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**D E C I S I O N**  
**of 3 May 2000**

**Case Number:** T 0941/97 - 3.5.2

**Application Number:** 90302944.5

**Publication Number:** 0390391

**IPC:** G11B 5/708

**Language of the proceedings:** EN

**Title of invention:**

A magnetic recording medium with improved electromagnetic conversion characteristics and anti-environment properties

**Patentee:**

KONICA CORPORATION

**Opponent:**

I: BASF Aktiengesellschaft Patente, Marken und Lizenzen  
II: FUJI PHOTO FILM CO. LTD.

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step - yes"

**Decisions cited:**

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**Catchword:**

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Case Number: T 0941/97 - 3.5.2

**D E C I S I O N**  
**of the Technical Board of Appeal 3.5.2**  
**of 3 May 2000**

**Appellant:** KONICA CORPORATION  
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**Respondent:** BASF Aktiengesellschaft  
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**Respondent:** FUJI PHOTO FILM CO. LTD.  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 9 July 1997  
revoking European patent No. 0 390 391 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** W. J. L. Wheeler

**Members:** R. G. O'Connell  
P. H. Mühlens

## Summary of Facts and Submissions

I. This is an appeal from the revocation by the opposition division of European patent No. 390 391. The reason given for the revocation was that the subject-matter of the amended claims then on file although new did not involve an inventive step, having regard to the following prior art:

D1b: English translation of JP-A-63 187 418

D2: EP-A-0 125 150

D6a: English translation of JP-A-64 19524

D8a: English translation of claim 1 of JP-A-63 224 025

D9: EP-A-0 107 985.

II. The appellant filed further amended claims with the statement of grounds of appeal. In a written communication the board expressed reservations as to the permissibility of these further amendments having regard to Article 123(2) EPC and Rule 57a EPC.

III. Oral proceedings were held before the board on 3 May 2000 at the commencement of which the appellant withdrew claims 4 to 6 and reverted (apart from a correction of a linguistic error) to claims 1 to 3 as refused by the opposition division.

IV. Claim 1 is worded as follows:

"1. A magnetic recording medium comprising a support and provided thereon a plurality of layers,

characterised in that the uppermost layer contains a Fe-Al ferromagnetic powder having an average major axis length of not longer than 0.3 micrometres, a binder comprising a resin having a functional group and the thickness of the uppermost layer is not more than 1.5 micrometres."

Claims 2 and 3 are dependent on claim 1.

V. The appellant argued essentially as follows:

The opposition division's finding in the decision under appeal that the subject matter of claim 1 was novel over D6a (or equivalently D1b) had not been contested in the appeal.

A magnetic recording medium comprising a support and a plurality of layers was known from the agreed closest prior art D6a or D1b. This document did not suggest the use of Fe-Al as the ferromagnetic powder in the uppermost layer. This feature enabled the invention of the opposed patent to provide multilayered magnetic tapes suitable for use as video tapes having excellent electromagnetic conversion characteristics even in severe environmental conditions such as high temperature and humidity. D6a at page 6, line 28 ff specified three "alloys", namely Fe, Fe-Ni and Fe-Ni-Co which may be combined with a small amount of any of a further twelve elements of which one is Al. In the examples only Fe-Co, Fe-Ni, and Fe-Zn-Ni alloys were used.

VI. Respondent opponent I submitted no substantive arguments but requested a decision on the file as it stood. In accordance with his previously signalled

intention, he was not represented at the oral proceedings.

VII. Respondent opponent II's arguments can be summarised as follows:

The subject matter of claim 1 of the opposed patent differed from the magnetic recording medium disclosed in the agreed closest prior art D6a (or D1b) solely in the fact that Fe-Al alloy was used as the ferromagnetic powder in the uppermost layer. Ferromagnetic powders in the uppermost layer were already known in general from these documents.

The technical problem addressed by the opposed patent was to provide a multilayer magnetic tape suitable for use as a video tape having excellent electromagnetic conversion characteristics even in severe environmental conditions such as high temperature and humidity; cf description of the opposed patent, page 2, lines 38 to 40.

According to the patent the anti-environment property was determined by the ratio  $B_m'$  (after exposure to temperature of 60°C and relative humidity of 80% for seven days) to  $B_m$  (before the test). The data in Tables 1 and 2 of the patent showed that media using Fe-Al had advantages over media using Fe-Ni in the anti-environment test.

The prior art document D2 also disclosed results for an anti-environment test (D2, page 23, Table 1 right hand column) involving exposure to temperatures of 50°C and relative humidity of 90 % for one week and measurement of  $B_m'/B_m$ . The results showed clearly that media using

Fe-Al alloys had advantages over media using Fe-Ni alloys.

The patent proprietor's arguments in respect of improved noise performance ie Y-CN, Lumi S/N and Chroma S/N did not support patentability of claim 1 since they did not take into account the fact that this improvement mainly resulted from the **size of the particles**. Particles smaller than 0.25 micrometre, ie within the range specified in claim 1 were disclosed in D6a at page 2, line 1 and it was to be expected that the same structural features would produce the same effects.

Further improvements in noise performance, in particular Chroma, apparently resulted from the **material used for the second layer** (cf examples 5 to 7). Since claim 1 did not specify any material for the second layer these advantages were irrelevant on inventive step.

Similarly the changes in Chroma in examples 8 to 12 depended on the **thickness of the lower layer** which again was not specified in claim 1 so that the proprietor's observations in respect of these examples were immaterial to the question of patentability of claim 1.

The range of thickness specified in claim 1 was known from the closest prior art so that the effects stemming from the thickness of the top layer had to be discounted in assessing inventive step in relation to claim 1.

The further improvements in examples 13 and 14

apparently resulted from the use of particular binders which however were not specified in claim 1, making arguments based on these examples irrelevant.

The new tables of experimental data T1' and T2' submitted with the statement of grounds of appeal only confirmed the observations made above that smaller particle size was conducive to better noise characteristics - a fact already exemplified in D6a/D1b - and that Fe-Al provided better anti-environment properties than Fe-Ni - a fact known from D2.

The person skilled in the art starting from D6a/D1b and addressing the technical problem of the opposed patent would be led to adopt Fe-Al as the ferromagnetic powder for the top layer since it would be obvious to first try the materials that have proved effective in solving the same environmental problem in single-layer materials. In this way he would arrive at the subject matter of claim 1 without an inventive step being involved.

In considering the effect of the teaching in D6a at page 6, lines 28 to 32:

"The composition of the ferromagnetic alloy powder is pure iron or an alloy such as Fe, Fe-Ni or Fe-Ni-Co, and may contain non-magnetic or non-metallic elements such as B, C, N, Al, Si, P, S, Ti, Cr, Mn, Cu or Zn in a small amount to improve the characteristics thereof."

it should be borne in mind that the technical field of magnetic recording media was a highly developed field in which new material combinations were routinely tested in a systematic way in very large specially



equipped laboratories. The person skilled in the art was in reality a team of highly skilled researchers in such a laboratory and it would be a routine matter for such a team to determine from the teaching in D6a/D1b that Fe-Al had particularly advantageous properties both in electromagnetic conversion characteristics and in anti-environmental properties. It was not appropriate to grant a patent which would prevent the person skilled in the art applying the results of such routine activity.

The further experimental data submitted by the proprietor by letter dated 3 April 2000 should be viewed as the inevitably partisan selective presentation of data which in the nature of things did not have the weight of the findings of a neutral expert laboratory. It was not realistic to expect the respondent to verify the reproducibility of this data in the time available and the board should evaluate this data and the arguments based thereon accordingly.

VIII. The appellant requested that the decision under appeal be set aside and that the patent be maintained, in amended form, in the following version:

**Claims:** 1 to 3 as filed in the oral proceedings;

**Description:** pages 2 and 4 as filed in the oral proceedings,  
insert A and pages 7 to 9 as filed with the grounds of appeal dated 9 November 1997,  
pages 3, 5 and 6 of the patent specification.

**Drawings:** none.

IX. The respondent opponent II requested that the appeal be dismissed.

### **Reasons for the Decision**

1. The appeal is admissible.

2. *Amendments*

Neither the opposition division nor the opponents (now respondents) raised any objection to the claim amendments made during the opposition procedure - in effect (apart from the deletion of the redundant word "having" in claim 2) the claims of the patent have not been amended further on appeal. The description has been adapted to the amended claims. In the judgement of the board the amendments are permissible under Articles 123(2) and 123(3) EPC.

3. *Novelty*

In the decision under appeal the opposition division found that the amended claim 1 of the opposed patent was novel, in particular over D6a or D1b. Both respondents have at least tacitly accepted this finding in the sense that neither has made submissions on this issue in the appeal proceedings.

4. *Inventive step*

4.1 It is common ground among the parties and it also

accords with the judgement of the board that prior art document D6a represents the closest prior art. It is also common ground that the disclosure of D1b is effectively the same as that of D6a and therefore requires no separate discussion.

4.2 D6a discloses a magnetic recording medium having plural magnetic layers having improved electromagnetic properties, head wear resistance and durability; cf D6a, page 2, lines 20 to 25. It is common ground and in particular admitted by the proprietor that this magnetic recording medium has all the features of claim 1 of the opposed patent as now amended apart from a specific disclosure of Fe-Al as the ferromagnetic powder in the uppermost layer.

4.3 The closest D6a comes to teaching Fe-Al for the top layer is in the passage at page 6, lines 28 to 32:

"The composition of the ferromagnetic alloy powder is pure iron or an alloy such as Fe, Fe-Ni or Fe-Ni-Co, and may contain non-magnetic or non-metallic elements such as B, C, N, Al, Si, P, S, Ti, Cr, Mn, Cu or Zn in a small amount to improve the characteristics thereof."

4.4 The board agrees with the finding of the opposition division at point 3a of the decision under appeal that, having regard to this disclosure of a main component consisting of pure iron or Fe-Ni or Fe-Ni-Co alloys combined with a dopant to be chosen from a list of twelve elements, the use of Fe-Al as ferromagnetic powder has to be regarded as novel given the wide range of possibilities that can arise from the combination of the members of the two lists.

- 4.5 Respondent opponent II has argued that even if novelty is conceded, the person skilled in the art, considered as a team in a fully equipped laboratory, would arrive at Fe-Al as the ferromagnetic powder in the top layer as a result of a routine investigation of the various compositional combinations taught in D6a motivated by an effort to solve the obvious problem of the patent, ie optimising electromagnetic characteristics while securing resistance to environmental degradation resulting from exposure to elevated temperatures and humidity.
- 4.6 The board is not persuaded by this argument. In its judgement the process thus envisaged by opponent II cannot fairly be characterised as routine investigation of the properties of a group of materials. It would be more accurately described as a research programme aimed at discovering which, if any, of the large range of compositions embraced by the disclosure in D6a had particularly advantageous properties in relation to the manifold requirements placed upon a magnetic recording medium suitable for video tapes including high storage density, high signal to noise ratio, head wear resistance, high durability and stability in harsh environmental conditions. The respondent's argument that maintaining the patent in amended form would stifle routine investigation by the person skilled in the art is, in the judgment of the board, refuted by the counterargument that a very widely cast disclosure in the form of a list of main components arbitrarily combinable with a catalogue of dopant elements cannot be allowed to preempt selective invention within the broad field thus staked out.
- 4.7 Turning to the objective technical problem solved by

the magnetic recording medium of claim 1 the board judges that the appellant proprietor has plausibly established by the examples and comparisons in the patent specification and in the further experimental data submitted on appeal that modifying the D6a media by including Fe-Al as ferromagnetic powder results in

- (i) improved characteristics for Lumi S/N, Chroma S/N and Y-C/N after storage at high temperatures and humidity and
- (ii) improved remanence after storage at high temperatures and humidity as measured by  $B_m'(after)/B_m(before)$ .

4.8 Opponent II has argued that the alleged technical effects result from either those features of the claim which are known from the prior art, such as particle size and layer thickness, or from other parameters not specified in claim 1, such as the material of the layer adjacent the top layer, but he has not discharged the onus which rests on an opponent of convincing the board, either by technical argument or by his own experiments, that the supplementary experimental data submitted by the appellant proprietor with the statement of grounds of appeal and subsequently one month before the oral proceedings by way of rebuttal of the opponent's arguments lacked credibility. Although the board acknowledges that opponent II would hardly have had time to perform experiments to confirm or refute the latest data submitted by the proprietor it was open to opponent II from the time of the filing of the statement of grounds of appeal to perform such experiments proactively in support of his arguments.

- 4.9 The opposition division in the decision under appeal at point 5c adopted an argument advanced by opponent I that since the remanence related directly to the signal output of the magnetic recording medium a similar improvement would be expected for the signal to noise (S/N) ratio, so that the skilled person who solved the problem of achieving improved remanence after storage at high temperatures and humidity as measured by  $B_m'(after)/B_m(before)$  would automatically achieve the improved signal to noise characteristics for Y, Lumi and Chroma. The appellant traverses this finding as based on an unsubstantiated assertion on the part of opponent I.
- 4.10 The board agrees with the appellant's contention that the link between improved remanence after storage and improved signal to noise ratio is not as direct as that expressed at point 5c of the decision under appeal, which although plausible at first sight does not take into account the effect of higher remanence on particle interactions at very high recording densities and frequencies.
- 4.11 The board concludes therefore that, having regard to the prior art on file, the claimed magnetic recording medium is not obvious for the person skilled in the art so that the subject matter of claim 1 involves an inventive step within the meaning of Article 56 EPC.
5. In the view of the board the patent as amended and the invention to which it relates meet the requirements of the EPC.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent in amended form in the following version:

**Claims:** 1 to 3 as filed in the oral proceedings;

**Description:** pages 2 and 4 as filed in the oral proceedings,  
insert A and pages 7 to 9 as filed with the grounds of appeal dated 9 November 1997,  
pages 3, 5 and 6 of the patent specification.

**Drawings:** none.

The Registrar:

The Chairman:

M. Hörnell

W. J. L. Wheeler