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Datasheet for the decision of 24 September 2013

Case Number: T 1140/11 - 3.3.09

Application Number: 02000814.0

Publication Number: 1226935

IPC: B32B 37/00, B29C 69/00

Language of the proceedings: EN

Title of invention:
Method and apparatus for manufacturing laminated material

Patent Proprietor:
Toyo Seikan Kaisha, Ltd.

Opponent:
Tata Steel IJmuiden BV

Headword:
-

Relevant legal provisions:
EPC Art. 83, 100(c)
RPBA Art. 13(1)(3)

Keyword:
"Main request: extension of subject-matter (yes), insufficiency of disclosure (yes)"
"Auxiliary requests: admitted (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1140/11 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 24 September 2013

Appellant: (Patent Proprietor)	Toyo Seikan Kaisha, Ltd. 3-1, Uchisaiwai-cho 1-chome Chiyoda-ku Tokyo 100-8522 (JP)
Representative:	Böck, Bernhard advotec. Patent- und Rechtsanwälte Widenmayerstrasse 4 D-80538 München (DE)
Respondent: (Opponent)	Tata Steel IJmuiden BV P.O. Box 10000 NL-1970 CA IJmuiden (NL)
Representative:	Bodin, Andre Tata Steel Group Intellectual Property Services P.O. Box 10000 NL-1970 CA IJmuiden (NL)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted 22 February 2011 revoking European patent No. 1226935 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman: K. Garnett
Members: N. Perakis
J. Jardón Álvarez

Summary of Facts and Submissions

I. Mention of the grant of European patent No. 1 226 935 in the name of Toyo Seikan Kaisha, Ltd. was published on 12 December 2007 (Bulletin 2007/50). The patent was granted with 10 claims, independent claims 1 and 4 reading as follows:

"1. A method for manufacturing laminated material which laminates a resin film (1) formed by extruding molten thermoplastic resin from a T-die (2), to a substrate, the method comprising forming a laminating film (10) by cutting ear portions (12) of the resin film (1) before laminating the film (10) to the substrate (3), wherein temperature of the resin film at the cutting is set equal to or more than the glass transfer point (Tg), characterized in that
the resin film (1) is temporarily received and held by a pre-roll and the ear portions (12) are cut thereafter."

"4. An apparatus for manufacturing laminated material comprising:
heating means (4) which preheat a substrate (3),
a T-die (2) which extrudes molten thermoplastic resin as a resin film (10),
cutting means (50) which form a laminating film by cutting ear portions (12) of the resin film (10) before lamination,
lamination rolls (6) which laminate the laminating film formed by cutting to the substrate (3), and
a cooling device (8) which quenches the formed laminated material,

wherein a temperature of the resin film (1) at the cutting is set equal to or more than the glass transfer point (Tg),
characterized in that
the apparatus comprises a pre-roll (5) which temporarily receives the resin film (1) which is extruded from the T-die (2)."

II. An opposition was filed by Corus Staal BV (now Tata Steel IJmuiden BV). The grounds for opposition relied upon by the opponent were lack of novelty and inventive step (Article 100(a) EPC), insufficiency of disclosure (Article 100(b) EPC) and added subject-matter (Article 100(c) EPC).

III. By its decision announced orally on 18 October 2010 and issued in writing on 22 February 2011, the opposition division revoked the patent because it considered that neither the main request filed with letter of 7 September 2010 nor any of the three auxiliary requests filed during the oral proceedings met the requirements of the EPC (Article 101(3)(b) EPC).

IV. On 21 April 2011 the patent proprietor (hereinafter: the appellant) filed an appeal against the decision of the opposition division and paid the appeal fee on the same day. The statement setting out the grounds of appeal was filed on 21 June 2011. The appellant requested that the decision of the opposition division be set aside and the patent be maintained on the basis of the main request, alternatively the auxiliary request, both as filed with the grounds of appeal.

For this decision only the main request is of relevance as the auxiliary request was amended subsequently. Independent claims 1 and 4 of the main request read as follows:

"1. A method for manufacturing laminated material which laminates a resin film (1) formed by extruding molten thermoplastic resin from a T-die (2), to a substrate, the method comprising forming a laminating film (10) by cutting ear portions (12) of the resin film (1) before laminating the film (10) to the substrate (3),

wherein a temperature of the resin film at the time of cutting is set equal to or more than the glass transfer point (Tg) **[feature A]**,

the resin film (1) is temporarily received and held by a pre-roll and the ear portions (12) are cut thereafter,

characterized in that

the cutting of the resin film (1) is performed in the state where only the contraction force in the widthwise direction remains in the resin film **[feature B1]**."

"4. An apparatus for manufacturing laminated material comprising:
heating means (4) which preheat a substrate (3),
a T-die (2) which extrudes molten thermoplastic resin as a resin film (10),
cutting means (50) which form a laminating film by cutting ear portions (12) of the resin film (10) before lamination,

lamination rolls (6) which laminate the laminating film formed by cutting to the substrate (3),

wherein a temperature of the resin film (1) at the time of cutting is set equal to ore *(sic)* more than the glass transfer point (Tg) **[feature A]** ,

the apparatus comprises a pre-roll (5) which temporarily receives the resin film (1) which is extruded from the T-die (2),

characterized by

a cooling device (8) which quenches the formed laminated material,

the cutting means (50) for cutting the resin film (1) being arranged at a position between the T-die (2) and the lamination rolls (6) where only the contraction force in the widthwise direction remains in the resin film **[feature B2]"**.

(Words in square brackets added by the Board)

V. By letter dated 6 December 2011, the opponent (hereinafter: the respondent) filed observations on the appeal and requested that the appeal be dismissed.

VI. Further arguments were filed by the parties: the appellant by letter dated 14 August 2012 and the respondent by letter dated 20 February 2013.

VII. The board issued a preliminary opinion with its communication dated 30 July 2013. The board raised an

objection under Article 100(c) EPC regarding the subject matter of independent claims 1 and 4.

VIII. By letter of 23 August 2013, the appellant withdrew the auxiliary request filed with the grounds of appeal and submitted eleven auxiliary requests.

IX. Oral proceedings were held before the board on 24 September 2013. During the discussion of the appellant's main request, the appellant filed two documents which were said to be relevant for the issue of sufficiency of disclosure:

(1) A print out from Wikipedia.org headed "Kelvin-Voigt material" (3 pages), and

(2) A print out from Wikipedia.org headed "Maxwell material" (4 pages).

After the appellant's main request had been discussed and the board had indicated in effect that the request was not allowable, the appellant withdrew all the auxiliary requests filed with the letter dated 23 August 2013 except for the seventh auxiliary request, which became its first auxiliary request, and filed a new second auxiliary request.

The subject-matter of independent claim 1 of this first auxiliary request derives from the subject-matter of claim 1 of the main request but modified so that:

- feature A reads as follows **[feature A']**:
  "wherein the thermoplastic resin is made of polyester and a temperature of the resin film at the time of

cutting is set equal to or more than the glass transfer point (Tg)" [emphasis by the board of the added feature];

– it contains the following additional feature **[feature C1]:**
"the laminating resin film (10) is laminated to the substrate (3) while maintaining the peripheral speed of lamination rolls (6a, 6b) at a speed which is 10 to 150 times higher than an extruding speed of the thermoplastic resin from the T-die".

The subject-matter of independent claim 3 of this first auxiliary request derives from the subject-matter of claim 4 of the main request but modified so that:

– feature A reads as **feature A'** cited above, and

– it contains the following additional feature **feature C2]:**
"lamination rolls (6a, 6b) laminating at a speed which is 10 to 150 times higher than an extruding speed of the thermoplastic resin from the T-die".

Claim 1 of the second auxiliary request derives from claim 1 of the first auxiliary request with the deletion of feature B1 and the addition of the following feature **[feature D1]:**
"the cutting is performed by laser beams of a CO2 gas laser".

Claim 3 of the second auxiliary request derives from claim 3 of the first auxiliary request with the deletion of feature B2 and the addition of the

following feature **[feature D2]**:
"a CO2 gas laser emitting laser beams as cutting means (50)".

X. The relevant arguments put forward by the appellant in its written submissions and during the oral proceedings may be summarised as follows:

- The features of claims 1 and 4 of the main request relating to the temperature of the resin at the time of cutting were disclosed in the originally filed application considered in its entirety. Reference was made to the A publication, paragraphs [0107] to [0111] (corresponding to page 17, line 23 to page 18, line 9, of the originally filed application).

- The subject-matter of Claim 1 of the main request was clear within the meaning of Article 84 EPC. The cutting of the ear portions of the extruded resin film was performed in the state where the contraction force in the widthwise direction was the only contraction force of the film.

- In relation to the issue of sufficiency of disclosure, the common general knowledge of the skilled person was relevant and was illustrated by the above two documents filed during the oral proceedings, which should be admitted into the proceedings.

- The claimed invention was sufficiently disclosed (Article 83 EPC). The skilled person would be aware on the basis of his general technical knowledge that the resin film had viscoelastic properties and consequently at a certain point in time it was in

such a state that the only contraction force in the film was the contraction force in the widthwise direction. Thus on the basis of simple tests he would be able to determine when was the appropriate point to perform the cutting of ear portions of the resin film.

- The first auxiliary request should be admitted into the proceedings because it was identical to the previously filed seventh auxiliary request. That request had been filed in time, since it was filed as a reaction to the objections raised by the board in its preliminary opinion.

- The second auxiliary request should also be admitted into the proceedings because it derived from the previously filed eleventh auxiliary request and could not have come as a surprise to the respondent. Compared to the previously filed auxiliary request the second auxiliary request did not contain feature B1/B2 any more and thus overcame the objection of insufficiency of disclosure.

XI. The relevant arguments put forward by the respondent in its written submissions and during the oral proceedings may be summarised as follows:

- The respondent agreed with the objection raised by the board in its communication that the subject-matter of claims 1 and 4 of the main request had been so modified that it extended beyond the content of the application as filed. Thus, original claim 4 and original page 17, lines 23-27, by using the term "and", combined the nature of the resin film, namely

a polyester, with the temperature of the resin film at the time of cutting, namely a temperature of equal to or more than the glass transfer point. Contrary to the assertions of the appellant, the original disclosure considered as a whole did not allow the dissociation of these two features.

– The subject-matter of claim 1 of the main request should be interpreted such that at the time of cutting the film was in such a state that the only contraction force remaining in the resin film was the contraction force in the widthwise direction. (This was not in dispute between the parties).

– The two documents filed by the appellant during the oral proceedings were late-filed and should not be admitted into the proceedings for the discussion of sufficiency of disclosure.

– The invention according to claim 1 of the main request was not sufficiently disclosed. The assertions of the appellant regarding sufficiency were not convincing since no example corresponding to the claimed invention was to be found in the patent in suit. The remaining disclosure did not provide the necessary information to enable the skilled person to determine the time of cutting, thereby putting an undue burden on him when seeking to reproduce the claimed invention. Furthermore, on the basis of the laws of nature it was not possible to manufacture an extruded film where a contraction force only in the widthwise direction remained in the film since contraction forces would always remain in the other two directions.

– The first and second auxiliary requests should not be admitted into the proceedings. The first auxiliary request was late-filed and had not provided the respondent with sufficient time to file substantive comments. Moreover neither request overcame all the objections raised against the main request. Claim 1 of the second auxiliary request, which was filed during the oral proceedings, contained substantial amendments by deletion and introduction of features taken from the description. It therefore raised new issues with which the respondent was not in a position to deal during the oral proceedings.

XII. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request filed with the grounds of appeal on 21 June 2011, alternatively on the basis of the seventh auxiliary request filed with the letter dated 23 August 2013, or the second auxiliary request filed during the oral proceedings of 24 September 2013.

XIII. The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. Amendments under Article 100(c) EPC

2.1 The subject-matter of claims 1 and 4 of the main request contains feature A:

"wherein a temperature of the resin film at the time of cutting is set equal to or more than the glass transfer point (Tg)"

which was disclosed in the originally filed application always in combination with a specific type of thermoplastic resin film, namely a polyester.

Thus original claim 4 discloses:

"The method of any one of the claims 1 to 3, wherein the thermoplastic resin is made of polyester and a temperature of the resin film at the time of cutting is set equal to or more than the glass transfer point (Tg)". (emphasis by the board)

Furthermore, the original description, page 17, lines 25-27 discloses:

"it is preferable to use polyester as the molten thermoplastic resin and to maintain the temperature (T2 °C) of the laminating film 10 which is formed of the flattened portion 11 by cutting the resin film at a

temperature more than the glass transfer point (Tg) of polyester". (emphasis by the board)

In view of these explicit disclosures the use of the term "and" restricts the disclosure of the original application to the combination of the polyester resin film feature with the temperature feature. Therefore the dissociation of these two features in claims 1 and 4 of the main request extends the claimed subject-matter beyond the content of the application as originally filed.

2.2 The board does not agree with the appellant that this dissociation is implicit having regard to the original application when read in its entirety. The board considers that the passage to which the appellant made reference - i.e., page 17, lines 28 to 30, immediately after the passage cited in the previous paragraph, which recites the temperature T2 - is linked to the content of the previous paragraph and discloses this temperature in combination with the polyester resin. Regarding the subsequent paragraphs (page 17, line 31 to page 18, line 6), they are irrelevant to the present issue since they concern the surface temperature of the lamination rolls.

2.3 Therefore for this ground alone the main request is not allowable.

3. Clarity

3.1 The clarity objection concerns essentially the meaning of feature B1. The board concurs with the parties, who both agreed during the oral proceedings that this

feature relates to the state of the film at the time of cutting the ear portions, the required state being one where the only contraction force in the resin film is the contraction force in the widthwise direction, i.e., there is no contraction force in the other directions of the film. As such, it appears to the board that what is meant by claim 1 is clear.

3.2 The objection of the respondent that such a film is not possible in view of the laws of nature is rather an objection of insufficient disclosure.

4. Sufficiency of disclosure

4.1 The issue of sufficiency of disclosure boils down to the question whether the skilled person, on the basis of the information provided by the patent in suit and his technical background knowledge, is able to determine the time of cutting the resin film. This is defined in the method of claim 1 as to be performed:

- at a temperature of the resin film which is set equal to or more than the glass transfer point (Tg) (see feature A); and

- in the state where only the contraction force in the widthwise direction remains in the resin film (see feature B1).

4.2 The first feature indicates that the film is cut at or above its Tg, which means at a state when it is still viscous. As the Tg of a specific resin can be measured, there is no difficulty in putting this feature into practice.

4.3 Regarding feature B1 the appellant's major argument was that it was derivable from the patent in suit in combination with the general technical knowledge of the skilled person. The appellant made particular reference to paragraphs [0022], [0041] and [0062] of the application as published, which correspond to paragraphs [0023], [0042] and [0063] of the granted patent.

The board does not consider these argument of the appellant convincing for the following reasons:

4.3.1 The cited passages of the patent in suit do not disclose how to determine the state of the film where only the contraction force in the widthwise direction remains in the film. They merely disclose that:

- "... the resin film 1 which is excluded *(sic)* from the T-die 2 in a molten form ... tends to generate a so-called neck-in-phenomenon in which both end portions (ear portions) of the resin film 1 are contracted in the course of solidification by cooling." (paragraph [0023]);
- "... the film 1 is to be laminated after being stretched in the longitudinal direction to form a thin film ..." (paragraph [0042]), and
- "(t)he cutting positions 25 at which the ear portions 12 of the resin film 1 extruded from the T-die 2 are cut must be determined such that the ear portions 12 can be cut before lamination when the temperature of the resin film 1 is still at the high state." (paragraph [0063]; emphasis by the board).

These passages are silent about how the required state of the film is to be determined.

4.3.2 Moreover, it is to be noted that as a result of the amendments made to the claims during examination and opposition proceedings the experiment described in the specification does not represent an example according to the claimed invention. Thus the experiment disclosed in paragraphs [0126] to [0131] does not disclose that the temperature of the resin film at the time of cutting is set equal to or more than the glass transfer point Tg. On the contrary, it seems that the temperature at the time of cutting is lower, since a resin film with a melting point of 220°C is used, the T-die of the extruder is set at the temperature of 220°C and the neck-in phenomenon occurs in the course of solidification by cooling (see paragraphs [0009] and [0023]). Moreover, this experiment does not disclose that the cutting of the resin film is performed in a state where only the contraction force in the widthwise direction remains in the resin film; it simply discloses that ear portions were cut before lamination in the course of the neck-in phenomenon using the CO2 gas laser.

In summary the specification gives the skilled person no information of how to determine feature B1.

4.3.3 Concerning the question whether the skilled person on the basis of his general technical knowledge would be able to determine feature B1, the board agrees with the respondent that this is not the case.

First of all, as indicated by the respondent, the molten thermoplastic resin film - a viscoelastic material - has during all steps of its manufacturing method a contraction force not only in the widthwise direction but also in the lengthwise direction. The reason is that during the transfer from the extruder to the laminating rolls the film is stretched and its thickness reduced since an external force acts on the resin between the die and the laminating rolls, which is the tensile force that is brought about by the laminating rolls having a peripheral speed which is larger than the extruding speed (patent: paragraph [0113]). This external tensile force generates an internal contracting force in the lengthwise direction in the resin film. Thus the external tensile force in the extruded polymer resin causes as a reaction an internal compressive stress. There are always at least two contracting forces, one in the lengthwise direction and the other in the widthwise direction with the consequence that it is not possible to determine the point where only one contraction force acts.

4.3.4 The appellant did not, principally, contest these considerations. According to its point of view, the claimed method should not to be construed to concern any stretching of the molten resin film exiting the extruder but only a very strong stretching leading to resin films which are not elastic any more and therefore have no observable internal contraction force in the lengthwise direction. Nevertheless, the patent in suit does not contain any indication of the necessary conditions which would allow the production of such a specific stretching. As the respondent

correctly pointed out, critical information is lacking relating to the nature of the material used, the Tg of the viscoelastic material, the dimensions of the extruder T-die, the difference of the extrusion speed and the peripheral speed of the laminating rolls, the thickness of the resin film, to name only some of them. Certainly, the board does not ignore that paragraph [0113] of the patent in suit discloses a peripheral speed of the lamination rolls which is 10 to 50 times larger than the extruding speed of the thermoplastic resin from the T-die. However, this feature not only is not included in the subject-matter of claim 1 but furthermore is not on its own sufficient to define an extruded resin film with no elastic properties. Under these circumstances, the board comes to the conclusion that the skilled person is not given the necessary information enabling him to determine the state of the resin film where only the contraction force in the widthwise direction remains in the resin film and is consequently unable to perform the cutting of ear portions of this film under the conditions imposed by the claimed invention.

4.3.5 The appellant argued that the wording used to define the time of the cutting in feature B1 was that of the result to be achieved. However, this formulation in the present case is inappropriate since there is insufficient information in the patent in suit to enable the skilled person to determine how the result could be achieved. As already mentioned there is no guidance to be found in the experimental evidence of the patent. Moreover, the molten resin film is a complex system which requires the control of many parameters, such as the nature of the resin film, the

extrusion conditions, the T-die characteristics, the stretching of the film (to name only some of them), so that an undue burden is put on the skilled person wishing to carry out the claimed invention.

4.3.6 Regarding the additional documents submitted by the appellant during the oral proceedings (see point VIII, above), they were not only late-filed but superfluous. Both parties acknowledged that the extruded molten thermoplastic resin film of claim 1 was a viscoelastic material. Therefore these documents did not provide more information beyond the basic knowledge of the skilled person and the board decided not to admit them into the proceedings.

4.4 The above reasoning applies also to the apparatus of claim 4 which defines the cutting means for cutting the resin film as being arranged at a position where only the contraction force in the widthwise direction remains in the resin film (feature B2).

4.5 On the basis of the above considerations the board concludes that the claimed invention as defined by claims 1 and 4 is not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art and therefore does not fulfil the requirements of Article 83 EPC.

4.6 Consequently, also for this reason the main request is not allowable.

First auxiliary request

5. The board concurs with the respondent that the first auxiliary request was late filed, did not *prima facie* overcome the objection under Article 83 EPC raised against the main request, and contained features taken from the description (paragraphs [0107] and [0113]) which potentially raised new issues which the respondent did not have the necessary time to deal with. Furthermore, contrary to the assertions of the appellant, the submission of the first auxiliary request cannot be considered as a reaction to the preliminary opinion of the board, except to the extent that it overcomes the objection under Article 100(c) EPC raised by the board in its communication. This is because the issue of insufficient disclosure had been raised by the respondent in its reply to the statement of grounds of appeal.

In view of the above considerations the first auxiliary request was not admitted into the proceedings under Articles 13(1) and (3) RPBA.

Second auxiliary request

6. In addition to the considerations regarding the first auxiliary request, the deletion of feature B, which had always been present in the claimed subject-matter, and the insertion of features C1/D1 and C2/D2 in claims 1 and 3, respectively, modified the subject-matter so that the case was changed completely.

Hence also the second auxiliary request was not admitted into the proceedings under Articles 13(1) and (3) RPBA.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Cañueto Carbajo K. Garnett