BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 18 April 1996

Case Number: T 0215/93 - 3.2.5

Application Number: 87302683.5

Publication Number: 0245933

IPC: D04H 3/16, D04H 1/54

Language of the proceedings: EN

Title of invention:
Non-woven fabric comprising at least one spun-bonded layer

Patentee:
KIMBERLY-CLARK LIMITED

Opponent:
Silver-Plastics GmbH & Co KG

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes) - after amendment"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0215/93 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 18 April 1996

Appellant: (Opponent)
Silver-Plastics GmbH & Co KG
Mendener Str. 21
D-53840 Troisdorf (DE)

Representative:
Müller-Gerbes, Margot, Dipl.-Ing.
Friedrich-Breuer-Strasse 112
53225 Bonn (DE)

Respondent: (Proprietor of the patent)
KIMBERLY-CLARK LIMITED
Larkfield
Maidstone
Kent, ME20 7PS (GB)

Representative:
Allen, Oliver John Richard
Lloyd Wise, Tregear & Co.
Commonwealth House
1-19 New Oxford Street
London WC1A 1LW (GB)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 23 December 1992 rejecting the opposition filed against European patent No. 0 245 933 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: G. O. J. Gall
Members: W. D. Weiß
C. G. F. Biggio

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division on the rejection of the opposition against the patent No. 0 245 933.

The opposition was filed against the patent as a whole and based on the grounds of lack of novelty and inventive step (Article 100(a) EPC) and of lack of sufficient disclosure (Article 100(b) EPC).

The Opposition Division held that the grounds for opposition mentioned above did not prejudice the maintenance of the patent as granted, having regard to the eight documents cited by the opponent during the opposition period and one document cited after its expiration.

II. In a communication accompanying the summons for oral proceedings on 18 April 1996, the Board drew the attention of the parties to the fact that the term of "hot calendering" was not restricted to the function of smoothing the textile surface but calendering might also be used to produce various kinds of modifications of the textile surface as well as to produce a bonding effect. The general handbook "Internationales Lexikon, Textiveredelung + Grenzgebiete, 4. Auflage 1975, pages 847/850, chapters "Kalander" and "Kalandern, and pages 1399/1402, chapters "Prägekalander" and "Prägen, Prägefinish", was cited by the Board in this respect.

III. The appellant requested that the decision under appeal be set aside and the patent be revoked.

IV. The respondent requested that the patent be maintained in amended form in the version of the Claims 1 to 11 and with a description adapted thereto, as filed at the oral proceedings of 18 April 1996.

The wording of the independent Claim 1 in this version reads as follows:

"1. A process for preparing a non-woven laminate material having at least one layer of spunbond polymeric filaments bonded by a patterned calender roll to a layer of meltblown polymeric fibres characterised in that subsequent to the pattern bonding the material is impregnated with a low surface tension fluid repellent agent having a higher melting point than the polymeric filaments of the spunbonded layer and in that the outer surface of at least one impregnated spunbond layer is thereafter hot calendered by a smooth calender roll."

V. The appellant submitted the following objections against the patent in its amended form:

The patent application as originally filed as well as the patent as granted disclosed the feature that the low surface tension repellant should have a higher melting point only in connection with the specific polyolefin polypropylen. The subject-matter of Claim 1, therefore, did not meet the requirements of Article 123 EPC.

Document

D5: US-A-4 041 203

had to be considered as the closest prior art in relation to the subject-matter of Claim 1 in its amended version. The subject-matter of said Claim differed from

the disclosure of this document merely by the final hot calendering step with a smooth calender roll. This feature, however, was devoid of inventive merit, because document

D9: US-A-4 379 192

(column 6, lines 9 to 12) disclosed that, when executing the patternbonding step, the filaments in the regions outside the bond regions were also cohesively adhered. Consequently, Claim 1 did not involve an inventive step.

In any case, the preamble of Claim 1 did not contain all the features disclosed in document D5 and, therefore, did not meet the requirements of Rule 29 EPC.

VI. The respondent submitted the following arguments:

It was clear from the disclosure of the patent application as originally filed as well as from granted patent that the general principle ruling the teaching of the invention was that the impregnating agent should have a higher melting point than the polymeric material of the fibres and filaments, respectively, making up the layers of the laminate material. When now the choice of the agent was restricted such as to additionally fulfil the functions of a low surface tension fluid repellent agent, it was clear to any skilled reader that the polypropylene mentioned in this context merely stood as an example for the polymeric material making up the layers of the laminate.

It was true that the agent used in example XIII of document D5 to impregnate the laminate web as a final step met the melting point requirements of the patent in suit. This agent, however, had not been selected with respect to its melting temperature which is not referred

to in document D5; the general teaching of this document being that the agent should meet certain minimum conditions with respect to its antistatic and repellent characteristics.

Contrary to the assertion by the appellant, document D5 (column 5, lines 10) disclosed that the filaments of the spunbond layer were not adversely destroyed even in those regions in register with the raised points of the pattern roll. There was no evidence at all that the surface regions of the patterned roll between the raised points contacted the surface of spunbond layer at all.

Document D9, starting from document D5 as the closest prior art (see column 1, lines 41 to 46) aimed at increasing the abrasion resistance of the surface and stabilising the internal structure with a minimum loss of absorbent capacity of the inner plies of the fibrous webs, i.e. an object which came close to the problem on which the subject-matter of the invention was based. This document, however, suggested a solution to this problem which was different from that suggested by the amended Claim 1 and which resulted in a less satisfactory product than that resulting from the claimed process.

Reasons for the Decision

1. *Amendments*

The amended Claim 1 is based on the Claims 2, 6, 7, and 12, as well as page 5, first and fourth paragraphs, as originally filed, and on Claims 1, 2, 5 as well as page 3, lines 4 to 6, and page 6 lines 21 to 25 of the patent as granted (EP-B-0 245 933).

It is true that the term "low surface tension repellent" is only mentioned explicitly in connection with the specific polymer "polypropylen". The considerations on page 3, lines 14 and 15, and on page 6, lines 21 to 25, of the patent in suit, which have been taken literally from the application as filed, suggest, however, that the basic function of the impregnating agent is independent of the specific choice of polypropylen as the polymer material for the filaments.

The dependent claims 2 to 11 correspond to dependent claims as granted, with the exception that the numeration has been adapted and that, in Claims 3 and 9, the formulations "coating substance" or "coated" have been replaced by the originally disclosed terms "impregnating agent" and "impregnated", respectively.

The new description is adapted to the amended claims.

The amended version of the patent is, therefore, not objectionable under Article 123(2) and (3) EPC.

2. *Novelty*

2.1 The Board is in agreement with the parties that document D5 discloses a process which comprises all the features in the preamble of Claim 1.

Document D5 discloses (column 15, line 56, to column 16, line 13) that the laminate, as a final step of its production, should be treated with an antistatic composition in order to reduce surface resistivity. Since many antistatic compositions also exhibit wetting characteristics which can adversely affect fluid repellency, it is frequently desirable to treat the material with a fluid repellent composition in order to avoid moisture transmitted contamination.

Commercially available fluorocarbons are recommended as suitable treating materials. These technical reasons lead the author of document D5 to impregnate the known laminate with an exemplary agent composition (column 16, lines 36 to 44) which, as the respondent has conceded during the oral proceedings, inherently meets the "melting point"-feature in Claim 1 of the patent in suit.

Consequently, the subject-matter of Claim 1 differs from the particular embodiment according to Example XIII of document D5 by the additional process step that the outer surface of at least one impregnated spunbond layer is hot calendered by a smooth calender roll as a final step.

2.2 In view of these circumstances, the appellant has requested that the feature: "subsequent to the pattern bonding the material is impregnated with a low surface tension fluid repellent agent having a higher melting point than the polymeric filaments of the spunbonded layer" be transferred from the characterising portion of Claim 1 to its preamble.

The Board has, however, refrained from demanding such a transfer of feature. As mentioned above, the particular repellant is selected in document D5 to compensate for adverse effects of an antistatic agent; this document being completely silent with respect to the melting point of the repellent to be selected. As a consequence, the set of agents which meet the rules of document D5 is not identical to but only overlapping the set of agents selectable according to the melting point requirement of the patent in suit. A transfer of this feature to the preamble would, therefore, mislead the reader of the claim with respect to the teaching of the patent in suit.

2.3 Also document D9 discloses a process for preparing a non-woven laminate material comprising all the features in the preamble of Claim 1. In the course of this known process, the web of spunbond filaments, before being pattern bonded to the layer of meltblown polymeric fibres, is treated with a surfactant to attain maximum absorbent rate of the fabrics column 8, lines 28 to 38). There is neither a detailed information about the composition of this surfactant nor about its melting point. Its intended function to increase the absorbent capacity, however, permits the conclusion that it should be wettable rather than repellent of nature. Moreover, the microfibre mat is treated with a surfactant to make the microfibres wettable before carrying out the pattern bonding step to form the laminate.

In contrast thereto, the process as specified in Claim 1 comprises the step that the laminate resulting from the pattern bonding step as a whole is impregnated with a fluid repellent agent which meets certain requirement with respect to its melting point, before the surface of its spunbond layer is hot calendered by smooth calendered roll.

2.4 Consequently, the prior art cited by the appellant does not prejudice the novelty of the subject-matter of Claim 1.

3. *Inventive step*

3.1 The patent as granted starts from document D5 as the closest prior art (EP-B-0 245 933, page 2, lines 5 to 34). The appellant has insisted, at the oral proceedings, that this document should also be considered to lie closest to the subject-matter of Claim 1 as now amended, because the specific embodiment disclosed under Example XIII of this document

anticipated one of the features in its characterising portion in addition to the features in the preamble of Claim 1. On one hand, this assumption is not generally true (see point 2.2 above); On the other hand, the fact that document D9 aims at improving the fuzz-up behaviour of the non-woven laminate material produced according to document D5 would have also qualified document D9 as a candidate for the closest prior art. Nevertheless, the now prevailing objective of the amended patent in suit to create a fluid repellent fabric-like material for garment applications may cast the vote for document D5.

3.2 According to the analysis given in points 2.1 and 2.2 above, example XIII disclosed in document D5 meets all the features of Claim 1 but the final step of hot calendering the laminate by a smooth calender roll.

3.3 The patent in suit asserts in its description (EP-B-0 245 933, page 2, lines 32 to 54) that the fibres in the outer spunbond web layers of this known material, when being used in conditions where heavy abrasive wear is likely to take place, can break between the bond areas causing the surface to fuzz and to form fibre pills which can detach from the surface and contaminate the environment. The resulting contamination can be a problem in critical environments such as vehicle spray painting, electronic manufacturing, pharmaceuticals preparation and general clean environments. Equally in certain applications requiring protection of the wearer from large amounts of fibres or dusts, a "fuzzy" fibre surface can trap excessive amounts of fibres or dust which can build up and be subsequently released in relatively large concentrations into the breathing zone of the wearer.

The basic problem of the patent in suit, therefore, consists in producing a fabric for workwear and the like, which has a highly bonded, smooth and abrasion-resistant surface which is resistant to fuzzing and linting and which deters adherence of dust whilst at the same time being sufficiently permeable to air/water vapour to be comfortable to wear and which reduces any tendency of the wearer to suffer from heat stress.

3.4 Starting from document D5, this problem is solved by selecting for the impregnation of the laminate only such repellent agents which have a higher melting point than the polymeric filaments of the spunbond layer and by hot calendering the outer surface of at least one impregnated spunbonded layer by a smooth calender roll.

Since the surfaces of both the surfaces filaments of the spunbond layer and the fibres of the meltblown layer are unprotected during the pattern bonding step, the materials of these two layers can readily fuse and create intimate bonds in those areas where they are contacted by the raised points of the patterned calender roll. If the patterned calender roll is adequately designed, the areas of the laminate intermediate the bonds will not be contacted by the low plain surface areas of the pattern roll intermediate the raised points and, therefore, exhibit a structure without a substantial degree of fusion (see D5, column 5, lines 35 to 54) similar to that of Figure 1 of the patent in suit. Here the length of the continuous spunbond filaments between the bond areas is relatively large giving rise to the problem of breakages due to abrasion.

The principle of the solution according to the patent in suit resides in that the impregnating repellent which has a higher melting point than the polymeric filaments provides a protective impregnation which prevents the

filaments from flowing into a continuous film (see Figure 3 of the patent in suit) but forming singular interlinking bonds only in the surface portion of the material thereby substantially preserving its favourable permeability and soft hand properties (see Figure 2).

3.5 Document D9 (column 1, lines 41 to 47) also starts from document D5 and, like the patent in suit, aims at obtaining a stabilised abrasion resistant surface (see column 1, lines 49 to 56; column 8, lines 55 to 60) which should be combined, however, with a minimum loss of absorbent capacity of the inner plies of fibrous web (see also column 3, lines 28 to 35, and lines 45 to 51; column 5, lines 40 to 47; column 6, lines 25 to 28).

To solve this combined problem, document D9 suggests to treat the microfibre layer and the spunbond filament layer before the pattern bonding step separately with different surfactant compositions (see column 8, lines 3 to 47) each of which has the function to increase the wettability of its respective layer; the surfactant applied to the spunbond layer additionally having an antistatic function.

Document D9 is silent about the melting points of the surfactants applied. Moreover, since the surfactants should increase the wettability, the use of fluorocarbon surfactants which have a high melting point but have a repellent effect, is excluded. The pattern bonding step is carried out after the layers to be bonded have been impregnated.

Since document D9 aims at producing a fabric with a combination of properties which is different from that striven for by the patent in suit in its now amended version and, hence, arrives at a production process which essentially different from that by Claim 1, the

Board cannot see how the disclosure of document D9 could possibly guide a skilled person from the process disclosed in document D5 to the solution according to Claim 1 of the patent in suit.

3.6 Consequently, the subject-matter of the independent Claim 1 involves an inventive step and this claim is, therefore, allowable.

4. Since the dependent claims and the adapted description are not subject to any objection either, the Board is of the opinion that, taking into consideration the amendments made by the proprietor of the patent, the patent and the invention to which it relates meet the requirements of the EPC.

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 in amended form in the following version:

Claims: 1 to 11 as presented during the oral proceedings on 18 April 1996;

description: pages 2 to 12 as presented during the oral proceedings on 18 April 1996;

drawings: as granted.

The Registrar: The Chairman:

A. Townend p.p. L. McGarry

G. Gall

1577.D
W.S.W.