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Datasheet for the decision of 3 April 2012

Case Number: T 1313/09 - 3.3.09

Application Number: 02717171.9

Publication Number: 1393898

IPC: B32B 27/36, B32B 27/20, B32B 3/26, B41M 5/40

Language of the proceedings: EN

Title of invention:
White laminate polyester film and receiving sheet for thermal transfer recording using it

Applicant:
TORAY INDUSTRIES, INC.

Opponent:
Mitsubishi Polyester Film GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Parameters in claim 1: Method of measurement different form prior art"
"Main request: Novelty (yes); Inventive step (yes)"

Decisions cited:
T 0131/03

Catchword:
-

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Case Number: T 1313/09 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 3 April 2012

Appellant: (Opponent)	Mitsubishi Polyester Film GmbH Rheingaustrasse 190 D-65203 Wiesbaden (DE)
Representative:	Schweitzer, Klaus Plate Schweitzer Zounek Patentanwälte Rheingaustrasse 196 D-65203 Wiesbaden (DE)
Respondent: (Patent Proprietor)	TORAY INDUSTRIES, INC. 2-1, Nihonbashi Muromachi 2-chome Chuo-ku Tokyo 103-8666 (JP)
Representative:	Kador & Partner Corneliusstrasse 15 D-80469 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted 31 March 2009 concerning maintenance of European patent No. 1393898 in amended form.**

Composition of the Board:

Chairman: W. Sieber
Members: W. Ehrenreich
K. Garnett

Summary of Facts and Submissions

I. Mention of the grant of European patent No. 1 393 898 in respect of European patent application No. 02 717 171.9, filed on 16 April 2002 as international application No. PCT/JP2002/003767 in the name of *Toray Industries, Inc.* was announced on 11 October 2006 in Bulletin 2006/41.

II. The patent was granted with 12 claims, claim 1 reading as follows:

"1. A white laminated polyester film comprising a white polyester layer (B) containing fine voids, and white polyester layers (A) containing inorganic fine particles and laminated on both surfaces of the white polyester (B), wherein assuming that elastic modulus of the film in the longitudinal and transverse directions are respectively E1 and E2 (N/mm^2), and the specific gravity of the film is ρ, the following equations are simultaneously satisfied.

$$0.9 \leq E2/E1 \leq 1.6 \qquad (1)$$

$$4000 \leq (E1 + E2)/\rho \leq 8000 \qquad (2)."$$

Claims 2 to 11 were dependent claims. Claim 12 was related to a receiving sheet for thermal transfer recording comprising the film according to any of claims 1 to 11.

III. Opposition against the patent was filed by *Mitsubishi Polyester Film GmbH* on 4 July 2007.

The opponent requested revocation of the patent in its entirety on the grounds of Article 100(a) EPC, namely that the subject-matter of the patent was not novel and was not based on an inventive step. In support of its objections the opponent cited a number of documents, including

D1 EP-A 0 360 201
D2 Declaration of Mr. Y. Sato dated 7 June 2007
D5 EP-A 0 884 347.

After expiry of the opposition period the opponent, with its letter dated 16 February 2009, cited the following documents

D12 A further declaration of Mr. Y. Sato dated 16 February 2009
D13 DE-A 43 18 232.

D12 was cited in reaction to the declaration of Mr. K. Takahashi, D11, submitted by the patent proprietor with its letter dated 14 January 2009, in which it was contested that example 1 of D1 could be properly reworked.

IV. By its interlocutory decision announced orally on 18 February 2009 and issued in writing on 31 March 2009 the opposition division maintained the patent in amended form on the basis of the claims according to the first auxiliary request filed by the proprietor with the letter dated 25 February 2008. The main request (claims as granted) was not allowed because, in the opposition division's view, the subject-matter of claim 1 was not novel over a film prepared according to

example 1 of D1 which, as could be derived from the declaration D2, inherently satisfied the conditions given by equations (1) and (2) of claim 1.

The film according to claim 1 of the first auxiliary request differed from that of granted claim 1 in that it additionally has certain optical properties expressed by the following parameters:

- a whiteness of 70% or more;
- a hue b value of 2 or less; and
- a glossiness of 40% or more.

The opposition division found that a film satisfying these additional parameters was neither explicitly nor implicitly disclosed in either D1 or D13. In particular, the opposition division did not accept the opponent's argument that the fact that the films of D1 had the same mechanical properties (ie elastic moduli E1 and E2 as disclosed in D2) automatically implied that the optical parameters were also the same.

As regards inventive step of the film according to the first auxiliary request, D5 was considered by the opposition division to represent the closest prior art because it dealt with the same type of material as the patent in suit and essentially concerned the same technical problems. The essential differences of the claimed film over the material of D5 were the elastic moduli E1 and E2 and the whiteness of 70% or more. The opposition division held that there was no teaching emanating form either D1 or D13 that the absolute value of the elastic moduli E1 and E2 and their ratio influenced the crease resistance properties of a voided

polyester film. Inventive step was therefore acknowledged also.

V. Notice of appeal was filed by the opponent (hereinafter: appellant) on 2 June 2009. The prescribed fee was paid on the same day. The statement of the grounds of appeal was received on 7 August 2009.

With the grounds of appeal the appellant submitted yet a further declaration of Mr. Sato, D14, in which (besides the mechanical data E1 and E2 already given in D2) the following optical data for the film of example 1 of D1 were presented:

- Whiteness 89%;
- Gloss@60° 92%;
- b-value -1.5.

The appellant requested that D14 be admitted into the proceedings even at this late stage given the surprising decision of the opposition division to acknowledge novelty and inventive step of the subject-matter of the first auxiliary request.

VI. In its letter of reply dated 22 February 2010 the proprietor (hereinafter: respondent) defended, as a main request, the patent as allowed by the opposition division on the basis of the then first auxiliary request, alternatively on the basis of one of auxiliary requests 1 to 5 enclosed with the letter.

The respondent further requested that D14 be not admitted into the proceedings. This request was confirmed by the respondent in its letter dated

16 March 2012. The essential arguments in this respect were as follows:

- The data on whiteness, b-value and glossiness presented in D14 were submitted one and a half years after the opponent was aware that the patent might be maintained on the basis of the first auxiliary request filed in the opposition proceedings on 28 February 2008. As the data in D14 were taken "from Mr. Sato's notes" they could have been provided earlier;

- D14 *was prima facie* not relevant because no method of measurement was given for the parameters E1, E2, Sm, St and the b-value listed in D14, although Mr. Sato was well aware that the measurement methods are important. In contrast thereto, the description of the patent in suit gave detailed information about the measurement of all parameters given in the claim;

- The only information about the measurement of the b-value in D14 was that a ND-300A colorimeter was used. However, b-values detected with a ND-300A colorimeter were different from hue b-values measured according to paragraphs [0080] and [0081] of the patent with a SE-2000 colour-meter according to the standard JIS Z-8730. Moreover, given that the ND-300A colorimeter was first available 2 years after the priority document to D1, the conclusion could be drawn that the film on which the parameters given in D14 were determined was obtained in a different (later) experiment than the original experiment on which the draft description in D1 was based. It was therefore uncertain whether this film

resulted from a faithful reproduction of example 1 of D1.

VII. In response to the respondent's arguments the appellant, with its letter dated 28 March 2012, submitted further documents

D21 Excerpt from JIS Z 8722
D22 Excerpt from JIS Z 8730
D23 Declaration of Dr. Kolar relating to the measurement of the hue b-value and the whiteness of polyester films
D24 Declaration of Dr. Kolar relating to the measurement of the E-moduli of polyester films.

Based on the data presented in D23 and D24 resulting from experiments carried out under the supervision of Mr. Kolar, Mr. Kolar's comments thereon, and the fact that Mr. Sato had not given details in either D2 or D14 about the method for measuring the parameters, the appellant argued that the values for the parameters of whiteness/hue b and E-modulus significantly depended on the method of measurement. The appellant concluded therefrom that the respective parameters of the claimed film represented unusual parameters in the sense of T 131/03.

VIII. Oral proceedings before the board were held on 3 April 2012. During the oral proceedings the respondent *inter alia* presented a document headed "Partial copy of instruction manual of SE-2000".

Referring to the manual for the SE-2000 colour-meter the respondent explained that a skilled person knew the

standards for measuring the whiteness and the hue b-value and would further consult the description of the patent specification proposing the use of the SE-2000 colour-meter which, as could be derived from the manual, was equipped as standard with "geometry b)" and white standard plate "C/2", ie illuminant "C" and 2° of view angle.

As to Mr. Kolar's statement in D24 that the measuring conditions for E1 and E1 given in paragraph [0073] of the patent specification were unusual with regard to the selected range of elongation between 0.5% (P_0) and 3% (P_1), the respondent argued that the determination of E1 and E2 within this specific range was meaningful having regard to the aim of the teaching of the patent, namely to obtain a high crease resistance of the claimed film.

IX. In the light of the declarations D23 and D24 and the fact that Mr. Sato had given no details in D2 and D14 about the methods for measuring mechanical parameters "E1" and "E2" or the optical parameters "whiteness", "gloss" and "b-value", both parties agreed in the oral proceedings that, it could not be unambiguously assessed whether the film of example 1 of D1 anticipated the film according to claim 1 of the main request. A discussion about admissibility of D14 was therefore accepted as being redundant by both parties. In fact, the issue of novelty was no longer pursued by the appellant in the oral proceedings in view of the ambiguity relating to the measurement methods.

X. The appellant's argumentation relating to the question of inventive step of the subject-matter of the main

request, which started from D13 as closest prior art, may be summarized as follows:

D13 described white laminated polyester films, *inter alia* those having a layer sequence B-A-B (A = base layer containing voids; B = layer containing white pigments) and was related to the same technical field as the patent in suit in that the film of D13 was *inter alia* considered suitable for thermal transfer recording (page 8, lines 5 et seq.). In claim 21 of D13 a recording paper for use in thermal transfer processes, obtainable by the film defined in the previous claims, was claimed. For this purpose, thermal and mechanical stability, retention of planarity (being tantamount to crease resistance of the film under thermal load) were therefore inherent properties of the film of D13. A disclosure relating to thermal and mechanical resistance was found on page 8, lines 15 to 17.

The film of D13 was characterised by a whiteness of 82 and a hue-b of 1.3 to 2.2 (Table X), both values lying within the claimed range. The densities of 0.82 to 1.1 given in Table I also corresponded to the values given in paragraph [0020] of the description of the patent specification.

According to Table II (page 20) the "*Anfangsmoduli*" of the films of D13 in both the machine and transverse directions corresponded to the elastic moduli E1 and E2 according to the patent and were in the range of 300 to 330 kg/mm^2 (about 3000 N/mm^2 when converted into the unit "N/mm^2). Although the (converted) values were not directly comparable with those indicated in the patent, owing to the different measuring methods applied in D13

(ASTM D-882-81) and the patent as disclosed in [0073], it could be assumed that at least relationship (1): 0.9 $\leq$ E2/E1 $\leq$ 1.6 of claim 1, formed by the quotient E2/E1, was fulfilled in D13. On the other hand, it could not unambiguously be assessed whether relationship (2): $4000 \leq (E1+E2)/\rho \leq 8000$ according to claim 1 was fulfilled in D13. It was however likely that the corresponding values for the film of D13 were close to this range. The essential difference was therefore only that the claimed films required a high gloss with a tendency towards high values of 40% or more, whereas the gloss values of the films of D13 showed a tendency towards low values, going down to 10% (page 10, line 49 of D13).

The objective technical problem to be solved by the invention was therefore the provision of films with higher gloss. Films with high gloss values were, however, known from D5. Consequently, the claimed film was obvious from a combination of D13 with D5.

XI. Contrary to the appellant's view, the respondent considered D5 as being the closest prior art because it focused on exactly the same problem, namely the provision of white polyester films which were suitable as receiving sheets for thermal transfer recording and for which good crease resistance was therefore indispensable. In addition, the structural details of the films of D5, which include a layer with fine voids and a layer containing fine inorganic particles, were similar to those of the claimed film. With regard to the technical problem to be solved by the teaching of the patent, D5 was therefore closer than D13, which neither addressed the problem of crease resistance nor provided any experimental evidence relating to this

problem. Besides that, thermal recording was only one of many film properties mentioned in the list on page 8, lines 5 et seq. of D13.

Although D5 addressed the same problem underlying the patent, a skilled person starting from D5 could not derive from it any information either about elastic moduli of the films or about their significance for the crease resistance and printability. The skilled person would not therefore be steered towards adjusting the elastic moduli E1 and E2 in a way such that the relationships (1) and (2) of claim 1 are fulfilled. As demonstrated in the examples and comparative examples, these relationships, however, had both to be satisfied in order to obtain the desired improvements in crease resistance and printability of the claimed film. The solution to the problem was therefore not obvious.

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

XIII. The respondent requested that the appeal be dismissed, alternatively that the patent be maintained on the basis of one of the first to fifth auxiliary requests filed with the letter dated 22 February 2010.

Reasons for the Decision

1. The appeal is admissible.

2. The content of D14 is not relevant for the outcome of the appeal proceedings. In addition, both parties agreed in the oral proceedings that a discussion about

admissibility of D14 was redundant (point IX above). Therefore, the necessity did not arise to decide whether D14 should be admitted into the proceedings.

3. Novelty - Main request

The white laminated polyester film according to claim 1 of the main request is characterised by structural features and in addition has to meet mechanical and optical properties defined by the following five parameters:

(a) relationship (1): $0.9 \leq E2/E1 \leq 1.6$;
(b) relationship (2): $4000 \leq (E1 + E2)/\rho \leq 8000$;
(c) whiteness of 70% or more;
(d) hue b value of 2 or less; and
(e) glossiness of 40% or more.

3.1 Novelty over D1

The only document relied upon in the written proceedings by the appellant in respect of novelty was D1.

Example 1 of D1 describes a white laminated polyester film having a density of 0.82 g/cm^3. The film also corresponds to the claimed film with regard to its structural features (number of layers, voids in one layer and fine inorganic particles in the other two layers). However, the mechanical or optical properties of the claimed film are not disclosed in D1, let alone the parameters required in claim 1.

In the opposition proceedings, the appellant submitted the document D2, wherein Mr. Sato presented mechanical data for the film of example 1 of D1, taken from his notes. According to these, the values for the elastic moduli E1 and E2 given in D2 are 2540 N/mm^2 and 2620 N/mm^2, respectively. On the basis of the film density given in example 1 of D1 and the mechanical data presented in D2 the appellant concluded that the film of example 1 of D1 fulfilled the relationships (1) and (2) required by claim 1.

The board cannot accept this conclusion. It has first of all to be noted that it is not said in D2 under what conditions the elastic moduli of the films of D1 were measured. In contrast, the description of the patent in suit discloses in paragraph [0073] details for measuring E1 and E2, and in particular defines the load P_0 and P_1 with an elongation of 0.5% and 3% under which E1 and E2 are determined. The board accepts Mr. Kolar's explanations in points 9 to 12 of his declaration D24 that these measurement conditions are unusual for the determination of "normal values" for elastic moduli of common polyester films because they lie outside the linear region of the tensile-elongation diagram. Mr. Kolar's results presented in the experimental report enclosed with D24 and his submissions as a technical expert are indisputable. It has therefore to be considered as a fact that the values for elastic moduli measured under the specific (unusual) conditions according to the patent significantly differ from elastic moduli which are measured under usual conditions at a load within an elongation range of 0.2 and 0.4% (point 12 of D24).

In the absence of any contrary indication in D2, it has to be assumed that the values presented in D2 and representing the elastic moduli E1 and E2 of the film prepared according to example 1 of D1 were determined by Mr. Sato under the above "usual" conditions. In the light of the above, D1 therefore lacks an implicit disclosure from which it can clearly and unambiguously be concluded that relationships (1) and (2) of claim 1, calculated under the provision that E1 and E2 have been measured under the specific conditions according to paragraph [0073] of the patent specification, are satisfied.

The question whether or not the optical parameters (features (c) to (e) above) of the film of example 1 of D1 are in the ranges indicated in claim 1 of the main request is therefore irrelevant for the assessment of novelty. The appellant accepted this in the oral proceedings and did therefore not pursue its novelty objection anymore. Nor did he pursue its request to admit D14, in which such optical data were presented (point IX above).

The claimed film is therefore novel over D1.

3.2 Novelty over D5

Novelty over D5 was not contested by the appellant. The board is satisfied that the claimed subject-matter is indeed novel over this document.

3.3 Novelty over D13

Besides D1, the opposition division, in the appealed decision, dealt with D13 under the aspect of novelty.

D13 describes a white laminated polyester film which structurally corresponds to the film of claim 1. The following mechanical and optical parameters additionally characterise the film in D13:

- "*Anfangsmodul*": 300-330 kg/mm^2, corresponding to about 3000 N/mm^2, in both machine and transverse directions, measured according to ASTM D-882-81 (cf. e.g. Table II; and page 9, item 9);
- Raw density ρ: 0.8 to 1.1 (Table I);
- Whiteness: 75-82% (Table II);
- hue b: 1.3-2.2 (Table X);
- ranges for gloss 60° values: 100-70% (bad); 69-45% (acceptable); 44-20% (good); 19-10% (excellent), (page 10, item 17). From the above qualification of the ranges as "bad/good/excellent" it can be seen that low gloss is preferred, which is in contrast to the claimed film.

In Table VI the films according to examples 14 and 15 of D13 are inter alia characterised by:

- an "*Anfangsmodul*" MD/TD of 330/310 kg/mm^2
- a whiteness of 80.0/82.0
- a surface gloss of "good".

The characterisation "good" for the surface gloss implies with respect to the above qualification of the

gloss ranges that this parameter lies in the range of 44 to 20%. This does, however, not allow the unambiguous conclusion that the gloss is necessarily in the range of 40% to 44%, ie in the partial range falling within the range as required by claim 1 (ie 40% or more). For this reason alone D13 is not novelty-destroying.

Under the assumption that the "*Anfangsmoduli*" of 300 to 330 kg/mm^2 in MD and TD (corresponding to about 3000 N/mm^2) given for the films in D13 represent elastic moduli E1 and E2 in the sense of the patent, the question arises whether the films of D13 fulfil the relationships (1) and (2) of claim 1. In this context, however, it has to be noted that the elastic moduli were measured in D13 by a method described in ASTM D 882-81 (page 9, item 9) of D13), which differs from the conditions given in paragraph [0073] of the patent. As set out in D24 (see above under 3.1), the values in D13 are not fairly comparable with the values of E1 and E2, on which relationships (1) and (2) of the claimed films are based. Although it can be assumed that the quotient E2/E1 for the films of D13 is in the region of about 1 and therefore within the range given in relationship (1), such a conclusion cannot be drawn for relationship (2), which is based on the sum of E1 and E2. Consequently, relationship (2) of claim 1 is a further distinguishing feature over the films of D13.

The claimed film is therefore also novel over D13.

3.4 Because none of the other cited documents disclose a polyester film which meets all requirements of claim 1, novelty of the film of claim 1 and the receiving sheet

claimed in claim 11 of the main request is in each case acknowledged.

4. Inventive step - Main request

4.1 The patent is concerned with white, laminated polyester films, suitable as receiving sheet substrates for thermal transfer recording and having improved print clearness and crease resistance (paragraph [0001]). In paragraphs [0006] and [0007] it is stated that a white laminated polyester film satisfying the following equations:

$$0.9 \leq E2/E1 \leq 1.6 \quad (1); \text{ and}$$
$$4000 \leq (E1 + E2)/\rho \leq 8000 \quad (2)$$

is excellent in whiteness, image clearness and crease resistance.

4.2 The board shares the respondent's view that D5 represents the closest prior art because it focuses on exactly the same technical problem, namely the provision of laminated white polyester films suitable as substrates for thermal image-receiving sheets having good surface smoothness and resistance to wrinkles, ie crease resistance (D5, page 2, lines 5 to 7 and page 3, lines 11 to 13).

D5 discloses white laminated polyester films including a layer comprising voids and a layer comprising inorganic fine particles. The film is *inter alia* characterised by mechanical and optical data, such as dynamic hardness, surface gloss and the b-value (pages 7/8 of D5). Features relating to elastic moduli

and their relevance for mechanical properties of the film are not disclosed.

4.3 In the light of the closest prior art D5, the respondent saw the problem to be solved underlying the subject-matter of claim 1 in the provision of a white polyester film providing improved print clearness and crease resistance when used as a receiving sheet in thermal transfer recording processes.

The technical effects achieved by the claimed film are shown in the examples and comparative examples of the patent specification. In Table 2 (pages 15-16), the printability (print density/dot shape) and the crease resistance in machine and transverse direction (MD and TD) of films according to the invention satisfying relationships (1) and (2) according to claim 1 are compared with films wherein at least one of the values is outside the numerical range defined by (1) or (2). The experiments clearly show that comparative films for which either relationship (1) E2/E1 (comparative examples 1 and 2) or relationship (2) (E1 + E1)/ρ (comparative examples 3 and 4) is not satisfied, are worse in printability and crease resistance than films of the invention (represented by examples 1 to 4) satisfying both relationships (1) and (2).

The board is therefore satisfied that improved printability and crease resistance constitute the objective technical problem and that this problem has plausibly been solved when both relationships (1) and (2) are fulfilled.

4.4 It remains to be decided whether the claimed solution, namely satisfaction of relationships (1) and (2) of claim 1, is obvious from the prior art.

As mentioned above, D5 lacks any information about the elastic moduli of the white laminated polyester films disclosed in this document. Therefore, D5 cannot contribute to the solution of the posed problem. The same applies to D1 which also is silent about elastic moduli and their technical relevance for the properties of the film disclosed therein.

Although the films disclosed in D13 are *inter alia* characterised by "*Anfangsmoduli*", which seem to correspond to elastic moduli E1 and E2 in machine and transverse directions (MD/TD), and the quotient E2/E1 apparently satisfies relationship (1) of claim 1, there is no information in D13 about the technical relevance of the elastic moduli for printability and crease resistance of the films when used in thermal transfer recording media. Thus in order to solve the problem posed a skilled person would not be induced to optimize the elastic moduli of the films in such a way that both relationships (1) and (2) of claim 1 were fulfilled. In this context it should also be noted in respect of page 8, lines 5 to 14 of D13 that thermal transfer recording is only one of many purposes for which the films disclosed in D13 are suitable.

A combination of D5 with D13 would therefore not lead to the claimed invention.

The above considerations in principle also apply when starting from D13 as the closest prior art as favoured by the appellant.

4.5 The film of claim 1 of the main request is therefore based on an inventive step. This also applies to the receiving sheet according to claim 11. It is therefore not necessary to discuss the auxiliary requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar The Chairman

G. Röhn W. Sieber