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**Datasheet for the decision
of 29 June 2010**

Case Number: T 0502/09 - 3.2.06

Application Number: 00112965.9

Publication Number: 1062930

IPC: A61F 13/534

Language of the proceedings: EN

Title of invention:
Absorbent article

Patentee:
KAO CORPORATION

Opponent:
SCA Hygiene Products AB

Headword:
-

Relevant legal provisions:
EPC Art. 83, 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Main request: thickness ration not sufficiently specified"
"Auxiliary request 1, 2, 3, 6: inventive step - no"
"Auxiliary request 4, 5: not admitted"

Decisions cited:
-

Catchword:
-



Case Number: T 0502/09 - 3.2.06

D E C I S I O N
of the Technical Board of Appeal 3.2.06
of 29 June 2010

Appellant: SCA Hygiene Products AB
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
15 December 2008 concerning maintenance of
European patent No. 1062930 in amended form.

Composition of the Board:

Chairman: P. Alting van Geusau
Members: G. de Crignis
K. Garnett

Summary of Facts and Submissions

- I. European Patent No. 1 062 930, granted on application No. 00 112 965.9, was maintained in amended form by decision of the opposition division posted on 15 December 2008.

Claim 1 as maintained is identical to claim 1 as granted and reads as follows (claim 4 of the set of granted claims has been deleted):

"An absorbent article comprising a liquid permeable topsheet, a liquid-impermeable and moisture-permeable leak proof sheet, and a liquid retentive absorbent member interposed between said topsheet and said leak proof sheet, wherein a foamed material is disposed between said leak proof sheet and said absorbent member, between said topsheet and said absorbent member, inside said absorbent member or in plural positions thereof, said foamed material having a density of 5 to 35 kg/m³, a no-load thickness of 1 to 10 mm, and a compressive recovery of 60% or more in terms of $(b/a \times 100)$, wherein a is a thickness (mm) measured after 24 hour standing with no load applied, and b is a thickness (mm) measured after 24 hour compression under a load of 180 gf/cm² followed by 30-minute standing with no load applied, and said foamed material is fixed at the prescribed position with an adhesive which has been applied to substantially the entire surface of at least one side of said foamed material or substantially the entire contact area of a member to be brought into contact with said foamed material in such a manner that the

adhesive is distributed substantially uniformly while providing applied parts and unapplied parts, wherein the thickness of the absorbent article under a load of 17.6 kPa and the thickness of the article after unloading (no-load thickness) are such that the latter is 1.3 times or greater the former."

- II. On 19 February 2009 the appellant (opponent) filed an appeal against this decision and simultaneously paid the appeal fee. A statement setting out the grounds of appeal was received at the European Patent Office on 23 March 2009.

- III. In a communication annexed to summons to oral proceedings, the Board in particular pointed to the lack of specific methods in claim 1 for determining the claimed parameters and further commented on the disclosure of D1 in respect of novelty of the claimed subject-matter.

- IV. Oral proceedings were held on 29 June 2010. The appellant requested that the decision under appeal be set aside and that the patent be revoked. The respondent requested that the appeal be dismissed, alternatively that the decision under appeal be set aside and the patent be maintained on the basis of one of the first to sixth auxiliary requests filed during the oral proceedings.

Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the foamed material is specified as having:

- a density of 5 to 35 kg/m³, *the density being obtained after it is allowed to stand for 24 hours with no load applied;*
- a no-load thickness of 1 to 10 mm, *wherein the no-load thickness is measured after 24-hour standing with no load applied and with the apparatus and method described herein;*
- a compressive recovery of 60% or more in terms of $(b/a \times 100)$, wherein a is a thickness (mm) measured after 24 hour standing with no load applied, and b is a thickness (mm) measured after 24 hour compression under a load of 17.6 kPa (180 gf/cm²) followed by 30-minute standing with no load applied *and with the apparatus and method described herein;*
and in that "*... the thickness of the absorbent article being measured as described herein*".
(amendments in italics)

Claim 1 of the second auxiliary request differs from claim 1 of the first auxiliary request in that the position of the foamed material is limited to being between the leakproof sheet and the absorbent member.

Claim 1 of the third auxiliary request differs from claim 1 of the second auxiliary request in that the application of the adhesive is specified such that "wherein the configuration of said applied parts is spots, lines, dots or spirals, the area ratio of the coated parts to the uncoated parts is 2/8 to 7/3".

Claim 1 of the fourth auxiliary request differs from claim 1 of the third auxiliary request in that the foamed material is specified as being ether-type urethane foam.

Claim 1 of the fifth auxiliary request differs from claim 1 of the fourth auxiliary request in that the density range of the ether-type urethane foam material is limited to 5 to 20 kg/m³.

Claim 1 of the sixth auxiliary request differs from claim 1 of the fifth auxiliary request in that the foamed material is specified as being urethane foam "which has a yellowness index of 40 or smaller when allowed to stand in 200 ppm nitrogen monoxide for 5 hours and when irradiated with ultraviolet rays in a carbon arc fadeometer for 24 hours, the yellowness index being measured in accordance with JIS K 7103-1977".

V. The arguments of the appellant may be summarised as follows:

Claim 1 as maintained by the opposition division included parameters without specifying the methods enabling the claimed values to be obtained reliably reproducibly. Therefore, the skilled person did not know how to carry out the invention within the full scope of the claim (Article 100(b) EPC). In particular, for the thickness ratio of the absorbent article, the inconsistencies regarding the wording of the claim and the test method referred to in the description did not give the skilled person any guidance as to how to arrive at reliable data. Hence, the patent in suit did not disclose the invention sufficiently clearly or completely for it to be carried out by a skilled person.

The subject-matter of claim 1 of the first auxiliary request was not disclosed in the application as originally filed insofar as the claimed combination of features was concerned (Article 123(2) EPC). The test method for the thickness ratio referred to in paragraphs [0066] and [0067] - although literally specifying an absorbent article - concerned only a disposable diaper. The claim referred to foamed material in general although in the examples only ether and ester type urethane foam was disclosed.

Moreover, the requirements of Article 123(3) EPC were not met. Different articles fell within the scope of the claim, which articles had not been included in the granted claim. This applied in particular for the feature concerning the thickness and the thickness ratio of the absorbent article. In the test method of paragraphs [0066] and [0067] which was now referred to in the claim, only four points had to be measured for the test piece and such articles could be different from the articles whose overall thickness and thickness ratio had to have a certain value.

With regard to the requirements of Article 84 EPC, the claim specified neither a position nor the extension of the foamed material.

Also the objections concerning sufficiency of disclosure had not been completely remedied. The wording of the claim was inconsistent with regard to the "no-load" feature to such an extent that the skilled person did not know whether "no-load" really meant no load. Moreover, the test methods were not specified concerning preconditioning.

Concerning novelty of the subject-matter of claim 1 of the first auxiliary request, D1 disclosed, at least in

an implicit manner, all features thereof. The only feature put into question by the opposition division was whether D1 provided a teaching for an adhesive being applied in the claimed manner on the foamed material. This was however clearly derivable from the passage on page 9, lines 10 to 25 of D1.

Even when considering this feature as distinguishing the claimed subject-matter from the prior art, the skilled person was well aware of techniques for the application of adhesive while maintaining the fluid communication between the layers so as to maintain breathability and flexibility of the article. The corresponding knowledge was documented in D5, page 7. Accordingly, no inventive step was necessary to arrive at the claimed combination of features.

The subject-matter of claim 1 of auxiliary request 2 specified the position of the foamed material in the same manner as shown in Figure 7 of D1. Accordingly, the arguments concerning lack of inventive step applied as well.

With regard to the subject-matter of claim 1 of auxiliary request 3, a further sufficiency objection arose. It was not in any way disclosed how the area ratio of the coated to the uncoated adhesive parts should be determined.

With regard to inventive step of such subject-matter, D5 referred to a preferred percentage of not more than 40% of the common interface of two adjacent layers. Hence an overlap in the area of from 25 to 40% was present. The joined area depended on the kind of adhesive, on the particular technique of application

and on the desired flexibility of the article. None of these considerations nor the corresponding measures to be taken could form the basis of an inventive step.

Concerning the subject-matter of claim 1 of auxiliary requests 4 and 5, there was no disclosure in the patent in suit which linked the claimed parameters to an ether-type urethane foam. Accordingly the respective claims 1 did not add inventive features to the subject-matter of the earlier requests. Therefore these late-filed requests should not be admitted to the proceedings.

Concerning the subject-matter of claim 1 of auxiliary request 6, the range for the yellowness index was derivable from D7. D7 disclosed the use of UV-stabilizers for polyurethane materials. Accordingly, the subject-matter of claim 1 also did not involve an inventive step.

VI. The arguments of the respondent may be summarised as follows:

The objections set out under Article 100 (b) EPC concerned clarity (Article 84 EPC) which was no ground of opposition. The patent in suit disclosed how to measure the thickness ratio of the claimed article. The test method was disclosed in paragraphs [0066] and [0067], in particular with regard to small dimensions of the article. Hence, there was sufficient information in the description; it was the dry recovery which should be measured; pre-conditioning should be carried out as usually applied in this technical field; the no-

load feature was related to 98Pa. Accordingly, there was no lack of sufficiency.

The subject-matter of claim 1 of the first auxiliary request was literally disclosed in the application as originally filed and limited to the specifically disclosed test methods (Article 123(2) EPC). The test method referred to in paragraphs [0066] and [0067] explicitly stated how to choose the test piece even for cases where the absorbent article was smaller than 100 mm in longitudinal or lateral size. The skilled person would have no difficulty in applying this test method. The disclosure of the patent in suit referred generally to foamed material.

Also the requirements of Article 123(3) EPC were met because the test method had always been the basis for the determination of the parameter of the claimed subject-matter.

With regard to the requirements of Article 84 EPC, the skilled person would understand that the foam had to be present in the "whole" centre of the test piece. The claim had to be read with a mind willing to understand the invention claimed. Moreover, the skilled person could easily distinguish the meaning of "no-load" for the foamed material from the meaning of "no-load" for the absorbent article, where a low load was required for flattening the test piece. The skilled person could apply usual pre-conditioning without any problem. Therefore, the objections concerning sufficiency of disclosure were not probative.

The subject-matter of claim 1 of the first auxiliary request was novel over the disclosure of D1. D1 did not disclose that the adhesive should be distributed substantially over the entire surface of one side of

the foamed material such as to provide "applied and unapplied parts". Moreover, the wet recovery mentioned in D1 could not be compared with the dry compression recovery of the claimed article.

With regard to inventive step, the skilled person would not be led to apply adhesive over the whole surface for joining the individual layers in D1 since adhesive applied in such a manner would negatively affect the fluid communication. Moreover D5 did not add anything in this respect as it was concerned about flexibility of the article and not concerned about recovery characteristics.

The subject-matter of claim 1 of auxiliary request 2 limited the position of the foamed material so as to lie between the leakproof sheet and the absorbent member. No such position was shown in D1; Figure 7 of D1 represented a sequence of layers having the foamed layer located between two absorbent members.

With regard to the subject-matter of claim 1 of auxiliary request 3, the skilled person could easily recognize which areas were covered by adhesive. No particular method had to be used and therefore the skilled person would have no difficulty in determining the ratio of the coated to the non-coated areas. D5 referred to a preferred area of not more than 40% of the common interface of two adjacent layers being joined and did not specify a foamed layer. Accordingly, there was no direct overlap of the claimed range and the known range. Furthermore, no suggestion as regards the claimed range was derivable from the cited prior art.

The subject-matter of claim 1 of auxiliary requests 4 and 5 was limited to ether-type urethane foam which was used in the examples 1 to 5. No suggestion was derivable from the cited prior art to arrange the claimed features in this particular combination leading to the advantages as set out in description of the patent.

Concerning the subject-matter of claim 1 of auxiliary request 6, only embodiments whose yellowness index was in the claimed range were involved. The yellowness index was not linked to the adhesive application. D7 did not refer to the same yellowness index, even less to its use for layers of absorbent articles. Therefore, the skilled person was not given any suggestion for the claimed combination of features and therefore an inventive step should be recognised.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request - sufficiency*
 - 2.1 Claim 1 includes a variety of parameters, which concern either the foamed material (density, no-load thickness and compressive recovery) or the absorbent article (the thickness of the absorbent article under a load of 17.6 kPa and the thickness of the article after unloading - the no-load thickness - are such that the latter is 1.3 or more times greater than the former).

- 2.2 The discussion during the oral proceedings focussed on the reliable reproducibility of the latter feature concerning the thickness ratio of the absorbent article. The respondent referred to the test method disclosed in paragraphs [0066] and [0067] as providing sufficient information for the skilled person to reliably reproduce such data.
- 2.3 With regard to the determination of the thickness ratio, the patent in suit discloses in these paragraphs that a test piece of 100 x 100 mm is chosen in a specific way and a certain load (17.6 kPa) is applied for 24 hours to this test piece. The no-load thickness is specifically determined after a specific time-delay with a pressure of 98 Pa.
- 2.4 It could be accepted that if the method disclosed in the patent in suit was the only reasonable determination method, such that the skilled person would apply the parameters concerned, the subject-matter of claim 1 would have to be considered having regard to this measuring procedure only. However, this is clearly not the case here. First, the "no-load thickness" not in reality determined under no load at all but rather under a very specific load, not having any antecedent in the claimed subject-matter. Second, and moreover, in determining the thickness a specified load is applied to the whole absorbent article instead of the foamed material alone and without specifying any time interval for the application of the load and without specifying any delay before measurement of the no-load value. It is therefore immediately apparent that in the absence of

any generally valid measurement protocol no consistent values can be obtained for the claimed parameters.

- 2.5 For these reasons, the skilled person is not in a position to establish with sufficient certainty, and for any given absorbent article, whether the article lies within the scope of the claim, in particular whether the lower limit of the thickness ratio specified in the claim is present in an article. The disclosure of the patent in suit is therefore to be regarded as insufficient within the meaning of Article 83 EPC.

3. *Auxiliary request 1*

3.1 Amendments

The subject-matter of claim 1 is limited with regard to the claimed parameters to the test methods referred to in the description for obtaining the characteristics claimed for the foamed material and the absorbent article. Additionally, the SI-units are now consistently applied.

3.2 Article 123(2) EPC

The test method referred to in paragraphs [0066] and [0067] concerning the thickness of the absorbent article specifies an absorbent article. For articles smaller in size than the usually used test piece it is stated that the whole of the absorbent article could form the test piece. Although these paragraphs are set out in the context of a disposable diaper, this test

method can be applied to other absorbent articles without any difficulty.

The disclosure of the patent in suit refers generally to foamed material. Although in the examples only ether and ester-type urethane foam is disclosed, the whole description of the patent in suit refers to foamed material in general. The test procedures are nowhere disclosed as being linked to a specific foamed material. Additionally, the claimed ranges are disclosed in the summary of the invention. Accordingly, the requirements of Article 123(2) EPC are met.

3.3 Article 123(3) EPC

The description of the test methods always included the articles falling within the scope of present claim 1. Hence, the requirements of Article 123(3) EPC are met.

3.4 Article 84 EPC

The skilled person reading the patent in suit would understand that the foamed material has to be present in the whole of the centre of the absorbent article and thus also of the test piece. Such a view is reinforced in all the Figures which show such embodiments. Although it is not specified how much foam is to be applied within an article, the skilled person is capable of designing such an article with respect to the desired dimensions, having regard to the specified thickness and density of the foam. Hence, no clarity issue arises.

3.5 Article 83 EPC

3.5.1 It is correct that neither the test procedure in paragraphs [0066]/[0067] nor any other procedure in the specification of the patent in suit clearly specifies the pre-conditioning of the foamed material or of the test piece of the absorbent article.

3.5.2 However, the respondent's view that the skilled person would apply usual temperature and humidity conditions is reasonable. Although no such conditions are specified, these conditions have not been shown to have an important influence on the claimed ratio. Therefore, the test method does not need to be limited to a specific pre-conditioning other than what is common in this art. The appellant's argument that the boundaries of the claim are slightly unclear is correct but in the present case there is no reason to assume that this would prevent the skilled person from carrying out the invention.

3.5.3 Also the objections concerning the wording of the claim being inconsistent with regard to the "no-load" feature to such an extent that the skilled person would not know whether "no-load" really meant no load or a slight specific load, do not mean that the skilled person would not be able to carry out the invention. The skilled person could easily distinguish the meaning of "no-load" for the foamed material - referring effectively to no load being applied - from the meaning of "no-load" for the absorbent article, where a certain low load (98 Pa) is required for flattening the test piece. Accordingly, the requirements of Article 83 EPC are fulfilled.

3.6 Novelty

3.6.1 D1 discloses in its example 1 (page 37) a disposable diaper having a composite absorbent core which comprises a first absorbent portion including wood pulp fluff and superabsorbent material. In a first and second resilient portion, polyurethane foam material is present having a density of 27 kg/m^3 , a thickness of 5 mm and a wet compression recovery of 97% (page 38, 39, Table 1). With regard to the overall design of the article, reference is made to the composite absorbent core shown in Figure 7 of D1.

3.6.2 Generally, D1 discloses these composite absorbent cores as being located within a pocket formed by the bodyside liner (liquid permeable top sheet) and an outer cover (leakproof back sheet). Generally, D1 considers resiliency in the wet and dry state as being a property of the absorbent structure (page 3, line 5/6, page 16, lines 15/16, page 20, lines 6/7) and specifies for the resilient portions a wet compression recovery of at least about 85% (page 3, line 18/19; page 20, lines 11/12).

3.6.3 The respondent considered the subject-matter of claim 1 to differ from this disclosure by the dry compressive recovery, which is claimed to be 60% or more. The Board has already expressed in the annex to the summons the view that the wet compressive recovery value is usually less than the dry compression recovery value (see D3, column 25, lines 25 - 57). The respondent argued that under specific conditions such a view would not be correct and that the wet compressive recovery could not

be compared with the dry compressive recovery of the present invention. The argument was that measurement conditions (time, pressure) of compression recovery would influence such data. However, no data have been provided by way of evidence. Hence, mainly in view of the high wet compression recovery referred to in D1, both generally and as in the above referenced example, and in view of the same foam materials (polyurethane) being used in D1 and in the patent in suit, the Board maintains its view that the wet compressive recovery figure of D1 falls within the claimed range. Therefore, this feature is not suitable to distinguish the claimed subject-matter from the disclosure in D1.

3.6.4 D1 discloses with regard to bonding of the bodyside liner and the outer cover that: "*... a uniform continuous layer of adhesive, a patterned layer of adhesive, a sprayer or melt blown pattern of adhesive or an array of lines, swirls or spots of adhesive may be used to affix the body side liner to the outer cover. Such bonding means may also be suitable for attaching other components of the composite absorbent core and absorbent article of the present invention together.*" (page 9, second paragraph).

This general disclosure applies for all components and also for all the examples.

3.6.5 Claim 1 requires that "*said foamed material is fixed at the prescribed position with an adhesive which has been applied to substantially the entire surface of at least one side of said foam material or substantially the entire contact area of a member to be brought into contact with said foamed material in such a manner that*

the adhesive is distributed substantially uniformly while providing applied parts and unapplied parts". Consistently with this, paragraph [0035] states that the coated parts are uniformly distributed over the contact area of either the foamed material or the contact member.

3.6.6 D1 discloses that adhesive can be applied on any layer. The fact that sufficient adhesive has to be used in order to avoid wrinkles or detachments of the individual layers of the absorbent article is considered as a basic requirement for such an article. However, the provision of coated and uncoated parts of the foamed layer is not directly and unambiguously disclosed in D1 in connection with such bonding pattern. Accordingly, the subject-matter of claim 1 is novel over D1 (Article 54 EPC).

3.7 Inventive step - claim 1 - auxiliary request 1

3.7.1 For the assessment of inventive step, D1 represents the closest prior art. In addition to the paragraph cited above (point 3.6.4), D1 refers (page 11, lines 13 to 19) to the connection of the adjacent portions of an absorbent article by adhesive bonding such as is well-known in the art while maintenance of the fluid communication is to be considered (page 16, lines 22/23; page 21, line 11/13). The feature distinguishing the claimed subject-matter from the disclosure of D1 is the application of adhesive on substantially the entire surface of the foamed material in such a manner that the adhesive is distributed substantially uniformly while providing applied and unapplied parts.

- 3.7.2 When starting from the embodiment disclosed in example 1 of D1, the objective technical problem to be solved is to optimize the joining of the different layers while maintaining the specific properties of the different layers.
- 3.7.3 The solution according to claim 1 is to apply the adhesive in a pattern providing applied and unapplied parts. The effect of such an application of adhesive is to maintain moisture-permeability and, if desired, breathability (paragraph [0079]). The applied and unapplied parts can be implemented by for example line patterns or spiral patterns (paragraph [0076]).
- 3.7.4 In principle, the concept of the application of adhesive in spots, lines, dots or spirals was already known in the prior art (D5: page 7, lines 42 - 58). The concept of reducing the application of adhesive to the minimal level required for the attachment/joining of two adjacent layers in order to minimise the impact on permeability (breathability) and flexibility of the article was also known, at least from this prior art.
- 3.7.5 Accordingly, - when starting from D1 - and desiring to solve the above cited problem, the skilled person would follow the concept of absorbent article construction such as that described in some detail on page 7 in D5, because it directly indicates the claimed solution in combination with the corresponding advantages.
- 3.7.6 D5 suggests in this section (titled: "Construction of absorbent articles") joining preferably all of the elements (page 7, lines 34/35) and, as preferred means, joining by means of the application of adhesive (page 7,

line 46). In this respect reference is made to *inter alia* spiral application, slot coating, spraying (page 7, lines 47/48/58), with a preference for spiral spraying. In order to minimise the impact of the adhesive on the permeability (breathability) and flexibility of the absorbent article, the amount of adhesive should be minimised and areas of the common interface which are adhesive free should be present (page 7, lines 54 - 57). Such teaching directly corresponds to the solution according to claim 1 of the patent in suit. Accordingly, the subject-matter of claim 1 lacks an inventive step (Article 56 EPC).

4. *Auxiliary request 2*

4.1 Amendments

Claim 1 of auxiliary request 2 differs from the subject-matter of claim 1 of auxiliary request 1 in that the position of the foamed material is limited to one being between the leakproof sheet and the absorbent member.

4.2 Inventive step claim 1 auxiliary request 2

Such a position of the foamed material is shown in Figure 7 of D1 - although indirectly, in that an absorbent layer underlies and overlies the foam resilient layer. However, such an ordering of the layers includes the position of the foamed material which is claimed in the subject-matter of claim 1. Accordingly, the arguments concerning lack of inventive step given above for claim 1 of the first auxiliary request apply.

5. *Auxiliary request 3*

5.1 Amendments

Claim 1 of the third auxiliary request differs from claim 1 of the second auxiliary request in that the application of the adhesive is specified further such that "wherein the configuration of said applied parts is spots, lines, dots or spirals, the area ratio of the coated parts to the uncoated parts is 2/8 to 7/3".

5.2 Sufficiency

Although no method is disclosed as to how to determine the area ratio of the coated to uncoated adhesive parts, corresponding information can be obtained by examples 1 to 6 of the patent in suit (paragraph [0076]). The hot-melt adhesive is applied in a spiral pattern to the foamed material of these examples. The area ratio of the coated to the uncoated part is 4/6 (140cm² to 211cm²). Without doubt the skilled person can reproduce such an application of adhesive, something that is generally confirmed by the above cited paragraph in D5 (page 7, lines 50 - 58) concerning the construction of absorbent articles. The requirements of Article 83 EPC are met.

5.3 Inventive step claim 1 auxiliary request 3

5.3.1 As set out above (point 3.8.5), in principle the concept of the application of adhesive was already known from D5. D5 states that a preferred percentage of not more than 40% of the common interface of two

adjacent layers should be joined and indicates that a thin application of adhesive is preferred (page 8, lines 4 to 6).

5.3.2 Accordingly, - when starting from D1 - and desiring to solve the above cited problem concerning the optimal joining of the layers in combination with the additional desire to ensure breathability of the absorbent article, the skilled person would take into account the considerations disclosed in some detail in D5 on page 7, line 50 to page 8, line 6. This passage is directed to achieving secure joining with the required level of attachment while maintaining adhesive-free areas in order to allow sufficient liquid transport for enabling breathability and flexibility (comfort) of the article.

5.3.3 Hence, these considerations with regard to the construction of absorbent articles directly indicate the claimed solution. They are not limited to a special material or layer but apply to all layers which are to be considered for liquid transport in an absorbent article. The preferred area of the common interface of not more than 40% as disclosed in D5 results in an overlap with the claimed invention in the range of the area of from 25% to 40%. The specific area ratio to be chosen depends on the kind of adhesive, on the particular technique of application and on the desired flexibility of the article, which features are not specified in claim 1. Therefore, at least with regard to the overlapping part, the solution to the above cited problem would have been directly indicated to the skilled person. Accordingly, the subject-matter of claim 1 lacks an inventive step (Article 56 EPC).

6. *Auxiliary request 4*

6.1 Amendments

In claim 1 of the fourth auxiliary request it is additionally specified that the foamed material is ether-type urethane foam. Such material is used in the examples 1 to 5. Table 2 shows the values obtained for these foamed materials concerning density, thickness, compressive recovery and the values obtained for diapers comprising such foamed materials as regards thickness both with and without load and the corresponding thickness ratio. Paragraph [0039] of the patent in suit refers to ether-type urethane foam material as a preferred material for "obtaining a low density foam, with which lightweight disposable diapers showing good recovery from compression can be obtained."

6.2 Admissibility

6.2.1 This request was filed during the oral proceedings, hence at the last possible stage in the proceedings. According to Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA), it lies within the discretion of the Board to admit such a late-filed request in the proceedings. In order to be admitted, the request should be clearly allowable, which is not the case for the present request, for the following reasons.

6.2.2 The ranges claimed for the parameters are disclosed in the patent in suit generally for the foamed materials

and accordingly there is no doubt that the claimed ranges apply generally for all kinds of urethane foams, and that they also apply to polyolefin foam, which is disclosed in paragraph [0039].

6.2.3 Hence, the claimed parameters are disclosed in respect of the whole invention and there is no support which would enable the conclusion to be drawn, or which clearly demonstrates, that the whole range is applicable to ether-type urethane foam. The examples given in Table 2 represent five specific examples of ether-type urethane foam having an initial thickness of 1, 1.5 or 2 mm, densities in the range of 13.5 to 18.1 kg/m³ and compressive recoveries in the range of 94 to 96%. In view of missing details concerning pore volume or pore size, it is impossible to conclude that only such density ranges would be justified for this material and it is equally impossible to know whether the generally disclosed ranges for density, no-load thickness and compressive recovery apply.

6.2.4 Accordingly, there is no clear and unambiguous disclosure for the subject-matter of claim 1 (Article 123(2) EPC) and the request is not admitted into the proceedings.

7. *Auxiliary request 5*

7.1 Amendments

Claim 1 of the fifth auxiliary request differs from claim 1 of the fourth auxiliary request in that the density range is limited to 5 to 20 kg/m³.

7.2 Admissibility

Although in paragraph [0036] a particular range for the density is disclosed which is limited to 5 to 20 kg/m³, this particular range is not related *expressis verbis* to a particular foam material.

Accordingly, the conclusion above for auxiliary request 4 (see point 6.2) applies as well and there is no clear and unambiguous disclosure for the subject-matter of claim 1 (Article 123(2) EPC) and at least for these reasons claim 1 is not clearly allowable. Therefore this request is not admitted into the proceedings.

8. *Auxiliary request 6*

8.1 Amendments

Claim 1 of the sixth auxiliary request differs from claim 1 of the fifth auxiliary request in that the foamed material is specified as being urethane foam "which has a yellowness index of 40 or smaller when allowed to stand in 200 ppm nitrogen monoxide for 5 hours and when irradiated with ultraviolet rays in a carbon arc fadeometer for 24 hours, the yellowness index being measured in accordance with JIS K 7103-1977".

This added subject-matter was the subject-matter of claim 5 as granted, corresponding to claim 4 as originally filed with the addition of the test method which was disclosed in paragraph [0040] of the patent in suit corresponding to page 11, lines 27 - page 12, line 7 as originally filed.

This feature is independent of the compressive recovery of the foam and is also not related to the application of adhesive. Therefore, no formal deficiencies are present and the request is formally acceptable.

8.2 Inventive step - claim 1 - auxiliary request 6

8.2.1 When starting from the embodiment disclosed in example 1 of D1, the objective technical problem to be solved is to provide a polyurethane material which does not change its colour to a substantial amount when subjected to environmental stress conditions (UV, NO_x gases) (paragraphs [0001], [0007], [0008], [0010], [0011]). The solution according to present claim 1 is a urethane foam material having a specific maximum yellowness index when exposed to specific environmental conditions.

8.2.2 The patent in suit notes in paragraphs [0008] and [0010] that it is known that urethane foams are yellowed or browned by ultraviolet rays and that this effect, for optical reasons, is undesired in absorbent articles. In paragraph [0010] it is also disclosed that the addition of UV-stabilizers has been suggested in the prior art and in paragraph [0011] the problem is extended to the influence of nitrogen oxide gas, which also contributes to colour change.

8.2.3 The tables in the patent in suit show that for all examples the value of the yellowness index is smaller when comparing NO_x- to UV-exposition. Therefore, the feature in question does not actually concern two independent requirements. Consistently with this, the

description of the patent in suit discloses (paragraph [0040]) that "*Urethane foam having a yellowness index of 40 or smaller hardly undergoes yellowing when exposed to NO_x in the environment..., or to ultraviolet rays in the environment.*" Hence, the feature concerning the yellowness index does not relate to two cumulative and independent features according to the wording of the claim. Accordingly, it is sufficient to consider the UV-stability and, when this criteria is met, the NO_x-stability will also be met.

8.2.4 The skilled person starting from example 1 of D1 and confronted with the above problem would certainly be a chemist who was familiar with polyurethane chemistry and knew that UV stabilisation of such materials is necessary in order to avoid undesirable yellowing. In this respect the skilled person would have to identify an upper limit for yellowness and an appropriate test procedure. An example for such knowledge is present via D7.

8.2.5 D7 discloses that a stabilizer composition can significantly improve the weather resistance of polyurethane and thereby significantly prevent polyurethane articles from browning ((page 2, lines 18 to 25; page 28, lines 1 to 6). It discloses the application of specific stabilizer compositions which are effective in maintaining the whiteness of polyurethane (page 3, lines 17 to page 4, line 12). These stabilizer compositions consist of an amount of 0.05 to 5% by weight of an ultraviolet absorber in combination with a tertiary phosphite, an oxidant and a 1,1-dialkyl-substituted semicarbazide or carbazate based on the polyurethane (D7: page 17, lines 17 - 20).

D7 points to the fact that smaller amounts of additives may result in an insufficient stability. In its Table 1 D7 indicates the yellowness index of thirteen examples and five comparative examples. The yellowness index of the examples lies within the range of 24 to 41 whereas, for the comparative examples, the yellowness index lies between 45 and 80. Accordingly, D7 shows that an acceptable whiteness of polyurethane is maintained up to a yellowness index of 41.

8.2.6 D7 refers with regard to the determination of the yellowness index to the subjection of the examples to an irradiation test under a carbon-arc sunshine weather meter for 30 hours whereas the patent in suit refers to the specific yellowness index when allowed to stand in 200 ppm nitrogen monoxide gas for 5 hours and the (alternative) further requirement concerning irradiation with UV rays in a carbon arc fadeometer for 24 hours.

8.2.7 When comparing the data for the yellowness index of the examples in D7 with the data for the yellowness index in the examples of the patent in suit, the yellowness index disclosed in D7 is slightly below the one tested in the patent in suit. This can be verified in that examples 4 to 7 of the patent in suit correspond exactly to examples 10 to 13 of D7 in that they rely upon polyurethane comprising the same stabilizer compositions in identical amounts and result in yellowness indices of 36/30/32/29 and 29/25/26/24 respectively. Such slight discrepancy in the yellowness indices most probably results from the slightly different preparation of the urethane foam (different water content) and in particular from the different

density and thickness of the tested polyurethane sheets (2mm in the patent in suit, 5mm in D7) as well as the different test procedures.

- 8.2.8 The claimed maximum value of 40 for the yellowness index is in line with the corresponding values disclosed for the examples in D7 (see points 8.2.5 and 8.2.7 above). With regard to the choice of an upper limit for an acceptable yellowness index, it is to be noted that this number indicates the yellowness which is acceptable; but the yellowness itself is a colour and can result from different environmental test conditions. The claimed value of the yellowness index thus identifies which polyurethane still has an acceptable colour and is independent of the choice of a specific test scenario, which defines a certain environmental exposure of the urethane foam.
- 8.2.9 When evaluating the "acceptable" yellowing, the skilled person would have to scrutinize the examples and the table disclosed in D7. These data demonstrate (as well as those in the tables in the patent in suit) that the degree of yellowing mainly depends on the amount of stabilizers used. Therefore, when deducing from the examples in D7 that an acceptable colour corresponds to a maximum value of the yellowness index of 41, the decision concerning the desired degree of stabilization by applying the corresponding amount of stabilizers would be part of the routine work of the skilled person and would not include any inventive activity. The more so, since D7 already shows in its examples how to obtain such results. The difference between the claimed upper limit of 40 for the yellowness index instead of 41 such as set out in D7 is of marginal significance,

as this is not a substantial deviation. Accordingly, the specification of a yellowness index of 40 or less is a purposive selection consistent with the examples disclosed in D7. Such purpose is plainly obvious in the context of a method of obtaining colour-stable polyurethanes.

8.2.10 When defining a suitable environmental stress exposition for the test set up of the urethane foam, the environmental stress of the test set up in D7 is similar to the one in the patent in suit. The duration time of the irradiation is not the only relevant factor; also relevant are the intensity and the wavelength of the irradiation. These further conditions are not specified. However, as shown in examples 10 to 13, corresponding to examples 4 to 7 of the patent in suit, there is no fundamental difference when comparing the results for the yellowness index of these two similar test procedures.

8.2.11 Accordingly, the skilled person trying to solve the problem set out above would directly choose a polyurethane material to which a stabilizer composition such as suggested in D7 had been applied in the suggested amounts, and would obtain a material having a yellowness index of 40 or smaller when exposed to reasonable environmental stress test conditions. Accordingly, the subject-matter of claim 1 lacks an inventive step (Article 56 EPC).

9. Consequently the invention claimed in claim 1 of the respondent's main request lacks sufficient information in the patent in suit in order to carry out the invention; the first, second, third and sixth auxiliary

requests are not allowable for lack of inventive step (Art. 56 EPC), and the fourth and fifth auxiliary requests are not admitted into the proceedings.

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

M. Patin

P. Alting van Geusau