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**D E C I S I O N**  
**of 19 May 2005**

**Case Number:** T 0547/01 - 3.5.3

**Application Number:** 92121769.1

**Publication Number:** 0548904

**IPC:** G11B 5/704

**Language of the proceedings:** EN

**Title of invention:**

Polyester films for magnetic recording medium

**Applicant:**

Teijin Limited

**Opponent:**

-

**Headword:**

Polyester films for magnetic recording medium/TEIJIN

**Relevant legal provisions:**

EPC Art. 52(1), 54(1), (2), (3), 56, 123(2), 83

**Keyword:**

"Novely (yes)"

"Inventive step (yes)"

"Disclosure - Sufficiency (yes)"

**Decisions cited:**

T 0666/89

**Catchword:**

-



Case Number: T 0547/01 - 3.5.3

**D E C I S I O N**  
of the Technical Board of Appeal 3.5.3  
of 19 May 2005

**Appellant:** Teijin Limited  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 22 September 2000  
refusing European application No. 92121769.1  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** A. S. Clelland  
**Members:** A. J. Madenach  
M.-B. Tardo-Dino

## Summary of Facts and Submissions

I. The present appeal is from a decision of the examining division to refuse patent application No. 92 121 769.1, filed on 22 December 1992 and claiming priority from JP 356456/91 of 25 December 1991 and JP 10089/92 of 23 January 1992. The written decision was dispatched on 22 September 2000.

This decision was based on the ground of lack of novelty (Article 52, 54(1) and (2) EPC) of the subject-matter of independent claims 1 and 5 according to both a main request and an auxiliary request with respect to the disclosure of

D1: EP 0 203 604 A.

The examining division in essence argued that although D1 was silent with respect to the micro-protuberances defined in claim 1, polyester films made in accordance with the teaching of D1 would as a result of the coating methods used in D1 inevitably have micro-protuberances as claimed in claim 1 of the main and the auxiliary requests. D1 thus provided an implicit disclosure of the claimed micro-protuberances in addition to an explicit disclosure of the remaining features of the claim.

In an obiter dictum, the examining division furthermore stated its opinion that the subject-matter of claims 1 and 5 was not sufficiently disclosed as required by Article 83 EPC.

During the examination procedure the following further document had been considered:

D2: EP 0 504 416 A.

This document was published on 23 September 1992 and claims priorities of 8 October 1990 and 5 June 1991.

- II. The appellant (applicant) filed a notice of appeal against this decision on 16 November 2000 and maintained the requests considered by the examining division in their decision; that is, it was requested that the decision be set aside and a patent be granted on the basis of the main request or, failing this, on the basis of the auxiliary request. A statement setting out the grounds of appeal was filed on 26 January 2001.
- III. In a communication of 11 November 2004 the board gave its preliminary view.
- IV. With letter of 21 March 2005, the appellant submitted a new set of claims 1-9 and requested the grant of a patent on the basis of this set of claims.
- V. The single independent claim 1 of this set of claims reads as follows:

"A polyester film for use in a magnetic recording medium characterized in that a continuous thin film which contains a resin as a matrix and acts as a primer layer for a magnetic layer is coated on one surface of a support film composed of a polyester in an amount of about 0.001 to 1 g as a solids content per m<sup>2</sup> of the film, and the surface of the continuous thin film has

(A) small protuberances each containing particles with an average particle size of less than 0.06 micrometer as a nucleus and having a height of 13 nm or less, (B) large protuberances each containing particles with an average particle size of 0.06 micrometer or more as a nucleus and having a height of 30 nm or less, and (C) micro-protuberances composed of a matrix resin alone, the numbers, per mm<sup>2</sup> of the film, of these protuberances satisfying the formulas,

$$A_n = 1.0 \times 10^4 - 1.0 \times 10^8/\text{mm}^2,$$

$$B_n = 0 - 4 \times 10^4/\text{mm}^2, \text{ and}$$

$$C_n \leq 4.0 \times 10^6/\text{mm}^2$$

wherein  $A_n$  is the number of the small protuberances,  $B_n$  is the number of the large protuberances, and  $C_n$  is the number of the micro-protuberances,

the fine surface roughness  $Ra^s$  of the continuous thin film portion composed of the matrix resin alone being 1.10 nm or less, and the surface roughness  $Ra$  of the overall continuous thin film being 1 to 10 nm."

Claims 2-9 depend on claim 1.

Present claim 1 corresponds to claim 1 according to the main request considered in the appealed decision.

Claim 5, formerly an independent claim, has been made dependent on claim 1 and further limits the range of the protuberance numbers.

## Reasons for the Decision

### 1. *Admissibility of amendments*

Claim 1 differs from the originally filed claim 1 in including a further feature relating to the continuous thin film coated on one surface of the support film. This feature derives from page 6, lines 44-46 of the application as published.

The amendment in claim 5 restricts its subject-matter to that part of the protuberance number ranges which overlaps with the ranges of claim 1.

The above amendments do not give rise to objection under Article 123(2) EPC.

### 2. *Novelty and inventive step*

2.1 The present invention relates to a polyester film for use in a magnetic recording medium. The object of the invention is to provide a polyester film which allows coating with a magnetic layer, which is on the one hand stable and has on the other hand superior noise properties. This object is achieved by forming the polyester film with micro-protuberances, small protuberances and large protuberances in given ranges.

2.2 D1 is considered to represent the closest prior art.

It discloses a polyester film for use in a magnetic recording medium (see page 1, lines 1-7).

Furthermore disclosed is a continuous thin film which contains a resin as a matrix and acts as a primer layer for a magnetic layer and which is coated on one surface of a support film composed of a polyester (see e.g. page 9, lines 10-15; the fact that this continuous thin film serves as a primer layer for a magnetic layer follows for example from page 1, lines 1-7).

In tables 1-3 of D1 a variety of values are given as examples for the amount of coating as solids content: 1 mg/m<sup>2</sup>, 1.5 mg/m<sup>2</sup>, 2 mg/m<sup>2</sup>, 2.5 mg/m<sup>2</sup>, 5 mg/m<sup>2</sup>, 10 mg/m<sup>2</sup> which values thus fall into the claimed range of about 0.001 to 1 g as a solids content per m<sup>2</sup> of the film.

According to D1, the continuous thin film has small protrusions with a diameter of 0.01 to 0.1 micrometer and a height of 1 to 10 nm distributed at a density of from 10<sup>6</sup> up to 10<sup>9</sup> per mm<sup>2</sup> (see claim 1 of D1). This has to be compared with the small protuberances each containing particles with an average particle size of less than 0.06 micrometer as a nucleus and having a height of 13 nm or less, and a density  $A_n = 1.0 \times 10^4 - 1.0 \times 10^8/\text{mm}^2$  as claimed in claim 1 of the application in suit. According to claim 5 of D1, the small protrusions result from a coating comprising particles with a diameter of 0.01 to 0.1 micrometers.

Furthermore, according to D1 the surface roughness of the continuous thin film is not more than 5 nm (see page 13, line 20), which is within the range of the surface roughness Ra of the overall continuous thin film of 1 to 10 nm according to claim 1 of the application in suit.

Finally, the continuous thin film according to D1 also comprises large protrusions (see for example page 13, lines 18-19), which are obtained by dispersing fine inert solid particles in the polyester before film formation (see page 6, lines 28-31) and which have a diameter of 0.2 to 2 micrometers and a height of 2 to 20 nm and are distributed at a density of a least  $10^3$  but less than  $10^6$  per  $\text{mm}^2$  (see claim 1 of D1). This has to be compared with the large protuberances each containing particles with an average particle size of 0.06 micrometer or more as a nucleus and having a height of 30 nm or less and density  $B_n = 0 - 4 \times 10^4/\text{mm}^2$  as claimed in claim 1 of the application in suit. According to claim 4 of D1, the large protrusions result from particles with a diameter of 0.05 to 0.5 micrometers.

There is no explicit disclosure in D1 relating to micro-protuberances composed of a matrix resin alone, the numbers, per  $\text{mm}^2$  of the film, of these protuberances satisfying the formula

$$C_n \leq 4.0 \times 10^6/\text{mm}^2$$

and of the fine surface roughness  $R_a^s$  of the continuous thin film portion composed of the matrix resin alone being 1.10 nm or less.

According to page 7, line 47 to page 8, line 7 of the application in suit, the fine surface roughness is measured in areas free of small and large protuberances and, thus, according to the board's understanding,



gives a measure of the surface roughness due to the micro-protuberances alone.

- 2.3 For the reasons given below, the board considers that the claimed small and large protuberances correspond to the small and large protrusions disclosed in D1 and, thus, comes to the same conclusion as the examining division in their decision (see page 6, second full paragraph of the appealed decision).

The board concurs with the appellant's analysis that none of the examples 1-9 of D1 explicitly discloses the claimed small and large protuberances: in examples 1-3 (the second example 2 appears to be erroneously numbered and is understood to be example 3) as well as in the comparative examples 1-3, the nuclei for the small protuberances are 70-80 nm (see page 21, line 16; the unit micrometer must be an error since it is in conflict with claim 5 and with the diameter of the resulting protrusions as given in the corresponding table; apparently, the diameter should have been expressed in nanometres), which is larger than the claimed maximum value of 60 nm. In examples 4-6, there are too many small protrusions; from table 2 it can be seen that there are 2, 4 and 5 times as many as the claimed upper limit of  $1.0 \times 10^8/\text{mm}^2$ . In examples 7-9, the nuclei for the small protrusions are too large since they are the same as in example 3 above (see page 27, lines 2-10). Furthermore, the density of large protrusions exceeds the claimed upper limit of  $4 \times 10^4/\text{mm}^2$  by  $1 \times 10^4/\text{mm}^2$  and  $2 \times 10^4/\text{mm}^2$ , respectively (see table 3).

However, the parameter ranges for the small and large protrusions and their nuclei as given in claims 1, 4

and 5 of D1 overlap to a large extent with the corresponding parameter ranges as claimed in the application in suit, as has been discussed under point 2.2 above.

Given that the differences in the parameter values for the small and large protrusions in the examples of D1 with respect to the corresponding values of claim 1 of the application in suit are only marginal and given the parameter ranges in claims 1, 4 and 5 of D1, the board concludes that the skilled person would have applied the technical teaching of D1 in the whole range of overlap with the subject-matter of claim 1 of the application in suit as far as the small and large protuberances are concerned. Thus, following the reasoning of T 0666/89 (OJ EPO 1993, 495; points 6-8 of the reasons), the board takes the view that D1 discloses the claimed small and large protuberances.

2.4 Therefore, the board concurs with the examining division that the question of whether the subject-matter of claim 1 is novel with respect to the disclosure of D1 depends on whether D1 provides an implicit disclosure for the micro-protuberances and the related fine surface roughness.

The term "micro-protuberances" is only defined in the application in suit inasmuch as such protuberances are composed of the matrix alone and are, therefore, unrelated to any nuclei. Their dimensions, however, are unspecified.

From what has been said under point 2.3 above it follows that none of the examples 1-9 of D1 are

prejudicial to the novelty of the subject-matter of claim 1 irrespective of the question whether the films of these examples comprise micro-protuberances or not.

There remains the question of whether the more general disclosure of claims 1, 4 and 5 of D1 is in itself prejudicial to the novelty of claim 1. According to established case law the concept of implicit disclosure requires that enacting the teaching of D1 will inevitably and unambiguously result in a device as claimed. The teaching of D1 must thus be specific to such a degree that it can actually be performed as a mind experiment or as an actual experiment in order to verify whether the result of such an experiment leads indeed to the claimed device. In the present situation, however, the more general disclosure of claims 1, 4 and 5 of D1 in combination with the general statement relating to the coating of a thin film on page 12, lines 26-32 is in the board's view insufficient to allow any conclusions as to the presence and quantity of micro-protuberances. As is clear from a comparison of the examples and comparative examples of the application in suit, the density of micro-protuberances and the related fine surface roughness depend very sensitively on the choice of a large number of non-trivial parameters for the fabrication of the matrix resin and/or the coated film. Minor variations in these parameters result in films having micro-protuberances not meeting the claimed specifications (see in particular comparative examples 2-4 and 12 in the application in suit). The disclosure relating to the coating of a thin film at page 12, lines 14-32 of D1 merely mentions a number of coating methods such as roll coating and gravure coating, and refers in general

terms to the necessity of a proper control of the various ingredients of the coating material and of the coating rate. The examples in the application in suit on the other hand give a very specific account of the various ingredients, temperatures and pressures to be used, which cannot be deduced in any way from the more general disclosure at page 12, lines 14-32 of D1.

The general disclosure of D1 does not therefore lead inevitably to the claimed film, which is, thus, new with respect to the disclosure of D1.

2.5 The film as claimed in claim 1 is also in the board's view inventive over the disclosure of D1 since this document does not suggest the concept of micro-protuberances for the purpose of improving the adhesive and noise properties for a recording layer to be formed on such a film. Indeed, it does not mention micro-protuberances at all. The examining division has in any case not advanced any argument with respect to a possible lack of inventive step of the subject-matter of claim 1.

2.6 Since all claimed features of the application in suit are derivable from its priority documents (reference is made in particular to table 1 of both documents) the further document D2 is only relevant under Article 54(3) EPC to the question of novelty. This document does not disclose the size of small and large protuberances and is also silent about the presence of micro-protuberances. Therefore, the disclosure of D2 does not prejudice the grant of a patent.

3. *Disclosure of the invention*

3.1 The examining division in its decision additionally indicated that the application in suit did not in its view meet the requirements of Article 83 EPC. It was in particular argued that, based on the applicant's statement in his submission of 5 March 1999 that the formation of micro-protuberances depended on the interaction between the film-forming properties of the primer coating, the drying conditions of the primer coating after it is applied on a film, and the film stretching conditions. None of these properties or conditions was actually disclosed in the patent application.

3.2 The board however considers that examples 1-9 of the application in suit give detailed and sufficient instructions including the above film-forming properties as to how to prepare the film. The range of parameters covered by the films obtained in these examples coincides fairly with the claimed parameter ranges. The board sees no reason to doubt that the skilled person would be able to extend the parameter values of the films to the full claimed parameter range by further experimentation in the neighbourhood of the examples 1-9, the comparative examples 1-13 serving as an indication as to which parameter ranges will produce results which are no longer covered by claim 1.

4. The board therefore concludes that the application in suit fulfils the requirements of the EPC. As a consequence, the appealed decision is to be set aside.

**Order**

**For these reasons it is decided that:**

1. The decision under appeal is set aside.
  
2. The case is remitted to the examining division with the order to grant a patent on the basis of
  - claims 1 to 9 as submitted with letter of 21 March 2005
  
  - description pages 3 and 3a as submitted with letter of 15 July 1997
  
  - description pages 1, 2 and 4-50 as originally filed
  
  - drawing page 1 as originally filed

The Registrar:

The Chairman:

G. Nachtigall

A. S. Clelland