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Paper 10
Date: July 11, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

IMMERVISION, INC.,
Patent Owner.

IPR2023-00471
Patent 6,844,990 B2

Before KRISTINA M. KALAN, JOHN D. HAMANN, and STEPHEN E. BELISLE, *Administrative Patent Judges.*

Opinion Dissenting filed by KALAN, *Administrative Patent Judge.*

PER CURIAM.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Apple Inc. ("Petitioner") filed a Petition (Paper 2, "Pet.") requesting *inter partes* review of claims 2, 4, 27, 29, and 30 of U.S. Patent No. 6,844,990 B2 (Ex. 1001, "the '990 patent"). ImmerVision, Inc. ("Patent Owner") filed a Preliminary Response (Paper 7, "Prelim. Resp."). With Board authorization, Petitioner filed a Preliminary Reply (Paper 8, "Reply") and Patent Owner filed a Preliminary Sur-Reply (Paper 9, "Sur-Reply").

To institute *inter partes* review, we must determine that the information presented in the Petition shows "there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a) (2018). For the reasons discussed below, after considering the parties' submissions and the evidence of record, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the '990 patent, and we institute *inter partes* review on all challenges raised in the Petition. 37 C.F.R. § 42.108(a) (2022).

A. Related Proceedings

The parties identify the following district court litigations as related matters: *ImmerVision, Inc. v. Apple, Inc.*, 1:21-cv-01733-MN-CJB (D. Del.) and *ImmerVision, Inc. v. Apple, Inc.*, 1:21-cv-01484-MN-CJB (D. Del.). Pet. 80; Paper 3, 2–3 (Patent Owner's Mandatory Notices). Petitioner further identifies the following district court litigations as related matters: *ImmerVision, Inc. v. LG Electronics U.S.A., Inc.*, 1:18-cv- 01631 (D. Del.) and *ImmerVision, Inc. v. LG Electronics U.S.A.*, Inc., 1:18-cv-01630 (D. Del.). Pet. 80. Petitioner also identifies the following proceedings as

related matters: IPR2014-01438; Reexamination Request 90/013,410; IPR2020-00195; and IPR2020-00179. *Id.*

B. Real Party-in-Interest

Petitioner states, "Apple is a real party-in-interest." Pet. 79. Patent Owner states that ImmerVision, Inc. is the real party-in-interest. Paper 3, 2.

C. The '990 Patent

The '990 patent is titled "Method for Capturing and Displaying a Variable Resolution Digital Panoramic Image." Ex. 1001, code (54). The '990 patent "relates to obtaining digital panoramic images and displaying panoramic images on computer screens." *Id.* at 1:12–14. The '990 patent explains that in order to avoid a displayed image sector having geometrical distortions, "the classical panoramic objective lenses must have a distribution function of the image points according to the field angle of the object points of a panorama that is as linear as possible." *Id.* at 2:4–8. However, when digital enlargement increases using techniques of displaying a digital panoramic image sector on a computer screen, "the granulosity of the image appears as the limits of the resolution of the image sensor are being reached." *Id.* at 3:1–9. The '990 patent observes that for this problem of the low quality in enlargements "only certain zones of a panoramic image are of a practical interest and are likely to be expanded by the observer by means of a digital zoom." *Id.* at 3:43–46. According to the '990 patent, using a panoramic objective lens that is not linear, which expands certain zones of the image and compresses other zones of the image, "the expanded zones of the image cover a number of pixels of the image sensor that is higher than if they were not expanded, and thus benefit from a better definition." *Id.* at 3:66–4:6. The '990 patent thus discloses

> a method for capturing a digital panoramic image, by projecting a panorama onto an image sensor by means of a panoramic objective lens, in which the panoramic objective lens has an image point distribution function that is not linear relative to the field angle of object points of the panorama, the distribution function having a maximum divergence of at least ±10% compared to a linear distribution function, such that the panoramic image obtained has at least one substantially expanded zone and at least one substantially compressed zone.

Id. at 4:11–21.

Petitioner's annotated version of Figure 5 is reproduced below:

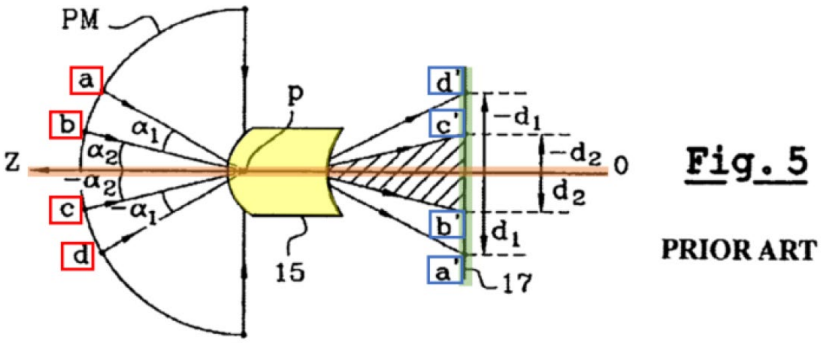

Fig. 5

PRIOR ART

Pet. 5 (annotating Ex. 1001, Fig. 5). Figure 5 illustrates a classical system for taking panoramic shots using panoramic objective lens 15 (yellow) having optical axis OZ (horizontal orange line) and digital image sensor 17 (vertical green line) arranged in the image plane of lens 15. Ex. 1001, 6:65–7:2. Object points a, b, c, d (in red boxes) are projected through lens 15 and captured as respective image points a', b', c', d' (in blue boxes) at image sensor 17. *Id.* at 7:2–14. Each of field angles α1, α2, -α2, -α1 of corresponding object points a, b, c, d is an angle that an incident light ray passes through the corresponding object point and center p of panorama PM. *Id.* at 7:2–10. On image sensor 17, image points a', b', c', and d' are located at distances d1, d2, -d2, -d1, respectively, from the center of the image. *Id.* at 7:11–14.

Figure 7A of the '990 patent is reproduced below:

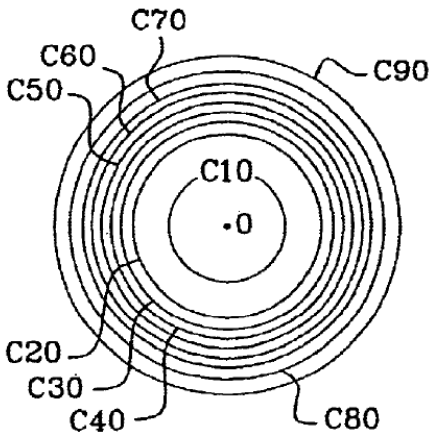

Fig. 7A

Fig. 7A shows the non-linearity of a panoramic objective lens. Ex. 1001, 6:29–30. The circles represent distributions of image points corresponding to object points having an identical field angle on a disk. *Id.* at 2:15–17. Because of the non-linear panoramic objective lens, circles C10 and C20 are further from the center of the image and further from each other whereas circles C30 to C90 are closer to each other, thereby representing a panoramic image having an expanded zone in the center and a compressed zone towards the edge of the image disk. *Id.* at 8:21–28.

The '990 patent further discloses that the point of "maximum divergence" refers to the point on an image point distribution function plot that is farthest away from a corresponding point on a linear distribution function plot. *Id.* at 8:44–67. The maximum divergence from the non-linearity of a panoramic objective lens is demonstrated in Figure 8, which is reproduced below:

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