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D E C I S I O N
of 6 December 1993

Case Number: T 0981/91 - 3.2.5

Application Number: 85104374.5

Publication Number: 0158344

IPC: B41M 5/10

Language of the proceedings: EN

Title of invention:
Ink transfer material for printer

Patentee:
Toray Industries, Inc.

Opponent:
Hoechst Aktiengesellschaft Werk Kalle-Albert

Headword:
-

Relevant legal norms:
EPC Art. 56

Keyword:
"Inventive step (yes, after amendment)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0981/91 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 6 December 1993

Appellant: (Opponent)
Hoechst Aktiengesellschaft
Werk Kalle-Albert
Zentrale Patentabteilung KA
D-65174 Wiesbaden (DE)

Representative:
-

Respondent: (Proprietor of the patent)
Toray Industries, Inc.
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Representative:
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office dated 15 October 1991 rejecting the opposition filed against European patent No. 0 158 344 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: C.V. Payraudeau
Members: A. Burkhart
H.P. Ostertag

Summary of Facts and Submissions

I. The Appellant (Opponent) lodged an appeal against the decision of the Opposition Division to reject the opposition against the patent No. 0 158 344.

The reason for the decision of the Opposition Division was that the maintenance of the granted patent was not prejudiced by the prior art documents cited by the Appellant.

II. Oral proceedings were held on 6 December 1993.

(i) The Appellant requested that the decision under appeal be set aside and the patent revoked.

(ii) The Respondent (Proprietor of the patent) requested that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the following documents:

Description: pages 2 to 7, filed during the oral proceedings,

Claims 1 to 11, filed during the oral proceedings.

(iii) Claim 1 reads as follows:

"1. An ink transfer material for printers, comprising a biaxially oriented thermoplastic linear polyester film and a transfer ink layer deposited on one side of said thermoplastic linear polyester film, said biaxially oriented thermoplastic linear polyester film having a thickness in the range of 1 to 10 µm, an F-5

value in the longitudinal direction in the range of 11 to 16 kg/mm^2, refractive indices in each of the longitudinal and lateral directions in the range of 1.650 to 1.675, and a birefringence of not more than 0.02, possessing a rough surface on at least one side thereof, and said rough surface having a center line average height in the range 0.02 to 1 µm and a maximum height in the range of 0.2 to 10 µm."

Independent Claims 10 and 11 read as follows:

"10. Use of the ink transfer material according to any of the preceding claims in a thermal transfer printer."

"11. Use of the ink transfer material according to any of the preceding claims in an impact printer."

(iv) The Appellant based his arguments on the prior art documents:

D1: IEEE Transactions On Electron Devices, Vol. ED-27, No. 1 (1980), pages 218-222, "Thermal Ink-Transfer Imaging",

D2: EP-A-0 008 679
D3: DE-A-3 101 232,
D4: EP-A-0 086 302,

and essentially argued as follows:

Document D4, which had to be considered as representing the closest prior art, disclosed a printing material comprising a biaxially oriented polyester film having all the features

of Claim 1 except the refractive indices and the roughness values of the surface. In particular, the films according to the "comparative examples" Nos. 3 and 6 of document D4, which were obtained under stretching conditions similar to those of the contested patent, had mechanical properties (F-5 values and birefringence) identical with those claimed in Claim 1 of the contested patent. The other film properties defined in Claim 1, which were not mentioned in document D4, like refractive indices and surface roughness, were either inherently present in the films according to document D4 or were obvious to the person skilled in the art who was looking for a film material suitable for both thermal and impact printers and fulfilling the requirements of the objects mentioned on page 2, lines 38 to 47 of the contested patent, which objects were likewise to be achieved by the film materials of document D4.

Also the teachings of documents D1, D2 and D3 suggested the film parameters as claimed in Claim 1 of the contested patent.

(v) The Respondent essentially argued as follows:

Document D4 did not refer to an ink transfer material for printers but to films suitable for magnetic tapes and dielectric of condensers. The indication on page 15, line 2, that the films were also suitable for use in "graphic and/or printing material" was too vague and could not be interpreted as disclosing an ink transfer material useful for impact and thermal transfer

printers. Therefore, document D4 did not represent the closest prior art.

The closest prior art was represented by document D1 which disclosed an ink transfer material useful for thermal transfer printers, comprising a polyester film coated with a transfer ink layer. However, the teaching of this document led away from the use of thin polyester film having a thickness in the range of 1:10 µm, and document D1 did not disclose any of the features of Claim 1 of the contested patent referring to strength, refractive indices, birefringence and surface roughness.

Documents D2, D3 and D4 referred to magnetic tapes or condenser materials. Since the requirements for magnetic tapes or condenser materials were quite different from the requirements for ink transfer material for impact or thermal printers, documents D2 to D4 did not address the problem underlying the invention and could not render obvious the specific polyester film material as defined in Claim 1 of the contested patent.

The examples of the contested patent demonstrated that all features of Claim 1 acted together in the sense of solving the problem underlying the invention, and that this problem could not be solved, if only one of the conditions as defined in Claim 1 was not followed, as was demonstrated by the comparative examples Nos. D, E and 3.

Reasons for the Decision

1. *Amendments*

With respect to the originally filed Claim 1 and the Claim 1 of the granted patent, new Claim 1 has been amended in the sense that the upper limit for the thickness range has been lowered to 10 µm. This amendment, which constitutes a restriction of the scope of the claimed thickness range with respect to Claim 1 of the granted patent, is based on the originally filed Claim 2.

The subject-matter of Claims 2 to 11, which correspond to Claims 3 to 12 of the granted patent, is disclosed in the originally filed Claims 3 to 13.

The description has been adapted to the amended Claim 1.

Therefore, no objection arises with respect to Article 123(2) and (3) EPC.

2. *Novelty*

None of the documents under consideration discloses an ink transfer material comprising all the features of Claim 1. Novelty, in fact, was not in dispute in these proceedings.

Therefore, the subject-matter of Claim 1 is new.

3. *Inventive step*

3.1 Closest prior art

The Board agrees with the Respondent that document D1 has to be considered as representing the closest prior art, since this document is the only document cited by the Appellant which discloses an ink transfer material comprising a polyester film coated with a transfer ink layer (see title; Fig. 3; Table 1; page 220, left column, lines 6 to 12 of document D1).

Document D4, which is considered by the Appellant as representing the closest prior art, refers to a polyester film and a magnetic recording medium containing the same as a base (see title; page 1, lines 6 to 15; page 3, lines 7 to 10 and lines 14 to 18; and the preferred embodiments according to page 15, line 5 to page 17, line 18). The only reference to printing in this document is made on page 14, line 25 to page 15, line 2, where it is stated that "the film according to the present invention is suitable for use as a quite thin film such as a base of magnetic recording medium, dielectric of condenser and graphic and/or **printing material**".

The term "printing material" is vague and so broad that it covers any material which can be used in a printing process, including materials to be printed on. In any case, this unspecified term cannot be interpreted as clearly meaning "an ink transfer material having a transfer ink layer deposited thereon" as is claimed in the contested patent.

Therefore, the prior art disclosed in document D4 is further away from the subject-matter of the contested patent than the prior art disclosed in document D1.

3.2 Problem

The problem underlying the invention consists in providing a polyester film as a substrate for an ink transfer material, which is extremely thin to increase thermal conductivity and resolution, but nevertheless is resistant to thermal shrinkage and sufficiently strong to endure the heat, which further permits smooth transport and rewinding within the printer and which does not produce persistent deformation under the impact of the printing types (see page 2, lines 10 and 11 and lines 38 to 47, and page 4, lines 43 to 56 of the granted patent).

3.3 Solution

This problem is solved by the invention according to Claim 1 of the contested patent in that the polyester film constituting the substrate of the ink transfer material is a biaxially oriented thermoplastic linear polyester film having a thickness in the range of 1 to 10 µm, an F-5 value in the longitudinal direction in the range of 11 to 16 kg/mm^2, refractive indices in each of the longitudinal and lateral directions in the range of 1.650 to 1.675, a birefringence of not more than 0.02, and a rough surface on at least one side thereof, said rough surface having a centre line average height in the range of 0.02 to 1 µm and a maximum height in the range of 0.2 to 10 µm.

The significance and the effects produced by the aforementioned specific values of thickness, F-5 value, refractive indices, birefringence and surface roughness is explained on page 3, lines 2 to 35 and is demonstrated by examples A, B and C and comparative examples D, E and 3.

This explanation and demonstration clearly shows that all the features of Claim 1 act together in the sense as to solve the above-mentioned problem underlying the invention.

3.4 The teachings of documents D1 to D4 do not render obvious the above-mentioned solution according to Claim 1, for the following reasons:

Document D1 teaches that the base polyester film used as substrate in a thermal ink transfer material should have a thickness of more than 10 µm in order to avoid creasing and recommends a polyester film having a thickness of 12 µm (see Table 1 of page 219 and page 220, left column, lines 9 to 12).

Therefore, this teaching of document D1 leads the person skilled in the art away from the use of very thin polyester films having a thickness in the range of 1 to 10 µm as claimed in Claim 1.

Furthermore, document D1 does not disclose or suggest any of the features characterising the strength, the refractive indices, the birefringence and the surface roughness of the polyester film substrate of the ink transfer material according to Claim 1 of the contested patent.

Document D4 refers to a biaxially oriented polyester film and a magnetic recording medium containing the same as a base (see title; page 1, lines 6 to 15; page 3, lines 7 to 10 and lines 14 to 18; and the preferred embodiments according to page 15, line 5 to page 17, line 18). This document teaches that the polyester film should have low heat shrinkage values, a F-5 value in the longitudinal direction of at least 18 kg/mm^2 (see Claims 1 and 2). In the examples, which fall within the

scope of Claims 1 and 2 of document D4, the thickness of the film is given as 7 to 9 µm (see page 20, lines 16 to 17) and the birefringence value of the film is indicated as lying in the range of 0.029 to 0.068 (see Table 1-1 on page 24).

The films according to the comparative examples 3 and 6 referred to by the Appellant have a longitudinal F-5 value of 14,3 and 12,2 kg/mm^2, respectively, and a birefringence value of 0.013 and 0.018, respectively (see Tables 1-1 and 1-2 on pages 24 and 25). However, these comparative examples are clearly reported as not satisfying the requirements according to the invention of document D4 due to low F-5 values (see page 23, lines 1 to 12).

Therefore, the person skilled in the art obtains from document D4 the teaching that a biaxially oriented thin polyester film, which is suitable as a base of printing material (see page 14, line 25 to page 15, line 2), should have an F-5 value of at least 18 kg/mm^2 and a birefringence of at least 0.029.

This teaching of document D4 leads the person skilled in the art away from the invention of the contested patent which requires a longitudinal F-5 value in the range of 11 to 16 kg/mm^2 and a birefringence of not more than 0.02. In any case, the person skilled in the art was by no means incited by document D4 to use the films according to the comparative examples 3 and 6 as a base substrate for an ink transfer material for printers.

Documents D2 and D3 refer to polyester films suitable for use as carrier substrates of magnetic tapes and/or condensers. Since these documents do not refer to ink transfer materials for printers and do not address the problem underlying the invention according to point 3.2

above, the person skilled in the art would not consider these documents when looking for a solution of the problem underlying the invention.

Moreover, although document D2 discloses polyester films for magnetic tapes having a thickness below 10 µm (see page 8, lines 1 to 4) and with longitudinal F-5 values which partially overlap the range of F-5 values of Claim 1 of the contested patent (see Tables on pages 12 to 14), it teaches that the F-5 value should be as high as possible, preferably above 18 kg/mm^2 (page 4, second paragraph). In contrast thereto, the substrate of the ink transfer material according to the contested patent should exhibit a longitudinal F-5 value of 11 to 16 kg/mm^2, higher values leading to unfavourable results (see comparative example E of the contested patent).

Moreover, document D2 does not disclose or suggest the other features concerning refractive indices, birefringence and surface roughness as claimed in Claim 1 of the contested patent.

The carrier films for magnetic recording tapes disclosed in document D3 are biaxially oriented polyester films exhibiting a longitudinal F-5 value in the range of 9.2 to 15.3 kg/mm^2 and an average surface roughness of 0.005 to 0.40 µm (see Claims 1 and 2). However, document D3 does not disclose any values for thickness, refractive indices and birefringence.

Therefore, even if the person skilled in the art would combine the teachings of documents D2 and D3 with the teaching of document D1, he would not arrive at an ink transfer material having all the features as defined in Claim 1 of the contested patent.

In conclusion, the person skilled in the art does not obtain from documents D1 to D4 any hint for the selection of the claimed specific parameter ranges which are of decisive significance for the solution of the problem underlying the invention, as is explained on page 3, lines 2 to 35 of the contested patent.

3.5 For these reasons, the subject-matter of Claim 1 involves an inventive step in the meaning of Article 56 EPC.

4. Therefore, Claim 1 is allowable with respect to Article 52(1) EPC.

Dependent Claims 2 to 9, which refer to specific embodiments of the subject-matter of Claim 1, and independent Claims 10 and 11, which refer to specific uses of the subject-matter of Claims 1 to 9, are also allowable.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent on the basis of the following documents:

Description: pages 2 to 7, filed during the oral proceedings of 6 December 1993,

Claims: 1 to 11, filed during the oral proceedings of 6 December 1993.

The Registrar: The Chairman:

A. Townend C. Payraudeau