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D E C I S I O N
of 14 March 2006

Case Number: T 0844/04 - 3.3.09

Application Number: 93101937.6

Publication Number: 0596191

IPC: B32B 5/26

Language of the proceedings: EN

Title of invention:

Laminated fibrous material, method and apparatus for making
and use the same

Patentee:

KIMBERLY-CLARK WORLDWIDE, INC.

Opponent:

SCA Hygiene Products AB

Headword:

-

Relevant legal provisions:

EPC Art. 56

Keyword:

"Main request: inventive step (no)"

"Auxiliary request: inventive step (yes)"

Decisions cited:

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Catchword:

-



Case Number: T 0844/04 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 14 March 2006

Appellant: KIMBERLY-CLARK WORLDWIDE, INC.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 27 April 2004
revoking European patent No. 0596191 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: P. Kitzmantel
Members: A.-T. Liu
K. Garnett

Summary of Facts and Submissions

I. European Patent No. 596 191 was granted with a set of 26 claims. The granted independent claims read as follows:

"1. A laminated fibrous material (10,80) comprising:

a first fibrous layer (12) comprising a plurality of fibers of one or more thermoplastic polymeric materials;

a second fibrous layer (22) comprising a plurality of fibers of two or more different thermoplastic polymeric materials forming fibers of different diameters;

said first and second layers being bonded together in a spaced apart bonding pattern (18) comprising a plurality of compacted bonding areas with lightly bonded fiber spans (19) therebetween; and

said bonding areas having apertures (30) formed therein.

14. A process for making a laminated fibrous material comprising the steps of:

a. forming a first fibrous layer comprising a plurality of fibers of one or more thermoplastic polymeric materials;

b. forming a second fibrous layer comprising a plurality of fibers of two or more different

thermoplastic polymeric materials forming fibers of different diameters;

c. bonding said first and second layers together in a spaced apart bonding pattern comprising a plurality of compacted bonding areas with lightly bonded fiber spans therebetween; and

d. forming apertures within said bonding areas.

22. An apparatus for forming a laminated fibrous material comprising:

means (42) for forming a first fibrous layer (12) comprising a plurality of fibers of one or more thermoplastic polymeric materials;

means (52) for forming a second fibrous layer (22) comprising a plurality of fibers of two or more different thermoplastic polymeric materials forming fibers of different diameters;

bonding means (60,70) for bonding said first and second layers together in a spaced apart bonding pattern comprising a plurality of compacted bonding areas with lightly bonded fiber spans therebetween; and means for forming apertures within said bonding areas."

II. A notice of opposition was filed by SCA Hygiene Products AB against this patent under Article 100(a), based on the grounds of lack of novelty and lack of inventive step, and under Articles 100(b) and (c) EPC. Of the prior art documents cited in the course of the

opposition proceedings, reference will be expressly made to the following in the present decision:

D1: WO-A-91/14414 and

D2: US-A-3 542 634.

III. At the conclusion of the oral proceedings on 6 April 2004, the opposition division decided to revoke the patent in suit. Essentially, it was held that the subject-matter of Claim 1 as granted lacked an inventive step in view of the disclosure of D1 in combination with that of D2, a document expressly cited in D1. The patentability of Claim 22 did not form part of the decision under appeal. However, it was remarked additionally that the finding of lack of inventive step would also apply to the apparatus of Claim 22.

IV. The decision of the opposition division was dispatched in written form on 27 April 2004 and a notice of appeal against it was filed by the patentee (Kimberley-Clark Worldwide, Inc.) on 6 July 2004. Together with the statement of the grounds of appeal dated 6 September 2004, the appellant filed amended claims as bases for seven auxiliary requests.

Further, in view of the fact that the "B" specification of the patent in suit contained printing errors, a corrected version of the claims as granted was also submitted as the basis for the main request.

V. At the oral proceedings on 14 March 2006, the appellant submitted new sets of claims, as bases for a new main request and 7 auxiliary requests, to supersede the ones

previously submitted with the statement of the grounds of appeal. Of these, the appellant subsequently relinquished the first to fifth and seventh auxiliary requests, retaining only the new main request and the sixth auxiliary request for decision.

The main request on file was based on Claims 1 to 21 as granted. The sixth auxiliary request was based on a set of 20 claims. The independent Claims 1 and 13 of the sixth auxiliary request corresponded to Claims 1 and 14 as granted, with the difference that they each incorporated at the end of the claim the additional feature:

"... wherein the bonded areas constitute from 1.0 to 6.0 percent of the surface area of the material."

VI. The appellant's arguments were as follows:

- The closest prior art was represented by D1, which disclosed a multi-layer fabric.
- It was conceded that the constitution of the layers according to Claim 1 corresponded to that defined in Claim 1 of the main request.
- However, the claimed material was distinguished from that of D1 in the bonding features as defined.
- These bonding features were essential for solving the technical problem of fluid management for use in absorbent articles.

- Although D1, by reference to D2, mentioned calender bonding with helically engraved rolls, it made no use of such rolls. Thus, it was highly questionable whether a skilled person would consult the teaching disclosed in D2 when trying to solve the present technical problem.

- Even if the skilled person did consult D2, he would not arrive at the subject-matter of Claim 1. The reason was that according to D2 no lightly bonded areas would be formed by this calender bonding since the areas unaffected thereby represented unbonded areas.

- The selection of the bonding area of from 1.0 to 6.0 percent of the surface area of the material was to achieve an optimum balance between the bond integrity and the softness of the structure.

- The determination of this bonding area required the provision of suitable heating rolls for lamination, a measure neither disclosed nor suggested in the available prior art.

VII. The Respondents essentially argued as follows:

- The opposition ground under Article 100(b) EPC was maintained in case the appellant based the reasoning of inventive step on the feature concerning the different fibre diameters for the second layer.

- The subject-matter of Claim 1 of the main request was distinguished from that of D1 only by the presence of apertures.
- The teaching of D2 was incorporated in the disclosure of D1 by reference, so that the relevant disclosure in D2 was to be considered as an alternative envisaged by D1.
- D2 was focussed on the formation of apertures in the laminates and indicated the advantage of such apertures.
- Furthermore, when the fibrous sheet comprised polypropylene fibres, as was the case in D1, the use of helically engraved rolls would yield a product where the heavily depressed areas actually became apertures.
- The determination of an optimum balance between the bond integrity and the softness of the laminated structure amounted to routine experimentation not requiring an inventive step.

VIII. The appellant (patentee) requested that the decision under appeal be set aside and that the patent be maintained on the basis of the new main request filed during the oral proceedings, alternatively on the basis of the sixth auxiliary request also filed during the oral proceedings.

The respondent (opponent) requested that the appeal be dismissed.

Reasons for the Decision

1. *Correction of printing errors*

As is already observed in the notice of opposition dated 24 June 2002, the patent in suit ("B" specification) contains several printing errors in the text of the claims (see notice of opposition, page 6, item 10). The text of the claims actually intended for grant and approved by the patentee is, however, clearly indicated in the communication under Rule 51(4) EPC of 14 November 2000 and the letter of reply dated 15 January 2001. Therefore, for the purpose of this decision, references to claim(s) as granted are to the claims as actually granted, and not to the claims as printed in the patent in suit.

Main request

2. Inventive step, Article 56 EPC

2.1 Claim 1 essentially relates to a laminated fibrous material comprising two layers of thermoplastic polymeric materials. These layers are bonded:

- (i) in a spaced-apart bonding pattern comprising
- (ii) a plurality of compacted bonding areas
- (iii) with lightly bonded fiber spans therebetween; and
- (iv) said bonding areas having apertures formed therein (see item I above).

2.2 Closest prior art

Similar to the patent in suit, D1 is directed to the making of a multi-layer material suitable as a bodyside liner in a disposable absorbent article (compare D1, abstract and page 1, first paragraph and patent in suit page 2, paragraphs [0002] and [0006]). It is therefore common ground that D1 comprises the closest prior art teaching.

2.2.1 As submitted by the respondent and admitted by the appellant at the oral proceedings, the nonwoven webs (a) and (b) of the multi-layer fabric according to D1 correspond to the first and second fibrous layers as defined in present Claim 1 (see also D1, page 8, first full paragraph).

2.2.2 In D1, the non-woven webs are thermally bonded by any method in the art which generates melt-bonded thermoplastic filaments. Preferably these webs are bonded together by calendering the composite between opposed rolls. The calendering may be between a smooth surface roll and a roll having a raised pattern on the surface thereof, or between helically engraved rolls as disclosed in D2 (paragraph bridging pages 9 and 10).

2.3 Problem / Solution

2.3.1 The board can accept the appellant's submission that, with respect to D1, the technical problem to be solved is to improve the characteristics of fluid management (patent in suit, page 2, lines 29 to 42).

2.3.2 As indicated above, D1 explicitly indicates that the nonwoven webs may be bonded using the apparatus of D2 (D1, page 10, line 4). Since D2 is explicitly incorporated into D1 by reference, the board considers that the disclosure of D2 pertaining to the helically engraved rolls and their use for thermal bonding is an integral part of D1.

In D2, the apparatus is described as comprising a pair of metal rolls each engraved with a pattern of lands and grooves (Figures 1, 3-5, 7 and 9 and the corresponding parts of the description from column 3, line 27 to column 5, line 58). It is undisputed that after passing through these heated rolls, the thermoplastic layers (of D1) will be bonded in a pattern as illustrated in D2, comprising three areas of different compression: highly compacted areas 52 where a land has traversed a land; more lightly compressed areas 50 and 51 where a land on one roll has traversed a groove on the other roll; and a substantially unaffected area 48 where a groove on one roll has traversed a groove on the other roll (see D2, column 3, lines 46 to 55 and Figure 2). The board therefore holds that the bonding characteristics (i) to (iii) referred to in section 2.1 supra are also disclosed in D1.

In consequence, the solution to the present technical problem as proposed in Claim 1 is only distinguished from the multi-layer, nonwoven fabric of D1 by the presence of the apertures in the bonded areas (ie afore-mentioned characteristic (iv)).

2.3.3 The board notes that the file does not contain any evidence showing that the claimed product is improved

over that of D1. However, for the sake of discussion, the board assumes in favour of the appellant that the technical problem is indeed solved with the incorporation of apertures into the bonded areas as required by Claim 1. The question is therefore as to whether or not the proposed solution is obvious in view of the cited prior art.

2.4 Obviousness

2.4.1 It is undisputed that D1 explicitly proposes two possibilities for laminating the layers, the preferred one being calendering between a smooth surfaced roll and a roll having a raised surface pattern, the other one comprising the use of helically engraved rolls as disclosed in D2 (cf. D1: paragraph bridging pages 9 and 10; examples 1 to 4, page 10, line 3). According to D2, however, the formation of apertures is almost unavoidable when the fibrous sheet to be laminated comprises polypropylene fibres in combination with low modulus fibres such as eg cotton or viscose rayon (column 4, lines 68 to 73). However, exactly this material combination, (ie rayon fibres blended with polypropylene fibres) is used in all examples of D1. Thus, when the skilled person opts for the only alternative to the preferred laminating technique of D1, ie the one using helically engraved rolls, he would be led to form apertures in the bonding areas.

2.4.2 For the sake of discussion, the board can also accept that the formation of apertures still depends on the process conditions. Therefore, the question is whether the skilled person would have an incentive to choose the suitable conditions.

In the board's judgment, when the skilled person is directed to D2 by the reference in D1, he cannot ignore the fact that this document is entitled "Apertured, bonded, and differentially embossed non-woven fabrics". Furthermore, it is indicated in D2 that the apertures "facilitate the transmission of moisture and moisture vapour from aperture to aperture" (column 4, lines 51 to 53). It is true that this property of the apertures is described in relation to the processing of plastic masses laminated to fibrous sheet materials, such as adhesive tapes. However, the appellant did not advance any argument as to why the skilled person would not take this information into consideration when trying to solve the present technical problem, this also being related to the transmission of moisture (or fluid) through the laminate.

D2 also points out that the use of a pair of rolls which are both engraved in a pattern of lands and grooves (ie the helically engraved rolls referred to above) is particularly suitable for spot-aperturing of both woven and nonwoven fabrics (title and column 2, lines 13 to 24). Depending on the processing conditions, the rhomboidal impressions in the highly compacted areas may be thinned-out areas, or may be actual apertures, usually bordered by a ridge or grommet of film substance (column 4, lines 15 to 24). Furthermore, as pointed out at the oral proceedings, a concrete example of apertured bonded webs comprising a blend of rayon and polypropylene fibres is explicitly given in D2 (Example 5, column 9).

Thus, in the board's judgment, when looking for a solution to the present technical problem of fluid management of laminated materials, the skilled person would get from D2 not only the incentive and but also a concrete teaching for the making of apertured laminated materials. By combining the teaching of D2 with that of D1, the skilled person would thus directly arrive at the subject-matter of Claim 1 in an obvious manner. The claimed laminate therefore lacks an inventive step in view of the teaching of D2 in combination with that of D1, Article 56 EPC.

2.4.3 This conclusion is not invalidated by the appellant's argument that D2 only discloses the formation of apertures in single fibrous sheets. The skilled person, so the argument goes, would therefore not consider applying that teaching the formation of apertures when bonding the fibrous layers of D1. Firstly, this interpretation of D2's teaching is inconsistent with the thrust of its disclosure, particularly having regard to its the title: "Apertured, bonded, and differentially embossed non-woven fabrics". Secondly, the formation of apertures - as compared to only highly compressed areas - is presented in D2 as being dependent on the thickness of the material and the nip pressure between the rolls, and not as being dependent on the number of fibrous layers constituting the material, as can be seen in Example 5 (column 4, lines 15 to 28 and column 9, lines 19 to 36).

2.4.4 Nor can the Board accept the appellant's argument that even a combination of the teaching of D2 with that of D1 would not lead to the claimed laminate. As established above and not refuted by the appellant,

after passing through the heated rolls, the fibrous webs according to D2 are bonded in a spaced-apart bonding pattern comprising alternate compacted and lightly bonded areas (see item 2.3.2). Furthermore, when apertures are formed, they are bordered by a ridge or grommet of film substance (see item 2.4.2 above). Clearly, this is only a different way of describing compacted bonding areas (ridges or grommets) having apertures formed therein. Thus, when the skilled person follows the teaching of D2 and laminates the layers of D1 under such process conditions as to form apertures, the resulting laminate will show all the bonding characteristics as stipulated in Claim 1.

Auxiliary request

This request, submitted at the oral proceedings as the sixth auxiliary request, is the sole auxiliary request retained by the appellant (see point V above).

3. *Amendment*

Claim 1 and Claim 13 of this request are based on Claims 1 and Claim 14 as granted, respectively, each of them further incorporating the additional feature of Claim 6 as granted.

As indicated in the decision under appeal, granted Claim 1, as amended with respect to Claim 1 as originally filed, is in conformity with the requirements of Article 123(2) EPC (see page 4, item I of the decision). This is no longer contested by the respondent. The Board sees no reason for querying this finding, which also applies to Claim 13. Furthermore,

Claim 6 as granted has remained as originally filed. It is therefore common ground that Claims 1 and 13 of the present request satisfy the requirements of Articles 123(2) and (3) EPC.

Claims 2 to 12, and 14 to 20, correspond to Claims 2 to 5, 7 to 13, and 15 to 21 as granted and as originally filed.

4. *Sufficiency of disclosure*

At the oral proceedings, the respondent did not maintain his objection under Articles 100(b) and 83 EPC against the claims of this request (see also item VII above and item 6 below). Nor does the Board see any reason for finding otherwise.

5. *Novelty*

Novelty is not an issue for the claims according to this request. The reasons for this will be clear from the following discussion of inventive step.

6. *Inventive step*

- 6.1 As already indicated in the patent in suit (page 6, lines 49 to 51) and confirmed at the oral proceedings, the additional problem to be solved with respect to D1 by the subject-matter of amended Claim 1 of this request is the optimisation of the bond integrity and the softness of the structure.

6.2 According to the present Claim 1, this technical problem is solved with a laminate characterised in that "the bonded areas constitute from 1.0 to 6.0 percent of the surface area of the material". It is undisputed that the existing technical problem is indeed solved by the laminate of Claim 1.

6.3 As confirmed at the oral proceedings, the bonded areas according to Claim 1 include the compacted bonded areas and the apertures. These are formed by the points of contact between the raised bonding pattern on the heated rolls (see also patent in suit, page 6, lines 30 to 34). The manner for calculating the bonded areas and the configuration of the bonding rolls for obtaining these areas are described in the patent in suit. Specifically, the two parameters which together affect the percentage area of the laminate that becomes bonded are the size of the raised bonding areas of each bonding roll and the distance or spacing separating these bonding areas. The percent bond area of the laminate is the mathematical product of the percent bond areas of the upper roll and lower roll (page 6, paragraphs [0032] to [0034]). In consequence, the Board accepts that a selection of suitable bonding rolls is necessary for obtaining the selected bond area range. The respondent did not submit and, in the face of the available prior art, the Board has no reason to presume that such selection is a result of mere routine experiments based on trial and error.

In particular, D1 does not give details concerning the bonded areas of the multi-layer fabric and, according to Example 5 of D2, which concerns a laminate comprising two fibrous webs sandwiching a thin

polyurethane film, the apertures account for 23% percent of the total area of the fabric. At the oral proceedings, the respondent did not contest that the compression lamination processes according to the other examples of D2 yield similar bonding areas. The Board therefore considers that neither D1 nor D2 gives the skilled person an obvious incentive for selecting a bonded area in the range of from 1.0 to 6.0 percent, which requires selecting suitably engraved bonding rolls.

The respondent has not cited any other prior art susceptible of rendering the choice of the stipulated range of bonded areas obvious. Under these circumstances, the Board concludes that the respondent has failed to establish that the subject-matter of Claim 1 is an obvious combination of prior art teachings, including D1 and D2.

- 6.4 Claim 13 is directed to a process for making a laminated fibrous material characterised by the same features as that of claim 1. The reasoning and finding of an inventive step with respect to the subject-matter of Claim 1 therefore applies mutatis mutandis to that of Claim 13.

Claims 2 to 12, and 14 to 20, are preferred embodiments of the laminated material according to Claim 1 and of the process according to Claim 13, respectively. For the same reasons, their subject-matter also involves an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent on the basis of Claims 1 to 20 of the sixth auxiliary request filed during the oral proceedings after any necessary consequential amendments to the description and drawings.

The Registrar:

The Chairman:

D. Magliano

P. Kitzmantel