

The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YASUSHI SAKAI and SADAYUKI WATANABE

Appeal 2007-3546
Application 10/418,180
Technology Center 1700

Decided: August 29, 2007

Before CHUNG K. PAK, PETER F. KRATZ, and CATHERINE Q. TIMM,
Administrative Patent Judges.

KRATZ, *Administrative Patent Judge.*

DECISION ON APPEAL

This is a decision on an appeal from the Examiner's final rejection of claims 1-13, and 15, the only claims that remain pending in this application. We have jurisdiction pursuant to 35 U.S.C. §§ 6 and 134.

Appellants' claimed invention is directed to a perpendicular magnetic recording medium and a process for making same. The medium includes, among possible other items, a non-magnetic substrate, an intermediate layer, a magnetic recording layer, a protective layer, and a liquid lubricant layer, in that order. The magnetic layer comprises an amorphous alloy including a rare earth metal, a transition metal, and silver (Ag). The layer includes terbium (Tb) and cobalt (Co). According to Appellants, provision of a segregated silver component in the magnetic recording medium layer can serve to fix domain walls and can contribute to the magnetic characteristics of the perpendicular magnetic recording medium (Specification ¶ 0009).

Claim 1 is illustrative and reproduced below:

1. A perpendicular magnetic recording medium comprising:

a nonmagnetic substrate of glass or an aluminum alloy;

an intermediate layer above the nonmagnetic substrate;

a magnetic recording layer on the intermediate layer;

a protective layer on the magnetic recording layer; and

a liquid lubricant layer on the protective layer;

wherein the magnetic recording layer comprises an amorphous alloy layer comprising a rare earth element, a transition metal and Ag, wherein said amorphous alloy layer comprises Tb and Co.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims:

Sekiya

US 5,665,468

Sep. 9, 1997

Heyse

US 6,602,483 B2

Aug. 5, 2003

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Dai	US 6,638,622 B2	Oct. 28, 2003
Tanahashi	US 6,723,457 B2	Apr. 20, 2004
Sakawaki	US 6,818,331 B2	Nov. 16, 2004

Ozaki, *TbFeCo as a Perpendicular Magnetic Recording Material*, Journal of the Magnetics Society of Japan, 25, 322-327 (2001).

Claims 1-4, 7, 9-11, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozaki in view of Sekiya. Claims 5, 6, 12, and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozaki in view of Sekiya and Tanahashi. Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozaki in view of Sekiya and Sakawaki.

We affirm all of the stated rejections for substantially the reasons set forth by the Examiner in the Answer and as further explained below.¹

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level

¹ We limit our consideration of the Examiner's rejections to the reference evidence listed in the Examiner's rejection statements and the explanation thereof provided in the Final Office Action and the Answer. Moreover, we note that Appellants do not list any additional evidence as being relied upon in rebuttal in the Evidence Appendix to the Brief. Thus, we consider Appellants' arguments as presented in the Briefs on the basis of the representative claims and the reference evidence applied in the rejections. Appellants' Specification is taken into account to the extent of any admissions therein and, as necessary, to understand the claimed subject matter in reaching this Decision. Moreover, the Specification is considered to the extent specifically referred to in any arguments presented in the Briefs. Other evidence brought into the discussion in the appeal papers submitted by the Examiner and Appellants is not properly before us for review.

of ordinary skill in the art; and (4) secondary consideration (e.g., the problem solved). *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966). “[A]nalysis [of whether the subject matter of a claim would have been obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007) quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336-37 (Fed. Cir. 2006); *see also DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361, 80 USPQ2d 1641, 1645 (Fed. Cir. 2006)(“The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.”); *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969)(“Having established that this knowledge was in the art, the examiner could then properly rely, as put forth by the solicitor, on a conclusion of obviousness ‘from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference.’”).

Appellants argue the claims subject to the first stated rejection together as a group. Accordingly, we select claim 1 as the representative claim on which we decide the appeal as to this rejection.

Ozaki discloses perpendicular magnetic recording material including a layered structure including a substrate, at least one intermediate layer, a magnetic recording layer, a protection layer and a lubricant layer

substantially corresponding to the layers called for in representative claim 1 but for a description of a silver (Ag) component in the magnetic recording layer alloy (Ozaki, p. 322 and Figs. 2 and 14).

Appellants' only dispute with the Examiner's application of the applied prior art to representative claim 1 is limited to the required Ag inclusion in the magnetic recording layer and the Examiner's obviousness assertion with respect thereto (Br. 8-11, Answer 3-4).

Concerning this Ag additive difference in the representative claim 1 product over that of Ozaki, the Examiner turns to the additional teachings of Sekiya (Answer 4). The Examiner takes the position that it would have been obvious to one of ordinary skill in the art at the time of the invention to provide Ag in the magnetic recording medium layer of Ozaki based on the combined teachings of the references (*id.*). This is because: (1) Ozaki suggests that "Rare Earth - Transition Metal (RE-TM) alloy films that are widely used as magneto-optical (MO) recording materials have an amorphous and continuous structure" and such alloy materials would be expected to be useful in perpendicular magnetic recording media; and, (2) Sekiya teaches the optional incorporation of silver (Ag) in such RE-TM alloy MO recording materials, which materials are of interest to Ozaki for the magnetic recording layer thereof (Ozaki, p. 322; Sekiya, col. 3, l. 55 – col. 4, l. 3; Answer 4, 6, and 7). The Examiner notes that Sekiya suggests the incorporation of Ag can enhance corrosion protection (Answer 4, 6, and 7).

Appellants do not deny that Sekiya describes Ag addition to an RE-TM alloy used in MO recording materials. Rather, Appellants focus on the

Examiner's assertion of a corrosion preventive function for the added silver and contend that one of ordinary skill in the art would not have been motivated by the teachings of Sekiya to select Ag for inclusion in the RE-TM magnetic layer of the perpendicular magnetic recording medium of Ozaki on this basis.

We are not persuaded of reversible error in the Examiner's first stated rejection by the arguments presented in the Briefs. As acknowledged by Appellants (Br. 7-8), Sekiya specifically includes (describes) Ag as one element amongst a list of elements that can be added to the RE-TM magnetic layer of a magneto-optical recording medium. The list includes 22 elements that can be added (Sekiya, col. 3, l. 63 – col. 4, l. 1). Following that list, Sekiya presents a smaller preferred list including 5 elements (Sekiya, col. 4, ll. 1-3). The latter preferred list is accompanied by a disclosed oxidation corrosion prevention function. Appellants argue that the Examiner has drawn an incorrect inference from that disclosure of Sekiya in asserting a corrosion protective function to the disclosed Ag additive, which additive does not appear in the smaller preferred listing of additive elements. However, Appellants have not persuasively substantiated this argued contrary inference with properly presented evidence; that is, that the Ag additive was not disclosed as being useful for corrosion protection.²

² Appellants refer to an indication by Sekiya that Ag is sensitive to corrosion when added to a metal reflecting layer (Br. 8: Sekiya, col. 14, ll. 10-13). The Examiner counters with a rebuttal asserting that the metal reflecting layer is not an alloy layer and does not address an alloy of Ag (Answer 7). Sekiya teaches that an AgAu alloy is resistant to corrosion even in the metal reflecting layer (Sekiya, col. 14, ll. 10-13).

On balance, we agree with the Examiner's position that an ordinarily skilled artisan would have the reasonable expectation that silver (Ag) would have some anti-oxidative/anti-corrosion characteristics, properties that would accrue to a RE-TM alloy upon addition of silver thereto.

More importantly, however, there is another rationale that would have led one of ordinary skill in the art to add silver to the RE-TM material layer of Ozaki. As explained by the Examiner, Sekiya "establishes that it is old in the art to add Ag to a RE-TM alloy containing Tb and Co" (Answer 7). Certainly, one of ordinary skill in the art would have been familiar with the known additive elements in the list of additives taught by Sekiya, including their known properties. Thus, an ordinarily skilled artisan would have been led by the combined teachings of the applied references to add Ag to the RE-TM material layer of Ozaki with the expectation that the addition of Ag would contribute properties to the magnetic material layer in accordance with the known characteristics of Ag. *See KSR*, 127 S. Ct. at 1739, 82 USPQ2d at 1395 ("The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.").

Appellants argue that there would be no need for the additional anti-corrosion properties arising from adding silver to the RE-TM layer of the perpendicular magnetic recording medium of Ozaki because the magnetic layer is protected by a carbon protective layer and a lubricant layer. However, that contention is not persuasive because one of ordinary skill in the art would have been led to add Ag to the RE-TM layer notwithstanding the presence of protective layers for the additive protective effects such Ag

addition would provide as well as for the other known properties that Ag would have been expected to possess and furnish upon addition to the RE-TM layer.

As for Appellants' contentions with regard to a lack of a disclosure in the applied references that Ag addition to the magnetic recording layer would facilitate domain wall fixing, we note that the Examiner's basis for the combination need not be for the same reasons as Appellants disclose. *See In re Kemps*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996) (the motivation to combine features need not be identical to that of appellant to establish a prima facie case of obviousness).

On this regard, we affirm the Examiner's first stated obviousness rejection.

In rejecting claims 5, 6, 12, and 13 as obvious to one of ordinary skill in the art at the time of the invention, the Examiner additionally relies on Tanahashi. Appellants argue these rejected claims as a group. Thus, we select claim 5 as the representative claim.

Dependent claim 5, requires that the perpendicular magnetic recording medium of claim 1 further includes a soft magnetic under layer between the substrate and the intermediate layer, one or more undercoating layers between the substrate and the soft magnetic under layer, and a domain controlling layer located between the under layer(s) and the soft magnetic layer.

The Examiner relies on Tanahashi for disclosing a domain controlling layer (anti-ferromagnetic layer) between a soft magnetic layer and an under layer (one of the three domain control layers) in a perpendicular magnetic

recording medium (Answer 5). Tanahashi teaches that the domain control layer controls the soft magnetic under layer domains and suppresses spike noises (Tanahashi, col. 1, l. 65 - col. 2, l. 54). The Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to add the above-noted layers taught by Tanahashi with their functions to the perpendicular magnetic recording medium of Ozaki to obtain the expected benefit (suppressing spike noises) of providing such additional layers to a perpendicular magnetic recording medium as taught by Tanahashi.

Appellants' argument concerning the labeling of the three layers of Tanahashi as domain control layers whereas representative claim 5 labels the layers as under coating layer(s) and a separate domain control layer is singularly unpersuasive absent any argumentation as to a difference in the makeup of the layers other than the names or terminology employed to identify the layers. For example, Appellants disclose that a Mn alloy can be used for the domain control layer (Specification ¶ 0022). Likewise, Tanahashi discloses the use of a Mn-containing anti-ferromagnetic layer (col. 2, ll. 33-54). On this record, we do not find the additional arguments presented with respect to this rejection persuasive of reversible error in the Examiner's rejection. It follows that we shall affirm the Examiner's second stated § 103(a) rejection.

In rejecting claim 8 as obvious within the meaning of § 103(a), the Examiner relies on Sakawaki in addition to Ozaki and Sekiya. Claim 8 is drawn to a method of manufacturing a perpendicular magnetic recording medium wherein the magnetic recording layer is formed under a gas

pressure of 10 mTorr - 100 mTorr. Sakawaki is relied upon by the Examiner for disclosing the formation of a RE-TM magnetic layer by sputtering at a gas pressure of 5-15 Pa (37.5- 112.5 mTorr) (Answer 6; Sakawaki, col. 15, ll. 57-58). Based on that disclosure, the Examiner has determined that it would have been obvious to an ordinarily skilled artisan at the time of the invention to select a sputtering pressure as taught by Sakawaki, which corresponds to the here-claimed manufacturing pressure, for forming the magnetic recording layer of Ozaki in an effective manner. We agree.

We are not persuaded by Appellants' arguments with regard to this separate rejection for substantially the reasons presented by the Examiner in the Answer. Compare the Brief (pp. 12-13) with the Answer (pp. 8-9). Moreover, we agree with the Examiner's obviousness position because it would have been obvious for one of ordinary skill in the art to determine the workable/optimum sputtering pressures for forming the magnetic recording layer of Ozaki. After all, skill and not the converse is expected from one of ordinary skill in the art of formation of a magnetic recording layer for a perpendicular magnetic recording medium. *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985). Accordingly, we affirm the Examiner's third stated rejection.

CONCLUSION

The decision of the Examiner to reject claims 1-4, 7, 9-11, and 15 under 35 U.S.C. § 103(a) as being unpatentable over Ozaki in view of Sekiya; to reject claims 5, 6, 12, and 13 under 35 U.S.C. § 103(a) as being

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unpatentable over Ozaki in view of Sekiya and Tanahashi; and to reject claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Ozaki in view of Sekiya and Sakawaki 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) (2006).

AFFIRMED

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ROSSI, KIMMS & McDOWELL, LLP
P.O. BOX 826
ASHBURN, VA 20146-0826