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Paper 37
Date: December 3, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

COREPHOTONICS LTD.,
Patent Owner.

IPR2018-01140
Patent 9,402,032 B2

Before MARC S. HOFF, BRYAN MOORE, and MONICA ULLAGADDI, *Administrative Patent Judges.*

HOFF, *Administrative Patent Judge.*

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

I. INTRODUCTION

We have jurisdiction to hear this *inter partes* review under 35 U.S.C. § 6(b), and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 13, 14, and 15 ("challenged claims") of U.S. Patent No. 9,402,032 B2 (Ex. 1001, "the '032 Patent") are unpatentable.

Procedural History

Apple Inc. ("Petitioner") requested an *inter partes* review of claims 1 and 13–15 (the "Challenged Claims") of U.S. Patent No. 9,402,032 B2 (Ex. 1001, "the '032 Patent"). Paper 2 ("Petition" or "Pet.").

After we instituted trial on the challenged claims (Paper 10, "Institution Decision" or "Decision on Institution"), Corephotonics Ltd. ("Patent Owner") filed a Response. Paper 14 ("PO Response" or "PO Resp."). Petitioner filed a Reply to Patent Owner's Response (Paper 22, "Reply"), and Patent Owner filed a Sur-Reply to Petitioner's Reply (Paper 24, "Sur-Reply" or "PO Sur-Reply").

An oral argument was held on October 8, 2019. A transcript of the oral argument is included in the record. Paper 32 ("Tr.").

The Board invited additional briefing from the parties on the question of the construction of the claim term "total track length" (Paper 31, "Order"). In response, Petitioner and Patent Owner filed responsive briefs (Petitioner: Paper 33, "Pet. Resp. Br.;" Patent Owner: Paper 34, "PO Resp. Br."). Subsequently, Petitioner and Patent Owner filed respective replies to

those responsive briefs (Petitioner: Paper 35, "Pet. Suppl. Reply;" Patent Owner: Paper 36, "PO Suppl. Resp.").

Petitioner relies on a declaration from Dr. José Sasián. Ex. 1003. Patent Owner relies on a declaration from Duncan Moore, Ph.D. Ex. 2013.

Related Proceedings

The '032 Patent is asserted in litigation by Patent Owner in *Corephotonics, Ltd. v. Apple Inc.*, 5-17-cv-06457 (N.D. Cal.). Pet. 2; Ex. 2007.

This proceeding is also related to IPR2018-01146, requested by Petitioner Apple Inc., seeking review of U.S. Patent No. 9,568,712. Both patents for which review is requested are continuations (in a chain of continuity) from PCT/IB2014/062465.

II. BACKGROUND

A. The '032 Patent (Ex. 1001)

The '032 Patent concerns an optical lens assembly with five lens elements. Ex. 1001, code (57). Ex. 1001, 7:31–33. The '032 patent issued on July 26, 2016, based upon an application filed November 4, 2015, ultimately claiming priority to a provisional application filed July 4, 2013.[1] Figure 1A of the '032 Patent is reproduced below:

[1] Because the effective filing date of this patent is March 16, 2013 or later, post-AIA § 103 applies to this proceeding.

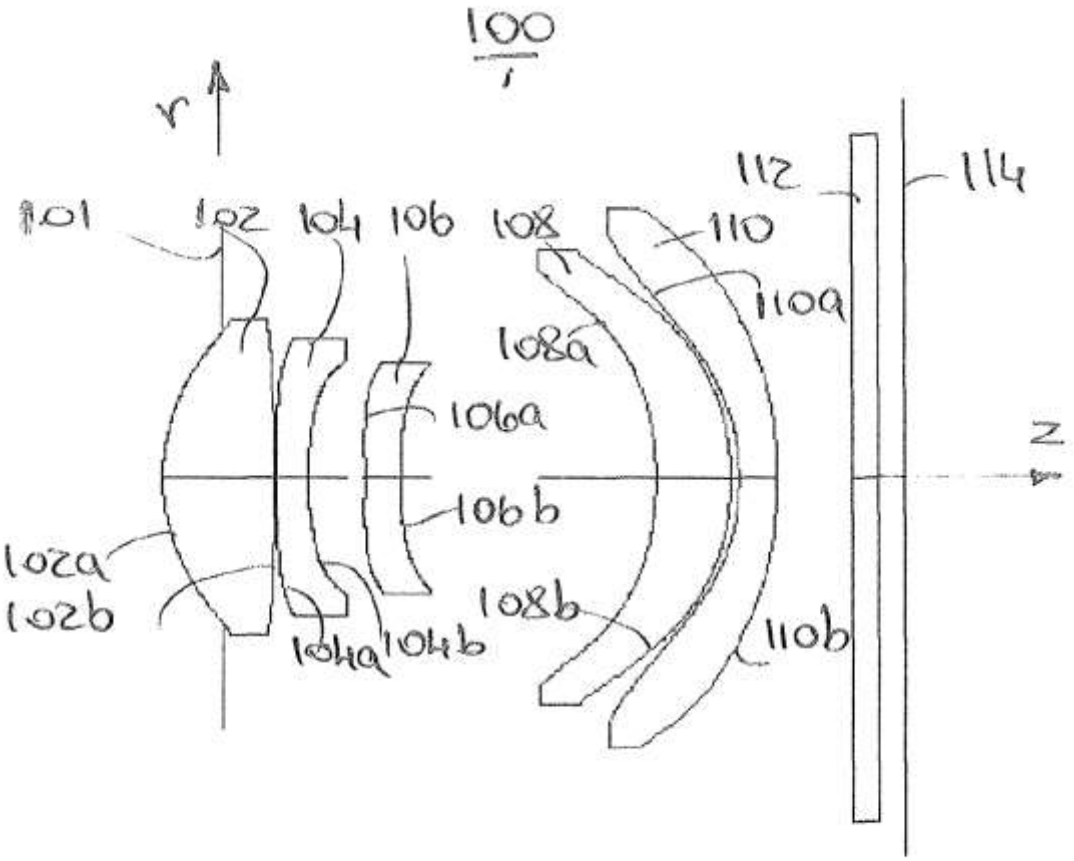

FIG. 1A

Figure 1A of the ’032 Patent shows a first embodiment of its optical lens system. Ex. 1001, Figure 1A.

In order from an object side to an image side, the lens assembly comprises a first lens element (102) with positive refractive power having a convex object side surface; a second lens element (104) with negative refractive power having a thickness d_2 on an optical axis and separated from the first lens element by a first air gap; a third lens element (106) with negative refractive power and separated from the second lens element by a second air gap; a fourth lens element (108) having a positive refractive power and separated from the third lens element by a third air gap; and a fifth lens element (110) having a negative refractive power, separated from

the fourth lens element by a fourth air gap, the fifth lens element having a thickness d_5 on the optical axis. *Id*. at 1:44–54, 2:61–3:7. An image sensor (not shown) is disposed at the image plane (114) for the image formation. *Id*. at 3:13–15.

The lens system of the ’032 Patent has an effective focal length (EFL), and a total track length (TTL) on an optical axis between the object-side surface of the first lens element and the image sensor. *Id*. at 1:60–63. In all embodiments of the ’032 Patent, the TTL/EFL ratio is smaller than 1.0. *Id*. at 1:63–65.

B. Challenged Claims

Claim 1 is independent. Claims 13–15 depend from claim 1. Claim 1 is reproduced below:

> 1. A lens assembly, comprising: a plurality of refractive lens elements arranged along an optical axis, wherein at least one surface of at least one of the plurality of lens elements is aspheric, wherein the lens assembly has an effective focal length (EFL), and wherein the lens assembly has a total track length (TTL) of 6.5 millimeters or less and a ratio TTL/EFL of less than 1.0, wherein the plurality of lens elements comprises, in order from an object side to an image side, a first lens element with positive refractive power and a second lens element with negative refractive power, wherein a focal length f1 of the first lens element is smaller than TTL/2.

Ex. 1001, 7:43–53.

C. Evidence Relied Upon

Petitioner relies on the following references. Pet. 11-16, 34-46.

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