

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. 32

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte CHARLES H. TOLMAN

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Appeal No. 2003-1573  
Application No. 08/854,407

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ON BRIEF

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Before OWENS, WALTZ, and TIMM, Administrative Patent Judges.  
WALTZ, Administrative Patent Judge.

**DECISION ON APPEAL**

This is a decision on an appeal from the primary examiner's final rejection of claims 1 through 3, 5, 6, 9 through 12, 14, 15, and 25 through 29, which are the only claims remaining in this application.<sup>1</sup> We have jurisdiction pursuant to 35 U.S.C. § 134.

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<sup>1</sup>As correctly noted by the examiner, claim 8 was mistakenly listed as included in the finally rejected and appealed claims but was cancelled before the final rejection (Answer, page 1, and page 2, ¶(3)). Therefore on this record claim 8 is not part of the claims on appeal.

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According to appellant, the invention is directed to a method of making an efficient magnetoresistive (MR) sensor for which the output voltage signal has been maximized for a given applied sense current, with an increase in resistivity of the bias layer and the spacer layer minimizing the shunt of sense current through these layers (Brief, page 2). A further understanding of the invention may be seen from representative independent claims 1 and 9, a copy of which may be found in Appendix A of the Brief.

The examiner has relied upon the following references as evidence of obviousness:

Cuomo et al. (Cuomo)	4,231,816	Nov. 04, 1980
Koyama et al. (Koyama)	4,364,099	Dec. 14, 1982
Jenson	4,897,288	Jan. 30, 1990
Osano et al. (Osano)	5,429,731	Jul. 04, 1995
Bonyhard et al. (Bonyhard)	5,495,378	Feb. 27, 1996
Matsushita (published Japanese patent application) <sup>2</sup>	01152255	Jun. 14, 1989

The claims on appeal stand rejected under 35 U.S.C. § 103(a) as unpatentable over Bonyhard in view of Jenson, Koyama, Osano,

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<sup>2</sup>The inventors of this application are Akihiro et al. (Matsushita is the applicant). Since the examiner and appellant refer to this document as "Matsushita" (Brief, page 5; Answer, page 3), we will also use this terminology. We note that the examiner only relies upon a Patent Abstract of this document (Answer, page 8, last paragraph), but the record now contains a full English translation of this document (see Paper No. 30 dated Mar. 16, 2003). Accordingly, we refer to and cite from the full English translation now of record.

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Matsushita, and Cuomo (Answer, page 4). We reverse this rejection essentially for the reasons stated in the Brief and those reasons set forth below.

#### OPINION

It is undisputed that Bonyhard teaches the basic structure of a MR sensor 50 as recited in claims 1 and 9 on appeal (Brief, page 10; Answer, pages 4-5).<sup>3</sup> As indicated by claim 25 on appeal, appellant's improvement is directed to sputter depositing the spacer and bias layers in a sputtering gas mixture of nitrogen in argon to incorporate a sufficient amount of nitrogen into these layers to increase the resistivity thereof. Accordingly, the dispositive issue is whether the applied secondary references disclose, teach or suggest this improvement in the MR sensor of Bonyhard.

We agree with the examiner that Jenson teaches the advantages of using a nitrogen doped tantalum as a spacer layer between MR layers, namely that this type of spacer layer "prevents exchange coupling" or "prevent[s] the magnetic domains in layer **18** from

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<sup>3</sup>As correctly stated by appellant on page 7 of the Brief, claim 9 differs from claim 1 on appeal by not requiring the incorporation of nitrogen into the spacer layer by sputtering in a gas mixture of nitrogen and argon. For completeness, we consider all of the references as applied against both claims 1 and 9 on appeal.

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coupling to the magnetic domains of layer **20**." Col. 1, l. 39; col. 1, ll. 58-60; col. 3, ll. 4-8; col. 3, ll. 42-47; and col. 4, ll. 19-24. This is the same function taught by Bonyhard for the spacer layer **54** (col. 4, ll. 15-18). However, the examiner does not point to any disclosure or suggestion in Jenson regarding the bias layer of claims 1 or 9 on appeal.

Similarly, the examiner does not apply Koyama for any teachings about the bias layer (see the Brief, page 7). The examiner finds that Koyama discloses a graph of resistivity of alpha-tantalum thin films at various nitrogen concentrations (Answer, page 6). The examiner's showing of "motivation" for forming a tantalum nitride film does not refer to the spacer or bias layer, but alleges that "it contributes to the nucleation of further films deposited thereon." Answer, page 7, citing col. 8, ll. 48-51. We determine that this showing of motivation, whether for the spacer or bias layer, is not sufficient since there is no showing why one of ordinary skill in this art would have modified Bonyhard with the tantalum nitride film of Koyama, i.e., why would one of ordinary skill in this art want to contribute to the nucleation of further films deposited thereon. See *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir.

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1999) (the showing of evidence of a suggestion, teaching or motivation to combine must be clear and particular).

The examiner finds that Osano teaches certain alloys within the scope of the claims on appeal that show a small magnetic anisotropy and an isotropic soft magnetic characteristic suitable for a magnetic head in a VTR (Answer, pages 7-8). The examiner's "motivation" for using the nitrided permalloy of Osano as a magnetic layer in a magnetic head is "that it is desired to obtain an alloy layer showing a small magnetic anisotropy and an isotropic soft magnetic characteristic." Answer, page 8, citing col. 2, ll. 24-28. We determine that this showing of "motivation" is not sufficient since the examiner has not shown why Bonyhard desires a small magnetic anisotropy and an isotropic soft magnetic characteristic, only that Osano desires this characteristic. Furthermore, the examiner only attempts to show that the layer of Osano would be usable in a MR sensor or head (Answer, page 10), with no indication or teaching that this layer should be used for the bias layer in Bonyhard.

The examiner finds that Cuomo teaches certain alloy films sputtered in a chamber with nitrogen to affect the perpendicular anisotropy of the resulting film (Answer, page 9). The examiner's "motivation" for utilizing nitrogen in a sputtered Sendust alloy is

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"that it controls the anisotropy of the film" (Answer, page 9, citing col. 4, ll. 28-33). Again we determine that this "motivation" is not sufficient since the examiner has not presented any convincing reasons for the combination of Cuomo with Bonyhard, i.e., why would Bonyhard desire to control the anisotropy, specifically to affect the perpendicular anisotropy of the film. See *In re Dembiczak, supra*.

The examiner finds that Matsushita teaches a Fe-Al-Si-N film sputtered from a FeAlSi alloy in a nitrogen-argon sputtering gas (Answer, page 8). The examiner's "motivation" for sputtering a Sendust film including nitrogen is that it "provides good wear resistance and high frequency soft range magnetism in VTR head materials." Answer, page 9. We determine that this "motivation" is also insufficient since the examiner has not shown why one of ordinary skill in this art would have modified the bias layer of Bonyhard by use of a Sendust film including nitrogen as disclosed by Matsushita. The examiner found that Bonyhard disclosed certain alloys as the bias (or SAL) layer but failed to present any findings that a Sendust alloy was disclosed/suggested (Answer, page 5, second full paragraph; see Bonyhard, col. 4, ll. 25-31). The examiner found that Matsushita disclosed incorporating nitrogen into a metal alloy used in general in "VTR head materials" (Answer,

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page 9, line 2), with no finding that these alloys were useful in bias layers in an MR sensor. Matsushita only discloses these nitrided alloys used as "a core material for a VTR head" (translation, page 5, last paragraph). Accordingly, we determine that the examiner has failed to show any specific motivation or reasoning that one of ordinary skill in this art would have used the nitrided Sendust alloy of Matsushita as a substitute for the bias layer of Bonyhard.

For the foregoing reasons and those set forth in the Brief, we determine that the examiner has not established a *prima facie* case of obviousness in view of the reference evidence. Accordingly, we cannot sustain the rejection on appeal.

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The decision of the examiner is reversed.

**REVERSED**

TERRY J. OWENS	)	
Administrative Patent Judge	)	
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	)	
	)	BOARD OF PATENT
THOMAS A. WALTZ	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
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	)	
	)	
CATHERINE TIMM	)	
Administrative Patent Judge	)	

TAW/jrg

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