UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MANISH SHARMA and MANOJ K. BHATTACHARYYA

Appeal 2007-4447
Application 10/414,927
Technology Center 2800

Decided: April 16, 2008

Before ANITA PELLMAN GROSS, MAHSHID D. SAADAT,
and MARC S. HOFF, *Administrative Patent Judges*.

GROSS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Sharma and Bhattacharyya (Appellants) appeal under 35 U.S.C. § 134 from the Examiner's Final Rejection of claims 1 through 28, which are all of the claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

Appellants' invention relates to an optical signal transducer formed of a magnetic tunnel junction that is tuned to switch states in response to

selected frequencies of a magnetic field. Claim 1 is illustrative of the claimed invention, and it reads as follows:

1. An optical signal transmission transducer:

a magnetic tunnel junction, the magnetic tunnel junction being tuned to switch states in response to selected frequencies of a magnetic field; and

a light source that is modulated based upon states of the magnetic tunnel junction.

The prior art references of record relied upon by the Examiner in rejecting the appealed claims are:

Sato	US 6,232,777 B1	May 15, 2001
Slaughter	US 6,549,454 B1	Apr. 15, 2003

Yiping He et al., (He), *Hybrid magnetic tunnel junction/vertical cavity surface emitting laser field sensor device*, Electronic Letters, Vol. 37, No. 24, pp. 1459-60, November 22, 2001.

Claims 1 through 28 stand rejected under 35 U.S.C. § 103 as being unpatentable over Slaughter in view of Sato and He.

We refer to the Examiner's Answer (mailed May 3, 2006) and to Appellants' Brief (filed March 13, 2006) for the respective arguments.

SUMMARY OF DECISION

As a consequence of our review, we will reverse the obviousness rejection of claims 1 through 28.

OPINION

Appellants contend (Br. 8-11) that Sato fails to teach or suggest tuning a magnetic tunnel junction to switch states in response to selected

frequencies. Appellants state (Br. 8) that "Sato includes absolutely no discussion regarding any frequency components of the external field H, much less frequency selectivity of the magnetic sensor to frequency components of the external magnetic field H."

The Examiner (Ans. 4-5) relies only upon Sato for a disclosure of switching states of the magnetic tunnel junction in response to selected frequencies. The Examiner asserts (Ans. 5) that "[i]t is implied herein that filtering out the harmonic component, so that the current detection amplifier detects only the second harmonic I (f, 3 f) frequency, does provide a magnetic tunneling junction device that switches states as a function of changes in the external magnetic field and is frequency dependent." The Examiner further asserts (Ans. 10) that "Sato … discloses that the MTJ can be used for magnetic recording sensor heads, which one of ordinary skill in the art would recognize that magnetic recording heads operate by applying magnetic fields at varying pulse-widths and frequencies." Last, the Examiner asserts (Ans. 11) that the skilled artisan would recognize that "the variations in the external magnetic field of Slaughter …, Sato …, and He … are time dependent; i.e., the field sweep rate has a frequency" and that "varying the magnetic field applied to the MTJ until it switches causing the VCSEL to modulate in accordance with he [sic, He] … is equivalent to tuning the sensor to switch states in response to selected frequencies."

The sole issue before us is whether Sato teaches or suggests tuning the magnetic tunnel junction to switch states in response to selected frequencies of a magnetic field, as is recited in each of the independent claims. We find no such teaching or suggestion in Sato.

The only mention of frequencies in any of the three applied references is by Sato (col. 9, ll. 26-48), wherein Sato discloses applying an AC voltage of frequency *f* to a magnetic sensor. Sato discloses that the tunnel current I (f, 3 f) has components of frequencies f and 3f, and the current changes when an external magnetic field changes. Sato further discloses that a high-pass filter removes the frequency *f* component "in which the tunneling magnetoresistance effect is not enhanced," and the response of the frequency 3*f* component to the change in magnetic field is treated as a sensor signal. However, Sato does not teach or suggest that the switching characteristics of the magnetic tunnel junction will vary with the frequency of the magnetic field, and, thus, does not teach or suggest tuning the magnetic tunnel junction to switch states in response to selected frequencies of the magnetic field. Consequently, we cannot sustain the obviousness rejection of claims 1 through 28 over Slaughter, Sato, and He.

ORDER

The decision of the Examiner rejecting claims 1 through 28 under 35 U.S.C. § 103 is reversed.

REVERSED

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MYERS BIGEL SIBLEY & SAJOVEC
P. O. BOX 37428
RALEIGH, NC 27627