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Datasheet for the decision of 19 November 2008

Case Number: T 0326/07 - 3.2.06

Application Number: 97950996.5

Publication Number: 0953074

IPC: D04H 1/54

Language of the proceedings: EN

Title of invention:
Process for manufacturing a band-shaped non-woven product with increased tensile strength

Patentee:
Wattex

Opponents:
FREUDENBERG POLITEX s.r.l.
Johns Manville International, Inc.

Headword:
-

Relevant legal provisions:
EPC Art. 83, 54, 56
RPBA Art. 13(1)

Keyword:
"Interpretation of a term in the claims"
"Sufficiency of disclosure (yes)"
"Novelty (yes)"
"Inventive step (no)"

Decisions cited:
-

Catchword:
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Case Number: T 0326/07 - 3.2.06

D E C I S I O N
of the Technical Board of Appeal 3.2.06
of 19 November 2008

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Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 27 December 2006 concerning maintenance of European patent No. 0953074 in amended form.

Composition of the Board:

Chairman: P. Alting Van Geusau
Members: G. de Crignis
R. Menapace

Summary of Facts and Submissions

I. European Patent Nr. 0 953 074, granted on application Nr.97950996.5, was maintained in amended form by decision of the opposition division posted on 27 December 2006.

Claim 1 as upheld by the opposition division reads:

"Process for manufacturing a band-shaped non-woven product reinforced by strengthening threads or filaments and showing an increased tensile strength longitudinally or in the cross direction of the band-shaped product, comprising the steps of:
a) providing a fleece;
b) laying strengthening threads or filaments onto the fleece;
c) applying and joining said strengthening threads or filaments to the fleece of which the non-woven consists in the direction in which the tensile strength of the non-woven product is to be increased, by application of the needling technique;
characterised in that said strengthening threads or filaments are laid tensionless onto the fleece."

II. The opposition division held that the patent in suit disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC); furthermore it found that the subject-matter of claim 1 had not been amended in a way that it contained subject-matter which extended beyond the content of the application as filed (Article 123(2) EPC) and was clear and supported by the description (Article 84 EPC); moreover it found that

the subject-matter of claim 1 in accordance with the patent proprietor's main request was novel (Article 54 EPC) over the disclosure in
D1 US-A-5 118 550 and
D4 EP-A-0 572891
and also involved an inventive step (Article 56 EPC) with regard to the disclosure of D1, D4 or
D6 DE-U-9 217 045.

III. With its letter dated 22 February 2007 the appellant (opponent I) filed an appeal against the decision of the opposition division and on the same day paid the appeal fee. With its letter of 23 April 2007 the statement of grounds of appeal was filed. The appellant based its appeal on insufficient disclosure, absence of novelty and lack of inventive step (Articles 100(a) and (b) EPC).

IV. In a communication in preparation for the oral proceedings dated 11 July 2008, the Board indicated that the term "tensionless" which was objected to under Article 83 EPC appeared to have a sufficiently clear meaning in the art, and that the subject-matter of claim 1 of the main request was considered to be novel over the disclosure in D1 and D4. Furthermore, for the assessment of inventive step the objective technical problem to be solved *vis-à-vis* the closest prior art should be identified.

V. Oral proceedings were held before the Board on 2 December 2008, during which the appellant requested to set aside the decision under appeal and to revoke the patent. The respondent (patent proprietor) requested that the appeal be dismissed or the patent be

maintained with claim 1 and amendments to the description as filed during the oral proceedings. The other party was not represented as announced with letter of 27 October 2008.

Claim 1 according to the auxiliary request reads (Amendments with regard to claim 1 of the main request are in italics):

"Process for manufacturing a band-shaped non-woven product *based on staple fibres and* reinforced by strengthening threads or filaments and showing an increased tensile strength longitudinally or in the cross direction of the band-shaped product, comprising the steps of:
a) providing a fleece;
b) laying strengthening threads or filaments onto the fleece;
c) applying and joining said strengthening threads or filaments to the fleece of which the non-woven consists in the direction in which the tensile strength [of the non-woven product] is to be increased, by application of the needling technique;
characterised in that
said strengthening threads or filaments are laid tensionless onto the fleece; *and wherein the fleece is manufactured by bringing basic fleeces coming from a card together by means of a cross-laying device until a desired weight is obtained, whereby the speed of the cross-laying device is adjusted so as to preserve the rectilinearity of the staple fibres as much as possible; and in that, prior to the final needling, the non-woven product is stretched by means of a draw bench, so that the fibres take up a less parallel position*."

VI. The appellant (opponent OI) essentially argued:

The skilled person did not find in the patent in suit any useful teaching on how to carry out the claimed process. In particular it was not disclosed how the strengthening threads or filaments could be laid down tensionless while they were being pulled with tension from the bobbins. Accordingly, the invention was not disclosed in a manner sufficiently clear and complete for it to be carried out (Article 83 EPC).

The subject-matter of claim 1 of the main request was not novel over the disclosure in either D1 or D6. When interpreting "tensionless" as meaning to apply no deformational forces on the strengthening threads, this necessarily was implicitly present in the processes of either D1 or D6.

The subject-matter of claim 1 of the main request did not involve an inventive step. When starting from the disclosure of D1, which represented the closest prior art, the problem was to avoid elastic tensions and forces in the final product. In view of the further product steps and the use of the final nonwoven product, the solution to lay down the strengthening threads without deformation was obvious for the skilled person.

The auxiliary request should not be admitted since the amended claim 1 was not clearly allowable as required by the case law of the Boards of appeal when late filed request were concerned. The embodiment disclosed in the patent including only staple fibres referred to an increased tensile strength in the cross direction and

not in the longitudinal direction as now claimed. Accordingly, the requirements of Article 123(2) EPC were not met. Moreover it was not possible to amend claim 1 by including both features (longitudinally and in the cross direction) since such a process would extend the protection conferred (Article 123(3) EPC). Moreover, the requirements of Article 84 EPC were not met in view of a "final needling" without any link to the previous process and particular pre-needling steps.

VII. In support of its requests the respondent substantially relied upon the following submissions:

The invention was sufficiently disclosed. The "tensionless" application of the strengthening threads or filaments included two stages, unwinding the threads or filaments from the bobbins and subsequent laying them onto the fleece. The necessity of a parallel orientation of the threads implicitly clarified that the term "tensionless" did not exclude any tension forces but that only such small tension forces were to be considered which did not adversely influence the further process steps or the final product. The claimed process steps were well-known in the art, could be performed and no lack of clarity was present in this respect either.

The subject-matter of claim 1 of the main request was novel over the disclosure in either D1 or D6. D1 referred to a continuous process involving a tensioning bar when unwinding the threads. Accordingly, at least some tension was present during the step of laying the threads onto the fleece. In the absence of any disclosure with regard to the amount of tension force

the skilled person had no clear and unambiguous teaching in this respect. Also D6 was silent with regard to the amount of tension force during the application of the strengthening threads.

Considering inventive step, D1 represented the closest prior art. It led away from the teaching of the patent in suit in that sufficient tension had to be applied in order to stretch the reinforcing threads throughout the consolidation stages (col. 7, l. 35 - 43). No range or amount for the tension force was disclosed. Hence, the claimed subject-matter was not to be considered and it involved an inventive step.

The late-filed auxiliary request should be admitted. It was based upon a request already submitted during the first instance proceedings and thus could have been expected. The subject-matter of its claim 1 was further limited as it referred to the embodiment restricted to staple fibres.

Reasons for the Decision

1. The appeal is admissible.

2. *Article 83 EPC*

2.1 Interpretation of "tensionless"

No direct specific disclosure is present in the patent in suit explaining the term "tensionless" application of the wires and/or filaments on the fleece.

The opposition division considered that in the absence of any such indication in the patent the term "tensionless" should be taken at face value i.e. meaning zero tension or without a pull on the threads or filaments.

Although this straightforward approach appears reasonable at first sight, it is to be noted that in this case the feature of "tensionless" was the only feature of claim 1 that was considered novel when compared to the closest prior art disclosed in D1. Therefore the issue of inventive step depended solely on the meaning of this term and consequently the approach chosen by the opposition division incorporates the risk that a single word, irrespective of whether it is used in the right or wrong manner, becomes decisive for deciding the question of inventive step.
It will be clear that in such a situation further investigation is needed to establish the exact meaning of "tensionless" in the context of the subject-matter claimed.

In the context of the disclosure in the patent in suit, as was also relied upon by the appellant when referring to paragraph [0026] of the patent in suit, the reason for the "tensionless" laying down of the wires and/or filaments is that during needling the elasticity in the direction in which the wires and/or filaments are found should not be affected by stresses in the wires and/or filaments.

However, it will be immediately clear to the skilled person that stresses in the wires and/or filaments will have an effect on the elasticity of the end product

only if the stresses lead to any appreciable elastic deformation of the wires and/or filaments; if there is no deformation of the filaments then there is also no deformative interaction between the filaments and the fleece.

It is further to be noted that in the only paragraph of the description [0024] in which the term "tensionless" is mentioned reference is made to bobbins on which the wires and/or filaments are wound. In the context of unwinding of the strengthening threads and laying them onto the fleece, at least some force has to be applied, also in view of the fact that the wires and/or filaments should be positioned sufficiently accurately so that during needling the needles will not interfere with the strengthening wires and/or filaments. In view of the materials used for the strengthening filaments the unwinding forces cannot lead to any appreciable elastic lengthening of the filaments.

Thus, when taking into account these interactions and dependencies, it follows that the application of the strengthening wires and/or filaments without any appreciable elastic deformation is the technical essence of the term "tensionless".

2.2 Sufficiency

With regard to the above interpretation of the term "tensionless", the skilled person can lay down the strengthening wires and/or filaments onto the fleece as set out above after unwinding them from bobbins. Means and apparatus for doing so are available as for example disclosed in D1. And as was mentioned above, in view of

the materials mentioned in D1 for the strengthening filaments normal unwinding forces will not lead to any appreciable lengthening of the filaments. Accordingly, the patent in suit is disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC).

3. *Amendments - Main request*

The subject-matter of originally filed claims 1 and 4 is combined in claim 1. The requirements of Article 123(2) EPC are met.

4. *Novelty - Main request*

4.1 D1 refers to a process for manufacturing a nonwoven sheet which is reinforced by high-modulus strengthening threads (Figures 3, 4) which may be based for example on materials like glass, aramids, aromatic polyamides, high-tenacity polyesters (col. 4, l. 62 - 63). The strengthening threads are arranged parallel to each other in the lengthwise direction (col. 4, l. 16 - 18, col. 6, l. 47 - 40). Figures 3 and 4 (col. 9, l. 5 - 10) show a tensioning bar system after the feeding creel and before the combination of the reinforcing threads with the fibrous nonwoven sheet. Bonding of the threads to the sheet is preferably carried out by needling and/or heat-bonding while maintaining sufficient tension (col. 7, l. 35 - 41).

4.2 It is undisputed that D1 discloses with regard to the process of claim 1 all features of the preamble.

4.3 No amount or range of tension force is disclosed in D1 with regard to any operational step. Accordingly, no clear and unambiguous disclosure of the strengthening threads or filaments being laid "tensionless" onto the fleece is present with regard to the interpretation as given under point 2.1 above. Therefore, the subject-matter of claim 1 is - at least formally - novel over D1.

4.4 Also D6 refers to a process having all the features of the preamble of claim 1. With regard to the same distinguishing feature as set out above for D1, the disclosure on page 10, second paragraph of D6 was cited. This paragraph reads: "*Selbstverständlich ist es auch möglich, erfindungsgemäße Schichtstoffe durch Vereinigung der vorgefertigten und verfestigten Vlies- und Gelegeschichten und der Metallfolie auf Assembliermaschinen und anschließendes Vernadeln zu erzeugen*."

4.5 Accordingly, again no particular amount or range of tension force is disclosed. The same arguments as given above under point 4.3 with regard to D1 thus apply for D6 as well. Hence, the subject-matter of claim 1 of the main request is novel (Article 54 EPC).

5. *Inventive Step - Main Request*

5.1 The feature distinguishing the claimed subject-matter from D1 which represents the closest prior art is the process step concerning "tensionless" application of the strengthening threads or filaments onto the nonwoven sheet.

5.2 According to the description of the patent in suit the technical problem to be solved relates to the provision of a reinforced nonwoven sheet in a "*process [that] enables the elasticity, in the direction in which the wires and/or filaments are found, to be varied within certain limits, and this by adapting the ratio of feed rate and speed of thermostabilising element*" (paragraph [0026]). Accordingly, it is not a completely inelastic nonwoven product which shall be obtained. The problem is thus consistent with the interpretation given above (see point 2.1) for "tensionless" application.

5.3 It is further to be taken into account that the subject-matter of claim 1 according to the patent in suit leads only to a partial solution in this respect, since the claimed process concerns only the manufacturing of an interim product. The influence of subsequent manufacturing steps upon the characteristics of the final product like ratio of feed rate and speed of the thermo-stabilising element and the binding of the fibres and/or filaments may be significant but not specified within the scope of the claim.

5.4 Accordingly, the problem to be solved by the claimed subject-matter has to be considered in the framework of the complete process but limited to the issue of how to maintain the possibility of obtaining the desired characteristics of elasticity/strength in a final nonwoven product in the early process phase. The solution according to the patent in suit is to support and maintain this possibility by laying the strengthening threads or filaments without deformation (tensionless) onto the fleece.

5.5 When starting from D1, it belongs to the normal professional activities of the skilled person to carefully plan the complete succession of process steps and to choose corresponding tension forces. Already when planning these steps, the deformation of the strengthening threads or filaments has to be avoided during all steps in case such deformation would influence adversely the further process steps and/or the final product.

5.6 When including a needling step in the process, a parallel direction of the strengthening threads or filaments is mandatory. Consistently, the tension forces to be applied must be sufficiently high to enable a parallel orientation of the strengthening threads or filaments. At the same time, the tension forces to be applied must be sufficiently low to avoid tensioned interim products which would complicate, disturb or adversely affect subsequent process steps. Such considerations extend to the influence of tensions on the final product whose characteristics should not be negatively affected or adversely influenced. The skilled person thus knows that the tension forces should be chosen with regard to subsequent process steps and with regard to the dimensional stability of the final product.

5.7 Consistent with the tension forces, the nature and kind of the strengthening threads or filaments have to be considered. These threads are high-modulus threads (D1: col. 4, l. 51 - 68; patent in suit: paragraph [0017]). When using such strengthening threads or filaments there is no reason to apply higher tension forces than

necessary for arriving at a parallel alignment of the threads.

5.8 Thus no further investigation or tests are necessary to arrive at the conclusion that deformation of the threads in any of the process steps does not appear desirable, and thus in the first place the step of laying down the strengthening threads has to be carried out "tensionless" in the interpretation given under point 2.1 above. Accordingly, the subject-matter of claim 1 does not involve an inventive step (Article 56 EPC).

6. *Auxiliary request - Admissibility*

6.1 The auxiliary request was filed during the oral proceedings after discussion of the main request. According to Article 13(1) of the Rules of Procedure of the Boards of Appeal any amendment to a party's case after it has filed its grounds of appeal may be admitted and considered at the Board's discretion. The discretion has to be exercised in view of *inter alia* the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy.

6.2 The auxiliary request is based upon a claim 1 whose subject-matter includes further features which are not consistent with the Rules and Articles of the EPC.

6.3 The subject-matter of its claim 1 is limited to a non-woven product based on staple fibres. The corresponding disclosure in the WO-publication (as originally filed) on page 4, lines 15 to 22 refers to the increased

tensile strength of the nonwoven product based on staple fibres in the cross-direction. Accordingly, the reference in claim 1 to the increased tensile strength of the nonwoven product in the longitudinal direction leads to a broadening of its subject-matter beyond the content of the application as filed (Article 123(2) EPC).

6.4 The suggestion of the patent proprietor to amend this claim further by providing both alternatives of an increased tensile strength longitudinally "and/or" in the cross direction would extend the protection conferred by claim 1 of the granted patent which limited the scope of protection to the alternatives (Article 123(3) EPC).

6.5 Moreover, the subject-matter of its claim 1 refers to a "final needling" without clarification as to which number or kind of pre-needling has to be performed. No distinct disclosure in this respect is present in the description either. Thus, the requirements of Article 84 EPC are not met.

6.6 Accordingly, the auxiliary request is not *prima facie* allowable and thus not admitted into the proceedings.

7. Consequently the subject-matter of claim 1 of the appellant's main request is not allowable for lack of inventive step (Article 56 EPC) and the auxiliary request is not admitted into the proceedings (Article 13(1) RPBA).

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