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**Datasheet for the decision
of 10 October 2006**

Case Number: T 1358/04 - 3.2.06

Application Number: 95101430.7

Publication Number: 0672775

IPC: D04H 1/54

Language of the proceedings: EN

Title of invention:
Point bonded nonwoven fabrics

Patentee:
KIMBERLY-CLARK WORLDWIDE, INC.

Opponent:
Carl Freudenberg KG

Headword:
-

Relevant legal provisions:
EPC Art. 54(3), 54(2), 56, 114(2)

Keyword:
"Novelty (yes)"
"Inventive step (yes)"
"Late-filed document - not admitted"

Decisions cited:
T 1002/92

Catchword:
-



Case Number: T 1358/04 - 3.2.06

D E C I S I O N
of the Technical Board of Appeal 3.2.06
of 10 October 2006

Appellant: Carl Freudenberg KG
(Opponent) Höhnerweg 2-4
D-69469 Weinheim/Bergstrasse (DE)

Representative: -

Respondent: KIMBERLY-CLARK WORLDWIDE, INC.
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Representative: Grünecker, Kinkeldey,
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 4 October 2004
rejecting the opposition filed against European
patent No. 0672775 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: P. Alting Van Geusau
Members: G. Pricolo
W. Sekretaruk

Summary of Facts and Submissions

I. The appeal is from the decision of the Opposition Division posted on 4 October 2004 to reject the opposition against European patent No. 0 672 775, granted in respect of European patent application No. 95 101 430.7.

Independent claims 1 and 8 of the patent as granted read as follows:

"1. A process for producing a point-bonded nonwoven fabric of conjugate fibers having strong bond points, said conjugate fibers comprising a polyolefin and a polyamide, comprising:

a) depositing said conjugate fibers on a forming surface to form a nonwoven web,
b) passing said web into a nip formed by two abutting bonding rolls, said bonding rolls being heated to a temperature lower than about 10 °C below the melting point of said polyolefin and providing a nip pressure on raised points between about 20685 (3,000) to about 1241100 kPa (180,000) (psi)."

"8. A point bonded nonwoven fabric of conjugate fibers having strong bond points, wherein said fabric has a machine direction grab tensile strength of at least 67 N (15 lbs) as measured in accordance with Federal Standard Methods 191A, Method 5100 and said conjugate fibers comprising a polyolefin and a polyamide, obtainable by a process according to claim 1."

II. In coming to its decision the Opposition Division considered that the claimed subject-matter was novel over the absorbent article disclosed by document:

E1: EP-A-624 676;

which was state of the art according to Article 54(3) EPC. This document did not disclose the features of claim 1 according to which the bonding rolls were heated to a temperature lower than about 10°C below the melting point of the polyolefin and the nip pressure on raised points was between about 20685 to about 1241100 kPa. E1 did also not disclose the feature of claim 8 according to which the grab tensile strength was of at least 67 N. The claimed subject-matter also involved an inventive step over the other relevant prior art represented by:

E2: CA-A-2 080 453;

E3: US-A-3 855 045;

E4: US-A-4 830 904;

E5: US-A-4 306 929,

when starting either from E2 or from E4 as the closest prior art.

III. The appellant (opponent) lodged an appeal against this decision, received at the EPO on 23 November 2004, and simultaneously paid the appeal fee. With the statement setting out the grounds of appeal, received at the EPO

on 3 February 2005, the appellant filed the following additional documents:

E6: EP-B-105 729;

E7: GB-A-1 245 088;

E8: US-A-4 005 169.

- IV. In an annex to the summons for oral proceedings pursuant to Article 11(1) Rules of Procedure of the boards of appeal the Board explained its preliminary opinion according to which the skilled person did not clearly and unambiguously read in E1 the feature of claim 1 that the bonding rolls were heated to a temperature lower than about 10°C below the melting point of the polyolefin. Furthermore, it appeared that E1 did not disclose a fabric having the features defined in claim 8. As regards inventive step, the Board explained why it considered that E4 represented the closest prior art, and why the late-filed documents E6 to E8 did not appear more relevant than the prior art already on file. Consequently E6 to E8 should not be admitted into the proceedings pursuant to Article 114(2) EPC.
- V. With letter dated 3 August 2006 the appellant informed the Board that it did not intend to attend the oral proceedings, and that it maintained its request to revoke the patent.
- VI. Oral proceedings, at the end of which the decision of the Board was announced, took place on 10 October 2006.

Since the appellant did not attend as announced, the oral proceedings was continued in its absence pursuant to Rule 71(2) EPC.

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

VII. The arguments submitted in writing by the appellant in support of its requests can be summarized as follows:

E1 specifically disclosed, in example 1, a temperature of the rolls of 120° which was 10° below the melting temperature of polyolefin (polyethylene) used in the conjugate fibers constituting the fabric of the example. Taking into account the normal tolerances, the disclosure of E1 corresponded to the teaching of claim 1 of the patent in suit in respect of the temperature of the bonding rolls. In any event, the skilled person would implicitly read the claimed temperature requirements into the disclosure of E1, and the claimed pressure requirements as well, having regard to common general knowledge and to the fact that the bonds were only provided by the lower melting point component. E3 and E6 were evidence that it was common general knowledge to provide a temperature of the rolls sufficiently below the melting temperature of the component having the lower melting temperature and a nip pressure sufficient for producing flow of, deforming, and compacting said component. Therefore, the subject-matter of claim 1 was not novel over the disclosure of E1. It also did not involve an inventive step over the remaining prior art. E2 did not disclose the step of passing the web into a nip formed by two abutting bonding rolls, nor the temperature and

pressure conditions recited in claim 1. However, these features were rendered obvious by E3. The subject-matter of claim 1 was likewise obvious in view of the combination of E4 and E3 and of E2 and E5. Furthermore, also the combination of E2 or E4 with E7 or E8 would immediately lead to the subject-matter of claim 1.

VIII. In support of its main request, the respondent relied essentially on the following submissions:

The Opposition Division correctly argued why the subject-matter of claims 1 and 8 was novel over E1. E3 did not relate to bicomponent fibers and therefore its teaching could not be used to complete the disclosure of E1. The subject-matter of claim 1 was novel even if account was taken of E6. This document did neither disclose conjugate fibers comprising a polyolefin and a polyamide, nor the temperature and pressure conditions referred to in claim 1. Therefore, it was irrelevant and should be rejected because filed late. The claimed subject-matter also involved an inventive step. Starting from the closest prior art, represented by E4, there was no indication in the cited documents to provide, in combination, the temperature and pressure conditions in accordance with claim 1. Document E3 was the only document with similar pressure and temperature conditions in the bonding step. However, since E3 related to bonding of monocomponent fibers, the skilled person would not directly transpose the pressure and temperature conditions known from E3 to the process of E4, and in any case, he would select the higher temperatures disclosed by E3, which were above the melting point of the fibers. Documents E7 and E8, which were late-filed, were not more relevant than the prior

art already on file. In particular, neither E7 nor E8 disclosed the combination of a bicomponent fiber comprising a polyamide and a polyolefin.

Reasons for the Decision

1. The appeal is admissible.
2. *Novelty - claim 1*
 - 2.1 E1 is an European patent application filed on 4 October 1993 and published on 17 November 1994 in accordance with Article 158(3) EPC. The corresponding International application was published on 14 April 1994. Accordingly, E1 is state of the art under Article 54(3) EPC for the designated States in common with the patent in suit (DE, FR, GB).

Using the wording of claim 1, E1 discloses a process for producing a point-bonded nonwoven fabric of conjugate fibers having strong bond points, said conjugate fibers comprising a polyolefin and a polyamide (page 5, line 4), comprising: a) depositing said conjugate fibers on a forming surface to form a nonwoven web (page 6, lines 10, 11), b) passing said web into a nip formed by two abutting bonding rolls, said bonding rolls being heated (page 6, lines 12 to 15 and 22 to 25).

The reasoned opinion given in the Board's communication, according to which E1 does not disclose at least the feature of claim 1 of the patent in suit according to which the bonding rolls are heated to a

temperature lower than about 10°C below the melting point of the polyolefin, has not been contested by the appellant. The Board is therefore justified in basing its decision on that opinion, as no reason has been provided which would change this.

There is no explicit disclosure in E1 concerning the temperature of, and the pressure applied by, the rolls when producing a fabric of polyolefin and polyamide conjugate fibers. The appellant referred to example 1, in which the temperature of the rolls is specified to be 120° (page 9, line 32). In this example, however, the components of the conjugate fibers are polyethylene and polyethylene terephthalate (PET) which is not a polyamide.

The appellant submitted that the skilled person would complete the disclosure of E1 on the basis of his common general knowledge. It further referred to documents E3 and E6 (filed only with the grounds of appeal) as evidence that, when putting to practice the teaching of E1, the skilled person would indeed apply temperature and pressure conditions according to claim 1 of the patent in suit.

Both E3 and E6 disclose that the temperatures used for bonding thermoplastic fibers may be higher than the melting point thereof. As a matter of fact, E3 discloses temperatures of from 138°C (280°F) to 177°C (350°C) (see col. 7, lines 51 to 58) for bonding filaments of polypropylene, which has generally a melting point of about 160-170°C and specifically (see Table I of E3) a crystalline melting point of 286°F. E6 discloses that it is conventional to heat the rolls to

a temperature many degrees above the effective temperature needed at the nip (col. 2, lines 53 to 56). Accordingly, the disclosures of E3 and E6 confirm the statement on page 1, lines 19 and 20, of the patent in suit, according to which "*Conventionally, the bonding roll temperature for polyolefin fiber webs needs to be higher than about 10 °C below the melting point of the fiber polymer to provide properly bonded webs*".

Therefore, there is no basis either in common general knowledge or in E3 and E6 to conclude that the skilled person would only consider implementing the teaching of E1 in respect of a fabric of polyolefin and polyamide conjugate fibers by heating the rolls to a temperature lower than about 10°C below the melting point of the polyolefin, as submitted by the appellant. This feature not being clearly and unambiguously disclosed, the subject-matter of claim 1 must be regarded as novel over E1.

- 2.2 The other available documents do not disclose the combination of features of independent claim 1.

In fact, novelty was questioned only in respect of E1.

3. *Inventive step - claim 1.*

- 3.1 The object underlying the patent in suit (see par. [0005]) is to provide high tensile strength nonwoven fabrics that are strongly bonded at the bond points and in which the fibers between the bond points are free of any significant interfiber fusion, and which can be point bonded at a wide range of bonding temperatures.

3.2 The appellant did not contest the finding, stated in the communication annexed to the summons for oral proceedings, that E4 represents the closest prior art. E4 indeed relates to a similar process for producing a point-bonded nonwoven fabric of conjugate fibers having strong bond points, said conjugate fibers comprising a polyolefin and a polyamide (col. 3, last paragraph, polypropylene/Nylon), comprising: depositing said conjugate fibers on a forming surface to form a nonwoven web (carding step, col. 2, lines 17 to 20), and passing said web into a nip formed by two abutting bonding rolls, said bonding rolls being heated (col. 2, lines 25 to 27).

E2 is a less appropriate starting point because, even if it discloses a step of heating under compression a web of conjugate fibers comprising a polyolefin and a polyamide (page 3, line 33: polyolefin with nylon core; see page 2, lines 22 ff.), it does not disclose passing said web into a nip formed by two abutting bonding rolls.

3.3 E4 does not disclose the temperature of the rolls when bonding conjugate fibers comprising a polyolefin and a polyamide. Furthermore, there is no mention in E4 of the pressure on raised points between the rolls. The example (col. 4) refers to heat bonding between calendar rolls at 150 pounds per linear inch. This is a disclosure of the load applied, not of the pressure in accordance with the definition of claim 1 of the patent in suit. In this respect it is noted that claim 1 refers to the "*nip pressure on raised points*", which can only be understood, in accordance with the respondent's submissions during oral proceedings, as

the pressure exerted by the raised points of the rolls on the fabric which passes through the rolls.

Therefore, the subject-matter of claim 1 differs from the process according to E4 in that the bonding rolls are heated to a temperature lower than about 10°C below the melting point of said polyolefin and in that a nip pressure on raised points between about 20685 (3,000) to about 1241100 kPa (180,000) (psi) is provided.

The distinguishing features effectively solve the above-mentioned problem: the selection of an appropriate pressure in combination with a temperature sufficiently below the melting point of the polyolefin allows strong bond points to be made at a wide range of bonding temperatures without significant interfiber fusion (see par. [0017] and [0018] of the patent in suit).

- 3.4 As already mentioned before, E4 does not disclose the temperature of the rolls when bonding conjugate fibers comprising a polyolefin and a polyamide. According to the sole example of E4 (see col. 4), which relates to a different fiber composition, namely polypropylene/PET bicomponent fibers, the temperature of the rolls is 298°C, which is definitely above the melting point of polypropylene (160 to 170°C) and also of PET (260°C). Accordingly, E4 does not suggest using rolls heated at a temperature below that of the melting point of the polyolefin.

E2 discloses a process for producing a point-bonded nonwoven fabric of conjugate fibers comprising a polyolefin and a polyamide (page 3, line 33: polyolefin

with nylon core). The conjugate fibers are heated at or above the softening point of the polyolefin to provide bonding points (page 2, lines 11 to 22). This heating step is not performed by means of heated bonding rolls, but for instance by air bonding (page 4, example 1). E2 discloses an additional step of heating under compression the thus obtained web to achieve a more densely bonded web (page 2, lines 22 ff.). According to example 1 (page 4), the pressure used in this additional step is of 300 psi. E2 contains no indications suggesting the appropriate pressure which should be applied to the fabric by raised points of abutting bonding rolls; in particular it does not suggest that this pressure should be between about 3,000 to about 180,000 psi.

E3, as discussed above (point 2.1), relates to a process for producing a point-bonded nonwoven fabric of fibers which are not conjugate, but consist e.g. of polypropylene (polyolefin), for which pressures on the raised points of about 8000 to 22000 psi and temperatures below or above the melting point of the polypropylene are used (from 138 to 177°C, see col. 7, lines 51 to 58). There is no indication in E3 which would suggest that the known combination of pressures and temperatures is appropriate for bonding conjugate fibers. Nor is there any suggestion to specifically select temperatures lower than about 10°C below the melting point of the polyolefin.

E5 discloses a process for producing a point-bonded nonwoven fabric of conjugate fibers (see col. 2, lines 47, 48), comprising: depositing said conjugate fibers on a forming surface to form a nonwoven web and passing

said web into a nip formed by two abutting bonding rolls (see col. 2, lines 64,65 and col. 4, lines 29 to 37). E5 does not disclose conjugate fibers specifically comprising a polyolefin and a polyamide. Example 1 (col. 6) discloses bonding of monocomponent PET fibers with rolls heated to a temperature of 230°C, which is 30° below the melting temperature of PET, at a pressure of 65.0 kg/cm. This, however, is an indication of the load applied, not of the pressure in accordance with the definition of claim 1 of the patent in suit (see point 3.3 above). Accordingly, also E5 does not include any hints which would lead the skilled person to the claimed solution of the above-mentioned problem.

E6 does not relate to conjugate fibers comprising a polyolefin and a polyamide, and does not mention the pressure applied by the rolls. Accordingly, it does not include any hint pointing towards the claimed solution to the above-mentioned technical problem.

- 3.5 With the statement of grounds of appeal, the appellant referred to documents E7 and E8 as regards lack of inventive step of claim 1. As already stated in the communication accompanying the summons to oral proceedings, these documents neither specifically relate to conjugate fibers comprising a polyolefin and a polyamide, nor disclose the pressure applied by the raised points of the rolls to the fabric.

Accordingly, these documents are not prima facie relevant in the sense that they can reasonably be expected to change the eventual result and are thus highly likely to prejudice the maintenance of the

European patent (see e.g. T 1002/92). E7 and E8 are therefore disregarded pursuant to Article 114(2) EPC.

3.6 It follows from the above that the prior art does not suggest the subject-matter of claim 1, which thus involves an inventive step (Article 52(1), 56 EPC).

3.7 *Claim 8*

The appellant did not submit arguments in respect of claim 8. Since the Board does not see any reason to deviate from the view expressed by the Opposition Division in the decision under appeal, according to which the prior art does neither disclose nor suggest a fabric having all the features of claim 8 in combination, also the subject-matter of independent claim 8 is regarded as being novel and inventive over the available prior art.

4. Therefore, the Opposition Division's decision to reject the opposition must, in effect, be confirmed.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar:

The Chairman:

M. Patin

P. Alting van Geusau