

NOTE: This disposition is nonprecedential.

**United States Court of Appeals
for the Federal Circuit**

COREPHOTONICS, LTD.,
Appellant

v.

APPLE INC.,
Appellee

**ANDREW HIRSHFELD, PERFORMING THE
FUNCTIONS AND DUTIES OF THE UNDER
SECRETARY OF COMMERCE FOR
INTELLECTUAL PROPERTY AND DIRECTOR OF
THE UNITED STATES PATENT AND TRADEMARK
OFFICE,**
Intervenor

2020-1425

Appeal from the United States Patent and Trademark
Office, Patent Trial and Appeal Board in No. IPR2018-
01133.

Decided: May 20, 2021

ROBERT J. GAJARSA, Russ August & Kabat, Washing-
ton, DC, argued for appellant. Also represented by MARC

AARON FENSTER, NEIL RUBIN, Los Angeles, CA.

ANGELA OLIVER, Haynes & Boone, LLP, Washington, DC, argued for appellee. Also represented by ANDREW S. EHMKE, DEBRA JANECE MCCOMAS, Dallas, TX; DAVID W. O'BRIEN, HONG SHI, Austin, TX.

MAUREEN DONOVAN QUELER, Office of the Solicitor, United States Patent and Trademark Office, Alexandria, VA, for intervenor. Also represented by MICHAEL S. FORMAN, THOMAS W. KRAUSE, FARHEENA YASMEEN RASHEED.

Before NEWMAN, REYNA, and TARANTO, *Circuit Judges*.

REYNA, *Circuit Judge*.

Corephotonics, Ltd. appeals a final written decision of the Patent Trial and Appeal Board in an inter partes review brought by Apple Inc. Corephotonics argues that the Board issued its decision in violation of the Appointments Clause because the Board's decision came after this court's decision in *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320, 1335 (Fed. Cir. 2019) but before this court issued its mandate. On this basis, Corephotonics argues that the Board's decision should be vacated and remanded. On the merits, Corephotonics argues that substantial evidence does not support the Board's findings as to patentability. Because we determine that the Board issued its decision after this court's decision in *Arthrex* we decline to vacate and remand the Board's decision underlying this appeal. Moreover, because substantial evidence supports the Board's patentability determination, we affirm.

BACKGROUND

On May 22, 2018, Apple Inc. ("Apple") filed a petition for inter partes review at the Patent Trial and Appeal Board ("Board"), asserting that claims 1–4 of U.S. Patent

No. 9,538,152 (the “152 patent”) would have been obvious over U.S. Patent Publication No. 2008/0030592 to Border et al. (“Border”) in view of U.S. Patent No. 7,859,588 to Parulski et al. (“Parulski”). J.A. 102.

The ’152 patent is directed to a “multi-aperture imaging system comprising a first camera with a first sensor that captures a first image and a second camera with a second sensor that captures a second image.” ’152 patent, Abstract. The ’152 patent discloses a dual-aperture camera used to capture synchronous images from both a wide-angle lens and a miniature telephoto lens with higher resolution in a narrower field. *Id.*, col. 2, ll. 30–43; *see also id.* col. 2 l. 64–col. 3 l. 10. A “different magnification image of the same scene is grabbed by each subset, resulting in field of view (FOV) overlap between the two subsets.” ’152 patent at col. 3 ll. 11–14. The wide-angle and telephoto images are then fused to output one combined image. *Id.* at col. 3 ll. 11–24.

The claims of the ’152 patent require a processor configured to “register the overlap area” of a “second image as non-primary image” to a “first image as primary image to obtain the output image,” where the output image must be from either the “point of view of the first camera” or the “point of the view of the second camera.” *Id.* at col. 13 ll. 5–17. The image registration enables the “output image point of view” to be “determined according to the primary image point of view (camera angle).” *Id.* at col. 9 ll. 26–29. As a result of this image registration process, “the point of view of the output image is that of the first camera,” if the field of view, or FOV, of the second camera (2) is less than the FOV of the first camera (1) based on a zoom factor (ZF) input, or if $FOV_2 < FOV_{ZF} < FOV_1$. *Id.* at col. 13 ll. 8–11.¹

¹ The patent further explains how the first or second image become the primary image as follows: the “choice of the Wide image or the Tele image as the primary and

Specifically, the representative asserted claims of the '152 patent recite:

1. A multi-aperture imaging system comprising:
 - a) a first camera that provides a first image, the first camera having a first field of view (FOV_1) and a first sensor with a first plurality of sensor pixels covered at least in part with a standard color filter array (CFA);
 - b) a second camera that provides a second image, the second camera having a second field of view (FOV_2) such that $FOV_2 < FOV_1$ and a second sensor with a second plurality of sensor pixels, the second plurality of sensor pixels being either Clear or covered with a standard CFA, the second image having an overlap area with the first image; and
 - c) a processor configured to provide an output image from a point of view of the first camera based on a zoom factor (ZF) input that defines a respective field of view (FOV_{ZF}), the first image being a primary image and the second image being a non-primary image, **wherein if $FOV_2 < FOV_{ZF} < FOV_1$ then the point of view of the output image is that of the first camera**, the processor further configured to register the overlap area of the

auxiliary images is based on the ZF chosen for the output image. If the chosen ZF is larger than the ratio between the focal-lengths of the Tele and Wide cameras, the Tele image is set to be the primary image and the Wide image is set to be the auxiliary image. If the chosen ZF is smaller than or equal to the ratio between the focal-lengths of the Tele and Wide cameras, the Wide image is set to be the primary image and the Tele image is set to be the auxiliary image." '152 patent col. 9 ll. 33–40.

second image as non-primary image to the first image as primary image to obtain the output image.

2. The multi-aperture imaging system of claim 1, wherein, if $FOV_2 \geq FOV_{ZF}$, then the processor is further configured to provide an output image from a point of view of the second camera.

'152 patent col. 12 l. 59–col. 13 l. 17 (emphasis added).²

The Board issued its final written decision on December 2, 2019, concluding that all challenged claims are unpatentable as obvious. J.A. 1–33; *see also Apple Inc. v. Corephotonics Ltd.*, IPR2018-01133, 2019 WL6523190 (P.T.A.B. Dec. 2, 2019). Of particular importance to the merits of this appeal, the Board found that the Border reference disclosed the limitation “the point of view of the output image is that of the first camera” appearing in claim 1. J.A. 24.

Corephotonics appeals. This court has jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

This court reviews the Board’s factual determinations for substantial evidence and its legal determinations de novo. *In re Stepan Co.*, 868 F.3d 1342, 1345 (Fed. Cir. 2017). Obviousness is a question of law based on subsidiary findings of fact. *Id.*

I

Before reaching the merits, we address Corephotonics, Ltd.’s (“Corephotonics”) initial argument. Corephotonics argues that the Board’s decision was issued in violation of the Appointments Clause because the Board issued its

² Claims 3 and 4 parallel the limitations of claims 1 and 2, but are method claims rather than system claims. '152 patent col. 13 l. 18–col. 14 l. 22.

final written decision on December 2, 2019, which was after this court's decision in *Arthrex*, but before the associated mandate was issued. Specifically, Corephotonics contends that only the mandate in *Arthrex* would have ordered compliance by the agency to this court's opinion in *Arthrex*.

In *Caterpillar*, this court determined that final written decisions issued by the Board after the *Arthrex* decision do not require a remand because they do not implicate the Appointments Clause issues raised in *Arthrex*. See *Caterpillar Paving Prods. Inc. v. Wirtgen Am., Inc.*, 957 F.3d 1342, 1343 (Fed. Cir. 2020) (denying a motion to vacate and remand based on *Arthrex* where the Board's decision issued in November 2019, after the opinion in *Arthrex*). While the appellant in *Caterpillar* may not have raised the specific argument regarding the mandate implication that Corephotonics raises here, we see no reason to depart from our holding in *Caterpillar* for purposes of resolving this appeal. Accordingly, we decline to vacate the Board's decision and remand to the Board.

II

As to the merits of its appeal, Corephotonics argues that substantial evidence does not support the Board's finding because Border does not teach providing "an output image from a point of view of the first camera," as required by the claims. '152 patent col. 13 ll. 5–6. Instead, Corephotonics contends that Border teaches stitching two images together to provide a composite image with portions from the point of view of the first camera and other portions from the point of view of the second camera. Appellant's Br. 1–2, 13. In other words, Border's teaching produces a composite image with parts having two different points of view, not an image with the "point of view of the first camera." *Id.*

The Board concluded that Border's express disclosure of transforming coordinates from the telephoto to the wide-

angle image, along with the testimony of Apple’s expert, Dr. Oliver Cossairt, is sufficient to meet the limitation. J.A. 24. We agree. Specifically, Border states that it “transforms the coordinates of the telephoto image 206 to the wide image 204.” Border at ¶ 38 (J.A. 694). In addition, Dr. Cossairt testified that transforming the coordinates has the effect of making the telephoto portion of the composite image have the same point of view as the wide image. J.A. 19; *see also* J.A. 651–52 (Declaration of Dr. Oliver Cossairt). Notably, Corephotonics’s expert did not, and could not, testify to the contrary as he stated that he was not an expert on this particular topic. J.A. 19; *see also* J.A. 1553–54 (Declaration of Dr. James Koshmach). Accordingly, because substantial evidence supports the Board’s determination, we affirm. The court has considered the remainder of Corephotonics’s arguments and finds them unpersuasive.

CONCLUSION

The court declines to vacate and remand the Board’s decision in view of *Arthrex*, because the final written decision underlying this appeal issued after this court issued its decision in *Arthrex*. In addition, substantial evidence supports the Board’s well-reasoned decision, and thus the court affirms the Board’s unpatentability findings as to claims 1–4 of the ’152 patent.

AFFIRMED