

**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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

**Ex parte** JORGE R. JIMENEZ  
PAUL W. PELLEGRINI

---

Appeal No. 1997-2691  
Application 08/496,849

---

ON BRIEF

---

Before FLEMING, RUGGIERO, and FRAHM, **Administrative Patent Judges**.

FLEMING, **Administrative Patent Judge**.

**DECISION ON APPEAL**

This is a decision on appeal from the final rejection of claims 1 through 7, all the claims pending in the application.

The invention relates to a schottky diode infrared detector with a voltage tunable cutoff wavelength. Appellants disclose on page 2 of the specification that their invention is a schottky

diode infrared detector with a voltage tunable cutoff wavelength which is obtained by inserting a SiGe layer between the metal silicide and the Si substrate. Appellants disclose on page 5 of the specification that Fig. 1 shows the current state of the art for metal photoemissive devices which do not have a SiGe layer between the metal silicide and the Si substrate. Appellants disclose on page 8 of the specification that Fig. 3 shows the Appellants' invention having the SiGe layer between the metal silicide and the Si substrate.

Independent claim 1 presented in the application is reproduced as follows:

1. A Schottky barrier infrared photovoltaic detector; which outputs a detection signal which is adjusted by an externally applied voltage and which comprising:

a silicon substrate having a first and second surface;

a silicide layer placed on the first surface of the silicon substrate to form a detector which has a barrier height and which operates in an infrared portion of an electromagnetic spectrum by internal photoemission of holes over an electrical barrier, said detector outputting said detection signal in response to said internal photoemission;

a guard ring implanted in said silicon substrate, said guard ring surrounding the periphery of said silicide layer to block surface currents formed on said substrate and to eliminate edge effects;

Appeal No. 1997-2691  
Application 08/496,849

a SiGe intermediate layer which is grown on the said first surface of the said silicon substrate before the growth of the silicide layer, said SiGe intermediate layer producing an interface with a valance band offset that serves as an additional barrier to photoemitted carriers to enhance thereby a voltage tunable cutoff of said electrical barrier in response to the externally applied voltage; and

first and second contact means for making ohmic contact with said silicide layer and with said silicon substrate respectively, said first and second contact means conducting said externally applied voltage to said detector and outputting said detection signal.

The references relied on by the Examiner are follows:

Yamaka et al. (Yamaka) 1990	4,939,561	July 3,
Pellegrini 1992	5,163,179	Nov. 10,

Claims 1 through 7 stand rejected under 35 U.S.C. § 103 as being unpatentable over Yamaka and Pellegrini.

Rather than repeat the arguments of the Appellants or the Examiner, we make reference to the brief and the answer for the details thereof.

**OPINION**

After a careful review of the evidence before us, we agree with the Examiner that claims 1 and 3 are properly rejected under 35 U.S.C. § 103. Thus, we will sustain the rejection of these claims but we will reverse the rejection of claims 2 and 4 through 7.

On page 3 of the brief, Appellants argue that Yamaka fails to provide a tunability of wavelength sensibility during operation. The Examiner responds on page 10 of the answer that the claim does not require tunability of wavelength sensibility during operation, because the claim is setting forth a structure which is shown to have been met by the combination of Yamaka and Pellegrini.

As pointed out by the our reviewing court, we must first determine the scope of the claim. "[T]he name of the game is the claim." *In re Hinkiker Co.*, 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998). Claims will be given their broadest reasonable interpretation consistent with the specification, and limitations appearing in the specification are not to be read into the claims. *In re Etter*, 756 F.2d

Appeal No. 1997-2691  
Application 08/496,849

852, 858, 225 USPQ 1, 5 (Fed. Cir. 1985).

Turning to claim 1, we find that the Appellants' claim 1 argue is setting forth a Schottky barrier infrared photovoltaic detector. Furthermore, we note that Appellants' claim 1 does not recite a method for operation of the Schottky barrier infrared photovoltaic detector. In addition, we find that the claim does not set forth structure that requires Applicants' argued tunability of wavelength sensibility during operation. Therefore, we fail to find that the Examiner has erred in finding that the combination of Yamaka and Pellegrini in combination meets the Appellants' claim structure.

Appellants argue that there is no basis in the art of record for combining Yamaka and Pellegrini as proposed by the Examiner. In particular, Appellants argue that the combination is improper because neither of these references recognizes the problem solved by the present invention.

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**

Appeal No. 1997-2691  
Application 08/496,849

**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). The Federal Circuit reasons in **Para-Ordnace Mfg. Inc. v. SGS Importers Int'l Inc.**, 73 F.3d 1085, 1088-89, 37 USPQ2d 1237, 1239-40 (Fed. Cir. 1995), **cert. denied**, 519 U.S. 822 (1996), that for the determination of obviousness, the court must answer whether one of ordinary skill in the art who sets out to solve the problem and who had before him in his workshop the prior art, would have been reasonably expected to use the solution that is claimed by the Appellants. However, it is not required that the Examiner shows that the motivation to make the modification is the same motivation as that of the Appellants' motivation. In **In re Kemps**, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996), **citing In re Dillon**, 919 F.2d 688, 693, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990)(in banc), our reviewing court states:

[A]lthough the motivation to combine here differs from that of the applicant, the motivation in the prior art to combine the references does not have to be identical to that of the applicant to establish obviousness.

Appeal No. 1997-2691  
Application 08/496,849

On page 6 of the answer, the Examiner provides the following rationale: one of ordinary skill in the art at the time the invention was made would have been motivated to use the Pellegrini guard ring to prevent current leakage in the Yamaka Schottky barrier infrared photovoltaic detector. We note that the Appellants have not argued that this is an improper rationale. Upon our review of the references, we find that one of ordinary skill in the art would have reason to combine Pellegrini's guard rails so as to prevent current leakage as disclosed and suggested by Pellegrini in col. 4, lines 25-27, with the Yamaka's Schottky barrier infrared photovoltaic detector.

On page 4 of the brief, Appellants argue that neither Yamaka nor Pellegrini teaches that SiGe intermediate layer has a Ge concentration selected from a range of 1% to 40%. The Examiner responds to this argument on page 7 of the answer stating that Yamaka discloses that the Ge concentration in the SiGe layer is a concentration of 30%.

We find in col. 3, lines 4-61, that Yamaka teaches that the SiGe intermediate layer has a Ge concentration of 30%.

Appeal No. 1997-2691  
Application 08/496,849

Therefore, Yamaka reads on Appellants' claim 3.

Appeal No. 1997-2691  
Application 08/496,849

In view of the foregoing, we find that the Examiner did not err in rejecting claims 1 and 3 under 35 U.S.C. § 103. Therefore, we will sustain the decision of the Examiner.

On page 4 of the brief, Appellants argue that neither Yamaka and Pellegrini teaches or suggests a Schottky barrier infrared photovoltaic detector wherein the SiGe intermediate layer has a thickness that is selected from a range of 10 to 800 angstroms. Appellants argue that this thickness adjusts the barrier height and is not discussed in the cited references.

Turning to Yamaka, we find that Yamaka teaches in Fig. 1 that the intermediate layer has a thickness of 1000 angstroms. Therefore, we find that Yamaka does not teach a Schottky barrier infrared photovoltaic detector wherein the SiGe intermediate layer has a thickness that is selected from a range of 10 to 800 angstroms. Therefore, we will not sustain the Examiner's rejection of claim 2 as well as the rejection of the dependent claims from claim 2, claims 4 through 7.

Therefore, the decision of the Examiner rejecting claims 1 and 3 under 35 U.S.C. § 103 is affirmed; however, the

Appeal No. 1997-2691  
Application 08/496,849

decision of the Examiner rejecting claims 2 and 4 through 7  
under 35 U.S.C.

§ 103 is reversed.

Appeal No. 1997-2691  
Application 08/496,849

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

**AFFIRMED-IN-PART**

MICHAEL R. FLEMING )  
Administrative Patent Judge )  
 )  
 )  
 ) BOARD OF PATENT  
JOSEPH F. RUGGIERO )  
Administrative Patent Judge ) APPEALS  
AND )  
 )  
 ) INTERFERENCES  
 )  
ERIC FRAHM )  
Administrative Patent Judge )

Appeal No. 1997-2691  
Application 08/496,849

MRF/dal

Appeal No. 1997-2691  
Application 08/496,849

ESC/JAZ  
40 WRIGHT ST.  
HANSCOM AFB MA 01731-2903