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**D E C I S I O N**  
**of 15 February 2006**

**Case Number:** T 0667/01 - 3.5.03

**Application Number:** 90109147.0

**Publication Number:** 0398255

**IPC:** G11B 7/24

**Language of the proceedings:** EN

**Title of invention:**

Optical recording medium and a system comprising a reproduction apparatus and the optical recording medium

**Patentee:**

SANYO ELECTRIC CO., LTD.

**Opponent:**

Akzo Nobel N.V.

**Headword:**

Optical recording medium/SANYO

**Relevant legal provisions:**

EPC Art. 54(2), 54(3), 123(2)

**Keyword:**

"Novelty - public availability (no)"  
"Novelty - prior European application (yes, after amendment)"  
"Amendments - disclaimer with respect to prior European application (admissible)"

**Decisions cited:**

G 0004/92, G 0001/03, T 1212/97

**Catchword:**

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Case Number: T 0667/01 - 3.5.03

**D E C I S I O N**  
of the Technical Board of Appeal 3.5.03  
of 15 February 2006

**Appellant:** SANYO ELECTRIC CO., LTD.  
(Proprietor of the patent) 5-5, Keihan-Hondori 2-chome  
Moriguchi-shi, Osaka (JP)

**Representative:** Glawe, Delfs, Moll  
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**Respondent:** Akzo Nobel N.V.  
(Opponent) Velperweg 76  
NL-6824 BM Arnhem (NL)

**Representative:**

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 11. April 2001  
revoking European patent No. 0398255 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** A. Clelland  
**Members:** A. J. Madenach  
M.-B. Tardo-Dino

## Summary of Facts and Submissions

- I. This is an appeal against the decision by the opposition division, posted on 11 April 2001, to revoke European Patent No 0 398 255.
- II. The decision of the opposition division to revoke the patent was based on the grounds of Art. 100(a) EPC. Inter alia the following documents were cited:
- D6: EP-A-0 376 327
- D9: "CD-compatible write-once disc with high refractivity [sic]", by E. Hamada, Y. Shin and T. Ishiguro, in Proceedings of the SPIE, The International Society for Optical Engineering (1989), vol. 1078, p. 80-87
- III. In their decision, the opposition division apparently considered the content of D9 to have been made available to the public before the priority date. The subject-matter of independent claims 1 and 3 of the main request was held not to be new having regard to the disclosure of D6 or D9. The same was said to apply to claim 1 of the first auxiliary request, which was identical to claim 3 of the main request. The subject-matter of claim 1 of the second as well as of the third auxiliary request was considered not to involve an inventive step with respect to the disclosure of D9.
- IV. The appellant (patentee) appealed on 11 June 2001 with the corresponding grounds of appeal being submitted on 9 August 2001. The appellant requested that the decision be set aside and the patent be maintained in amended form based on the claims of a main request, or

first, second or third auxiliary requests. As a further auxiliary measure, maintenance of the patent based on the above requests but without the disclaimer present in certain independent claims was requested. As a further auxiliary measure, oral proceedings were requested.

The appellant submitted that the subject-matter of claim 1 according to the newly filed main request was novel having regard to the disclosure of D6 and involved an inventive step having regard to the disclosure of D9, even if this document was part of the state of the art.

V. In the course of the appeal proceedings the following additional documents were introduced:

- E1: Letter by Mr. E. A. Pepper, SPIE director of publications, dated 22 May 2001 and relating to the publication date of D9
- E2: Computer printout relating to the publication date of D9
- E3: Document with the title "That's CD-R" by the same authors as D9 with similar content to that of D9
- E4: Declaration by Mr. E. Hamada dated 10 September 2001
- E5: Copies of slides with the title page "That's CD-R"

E1 - E3 were introduced by the appellant, E4 and E5 by the respondent.

The appellant submitted evidence (E1 and E2) which was intended to prove that the publication date of the printed document D9 was 19 May 1989, i.e. after the

claimed priority date of 17 May 1989. The appellant submitted further evidence (E3) which was intended to prove that document D9 did not give an accurate account of the earlier oral presentation from which it derived and which took place on 17 January 1989, i.e. before the claimed priority date.

VI. The opponent (respondent) requested in his letter of 23 November 2001 that the appeal be dismissed. As an auxiliary measure, oral proceedings were requested.

The respondent maintained that the invention according to claim 1 of the newly filed main request was not novel having regard to the disclosure of D6 and D9. With respect to D9, the respondent provided evidence (E4, E5) which was intended to prove that the publication D9 actually corresponded to what was presented during the earlier oral presentation. E4 is a declaration by one of the presenters of the oral presentation that D9 corresponded to what had actually been presented orally. E5 is a copy of a series of slides with a title page bearing the title "That's CD-R" and said to have been presented at the symposium.

The respondent also objected to the feature "where  $\delta_1$ ,  $\delta_2$ ,  $(m+1)\pi$  are in radian" present in the independent claims of all the requests as not having been originally disclosed and thus violating the requirements of Art. 123(2) EPC.

The respondent furthermore argued that in practice the value of the integer  $m$  specified in the independent claims was virtually always 0, but none of the media disclosed in the patent corresponded to such a value.

VII. In a reply of 29 May 2002 to the respondent's arguments, the appellant maintained that the claimed invention was new having regard to the disclosure of D6.

With respect to D9, the appellant requested that the respondent's evidence should not be considered because it was late filed, having been presented for the first time at the appeal stage, despite the fact that the appellant had consistently maintained during the opposition procedure that D9 had not been made available to the public in the course of the earlier lecture. Moreover, the declaration (E4) submitted as evidence was not to be relied upon since twelve years had passed between the lecture and the declaration. Furthermore, the declaration referred to the author's manuscript, which was, however, not included in the declaration. The slides of E5 were undated and their relation to the author's manuscript was unclear.

Finally, even if D9 were assumed to be published prior art, it was doubtful that it disclosed the claimed subject-matter.

VIII. On 21 October 2004, the board summoned the parties to oral proceedings. Together with the summons, the board issued a communication under Rule 11(1) of the Rules of Procedure of the Boards of Appeal. In this communication, the board gave its preliminary opinion that on the evidence on file, the content of D9 had not been proven to have been published before the priority date of the patent in suit, and it had not been shown beyond any reasonable doubt that the earlier oral presentation corresponded to the content of D9. The

board furthermore took the view that D6, which was a prior art document in the sense of Art. 54(3) and (4) EPC, was not prejudicial to the subject-matter of the main request.

- IX. With letter of 12 November 2004, the respondent declared that it would not attend the oral proceedings.
- X. On 26 November 2004, the board informed the parties that the scheduled oral proceedings were cancelled and that it intended to arrive at a decision on the basis of the written submissions.
- XI. In a communication of 2 March 2005, the Board indicated that it had found further problems in the subject-matter of claim 1 with respect to the disclosure of D6. On 18 October 2005, it again summoned the parties to oral proceedings.
- XII. Oral proceedings took place on 15 February 2006 in the absence of the respondent. In the course of the oral proceedings the board provided a calculation for the thickness of the recording layer using the parameters of example 3 of D6 and the equations of claim 1. The appellant thereupon amended his main request and submitted new claims 1-4 with a revised disclaimer and an amended description page 2. Auxiliary requests 1-3 as filed with the grounds of appeal were maintained, with a disclaimer corresponding to that of the main request. At the end of the oral proceedings, the chairman announced the board's decision.

XIII. Claim 1 of the main request reads:

"An optical recording medium comprising a light-transmitting recording layer (2), a reflecting layer (3) formed on the rear surface of the recording layer (2) and a transparent substrate (1) located on the front side of the recording layer, the recording layer (2) being adapted to record data thereon by being locally irradiated with a light beam on the front surface thereof through the transparent substrate and thereby reduced in thickness for forming pits, the light irradiated through the transparent substrate (1) is reflected partly at the interface (11) of the substrate (1) and the recording layer (2) and partly at the interface (21) of the recording layer (2) and the reflecting layer (3),

characterized in that the reflectance of the recording medium resulting from these reflections is a function of the thickness (d) of the recording layer (2) having maxima and minima at predetermined values of said thickness (d),

and that the thickness (d) of the recording layer in the unrecorded state is set to a predetermined value where the reflectance is a maximum, a thickness (d<sub>2</sub>), which gives the maximum reflectance is expressed by the following equation,

$$d_2 = \frac{\lambda}{4\pi n_1} \{(m+1)\pi + \delta_1 + \delta_2\}$$

$$\delta_1 = \tan^{-1} \frac{2k_1 n_0}{n_1^2 - n_0^2 + k_1^2}$$



$$\delta_2 = \tan^{-1} \frac{2(k_1 n_2 - k_2 n_1)}{n_2^2 - n_1^2 + k_2^2 - k_1^2}$$

where  $\delta_1$ ,  $\delta_2$ ,  $(m+1)\pi$  are in radian,  $\lambda$  is a wavelength of a laser beam and is 0.78  $\mu\text{m}$ ,  $n_0$  is a refractive index of the substrate (1) at wavelength  $\lambda$ , and  $m$  is an integer giving positive  $d_2$  value and  $m$  is set to the smallest possible value, and the extinction coefficient ( $k_2$ ) of the reflecting layer (3) at wavelength  $\lambda$  is larger than that ( $k_1$ ) of the recording layer (2) at wavelength  $\lambda$  and that the refractive index ( $n_2$ ) of the reflecting layer (3) at wavelength  $\lambda$  is smaller than that ( $n_1$ ) of the recording layer (2) at wavelength  $\lambda$ , but not including the condition of the substrate made by polycarbonate, reflecting layer made by gold and the recording layer having optical characteristics of  $n_1=2.4$ ,  $k_1=0.05$  and thickness of the recording layer is  $d_2=140\text{nm}$ , wherein all features of the excluding condition have to be fulfilled at the same time, also not including the condition of the substrate made by polycarbonate, reflecting layer made by gold and the recording layer having optical characteristics of  $n_1=2.45$ ,  $k_1=0.06$  and thickness of the recording layer is  $d_2=140\text{nm}$ , wherein all features of the excluding condition have to be fulfilled at the same time, and also not including the condition of the substrate made by polycarbonate, reflecting layer made by gold and the recording layer having optical characteristics of  $n_1=2.35$ ,  $k_1=0.08$  and thickness of the recording layer is  $d_2=140\text{nm}$ , wherein all features of the excluding condition have to be fulfilled at the same time."

Independent claim 3 of the main request relates to a "system comprising a reproducing apparatus having a reproducing light beam and an optical recording medium", the optical recording medium being essentially that defined in claim 1.

## **Reasons for the Decision**

### *Main request*

1. *Admissibility of amendments (Art. 123(2) and (3) EPC) and support (Art. 84 EPC)*

Claims 1 to 4 were filed during the oral proceedings. The question of their admissibility accordingly arises since they were filed at a late stage of the procedure and in the absence of the respondent.

- 1.1 With regard to the time of filing, the board notes that the amendments were made in an attempt to overcome the objections raised in the communications of 2 March and 18 November 2005 and discussed during the oral proceedings. They take form of an additional disclaimer. In the board's view these amendments are straightforward and merely serve to remedy the objections previously raised without raising new issues which would delay the procedure. The board was in consequence in a position to maintain the patent in amended form as discussed below.
- 1.2 According to Article 113(1) EPC, the decisions of the European Patent Office may only be based on grounds or evidence on which the parties concerned have had an

opportunity to present their comments. In the present case, the question arises as to whether the opponent would have been entitled to claim that he was taken by surprise as a result of the board admitting the amendments filed in his absence during the oral proceedings. The board considers that this is not the case and that admitting the claims as amended during oral proceedings in the absence of the opponent does not conflict with the requirements of Article 113(1) EPC or indeed with opinion G 4/92 (OJ EPC 1994, 149) of the Enlarged Board of Appeal. According to this opinion, a party who fails to appear at oral proceedings must have the opportunity, in accordance with Article 113(1) EPC, to comment on new (and therefore surprising) facts and evidence submitted in these proceedings. In the present case, the objections to the claims were not new, having been raised in the communications of 2 March and 18 November 2005. In such a situation, the opponent could not have been taken by surprise by amended claims, because he could reasonably expect the appellant to try to overcome these objections.

Therefore, the board admitted the claims filed during oral proceedings into the procedure.

- 1.3 In the course of the opposition proceedings, three equations were introduced into claims 1 and 3; these correspond to equations 14, 7 and 8 of the originally filed application. The feature "where m is set to the smallest possible value", also introduced during the opposition proceedings, is found on page 18, lines 5 to 7 of the originally filed application. The original disclosure of the equations and of this feature was not put into question by the respondent.

1.4 The respondent did however raise objection under Article 123(2) EPC to the introduction into claims 1 and 3 of the feature " $\delta_1, \delta_2, (m+1)\pi$  are in radian". This feature was not explicitly disclosed in the original application. In the board's view it is, however, simply a clarification. In the equation

$$d_2 = \frac{\lambda}{4\pi m_1} \{(m+1)\pi + \delta_1 + \delta_2\}$$

the angles  $\delta_1, \delta_2, (m+1)\pi$  must be understood as being in radians since any angle based on  $\pi$  is by definition in radians.

1.5 Finally, the disclaimer in claims 1 and 3 was introduced in order to restore novelty by delimiting these claims against state of the art under Article 54(3) and (4) EPC. In the light of the decision G 1/03 (OJ EPO 2004, 413) of the Enlarged Board of Appeal, the introduction of disclaimers is allowable under such circumstances (see Order 2.1). The board is also satisfied that the disclaimer corresponds to the requirements of conciseness and clarity explicitly addressed in the decision of the Enlarged Board (point 3, 3rd paragraph) as it disclaims 3 pairs of parameters in addition to properties common to these parameters in a way immediately comprehensible to the skilled person.

1.6 As the above amendments derive from the application as originally filed and do not extend the protection conferred by the European patent, they comply with the requirements of Art. 123(2) and (3) EPC.

- 1.7 The respondent's argument in his letter of 23 November 2001 that the smallest possible value of  $m$  was virtually always  $m = 0$  and that none of the disclosed media satisfied this requirement is understood as an objection under Art. 84 EPC.

The board agrees that an apparent lack of clarity arises from the use of the term "smallest possible value". This term is, however, to be interpreted in the context of lines 21-49 on page 6 of the patent from which it appears that there is a trade-off between the value of  $m$ , and hence the recording layer thickness, and the required laser power. It would be clear to the skilled person that the lower limit to the value of  $m$  is given by the thinnest technically feasible recording layer. Thus, the formulation "smallest possible value" is to be understood in this context.

2. *Public availability of the content of D9, Art. 54(2) EPC*

- 2.1 D9 is apparently based on a lecture given at a meeting sponsored by the International Society for Optical Engineering (SPIE) and which took place on 17 January 1989, i.e. before the claimed priority date of the patent in suit. It is common ground that the meeting was open to the public. D9 does not have a specific publication date.

In the absence of any evidence to the contrary, the board considers that the declaration by the SPIE director of publications given in E1 together with the accompanying printout E2 relating to the publication

date of D9 sufficiently prove that D9 was actually published on 19 May 1989 and thus after the claimed priority date of the patent in suit. D9 is therefore not part of the state of the art under Art. 54(2) EPC. The respondent has not contested this finding.

- 2.2 It is, therefore, necessary to investigate the extent to which the oral presentation before the claimed priority date was based on the content of D9.
- 2.3 It follows from the established case law of the Boards of Appeal that a written publication allegedly based on a paper previously read at a public meeting held some time earlier cannot be assumed to be identical to what was orally disclosed. Reference is made to decision T 1212/97, unpublished, points 1-13 of the reasons, which states that the content of a prior publication which is material for the maintenance or revocation of a patent must be proved beyond any reasonable doubt. With respect to oral presentations during a conference, a declaration of the presenter as to the content of his presentation is not usually regarded as sufficient since the presenter may have deviated during his presentation from what he intended to present and from what he later remembers as having presented, or he may have presented relevant issues in such a way that the audience was unable to take note of it. If the extent to which the audience understood the presented issues remains uncertain, the established standard of proof typically requires a further, independent statement by a person having attended the presentation. In the present case, the statement E4 by one of the presenters, Dr. Hamada, relating to the content of the presentation was made 12 years after the presentation. There must

remain considerable doubt as to whether the presenter can, after such a long period, still remember what exactly was presented. The statement E4 was accompanied by a number of copies of slides E5 titled "That's CD-R" by the same authors as D9. No statement of a member of the audience and no independent proof was given as to whether any or all of the slides were presented during the conference.

- 2.4 In the absence of independent proof as to whether the content of D9 was actually made available to the public before the claimed priority date, the board considers there is insufficient evidence that this was the case, according to the usual standard of proof. The disclosure of D9 is therefore not considered to be prior published and therefore not relevant to novelty and inventive step.

The board has arrived at this conclusion without taking into account document E3, submitted by the appellant in order to prove that the oral presentation given on 17 January 1989 was different from the content of D9.

3. *Novelty with respect to the disclosure of D6, Art. 54(3) EPC, main request*

- 3.1 Claim 1 of the main request relates to an optical recording medium having a three layer structure with a transparent substrate 1, a light-transmitting recording layer 2 and a reflecting layer 3 arranged in that order, the recording layer being adapted to be of variable thickness locally in response to a light beam in order to record data. It appears to be common ground that

such three layer structures were known at the claimed priority date.

The reflectance of the recording layer is determined according to physical laws by various parameters including its thickness. Again according to physical laws, the reflectance shows maxima and minima as a function of the thickness of the recording layer and determined by various parameters as given by the equations in claim 1.

As the physical laws given by the equations in claim 1 merely describe the reflectance properties of the above three layer system, the invention is understood to reside in the following features:

- (i) the thickness of the recording layer in the unrecorded state is set to a predetermined value where the reflectance is maximum,
- (ii) the wavelength  $\lambda$  of a laser beam is set to 0.78  $\mu\text{m}$ ,
- (iii) the integer  $m$ , which is a free parameter determining possible maxima, is set to the smallest possible value,
- (iv) the extinction coefficient  $k_2$  of the reflecting layer at wavelength  $\lambda$  is set higher than the corresponding value  $k_1$  of the recording layer,
- (v) the refractive index  $n_2$  of the reflecting layer at wavelength  $\lambda$  is set smaller than the corresponding value  $n_1$  of the recording layer.



Three specific sets of parameters corresponding to three specific disclosed in D6, are excluded.

3.2 In comparison with D6, the following is found:

Features (iv) and (v) result from the fact that the reflecting layer is a metal. All prior art is assumed to meet this condition; with respect to D6 reference is made to page 13, lines 44 and 45 and table 1.

Feature (ii) appears to be standard in the art and is disclosed in D6, see p. 14, l. 4.

Features (i) and (iii) do not follow explicitly from D6. They can, however, be determined by the parameters given in table 1, sample 2 on page 14 of D6 with the help of the equations of claim 1. The calculation was presented by the respondent during the oral proceedings before the opposition division and corresponds to annex page 2/7 of the minutes of those oral proceedings. It results in a value  $d_2$  of 140.9 nm for a minimum value  $m$  of 1. The actual value of  $d_2$  according to table 2, example 2 on page 15 of D6 is 140 nm.

A similar calculation (see respondent's letter of 23 November 2001) can be performed for the parameters given in table 1, sample 1 on page 14 of D6 resulting in a value  $d_2$  of about 135 nm for a minimum value  $m$  of 1. The actual value of  $d_2$  according to table 2, example 1 on page 15 of D6 is 140 nm.

Since D6 is prior art under Art. 54(3) EPC it is only relevant to the novelty of the subject-matter of claim 1. However, it follows from page 1/7 of the above

annex to the minutes that the thickness of the recording layer in the example given in the patent in suit on page 6 (the reference to page 5 in said annex is apparently a mistake), lines 12-17 deviates in a similar manner from the thickness value as calculated from claim 1. Furthermore, claim 1 as granted comprises the wording "is a maximum or close to maxima". From this, the board concludes that claim 1 of the main request has to be interpreted such that it actually comprises thickness values close to the values given in the claim. From the above comparison between the example on page 6 of the patent and the value derived from claim 1, it follows that "close to" must embrace a deviation of about 10%.

Therefore, upon a proper interpretation D6 discloses all of the above features i - v.

3.3 The subject-matter of claim 1 is, however, rendered novel with respect to the teaching of D6 by the introduction of a disclaimer directed to the specific features of examples 1, 2 and 3 of D6.

3.4 The respondent argued in his letter of 23 November 2001 that the disclaimer in claim 1 only excluded examples of D6 and did not take away the novelty-destroying teaching of D6 as a whole. The mathematical description in claim 1 had already been disclosed in D6.

The board notes that the respondent's arguments have already been considered under point 3.2 above. The respondent was not able to show that D6 disclosed an optical recording medium "not including the condition of the substrate made by polycarbonate, reflecting

layer made by gold and the recording layer" having optical characteristics other than those given by the examples.

3.5 As a result, D6 is not relevant for considering the patentability of the subject-matter of the claims according to the main request.

3.6 Similar arguments apply, *mutatis mutandis*, to independent claim 3.

4. Thus none of the objections raised by the respondent against the subject-matter of the claims of the main request are convincing. Therefore, the appellant's main request is found allowable and, consequently, it has not proved necessary to consider the auxiliary requests.

**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 on the basis of:
  - Claims 1 - 4 as filed during the oral proceedings
  - Description pages 1 - 7 of the patent as granted with the amendment to page 2 filed during the oral proceedings
  - Figures 1 - 9 of the patent as granted

The Registrar

The Chairman

D. Magliano

A. S. Clelland