

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BOON SIEW OOI, YEE LOY LAM, YUEN CHUEN CHAN, YAN ZHOU,
and GEOK ING NG

Appeal No. 2005-0779
Application No. 09/802,084

ON BRIEF

Before GARRIS, WALTZ, and TIMM, Administrative Patent Judges.
GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal which involves claims 1-16.

The subject matter on appeal relates to a method of manufacturing a photonic integrated circuit comprising a compound semiconductor structure having a quantum well region. The method comprises irradiating the structure using a source of photons to generate defects and subsequently annealing the structure to

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promote quantum well intermixing. This appealed subject matter is adequately represented by independent claim 1 which reads as follows:

1. A method of manufacturing a photonic integrated circuit comprising a compound semiconductor structure having a quantum well region, comprising the steps of irradiating the structure using a source of photons to generate defects, the photons having an energy (E) at least that of the displacement energy (E_D) of at least one element of the compound semiconductor, and subsequently annealing the structure to promote quantum well intermixing.

The references set forth below are relied upon by the examiner in the Section 102 and Section 103 rejections before us:

Burnham et al. (Burnham)	Re. 33,274	Jul. 24, 1990
Poole et al. (Poole)	6,027,989	Feb. 22, 2000
Feldman et al. (Feldman)	6,071,652	Jun. 6, 2000
Thompson et al. (Thompson)	US 2002/0127752 A1	Sep. 12, 2002

Claims 1 and 4-9 are rejected under 35 U.S.C. § 102(b) as being anticipated by Burnham.

Claims 2, 3 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Burnham in view of Thompson, and claims 10-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Burnham in view of Poole and Feldman.

We refer to the brief and reply brief and to the answer for a complete discussion of the opposing viewpoints expressed by the appellants and by the examiner concerning the above noted rejections.

OPINION

For the reasons set forth below, these rejections cannot be sustained.

On pages 3-4 of the answer, the examiner expresses his anticipation finding with respect to appealed claim 1 (the sole independent claim before us) in the following manner:

Pertaining to claim 1, see **FIGS. 1-5**, where Burnham teaches a method of manufacturing a photonic integrated circuit comprising a compound semiconductor structure having a quantum well region 54, comprising the steps of irradiating the structure using a source of photons (i.e., laser, column 2, lines 1-5) to generate defects, the photons having an energy (E) at least that of the displacement energy ($E_{[D]}$) of at least one element of the compound semiconductor, and subsequently annealing the structure to promote quantum well intermixing.

In support of their contrary view, the appellants argue that the Burnham patent contains no disclosure concerning the appealed claim 1 steps of irradiating a semiconductor structure "to generate defects" and "subsequently annealing the structure." More specifically, the appellants acknowledge that Burnham irradiates his semiconductor structure with a laser beam but point out that this laser beam irradiation is for the purpose of creating thermally disordered areas as opposed to generating defects as here claimed. The appellants additionally point out that the Burnham method does not include an annealing step

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subsequent to the aforementioned irradiating step. In this regard, the appellants explain that "[n]o additional annealing step is required in the Burnham method because the whole structure has already been heated to this high temperature" (brief, page 5).

The appellants are unquestionably correct that Burnham teaches laser beam irradiation for the purpose of providing disordered areas or patterns (e.g., see lines 13-32 in column 3, lines 13-39 in column 5, the paragraph bridging columns 5 and 6, lines 38-58 in column 6 as well as patent claims 1 and 8 in columns 7 and 8 respectively). The examiner does not identify, and we do not independently find, any disclosure in the Burnham patent of generating defects as required by the claim under review. Significantly, the answer contains no acknowledgment of, much less rebuttal to, the argued distinction between generating defects as claimed by the appellants versus creating a disordered pattern as taught by Burnham. Although he does not say so expressly, the examiner may consider patentee's disordered areas to be equivalent to the here claimed defects. Assuming this to be the case, the Section 102 rejection before us still would be deficient in that the examiner has proffered no evidence of any kind to show such equivalency.

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The Section 102 rejection is further deficient in that Burnham's method does not include the appealed claim 1 step of "subsequently annealing the structure" as correctly argued by the appellants. Again, the answer contains no reasonably specific discussion or even acknowledgment of this argued claim feature. Although the examiner once again does not say so, he may regard patentee's laser beam irradiating step as performing an annealing function. However, such a step of simultaneously irradiating and annealing would not satisfy the requirements of the independent claim on appeal. This is because claim 1 requires these steps to be practiced sequentially, that is, "irradiating the structure . . . and subsequently annealing the structure" (emphasis added).

For the above stated reasons, we cannot sustain the examiner's Section 102 rejection of appealed independent claim 1 or concomitantly of appealed dependent claims 4-9 as being anticipated by Burnham. Because the other applied references have not been relied upon by the examiner to supply these deficiencies of Burnham, we also cannot sustain the Section 103 rejections of claims 2, 3 and 16 as being unpatentable over Burnham in view of Thompson or of claims 10-15 as being unpatentable over Burnham in view of Poole and Feldman.

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The decision of the examiner is reversed.

REVERSED

BRADLEY R. GARRIS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
THOMAS A. WALTZ)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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)	
CATHERINE TIMM)	
Administrative Patent Judge)	

BRG/hh

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