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D E C I S I O N
of 23 January 2001

Case Number: T 0281/94 - 3.3.7

Application Number: 86400037.7

Publication Number: 0187725

IPC: B32B 27/12, A61L 15/00

Language of the proceedings: EN

Title of invention:
Coated fabric and method of making the same

Patentee:
KIMBERLY-CLARK CORPORATION

Opponent:
PROCTER & GAMBLE European Technical Center N.V.

Headword:
-

Relevant legal provisions:
EPC Art. 56, 113(1), 123

Keyword:
"Amendments - broadening of claim (no) - added subject-matter (no)"
"Basis of decisions - right to be heard - oral proceedings"
"Inventive step - (yes) after amendment"

Decisions cited:
T 0133/92

Catchword:
-

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Case Number: T 0281/94 - 3.3.7

D E C I S I O N
of the Technical Board of Appeal 3.3.7
of 23 January 2001

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 11 February 1994 revoking European patent No. 0 187 725 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: R. E. Teschemacher
Members: G. Santavicca
R. J. Young

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 187 725, in respect of European patent application 86 400 037.7, filed on 9 January 1986 and claiming the priority of US 690350 filed on 10 January 1985, was published on 27 March 1991.

Claim 1 read as follows:

"A coated fabric comprising:
a base ply of non-woven fiber material having preformed therein densified and undensified portions thereof defining an interspersed pattern of densified and undensified areas on at least one surface, designated as the preformed coating surface, of the base ply; and
a thermoplastic film heat-bonded to said preformed coating surface at least at the densified areas thereof, wherein the depth of penetration of the film into said base ply is limited to less than the entire depth of the base ply so that the thermoplastic film comprises a surface coating only on the preformed coating surface of the base ply with an opposite surface of the base ply retaining its fibrous characteristics thereon."

Claims 2 to 10 were dependent claims directed to preferred embodiments of the coated fabric of claim 1.

Claim 11, an independent claim, was worded as follows:
"A method of making a coated fabric comprising:
providing a base ply of non-woven fiber material having a so-called coating surface
providing a thermoplastic film
contacting the thermoplastic film with the coating

surface of the base ply
providing means for forming in the base ply material a pattern of densified and undensified portions, the densified portions extending to at least said coating surface and for heat-bonding said thermoplastic film to said coating surface
thereafter allowing the surface coating of film to cool
characterized in that the pattern of densified and undensified portions is formed in the base ply material before contacting the coating surface thereof with the thermoplastic film, said film being in a heat-softened condition before contacting the coating surface, and in that the depth of penetration of the heat-softened thermoplastic film into the base ply to a depth less than the entire depth of the base ply is controlled by maintaining, at appropriate values, the temperature of the film and the contact pressure between the film and the base ply, thereby forming the film into a surface coating only on the coating surface of the base ply."

Claims 12 to 18 were dependent claims directed to preferred features of the method according to claim 11.

Claims 19 and 20 were independent claims worded, respectively, as follows:
"A multi-ply incontinence control garment wherein the outermost ply thereof comprises the fabric of claim 1 with the base ply thereof facing outwardly.", and
"A multi-ply incontinence control garment wherein the outermost ply thereof comprises the fabric of claim 9 with the base ply thereof facing outwardly".

II. Notice of opposition was filed on 27 December 1991 on the grounds of Article 100(a) EPC that the subject-matter claimed in the patent in suit lacked novelty and

inventive step. The opposition was supported, in particular, by the following document:

D3: US-A-4 379 192.

III. By a decision announced at the end of the oral proceedings held on 26 January 1994 and issued in writing on 11 February 1994, the opposition division revoked the patent. The decision was based on a set of claims which differed from the claims of the patent as granted only in that granted claims 1 and 11 had been amended to specify that the thermoplastic film was heat-bonded to the preformed coating surface of the base ply "at the densified and undensified areas".

According to the decision, this change, which had been objected to by the opponent under Article 123(2) EPC, did not offend the provisions of that article in view of the initial description on page 6, lines 15 to 22.

The subject-matter of claim 1 of the patent in suit differed over the coated fabrics disclosed by D3 at most in that the thermoplastic film was heat-bonded to the coating surface of the base ply not only at the densified but also at the undensified areas.

The only special technical effect which could be produced by such a distinguishing feature appeared to be higher strength of attachment between the base ply and the thermoplastic film. However, it was well known that the strength of attachment of bonded layers was directly proportional to the area of bonding.

Hence, it was obvious for the skilled person confronted with the problem of achieving higher strength of

attachment between the base ply and the thermoplastic film than that achieved in the coated fabric of D3 to arrive at the claimed subject-matter.

IV. The appellant filed a notice of appeal against the above decision, received on 28 March 1994, the prescribed fee having already been paid on 24 March 1994, and requested the cancellation of the revocation in its entirety and the maintenance of the opposed patent as amended during oral proceedings held on 26 January 1994.

However, the Statement of Grounds of Appeal, filed on 10 June 1994, was accompanied by further sets of claims forming a new main request and five new auxiliary requests.

The appellant argued in substance as follows:

The intention in submitting the new claims had been clearly to distinguish from the features known from D3, which did not teach the following three key elements:

(1) the non-woven fibre material having preformed therein densified and undensified portions;

(2) the thermoplastic film being heat-bonded to coat the preformed non-woven fibre material, at the densified and undensified portions thereof; and,

(3) the depth of penetration of the film into the non-woven fibre material being less than the entire depth of the fibre material.

The presence of the preformed densified portions in the

base ply according to the patent in suit had:

- not only an effect on the bonding strength between the thermoplastic film and the base ply (as acknowledged in the decision), but also

- an effect on the depth of penetration of the thermoplastic film into the base ply, such that, in cross-section, the resulting laminated structure differed from that obtained in the absence of such preformed densified portions.

In the fabric according to D3, the micro fibres were embedded in the plastic film material, which extended completely through the thickness of the base web. As a consequence thereof, the cloth-like texture on the face opposite to the bonding surface could not have been provided.

V. The respondent (opponent) objected to the new claims and argued substantially as follows:

The newly submitted claims of all of the requests were open to objection under Articles 84 and 123 EPC, and hence were not allowable.

The subject-matter of the newly submitted claims also lacked inventive step. In particular, the composite structure of D3 did indeed have a cloth-like structure on the face opposite the bonding surface. Furthermore, if the densified regions in the web were formed just prior to bonding the web to the film in a patterned nip as taught by D3, the effect alleged by the appellant that the depth of penetration was controlled by the pre-densified regions would similarly take place in the

method of D3 and result in the relevant product.

VI. In a communication issued on 13 November 2000 in preparation for oral proceedings, the Board expressed a preliminary and provisional view on the requests of the appellant. In particular, the Board raised objections under Articles 123(2) and 123(3) EPC and under Rule 57a EPC to certain of the claims of all of the requests on file.

VII. With a letter received on 20 December 2000, the appellant filed further sets of claims forming a new main request and first and second auxiliary requests, whereby each of the requests consisted of a single claim directed to a method of making a coated fabric. Amended pages of the description were also enclosed.

VIII. With a fax received on 3 January 2001, the respondent announced that as long as there was no change in the claims presented in appellant's letter of 20 December 2000, it would not be represented at the oral proceedings. However, the respondent reserved the right to comment on any change in the claims, should any be made.

IX. Oral proceedings were held on 23 January 2001, in the absence of the respondent, in accordance with Rule 71(2) EPC. After discussion of the admissibility of the amendments, the appellant submitted a new main request consisting of a single method claim and an amended page 2 of the description.

The sole claim according to the main request reads as follows:

"A method of making a coated fabric comprising:

- providing a base ply of non-woven fiber material having a so-called coating surface,
- preforming in the base ply material a pattern of densified and undensified portions, the densified portions extending to at least said coating surface, which defines an interspersed pattern of densified and undensified areas,
- providing a heat-softened thermoplastic film,
- contacting the heat-softened thermoplastic film with the coating surface of the base ply having therein said pattern of densified and undensified portions, heat being transferred from the hot thermoplastic film,
- heat-bonding said thermoplastic film at least at the densified portions of the base ply by simultaneously cooling and pressing together said heat-softened thermoplastic film and said base ply having therein said pattern of densified and undensified portions, in the nip pressure of opposed pressure rolls,

the temperature of the heat-softened film and the contact pressure between the heat-softened film and the base ply being maintained at appropriate values, in order to control the depth of penetration of the heat-softened thermoplastic film into the base ply to a depth less than the entire depth of the base ply, thereby forming the film into a surface coating only on the coating surface of the base ply, with the opposite surface of the base ply retaining its fibrous characteristics thereon."

The issue of inventive step was then debated. At the end of the oral proceedings the decision of the Board was given orally.

X. Requests of the parties (final)

The appellant (patentee) requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request as submitted at the oral proceedings, or, alternatively, on the basis of the first or the second auxiliary request submitted on 20 December 2000.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments (main request)*

The sole claim results from claim 11 as granted with the following modifications:

2.1 The feature of "providing means for forming in the base ply material a pattern of densified and undensified portions ...", in claim 11 as granted, has been replaced, in the new claim, by the feature of "preforming in the base ply material a pattern of densified and undensified portions".

2.1.1 The basis for the step of preforming is provided explicitly in claim 1 as granted, which refers to "a base ply of non-woven fiber material having pre-formed therein densified and undensified portions ...", and is further supported by the corresponding requirement, made in the characterizing portion of claim 11 as granted, that "the pattern of densified and undensified

portions is formed in the base ply material before contacting the coating surface thereof with the thermoplastic film ...". Consequently, there is no contravention of Article 123(2) EPC in the replacement.

2.1.2 Furthermore, both the features, in claim 11 as granted, of "providing means for forming ... a pattern of ..." and that "the pattern ... is formed ... before contacting ..." have been subsumed, in the new claim, under the composite feature of "pre-forming ... a pattern ...", referred to above, the action of preforming corresponding to a narrower definition of the means for carrying out the action, since the former implies at least the latter, so that no broadening of former claim 11 results. Consequently, there is no contravention of Article 123(3) EPC in the replacement.

2.2 The definition of the "pattern of densified and undensified portions, the densified portions extending to at least said coating surface", in claim 11 as granted, has been supplemented, in the new claim, by the phrase "which defines an interspersed pattern of densified and undensified areas".

2.2.1 This is supported by the corresponding definition of the product formed, in claim 1 as granted, which refers to the densified and undensified portions as defining an interspersed pattern of densified and undensified areas. Consequently, there is no contravention of Article 123(2) EPC.

2.2.2 Again, the elaboration of the definition does not result in any broadening of scope compared with claim 11 as granted. Hence, there is no contravention of Article 123(3) EPC.

2.3 The features of "providing a thermoplastic film ..." and "said film being in heat-softened condition before contacting the coating surface ...", in claim 11 as granted, have been replaced, in the new claim, by the features of "providing a heat-softened thermoplastic film" and "... contacting the heat-softened thermoplastic film with the coating surface ...".

2.3.1 The amendment is supported by the wording of claim 11 as granted and makes explicit instead of implicit the essential step of "contacting".

2.3.2 Consequently, there is no addition of subject-matter or broadening of the scope of granted claim 11, and therefore no contravention of Articles 123(2) or 123(3) EPC.

2.4 The feature, "heat being transferred from the hot thermoplastic film", has been added as a further functional restriction of the "contacting" step.

2.4.1 This restriction has an explicit basis in the description which refers twice to the "heat transfer from the hot thermoplastic film". Whilst the first reference is made in the specific context of enhanced heat transfer by reason of the presence of the densified areas (see column 5, lines 15 to 23), it is evident, from the second (see column 5, lines 23 to 27), that there is in any case heat transfer from the thermoplastic film during heat bonding. The latter is itself concomitant with the "contacting step", which forms the basis of obtaining an essential effect sought by the claimed method of enhancing bonding strength.

2.4.2 Consequently, this restriction does not contravene

Article 123(2) EPC, and in any case does not involve any broadening compared with claim 11 as granted (Article 123(3) EPC).

2.5 The feature of "providing ... means for heat bonding said thermoplastic film to said coating surface", in claim 11 as granted, has been replaced, in the new claim, by the feature of "heat bonding said thermoplastic film at least at the densified portions of the base ply ...".

2.5.1 This replacement is supported by the requirement, in product claim 1 of the patent in suit as granted, for "a thermoplastic film heat bonded to said coating surface at least at the densified areas thereof ...", read in the light of the definition, recited earlier in the same claim, of the "densified and undensified portions defining an interspersed pattern of densified and undensified areas on at least one surface, designated as the preformed coating surface" (see point 2.1.1 supra). Consequently, there is no contravention of Article 123(2) EPC.

2.5.2 Furthermore, the definition of the action itself of heat bonding corresponds to a narrower definition of the provision of means for carrying out the action, since the former implies at least the latter. Consequently, the replacement is not in contravention of the provisions of Article 123(3) EPC.

2.6 The definition of the manner of heat bonding, in claim 11 as granted, has been further elaborated, in the new claim, in the following terms: "by simultaneously cooling and pressing together said heat-softened thermoplastic film and said base ply having

therein said pattern of densified and undensified portions, in the nip pressure of opposed pressure rolls ...".

2.6.1 This feature has an explicit basis in the description of the preferred embodiment (see column 7, line 58 to column 8, line 14, in particular column 8, lines 12 and 13, and column 8, line 22). Whilst the use of the nip is described in the patent in suit, in relation to a particular heat-softened thermoplastic film, no other means are concretely disclosed in the entire patent specification for carrying out the step of heat bonding following contacting of the thermoplastic film with the coating surface of the base ply. Furthermore, such opposed pressure rolls are self-evidently generally applicable to the functional steps of temperature and pressure control as defined in the claim, which are relevant to the solution of the technical problem. Consequently, the incorporation of the specific limitation involves no inconsistency with the original disclosure. In other words, there is no contravention of Article 123(2) EPC.

2.6.2 The restriction, furthermore, in any case narrows the scope of the claim compared with claim 11 as granted, consequently there is no contravention of Article 123(3) EPC.

2.7 The feature "with the opposite surface of the base ply retaining its fibrous characteristics thereon" has been added compared with claim 11 as granted.

2.7.1 This feature was present in claim 1 as granted and was presented in the whole initial application as an essential characteristic of the product to be

manufactured by the claimed method. Its insertion in the method claim consequently does not contravene the requirements of Article 123(2) EPC.

2.7.2 The restriction, furthermore, in any case narrows the scope of the claim compared with claim 11 as granted, and consequently there is no contravention of Article 123(3) EPC either.

2.8 No objection was raised by the opponent under Article 123 EPC except in respect of the insertion, during the opposition proceedings, of the expression "at the densified and undensified areas", in claim 11 as granted, ie Article 123(2) EPC was not a ground of opposition in the notice of opposition. Since, furthermore, the objectionable phrase is no longer present in the claim, there is no longer any source of objection, under Article 123 EPC, to the claim in the appeal proceedings.

2.9 In summary, the amendments undertaken in the claim aim at overcoming the grounds of opposition and are allowable under the provisions of both paragraphs (2) and (3) of Article 123 EPC.

2.10 The description has been brought into line with the new claim during the oral proceedings. No objection has been raised by the respondent to the amended description filed on 20 December 2000. Only the changes necessary to bring the description into conformity with the sole claim have been carried out during the oral proceedings.

2.11 Summing up, the main request submitted during the oral proceedings on 23 January 2001 fulfils the requirements

of Article 123 and Rule 57a EPC and is consequently admissible.

3. *The technical problem and its solution*

3.1 The patent in suit aims at making a thermoplastic film-coated fabric, which is suitable for use in incontinence control garments, surgical gowns, sheets and dressings, as well as feminine hygiene products.

The coated fabric comprises a base ply of non-woven fiber material having densified and undensified portions thereof defining an interspersed pattern of densified and undensified areas, on at least one surface, designated the coating surface, of the base ply, and a thermoplastic film heat-bonded to the coated surface at least at the densified areas thereof (see column 1, lines 5 to 20).

Such a coated fabric is acknowledged to be known from GB-A-2 122 134, which corresponds to D3 in the present proceedings, the disclosure of which was, by common consent, considered to represent the closest state of the art.

3.2 According to D3, see claim 11, such a film-coated fabric may be manufactured by a process comprising:

(a) forming a fibrous section including a mat of polymeric melt blown microfibers

(b) bringing an impervious polymeric film adjacent the mat;

passing the fibrous section and the film through

the nip between heated rolls, with one of the rolls in contact with the fibrous section having a pattern of raised areas occupying less than about 15 percent of the surface of the roll and the other roll in contact with the film having a smooth surface, and

(c) applying pressure to the fibrous section and film by means of the rolls so as to form bond regions in the fabric.

The temperature of the rolls and the nip pressure are controlled to form pillars of bonds extending completely through the fabric from the outer surface where the fibrous elements are fused, to the interface between the mat and the film where the microfibers are fused to the film and the film has increased crystallinity in the bond regions without disrupting the imperviousness of the film, and to shape the surface of the fibrous section of the fabric to provide depressions in the bond regions and a three dimensional surface configuration.

According to a preferred embodiment (see claim 12) the step of forming a fibrous section includes providing a web of continuous and randomly deposited molecularly oriented filaments of a thermoplastic polymer, the web having intermittent discrete prebonded regions formed by the application of heat and pressure, and forming the mat of microfibers on the prebonded continuous filament web so as to entangle and provide primary bonds between the microfibers and the filaments of the fibrous section.

The resulting fabric may be liquid impervious, and have

a textured, abrasion resistant surface with a high coefficient of friction, useful for cover applications where a low-slip surface is desired (see column 2, lines 13 to 26).

3.3 Compared with this state of the art, the technical problem objectively arising may be seen in the manufacture of such a thermoplastic film-covered fabric, in which the strength of bonding of the film to the fabric is enhanced, whilst retaining the soft, cloth-like feel of the base ply (patent in suit, column 3, lines 30 to 40; column 9, lines 14 to 22).

3.4 The solution proposed according to the claim of the patent in suit is:

(i) to preform the pattern of densified and undensified portions in the fibrous web (base ply) to be coated, ie before contacting it with the thermoplastic film;

(ii) to provide the thermoplastic film in a heat-softened state, and to contact the heat-softened thermoplastic film with the patterned surface of the base ply, heat being transferred from the hot thermoplastic film; and

(iii) to heat-bond the thermoplastic film at least at the densified portions of the web by simultaneously cooling and pressing together the heat-softened thermoplastic film and the base ply,

whilst maintaining the temperature of the heat-softened thermoplastic film and the contact pressure between the

heat-softened thermoplastic film and the base ply, at appropriate values, to control the depth of penetration of the heat-softened thermoplastic film into the base ply to a depth less than the entire surface of the base ply.

3.5 It is credible to the Board, from the description of the temperature control according to the preferred embodiment in the patent in suit (see column 7, line 58 to column 9, line 13), and the explanations given regarding the facilitated transfer of heat from the hot thermoplastic film to the densified portions of the base ply, leading to enhanced bonding strength (see column 5, lines 1 to 42), which in any case have not been disputed by the respondent, that the claimed measures are effective to solve the stated problem.

4. *Novelty*

There is no disclosure in D3 of any of steps (i), (ii) and (iii) (see point 3.4 supra) forming the solution of the technical problem. It follows that the subject-matter of the claim in suit is novel in the sense of Articles 54(1)(2) and 52(1) EPC over this disclosure.

5. *Inventive step*

5.1 There is no suggestion in D3 to make any of modifications (i) to (iii) (see point 3.4 supra) of the solution of the technical problem. On the contrary, the densified and undensified portions of the fibrous web are formed, according to D3, together with the formation of bonds by heating rollers, instead of being preformed and subsequently bonded to a heat softened thermoplastic film by simultaneously pressing and

cooling. There is thus no such further element of positive control of heat flow corresponding to that provided by the cooling according to the patent in suit.

5.2 The argument of the respondent, that the formation of the densified portions of the web in a patterned nip according to D3 implied a similar control over the depth of penetration (Section V, supra) is not supported by the teaching of D3 which is, if anything, the diametric opposite of the solution of the technical problem and in any case omits the relevant level of temperature control provided according to the patent in suit (Section 5.1 supra). The argument is furthermore irrelevant, since the solution of the stated problem requires certain method steps to be carried out. There is in any case no suggestion in D3 to prepattern the entire web and provide the thermoplastic film in already heat-softened form, heat-bonding occurring under the control of cooling rollers.

5.3 Nor is there any other reason why the skilled person should depart from the specific teaching of D3. In summary, the solution of the stated technical problem does not arise in an obvious way starting from D3.

5.4 Consequently, the subject-matter of the claim involves an inventive step in the sense of Articles 56 and 52(1) EPC.

6. It follows from the above, that the main request is allowable.

7. It is not, therefore, necessary for the Board further to consider the claims of the auxiliary requests.

8. *Right to be heard and to comment upon any change of the claims*

In the fax received on 3 January 2001 the respondent reserved the right to comment upon any change in the claims filed on 20 December 2000 by the appellant.

Such a right to be heard and to comment had already been given by the Board, however, by appointing and holding the requested oral proceedings, wherein the respondent was afforded the opportunity to comment upon any change in the claims according to the requests of the appellant.

The fact that the respondent chose not to attend the oral proceedings did not prevent the Board from coming to a final decision in the oral proceedings in absence of the respondent.

The fact that the Board had reservations against the main request submitted on 20 December 2000 by the appellant was apparent from the maintenance of the oral proceedings, despite the indication of the respondent that it would not contest the claims of that request (Section VIII, supra).

As adjudicated in decision T 133/92 of 18 October 1994 (reasons, point 7, not published in OJ EPO) the respondent could not have been taken by surprise by the fact that amendments had been made by the appellant during the oral proceedings to overcome the reservations of the Board.

On the contrary it was to be expected that the appellant would try to overcome the reservations of the

Board.

Since the respondent was prepared to accept a broader version of the claim, it could not be assumed that there were further objections to the amended claim forming the basis of this decision which is more restricted in scope.

Hence, no violation of Article 113(1) EPC arises from the determination of the issues at the oral proceedings.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent as amended in the following version:

Claims: the sole claim forming the main request submitted during the oral proceedings.

Description: page 2 as submitted during the oral proceedings;
pages 3 to 6 as filed on 20 December 2000.

The Registrar: The Chairman:

C. Eickhoff R. E. Teschemacher