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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* JOSEPH MICHAEL FREUND

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Appeal 2010-008191  
Application 11/371,277  
Technology Center 2800

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Before ALLEN R. MacDONALD, LYNNE E. PETTIGREW and  
GEORGIANNA W. BRADEN, *Administrative Patent Judges*.

BRADEN, *Administrative Patent Judge*

DECISION ON APPEAL

This is an appeal<sup>1</sup> under 35 U.S.C. § 134(a) from the Non-Final Rejection of claims 1-8 and 11-20.<sup>2</sup> We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

## STATEMENT OF THE CASE

### *Appellant's Invention*

Appellant's invention relates to a surface-emitting semiconductor laser (SEL), where the direction of light output is perpendicular to the wafer surface. (Spec. page 1, ll. 4-11.) The SEL uses a substrate with an integrated photodiode for automatic power control. (Figs. 1B and 1D.) The photodiode monitors the secondary light output that is transmitted through the lower DBR (distributed Bragg reflector) mirror of the SEL so that the primary light output of the SEL is not involved in the automatic power control. (Spec. page 2, ll. 18-22.)

### *Exemplary Claim*

Claims 1, 15, and 20 are the pending independent claims. Claim 1 is exemplary, and is reproduced below with disputed limitations in italics:

1. A laser assembly comprising:

a substrate, the substrate having a first doped region and a second doped region, the second doped region being proximate to an upper surface of the substrate and forming a pn junction with the first doped region;

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<sup>1</sup> The Real Party in Interest is LSI Corp.

<sup>2</sup> Claims 9 and 10 were cancelled and are not on appeal.

one or more standoffs; and

a semiconductor laser, the semiconductor laser being operative to emit light from an upper surface and a lower surface and being attached to the upper surface of the substrate with the one or more standoffs such that the light emitted from the lower surface of the semiconductor laser impinges on the second doped region;

*wherein a groove is formed in the upper surface of the substrate in the second doped region, the groove having at least first and second sloped surfaces; and*

wherein the light emitted from the lower surface of the semiconductor laser and impinging on the second doped *region impinges on one or more of the sloped surfaces of the groove.*

#### *Examiner's Rejections*

1. Claims 1-4, 6-8, 11, 12, 14, 15, 19, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kwak (US Patent Application Publication No. 2005/0147360 A1, Jul. 7, 2005) in view of Rudenberg (US Patent No. 3,150,999, Sept. 29, 1964). (Ans. 4.)

2. Claims 3 and 5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kwak and Rudenberg in view of Kwok K. Ng, "Complete Guide to Semiconductor Devices," 2<sup>nd</sup> Edition (2002). (Ans. 8.)

3. Claims 8 and 15-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kwak and Rudenberg in view of Ouchi (US Patent No. 6,597,713 B2, Jul. 22, 2003). (Ans. 10-11, 14-15.)

4. Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kwak and Rudenberg in view of Gaw (US Patent No. 5,574,744, Nov. 12, 1996). (Ans. 10-11.)

5. Claim 18 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kwak and Rudenberg and Ouchi in further view of Nagara (US Patent Application Publication No. 2003/0002552 A1, Jan. 2, 2003). (Ans. 15.)

#### ISSUE 1

##### *§ 103(a) Rejection of Claims 1-4, 6-8, 11, 12, 14, 15, 19, and 20*

Appellant contends that the claim limitations “wherein a groove is formed in the upper surface of the substrate in the second doped region” and “impinges on one or more of the sloped surfaces of the groove” are not taught or suggested in the combination of Kwak and Rudenberg. (App. Br. 6-7).

*Issue 1:* Has the Examiner erred in finding that the combination of Kwak and Rudenberg teaches or suggests “wherein a groove is formed in the upper surface of the substrate in the second doped region” and “impinges on one or more of the sloped surfaces of the groove” as recited in claim 1?

#### ANALYSIS

We review the Examiner’s rejections in light of Appellant’s arguments that the Examiner has erred. We are unpersuaded by Appellant’s arguments (App. Br. 6-8) that the combination of Kwak and Rudenberg fails to teach or suggest “wherein a groove is formed in the upper surface of the

substrate in the second doped region” and “impinges on one or more of the sloped surfaces of the groove.” Appellant generally provides arguments that attack individual aspects of each reference, rather than the rejections as articulated by the Examiner based on the combined teachings of the references. (App. Br. 6-7.) For instance, Appellant asserts that in Kwak “the downward light emitted from the VCSEL 250 is incident on a monitor photodiode region 230” and that per Figure 2 in Kwak “the groove 222 is not formed in the region 230 nor in any doped region thereof.” (App. Br. 7.) However, the Examiner concedes that “Kwak et al. does not disclose the light impinging on the sloped surfaces, thus while the groove extends into the doped region it is not formed in the doped region. For the light to impinge on the sloped surfaces of the groove (i.e. where the groove is formed) and on the second doped region (the monitor photodiode and the purpose of the invention) the groove (with sloped sides[]) must be formed in the second doped region.” (Ans. 16-17.) Instead, the Examiner relies on Rudenberg to teach this limitation. (Ans. 17.)

The Examiner finds that Rudenberg meets the disputed claim limitation because “Rudenberg et al. discloses a pn junction photodiode substrate having a groove formed in the second region (Fig. 2 element 17) with at least a first and second sloped surface and the light impinging on the doped regions also impinges on one or more of the sloped surfaces of the groove (Fig. 2 elements 12,13,18,21, and 22).” (Ans. 5, 17; Rudenberg, col. 2, ll. 19-27, Figure 2.) We agree with the Examiner.

Appellant also contends that Kwak and Rudenberg fail to teach or suggest the claim limitation “impinges on one or more of the sloped surfaces of the groove” (App. Br. 7) because Rudenberg does not involve any light

emitted from a semiconductor laser (*Id.*). The Examiner notes this is true, but finds that Kwak shows light from the laser diode impinging on the photodiode, while Rudenberg is used to show an improvement to the photodiode. (Ans. 17; Rudenberg, col. 1, ll. 32-37.)

Appellant disagrees that “it would be obvious to modify Kwak to incorporate a photodiode allegedly taught by Rudenberg” (Reply Br. 2), because based on an illustrative embodiment disclosed in Appellant’s Specification, light is “steered away from the portion of the lower surface of the SEL where the light was emitted” and “the groove is intended to prevent light which has already been measured by the photodiode from reentering the SEL, rather than to increase the amount of light measured by the photodiode.” (*Id.*, emphasis in original.) However, there is no limitation in the claims as recited that limits the laser assembly to only those (a) where light is steered away from the lower surface of the SEL, and (b) that prevent light, which has already been measured by the photodiode, from reentering the SEL. Moreover, as discussed above, the Examiner finds that Rudenberg discloses a groove formed in the second region (Fig. 2 element 17) with at least a first and second sloped surface and the light impinging on the doped regions also impinges on one or more of the sloped surfaces of the groove. (Ans. 5, 17; Rudenberg, col. 2, ll. 19-27, Figure 2.)

Appellant further contends that Kwak teaches away from the invention because Kwak teaches that ““the light emitted downwards from the VCSEL 250 is incident on the MPD [monitor photodiode] region 230...VCSEL 250 is mounted on the bottom of the V-shaped groove 222, thus decreasing the height of the exposed part of the VCSEL 250 and simplifying the manufacturing process of the VCSEL module 200.”” (Reply

Br. 2, emphasis in original.) This statement, however, does not teach away because it does not criticize, discredit, or otherwise discourage Appellant's claimed arrangement. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Even if Kwak suggests a less complex manufacturing process than the claimed invention, as Appellant alleges (Reply Br. 3), it would not render Appellant's claims nonobvious. *See In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) ("A known or obvious [product] does not become patentable simply because it has been described as somewhat inferior to some other product . . ."). Moreover, Appellant's contention appears to analyze Kwak in isolation. Kwak's teachings should be weighed together with those of Rudenberg, which, as explained above, discloses a groove formed in the second region and light impinging on the doped region and one or more sloped surfaces of the groove. *See Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.*, 73 F.3d 1085, 1090 (Fed. Cir. 1995). Appellant has not provided an explanation as to why the combination of Kwak and Rudenberg does not fall within the scope of the claim language, especially in light of the Examiner's findings regarding the groove in the second region as taught by Rudenberg.

Finally, Appellant contends that Kwak and Rudenberg are not analogous art, and therefore, cannot be combined to establish an obviousness rejection. (App. Br. 7-8.) However, the Examiner finds that Rudenberg discusses an improved photodiode, which minimizes reflections from the surface of the photodiode, thereby improving efficiency. (Ans. 17.) Therefore, the reference is in the same field as the monitor photodiode disclosed by Kwak (i.e. photodiode), and also solves a well-known problem in the art (i.e. improved efficiency). (*Id.*) Therefore, according to the

Examiner, Rudenberg is analogous art to Kwak. We agree with the Examiner.

The arguments presented by Appellant appear to attack the references individually, rather than in combination. (App. Br. 6-8.) Nonobviousness cannot be established by attacking the references individually when the rejection is predicated upon a combination of prior art disclosures. *See In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Further, in attacking the references individually, Appellant fails to address the Examiner's actual rejections to establish an insufficiency in the combined teachings of the references and show the Examiner has erred in his determination of obviousness. Thus, Appellant has not persuaded us the Examiner erred in finding the combination of Kwak and Rudenberg teaches and/or suggests the invention as recited in claim 1.

Appellant has not presented any substantially different arguments for independent claims 15 and 20, which require the same disputed claim limitation as claim 1. Accordingly, we sustain the rejection of independent claims 15 and 20 under 35 U.S.C. § 103(a). Similarly, Appellant has not presented any substantive arguments with respect to dependent claims 2-4, 6-8, 11, 12, 14, and 19 and thus, these claims fall with their respective independent claims. Therefore, we sustain the rejection of claims 1-4, 6-8, 11, 12, 14, 15, 19, and 20 under 35 U.S.C. § 103(a).

## ISSUE 2

### *§ 103(a) Rejection of Claims 3 and 5*

Appellant contends that Ng fails to supplement deficiencies in Kwak and Rudenberg. (App. Br. 10.)

The Examiner finds that Ng teaches two common designs of p-i-n photodiodes, which is a type of p-n junction. (Ans. 9; Ng, pages 431-432.) We concur with the Examiner's findings, and are not persuaded the Examiner erred in finding the combination of Kwak and Rudenberg in view of Ng teaches or suggests the invention as recited in claims 3 and 5. Thus, we sustain the rejection of claims 3 and 5 under 35 U.S.C. § 103(a).

### ISSUE 3

#### *§ 103(a) Rejection of Claims 8 and 15-19*

Appellant contends that Kwak, Rudenberg, and Ouchi fail to teach or suggest the claim limitation “wherein an optical storage drive is capable of recording data in accordance with at least two different optical disc formats” as recited by claim 18. (App. Br. 11.) Appellant further contends that the portion of Ouchi cited by the Examiner for the disputed limitation appears to be inapposite to the limitation at issue. (*Id.*)

The Examiner finds that Ouchi teaches two VCSELs (lasers) with monitor photodiodes integrated together and capable of emitting at two different optical formats. (Ans. 13; Ouchi, col. 22, ll. 35-38, Figure 11.) Thus, the Examiner finds Ouchi in combination with Kwak and Rudenberg meets the disputed claim limitation. We agree.

Accordingly, we sustain the Examiner's rejection of claims 8 and 15-19 under 35 U.S.C. § 103(a).

### ISSUE 4

#### *§ 103(a) Rejection of Claim 13*

Appellant contends that Gaw fails to supplement deficiencies in Kwak and Rudenberg. (App. Br. 12.)

The Examiner finds that Gaw teaches that first and second semiconductor lasers emit light at different wavelengths from each other. (Ans. 10; Gaw, col. 2, ll. 28-39.) We concur with the Examiner's findings, and are not persuaded the Examiner erred in finding the combination of Kwak and Rudenberg in view of Gaw teaches or suggests the invention as recited in claim 13. Thus, we sustain the rejection of claim 13 under 35 U.S.C. § 103(a).

#### ISSUE 5

##### *§ 103(a) Rejection of Claim 18*

Appellant contends that Nagara fails to supplement deficiencies in Kwak and Rudenberg. (App. Br. 12.)

The Examiner finds that Nagara teaches that "optical recording devices have been used by the public for a number of years." (Ans. 19; Nagara, paragraph [0004].) We concur with the Examiner's findings, and are not persuaded the Examiner erred in finding the combination of Kwak and Rudenberg in view of Nagara teaches or suggests the invention as recited in claim 18. Thus, we sustain the rejection of claim 18 under 35 U.S.C. § 103(a).

#### DECISION

The Examiner's decision to reject claims 1-8 and 11-20 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

Appeal 2010-008191  
Application 11/371,277

AFFIRMED

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