

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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***Ex parte*** JOHN W. LITTLE, JR.

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Appeal No. 96-2120  
Application 08/300,097<sup>1</sup>

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ON BRIEF

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Before JERRY SMITH, BARRETT, and LEE, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

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<sup>1</sup> Application for patent filed September 1, 1994. According to appellants, the application is a continuation of Application 07/906,417, filed June 30, 1992; which is a continuation-in-part of Application 07/606,285, filed October 31, 1990, now abandoned.

***DECISION ON APPEAL***

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 15, 20 and 21. Claims 1-14, 17, 19 and 22 have been allowed by the examiner. Claims 16, 18 and 23-26 have been cancelled.

The disclosed invention pertains to a semiconductor device for detecting electromagnetic radiation. More particularly, the device consists of a plurality of doped quantum well layers, each of which has a bound ground energy state and one of a plurality of different bound excited energy states. A plurality of superlattice barrier layers are interleaved with the quantum well layers. The plurality of bound excited energy states of the quantum well layers are arranged in a predetermined pattern to detect desired electromagnetic radiation.

Representative claim 15 is reproduced as follows:

15. A semiconductor device for detecting electromagnetic radiation, comprising:

a plurality of doped quantum well layers, each doped quantum well layer comprising a bound ground energy state and one of a plurality of different bound excited energy states;

a plurality of superlattice barrier layers interleaved with the quantum well layers, each superlattice layer having a miniband of energy states in resonance with the excited energy states of its adjacent quantum well layers and strongly coupled to other minibands, said plurality of bound excited energy states of the quantum well layers being arranged in a predetermined pattern within the minibands of energy states of said superlattice barrier layers;

whereby carriers excited from the ground states to the excited energy states and miniband states by absorption of photons of electromagnetic radiation are transported for collection when an electric field is applied across the quantum well layers and the superlattice barrier layers.

The examiner relies on the following references:

Coon et al. (Coon), "Narrow band infrared detection in multiquantum well structures," Applied Physics Letters, Vol. 47, No. 3, August 1985, pages 289-291.

The admitted prior art shown in Figures 1(a) and 1(b) of the application.

Claims 15, 20 and 21 stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers the admitted prior art and Coon taken together.

Rather than repeat the arguments of appellant or the examiner, we make reference to the briefs and the answer for the respective details thereof.

### OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellant's arguments set forth in the briefs along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 15, 20 and 21. Accordingly, we reverse.

Appellant has nominally indicated that the claims on appeal do not stand or fall together [brief, page 3]. However, appellant has made no separate arguments with respect to independent claims 15 and 20. In fact, the brief states that claim 20 is patentable for the same reasons as claim 15 [page 5]. Since appellant has failed to appropriately argue the separate patentability of the claims, all contested claims stand or fall together. See In re King, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986); In re Sernaker, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983). Accordingly, we will consider the rejection against claim 15 as representative of all the claims on appeal.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (CCPA 1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine

prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art.

Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

With respect to representative claim 15, the examiner's position is that it would have been obvious to the artisan to replace the single barrier layers in the admitted prior art of Figures 1(a)-1(b) with superlattice barrier layers as taught by Coon [answer, pages 3-4] . Appellant does not dispute the obviousness of this proposed combination of teachings, but appellant argues that the collective teachings of the admitted prior art and Coon would result in quantum wells having a single bound excited energy state rather than the plurality of different bound excited energy states in a predetermined pattern as recited in claim 15 [brief, pages 4-5]. The examiner responds that even though the quantum wells of the prior

art combination would be designed to have the same bound excited energy state, these states would be different due to unavoidable manufacturing tolerances [answer, page 5]. The examiner asserts that “predetermined” is broad enough to read on practically anything so that the prior art structure with unavoidable manufacturing tolerances would result in a device having a “predetermined” pattern of the plurality of different bound excited energy states.

Although we agree with the examiner that “predetermined” is a term which should be construed very broadly, it cannot be interpreted so broadly as to read on the potential random occurrences of differences which might result from common manufacturing tolerances. The unintended differences resulting from manufacturing tolerances are the very opposite of the predetermined differences recited in the claims. We do not agree with the examiner’s assertion that the devices of the prior art and the claimed invention are indistinguishable from each other. These devices are manufactured products which have specific properties. One of the claimed properties of appellant’s device is that the plurality of quantum wells have one of a plurality of different bound excited energy states arranged in a predetermined pattern. No manufactured device having accidental or random differences can possibly possess these properties.

We would also interpret the phrase “one of a plurality of different bound excited energy states” in claim 15 as requiring an intended difference, and the phrase should not be

construed to include differences which result from manufacturing tolerances that are totally unintended and undesired by appellant's invention. The examiner's reading of "different" as including unintended differences caused by manufacturing tolerances would make it almost impossible for appellant to claim his invention because nothing can be predetermined according to the examiner's analysis. This is an interpretation of the claim language which we cannot accept.

For all the reasons just discussed, we do not sustain the examiner's rejection of claims 15, 20 and 21 under 35 U.S.C. § 103. Therefore, the decision of the examiner rejecting claims 15, 20 and 21 is reversed.

**REVERSED**

Jerry Smith	)	
Administrative Patent Judge	)	
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	)	
	)	BOARD OF PATENT
Lee E. Barrett	)	
Administrative Patent Judge	)	APPEALS AND
	)	
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