

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today  
(1) was not written for publication in a law journal and  
(2) is not binding precedent of the Board.

Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte HORST A. GEMPE  
and GARY W. HOSHIZAKI

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Appeal No. 1996-4073  
Application 08/345,917<sup>1</sup>

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ON BRIEF

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Before MARTIN, FLEMING, and HECKER, Administrative Patent  
Judges.

HECKER, Administrative Patent Judge.

DECISION ON APPEAL

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<sup>1</sup>Application for patent filed November 28, 1994.  
According to appellants, this application is a continuation of  
Application 08/072,016, filed June 07, 1993.

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This is a decision on appeal from the final rejection of claims 31 through 33<sup>2</sup>.

The invention is directed to a linear opto-coupler circuit that is used to electrically isolate one circuit from another. As shown in Figure 1, linear opto-coupler 12 includes a light emitting diode 13 and a detector diode 18 to linearize the circuit, which is connected to an input circuit including amplifier 19. The output circuit has photo detector 17 for optical isolation. In particular, referring to Figure 6 for the details of light emitting diode 13 and detector diode 18, an epitaxial layer 43 is formed on a planar side of semiconductor substrate 40. Epitaxial layer 43 forms an anode of light emitting diode 41. A terminal 48 couples to epitaxial layer 43. Semiconductor substrate 40 forms a cathode of light emitting diode 41. On a planar side opposite from which epitaxial layer 43 is formed, an epitaxial layer 44

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<sup>2</sup>The brief misstated the finally rejected claims as claims 30 through 32. This misstatement was repeated in the answer. However, paper no. 17, received Aug. 28, 1995, canceled claims 21 through 29 and 34 through 38, leaving claims 30 through 33 as the remaining pending claims. Of these remaining claims, claim 30 is directed to a non elected invention, and not included in this appeal.

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is formed on semiconductor substrate 40. Epitaxial layer 44 forms an anode of detector diode 42. Semiconductor substrate 40 also forms a cathode of detector diode 42. Looking at Figure 8, an integrated light emitting diode 62/detector diode 63 is mounted on a lead frame 51 at mounting area 59, and photo detector diode 61 is at mounting area 58. Mounting areas 58 and 59 are coplanar.

Independent claim 31 is reproduced as follows:

31. A linear integrated optocoupler comprising:

an integrated light emitting diode and detector diode wherein said detector diode detects light emitted by said light emitting diode and provides a signal for linearizing a response of said light emitting diode, said integrated light emitting diode and detector diode comprising:

a semiconductor substrate;

a first epitaxial layer formed on a first side of said semiconductor substrate;

a second epitaxial layer formed on a second side of said semiconductor substrate, said first and second sides of said semiconductor substrate oppose one another, said first epitaxial layer is an anode of said light emitting diode, said second epitaxial layer is an anode of said detector diode, and said semiconductor substrate is a common cathode of said integrated light emitting diode and detector diode;

a photodetector diode for receiving light emitted by said light emitting diode;

a lead frame including a first area and a second

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area, said first and second areas being coplanar, said integrated light emitting diode and detector diode being conductively mounted to said first area of said lead frame and said photodetector diode being conductively mounted to said second area, said photodetector diode is electrically and physically isolated from said integrated light emitting diode and detector diode;

a light flux coupling material placed on and between said first and second areas of said lead frame for coupling light emitted by said light emitting diode to said photodetector diode wherein said light flux coupling material covers said integrated light emitting diode and detector diode on said first area and said photodetector diode on said second area; and

a protective enclosure formed around said first and second areas and said light flux coupling material for enclosing said light emitting diode and detector diode, and said photodetector diode.

The Examiner relies on the following references:

Rutz	3,229,104	Jan. 11, 1966
Rideout et al.	3,881,113	Apr. 29, 1975
Oimura et al.	4,675,518	Jun. 23, 1987
Suzuki <sup>3</sup>	JP 58-48481	Mar. 22, 1983
Fujisawa <sup>3</sup>	JP 59-222973	Dec. 14, 1984

Claims 31 through 33 stand rejected under 35 U.S.C.

§ 103 as being unpatentable over Rutz or Rideout in view of Suzuki or Oimura and Appellants' prior art admissions or Fujisawa.

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<sup>3</sup> Any citation to this reference will be with respect to a translation in the file, by Schreiber Translations, Inc., dated May 1999.

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Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the brief and answer for the respective details thereof.

OPINION

After a careful review of the evidence before us, we will not sustain the rejection of claims 31 through 33 under 35 U.S.C. § 103.

The Examiner has failed to set forth a ***prima facie*** case. It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the reasonable teachings or suggestions found in the prior art, or by a reasonable inference to the artisan contained in such teachings or suggestions.

In re Sernaker, 702 F.2d 989, 995, 217 USPQ 1, 6

(Fed. Cir. 1983). "Additionally, when determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the

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invention."

Para-Ordnance Mfg. v. SGS Importers Int'l, Inc., 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995) (citing W. L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984)).

With regard to claim 31 Appellants argue:

[Appellants claim "a semiconductor substrate, a first epitaxial layer formed on a first side of said semiconductor substrate, a second epitaxial layer formed on a second side of said semiconductor substrate, said first and second sides of said semiconductor substrate oppose one another, said first epitaxial layer is an anode of said light emitting diode, said second epitaxial layer is an anode of said detector diode, and said semiconductor substrate is a common cathode of said integrated light emitting diode and detector diode". In particular, the light emitting diode is integrated with the detector diode, both share a common cathode (substrate). (Brief-page 5.)

Looking at all references cited by the Examiner, we find none that teach or suggest, individually or in combination, the claimed structure recited supra. No reference has a common substrate cathode with an epitaxial anode on each side of the substrate. Rutz and Rideout have separate cathodes and anodes for each diode on each side of a

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substrate. Their common substrates are not a common cathode. Oimura and Suzuki teach the use of a common cathode, but the anodes are not epitaxial layers on opposite sides of a substrate. There is no suggestion or teaching in any of these references that would lead one to make the common substrate of Rutz or Rideout into a common cathode structure akin to Oimura or Suzuki. The common substrates of Rutz and Rideout are insulators and isolators, not active components.

The Federal Circuit states that "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." In re Fritch, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992), citing In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). "Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor." Para-Ordnance Mfg. v. SGS Importers Int'l, 73 F.3d at 1087, 37 USPQ2d at 1239, citing W. L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d at 1551, 1553, 220 USPQ at 311, 312-13.

Since Appellants' specification provides the only

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teaching that would lead one to combine the references in the manner proposed by the Examiner, we will not sustain the rejection of claim 31 under 35 U.S.C. § 103. Likewise we will not sustain the rejection of dependent claims 32 and 33 since they contain the same unmet claim limitations.

We note that Fujisawa teaches the remaining claim limitations in figure 2 where light emitting diode 21 and photo detector diode 22 are mounted on two coplanar areas of lead frame 25. A light flux coupling material 23 is provided and a protective enclosure 24 is formed around the components.

We have not sustained the rejection of claims 31 through 33 under 35 U.S.C. § 103. Accordingly, the Examiner's decision is reversed.

REVERSED

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