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D E C I S I O N
of 13 July 2000

Case Number: T 0101/98 - 3.3.3

Application Number: 90100317.8

Publication Number: 0378154

IPC: C08K 3/00

Language of the proceedings: EN

Title of invention:
Biaxially oriented polyester film

Patentee:
TORAY INDUSTRIES, INC.

Opponent:
Teijin Ltd.
Hoechst Diafoil GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 54

Keyword:
"Novelty (yes) - no implicit disclosure - evidence not "beyond
all reasonable doubt"

Decisions cited:
T 1002/92, T 0793/93

Catchword:
-



Case Number: T 0101/98 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 13 July 2000

Appellant:
(Opponent)

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(Proprietor of the patent)

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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 10 December 1997
rejecting the opposition filed against European
patent No. 0 378 154 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: P. Kitzmantel
Members: A. Däweritz
A. C. G. Lindqvist

Summary of Facts and Submissions

I. Mention of the grant of European patent No. 0 378 154 in respect of European patent application No. 90 100 317.8 in the name of TORAY INDUSTRIES, INC., which had been filed on 8 January 1990 claiming JP priorities from 11 January 1989, 16 February 1989 and 28 April 1989, was announced on 8 November 1995 on the basis of 20 claims, Claim 1 reading as follows:

"1. A biaxially oriented polyester film characterized by the inclusion of particles (A) having an average primary particle diameter of 5-300 nm, an average degree of aggregation of 5-100 and a Moh's hardness of 6-10 by the content of 0.01-5 wt% in the film and of particles (B) which are larger than the particles (A) and which have an average particle diameter of 0.3 to 3 μ m, the Mohs hardness of said particles (A) being greater than that of said particles (B)."

Claims 2 to 20 are dependent on Claim 1.

II. Notice of Opposition requesting revocation of the patent in its entirety on the grounds of Article 100(a) EPC was filed by

- Teijin Limited (Opponent I) on 1 August 1996 and by
- Hoechst Diafoil GmbH (Opponent II) on 5 August 1996.

By its submission dated 7 October 1997 Opponent II withdrew its opposition.

The oppositions were *inter alia* based on documents

D3: JP-A-254328/1986 (partial English translation),

D6: US-A-3 884 870,

D7: JP-A-95339/1977 (English translation), and

D8: EP-A-0 423 402.

III. By its decision orally announced on 10 November 1997 and issued in writing on 10 December 1997, the Opposition Division rejected the oppositions.

That decision held *inter alia*

- (i) that the patent in suit was not entitled to any of the claimed priorities, with the consequence that D8 became prior art under Article 54(3) EPC,
- (ii) that the subject-matter of Claim 1 was novel over D7 and D8, because these documents did not disclose the degree of aggregation of the particles (A) required by Claim 1, and
- (iii) that the subject-matter of Claim 1 was also inventive, because neither the nearest state of the art disclosed in D7, alone or in combination with D3, nor D6 would suggest that the chipping and scratch resistance of bimodally filled polyester films could be optimized by appropriate selection of the degree of aggregation of particles (A).

IV. On 26 January 1998 Opponent I (Appellant) lodged an appeal against the decision of the Opposition Division and paid the appeal fee on the same day. The Statement of Grounds of Appeal was submitted on 1 April 1998. A further written submission of the Appellant dates from 13 June 2000.

V. The arguments presented by the Appellant in its written submissions and at the oral proceedings held on 13 July 2000 may be summarized as follows:

(i) Due to its novelty-destroying character the newly cited document

D12: EP-B-0 401 689,

should be admitted into the appeal proceedings even at this late stage; it constituted prior art under Article 54(3) EPC, because, as held in the decision under appeal, the patent in suit was not entitled to any of the claimed priorities,

(ii) the only feature of Claim 1 of the patent in suit, which was not explicitly disclosed in D12, namely the degree of aggregation of the particles (A), was the inevitable result of the processes according to Examples 1 and 2 of D12, as evidenced by the Experimental Report of Tatsuya Ogawa dated 18 March 1998 (hereinafter "Appellant's Declaration"); by adhering to the processing conditions set out in D12 and, with respect to lacking features, to common general knowledge, the reworking of Examples 1 and 2 of D12 led to degrees of particle aggregation within the claimed range;

(iii) an analogous novelty objection was valid with regard to Example 6 of D7, because, according to the Appellant's Declaration, the reworking of this example led as well to a degree of particle aggregation within the claimed range;

(iv) the Respondent's reworking of Examples 1 and 2 of D12 (cf. point VI (i-2) below) was open to criticism in two respects:

firstly, these experiments were not true repetitions of the teaching of D12, because the particle sizes of the resulting agglomerates were above the upper limit as specified in Claim 1 of D12, and secondly, the values resulting from the Respondent's reworking of Examples 1 and 2 of D12 of the average degrees of aggregation on the one hand, and of the average particle sizes of the agglomerates on the other hand were inconsistent with one another, because on the basis of the indicated particle sizes much higher degrees of aggregation could be calculated.

VI. The arguments presented by the Respondent (Patentee) in its written submissions dated 30 November 1998 and 7 July 2000 as well as at the oral proceedings may be summarized as follows:

(i) Document D12 should not be admitted for consideration, because it was filed late and because, for the reasons to follow, it was *prima facie* not relevant, i.e. not novelty destroying:

- (i-1) D12 failed to disclose the average degree of aggregation of the particles in the final film, which was different from the same degree of the added particles, which feature was crucial for the desired high scratch and chipping resistance;
- (i-2) although a proper reworking of Examples 1 and 2 of D12 was hampered by the fact that D12 did not disclose any of the parameters, which were important for the achievement of the required average degree of aggregation, the Respondent's reworking of Examples 1 and 2 of D12 showed, as evidenced in the Experimental Report dated 24 August 1998 (hereinafter "Respondent's Declaration"), that - contrary to the results in the Appellant's Declaration - the average degree of aggregation of the particles according to these examples was outside the claimed range of 5 to 100;
- (ii) similarly, D7 failed to disclose the average degree of aggregation of the particles in the final film and the critical importance of this feature for the achievement of the required properties; the Respondent's reworking of Example 6 of D7 (cf. Respondent's Declaration), which was again hampered by the insufficient disclosure of this document, particularly the missing particle size of the primary particles, confirmed that - contrary to the results obtained by the Appellant - this feature of present Claim 1 was not within the implicit disclosure of D7.

VII. The Appellant requested that the decision under appeal be set aside and that the European patent No. 378 154 be revoked.

The Respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.
2. *Procedural matters*

Document D12 was for the first time submitted together with the Statement of Grounds for Appeal. In view of the high *prima facie* relevance of the disclosure of D12 for the issue of novelty of the subject-matter of the patent in suit (cf. point 4.1 below) and in view of the fact that the Respondent, though protesting against its admission, submitted full arguments, including experimental data, this document is admitted for consideration (cf. T 1002/92, OJ EPO 1995, 605).

3. *Novelty*

In the ensuing discussion concerning the issue of novelty with respect to D7 and D12 the essential question is in both cases, whether the evidence submitted by the Appellant establishes that by following the instructions of the respective worked examples (Example 6 of D7; Examples 1 and 2 of D12) one inevitably arrives at films comprising particles (A), which have an average degree of aggregation within the range according to present Claim 1. The standard of proof that has to be applied in such a case is that of "beyond all reasonable doubt", meaning that if any reasonable doubt remains as to what might or might not

be the result of carrying out the literal disclosure and instructions of the respective prior art document, then the case on anticipation based on this document must fail (cf. point 2.1 of the Reasons of T 0793/93 of 27 September 1995).

3.1 Document D7 (English translation)

This document relates to a polyester composition comprising (A) porous inorganic particles having an average particle diameter of 0.05 to 3 μm , e.g. alumina particles, and (B) non-porous inorganic particles having an average particle diameter of 0.05 to 3 μm , e.g. particles from kaolin or calcium carbonate (cf. Claim 1; page 4, lines 21 to 34).

The particles are firmly bound to the polyester matrix. Films made from such compositions exhibit an improved wear resistance, which is not impaired by the incorporation of recycled scrap material (page 3, second to penultimate paragraph).

According to Examples 1 to 13 (pages 7 to 8) polyethylene terephthalate (PET) chips comprising porous particles of alumina or of silica were blended with PET chips comprising non-porous particles of kaolin. From this blend biaxially oriented films were made by extrusion and subsequent drawing.

Pursuant to Example 6 (cf. Table 1 on page 9) biaxially oriented polyester films were prepared, which comprise (i) about 0.25 wt.% of porous alumina particles having - prior to their incorporation into the polyester - an average particle diameter of 0.6 μm , and (ii) 0.25 wt.%

of non-porous kaolin particles having a particle diameter of 0.7 μm . There is agreement between the parties that the porous alumina particles are agglomerates of smaller primary particles (cf. D7: page 4, lines 24 to 28).

The nature of the particles used according to Example 6, alumina and kaolin, implies by reference to general common knowledge that the Mohs hardness requirements set out in present Claim 1 are met; this is uncontested by the Respondent and is further confirmed by the hardness values in Table B of the Appellant's reworking of said Example 6 (cf. page 4 of Appellant's Declaration).

- 3.1.1 However, D7 does not disclose, either explicitly or implicitly, the primary diameter of the particles (A) nor their average degree of aggregation in the film, which are both essential features of present Claim 1.
- 3.1.2 In the Appellant's view these missing features could be supplemented (i) by the use of commercial alumina particles and (ii) by the average degree of aggregation of these particles which is obtained when Example 6 of D7 is repeated.
- 3.1.3 However, for the following reasons the afore-mentioned attempts of the Appellant cannot establish that the polyester films resulting from Example 6 of D7 anticipate all features of the films according to present Claim 1:
 - (i) The assumption of a primary particle size of 25 nm of the porous alumina particles (A) (cf. page 4, Table B of Appellant's Declaration) is completely arbitrary; no evidence whatsoever has been provided by the Appellant that Example 6 of D7 made use of such a "commercial product" (cf.

page 4, third paragraph of the Statement of Grounds for Appeal) and the disclosure of D7 does not allow to calculate, on the basis of the disclosed secondary particle diameter, a corresponding primary particle diameter.

- (ii) In order to repeat Example 6 of D7 the Appellant had to fill some gaps in the information comprised by this document, because D7 does not specify to the required accuracy the process conditions used for preparing the slurry of the alumina particles in ethylene glycol (use of a media dispersion method?) and the operating conditions (configuration of filter?, filtering pressure?) of the extruder.

The fact that these instructions are missing in D7, and had, therefore, to be supplemented by the Appellant in its reworking experiment, is of importance for the correctness of the resulting average degree of aggregation, because it is stated in the patent in suit (page 4, lines 42 to 47; page 4, line 57 to page 5, line 3) that these conditions are effective to control the average degree of aggregation.

- (iii) The Appellant's resort to, what it calls, "general common knowledge" in order to fill the information gaps in Example 6 of D7 is unable to achieve this aim for two reasons: first, because the Appellant failed to produce any evidence in support of the allegation that the chosen conditions were in accordance with general common knowledge, and secondly, because general common knowledge can normally never be so precise as to teach the specific parameters of the undisclosed processing parameters, i.e. of the media dispersion method possibly used

according to Example 6 to prepare the slurry of the alumina particles and/or of the melt filtering conditions in the extruder. It must, however, be assumed that even small changes in these parameters cause changes in the value of the average degree of aggregation in the final film. This is particularly so with regard to the filtering conditions in the extruder, because it appears likely that the shear exerted on the melt will affect the arrangement of the particle agglomerates.

- (iv) It cannot be accepted, therefore, that the average degree of aggregation of 25 resulting from the Appellant's reworking of Example 6 of D7 is indeed the value obtained according to this document.

- (v) An analogous conclusion holds true for the value of 360 for the average degree of aggregation obtained according to the Respondent's reworking of the same example of this document. However, this conclusion has no bearing on the outcome of the case, because the burden to prove anticipation is clearly on the Appellant. For this reason the Appellant's criticism of the working conditions underlying the Respondent's experimental data (cf. point V (iv) supra) is of no avail.

3.1.4 Therefore, the Appellant failed to establish that the disclosure of document D7, particularly that according to its Example 6, is novelty destroying for the subject-matter of present Claim 1.

3.2 Document D12

This document, filed on 31 May 1990 but validly claiming a priority from 2 June 1989 was published on 12 December 1990. Since the patent in suit merely enjoys the priority of its actual filing date of 8 January 1990 (cf. point 5 of the Reasons of the decision under appeal) D12 represents prior art according to Article 54(3) EPC.

D12 discloses biaxially oriented polyester films containing (i) 0.05 to 3 wt.% of agglomerates of primary particles of aluminum oxide (~ alumina) having an average particle size of 5 to 40 nm, said agglomerates having an average particle size of 50 to 400 nm and (ii) 0.05 to 2 wt.% of additive particles having an average particle size of 0.1 to 3 μm (cf. Claims 1 and 3; page 4, lines 18 to 24; page 6, Examples 1 and 2).

The films have excellent wear and scuff resistance and are suitable for magnetic recording media (cf. page 2, lines 5 to 7; page 4, lines 2 to 9).

Examples 1 and 2 of D12 describe the preparation of PET films by (i) mixing a PET transesterification reaction product with (i-a) 0.25 wt.% (Example 1), respectively 0.50 wt.% (Example 2) of alumina agglomerates, which are constituted by primary particles having an average particle diameter of 20 nm, said agglomerates having a particle size of, respectively, 80 nm and 150 nm, and having been prepared in a sand grinder in the form of a particle dispersion in ethylene glycol, and (i-b) 0.1 wt.% silicon oxide particles (Example 1), respectively, 0.2 wt.% calcium carbonate particles (Example 2).

The nature of the particles used according to Examples 1 and 2, alumina on the one hand and silicon oxide or calcium carbonate on the other hand, implies by reference to general common knowledge that the Mohs hardness requirements set out in present Claim 1 are met; this is confirmed by the hardness values in Table A of the Appellant's reworking of said Examples 1 and 2 (cf. page 4 of Appellant's Declaration).

- 3.2.1 However, D12 does not disclose, either explicitly or implicitly, the average degree of aggregation of alumina particles in the film, which is an essential feature of present Claim 1.

In this context it was discussed whether the agglomerate particle sizes, which are indicated in Claim 1 of D12, relate to the agglomeration status of the starting material or to that of the alumina particles in the final film, as according to Claim 1 of the patent in suit. In the Board's judgment the first conclusion is correct, because the agglomerate particle size of 80 nm indicated with respect to Example 1 in Table 1 on page 7 of D12 is clearly the particle size after the grinding treatment of the alumina/ethylene glycol slurry (D12: page 6, lines 8 to 10). Since no other particle sizes are mentioned in D12, only this status of agglomeration can be the basis of the agglomerate particle size specified in Claim 1. However, this conclusion is of no relevance to the issue of novelty, because it is not related to the question whether or not the alumina particles had an average degree of aggregation within the range specified in present Claim 1.

3.2.2 In the Appellant's view the missing disclosure of the average degree of aggregation of the alumina particles in the film could be supplemented by the respective results obtained by the reworking of Examples 1 and 2 of D12.

3.2.3 However, for the following reasons these reworking experiments cannot establish that the polyester films resulting from Examples 1 and 2 of D12 anticipate all features of the films according to present Claim 1, including the average degree of aggregation of the alumina particles:

- (i) In order to repeat Examples 1 and 2 of D12 the Appellant had to fill some gaps in the information comprised by this document, because D12 does not specify to the required accuracy the
 - (i-a) process conditions used for the treatment of the ethylene glycol slurry of the alumina particles in the sand grinder (shape and size of sand particles? speed and duration of grinding?),
 - (i-b) the operating conditions (configuration of filter?, filtering pressure?) of the extruder and
 - (i-c) the temperature conditions of the biaxial stretching of the extruded film.

The fact that these instructions are missing in D7, and had, therefore, to be supplemented by the Appellant in its reworking experiments, is of importance for the correctness of the resulting average degrees of aggregation, because it is stated in the patent in suit (page 4, lines 42 to 47; page 4, line 57 to page 5, line 3; page 5, lines 12 to 16) that these conditions are effective to control the average degree of aggregation.

- (ii) The Appellant's resort to, what it calls, "general common knowledge" in order to fill the information gaps in Examples 1 and 2 of D12 is unable to achieve this aim for the reasons set out with respect to the Appellant's reworking of Example 6 of D7 in point 3.1.3 (iii) supra, because the underlying facts are analogous in both cases.

This conclusion is not affected by the identification in the Appellant's submission of 13 June 2000, Section 2 of the exact processing parameters used by the Appellant for its reworking, because thereby the deficient disclosure of D12 cannot be made good, irrespective of whether these parameters are different or similar to the corresponding parameters used according to the patent in suit; especially, there is no justification for the assumption that the process conditions used according to the present invention belong to the realm of general common knowledge.

- (iii) It cannot be accepted, therefore, that the average degrees of aggregation of, respectively, 5 and 9 resulting from the Appellant's reworking of Examples 1 and 2 of D12 are indeed the values obtained according to this document.

Concerning the accuracy of these reworking results the Board, furthermore, concurs with the misgivings expressed in Section 13 of the Respondent's submission of 30 November 1998, because the evidenced close correspondence between, on the one hand the calculated ratios of the particle diameters of the agglomerates and of the primary particles, and on the other hand the experimentally obtained average degrees

of aggregation is not consistent with the fact that the latter feature relates to the **spherical** arrangement of the primary particles, whereas the afore-mentioned diameter ratio reflects only a **linear** relationship.

(iv) As to the average degrees of aggregation of, respectively, 135 and 215, obtained according to the Respondent's reworking of Examples 1 and 2 of D12 the same conclusions apply which have been drawn with respect to the Respondent's reworking of Example 6 of D7 (cf. point 3.1.3(v) *supra*).

3.2.4 In view of the above considerations, the Appellant failed to establish that the disclosure of document D12, particularly that according to its Examples 1 and 2, is novelty destroying for the subject-matter of present Claim 1.

3.3 The subject-matter of present Claim 1 is not anticipated, therefore, by either D7 or D12.

3.4 The same conclusion applies *a fortiori* to the subject-matter of the dependent Claims 2 to 20.

4. *Inventive step*

The Board sees no reason to deviate from the finding of the Opposition Division that the claimed subject-matter was not obvious over the cited prior art. This finding was not questioned by the Appellant and is not affected by the newly cited document D12, which is only to be considered under Article 54(3) EPC.


5. The grounds of opposition under Article 100(a) EPC do not, therefore, prejudice the maintenance of the patent unamended.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:



E. Görgmaier

The Chairman:



P. Kitzmantel