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D E C I S I O N
of 23 March 1999

Case Number: T 0993/96 - 3.5.2

Application Number: 88115767.1

Publication Number: 0308979

IPC: G11B 5/70

Language of the proceedings: EN

Title of invention:
Magnetic disc

Patentee:
Hitachi Maxell Ltd.

Opponent:
Fuji Photo Film Co., Ltd.

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty - yes"
"Inventive step - yes"

Decisions cited:
T 0322/87, G 0010/91

Catchword:
-

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Case Number: T 0993/96 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 23 March 1999

Appellant: (Opponent)
Fuji Photo Film Co., Ltd.
No. 210, Nakanuma
Minami Ashigara-shi
Kanagawa, 250-01 (JP)

Representative:
Patentanwälte
Dr. Solf & Zapf
Candidplatz 15
81543 München (DE)

Respondent: (Proprietor of the patent)
Hitachi Maxell Ltd.
No 1-1-88, Ushitora
Ibaraki-shi
Osaka-fu (JP)

Representative:
von Kreisler, Alek, Dipl.-Chem.
Patentanwälte
von Kreisler-Selting-Werner
Postfach 10 22 41
50462 Köln (DE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 24 September 1996 rejecting the opposition filed against European patent No. 0 308 979 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: R. G. O'Connell
A. C. G. Lindqvist

Summary of Facts and Submissions

I. This appeal is against the rejection of the opposition to European patent No. 308 979.

II. In the notice of opposition the opponent (now appellant) had requested revocation of the patent in its entirety on the grounds that the subject-matter of the claims of the patent was not new and did not involve an inventive step (Article 100(a) EPC) having regard in particular to the following prior art documents:

JP-A-62 137 718

D1: English translation of JP-A-62 137 718 filed by appellant

D2: EP-A 0 098 307.

III. The patent has not been amended. Claim 1, the sole independent claim, reads as follows, the features of the claim being labelled in accordance with a scheme adopted by both parties:

"1. A magnetic disc comprising (A) a substrate and magnetic layers which are formed on both surfaces of the substrate and (B) comprises a sponge like structure without anisotropy in circumferential direction (C) of ferromagnetic metal powder, a liquid lubricant and a binder resin, wherein (D) the ferromagnetic metal powder comprises iron, has an average particle size of 0.1 top (sic) O.4 µm and (E) is contained in the magnetic layer in an amount of 25 to 40 % by volume,

and (F) the lubricant is contained in the magnetic layer in an amount of 80 to 500 mg/m^2."

IV. Oral proceedings were held before the board on 23 March 1999.

V. The appellant argued essentially as follows:

V.1 The opposed patent did not include all the information required to make the claimed magnetic disk. In particular, the opposed patent totally ignored the importance of the porosity and the pore size. The phrase "without anisotropy in circumferential direction of ferromagnetic powder" in claim 1 was unclear and could only mean globular magnetic particles. The lack of proper definition of the invention in the claim made the disclosure of the opposed patent unclear also. It was therefore necessary and justified to make calculations to compare the subject-matter of claim 1, expressed in indirect terms such as vol % of iron-containing ferromagnetic metal powder, with the teaching of D1 which was expressed directly in the relevant quantities of porosity and pore size. The primacy of these parameters was demonstrated in Table 1 of D1 which showed that decreasing the pore size improved the high pass modulation by reducing drop-outs whereas too low a porosity led to poor durability because of the reduction in lubricant.

V.2 Features A to D were disclosed in detail in D1 as follows:

- Feature A was disclosed in D1 at page 1, claims 1 and 5 in connection with page 30, lines 15 and 16

which taught that the coating films were formed on both sides of the base film to produce double-sided samples.

- Feature B was disclosed in D1 at page 9, lines 10 to 14. Since the magnetic layer of D1 had been subjected to the same random orientation treatment as was used by the opposed patent (cf. page 3, lines 19 to 33 of the latter document) feature B was known from D1.

- D1 also described feature C, cf. page 12, lines 8 to 21; page 2, claim 9; page 5, III to page 6, IV; page 10, line 7 to page 11, line 24; and page 30, lines 11 to 22.

- Feature D was disclosed on page 12, lines 8 to 21 in connection with page 14, lines 4 to 9 in D1. The iron alloy needle magnetic powder of magnetic coating composition 2 - see D1, page 28 - also had an average particle size within the range specified in feature D.

Hence features A to D at least were explicitly disclosed in D1 and belonged in the prior art portion of a claim properly delimited with respect to D1.

V.3 Furthermore features E and F were at least implicitly disclosed by D1 for the following reasons:

As regards feature F the lubricant content of example 13 in Table 1 of D1 could be calculated to be of the order of 280 mg/m^2 (cf. page 10 of the opposition statement). The proprietor's criticism of that

calculation based on the argument that it did not take into account lubricants present in the binder and magnetic particle compositions was not valid since even if a higher fatty acid modified silicone oil acted as an additional lubricant the density of the total lubricant was not significantly changed since the modified silicone oil had a density in or about the range of oleic acid or oleyl oleate. The calculated value of the lubricant content of example 13 would therefore in any case lie within the wide range (80 to 500 mg/m^2) specified in feature F of the opposed patent. This feature was therefore at least implicitly disclosed in example 13 of D1 for the person skilled in the art.

V.4 As regards feature E, the volume content of the iron alloy needle magnetic powder of example 13 of Table 1 of D1 had been calculated as 23.7 % by volume (cf. pages 7 to 9 of the opposition statement) using as specific gravity of the iron-containing ferromagnetic metal powder the value 6.3 mentioned in the opposed patent at page 5, line 35. This calculated value of 23.7% just failed to fall explicitly within the claimed range of 25 to 40%. However, example 13 should not be read in isolation but in the context of the general teaching of D1 (cf. decision T 332/87 dated 23 November 1990, not published in OJ EPO, reasons 2.2), in particular the general teaching derivable from Table 1 that reduced pore size led to enhanced electrical performance. The paragraph bridging pages 27 and 28 of D1 indicated a variation of the mixing ratio of binder to magnetic powder to obtain media with different magnetic layer porosities. This indication had to be read in the light of page 10, lines 4 to 6 which

disclosed that the amount of magnetic powder should range from 100 to 900 preferably from 150 to 600 parts by weight, per 100 parts by weight of the binder. For magnetic coating composition 2 described in D1, page 28, the ratio of magnetic powder to the binder compound should therefore be at least in a ratio of 1:1 for the preparation of sample 13 in Table 1. If further samples with different mixing ratios of binder and magnetic powder were prepared the amount of the magnetic coating composition 2 would have to be increased from at least 1:1 up to 9:1, preferably between 1,5:1 to 6:1. Comparison of examples 9 and 13 of Table 1 also suggested that sample 13 might have better durability if the porosity was decreased, i.e. if the volume content of the iron-containing ferromagnetic metal powder was increased. A magnetic coating composition in which the amount of the magnetic powder was slightly higher than that of example 13 would have an iron-containing ferromagnetic metal powder in an amount lying within the range disclosed in feature E of the contested patent. Feature E was therefore implicitly disclosed by D1 because the latter document taught the person skilled in the art not just the specific values of example 13 but the appropriate variations to achieve specific design choices, e.g. with regard to electrical performance and durability.

V.5 It was important to note that the above argument was not an analysis based on hindsight. On the contrary, the inventors of the opposed patent had effectively reworded the disclosure of D1 using the parameters "% by volume" and "g/m^2" instead of "mixture ratio" and "porosity", thus necessitating and justifying the above calculations.

V.6 The subject-matter of claim 1 was accordingly not new, or alternatively, if the above argument on feature E was not accepted, did not involve an inventive step since the person skilled in the art, starting from example 13 of Table 1 of D1 would vary the composition in accordance with the general teaching of that document so as to solve the problem of achieving enhanced durability while retaining good electrical recording characteristics and thus arrive, as explained above, at a magnetic disk within the terms of claim 1. In this connection it should be noted that D1 and the opposed patent addressed the same problem; cf. D1, page 4, at the bottom ("...enhancing durability.."), and the opposed patent at page 2, line 20 ("..to provide....excellent durability").

VI. The respondent objected to the introduction of a new ground of opposition (insufficiency - Article 100(b) EPC) and argued essentially as follows:

D1 disclosed feature A but the respondent did not accept that any of the remaining features of claim 1 were disclosed. In particular feature E was neither known nor derivable from D1. D1 and in particular example 1 referred to three different magnetic coating compositions and did not allow a proper recalculation of the material to rework those examples. The specific gravity and the composition of the iron alloy needle magnetic powder were not known. The paragraph bridging pages 27 and 28 pointed to Table 1 and the several different samples which were prepared by varying the magnetic field treatment and the mixing ratio of the binder and magnetic powder in order to obtain media having different magnetic layer porosities. However,

neither Table 1 nor any of the series of samples indicated the specific weight ratio of the binder and the magnetic powder. Thus, it was not possible to rework the compositions in order to evaluate the correctness of the data given in Table 1.

The description of D1 taught that a magnetic recording medium having a magnetic layer containing a needle magnetic powder and a binder on a nonmagnetic substrate should have appropriate porosity and pore areas. The pores should preferably be filled with a lubricant. D1 did not recognise the importance of the volume % of the iron-containing ferromagnetic metal powder for improved electrical performance and durability.

VII. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

VIII. The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. The issues in this appeal are novelty and inventive step with respect to the prior art document D1. In order to succeed the appellant must at least show that a magnetic disk having feature E is either old or obvious. Since it is clear from the submissions of the parties that this feature is critical the board will in the first place confine itself to consideration of novelty and inventive step in relation to this feature

of the claimed disk, since consideration of other features is not necessary if the appellant does not succeed on this critical feature.

3. *Novelty*

3.1 The appellant has sought to show that D1 discloses a magnetic recording medium having iron-containing ferromagnetic metal powder "contained in the magnetic layer in an amount of 25 to 40% by volume" as specified in claim 1 (feature E) by calculating the volume % of iron-containing ferromagnetic metal powder present in example 13 of Table 1 of D1. In the judgement of the board the disclosure of D1 does not permit this calculation to be carried out directly and unambiguously. The instructions given at pages 28 to 29 of D1 for making "Magnetic coating composition 2" - the composition used in example 13 - do not specify a magnetic powder to binder ratio. The proportions by weight of the iron alloy needle magnetic powder proper, the dispersant, and the solvent are listed and a mixing procedure is described for these materials. The description proceeds:

"Separately, a binder compound was prepared by fully mixing the following ingredients into a solution." There follows a list of six materials with their respective parts by weight and then the comment:

"They were thoroughly mixed with the magnetic powder mixture for one hour in a high speed mixer. The resulting magnetic coating composition was milled and dispersed for four hours using a sand mill."

The only reference in D1 to the magnetic powder/binder ratio in quantitative terms is the general teaching at page 10:

"In the present invention, the amount of magnetic powder ranges from 100 to 900 parts by weight, and preferably 150 to 600 parts by weight, per 100 parts by weight of the binder."

3.2 In the calculation made at pages 7 to 9 of the opposition statement which resulted in a value of 23.7 vol %, which is just below the lower limit of 25% in claim 1, the appellant tacitly assumed that the parts by weight given in the separate lists of ingredients for magnetic powder and binder respectively were on a common parts by weight scale. The board agrees with the respondent that this assumption is of doubtful validity. In the judgement of the board the disclosure of D1 is at best ambiguous on this point. It has to be borne in mind that D1 is primarily a teaching about pore surface area, porosity and lubricant content which is why the numerical data in the examples of Table 1 relate to these parameters. Although D1 includes the statement at pages 27/28: "As shown in Table 1, several different samples were prepared by varying the magnetic field treatment and the mixing ratio of the binder and magnetic powder in order to obtain media having different magnetic layer porosities.", nevertheless the reader is not instructed to use a specific magnetic powder/binder ratio to reproduce the respective examples in D1, ie to achieve a given pore surface area, porosity or lubricant content. It is therefore not possible to reverse engineer these examples so as to determine the magnetic powder/binder ratio and *a*

fortiori it is not possible to determine unambiguously the vol % of iron-containing ferromagnetic metal powder.

3.3 The respondent also contests the use in this calculation of the specific gravity value of 6.3 - taken from the opposed patent - for the iron alloy needle magnetic powder specified in D1. Again the board agrees that such an assumption goes beyond the direct and unambiguous disclosure of D1 - even for the person skilled in the art -, since different alloys will in general have different specific gravities.

3.4 On both the above points - magnetic powder/binder ratio and iron alloy needle magnetic powder density - the board judges that the assumptions underlying the appellant's calculation belong more in the realm of what the person skilled in the art could possibly surmise than what that person would understand as explicitly or implicitly disclosed in D1.

3.5 This applies with even greater force to the variations in the assumed magnetic powder/binder ratio that the appellant relies on to bring the calculated value explicitly within the claimed range. The appellant sought to justify this by invoking the general teaching at page 6 in D1 of a porosity range from 5 to 30%, preferably 15 to 30%, to vary the porosity of 25% specified in example 13 of Table 1, citing decision T 332/87 as support for the proposition that the specific disclosure of an example could be combined with the general teaching in the same document. However, as was noted in that decision at point 2.2 of the reasons, this is justified "provided that the

example concerned is indeed representative for the general technical teaching disclosed in the respective document", so that a generally taught feature (in T 332/87 use of an adhesive in combination with a filler) was to be regarded as taught for the specific examples (in T 332/87 adhesive compositions) even when this feature was not explicitly repeated in the specific disclosure of the examples. In the judgement of the board, the general technical teaching of a porosity range of 5 to 30% in D1 cannot be regarded in this way as a feature which is taught for the specific example 13 because varying the porosity in this way would be in conflict with its status as a specific example having, in addition, other specific compositional features and yielding specific performance characteristics. The rule derivable from T 332/87 (reasons, 2.2) is an aid to construing the disclosure of a specific example but is not a licence to generate new and further examples to create a further specific disclosure.

3.6 The board concludes therefore that the appellant has not shown that D1 discloses a magnetic recording medium having iron-containing ferromagnetic metal powder contained in the magnetic layer in a specific amount which falls within the range of 25 to 40% by volume specified in claim 1 (feature E).

3.7 Hence the appellant has not shown that the magnetic disk of claim 1 of the opposed patent lacks novelty with respect to D1.

4. *Inventive step*

4.1 The appellant argues that even if feature E is not implicitly disclosed in D1 it is nevertheless obvious for the person skilled in the art to modify the magnetic recording medium disclosed in example 13 of Table 1 of D1 by reducing the porosity from the specified value of 25% to a value of about 20% in accordance with the general teaching in D1 of a preferred range of 5 to 30%, more preferably 15 to 30%, thus arriving at a medium having an iron-containing ferromagnetic metal powder vol % within the range of feature E of claim 1.

4.2 It is common ground that D1 and the opposed patent both address the problem of enhanced durability of a magnetic recording medium. Whereas it is plausible that the person skilled in the art, starting from D1, would seek further to enhance durability by varying the parameters of the examples in D1 - this being a routine development activity - the board is not persuaded that example 13 would be an obvious starting point. It is true, as the appellant argues, that a study of Table 1, in particular examples 7, 9, 10 and 13, leads to the conclusion that lower porosity is associated with better durability so that some improvement might be expected by reducing porosity in some of the examples. Examples 9, 10 and 15, however, have better durability than example 13 and would therefore, absent hindsight, represent more plausible starting points. In particular example 9, which does not contain any iron, has not only better durability but also superior electrical characteristics. The only reason that the board can see for choosing example 13 in preference to better

examples is that it has - on certain assumptions (cf. the discussion of novelty above) - a vol % of iron-containing ferromagnetic metal powder which is closer to the range specified in feature E of claim 1 than any of the other examples. However, this is a reason which depends on knowledge of the opposed patent and cannot fairly be adduced in argument on inventive step.

4.3 At a more general level the appellant alleges that the opposed patent is a mere reformulation of the teaching of D1 using different parameters, in particular using vol % of iron-containing ferromagnetic metal powder instead of porosity. The board is not persuaded of the reasonableness of this allegation given that only one of the magnetic compositions taught in D1 includes an iron alloy and that in the case of that composition, as in the case of the other compositions mentioned in D1, the lack of precise disclosure of a link between magnetic powder/binder mixing ratios and porosity of the final product renders it impossible to make such a conversion of parameters in a systematic way.

4.4 The above allegation is linked to the appellant's contention that the subject-matter of claim 1 does not involve an inventive step because there is in fact no enhanced durability coterminous with the range claimed and in particular no improvement over D1. In the judgement of the board, the appellant has not discharged the burden of proof that rests on the party making such an allegation. Given that the parties differ on the question of comparing the results of the durability tests described in the opposed patent and in D1 respectively, experiments using a common test procedure would be necessary to resolve the question in

dispute. Absent convincing results from such experiments there can be no question of revoking the patent on the basis of the appellant's allegation.

5. The board therefore concludes that the appellant has not shown that the magnetic disk of claim 1 of the opposed patent is either old or obvious having regard to the cited prior art and that accordingly the ground of opposition pursuant to Article 100(a) EPC does not prejudice the maintenance of the opposed patent in unamended form.

6. The appellant also argued at the oral proceedings before the board that the opposed patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. The respondent did not agree to the introduction of this new ground of opposition (Article 100(b) EPC) and accordingly, following point 3 of the opinion of the Enlarged Board of Appeal G 10/91 OJ EPO 1993, 420 the board cannot consider such ground without exceeding its jurisdiction. Similarly, under the EPC, the board has no jurisdiction in relation to the appellant's allegation that claim 1 of the opposed patent is not clear, Article 84 EPC having no counterpart in Article 100 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl W. J. L. Wheeler