layer absorption body with a conventional wood pulp fibre upper layer. The benefits obtained by incorporating the highly absorbent material in the lower layer, in particular the increase in the liquid retention capacity, are clearly portrayed in document D2 and it must therefore be seen as an obvious measure for the person skilled in the art to replace the lower layer disclosed in document D6 by one as taught in document D2.

The argument put forward by the respondents in particular with respect to their auxiliary request that there was a prejudice in the art against using a layer containing highly absorbent material without an adjacent wicking layer, so that the person skilled in the art would at the most have considered placing a third layer containing the highly absorbent material under the second, more compressed, layer disclosed in document D6 and not in direct contact with the upper layer, cannot be accepted by the Board. Such a prejudice could only possibly have existed up until the time document D2 was published since this clearly discloses how the gel blocking problem is to be solved without the use of an additional wicking layer. In particular, document D2 specifically teaches that it is possible to use a compressed fibre layer containing highly absorbent material, having a bulk falling within the range specified in claim 1 of the auxiliary request, as an absorption body without any additional wicking layers, see for example the last paragraph of page 12.

The Board has therefore come to the conclusion that the subject-matter of the respective claim 1 according to the main and the auxiliary request lacks inventive step (Article 56 EPC).

7. *Reimbursement of the fee for appeal*

In support of their request for reimbursement of the fee for appeal the appellants argue that since the terms of claim 1 and the description, in particular the statement of the problem to be solved, were only finally settled late in the oral proceedings before the Opposition Division, then they should have been given a further opportunity to present their comments on inventive step to take the new problem and solution into account.

It must be noted, however, that the critical feature of the "poor liquid-distributing capacity" of the first layer of the absorption body had already been introduced into and amended claim 1 with the initial reply of the respondents to the notice of opposition, almost a year before the oral proceedings took place, and that the appellants were invited by the Opposition Division to make written submissions on the new claim, which they did extensively in their letter of 22 May 1992. The amendment to the statement of the problem to be solved consisted essentially in emphasising the technical effect associated with the "poor liquid-distributing capacity" of the first layer, this effect being clearly disclosed in the particular description of the patent specification. This should not therefore have come as a surprise to the appellants.

Accordingly the contested decision was not based on grounds or evidence on which the appellants did not have an opportunity to present their comments so that it did not offend against Article 113(1) EPC. There was therefore no substantial procedural violation which could justify a reimbursement of the appeal fee (Rule 67 EPC).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

3. The request for reimbursement of the appeal fee is refused.

The Registrar: The Chairman:

S. Fabiani H. Seidenschwarz