

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

IMMERVISION, INC.)
)
Plaintiff,)
) CA No. 1:18-cv-01630-MN-CJB
v.)
) JURY TRIAL DEMANDED
LG ELECTRONICS U.S.A., INC. AND)
LG ELECTRONICS INC.)
)
Defendants.)

PLAINTIFF’S INITIAL INFRINGEMENT CONTENTIONS

Pursuant to the Scheduling Order (D.I. 23), plaintiff ImmerVision, Inc. (“ImmerVision”) hereby submits its Initial Infringement Contentions and claim charts.

The patent in suit is U.S. Patent No. 6,844,990 (“the ‘990 Patent”). Claim 21 of the ‘990 Patent is asserted in this litigation against the LG G7 series, V30 series, V35 series, G8 series, and V50 series smartphones and any other phones or devices having the same wide-angle lens array, as shown in the following attached exhibits:

- Exhibit A – ‘990 Patent v. LG G7 series smartphone;
- Exhibit B – ‘990 Patent v. LG V30 series smartphone;
- Exhibit C – ‘990 Patent v. LG V35 series smartphone;
- Exhibit D – ‘990 Patent v. LG G8 series smartphone; and
- Exhibit E – ‘990 Patent v. LG V50 series smartphone.

ImmerVision submits that the pertinent field of art for claim 21 of the ‘990 Patent is optical lens design, and that one of ordinary skill in the art will have at least a master’s degree in optics or a related discipline and at least three years work experience in optical design.

ImmerVision asserts that the described LG products infringe claim 21 of the ‘990 Patent, either literally or under the doctrine of equivalents, in accordance with the attached Exhibits.

The analyses shown in the attached Exhibits were undertaken according to the following procedure.

The wide-angle lens of each phone was analyzed by opening the phone, removing the lens from the wide-angle camera module, and measuring the distortion using an Optikos LensCheck VIS machine. The Optikos outputs an Excel file showing the distortion profile of the lens as shown in the position and resolution graphs in the attached claim charts. After analysis by the Optikos, the lens was cut by placing it on a glass slide, covering the lens using 2-ton epoxy manufactured by Devcon, and allowing the epoxy to dry for 24 hours. The lens is cut using a Disco DAD3350 dicing saw using a 90 mm diameter, 0.4 mm thick saw blade, in the multi-pass operating mode at $400\mu\text{m} \leq \text{Z-Cut} \leq 700\mu\text{m}$.

ImmerVision notes that discovery is ongoing and therefore reserves the right to amend, modify, or supplement, without prejudice, these Initial Infringement Contentions, including but not limited to the products being accused and the bases for infringement, as additional facts are ascertained through discovery and additional testing, analyses are made, Defendants' positions shift, and through the litigation process in accordance with the rules of the Court.

Dated: October 25, 2019

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CERTIFICATE OF SERVICE

I hereby certify that on October 25, 2019, a true and correct copy of PLAINTIFF'S INITIAL INFRINGEMENT CONTENTIONS was served upon the following via electronic mail:

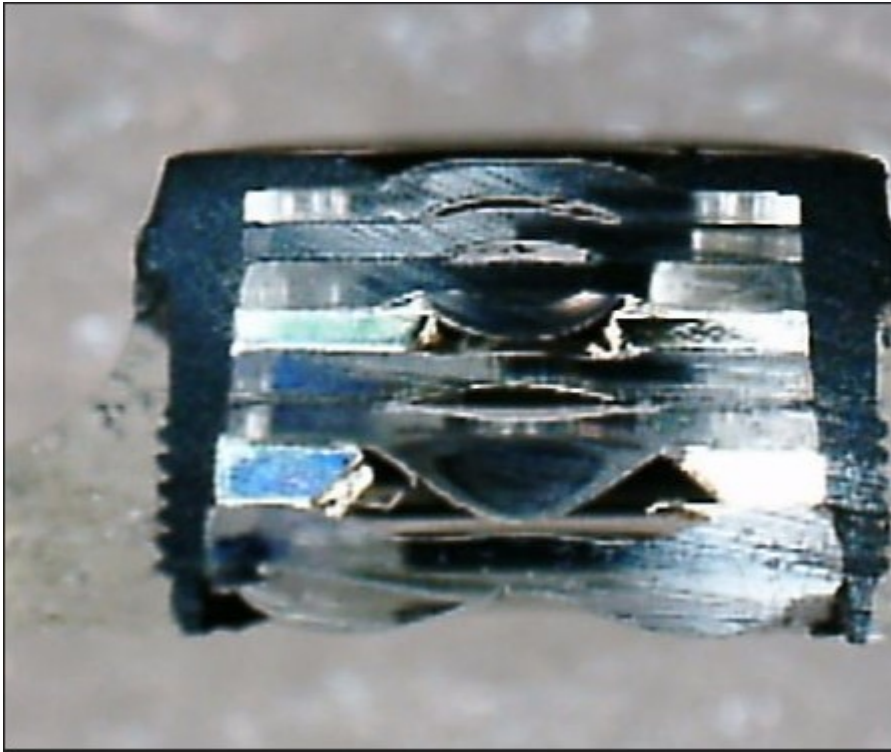
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US PATENT 6,844,990, CLAIM 21 v. LG G7 SERIES SMARTPHONE

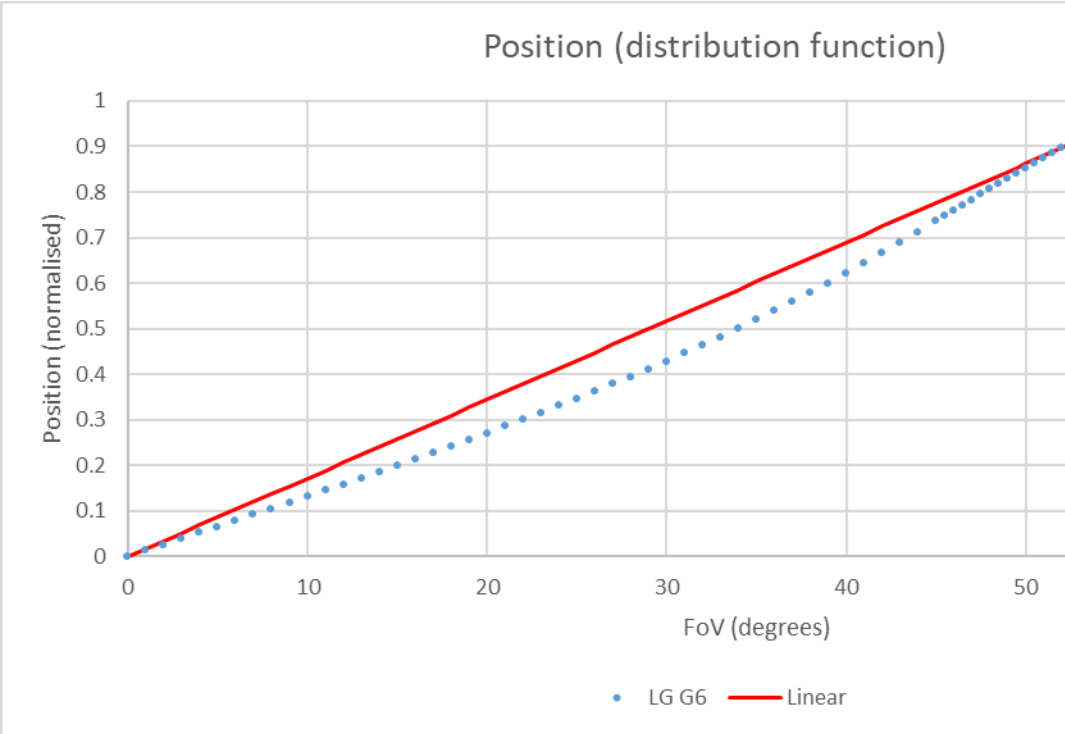
<u>Claim</u>	<u>LG G7 Series Smartphone</u>
<p>17. A panoramic objective lens comprising: optical means for projecting a panorama into an image plane of the objective lens, the optical means having an image point distribution function that is not linear relative to the field angle of object points of the panorama, the distribution function having a maximum divergence of at least $\pm 10\%$ compared to a linear distribution function, such that a panoramic image obtained by means of the objective lens comprises at least one substantially expanded zone and at least one substantially compressed zone.</p> <p>21. The panoramic objective lens according to claim 17, wherein the lens compresses the center of the image and the edges of the image, and expands an intermediate zone of the image located between the center and the edges of the image.</p>	 <p>As shown in the cross-sectional cut above (produced at IV0004045), the objective lens contains a series of six lenses which, when coupled together as in the LG G7, form a panoramic image as described in the '990 Patent.</p>

Claim

17. A panoramic objective lens comprising:
 optical means for projecting a panorama into an image plane of the objective lens, **the optical means having 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 $\pm 10\%$ compared to a linear distribution function, such that a panoramic image obtained by means of the objective lens comprises at least one substantially expanded zone and at least one substantially compressed zone.

21. The panoramic objective lens according to claim 17, wherein the lens compresses the center of the image and the edges of the image, and expands an intermediate zone of the image located between the center and the edges of the image.

LG G7 Series Smartphone



The above plot shows a normalized, linear point distribution function of an objective lens. The Y axis represents the position of a point in an image with respect to the image center, and the X axis represents the field angle in degrees of the corresponding object point.

The above plot also shows, in blue dots, measured position and field angle data (from LensCheck VIS and produced as IV0004044) for the wide-angle objective lens found in the LG G7. The lens array is panoramic as the lens reaches over 55 degrees away from center, resulting in a non-linear distribution. The deviation of the function for the LG G7 objective lens away from the linear function indicates that the image point distribution function of the LG G7 is not linear.

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