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# D E C I S I O N
## of 13 December 2000

**Case Number:** T 0148/99 - 3.5.2

**Application Number:** 91115193.4

**Publication Number:** 0477641

**IPC:** G11B 5/66

**Language of the proceedings:** EN

**Title of invention:**
Magnetic recording medium for digital recording

**Applicant:**
TDK Corporation

**Opponent:**
-

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 84, 123(2)

**Keyword:**
"Added subject-matter - no (after amendment)"
"Lack of clarity - yes"
"Main request refused"
"Remittal for further prosecution"

**Decisions cited:**
-

**Catchword:**
-

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Case Number: T 0148/99 - 3.5.2

# D E C I S I O N
## of the Technical Board of Appeal 3.5.2
## of 13 December 2000

**Appellant:** TDK Corporation
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**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted 23 September 1998 refusing European patent application No. 91 115 193.4 pursuant to Article 97(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 refusal by the examining division of European patent application No. 91 115 193.4. The refusal grounds were added subject-matter (claim 1 of the main request) and lack of clarity (claims 1 and 2 of the auxiliary request); Articles 123(2) and 84 EPC respectively.

II. In a communication accompanying a summons to oral proceedings the board expressed the provisional view that the refusal decision under appeal appeared to be well founded in respect of both requests and pointed out that the lack of clarity of claims 1 and 2 of the auxiliary request apparently resulted from the fact that two alternative teachings in the application as originally filed had been conflated to produce a combination which made no technical sense.

III. A month before the oral proceedings the appellant filed new main and auxiliary requests which differed from those refused in the decision under appeal mainly in the fact that claim 2 of both requests had been reformulated as an independent claim. Following discussion in the oral proceedings claim 2 of the auxiliary request was deleted and the dependent claims renumbered.

IV. Independent claims 1 and 2 of the main request now read as follows:

"1. A magnetic recording medium for digital recording wherein digital signals having a half value width of 50 to 500 nsec and a recording wavelength of 0.35 to 0.80 µm are recordable on a magnetic multilayer on a surface of a non-magnetic substrate,

said magnetic multilayer includes a first thin film consisting of at least one layer of cobalt base ferromagnetic metal formed by a oblique evaporation process in a first direction and a second thin film consisting of at least one layer of cobalt base ferromagnetic metal formed by a oblique evaporation process in a second direction different from the first direction,

provided that the angle included between the incident direction of ferromagnetic metal during evaporation and a normal to the surface of said non-magnetic substrate is designated incident angle, the incident angle varies from a maximum incident angle $\theta max$ to a minimum incident angle $\theta min$ during the oblique evaporation process, $\Delta\theta = \theta max - \theta min$, and the layers constituting said first and second ferromagnetic metal thin films each have a thickness t,

the total thickness of said first ferromagnetic metal thin film is 0.7 to 1.3 times the total thickness of said second ferromagnetic metal thin film,

the sum of $t\ \Delta\theta$ of the respective layers constituting said first ferromagnetic metal thin film is 0.7 to 1.3 times the sum of $t\ \Delta\theta$ of the respective layers constituting said second ferromagnetic metal thin film, and the magnetic multilayer has a coercive force Hc of 61.3 to 130.6 kA/m (800 to 1700 Oe), a residual magnetic flux density Br of 2.5 to 5.0 x $10^{-1}$ T (2500 to 5000 G) in the plane of said magnetic layer and a maximum magnetic flux density Bm of 3.0 to 7.0 x $10^{-1}$ T (3000 to 7000 G) in a tape longitudinal direction."

"2. A magnetic recording medium for digital recording wherein digital signals having a half value width of 50 to 500 nsec and a recording wavelength of 0.35 to 0.80

μm are recordable on a magnetic multilayer on a surface of a non-magnetic substrate, wherein

said magnetic multilayer includes a lower layer consisting of at least one ferromagnetic thin film nearer to the substrate surface and an upper layer consisting of at least one ferromagnetic metal thin film, each ferromagnetic metal thin film being composed of columnar grains deposited by a oblique evaporation process, and

the average growth direction of columnar grains in said lower layer and the average growth direction of columnar grains in said upper layer intersect each other from opposite sides of a normal to the substrate surface, the thickness of said lower layer is 1.2 to 5.0 times the thickness of said upper layer,

and the magnetic multilayer has a coercive force Hc of 61.3 to 130.6 kA/m (800 to 1700 Oe), a residual magnetic flux density Br of 2.5 to 5.0 x $10^{-1}$ T (2500 to 5000 G) in the plane of said magnetic layer and a maximum magnetic flux density Bm of 3.0 to 7.0 x $10^{-1}$ T (3000 to 7000 G) in a tape longitudinal direction."

The claims of the auxiliary request differ from those of the main request by the deletion of claim 2 and consequent renumbering.

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

*Main request*

(i) *Added subject-matter - claim 1*

In claim 1 the omission of the upper limits to the ranges for coercive force Hc, residual magnetic flux density Br and maximum magnetic flux density Bm which

had been found at point 1 of the decision under appeal to be impermissible as contravening Article 123(2) EPC had been corrected. The upper limits specified at page 10, lines 12 to 16 of the application as originally filed had been restored.

(ii) *Added subject-matter and clarity - claim 2*

In order to meet the objection of lack of clarity claim 2 had been reformulated as an independent claim. The "layer" and "film" terminology of claim 2 was now distinct from that of claim 1 thus avoiding the unclarity which had been caused by conflating these two terminologies - involving different layer/film hierarchies - in a single claim. By the same token the combination in one claim of incompatible teachings based on elements of alternative embodiments in the original disclosure had been rectified.

*Auxiliary request*

By deleting claim 2 from the main request the potential problems arising from conflating and combining incompatible terminology and teachings from alternative embodiments had been obviated.

V. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of:

Claims 1 to 5 of the main request filed in the oral proceedings on 13 December 2000, or

Claims 1 to 4 of the auxiliary request filed in oral proceedings on 13 December 2000.

## Reasons for the Decision

1. The appeal is admissible.

2. *Main request - clarity*

2.1 The presence in one set of claims of incompatible terminology regarding the hierarchy of "layer" and "film", in particular in claims 1 and 2 respectively, makes the claims as a whole unclear. Thus, by way of example only, in claim 1 a critical parameter is ratio of total thicknesses of multilayer films and has a range 0.7 to 1.3, while in claim 2 an otherwise apparently cognate parameter is ratio of total thicknesses of multifilm layers and has a range of 1.2 to 5.0. The lack of clarity makes it difficult to decide whether there is a single general inventive concept involved, and, if so, what that might be, since the identification of corresponding technical features becomes very problematic; the differences in the claims may be simple differences in expression arising from different arbitrary choices of terminological hierarchy for "layer" and "film" or they may signify substantive structural differences. It also makes it difficult to assess support in the description for features in the claims since certain parts of the description may or may not be restricted to particular hierarchical senses of "layer" or "film". In particular, no sensible assessment of novelty and inventive step can be made in the face of such ambiguity.

2.2 The board concludes therefore that the claims of the main request, considered as a whole, do not meet the clarity requirement of Article 84 EPC. The main request falls therefore to be refused.

3. *Auxiliary request*

3.1 Clarity and support - Article 84 EPC

The objection mentioned at point 2 above has been met by deleting claim 2 of the main request.

3.2 *Added subject-matter - Article 123(2) EPC*

The added subject-matter objection set out at point 1 of the decision under appeal arising from the impermissible omission from claim 1 of the upper ends of the ranges specified for coercive force Hc, residual magnetic flux density Br and maximum magnetic flux density Bm has been met by restoration of these upper limits.

4. *Further proceedings*

Given the defects which existed in the application documents before the examining division, the latter has not yet been able to assess the application for compliance with all requirements of the EPC including novelty, inventive step and unity of invention. In the present case the board deems it appropriate not to exercise its power under Article 111(1) EPC to examine and decide these issues itself: firstly, so as to afford the applicant an opportunity to seek appellate review of any decision made and secondly, to enable the applicant to consider his further course of action in relation to the subject-matter of old claim 2 now deleted.

5. *Other considerations*

For the avoidance of doubt the board observes that in relation to the auxiliary request it has decided only that the claims thereof overcome the well-founded

objections of the examining division set out in the decision under appeal. Since the board cannot assume that the claims, description and drawings have taken their final form, it would be otiose for it to determine definitively that the present claims meet the requirements of Article 84 and 123(2) EPC in relation to the present description and drawings. It has not, for example, investigated what the effect is, if any, of the interpolation of the phrase "in the plane of said magnetic layer" in a passage in the last five lines of claim 1 which otherwise follows the wording of page 10, lines 13 to 16 of the application as originally filed, the "about" being omitted. The department of first instance is free to accept further amendments that may be necessary to overcome any outstanding deficiencies, provided that the further prosecution of the case is not inconsistent with the *ratio decidendi* of this decision.

## Order

**For these reasons it is decided that:**

1. The decision under appeal is set aside.

2. The main request is refused.

3. The case is remitted to the department of first instance for further prosecution on the basis of claims 1 to 4 of the auxiliary request filed in the oral proceedings, and the description and drawings as originally filed.

The Registrar: The Chairman:

M. Hörnell W. J .L. Wheeler