BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Publication in the Official Journal Yes / No

File Number: T 417/91 - 3.5.2

Application No.: 83 902 124.3

Publication No.: 0 112 924

Title of invention: Magnetic recording medium

Classification: G11B 5/70

D E C I S I O N
of 20 May 1992

Proprietor of the patent: SONY CORPORATION

Opponent: BASF AG

Headword:

EPC Article 56

Keyword: "Inventive step - yes"

Headnote

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 417/91 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 20 May 1992

Appellant : (Opponent)
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Respondent : (Proprietor of the patent)
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Representative :
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Decision under appeal :
Interlocutory decision of the Opposition Division of the European Patent Office dated 19 April 1991 concerning maintenance of European patent No. 0 112 924 in amended form.

Composition of the Board :

Chairman : R.E. Persson
Members : J.A. van Voorthuizen
A. Hagenbucher

Summary of Facts and Submissions

I. The Appellant contests the interlocutory decision of the Opposition Division, maintaining European Patent No. 0 112 924 in amended form.

II. The following documents were considered inter alia in the proceedings before the Opposition Division and referred to in the appeal proceedings:

D1: DE-A-2 833 845
D4: DE-A-3 026 357
D5: JP-A-54 128 496
D9: Information leaflet from Toyobo Co., LTD.: "Polyester Resins for Magnetic Tape" (undated)
D10: Telex from Toyobo Co. dated 12.04.89
D12: JP-A-57 092 422
D13: DE-A-3 017 525

III. The decision under appeal was based on the following independent Claim 1:

"A magnetic recording medium having on a non-magnetic support a magnetic recording layer comprising an acicular iron oxide magnetic powder and a binder; characterised in that:

said iron oxide magnetic powder has a specific surface area as determined by the BET method, of not less than 35 m^2/g;

said binder contains not less than 30% of a resin with a single polar group having the general formula:

$$-SO_3M,\ -OSO_3M,\ -COOM \text{ or } \begin{array}{l} (OM_2) \\ | \\ -P-(OM_1) \\ || \\ O \end{array}$$

where M is hydrogen, lithium, sodium or potassium; and M_1 and M_2 are hydrogen, lithium, sodium, potassium or alkyl groups; and said resin has a molecular weight of 2,000 to 50,000;

the remaining resin binder constituent being nitrocellulose, a vinyl chloride-vinyl acetate copolymer, vinyl chloride-vinyl acetate-vinyl alcohol copolymer, vinyl chloride-vinyl propionate copolymer, vinylidene chloride-vinyl chloride copolymer, vinylidene chloride-acrylonitrile copolymer, acrylonitrile-butadiene copolymer, acetal resin, butyral resin, formal resin, polyester resin, polyurethane resin, polyamide resin, epoxy resin, phenoxy resin, or mixtures thereof."

Claims 2 to 5 are dependent on Claim 1.

IV. The Appellant's arguments can be summarised as follows:

It was known from D12 to improve the dispersibility of a magnetic coating comprising an iron oxide magnetic powder by means of a resin with at least a polar group per molecule and a molecular weight between 200 and 50.000. Magnetic particles having a specific surface area, as determined by the BET method, of 40 m^2/g and more were known from D5 and D13. Even in view of the higher durability shown by magnetic materials based on resins with a single polar group, the limitation of Claim 1 to such resins did not make its subject matter inventive. In fact, D12 taught that a resin with <u>at least</u> a single polar group increased not only the dispersibility of the magnetic powder but also the durability of the magnetic medium, as far as the parameters normally affected by the rubbing off of the material are concerned. D4, together with D9 and D10, related to the use of a resin with 1.5

polar groups per molecule. Since it was obvious in the light of the prior art to try out different resins with at least one polar group, the skilled person would necessarily arrive at the subject matter of the contested patent without an inventive step being involved.

V. The Respondent argued that all but one of the examples in D12 were based on the use of polymers with two or more terminal polar groups. The only exception was example 6 where the number of polar groups was not specified. The product of this example, however, did not show any substantial difference from the products of the other examples in D12. It was not shown in D12, any more than in D1 (regarded as closest prior art by the Opposition Division), that the use of a polymer containing a single polar group in the molecule had any special advantage as far as the properties of the magnetic material were concerned. The unexpectedness of the result supported therefore the patentability of the contested invention.

VI. The Appellant requested that the decision under appeal be set aside and that the European patent No. 0 112 924 be revoked.

VII. The Respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. The main issue to be considered in the present appeal is whether the subject-matter of Claim 1 involves an inventive step.

2.1 The contested patent relates to a magnetic recording medium based on an acicular iron oxide magnetic powder combined with a binder comprising a resin with a single polar group. According to comparative tests (application documents, page 6) provided by the Respondent, the claimed combination of features should result not only in improved dispersibility of the magnetic particles but also in increased "durability", a parameter defined in the patent as "the time a signal output takes to decrease to a predetermined level when the same position on a magnetic tape is scanned with a home VTR". This clearly must be understood to mean that the same length of tape is played a number of times in immediate succession.

2.2 The Appellant contended that D12 and not D1, as suggested by the Opposition Division, should be considered as closest prior art. In fact, both documents disclose the use of a binder comprising a resin with terminal polar groups of the kind listed in the contested patent to increase the dispersibility of iron oxide magnetic particles and, consequently, to reduce the viscosity of a magnetic coating. The examples given in D1 are based on resins containing different numbers of (metal sulphonate) groups, whereas D12 covers resins with at least one polar group (page 3, paragraph 2 of the English translation). Since iron oxide magnetic powders with a BET specific surface of at least 40 m^2/g are well known in the art (e.g. D5 and D13), the Board agrees that it would be obvious to the skilled person to apply the general teaching of e.g. D12, namely the use of a resin with at least a single polar group, to the iron oxide powders defined in the contested Claim 1.

2.3 In the patent in suit, however, the Respondent has shown that by using a resin with a single terminal polar group in combination with iron oxide particles having a BET

specific surface area "of not less than 35 m^2/g" a surprising improvement in the durability of the recording medium can be achieved. The Appellant did not contest the results of the Respondent's comparative tests. In his opinion, however, the skilled person would obviously arrive at the same conclusion by trying out all the possible combinations of magnetic powders and resins with at least one polar group, such as are covered by the cited prior art documents D12 and D5 (or D13).

2.4 Even if it is true that a correlation between magnetic and mechanical properties of the magnetic medium and the use of resins with at least one polar group is known in the art, none of the available documents contains the slightest hint that the use of only one polar group per molecule of resin (together with the further features listed in the contested claim) would lead to the remarkable improvement evidenced by the table on page 6 of the patent in suit. The Examples 1 to 5 and 7 given in D12 relate to a polyester resin with two terminal polar groups. As to Example 6, the number of polar groups is not specified. However, as pointed out by the Respondent, the corresponding tape does not appear to have better properties than the tape of the other examples. Furthermore, the Appellant's observations, in particular page 4 of the Grounds of Appeal, do not contain any convincing arguments as to why, in the light of the prior art, the skilled person would expect a particular advantageous result from the combination of features claimed in the contested patent. The Appellant's reference to D4 (together with D9 and D10), where a resin with 1.5 terminal polar groups per molecules is used, can only support the view that there was no prejudice against the idea of trying out resins with a low number of polar groups, but certainly does not suggest that a considerably

improved durability could be achieved by reducing the number of polar groups to one per molecule.

As in view of the prior art there appears to exist no other reasons which would make it obvious to the skilled person to use only one polar group, the great improvement in durability cannot be regarded as a mere bonus effect.

3. For the above reasons the Board finds the subject-matter of Claim 1, as amended in the opposition proceedings, to involve an inventive step as defined in Article 56 EPC. Consequently, the patent in suit can be maintained.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

J. Rückerl E. Persson