

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ROBERT A. STREET, PING MEI, and JEFFREY T. RAHN

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Appeal No. 2005-0776  
Application No. 09/898,321

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ON BRIEF

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Before THOMAS, GARRIS, and OWENS, *Administrative Patent Judges*.  
OWENS, *Administrative Patent Judge*.

*DECISION ON APPEAL*

This appeal is from the final rejection of claims 1-10, 21 and 24-30. Claims 22 and 23, which are the only other pending claims, stand withdrawn from consideration by the examiner.

*THE INVENTION*

The appellants claim an integrated circuit or an image sensor array, each having, at each of a plurality of crossover locations between a plurality of first lines and a plurality of

second lines, an air gap between the top surface of one line and the bottom surface of the other line. Claim 1, which claims the integrated circuit, is illustrative:

1. An integrated circuit comprising:

a plurality of pixel circuits arranged in rows and columns;

a plurality of first lines, each first line connected to a corresponding column of pixel circuits; and

a plurality of second lines, each second line connected to a corresponding row of pixel circuits,

wherein the plurality of first lines are formed such that each first line extends over the plurality of second lines at corresponding crossover locations, and

wherein an air-gap is defined at each crossover location that separates each first line from the plurality of second lines, wherein each air-gap extends from a top surface of a corresponding second line to a bottom surface of said each first line.<sup>[1]</sup>

*THE REFERENCES*

Antonuk et al. (Antonuk)	5,262,649	Nov. 16, 1993
Kingsley et al. (Kingsley)	5,587,591	Dec. 24, 1996
Pedder	5,604,658	Feb. 18, 1997
Fukuda et al. (Fukuda)	5,623,161	Apr. 22, 1997

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<sup>1</sup> It appears that in claim 8, in "a plurality of gate lines, each gate line connected to the access transistors of a corresponding column of pixel circuits", "column" should be "row", and in "a plurality of data lines, each data line connected to the access transistors of a corresponding row of pixel circuits", "row" should be "column". See the specification, page 4, last sentence of paragraph 0007, and page 7, last sentence of paragraph 0019.

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Akiyama et al. (Akiyama)	5,712,494	Jan. 27, 1998
Street	5,789,737	Aug. 4, 1998
Ahn	6,037,248	Mar. 14, 2000
Hwang et al. (Hwang)	6,337,284	Jan. 8, 2002
		(filed May 30, 2000)
Kunikiyo	US 2002/0135041 A1	Sep. 26, 2002
	(effective filing date	May 27, 1998)

#### *THE REJECTIONS*

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1-3 and 6 over Kingsley in view of Ahn; claim 4 over Kingsley in view of Ahn and Akiyama; claim 5 over Kingsley in view of Ahn and Hwang; claim 7 over Kingsley in view of Ahn and Street; claims 8 and 27-30 over Fukuda in view of Ahn; claim 9 over Fukuda in view of Ahn and Antonuk; claim 10 over Fukuda in view of Ahn and Kunikiyo; claim 21 over Fukuda in view of Ahn and Akiyama; claim 24 over Fukuda in view of Ahn and Hwang; claim 25 over Fukuda in view of Ahn and Pedder; and claim 26 over Fukuda in view of Ahn and Kingsley.

#### *OPINION*

We reverse the aforementioned rejections. We need to address only the independent claims, i.e., claims 1, 8, 28 and 30.<sup>2</sup>

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<sup>2</sup> The examiner does not rely upon the additional references applied to the dependent claims for any disclosure that remedies the deficiency in Kingsley or Fukuda, in view of Ahn, as to the independent claims.

Each of the appellants' independent claims requires, where one line crosses over another line, an air gap between a top surface of one line and a bottom surface of the other line.

Kingsley discloses a fluoroscopic radiation imager having, at a crossover location of a data line and a scan line, a layer of at least one dielectric material between the data line and the scan line (col. 1, lines 7-8; col. 2, lines 39-47; col. 5, lines 8-12).

Fukuda discloses an electronic element, such as a thin film transistor for driving an active matrix liquid crystal display, having, at a crossover location between a gate line and a data line, an insulating film between the gate line and the data line (col. 1, lines 14-17 and 23-28; figures 2 and 8).

Ahn discloses a semiconductor interconnect structure having conductive interconnect layers surrounded by air gaps (col. 3, lines 10-16). The air, which has a dielectric constant of 1, provides reduced plate capacitance of the interconnect structure (col. 3, lines 24-26; col. 5, lines 43-47).

The examiner argues that "[i]t would have been obvious to one of ordinary skill in the art at the time of the present invention to use the air gap of Ahn in the device[s] of Kingsley

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and Fukuda] in order to reduce the capacitance between the lines as taught by Ahn in column 3, lines 23-26" (answer, pages 5 and 8).

For a *prima facie* case of obviousness to be established, the teachings from the prior art itself must appear to have suggested the claimed subject matter to one of ordinary skill in the art. See *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976). The mere fact that the prior art could be modified as proposed by the examiner is not sufficient to establish a *prima facie* case of obviousness. See *In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992).

The examiner has not taken into account the differences in the thin film devices of Kingsley and Fukuda and the semiconductor interconnect structure of Ahn and provided evidence or technical reasoning which shows that, regardless of those differences, one of ordinary skill in the art would have been led by the references themselves to use Ahn's disclosure to modify the devices of Kingsley and Fukuda as proposed by the examiner. The examiner's mere assertion to that effect is not sufficient for establishing a *prima facie* case of obviousness.

The examiner argues that "[w]hile the manufacturing process of Ahn would have to be modified in order to only use an air-gap

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structure for the crossover locations in Kingsley [and Fukuda], the claims are drawn to a device. The rejection is not required to show how the method of manufacture of Kingsley [and Fukuda] and Ahn would be modified, only that the claimed device would be obvious" (answer, pages 16 and 20). That argument is not well taken because a method modification would be needed to arrive at the device proposed by the examiner.

Thus, the record indicates that the examiner's modification of the Kingsley and Fukuda devices is based upon impermissible hindsight in view of the appellants' disclosure rather than being based upon the applied references themselves. See *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984); *In re Rothermel*, 276 F.2d 393, 396, 125 USPQ 328, 331 (CCPA 1960). Accordingly, we reverse the examiner's rejection.

#### DECISION

The rejections under 35 U.S.C. § 103 of claims 1-3 and 6 over Kingsley in view of Ahn, claim 4 over Kingsley in view of Ahn and Akiyama, claim 5 over Kingsley in view of Ahn and Hwang, claim 7 over Kingsley in view of Ahn and Street, claims 8 and 27-30 over Fukuda in view of Ahn, claim 9 over Fukuda in view of Ahn

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and Antonuk, claim 10 over Fukuda in view of Ahn and Kunikiyo,  
claim 21 over Fukuda in view of Ahn and Akiyama, claim 24 over  
Fukuda in view of Ahn and Hwang, claim 25 over Fukuda in view of  
Ahn and Pedder, and claim 26 over Fukuda in view of Ahn and  
Kingsley, are reversed.

*REVERSED*

JAMES D. THOMAS	)	
Administrative Patent Judge	)	
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	)	BOARD OF PATENT
BRADLEY R. GARRIS	)	APPEALS AND
Administrative Patent Judge	)	INTERFERENCES
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TERRY J. OWENS	)	
Administrative Patent Judge	)	

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