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**UNITED STATES DISTRICT COURT**
**FOR THE DISTRICT OF NEW JERSEY**

| | |
|---|---|
| **Wi-LAN USA, Inc. and Wi-LAN INC.,**<br><br>**Plaintiffs,**<br><br>**v.**<br><br>**LG ELECTRONICS, INC. AND LG ELECTRONICS U.S.A., INC.,**<br><br>**Defendants.** | **C.A. No. 2:13-civ-04895-DMC-JBC**<br><br>**JURY TRIAL DEMANDED** |

# WI-LAN'S AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiffs Wi-LAN USA, Inc. and Wi-LAN Inc. ("Wi-LAN") submits this Complaint against Defendants LG Electronics, Inc. and LG Electronics USA, Inc. (collectively "LG") for infringement of U.S. Patent No. 6,359,654 ("the '654 patent").

## THE PARTIES

1. Plaintiff Wi-LAN Inc. is a corporation formed under the laws of the country of Canada with its principal place of business at 303 Terry Fox Drive, Suite 300, Ottawa, Ontario, Canada, K2K 3J1.

2. Plaintiff Wi-LAN USA, Inc. is a corporation organized and existing under the laws of Florida with its principal executive office at 303 Terry Fox Drive, Suite 300, Ottawa, ON, K2K 3J1, Canada, and a principal business office at 600 Anton Blvd., Suite 1350, Costa Mesa, CA, 92626.

3. On information and belief, LG Electronics Inc. ("LG Electronics") is a corporation organized under the laws of South Korea with its principal place of business at Twin Tower 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Korea 150- 721.

4. On information and belief, LG Electronics U.S.A., Inc. ("LG Electronics USA") is a corporation formed under the laws of the State of Delaware with its principal place of business at 111 Sylvan Avenue, Englewood Cliffs, New Jersey 07632. On information and belief, LG Electronics USA is a wholly-owned subsidiary of LG Electronics.

5. On information and belief, LG Electronics and LG Electronics USA acted in concert with regard to the allegations set forth in this Complaint, and therefore the conduct described herein is fairly attributable to either or both entities.

## JURISDICTION AND VENUE

6. This action arises under the patent laws of the United States, namely 35 U.S.C. §§ 271, 281, and 284-285, among others.

7. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

8. Venue is proper in this judicial district pursuant to 28 U.S.C. § 1391(c). LG Electronics is a foreign entity and may be sued in any judicial district under 28 U.S.C. § 1391(c)(3).

9. Venue is proper under in this judicial district pursuant to 28 U.S.C. § 1400(b). LG Electronics USA has a regular and established place of business in this district.

10. On information and belief and as further discussed herein, LG Electronics and LG Electronics USA transact and conduct business in this District and in the State of New Jersey, and are subject to personal jurisdiction of this Court. LG Electronics USA maintains its headquarters in the state of New Jersey. Personal jurisdiction over LG in this action comports with principles of due process. LG has sought protection and benefit from the laws of the State of New Jersey by placing infringing products into the stream of commerce through an established distribution channel with the awareness and/or intent that they will be purchased by consumers in this District. LG—either directly or indirectly—ships, distributes, offers for sale, and/or sells the infringing products in the United States and this District. These infringing products have been and continue to be purchased by consumers in this District. Through at least those activities, LG has committed the tort of patent infringement in this District and/or has induced others to commit patent infringement in this District. Wi-LAN's cause of action for patent infringement arises directly from LG's activities within this District.

## BACKGROUND

### A. The Patent-In-Suit

11. U.S. Patent No. 6,359,654 titled "Methods and Systems for Displaying Interlaced Video on Non-Interlaced Monitors" ("the '654 patent") was duly and legally issued by the U.S. Patent and Trademark Office on March 19, 2002, after full and fair examination. Stephen G.

Glennon, David A. G. Wilson, Michael J. Brunolli, and Benjamin Edwin Felts, III are the named inventors listed on the '654 patent. Wi-LAN holds all rights, title, and interest in the '654 patent, including the right to collect and receive damages for past, present and future infringements. A true and correct copy of the '654 patent is attached as **Exhibit A** and made a part hereof.

12. The '654 patent discloses a number of methods for displaying interlaced video on non-interlaced monitors. NTSC video is used as an example of interlaced video by the '654 patent, but the invention is explicitly not restricted to use with NTSC video. (See '654 patent at 1:25-33.)

13. One of the disclosed methods involves displaying all of the incoming fields (odd and even) sequentially and one at a time, and further correcting for the positional offset of one field relative to another in the interlaced data. ('654 patent at 3:30-33.) In this method, the two fields are captured into separate buffers, one for the odd field and one for the even field. When a field has been captured in the buffer, the content of the buffer is scaled and displayed on the monitor. That image is displayed until the next frame is displayed on the display screen. ('654 patent at 3:33-41.)

14. An important aspect of this disclosed method is the correction of positional offset of the two interlaced video fields. ('654 patent at 3:42-44.) This correction is necessary because "for truly interlaced video, odd fields and even fields are not from exactly the same place in the image." ('654 patent at 4:67-5:2.) The odd and even fields are from "positions one half a line different (vertically) in the original image." ('654 patent at 5:2-4.) "If the two fields are displayed 'as is' in the same position on the output screen, it appears that the image is rapidly jiggling up and down." ('654 patent at 5:4-7.) "In order to display the fields in a way which eliminates this artefact, it is necessary to either display the odd and even fields in different

positions on the display, or to alter the data before it is displayed to correct this vertical offset between the two fields." ('654 patent at 5:7-11).

15. The '654 patent describes two methods to perform the vertical offset adjustment of the two fields.

> An important aspect of the present invention is the correction of the positional offset of the two interlaced video fields. There are two ways presented to deal with the vertical offset of the two fields in accordance with the present invention.
>
> (a) The two fields can be displayed at different positions on the display using a non-interlaced display
>
> ******
>
> (b) The video data can be altered to correct the positional offset between the fields.

('654 patent at 5:12-18; 6:10-11.)

16. The first embodiment of the adjustment to correct for the offset prescribes displaying the two fields at different positions on the non-interlaced display ("the first embodiment"). ('654 patent at 5:8-9; 5:17-18.) For the example of NTSC video, in which the 240 lines of data in the field are scaled up to 480 display lines, a half line repositioning of the original 240 lines (to correct for the half line offset between the two fields) results in single line repositioning of the scaled image. ('654 patent at 5:12-24.) In other words, "[o]ne field is displayed at a particular line on the display, and the other field is displayed up one line or down one line on the display (whichever is appropriate for the correct repositioning of the other field—this depends on whether the first field is the odd or the even field.)" ('654 patent at 5:24-29.) In this case the scaling of the image—and in particular the vertical interpolation scaling technique recommended by the '654 patent—is performed before the vertical adjustment, which is performed as the image is displayed on the monitor. ('654 patent at 5:49-64.)

17. The second embodiment of the adjustment to correct for the offset prescribes altering the video data to correct the positional offset between the fields before displaying the data ("the second embodiment"). ('654 patent at 5:9-11; 6:10-13.) The patent discloses a number of possible techniques for altering the video data to achieve this vertical adjustment. One example described involves re-sampling vertically one of the two fields such that the pixels of a displayed line are generated by averaging two vertically adjacent pixels from two lines. "The resulting averaged pixel is effectively a pixel positioned half way between the two lines, thereby implementing a half line vertical repositioning." ('654 patent at 6:13-19.) Using this technique, only one of the fields needs to be re-sampled. For that field, the initial value of the vertical interpolator can be set "such that the first line it generates is 50% of the top line and 50% of the line after the top line." ('654 patent at 6:22-25.) Similarly, "[i]f the same vertical interpolator is used for both odd and even fields, it is necessary to be able to alter the initial line behavior on a field to field basis, so that one field can be generated with the first line being 100% of the first line of the incoming data (that is, no vertical repositioning), and the other field being generated using 50% line 1 and 50% line 2 for the first stored/displayed line." ('654 patent at 6:25-31.)

18. With further regard to the second embodiment and the data altering techniques described thereunder, "[i]t is possible to perform the interpolative repositioning on the input path, before the video fields are stored in memory." ('654 patent at 6:37-39.) But, alternatively, "the video fields can be stored in memory unaltered and the hardware which scales the video on output can affect the interpolative repositioning." ('654 patent at 6:39-41; and Fig. 4.) In other words, the interpolative repositioning can be performed concurrently with the scaling of the video data. The '654 patent explains that this technique is more desirable because otherwise the resampling of both the input data (when repositioned) and the output data (when scaled) results

in a "two-pass smoothing [that] can be detrimental to the quality of the output image, making it look much softer (with less detail) than a regular television picture." ('654 patent at 6:42-55.).

**B. LG's Infringing Conduct**

19. On information and belief, LG makes, uses, offers to sell, and/or sells within, and/or imports into the United States display products that incorporate the fundamental technology covered by the Patent-in-Suit.

20. As noted above, the patent-in-suit relates to the de-interlacing of interlaced content for display on a non-interlaced or progressive scan display. On information and belief, the patented method is practiced by LG's display products. For example, a datasheet for LG television model number 42LE7300[1] shows that it is a progressive scan display as its resolution is 1920 x 1080p, with the "p" indicating that it is progressive. The datasheet also advertises that the 42LE7300 can receive interlaced signals such as 1080i, with the "i" indicating interlaced content, from HDMI, Component, and RF inputs. Further, the datasheet also notes that 42LE7300 includes a built-in tuner that is compatible with the ATSC/NTSC/Clear QAM standards, which also involve the de-interlacing and display of interlaced signals. These compatibilities are an acknowledgement of the ubiquity of interlaced signals and the necessity of the patented technology in the infringing products. On information and belief, LG infringes the '654 patent by de-interlacing interlaced signals as claimed in at least claim 1 of the '654 patent:

> 1. A method for displaying interlaced video data on a non-interlaced monitor, the interlaced video data comprising a plurality of paired fields, each pair of fields being vertically offset relative to each other by one-half of a field line spacing distance, each field comprising a plurality of lines of video data, the method including:
>
> (a) capturing a first field and a second field of each pair of fields into respective buffers;

[1] https://www.lg.com/us/products/documents/LG_HE_DD_SS_42LE7300.pdf.

(b) scaling each of the first field and second field of each pair of fields to fill vertical resolution of the non-interlaced monitor;

(c) adjusting one of the first field or second field of the pair of fields to substantially correct for the vertical offset between the pairs of fields, where said adjusting is performed concurrently with said scaling;

(d) displaying the first field of each pair of fields on the non-interlaced monitor in a first time period; and

(e) displaying the second field of each pair of fields on the non-interlaced monitor in a second time period subsequent to the first time period.

21. On information and belief, the infringing display products include, but are not limited to, digital televisions. By way of example only, Wi-LAN identifies the following digital televisions as infringing products: 42LE7300, 55LE7300, 22LE5300, 26LE5300, 32LE5300, 37LE5300, 42LD520, 47LD520, 55LD520, 32LD450, 37LD450, 42LD450, 47LD450, 40LH5300, 43LH5000, 40LH5000, 49LF5400, 43LF5400, 22LF4520, 55LH50, 42LH50, 47LH50, 42LN5300, 39LN5300, 32LN5300, 42LM5800, 47LM5800, 55LM5800, 60PZ550, 50PZ550, 52LD550. Each of the infringing products includes at least one or more input ports capable of accepting interlaced video signals and providing them to a video processor chip, also known as a system-on-chip ("SoC"), that performs, in part, the steps in the method of claim 1 and displaying the converted video on the noninterlaced monitor of the infringing product. Similar models of LG digital televisions that are capable of receiving an interlaced signal and converting it for display on a non-interlaced or progressive scan display, including other models that share the same model of system-on-chip ("SoC") as any of the above-listed televisions, are believed to infringe as well.

22. On information and belief, LG Electronics also manufactures at least some of the SoC's that are incorporated into the infringing display products. On information and belief, these SoC's bear the LG Electronics logo, the "XD Engine" trademark, or a related XD Engine trademark (i.e., Triple XD Engine, 3D XD Engine, etc.) that is owned by LG Electronics, and an

LG Electronics part number denoted by an LGE prefix. A demonstrative example is shown below.


On information and belief, these SoC's are involved in performing the de-interlacing method claimed by the '654 patent. In each of the infringing products, regardless of whether the incorporated SoC is designed and manufactured by LG Electronics, LG procures the SoCs—either by manufacture or purchase from third-parties—that are incorporated into the infringing products. On information and belief, LG manufactures the infringing products by, at least, assembling the televisions to include the components—which includes the input ports, the SoCs, and the display module—that provide the infringing functionality. On information and belief, LG also tests the infringing products to confirm proper operation of the patented technology.

23. By incorporating the fundamental inventions covered by the Patent-in-Suit, LG can make improved products with features, including but not limited to, accurate display of interlaced video on a non-interlaced display. On information and belief, third-party distributors purchase and have purchased LG's infringing display products for sale or importation into the United States, including this District. On information and belief, third-party consumers use and have used LG's infringing display products in the United States, including this District.

**COUNT I**

**Patent Infringement of U.S. Patent No. 6,359,654**

24. Wi-LAN repeats and re-alleges each and every allegation of paragraphs 1-23 as though fully set forth herein.

25. The ’654 patent is valid and enforceable.

26. On information and belief, to the extent any marking or notice was required by 35 U.S.C. § 287, Wi-LAN has complied with the requirements of that statute by providing actual or constructive notice to LG of its alleged infringement. On information and belief, Wi-LAN surmises that any express licensees of the ’654 patent have complied with the marking requirements of 35 U.S.C. § 287 by placing a notice of the ’654 patent on all goods made, offered for sale, sold within, and/or imported into the United States that embody one or more claims of that patent.

27. On information and belief, LG has been and is directly infringing under 35 U.S.C. § 271(a), either literally or under the doctrine of equivalents, and/or indirectly infringing, by way of inducement with specific intent under 35 U.S.C. § 271(b), the ’654 patent by making, using, offering to sell, and/or selling to third-party manufacturers, distributors, and/or consumers (directly or through intermediaries and/or subsidiaries) in this District and elsewhere within the United States and/or importing into the United States, without authority, display products that include all of the limitations of one or more claims of the ’654 patent, including but not limited to digital televisions, their display components, and/or other products made, used, sold, offered for sale, or imported by LG that include all of the limitations of one or more claims of the ’654 patent.

28. On information and belief, distributors and consumers that purchase LG’s products that include all of the limitations of one or more claims of the ‘654 patent, including but

not limited to digital televisions, also directly infringe, either literally or under the doctrine of equivalents, under 35 U.S.C. § 271(a), the '654 patent by using, offering to sell, and/or selling infringing display products in this District and elsewhere in the United States.

29. On information and belief, the third-party manufacturers, distributors, and importers that sell display products to LG that include all of the limitations of one or more claims of the '654 patent, also directly infringe, either literally or under the doctrine of equivalents, under 35 U.S.C. § 271(a), the '654 patent by making, using, offering to sell, and/or selling infringing products in this District and elsewhere within the United States and/or importing infringing products into the United States.

30. On information and belief, LG had knowledge of the '654 patent and its infringing conduct at least since October 3, 2012, when Wi-LAN filed the original complaint in the Southern District of Florida (C.A. No. 1:12-cv-23611-JAL).

31. On information and belief, since at least the above-mentioned date when Wi-LAN formally placed LG on notice of its infringement, LG has actively induced, under U.S.C. § 271(b), third-party manufacturers, distributors, importers and/or consumers to directly infringe one or more claims of the '654 patent. Since at least the notice provided on the above-mentioned date, LG does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the '654 patent. On information and belief, LG intends to cause infringement by these third-party manufacturers, distributors, importers, and/or consumers. LG has taken affirmative steps to induce their infringement by, *inter alia*, creating advertisements that promote the infringing use of display products, creating established distribution channels for these products into and within the United States, purchasing these products, manufacturing these products in conformity with U.S. laws and regulations, distributing or making available

instructions or manuals for these products to purchasers and prospective buyers, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States.

32. On information and belief, LG's acts of infringement of the '654 patent have been willful and intentional. Since at least the above-mentioned date of notice, LG has acted with an objectively high likelihood that its actions constituted infringement of the '654 patent. LG infringing activities relative to the '654 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Wi-LAN is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

33. As a direct and proximate result of these acts of patent infringement, LG has encroached on the exclusive rights of Wi-LAN and its licensees to practice the '654 patent, for which Wi-LAN is entitled to at least a reasonable royalty.

## CONCLUSION

34. Wi-LAN is entitled to recover from LG the damages sustained by Wi-LAN as a result of LG's wrongful acts in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court.

35. Wi-LAN has incurred and will incur attorneys' fees, costs, and expenses in the prosecution of this action. The circumstances of this dispute create an exceptional case within the meaning of 35 U.S.C. § 285, and Wi-LAN is entitled to recover its reasonable and necessary attorneys' fees, costs, and expenses.

## JOINDER OF PARTIES

36. Wi-LAN incorporates paragraphs 1-35 herein by reference.

37. On information and belief, LG Electronics and LG Electronics USA have both been participating in or responsible for the making, having made, offering for sale, selling, importing, and/or using the infringing products. Thus, the right to relief against LG Electronics USA is asserted jointly and severally with LG Electronics.

38. The alleged infringement arises out of the same transaction, occurrence, or series of transactions or occurrences relating to the testing, making, using, offering for sale, selling, and/or importing of the infringing products.

39. Questions of fact common to all Defendants will arise in this action including, for example, infringement by, or through use of, the infringing products.

40. Thus, joinder of LG Electronics and LG Electronics USA is proper in this litigation pursuant to 35 U.S.C. § 299(a).

## JURY DEMAND

41. Wi-LAN hereby requests a trial by jury pursuant to Rule 38 of the Federal Rules of Civil Procedure.

## PRAYER FOR RELIEF

42. Wi-LAN respectfully requests that the Court find in its favor and against LG, and that the Court grants Wi-LAN the following relief:

a) A judgment that LG has infringed the Patent-in-Suit as alleged herein, directly and/or indirectly by way of inducing infringement of such patent;

b) A judgment for an accounting of all damages sustained by Wi-LAN as a result of the acts of infringement by LG;

c) A judgment and order requiring LG to pay Wi-LAN damages under 35 U.S.C. § 284, including up to treble damages for willful infringement as provided by 35 U.S.C. § 284, and any royalties determined to be appropriate;

d) A permanent injunction enjoining LG and its officers, directors, agents, servants, employees, affiliates, divisions, branches, subsidiaries, parents and all others acting in concert or privity with them from direct and/or indirect infringement of the Patent-in-Suit pursuant to 35 U.S.C. § 283;

e) A judgment and order requiring LG to pay Wi-LAN pre-judgment and post-judgment interest on the damages awarded;

f) A judgment and order finding this to be an exceptional case and requiring LG to pay the costs of this action (including all disbursements) and attorneys' fees as provided by 35 U.S.C. § 285; and

g) Such other and further relief as the Court deems just and equitable.

Date: November 2, 2018

Respectfully Submitted,

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**CERTIFICATE OF SERVICE**

This is to certify that a true and correct copy of the foregoing

**WI-LAN'S AMENDED COMPLAINT FOR PATENT INFRINGEMENT**

is to be electronically filed. Notice of this filing will be sent to all parties by operation of the Court's electronic filing system. Parties may access this filing through the Court's ECF system.

Date: November 2, 2018

/s/ Christina Saveriano
Christina L. Saveriano