

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DEREK D. CHAPMAN, JAMES C. FLEMING,
RAMANUJ GOSWAMI and CSABA A. KOVACS

Appeal No. 1999-0056
Application No. 08/734,431

ON BRIEF

Before KIMLIN, GARRIS and WARREN, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-4, all the claims in the present application. Claim 1 is illustrative:

1. An optical recording element having a transparent substrate and on the surface of said substrate, a recording layer and a light reflecting layer wherein (a) the

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unrecorded layer is such that the real part of the refractive index (n) at 780 nm, is not less than 1.8, and the imaginary part (k) is not greater than 0.15 and (b) the recording layer comprises one or more tetra dyes having a metallized azo dianionic dye with cationic dye counterions and (c) the recording layer thickness from 225 to 300 nanometers.

The examiner relies upon the following references as evidence of obviousness:

Howe et al. (Howe)	4,577,306	Mar. 18, 1986
Namba et al. (Namba)	4,735,889	Apr. 5, 1988
Kovacs et al. (Kovacs)	5,272,047	Dec. 21, 1993
Chapman et al. (Chapman)	5,426,015	Jun. 20, 1995
Shuttleworth et al. (Shuttleworth)	5,547,727	Aug. 20, 1996 (filed Dec. 13, 1994)

Douglas A. Skoog et al. (Skoog), Principles of Instrumental Analysis 150-52 (Saunders College/Holt, Rinehart and Winston 1980)

Appellants' claimed invention is directed to an optical recording element wherein the recording layer comprises one or more tetra dyes having a metallized azo dianionic dye with cationic dye counterions, and has a thickness in the range of 225-300 nanometers. According to appellants, "[t]he tetra dyes, including mixtures of such dyes, together with thicker recording layers provide improved laser recording sensitivity and superior recording layer performance" (page 2 of Brief, last paragraph).

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Appealed claims 1-4 stand rejected under 35 U.S.C. § 103 as being unpatentable over Chapman in view of Skoog, Howe and Kovacs, taken together, or in further view of Shuttleworth, or in still further view of Namba.

We have thoroughly reviewed the respective positions advanced by appellants and the examiner. In so doing, it is our judgment that the examiner has not presented sufficient evidence to support a legal conclusion of obviousness. Accordingly, we will not sustain the examiner's rejections.

The examiner apparently acknowledges that Chapman, the primary reference, which appellants concede describes some of the materials used in the present invention, does not disclose the claimed thickness for the recording layer. However, it is the examiner's position that, in accordance with Beer's Law,

[i]t would have been obvious to one skilled in the art to coat the Chapman et al. '015 to higher optical densities merely by increasing the coating thickness or absorber concentration . . . and increase the sensitivity of the recording medium merely due to the increased absorption of the laser light by the layer . . ." [page 5 of Answer, last paragraph].

In addition, the examiner reasons that it would have been obvious for one of ordinary skill in the art "to increase the

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sensitivity by increasing the coupling of light into the recording layer by optimizing the absorbance of the recording layer by optimizing both the dye concentration and thickness of the recording layer based upon the teachings of Howe et al. '306 to do so" (page 5 of Answer, last paragraph).

While the examiner's position seems reasonable in the first instance, particularly regarding the obviousness of optimizing the thickness of the recording layer based on the teachings of Howe, we find that the examiner's position has been effectively refuted by the Rule 1.132 Declaration of James C. Fleming, one of the present inventors who holds a PhD in organic chemistry and is an expert in the field of optical recording elements. According to Dr. Fleming, the examiner's reliance on Beer's Law is flawed on at least two accounts for the following reasons:

First, even if Beer's Law would be a dominant factor, as the thickness increases and more energy is absorbed, the energy absorbed per unit mass remains the same. Therefore, the energy available for mark formation remains the same. Second, this becomes a moot point because in thin layers the predominant effect is the interference effect and not Beer's Law [page 2 of Declaration, paragraph 4].

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According to Dr. Fleming, the finding that the thicker recording layer is more sensitive was surprising and unexpected because "[i]t follows that the energy per unit mass available for mark formation in the thicker layer should be less than in the thinner layer" (page 2 of Declaration, paragraph 4).

Regarding the disclosure of Howe, Dr. Fleming states that Howe "shows that increased absorption occurs at the **second reflectance minimum** relative to the first minimum, and they indicate a preference for that thickness, whereas the present invention deals with (at or near) the **second reflectance maximum** relative to the first maximum" (page 3 of Declaration, first full paragraph). Dr. Fleming goes on to state the following at page 3 of the Declaration:

These two situations are quite different. Howe et al. teaches that more light is absorbed at the second reflectance minimum. This does not teach us that increased recording **efficiency** would be observed in the CD-R application by working at the second reflectance maximum. In the present invention, we show that when the recording layer thicknesses are coated near the first and second reflectance maxima so that about the same amount of light is being absorbed, a 2mW sensitivity increase is observed with the second reflectance maximum coating. This

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unobvious finding has nothing to do with Howe et[.] al's teaching. . . . To our surprise, coatings with such high reflectivity near the second maximum and with about the same absorption as at the first maximum showed a 2mW sensitivity (efficiency) advantage over coatings near the first maximum.

In our judgment, the factual findings which serve as the underpinnings of the examiner's conclusion of obviousness have been rebutted by an expert in the field of the presently claimed invention, namely, optical recording elements. Accordingly, based on the present record, we are constrained to reverse the examiner's rejections.

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In conclusion, based on the foregoing, the examiner's
decision rejecting the appealed claims is reversed.

REVERSED

EDWARD C. KIMLIN)	
Administrative Patent Judge)	
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BRADLEY R. GARRIS)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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CHARLES F. WARREN)	
Administrative Patent Judge)	

ECK:clm

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Sarah Meeks Roberts
Eastman Kodak Co.
Patent Legal Staff
Rochester, NY 14650-2201