

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SINING MAO, ANTHONY M. MACK, BRENDA A. EVERITT, EDWARD S.
MURDOCK, and ZHENG GAO

Appeal No. 2002-1417
Application No. 09/306,484

ON BRIEF

Before DIXON, GROSS, and BLANKENSHIP, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1, 2, 4-11, and 20, which are all the claims remaining in the application.

We reverse.

BACKGROUND

The invention is directed to structure of a magnetic sensor utilizing the giant magnetoresistive (GMR) effect. Such a sensor is referred to in the pertinent art as a "spin valve" sensor. According to appellants, the inventive arrangement of layers provides thermal stability superior to that of prior art structures. Claim 1 is reproduced below.

1. A spin valve magnetoresistive sensor, comprising:
 - a free layer having a magnetization which changes in the presence of a magnetic field;
 - a synthetic antiferromagnet layer, comprising:
 - a first ferromagnetic layer comprising a layer of CoFe;
 - a second ferromagnetic layer comprising a layer of CoFe; and
 - a first spacer layer of nonmagnetic material positioned between and directly in contact with the first and second ferromagnetic layers, the first spacer layer comprising a layer of Ru;
 - a second spacer layer positioned between and directly in contact with the first ferromagnetic layer of the synthetic antiferromagnetic layer and the free layer; and
 - an antiferromagnetic layer comprising:
 - a buffer layer positioned directly in contact with the second ferromagnetic layer of the synthetic antiferromagnetic layer, the buffer layer selected from the group consisting of NiFe and CoFe; and
 - an Mn-alloy layer positioned directly in contact with the buffer layer.

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The examiner relies on the following references:

Fontana	5,701,223	Dec. 23, 1997
Fuke et al. (Fuke)	5,976,713	Nov. 2, 1999 (filed Apr. 2, 1998)
Gill	6,061,210	May 9, 2000 (filed Sep. 22, 1997)
Hayashi	6,101,072	Aug. 8, 2000 (filed Feb. 23, 1998)

Claims 1, 4-7, and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Fontana and Gill.

Claim 2 stands rejected under 35 U.S.C. § 103 as being unpatentable over Fontana, Gill, and Hayashi.

Claims 8-11 stand rejected under 35 U.S.C. § 103 as being unpatentable over Fontana, Gill, and Fuke.

We refer to the Final Rejection (Paper No. 5) and the Examiner's Answer (Paper No. 10) for a statement of the examiner's position and to the Brief (Paper No. 9) for appellants' position with respect to the claims which stand rejected.

OPINION

The rejection of instant claim 1 is set forth at pages 3 and 4 of the Answer. Since Fontana does not show a "buffer layer" as claimed, the examiner relies on Gill for

suggestion of adding the layer to the Fontana device, for the purpose of “better exchange coupling.”

According to appellants, however, the references do not disclose or suggest that better exchange coupling may be achieved between an Mn-alloy layer and a CoFe layer, and thus fail to suggest the combination contemplated by the rejection. Gill is deemed to teach the use of a NiFe buffer layer to enhance exchange coupling between a NiO antiferromagnetic layer and a synthetic antiferromagnetic (SAF). (Brief at 6-7.)

The examiner, in response, advances several arguments with respect to why the combination would have been suggested; i.e., that Gill’s teachings are not limited to the particular materials disclosed. (Answer at 7-8.) Appellants argue to the contrary. (Brief at 7.)

Gill discloses, at column 12, lines 58 through 65, that a layer 280 (Fig. 22) of NiFe is provided for better exchange coupling between a NiO AFM layer 222 and a Co film.

Neither the examiner nor appellants provide evidence in support of the respective position (e.g., a teaching from the prior art that shows inferences the artisan would have drawn from the relevant portion of the Gill disclosure). Disposition of the instant appeal follows from the allocation of burdens in ex parte prosecution.

The allocation of burdens requires that the USPTO produce the factual basis for its rejection of an application under 35 U.S.C. §§ 102 and 103. In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984) (citing In re Warner, 379 F.2d 1011,

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1016, 154 USPQ 173, 177 (CCPA 1967)). The one who bears the initial burden of presenting a prima facie case of unpatentability is the examiner. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

We are persuaded by appellants that the evidence relied upon is not sufficient to establish a case for prima facie unpatentability of the invention of instant claim 1. Gill teaches placing a layer of NiFe between a NiO layer and a Co film. While the artisan might have regarded the teaching as broader than the express terms, as alleged by the examiner, and applicable to the structure of Fontana to the extent that it meets the terms of instant claim 1, we have no factual support for the position in this record. Cf. In re Zurko, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001) (in a determination of unpatentability “the Board must point to some concrete evidence in the record in support of...[the]...findings”).

Instant claim 20, the remaining independent claim on appeal, also stands rejected over the combination of Fontana and Gill. The claim requires a buffer layer positioned between a synthetic antiferromagnetic layer and an Mn-based antiferromagnetic layer. We cannot sustain the rejection because Gill, relied upon for the “buffer layer,” has not been shown to suggest placing a buffer layer between a SAF and an Mn-based antiferromagnetic layer.

Since neither Hayashi nor Fuke remedy the deficiency of the rejection applied against base claims 1 and 20, we do not sustain any of the rejections under 35 U.S.C. § 103.

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CONCLUSION

The rejections of claims 1, 2, 4-11, and 20 under 35 U.S.C. § 103 are reversed.

REVERSED

JOSEPH L. DIXON
Administrative Patent Judge

ANITA PELLMAN GROSS
Administrative Patent Judge

HOWARD B. BLANKENSHIP
Administrative Patent Judge

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