

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KIMBLE DONG

Appeal No. 2004-1487
Application No. 09/085,519

ON BRIEF

Before HAIRSTON, BARRETT, and FLEMING, ***Administrative Patent Judges***.

FLEMING, ***Administrative Patent Judge***.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-24, all the claims pending in the instant application.

Invention

The present invention relates to a method and apparatus for reading out image signals from a CMOS image sensor. It is desirable in image sensors to remove fixed pattern noise from the signals that are processed from the pixels. See page 1 of Appellant's specification. A CMOS image sensor and readout

circuit 310 formed according to the present invention is illustrated in Figure 2. An active cell array 312 includes a number of pixels organized into rows and columns. The active cell array 312 includes at least one "reference row." The reference row may be placed at the top or bottom of the active array. The reference row is created by using a light shield or black layer to cover the cells of the reference row from light. Thus, the only signal that should be generated from the sensors of the reference row is a noise or dark signal. During the readout process, the exposure time of the reference row is the same as the rest of the rows of the active cell array. See page 5 of Appellant's specification. Signals from the pixels in cell array 312 are read out through a series of reading lines 314 by analog signal processing circuitry 316. Analog signal processing circuitry 316 sends signals through lines 318 to an analog-to-digital converter 322. Analog-to-digital converter 322 sends digital signals representing the processed signals through lines 324 to a fixed pattern noise storage circuitry 326 and to a fixed pattern noise canceling processor 330. See page 5 of Appellant's specification. Once the signals from the reference row are stored in the fixed pattern noise storage area 326, the remaining rows of the array may be processed. As each additional row of

the field of active cell array 312 is read, its signals are converted to digital signals by analog-to-digital converter 322 and then the appropriate column fixed pattern noise signals that are stored in fixed pattern noise storage area 326 is subtracted from them by fixed pattern noise canceling processor 330. See page 6 of Appellant's specification.

Claim 1 is representative of Appellant's claimed invention and is reproduced as follows:

1. A MOS image sensor comprising:

a pixel array formed from a plurality of individual pixels organized as rows and columns, said pixel array including a reference row;

analog signal processing circuitry for reading out analog signals from the pixel array;

an analog-to-digital converter for converting analog signals from the analog processing circuitry into digital signals;

fixed pattern noise storage circuitry for storing digital signals representative of the signals from the reference row of the pixel array; and

a fixed pattern noise canceling processor for subtracting the digital reference row signals stored in the fixed pattern noise storage circuitry from the digital signals representative of the signals from the other pixels in the pixel array.

Appeal No. 2004-1487
Application No. 09/085,519

satisfy this burden by showing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art suggests the claimed subject matter. **In re Fine**, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellants. **Oetiker**, 977 F.2d at 1445, 24 USPQ2d at 1444. **See also Piasecki**, 745 F.2d at 1472, 223 USPQ at 788.

An obviousness analysis commences with a review and consideration of all the pertinent evidence and arguments. "In reviewing the [E]xaminer's decision on appeal, the Board must necessarily weigh all of the evidence and argument." **Oetiker**, 977 F.2d at 1445, 24 USPQ2d at 1444. "[T]he Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion." **In re Lee**, 277 F.3d 1338, 1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002). With these principles in mind, we commence review of the pertinent evidence and arguments of Appellant and Examiner.

Appellant argues that the Examiner has failed to find a **prima facie** case of obviousness to establish that the teachings

Appeal No. 2004-1487
Application No. 09/085,519

from the prior art would have suggested the modification proposed by the Examiner. In particular, Appellant argues that even though the analog subtraction of Mendis could have been performed in the digital domain, that does not make such a modification obvious unless the prior art suggest such a change. See pages 5 and 6 of Appellant's brief. Appellant concedes that the Mendis reference teaches the readout of analog signals from a pixel array. However, Appellant points out that Mendis fails to teach that the fixed pattern noise is subtracted in the digital domain. Appellant further points out that Panicacci, although showing analog-to-digital converters, fails to suggest or teach this claimed limitation as well. See pages 7 and 8 of Appellant's brief.

When determining obviousness, "[t]he factual inquiry whether to combine references must be thorough and searching." ***In re Lee***, 277 F.3d at 1343, 61 USPQ2d at 1433 ***citing McGinley v. Franklin Sports, Inc.***, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001). "It must be based on objective evidence of record." ***Id.*** "Broad conclusory statements regarding the teaching of multiple references, standing alone, are not 'evidence.'" ***In re Dembiczak***, 175 F.3d 994, 999, 50 USPQ2d 1614,

Appeal No. 2004-1487
Application No. 09/085,519

1617 (Fed. Cir. 1999). "Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact." *Dembiczak*, 175 F.3d at 999, 50 USPQ2d at 1617, *citing McElmurry v. Arkansas Power & Light Co.*, 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993).

The Examiner agrees that Mendis does not expressly teach an analog-to-digital converter. See page 5 of the answer. The examiner points out that Panicacci teaches an analog-to-digital converter. The Examiner further points out that Nishiki also teaches subtraction in the digital domain. See page 5 of the answer. However, the Examiner has failed to find any evidence of record that supports that one of ordinary skill in the art would have reason to make the proposed modification to Mendis.

Appeal No. 2004-1487
Application No. 09/085,519

In view of the foregoing, we have not sustained the
Examiner's rejection of claims 1-24 under 35 U.S.C. § 103.

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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)	
)	
)	BOARD OF PATENT
LEE E. BARRETT)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
MICHAEL R. FLEMING)	
Administrative Patent Judge)	

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Appeal No. 2004-1487
Application No. 09/085,519

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