

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE INC.,  
Petitioner,

v.

COREPHOTONICS LTD.,  
Patent Owner.

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IPR2020-00897  
Patent 10,324,277 B2

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Before BRYAN F. MOORE, GREGG I. ANDERSON, and  
MONICA S. ULLAGADDI, *Administrative Patent Judges*.

ANDERSON, *Administrative Patent Judge*.

JUDGMENT  
Final Written Decision  
Determining All Challenged Claims Unpatentable  
*35 U.S.C. § 318(a)*

## I. INTRODUCTION

Apple, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–24 of U.S. Patent No. 10,324,277 (Ex. 1001, “the ’277 patent”). Paper 3 (“Pet.”). Corephotonics, Ltd. (“Patent Owner”) did not file a Preliminary Response. We instituted *inter partes* review on December 8, 2020. Paper 8 (“Inst. Dec.”). Patent Owner filed a Response (Paper 15, “PO Resp.”), Petitioner filed a Reply (Paper 22, “Reply”), and Patent Owner filed a Sur-Reply (Paper 23, “Sur-Reply”). A hearing was held on September 8, 2021, and a transcript is of record. Paper 33 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 314. Upon considering the record, for reasons discussed below, we find claims 1–24 unpatentable.

## II. BACKGROUND

### A. *Real Parties in Interest*

The real parties in interest are Apple Inc. and Corephotonics, Ltd. Pet. 1.

### B. *Related Matters*

Petitioner advises us that the ’277 patent is the subject of one pending civil action, *Corephotonics, Ltd. v. Apple Inc.*, Case No. 5-18-cv-02555 (N.D. Cal.) (“’2555 case”). Pet. 2. Patent Owner advises us of a separate civil action involving the same parties, *Corephotonics, Ltd. v. Apple Inc.*, Case No. 3:19-cv-04809 (N.D. Cal.) (“’4809 case”). Paper 6, 1. The ’2555 and ’4809 cases were found related to a previously filed case in the Northern District of California between the same parties, Case No. 17-cv-06457 (N.D.Cal.). See ’2555 case, Dkt. 14; ’4809 case, Dkt. 16.

Petitioner further advises us of two *inter partes* review proceedings between these same parties, IPR2018-01140 (“’1140 IPR”) and IPR2018-

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01146 (“’1146 IPR”), which challenge respectively certain claims of U.S. Pat. Nos. 9,568,712 (“the ’712 patent”) and 9,402,032 (“the ’032 patent”).<sup>1,2</sup> Pet. 8, fn.2.

We identify the following related administrative matters, including every application and patent claiming the benefit of the priority of the filing date of patents in the priority chain of the ’277 patent. *See* Office Consolidated Trial Practice Guide<sup>3</sup> at 18; *see also* 84 Fed. Reg. 64,280 (Nov. 21, 2019).

U.S. Patent No. 10,317,647 (“the ’647 patent”) and U.S. Patent No. 10,330,897 (“the ’897 patent”) claim priority to:

Application No. 15/817,235 (now the ’277 patent), which claims priority to Application No. 15/418,925 (now U.S. Patent No. 9,857,568, “the ’568 patent”), which claims priority to Application No. 15/170,472 (now the ’712 patent), which claims priority to Application No. 14/932,319 (now the ’032 patent), which claims priority to Application No. 14/367,924 (abandoned), which claims priority to PCT/IB2014/062465, which claims priority to Prov. No. 61/842,987.

With respect to AIA trial proceedings, we note the following:

IPR2020-00896 (challenges the ’647 patent);

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<sup>1</sup> The ’277 patent is a continuation-in-part of the ’712 patent which is a continuation of the ’032 patent. Ex. 1001, at [63].

<sup>2</sup> The ’1140 and ’1146 IPRs have both terminated in final written decisions relating to certain claims of the challenged patents. ’1140 IPR, Paper 37 (claims 1, 13, 14, and 15 shown unpatentable); ’1146 IPR, Paper 37 (claims 15–17 shown unpatentable). Patent Owner has appealed both decisions to the United States Court of Appeals for the Federal Circuit. ’1140 IPR, Paper 38; ’1146 IPR, Paper 38.

<sup>3</sup> Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

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IPR2020-00878 (challenges the '897 patent);  
IPR2019-00030 (challenges the '568 patent);<sup>4</sup>  
IPR2018-01146 (challenges '712 patent); and  
IPR2018-01140 (challenges the '032 patent), as identified by  
Petitioner.

### *C. The Technology and '277 Patent*

The application for the '277 patent was filed November 19, 2017. Ex. 1001, at [22]. A provisional application No. 61/842,987 was filed July 4, 2013.<sup>5</sup> *Id.* at [60].

#### *1. Technology*

The '277 patent describes and claims an optical lens system used in a portable electronic product such as a cell phone. Ex. 1001, 1:24–29. A long effective focal length (EFL) relative to a short total track length (TTL) of the lens assembly enables good quality images. *Id.* at 1:31–45. The latest lens designs use five lenses but the TTL/EFL ratio is larger than desired. *Id.* at 1:41–45.

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<sup>4</sup> The '030 IPR terminated in a final written decision finding all challenged claims unpatentable. '030 IPR, Paper 32, 48; *see also Corephotonics, Ltd. v. Apple Inc. & Andrew Hirshfeld, Intervenor2* (Appeal No. 2020-1961 (Fed. Cir. Oct. 25, 2021) (affirming final written decision)).

<sup>5</sup> Because the effective filing date of this patent is March 16, 2013, or later, AIA § 103 applies to this proceeding. Ex. 1001, at [52], [60].

## 2. '277 Patent

Figure 1A of the '277 patent is reproduced below.

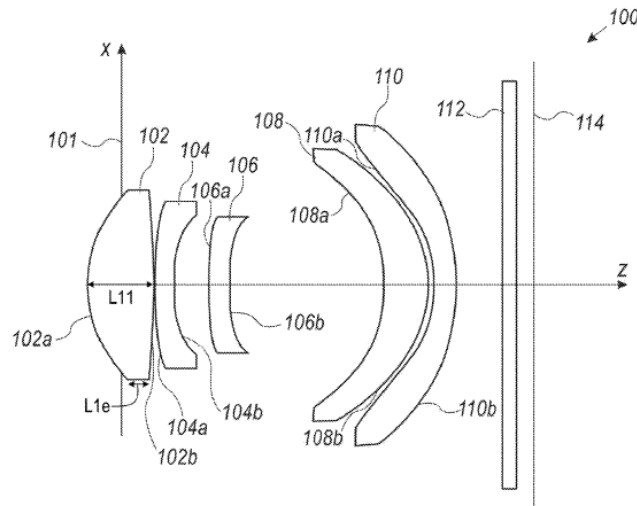


FIG. 1A

**Figure 1A illustrates a first embodiment of the optical lens system.**

Ex. 1001, 2:59–60. Referring to Figure 1A, optical lens system 100 includes five lenses 102, 104, 106, 108, and 110 arranged in order along optical axis z from the object side of the system (the x axis) to the image side (image plane 114). *Id.* at 3:25–46, 4:19 (discussing optical axis z). Each lens is of a specific refractive power and shape. *Id.* at 3:19–44. An “image sensor (not shown) is disposed at image plane 114 for the image formation.” *Id.* at 3:44–46.

Each of the five lenses of this embodiment has refractive powers and shapes shown in Figure 1A and further specified as follows:

first lens 102 has a positive refractive power and a convex object-side surface and a concave image side surface (Ex. 1001, 3:26–28);

second lens 104 has a negative refractive power of and a meniscus convex object-side surface (*Id.* at 3:28–31);

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