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D E C I S I O N
of 2 December 2002

Case Number: T 0519/00 - 3.5.2

Application Number: 92117461.1

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IPC: G11B 5/704

Language of the proceedings: EN

Title of invention:
Magnetic recording disc

Patentee:
FUJI PHOTO FILM CO., LTD.

Opponent:
EMTEC Magnetics GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - (yes) *ex post facto* analysis"

Decisions cited:
-

Catchword:
-

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Case Number: T 0519/00 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 2 December 2002

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 7 March 2000 revoking European patent No. 0 546 277 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: M. Ruggiu
P. Mühlens

Summary of Facts and Submissions

I. The patentee appealed the decision of the opposition division revoking European patent No. 0 546 277.

II. The reason given for the revocation was that the subject-matter of claim 1 filed with a letter of 30 December 1999 did not involve an inventive step. The decision of the opposition division relied on the following prior art documents cited by the opponent:

E3: US-A-4 863 793;

E4: US-A-4 874 633;

E9: JP-A-62 154 225; and

E12: pages 13 and 14 of the standard ECMA-54, "Data interchange on 200 mm flexible disk cartridges using two-frequency recording at 13262 ftprad on one side", by the ECMA (European Computer Manufacturers Association), second edition, January 1982.

III. In addition to documents E3 and E9, the appellant referred also in the statement of grounds of appeal to document

E6: C. Denis Mee and Eric D. Daniel, "Magnetic Recording", volume II "Computer Data Storage", McGraw-Hill Book Company, 1988, pages 130, 131, 138, 139, 152 to 155 and 158 to 161.

IV. The opponent withdrew its opposition to the patent on 27 August 2002.

V. The appellant requests that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of claims 1 to 4 filed with the letter of 30 December 1999 and the description as granted and specified in the communication under Rule 51(4) EPC posted 27 March 1997, with pages 7, 8, 9, 12, 25 , 28 and 30 of that description replaced by pages 7 and 7a, 8, 9, 12, 25, 28 and 30 filed with a letter of 21 October 2002.

VI. Claim 1 of the appellant's request reads as follows:

"A magnetic recording disc comprising a nonmagnetic support having thereon a nonmagnetic layer comprising nonmagnetic particles and a binder resin, and a magnetic layer comprising ferromagnetic particles and a binder resin, in this order, wherein

said nonmagnetic particles in said nonmagnetic layer are partially or entirely electrically conductive particles;

3 to 20% by weight of said nonmagnetic particles in said nonmagnetic layer is carbon black;

said nonmagnetic layer contains an aliphatic ester in an amount of from 3 to 20% by weight of said nonmagnetic particles;

said magnetic layer has a thickness of 0.5 µm or less,

said ferromagnetic particles in said magnetic layer have an orientation ratio of 0.85 or more, and

said magnetic particles are ferromagnetic metal particles;

both of said binder resin which is contained in the nonmagnetic layer and said binder resin which is contained in the magnetic layer comprise polyisocyanate; and

said magnetic layer is formed while said nonmagnetic layer coated is wet.

Claims 2 to 4 are dependent upon claim 1.

VII. The arguments of the appellant can be summarised as follows:

The reasoning of the opposition division was based on a hindsight perspective concerning the selection of the starting point for the assessment of inventive step, ie document E3, and the combination of E3 with document E9.

Document E3 was only devoted to tapes and the specific examples described therein were all constituted by tapes which had necessarily been subjected to a magnetic orientation leading to an orientation ratio outside the range specified in claim 1 of the patent in suit. Only examples 1, 4 and 5 of E3 related to magnetic recording tapes with a thickness of the magnetic layer corresponding to that of claim 1. All three examples were based on coating "A" for the underlayer and coating "a" for the upper layer. Coating "A" contained nonmagnetic particles formed by a mix of 100 parts α-iron oxide and 10 parts electroconductive carbon, a binder and 0.9 wt.% of an aliphatic ester based on the nonmagnetic particles. Coating "a" comprised Co-modified iron oxide particles as ferromagnetic particles and a binder resin. Therefore, examples 1, 4 and 5 of E3 differed from the subject-matter of claim 1 of the patent in suit at least in that they related to tapes and not discs, that the nonmagnetic layer did not contain an aliphatic ester in

the amount specified in claim 1, that the ferromagnetic particles necessarily had an orientation ratio outside the range specified in claim 1, and that the magnetic particles were oxide particle and not metal particles.

The invention aimed at providing an improved magnetic recording disc exhibiting excellent electromagnetic properties, excellent running properties, excellent overwriting capability and a high capacity recording at the same time, and which did not suffer from compromising one requirement by another.

In comparison to magnetic tapes, the capability to overwrite data was much more important in the case of discs, because disc recording devices were usually not equipped with means for erasing old data before recording new data, while such erasing means were commonly employed in recording devices using tapes. For improving the output characteristics, magnetic particles with a high coercive force were desirable. A high coercive force, however, impaired the overwriting capability and created difficulties in high density recording. Also, the problem of electrification of the disc surface, which caused dust to be attracted, was much more severe with recording discs than with recording tapes. The problem of electrostatic charge of the recording medium was conventionally addressed by incorporating some carbon black in the magnetic layer, which however had an adverse effect on the overwriting capability and the magnetic properties of the recording medium. In order to achieve a high recording density at high recording frequencies, thin magnetic layers were needed. However, simply making the magnetic layer in a known recording medium thinner did not lead to an improved product, as this affected the surface characteristics of the product and the adherence of the magnetic layer to the support.

A magnetic recording disc could also not be directly compared to a magnetic recording tape because discs and tapes had to be used in different machines and had to meet different requirements. In particular, the way in which recording and overwriting were effected differed substantially in discs and tapes. The same was true for the mechanical characteristics, not only in view of the fact that tapes had to be wound up while discs were not, but also in view of the different sizes and shapes of the recording heads and thus the mechanical strains imparted by the heads.

Therefore, the opposition division's reasoning, which identified E3 as representing the closest prior art, lacked an appreciation of the fact that moving from the tapes disclosed in E3 to the discs claimed in the patent in suit already constituted a first clear cut departure from the prior art. Document E6 merely noted a similarity between discs and tapes and there was no basis in the prior art for the allegation contained in the decision of the opposition division that it was common knowledge that magnetic recording media of the disc and tape types basically had the same compositions and layer structures.

The experimental data provided by the proprietor with a letter of 30 December 1999 showed that in the case where the coating compositions according to the examples of E3 were used for preparing magnetic recording discs, the magnetic layer invariably peeled off after very few passes. None of the inventive examples provided in the patent in suit suffered from a peeling of the magnetic layer, whereas all examples which suffered from this problem were not in correspondence with claim 1. Examples II-3, II-18 and II-20 of the patent in suit clearly showed that not including an aliphatic ester in the amount specified in

claim 1 led to products of much inferior quality. Further experimental investigations of the proprietor confirmed this.

Document E9 taught that the lubrification effect could be attained if the lubricant was incorporated into the nonmagnetic layer within a range from 0.1 to 40 wt.% with respect to the total amount of solid fraction component in the nonmagnetic layer. Furthermore, E9 was not limited to aliphatic esters as lubricants, but also envisaged other lubricants, such as myristic acid, which, as shown by comparative example II-20 of the patent in suit, were unsuited for improving the running durability of recording media. Thus E9 did not suggest to the skilled person that superior effects could be achieved by incorporating an aliphatic ester in the amount specified in claim 1. Furthermore, coating "A" of E3 contained a total of 139.7 parts of solid components, 3 parts of which constituted a lubricant in the sense of E9, which corresponded to approximately 2 wt.% lubricant in coating "A". This amount clearly fell within the range set forth in E9. Thus the skilled person had no reason to modify the composition of coating "A" in view of the teaching of E9.

Reasons for the Decision

1. The appeal is admissible.

2. Present claim 1 corresponds to a combination of claims 1 and 5 as granted while claims 2 to 4 as granted have remained unchanged. Furthermore the description has been amended so as to be consistent with the amended claims and acknowledge the prior art disclosed in documents EP-A-0 520 155 and JP-A-62 154 225 (E9).

Thus, the amendments made do not contravene Article 123(2) and (3) EPC.

3. Novelty of the subject-matter of claim 1 is not disputed.

4. The appellant has provided arguments in favour of the presence of an inventive step in the subject-matter of claim 1 which the board finds convincing. In particular, the board considers that it is not appropriate to take a magnetic tape (the state of the art according to document E3) as a starting point for the assessment of whether a magnetic disc (the subject-matter of claim 1) involves an inventive step, because tapes and discs are different objects, subject to different requirements. In the view of the board, a reasoning which in substance alleges it would be obvious to the skilled person to modify a magnetic tape, as disclosed in E3, to arrive at a disc, as specified in claim 1, relies on *ex post* considerations.

5. However, even if it were assumed that the skilled person would apply the tape coatings known from E3 to a disc presenting the orientation ratio specified in claim 1, this would not lead to the subject-matter of claim 1. In particular the amount of aliphatic ester in the nonmagnetic layer would not be within the range specified in claim 1, and the magnetic particles in the magnetic layer would not be ferromagnetic metal particles. The experimental tests provided by the appellant show that the running durability of such a disc would be insufficient and no obvious reason is apparent from the documents of the state of the art as to why these two particular aspects of the coatings of E3 should be modified to increase running durability. In this respect, it is observed that document E9 proposes to have a nonmagnetic layer containing **either** carbon black **or** a metal powder and between 0.1 to 40 wt.% of a lubricant with respect to the total

amount of solid fraction components in the nonmagnetic layer. Thus, when carbon black is used in the nonmagnetic layer, E9 suggests having 100% carbon black particles in that layer. No reason is apparent why the skilled person, in view of E9, would only consider modifying the amount of lubricant in the nonmagnetic layer, and not both the amount of carbon black and the amount of lubricant.

6. Thus, it does not seem possible, having regard to the cited documents of the state of the art, to arrive at the subject-matter of claim 1 of the patent in suit without the benefit of hindsight. The subject-matter of claim 1 can therefore be considered to involve an inventive step in the sense of Article 56 EPC.

The subject-matter of claims 2 to 4 can also be considered to involve an inventive step because these claims are dependent upon claim 1.

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 maintain the patent as amended in the following version:

Description: as granted and specified in the communication under Rule 51(4) EPC posted 27 March 1997, with pages 7, 8, 9, 12, 25, 28 and 30 of that description replaced by pages 7 and 7a, 8, 9, 12, 25, 28 and 30 filed with the letter of 21 October 2002.

Claims: Nos. 1 to 4 filed with the letter of 30 December 1999.

The Registrar: The Chairman:

D. Sauter W. J. L. Wheeler