

**Internal distribution code:**

- (A) [ ] Publication in OJ  
(B) [ ] To Chairmen and Members  
(C) [X] To Chairmen

**D E C I S I O N**  
**of 3 November 1999**

**Case Number:** T 1151/97 - 3.5.2

**Application Number:** 85304218.2

**Publication Number:** 0168962

**IPC:** G11B 5/72

**Language of the proceedings:** EN

**Title of invention:**  
Magnetic recording medium

**Patentee:**  
Konica Corporation

**Opponent:**  
N.V. Philips' Gloeilampenfabrieken  
Agfa-Gevaert AG  
Fuji Photo Film Co., Ltd.

**Headword:**

-

**Relevant legal provisions:**  
EPC Art. 52(1), 54, 56, 123(2) and (3)

**Keyword:**  
"Novelty and inventive step - yes, after amendment"

**Decisions cited:**

-

**Catchword:**

-





Case Number: T 1151/97 - 3.5.2

**D E C I S I O N**  
**of the Technical Board of Appeal 3.5.2**  
**of 3 November 1999**

**Appellant:**  
(Opponent 03)

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)

**Other party:**  
(Opponent 01)

N.V. Philips' Gloeilampenfabrieken  
Groenewoudseweg 1  
5621 BA Eindhoven (NL)

**Representative:**

van der Veer, Johannes Leendert  
International Octrooibureau B.V.  
Prof. Holstlaan 6  
5656 AA Eindhoven (NL)

**Other party:**  
(Opponent 02)

Agfa-Gevaert AG  
-Patentabteilung-  
Postfach  
51368 Leverkusen (DE)

**Representative:**

Langfinger, Klaus-Dieter, Dr.  
BASF Aktiengesellschaft  
Carl-Bosch-Strasse 38  
67056 Ludwigshafen (DE)

**Respondent:**  
(Proprietor of the patent)

Konica Corporation  
26-2, Nishishinjuku 1-chome  
Shinjuku-ku  
Tokyo 163 (JP)

**Representative:**

Ellis-Jones, Patrick George Armine  
J.A. Kemp & Co.  
14 South Square  
Gray's Inn  
London WC1R 5LX (GB)

**Decision under appeal:** Interlocutory decision of the Opposition Division of the European Patent Office posted 6 October 1997 concerning maintenance of European patent No. 0 168 962 in amended form.

**Composition of the Board:**

**Chairman:** W. J. L. Wheeler  
**Members:** A. G. Hagenbucher  
B. J. Schachenmann

## Summary of Facts and Submissions

I. The appellant and two other parties filed oppositions against European patent No. 168 962. The appellant now contests the interlocutory decision of the opposition division posted 6 October 1997 concerning maintenance of the patent in amended form.

II. The following documents cited in support of the oppositions have been discussed during the present appeal proceedings:

D1: The SM-4 Symposium Proceedings Textbook, Symposium on Magnetic Media Manufacturing Methods, Hawaii, May 1983, R. S. Mihalik: "The Relationships between Polyurethane Binders and Various Binder Additives and Modifiers", pages E-2-1 to E-2-36,

D2: US-A-4 284 750 (see also DE-A-3 124 199),

D5: US-A-4 409 291,

D6: US-A-4 439 486 (see also DE-A-3 208 865) and

D14: WO 84/00241 (for language reasons reference is made to the corresponding European patent application D14': EP-A-112 925).

Reference has also been made to two certificates dated 17 March 1994, a first one (referred to hereinafter as CI) filed 5 April 1994 concerning Nippollan 3022 (mentioned in D14' as "N-3022") and a second one (CII) filed 15 April 1999 concerning Nippollan FR-11 (mentioned in D5 as "FR-11") and to an Affidavit (A) of

12 October 1998 (filed 22 October 1998) and signed by Mr Toshio Shimizu concerning both certificates CI and CII.

- III. Oral proceedings were held before the Board on 3 November 1999, during which, for reasons of clarity and legibility, the respondent filed an amended specification, consisting of description pages 2 to 26, claims 1 to 10 and Figures 1 to 8.

Claim 1 now reads as follows:

"1. A magnetic recording medium comprising a support, a magnetic recording layer and optionally a back-coating layer, at least one of said magnetic recording layer and said back-coating layer containing a urethane resin characterised in that the said magnetic recording layer or said back-coating layer contains both the urethane resin which has a yield point which is in the stress range of from 50 kg/cm<sup>2</sup> to 600 kg/cm<sup>2</sup> (4900 to 58840 kPa) and at least one of a vinyl chloride copolymer and a phenoxy resin, the weight ratio of said urethane resin to said vinyl chloride or phenoxy resin being from 30:70 to 80:20, and said magnetic recording layer contains a magnetic particle having a specific surface area in terms of BET value of 30 m<sup>2</sup>/g or higher."

Claims 2 to 10 are dependent on claim 1.

- IV. The appellant argued essentially as follows:

Claim 1 concerned a magnetic recording medium comprising a support, a magnetic recording layer and

optionally a back-coating layer with the following features:

- (a) The said magnetic recording layer or said back-coating layer contains both
  - (a1) a urethane resin which has a yield point which is in the stress range of from 50 kg/cm<sup>2</sup> to 600 kg/cm<sup>2</sup> (4900 to 58840 kPa) and
  - (a2) at least one of a vinyl chloride copolymer and a phenoxy resin, the weight ratio of said urethane resin to said vinyl chloride or phenoxy resin being from 30:70 to 80:20,
- (b) The magnetic recording layer contains a magnetic particle having a specific surface area in terms of BET value of 30 m<sup>2</sup>/g or higher.

A magnetic layer with the features (a2) and (b) was known from D14 (see Examples 1 to 10). Regarding feature (b) Examples 1 to 5 and 10 had a BET value of 45 m<sup>2</sup>/g and Examples 6 to 9 had a BET value of 60 m<sup>2</sup>/g. In Examples 3 and 4 a urethane resin and a vinyl chloride were used in weight ratios 50:50 and 40:60. Regarding feature (a1) it should be considered that urethane resins used for magnetic recording media normally had a yield point as could be seen from document D1 (especially page E-2-4, third paragraph and Figure 1, page E-2-5, first paragraph, page E-2-6, Figure 2 in which curve B was for a polyurethane resin as explained on page E-2-7, first paragraph and page E-2-8, last paragraph). The person skilled in the

art could easily find out which yield point was appropriate for an intended purpose. Even if document D1 warned on page E-2-15 against over-modification in order to avoid brittle coatings, no legally relevant prejudice could be derived from this statement. Document D1 conceded on page E-2-14, first paragraph that at least some improvement could be gained by modification; see also page E-2-15, first paragraph. Therefore, the subject-matter of claim 1 did not involve an inventive step.

D14 could even be considered as novelty destroying. According to pages 13 and 14 of D14' Examples 6 to 9 concerned magnetic recording media with a BET value of 60 m<sup>2</sup>/g. In Examples 7 to 9 a urethane resin (N-3022) was mixed with a polyester resin in weight ratios of 30:70, 50:50 and 60:40. It was shown by certificate CI that N-3022 had a yield point of 95 which was "at least 80". According to page 6, 2nd paragraph and page 8, lines 1 to 4 and claim 12 of D14', a vinyl chloride-based resin containing a sodium sulfonate group could be used in Examples 7 and 8 instead of a polyester resin. Essential was only the use of a polar group (e.g. sodium sulfonate). Customers expected that products marketed under a certain brand such as N-3022 remained unchanged through the years. It must therefore be assumed that N-3022 always had a yield point in accordance with certificate CI. As far as the effects are concerned, Table 3 of D14 showed only small differences between Examples 1 to 10 regarding the electrical properties and did not indicate any mechanical properties. It was clear, however, from the last paragraph on page 15 of D14' that also the surface properties including durability were improved by the

various binders disclosed in D14. It could be seen from Figure 9 of D1 that also Morthane CA-310 modified with nitrocellulose, PKHH and VAGH, having a yield point, could be used for a binder. Document D2 should be considered in addition to document D1. Claim 1 of the opposed patent contained "tactical limitations". Document D5 inherently also disclosed all the features of the present claim 1 because samples 3 and 4 of D5 concerned a magnetic recording medium comprising a support, magnetic recording layer containing a urethane resin, wherein the urethane resin (Nipollan FR-11) had a yield point which was of the order of 75 kg/cm<sup>2</sup>, the magnetic recording layer containing a vinyl chloride copolymer and the magnetic recording layer containing magnetic particles having - according to calculation - a specific surface area in terms of BET value of 32.8 m<sup>2</sup>/g, wherein the weight ratio of the urethane resin to the vinyl chloride resin was 30:70 (Example 3) and 60:40 (Example 4). The correct date of the beginning of manufacture of Nippollan FR-11 was November 1979, the date of the beginning of the mass production of "Nippollan FR-11" was April 1982.

Hence, claim 1 was not acceptable in view of the novelty and inventive step requirements.

V. The respondent's arguments can be summarized as follows:

Document D14 mentioned the material N-3022 but not that it had a yield point. Affidavit A proved that - contrary to the translations provided by the appellant - the Japanese versions of certificates CI and CII did not indicate that the properties of the products had

remained unaltered but only that their chemical compositions had remained unchanged. This was significant because the particular properties of a product depended on the reaction conditions under which it was made. With the same chemical composition products having different properties could be obtained. Therefore, it was not beyond reasonable doubt that N-3022 in D14 possessed a yield point of at least 50 kg/m<sup>2</sup> as specified in claim 1. In view of the plural form "polyester polyurethanes" in D5, column 2, line 16 pp. several forms of "FR-11" existed. According to the certificate CII the manufacture of Nippollan FR-11 commenced in April 1982. Since D5 was filed already on 26 March 1981 "FR-11" referred to therein was at best in an experimental stage but not necessarily the same as described in CII. There was furthermore no clear and unambiguous teaching in D14 towards a material which contained a polyurethane resin and vinyl chloride copolymer in the amounts recited in claim 1. The appellant's calculations concerning the BET value for the magnetic recording medium of D5 provided in the statement of grounds were based on a false premise because the magnetic particles were substantially conical in shape, but the calculations introduced corrections for the particle pores based on an assumed cylindrical shape.

Since D1 did not discuss the presence or absence of polar groups which were said in D14 to be crucial to success, the person skilled in the art would not consider D1 and D14 in combination. Examples 6, 7 and 10 in D14 did not demonstrate particularly advantageous properties of the obtained products. Apart from other advantages, the present invention aimed at providing a

recording medium having a high coercive force. Examples 7, 8 and 10 of D14 had a lower coercive force than Example 9 the composition of which was completely different from that specified in claim 1.

It had also to be considered that a selection of parameters from several lists could not destroy novelty of a subsequent invention. Since the prior art did not teach what the inventors had discovered, the claimed subject-matter involved an inventive step.

- VI. The appellant (opponent III) requested that the decision under appeal be set aside and that the European patent No. 168 962 be revoked.
- VII. The respondent (patentee) requested that the patent be maintained on the basis of description pages 2 to 26, claims 1 to 10 and Figures 1 to 8 all as submitted during the oral proceedings.

### **Reasons for the Decision**

1. The appeal is admissible.
2. *Article 123(2) and (3) EPC*

Claim 1 has been restricted with respect to granted claim 1 by incorporating the features of granted claims 8 and 11 and the ratio of urethane resin to vinyl chloride or phenoxy resin defined on patent specification page 8, lines 37 to 39 (page 21, second paragraph of the originally filed description). The present claim 1 is narrower in scope than granted

claim 1. The description has been adapted to the narrower scope of claim 1. In Table 14 obvious clerical errors concerning the particle size for alumina have been corrected in line with original claim 8 and the paragraph bridging original description pages 27 and 28. The present amended version of the patent complies with the requirements of Article 123(2) and (3) EPC.

3. *Novelty*

The appellant attacked present claim 1 filed during the oral proceedings for lack of novelty with respect to document D14. Examples 7 to 10 of D14 have feature (b) of claim 1 (see paragraph IV above) and Example 10 of D14 meets feature (a2) of claim 1 insofar as it describes a composition which contains a vinyl chloride copolymer and a urethane resin. The composition of Example 10, however, contains 80 parts by weight of the vinyl chloride copolymer and 20 parts by weight of a urethane resin. Thus the amount of urethane resin in Example 14 lies far below the minimum amount (30 parts by weight) of urethane resin required in feature (a2) of claim 1. Page 8 of D14 mentions that a resin having a specific polar group may be a polyester resin, a polyurethane resin, or a vinyl chloride-based resin, into which the specified polar group has been introduced. D14 does not specify, however, in which way such a replacement of one resin would influence the ratios between the resins, or that, in particular, the 70 parts and 50 parts by weight of polyester resin containing the sodium sulfonate group in Examples 7 and 8 could simply be replaced by equal parts by weight of a vinyl chloride containing the sodium sulfonate group used in Example 10. Although claim 1 of D14' defines a

magnetic recording material which contains a specific ferromagnetic metal powder and a binder in which the binder contains not less than 50% by weight of a resin containing at least one polar group selected from a list of specific groups, it does not mention the specific polymer N-3022 nor the presence of a vinyl chloride or phenoxy resin.

Therefore, no matter whether the resin N-3022 mentioned in D14 has a yield point in the range defined in claim 1 or not, the subject-matter of claim 1 is novel over D14 in view of the fact that the claim specifies the weight ratio of the urethane resin to the vinyl chloride or phenoxy resin being from 30:70 to 80:20 (feature (a2)).

The subject-matter of present claim 1 filed during the oral proceedings has not been objected to for lack of novelty with respect to the other prior art documents referred to during the present appeal proceedings. Regarding D5 it has to be considered that the theoretical calculations of the BET value for the magnetic medium of D5 provided in the statement of grounds were based on assumptions which cannot be derived from document D5 and that it is unclear whether "FR-11" (mentioned in D5) has a yield point as required by feature (a1) of present claim 1 in view of the plural form "polyester polyurethanes" in D5, column 2, line 16 ff.

Hence, the subject-matter of claim 1 is considered to be novel (Article 54 EPC).

4. *Inventive step*

The introduction of the present patent specification explains that the prior art of magnetic recording media was focussed on improving the magnetic and electromagnetic properties through improvement in the magnetic layer and on preventing powder drop-off. Starting from this generally known prior art, the problem addressed by the present invention is to provide a magnetic recording medium having adequate flexibility as well as sufficient mechanical strength and durability, which shows excellent running performance and low powder drop-off. The recording medium should also have good reproduction output and electromagnetic converting characteristics. Furthermore damage to the sliding partner such as a magnetic head should be avoided while retaining abrasion resistance of the magnetic layer; see EP-B-168 962, page 3, lines 47 to 52.

Document D14 (see pages 3 and 4) describes a magnetic recording medium having excellent magnetic characteristics, especially a high coercive force, a low noise level, a good squareness ratio and a good dispersibility of the ferromagnetic metal powder, resulting in excellent surface properties, durability and performance. As explained under point 3 above, the solution defined in the present claim 1 differs from that of Example 10 of D14, which is seen as the closest prior art, in that according to Example 10 the weight ratio of the urethane resin to the vinyl chloride resin is 20:80 whereas claim 1 requires a range of 30:70 to 80:20. Moreover, D14 does not disclose that the urethane N-3022, manufactured by Nippon Polyurethane Kogyo K.K., has a yield point at all, not to speak of the specific stress range of from 50 kg/cm<sup>2</sup> to

600 kg/cm<sup>2</sup> required by present claim 1. It is in dispute and not clearly proved that N-3022 mentioned for Example 10 of D14 indeed had a yield point within the limits defined in features (a1) of claim 1. D14 does not contain any indication that it is advantageous to use a binder which comprises a polyurethane resin having a yield point in combination with a vinyl chloride copolymer or phenoxy resin in the specific amount defined in present claim 1. Figure 3 of the present patent shows, however, that the RF output is markedly improved when a binder is used which contains a polyurethane resin with the specified yield point and a vinyl chloride copolymer in the range defined in claim 1. Even from a combined consideration of D14 and D1 such a solution with the specific RF output improvement cannot be derived.

From D1 it can only be learnt that polyurethanes having a specific yield point have, to a great degree, the basic tensile characteristics of an ideal binder system for a magnetic medium, see page E-2-8, last paragraph. D1 mentions a number of polyurethane resins which are suitable as binders in magnetic materials, see for instance page E-2-7, second paragraph. D1 gives a clear indication that these polyurethanes are preferred over polyurethanes having no yield point. However, D1 furthermore teaches that little if anything can be gained by the addition of the common resinous modifiers to polyurethanes having a yield point. The common resinous modifiers are nitrocellulose, vinyl chloride copolymers and phenoxy resins. Thus, D1 teaches away from the claimed composition of resins.

No different conclusion can be drawn from a combined

consideration of D2 and D14. D2 describes binders for magnetic materials which contain polyurethane resins having a yield point, see D2, claim 1 in combination with Table IV. D2, however, does not contain any indication that more advantageous results are obtained when in addition to the polyurethane resin a vinyl chloride copolymer or phenoxy resin in an amount as recited in claim 1 is present.

Since document D5 does not indicate that "FR-11" should have a yield point, not to speak of the claimed range, and that the magnetic particles should have a surface area in terms of BET value of 30 m<sup>2</sup>/g or higher, it does not encourage the person skilled in the art, even in combination with the other available prior art, to adopt the combination of parameters defined in claim 1.

Document D6 recommends nitrocellulose as a modifier together with a polyurethane. It does not mention that any of the numerous polyurethanes indicated, including Morthane CA-250 HV, has a yield point. Comparative Example 1 shows that when nitrocellulose is replaced by a vinyl chloride, wear resistance is bad. Therefore, D6 leads away from using vinyl chloride as defined in present claim 1 for solving the problem underlying the present invention.

Therefore, the subject-matter of claim 1 is considered as involving an inventive step within the meaning of Article 56 EPC.

5. The Board therefore concludes that independent claim 1 and dependent claims 2 to 10 are allowable. The amended patent documents 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 first instance with the order to maintain the patent as amended in the following version:

**Claims:** 1 to 10

**Description:** pages 2 to 26

**Drawings:** Figures 1 to 8

all as filed during the oral proceedings.

The Registrar:

The Chairman:

M. Kiehl

W. J. L. Wheeler