

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

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GUO-FU ZHOU,
JOHANNES CORNELIS NORBERTUS RIJPERS,
ERWIN RINALDO MEINDERS,
and HERMANUS JOHANNES BORG

Appeal 2007-0409
Application 10/479,203
Technology Center 1700

Decided: May 15, 2007

Before, BRADLEY R. GARRIS, CHUNG K. PAK, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the Examiner's final rejection of claims 1-20, the only claims pending in this application. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

Appellants' invention relates to an optical data storage medium for recording by a focused laser-light beam. Independent Claims 1 and 12 are reproduced below:

1. An optical data storage medium for rewritable recording by means of a focused laser-light beam, said medium having a substrate with deposited on a side thereof a recording stack comprising:

- at least one transparent layer,
- a phase-change type recording layer, and
- a metal reflective layer,

characterized in that the transparent layer comprises indium tin oxide and is interposed between the recording layer and the metal reflective layer.

12. A rewritable optical data storage medium, having a substrate with deposited on a side thereof a recording stack comprising:

- a transparent layer of indium tin oxide,
- a phase-change type recording layer, and
- a metal reflective layer,

characterized in that the transparent layer of indium tin oxide is interposed between the recording layer and the metal reflective layer.

The Examiner relies on the following prior art references to show unpatentability:

Uchiumi	JP 61-208648	Sep. 17, 1986
Nonaka	EP 1 001 415 A1	May 17, 2000

The Examiner made the following rejections¹:

1. Claim 2 under 35 U.S.C. § 112, first paragraph for failing to comply with the written description requirement;
2. Claims 13 and 14 under 35 U.S.C. § 112 second paragraph as indefinite; and
3. Claims 1, 3-5, 9, 11-12, and 14-16 under 35 U.S.C. § 102(b) as anticipated by Uchiumi.
4. Claims 1-20 under 35 U.S.C. § 103(a) as unpatentable over Uchiumi in view of Nonaka.

ISSUES

I. The Examiner contends that the Specification does not provide support for a transparent layer having a thickness of 10 nm or less. Appellants contend that one of ordinary skill in the art, upon reading the Specification, would have understood that the inventors had possession of the entire claim 2 range of less than 25 nm although there is no explicit disclosure of the entire range. The issue before us is: Does the omission of any discussion as to minimum thickness in Appellants' Specification reasonably convey to the artisan that Appellants had possession of the range of 10 nm or less at the time of the invention?

¹ The rejection of claims 12-18 and 20 under 35 U.S.C § 112, second paragraph, has been withdrawn. (Answer 3).

For the reasons discussed below, we answer this question in the negative.

II. The Examiner contends that Uchiumi discloses the invention as claimed in each of claims 1, 3-5, 9, 11, 12, and 14-16. Appellants contend that the Examiner's findings are not sufficient to establish a prima facie case of anticipation. The issue before us is: Has the Examiner properly established that each of the recited claim elements is either expressly or inherently taught by Uchiumi?

For the reasons discussed below, we answer this question in the affirmative.

III. The Examiner contends that it would have been obvious to one of ordinary skill in the art to add the boundary layers of Nonaka to the recording medium of Uchiumi. Appellants contend that one of ordinary skill in the art would not have combined Uchiumi and Nonaka because Nonaka is intended to function as rewritable media while Uchiumi's recording layer is allegedly not rewritable. The issue for us to decide is: Has the Examiner made sufficient factual findings to establish reasonable expectation of success in combining Uchiumi with Nonaka?

For the reasons discussed below, we answer this question in the affirmative.

RELEVANT FINDINGS OF FACT (“FF”)

Uchiumi

- (1) Uchiumi is directed to manufacturing methods for optical recording media. Uchiumi teaches that a recording can be generally performed by varying the conditions of recording films while light is selectively radiated between amorphous crystal and crystal or between crystals. (Uchiumi 2).
- (2) Uchiumi Figure 1 shows a layered stack comprising a substrate 1, transparent film 2, recording film 3, protective film 4 and metal electrode film 5.
- (3) In Example 1, the layered stack comprises a disk glass substrate 1, an electrode film 2 of SnO₂ and ITO having a preferred thickness of 50 to 500 nm, a recording film 3 of an alloy of Te and Sn having a thickness of 150 nm, a protective film 4 of SnO₂ or ITO having a thickness of 150 nm, and a chromium electrode film 5 having a thickness of 200 nm.
- (4) According to Uchiumi, the electrode film 2 of SnO₂ and ITO acts as a protective film. (Uchiumi 4).
- (5) In Examples 1-3 of Uchiumi, the recording film 3 of Te and Sn is deposited in an amorphous state (*see* Uchiumi 5, ¶ 1) and then crystallized by heat treatment (*see* Uchiumi 5, ¶ 4).
- (6) Uchiumi teaches that each of the optical recording media of Examples 1-3 is rewritable. (Uchiumi 8:7-8).

Nonaka

- (7) Nonaka discloses an optical recording medium wherein recording and erasure of information are affected by reversible phase change between the amorphous phase and the crystalline phase of the recording layer. (Abstract).
- (8) Nonaka describes conventional rewritable phase change type optical recording medium technology as follows:

The conventional optical recording media have a recording layer mainly composed of tellurium, etc., and for recording, the recording layer in the crystalline state is irradiated with focused laser beam pulses for a short time, to be partially molten. The molten portions are quickly cooled and solidified by thermal diffusion, to form recorded marks of the amorphous state. The light reflectance of the recorded marks is lower than that of the crystalline state, and they can be optically reproduced as recorded signals. For erasing, the recorded marks are irradiated with a laser beam, to be heated to a temperature lower than the melting point and higher than the crystallization point of the recording layer, to crystallize the amorphous recorded marks, for restoring the original non-recorded state. [0002].

- (9) Nonaka's recording medium comprises, in order, a substrate, a first dielectric layer, a first boundary layer, and a recording layer. (Abstract). A second boundary layer may be formed on the recording layer on the side opposite the first boundary layer. [0023].
- (10) The boundary layers are mainly composed of oxides, carbides and nitrides of elements belonging to group 3A through group 6B of the 2nd period through the 6th period in the periodic table which include In, Sn, Zn, Al, and Si [0026].

- (11) The thickness of the first boundary layer is preferably 0.5 to 10 nm. [0039].
- (12) The thickness of the second boundary layer is preferably 0.5 to 50 nm. [0040].
- (13) According to Nonaka, the boundary layer reduces deterioration due to repeated overwriting. [0018].
- (14) “The dielectric layers act to prevent the recording layer from [sic, from] being deformed or opened during recording.” [0004].
- (15) Nonaka teaches that Te alloys, including alloys of Ge, Sb, Te, and Sn may be used as the recording layers in rewritable phase change type optical recording media. [0047] & [0050]. According to Nonaka, it is known that Te alloys have a high crystallization rate and allow high speed overwriting. [0003].
- (16) According to Nonaka, known materials used as the dielectric layer in contact with the recording layer include sulfides such as ZnS and a mixture film of ZnS and SiO₂. [0005].

ANALYSIS AND CONCLUSIONS

Rejections under 35 U.S.C. § 112:

Rejection of claims 13 and 14 under 35 U.S.C. § 112, ¶ 2

Appellants do not contest the Examiner’s finding that claims 13 and 14 contain a typographical error (i.e., double recitation of the phrase “transparent layer”) which renders these claims indefinite. (Reply Br. 3).

Because it is uncontested, the rejection is summarily affirmed.

Rejection of claim 2 under 35 U.S.C. § 112, ¶ 1

According to the Examiner, the Specification, as originally filed, does not provide support for the transparent layer having a thickness of "less than 25 nm" as recited in claim 2. (Answer 3-4). Appellants concede that there is no explicit disclosure of the recited range, but argue that the disclosure of the application as originally filed reasonably conveys to the artisan that Appellants had possession of this range at the time of the invention. (Br. 5). *See In re Kaslow*, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983). In support of their contention, Appellants direct us to the Specification, page 5, lines 4-8, which discloses a preferred thickness of 10-50 nm and further states that a transparent layer which is too thick may have a negative impact on the recording stack. Appellants assert that the absence of any discussion regarding minimum thickness provides sufficient evidence to support the full claim 2 thickness range of "less than 25 nm." (Br. 5). Like the Examiner, we fail to see how the omission of language in the Specification demonstrates that Appellants, at the time of the invention, contemplated a transparent layer having a thickness in the range of 0 to 10 nm. *See In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976).

The rejection is affirmed.

Prior Art Rejections:

Appellants' brief includes separate headings for each of claims 1-20. However, Appellants do nothing more than point out what each claim recites. Therefore, we do consider Appellants' Brief as presenting arguments for separate patentability of the claims. *See 37 C.F.R.*

41.37(c)(1)(vii). In any event, we note that the Examiner has addressed, and persuasively demonstrated, that each of the appealed claims is prima facie anticipated and/or obvious for the reasons stated in the Answer. For the reasons discussed below, we find that Appellants have failed to overcome the Examiner's prima facie showing of anticipation as to claims 1, 3-5, 9, 11, 12, and 14-16, and prima facie showing of obviousness as to appealed claims 2, 6-8, 13, and 17-20.

Rejection of claims 1, 3-5, 9, 11, 12, and 14-16 under 35 U.S.C. § 102(b)

The Examiner found that Uchiumi discloses the invention as claimed in each of claims 1, 3-5, 9, 11, 12, and 14-16. Appellants argue that the Examiner's findings are not sufficient to establish that Uchiumi teaches each of the recited claim limitations. (*See Reply Br. 4-5*). We address Appellants' arguments as to each of the claim limitations in turn.

Appellants argue that the Examiner has not provided evidence that a Te-Sn recording layer is rewritable. The Examiner found that Uchiumi's Te-Sn recording layer is inherently rewritable based on specific disclosures in the Specification that the recording layer changes between amorphous and crystalline phases. The Examiner also relied on Uchiumi's explicit statement that the optical recording media of Examples 1-3 is rewritable. (*Answer 7*). Based on these findings, we fail to see any merit in Appellants' argument. Moreover, we note that the Examiner's position is supported by Nonaka's teaching that Te alloys, including alloys of Ge, Sb, Te, and Sn may be used as the recording layers in rewritable phase change type optical recording media. (FF 15).

Appellants argue that Uchiumi fails to disclose a dielectric layer. The Examiner found that the recitation of a “dielectric layer” is met by Uchiumi’s electrode film 2. (Answer 8, ¶ 2). In our view, the Examiner’s finding is reasonable, particularly given Appellants’ disclosure that SiO₂, Ta₂O₅, SiO₂, and ZnS may be used for the claimed dielectric layer (*see* Specification 4:18-29). The Examiner’s finding also appears to be supported by Uchiumi’s teaching that electrode film 2 serves as a protective film (FF 4) and Nonaka’s teaching that dielectric layers act to prevent the recording layer from being deformed or opened during recording (FF 14), thereby acting as protective layers. Appellants have not presented evidence to refute the Examiner’s finding, such as evidence which shows that Uchiumi’s layer of SnO₂ and ITO does not act as a dielectric layer.

Appellants argue that Uchiumi does not disclose a further transparent layer having a thickness in the range of 50 to 250 nm. As pointed out by the Examiner, the claims, as drafted, do not require three separate layers, i.e., two transparent layers and a dielectric layer. Appellants have failed to refute the Examiner’s finding that Uchiumi teaches a recording media having a first layer which meets the limitation of Appellants’ claimed first transparent layer and a second layer which meets the claim limitation of a dielectric layer (claims 5 and 16) or a second transparent layer (claims 4, 9, and 15). (Answer 8).

Appellants argue that Uchiumi does not disclose or suggest high data rate recording. The Examiner found that Uchiumi's data storage medium would inherently record data at a high rate because of rapid heat dissipation through the ITO layer to the 200 nm metal layer. (Answer 11). This finding is supported by Nonaka's teaching that it is known that Te alloys have a high crystallization rate and allow high speed overwriting. (FF 15). Thus, in our view, the Examiner properly shifted the burden to Appellants to present evidence showing that Uchiumi's data storage medium cannot be used for high data storage. *See In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)("[W]hen the PTO shows sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not."). Appellants have not met this burden.

For the foregoing reasons, we find that Examiner has established a prima facie case of anticipation as to claims 1, 3-5, 9, 11, 12, and 14-16, which Appellants have failed to overcome. The rejection is affirmed.

Rejection of claims 1-20 under 35 U.S.C § 103(a)

The Examiner found that it would have been obvious to one of ordinary skill in the art to add the boundary layers of Nonaka to the recording medium of Uchiumi with a reasonable expectation of reducing degradation of the optical properties of the recording medium as taught by Nonaka. (Answer 5-6). According to Appellants, one of ordinary skill in the art would not have had a reasonable expectation of success in combining Uchiumi with Nonaka because Nonaka is intended to function as a rewritable media. (Reply Br. 5-6). We do not find Appellants' arguments

Appeal 2007-0409
Application 10/479,203

persuasive since they are premised on Appellants' contention that Uchiumi does not disclose or suggest a phase change type recording media. As noted above, we find that the Examiner has provided sufficient evidence to establish that Uchiumi does, in fact, teach a rewritable recording medium.

The rejection is affirmed.

ORDER

The rejection of claim 2 under 35 U.S.C. § 112, first paragraph for failing to comply with the written description requirement is affirmed.

The rejection of claims 13 and 14 under 35 U.S.C. § 112, second paragraph, as indefinite is affirmed

The rejection of claims 1, 3-5, 9, 11-12, and 14-16 under 35 U.S.C. § 102(b) as anticipated by Uchiumi is affirmed.

The rejection of claims 1-20 under 35 U.S.C. § 103(a) as unpatentable over Uchiumi in view of Nonaka is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

sld/ls

MICHAEL E. BELK
US PHILIPS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510