

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HAMAMATSU CORPORATION
Petitioner,

v.

SIONYX, LLC
Patent Owner.

Case IPR2016-01910
Patent 8,680,591 B2

Before GEORGIANNA W. BRADEN, MATTHEW R. CLEMENTS, and
MONICA S. ULLAGADDI, *Administrative Patent Judges*.

ULLAGADDI, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

Hamamatsu Corporation (“Petitioner”) filed a Petition (Paper 2, “Pet.”) for *inter partes* review of claims 1–26 (the “challenged claims”) of U.S. Patent No. 8,680,591 B2 (Ex. 1001, “the ’591 patent”). SiOnyx, LLC (“Patent Owner”) timely filed a Preliminary Response (Paper 21, “Prelim. Resp.”).

Pursuant to 35 U.S.C. § 314(a), *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” *See also* 37 C.F.R. § 42.4(a) (delegating authority to the Board).

Upon consideration of the Petition, the Petitioner’s supporting evidence, as well as Patent Owner’s Preliminary Response and supporting evidence, and for the purposes of this Decision, we are persuaded Petitioner has established a reasonable likelihood it would prevail with respect to at least one of the challenged claims. Accordingly, for the reasons that follow, we institute an *inter partes* review of the ’591 patent as to claims 1, 2, 4–18, 21, and 23–26, but not as to claims 3, 19, 20, and 22.

B. Related Proceedings

The parties inform us that the ’591 patent is at issue in the following proceeding: *SiOnyx LLC, et al. v. Hamamatsu Photonics K.K., et al.*, 1:2015-cv-13488, (D. Mass.), which was originally filed on October 1, 2015. Pet. 1; Paper 20, 1.

C. The '591 Patent

The '591 patent is entitled “Photosensitive Imaging Devices and Associated Methods” and discloses a photosensitive pixel device including a semiconductor substrate with a textured region coupled thereto. Ex. 1001, [54], [57]. The textured region interacts with electromagnetic radiation by “increasing the semiconductor substrate’s effective absorption wavelength as compared to a semiconductor substrate lacking a textured region.” *Id.* at [57]. In Figure 10, reproduced below, textured region 90 is depicted as being adjacent to semiconductor substrate 72. *See id.* at 16:26–41.

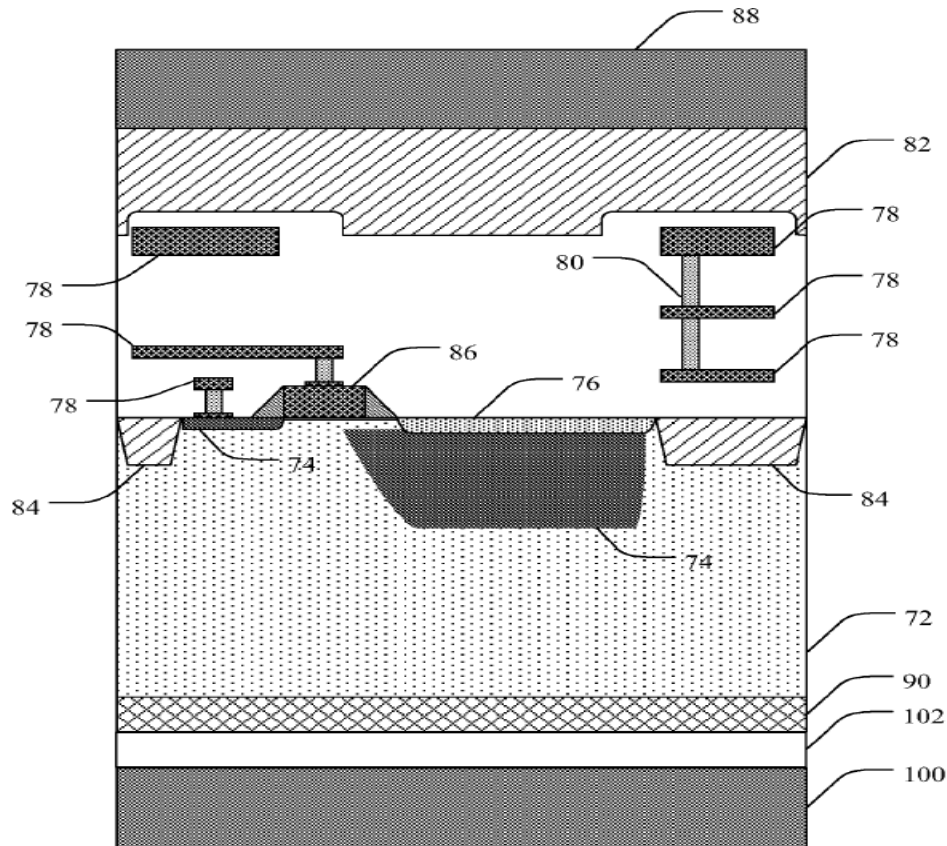


Figure 10 of the '591 patent is a schematic view of a photosensitive pixel device. As shown in Figure 10, additional carrier support substrate 100 is coupled to the photosensitive pixel device on an opposing side from carrier support substrate 88.

Id. at 16:26–28. Reflective layer 102 is disposed between textured region 90 and additional carrier support substrate 100. *See id.* at 16:32–33. The ’591 patent discloses that “the configuration of the textured region can function to direct or focus electromagnetic radiation” into or away from the semiconductor substrate. *Id.* at 15:11–16. The ’591 patent further discloses that the “location of the textured region can be used to provide enhancement and/or filtering of the incoming electromagnetic radiation.” *Id.* at 14:41–43.

The photosensitive pixel device further includes metal regions 78, at least one via 80, passivation layer 82, trench isolation 84, and electrical transfer element 86. *Id.* at 15:55–57. The ’591 patent discloses that “[t]rench isolation elements can maintain pixel to pixel uniformity by reducing optical and electrical crosstalk.” *Id.* at 15:57–59.

D. Illustrative Claims

As noted above, Petitioner challenges claims 1–26 of the ’591 patent, of which claims 1, 13, and 23 are independent. Independent claims 1 and 23 are reproduced below.

1. A photosensitive imager device, comprising:
a semiconductor substrate having a substantially planar surface and multiple doped regions forming a least one junction;
a textured region coupled to the semiconductor substrate on a surface opposite the substantially planar surface and positioned to interact with electromagnetic radiation;
integrated circuitry formed at the substantially planar surface; and
an electrical transfer element coupled to the semiconductor substrate and operable to transfer an electrical signal from the at least one junction.

Ex. 1001, 18:33–45.

23. A photosensitive imager device, comprising:

a semiconductor substrate having a substantially planar surface and multiple doped regions forming a least one junction;
a textured region coupled to the semiconductor substrate on a surface opposite the substantially planar surface and positioned to interact with electromagnetic radiation; and
at least 4 transistors formed at the substantially planar surface with at least one of the transistors electrically coupled to the at least one junction.

Id. at 20:24–34.

E. The Evidence of Record

Petitioner relies upon the following references, as well as the Declaration of Dr. Shukri J. Sourì (Ex. 1010):

Reference	Date	Exhibit
U.S. Patent Pub. No. 2007/0237504 A1 (“Nakashiba”)	Oct. 11, 2007	1003
U.S. Patent No. 6,204,506 B1 (“Akahori”)	Mar. 20, 2001	1004
U.S. Patent Pub. No. 2003/0029495 A1 (“Mazur”)	Feb. 13, 2003	1005
U.S. Patent Pub. No. 2003/0214595 A1 (“Mabuchi”)	Nov. 20, 2003	1006
U.S. Patent Pub. No. 2006/0086956 A1 (“Furukawa”)	Apr. 27, 2006	1007
English Translation of JP 06-94-244444 (“Uematsu”) ¹	Sept. 2, 1994	1009

Patent Owner relies upon the Declaration of R. Michael Guidash (Ex. 2001).

F. The Asserted Grounds of Unpatentability

Petitioner asserts unpatentability of the challenged claims of the ’591 patent based on the following grounds:

¹ The original publication in Japanese is Exhibit 1008.

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