UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

VISUAL EFFECT INNOVATIONS, LLC **Plaintiff,** **v.** **SAMSUNG ELECTRONICS AMERICA, INC., and SAMSUNG ELECTRONICS CO., LTD.** **Defendants,**	**Civil Action No. 2:17-cv-645** **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement arising under the Patent Laws of the United States of America, 35 U.S.C. § 1 et seq. in which Plaintiff Visual Effect Innovations, LLC ("VEI" or "Plaintiff") files this patent infringement action against Defendants Samsung Electronics America, Inc. ("SEA") and Samsung Electronics Co., Ltd. ("SEC") (collectively, "Samsung"), and alleges as follows:

BACKGROUND

1. Plaintiff VEI is the assignee of all right, title, and interest in and to U.S. Patent No. 9,699,444, entitled "Faster state transitioning for continuous adjustable 3Deeps filter spectacles using multi-layered variable tint materials" ("the '444 Patent," attached as Exhibit A), and U.S. Patent No. 9,716,874, entitled "Continuous adjustable 3Deeps Filter Spectacles for optimized 3Deeps stereoscopic viewing, control method and means therefor, and system and method of generating and displaying a modified video" ("the '874 Patent," attached as Exhibit B), and (collectively, the "Patents-in-Suit"). VEI has the exclusive right to assert all causes of action arising under the Patents-in-Suit and the right to remedies for infringement thereof.

2. The inventors on the Patents-in-Suit are Kenneth Martin Jacobs and Ronald Steven Karpf.

3. Mr. Jacobs is the Distinguished Professor Emeritus of Cinema at SUNY Binghamton. He is the recipient of the American Film Institute's Maya Deren Independent Film and Video Artists Award, and the winner of the Los Angeles Film Critic's Douglas Edwards Experimental/Independent Film/Video Award. He is also the recipient of the Guggenheim Award and a special Rockefeller Foundation grant, and his work has been featured in prominent museums including the New York Museum of Modern Art, The American House in Paris, the Arsenal Theater in Berlin, the Louvre in Paris, and at the Getty Center in Los Angeles.

4. Mr. Karpf is the Founding Partner of bioinformatics company ADDIS Informatics, and Founding Partner of technology security company Geo Codex LLC. Mr. Karpf has an MA and Ph.D. in Mathematical Sciences.

5. By making, using, selling, offering for sale, and importing products including but not limited to Samsung TVs, Samsung is infringing the claims of the Patents-in-Suit.

PARTIES

6. VEI is a Texas Limited Liability Company with a principal place of business at 1400 Preston Road, Suite 400, Plano, Texas 75093.

7. On information and belief, Samsung Electronics America, Inc. is a New York corporation with its principal place of business located at 85 Challenger Road, Ridgefield Park, NJ 07660. Samsung Electronics America, Inc. can be served through its registered agent CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, TX 75201-3136.

8. Defendant Samsung Electronics Co., Ltd. is a Korean corporation with its principal place of business located at 129 Samsung-Ro, Maetan-3-dong, Yeongtong-gu, Seoul 443-772, Republic of Korea.

JURISDICTION AND VENUE

9. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

10. This Court has general and specific personal jurisdiction over Samsung. Samsung has sufficient contacts with this judicial district, including but not limited to a regular and established place of business for SEA located within the district at 1301 E. Lookout Drive, Richardson, TX 75080 ("the Richardson facility"). Samsung also maintains multiple service centers within the District.

11. Venue is proper in this District under 28 U.S.C. § 1400(b). SEC is a foreign corporation, and SEA has a regular and established place of business located at the Richardson Facility. The Richardson Facility is located in the Eastern District of Texas and employs individuals residing in the Eastern District of Texas. On information and belief, Samsung develops and markets electronics out of the Richardson Facility. A substantial part of the infringement alleged in this Complaint has occurred and is occurring in this district, including the marketing, selling, and offering for sale of infringing products.

COUNT I

INFRINGEMENT OF U.S. PATENT NO. 9,699,444

12. Plaintiff incorporates by reference the foregoing paragraphs and further alleges as follows:

13. On July 4, 2017, the United States Patent and Trademark Office issued the '444 Patent for inventions covering an apparatus, which in one claimed embodiment comprises a storage adapted to: store one or more image frames; and a processor adapted to: obtain a first image frame from a first video stream; generate a modified image frame by performing at least one of expanding the first image frame, shrinking the first image frame, removing a portion of the first image frame, stitching together the first image frame with a second image frame, inserting a selected image into the first image frame, and reshaping the first image frame, wherein the

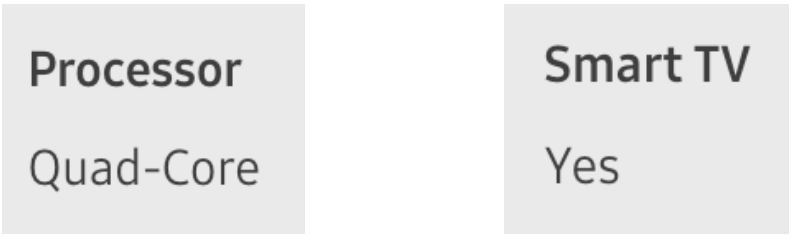
modified image frame is different from the first image frame; generate a bridge frame, wherein the bridge frame is a solid color, wherein the bridge frame is different from the first image frame and different from the modified image frame; display the modified image frame; and display the bridge frame. A true and correct copy of the '444 Patent is attached as Exhibit A.

14. Samsung has been and is now directly and indirectly infringing one or more claims of the '444 Patent, in this judicial District and elsewhere in the United States.

15. For example, Samsung directly infringes the '444 Patent, including but not limited to claim 1 and 26, by making, using, selling, offering for sale, selling and importing Samsung TVs including processors. The Samsung products discussed herein are representative of the products accused, which encompass other Samsung products having similar features.

http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/un55mu8500fxza-un55mu8500fxza/

16. Samsung TVs comprise a storage adapted to store one or more image frames. For example, the Samsung 55" MU8500 is a Smart TV including a Quad-Core processor. Accordingly, it includes a storage capable of storing one or more image frames, e.g.:



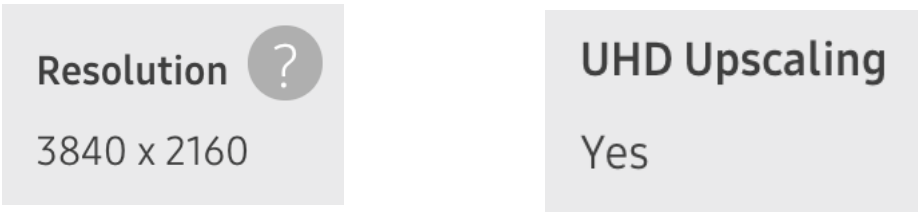
http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/un55mu8500fxza-un55mu8500fxza/

17. Samsung TVs comprise a processor adapted to obtain a first image frame from a first video stream. For example, the Samsung 55" MU8500 includes a quad core CPU. Accordingly, it is capable of obtaining a first image frame from a first video stream via any of its video input connections. The video stream could come from a cable box, DVD/Blu-Ray player, computer, or one of many other sources, e.g.:

http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/un55mu8500fxza-un55mu8500fxza/

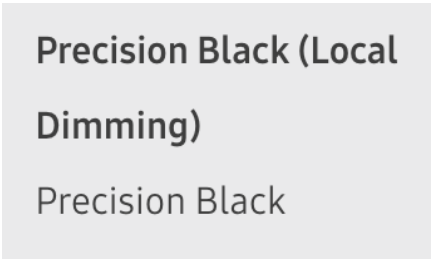
18. Samsung TVs expand the first image frame to generate a modified image frame different from the first image frame. For example, the Samsung 55" MU8500 has a screen resolution of 3840 x 2160 pixels. It has an Upscaler which in real-time expands the input frame

to a modified image frame with the screen resolution. The Image processor Upscales by expanding the image frame to a modified image frame. Since the image frame and the modified image frame are on different sizes, the modified image frame is different from the first image frame, e.g.:

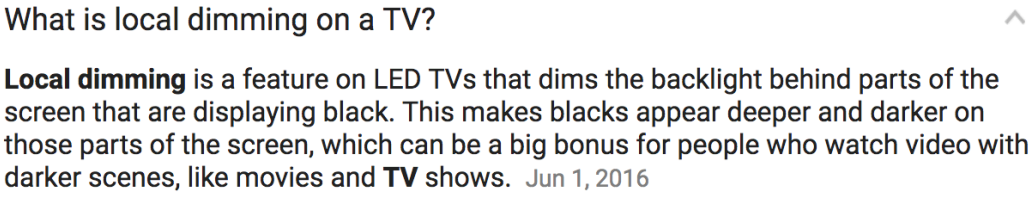


http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/un55mu8500fxza-un55mu8500fxza/

19. Samsung TVs generate a non-solid color bridge frame that is different from the first image frame and different from the modified image frame. For example, the Samsung 55" MU8500 uses Local Dimming. Local Dimming is a non-solid color backlight. The TV therefore uses a bridge frame that is a non-solid color and is different from the first frame and different from the modified (expanded) image frame, e.g.:



http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/un55mu8500fxza-un55mu8500fxza/



https://www.google.com/search?q=what+is+local+dimming+on+a+tv&rlz=1C5CHFA_enUS519US519&oq=what+is+local+dimming+on+a+tv&aqs=chrome..69i57j0.3840j0j7&sourceid=chrome&ie=UTF-8#safe=off&q=local+dimming

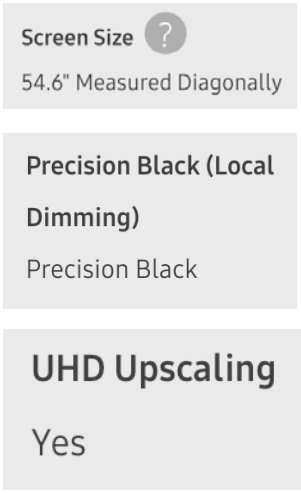
20. Samsung TVs generate a bridge frame, wherein the bridge frame is a non-solid color, wherein the bridge frame is different from the first image frame and different from the modified image frame, e.g.:

Experience sharper contrast with **Precision Black Local Dimming** in Samsung H series TV. It dims LEDs behind the darkest area of the picture for greater contrast and darker blacks, while the brighter elements remain as bright as they should be.

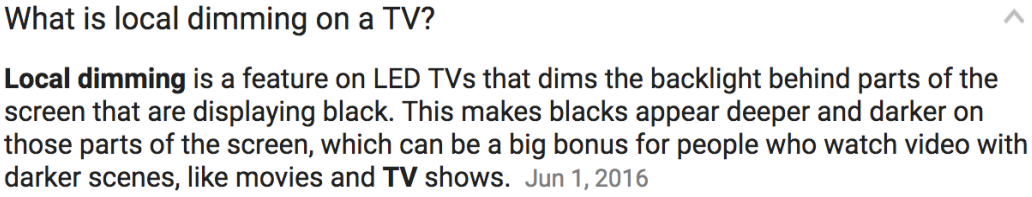
http://www.samsung.com/in/support/skp/faq/1050622 ; http://www.samsung.com/nl/cmr/CMR_brochure.pdf

21. Samsung TVs blend the modified image frame (e.g., upscaled image) with the bridge frame (e.g., partially lit backlight) to generate a blended modified image (e.g., frame viewed

by user) and display the blended modified image frame. Samsung TVs, such as the Samsung 55" MU8500, generate a frame image by blending the LCD layer with a backlight. The Upscaler creates a modified image frame on the LCD layer and the Local Dimming feature generates a non-solid color bridge frame using the backlight. Together, the modified image frame and bridge frame generate a blended modified image frame. This blended modified image frame is then displayed on the Samsung 55" MU8500's screen., e.g.:



http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/un55mu8500fxza-un55mu8500fxza/



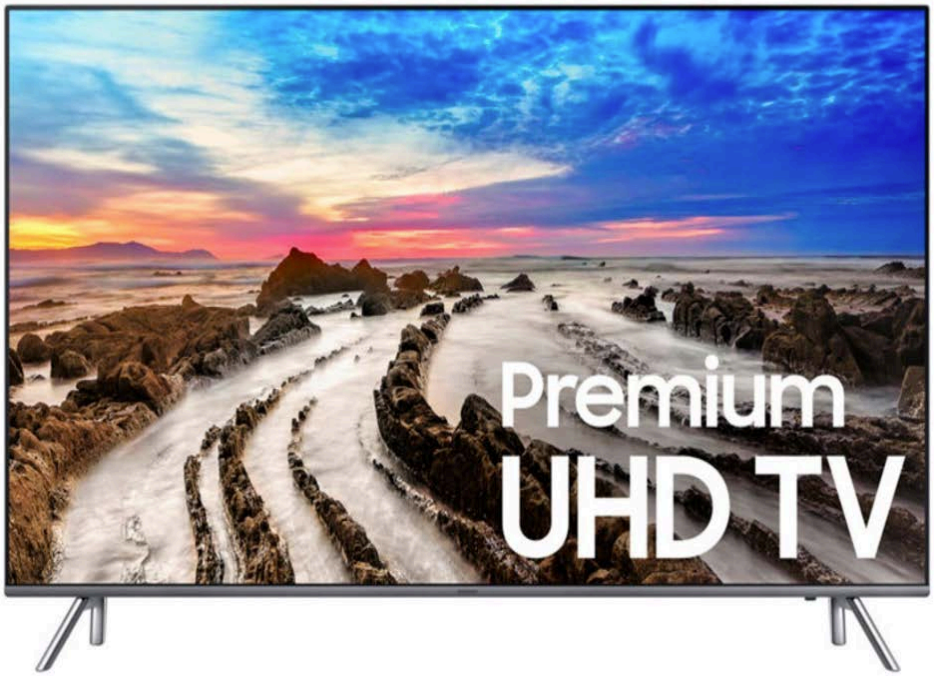
https://www.google.com/search?q=what+is+local+dimming+on+a+tv&rlz=1C5CHFA_enUS519US519&oq=what+is+local+dimming+on+a+tv&aqs=chrome..69i57j0.3840j0j7&sourceid=chrome&ie=UTF-8#safe=off&q=local+dimming

22. Samsung also infringes claim 26 of the '444 Patent by making, using, selling, offering for sale and importing Samsung TVs. The Samsung products discussed herein are representative of the products accused, which encompass other Samsung products having similar features.

SAMSUNG

UN65MU8000FXZA

65" Class MU8000 4K UHD TV



http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/65--class-mu8000-4k-uhd-tv-un65mu8000fxza/

23. Samsung TVs comprise a storage adapted to store one or more image frames. For example, the Samsung 65" MU8000 is a Smart TV including a Quad-Core processor. Accordingly, it also includes a storage capable of storing one or more image frames, e.g.:

Processor

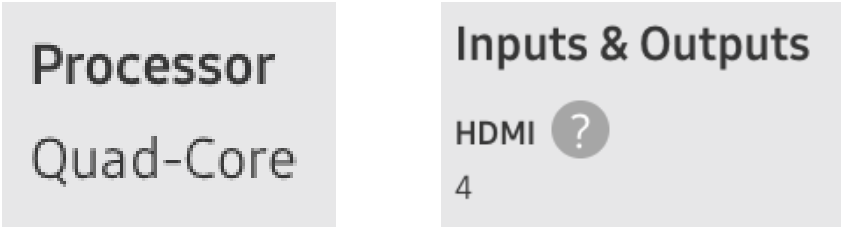
Quad-Core

Smart TV

Yes

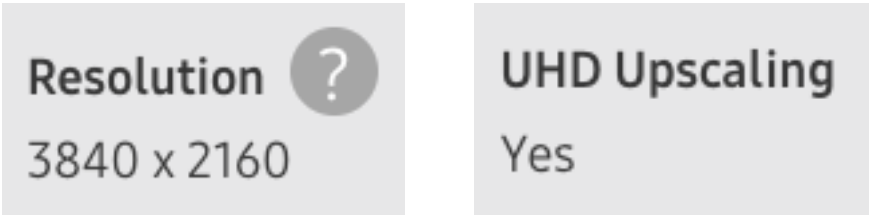
http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/65--class-mu8000-4k-uhd-tv-un65mu8000fxza/

24. Samsung TVs comprise a processor adapted to obtain a first image frame from a first video stream. For example, the Samsung 65” MU8000 includes a quad core CPU. Accordingly, it is capable of obtaining a first image frame from a first video stream via any of its video input connections. The video stream could come from a cable box, DVD/Blu-Ray player, computer, or one of many other sources, e.g.:



http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/65--class-mu8000-4k-uhd-tv-un65mu8000fxza/

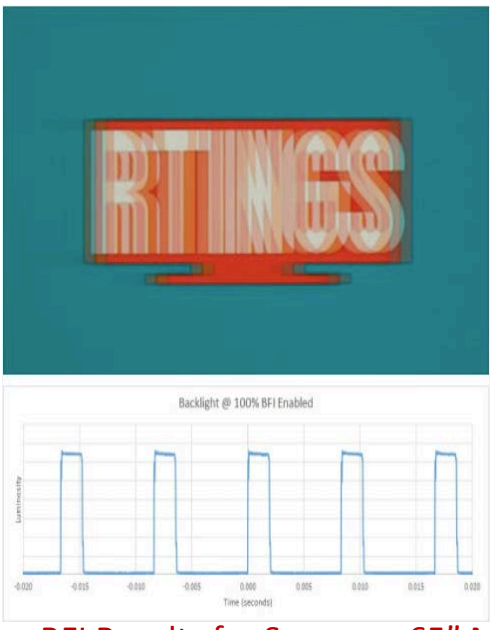
25. Samsung TVs generate a modified image frame at least by expanding the first image. For example, the Samsung 65” MU8000 has a screen resolution of 3840 x 2160 pixels. It has an Upscaler which in real-time expands the input frame to a modified image frame with the screen resolution. Since the image frame and the modified image frame are on different sizes, the modified image frame is different from the first image frame, e.g.:



http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/65--class-mu8000-4k-uhd-tv-un65mu8000fxza/

26. Samsung TVs generate a solid color bridge frame that is different from the first image and the modified image frame. For example, the MU8000 uses black frame insertion

("BFI"). BFI creates a solid black frame that is different from the first frame and different from the modified (expanded) image frame, e.g.:



BLACK FRAME INSERTION (BFI)

To pass our black frame insertion test, the TV must have an option to introduce more black frames into a 60 fps source. A TV which doesn't flicker when using our calibration settings even when the backlight is dimmed requires an option to add flicker to pass this test. For a TV which does flicker it needs to be able to reduce this backlight frequency. This is visible in the backlight oscilloscope as a change in the pattern. The blur photo with black frame insertion enabled is taken with the same methodology described here.

What it is: Option to turn screen black between frames

When it matters: Reduces eye tracking blur in sports or video games

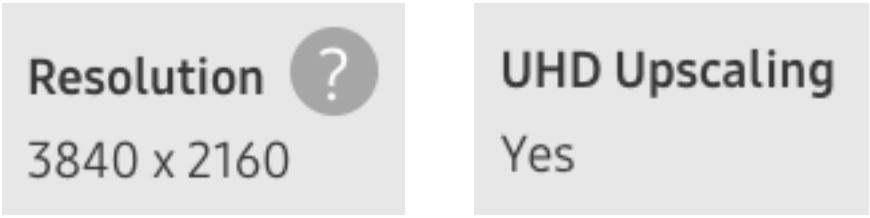
Good value: Yes

BFI Results for Samsung 65" MU8000

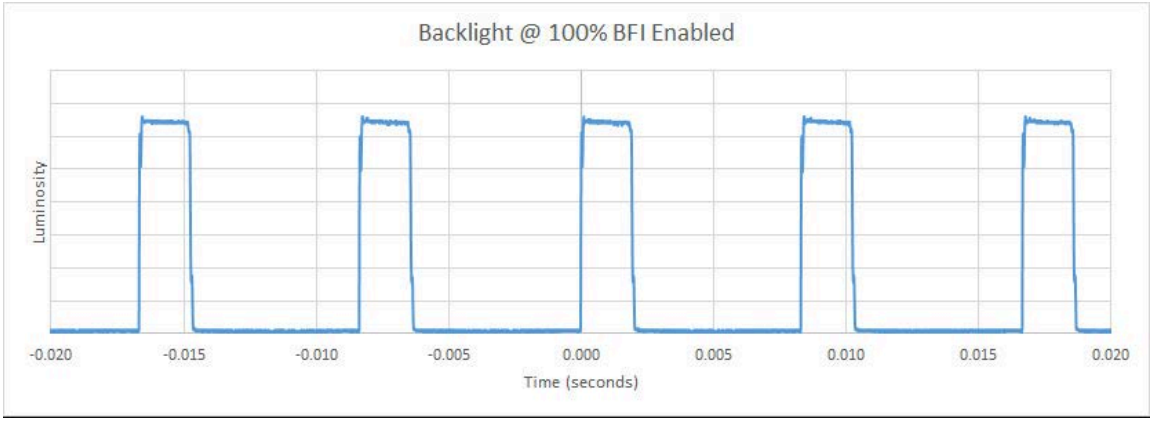
substantially similar. In electronic media, the bridge-picture may simply be a timed unlit-screen pause between serial re-appearances of the two or more similar image pictures. The rolling movements of

http://www.rtings.com/tv/tests/motion/image-flicker; http://www.rtings.com/tv/reviews/samsung/mu8000; 15/217,612 specification

27. Samsung displays the modified image frame and the bridge frame. For example, the MU8000 processor is adapted to display both the modified image frame (i.e., upscaled image) and the bridge frame (i.e., black frame), e.g.:



http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/65--class-mu8000-4k-uhd-tv-un65mu8000fxza/



http://www.rtings.com/tv/reviews/samsung/mu8000

28. By making using, selling, offering for sale, and importing Samsung TVs and other similar products, Samsung is infringing the claims of the ’444 Patent, including but not limited to claims 1 and 26. Samsung has committed these acts of infringement without license or authorization.

29. Samsung has injured VEI and is liable to VEI for direct and indirect infringement of the claims of the ‘444 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

30. As a result of Samsung’s infringement of the ’444 Patent, VEI has suffered harm and seeks monetary damages in an amount adequate to compensate for infringement, but in no event less than a reasonable royalty for the use made of the invention by Samsung, together with interest and costs as fixed by the Court.

COUNT II

INFRINGEMENT OF U.S. PATENT NO. 9,716,874

31. Plaintiff incorporates by reference each of the allegations in the foregoing paragraphs, and further alleges as follows:

32. On July 25, 2017, the United States Patent and Trademark Office issued the '874 Patent for inventions covering A method for generating and displaying modified video, the method comprising; (1) acquiring a source video comprising a sequence of image frames; (2) obtaining a first image frame based on a selected one of the image frames of the source video; (3) generating a modified image frame by performing one of: (i) expanding the first image frame; (ii) removing a first portion of the first image frame; and (iii) stitching together the first image frame with a second portion of a second image frame; and (4) generating a first altered image frame that includes first and second non-overlapping portions, wherein the first non-overlapping portion comprises a first selected portion of the modified image frame, wherein the first image frame does not include the second non-overlapping portion, wherein the modified image frame does not include the second non-overlapping portion; and (5) generating a second altered image frame that includes third and fourth non-overlapping portions, wherein the third non-overlapping portion comprises a second selected portion of the modified image frame, the second selected portion of the modified image frame being different from the first selected portion of the modified image frame, wherein the first image frame does not include the fourth non-overlapping portion, wherein the modified image frame does not include the fourth non-overlapping portion. A true and correct copy of the '874 Patent is attached as Exhibit B.

33. Samsung has been and is now directly and indirectly infringing one or more claims of the '874 Patent, in this judicial District and elsewhere in the United States.

34. For example, Samsung directly infringes the '874 Patent, including but not limited to claim 1, by making, using, selling, offering for sale and importing Samsung TVs. The Samsung products discussed herein are representative of the products accused, which encompass other Samsung products having similar features.

Samsung UNES8000 series information: *We based our review of the Samsung UN55ES8000 on our hands-on time spent with the 60-inch UN60ES8000 model. Samsung states that all the models in the ES8000 series have the same components (excepting for weight and dimensions) and should offer similar performances.*

https://www.digitaltrends.com/tv-reviews/samsung-un55es8000-review/

35. Samsung TVs acquire a source video comprising a sequence of image frames. For example, the ES8000 line of Samsung TVs acquires a source video from one of its plurality of video inputs, such as an HDMI input from a computer or cable box, e.g.:

https://www.digitaltrends.com/tv-reviews/samsung-un55es8000-review/

36. Most programming is produced in 720p or 1080i resolution. As such, when the video source is a cable box, the Product obtains a first image frame in 720p or 1080i resolution from the source video, e.g.:

- Since the vast majority of programming is currently produced in 720p and 1080i, if your television is enabled with 1080p or 4K technology, your TV will convert our HD signal so you can continue to enjoy Spectrum TV.

http://www.spectrum.net/support/tv/hdtv-picture-formats/

37. Samsung TVs generate a modified image frame by at least expanding the first image frame. For example, the ES800 TV line has an Upscaler which in real-time expands the received image frames to a modified image frame with the screen's resolution. As the first image frame and the modified image frame are different sizes, the modified image frame is different from the first image frame, e.g.:

While the Samsung UE46ES8000 clearly revels in showing HD movies and TV shows, it's a talented standard definition performer too. The power and speed of its dual-core processor enables it to upscale SD sources exceptionally well, in fact, adding detail and sharpness while simultaneously removing source noise.

https://www.digitaltrends.com/tv-reviews/samsung-un55es8000-review/

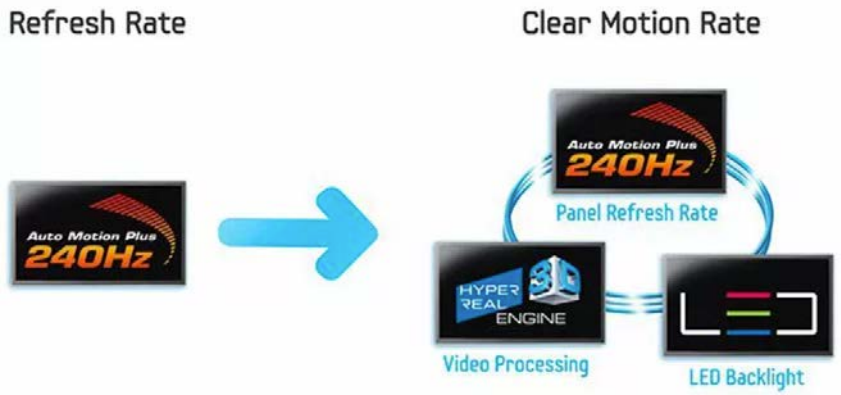
38. Samsung TVs generate a first altered image frame that includes first and second non-overlapping portions. For example, the ES8000 TV line features Samsung's Motion Rate 960. A Motion Rate 960 TV utilizes a scanning backlight, e.g.:

Samsung doesn't include mention of the panel refresh rate in its specifications, but I asked and was told it has a **240Hz** panel. The company's Clear Motion Rate specification, new for this year, **supposedly** includes refresh rate among its calculations, along with video processing and backlight scanning. For what it's worth -- not much, as far as I'm concerned -- the ES8000's CMR is said to be 960.

https://www.cnet.com/products/samsung-un55es8000/review/

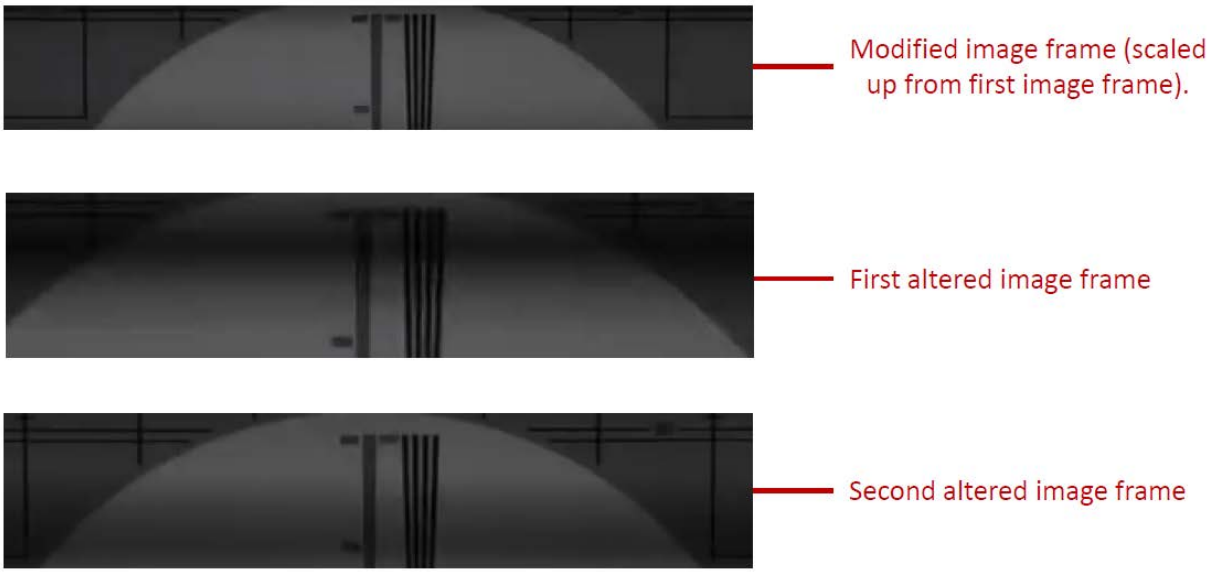
39. The image processing and backlight scanning of Samsung's Motion Rate feature add additional frames between images to achieve a higher perceived refresh rate. This results in generating altered image frames with first and second non-overlapping portions, e.g.:

Clear Motion Rate. "Samsung's more comprehensive Clear Motion Rate takes into account all three factors that contribute to motion clarity: panel refresh rate, image processor speed, and backlight technology." In other words, a TV with a CMR of 240 could be a 120Hz panel, with an average processor, and a scanning backlight, or a 60Hz panel, a fancy processor, and a scanning backlight. It's unlikely a TV with a CMR of 240 would be a 240Hz panel, as such an expensive panel would almost certainly come with one or both the other features. Here's an illustration showing how it gets the numbers.

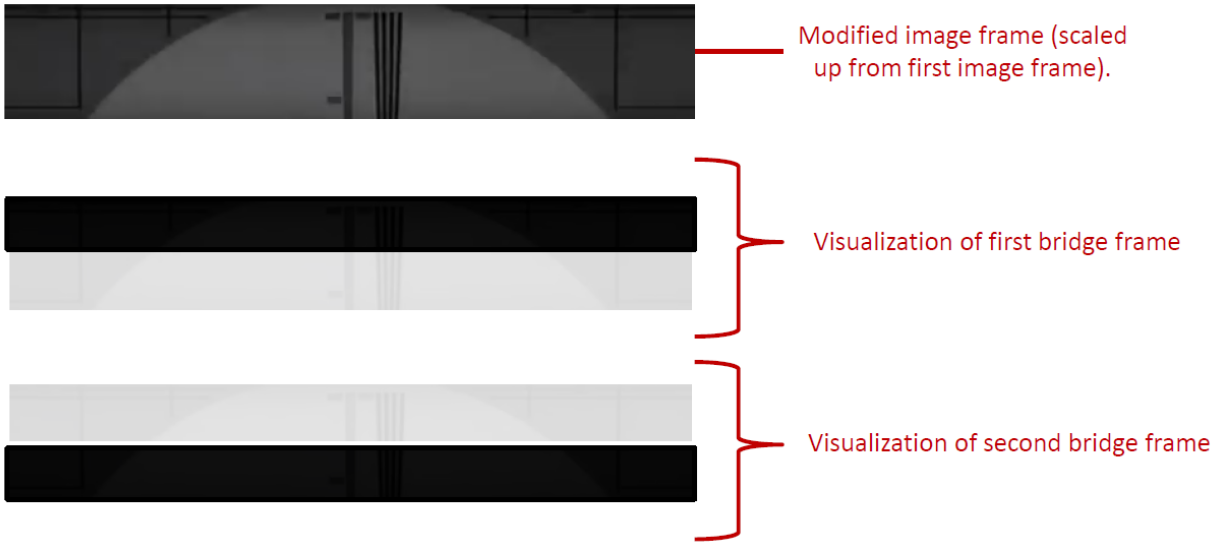


https://www.cnet.com/news/fake-refresh-rates-is-your-tv-really-120hz/

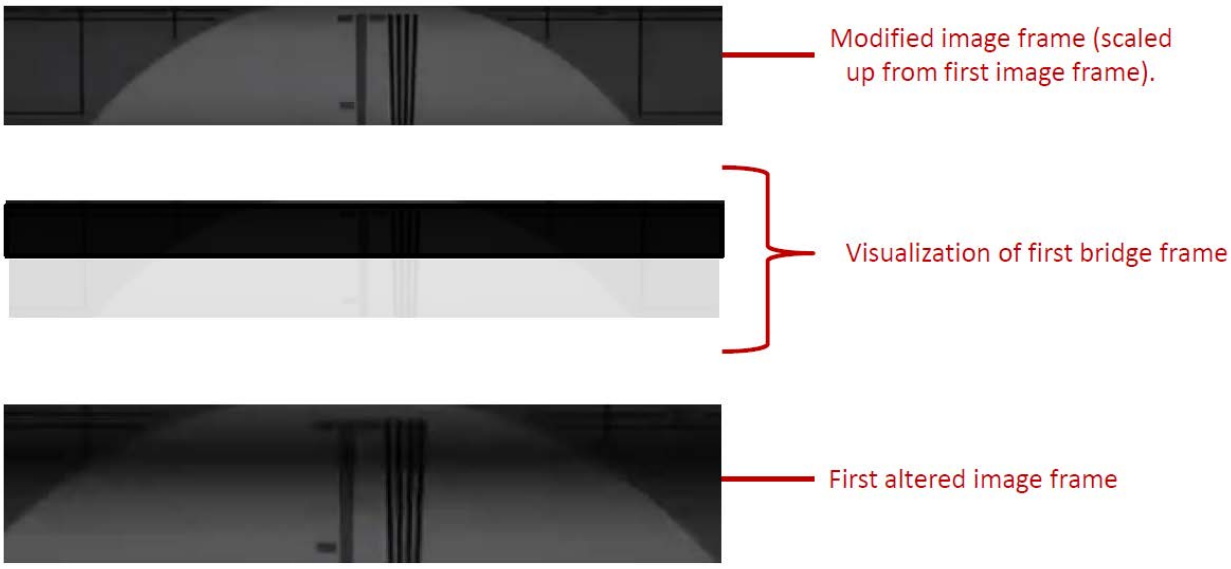
40. The following are screenshots from a recording of an ES8000 TV showing how backlight scanning generate a first (and second) altered image frame that includes first and second non-overlapping portions, e.g.:



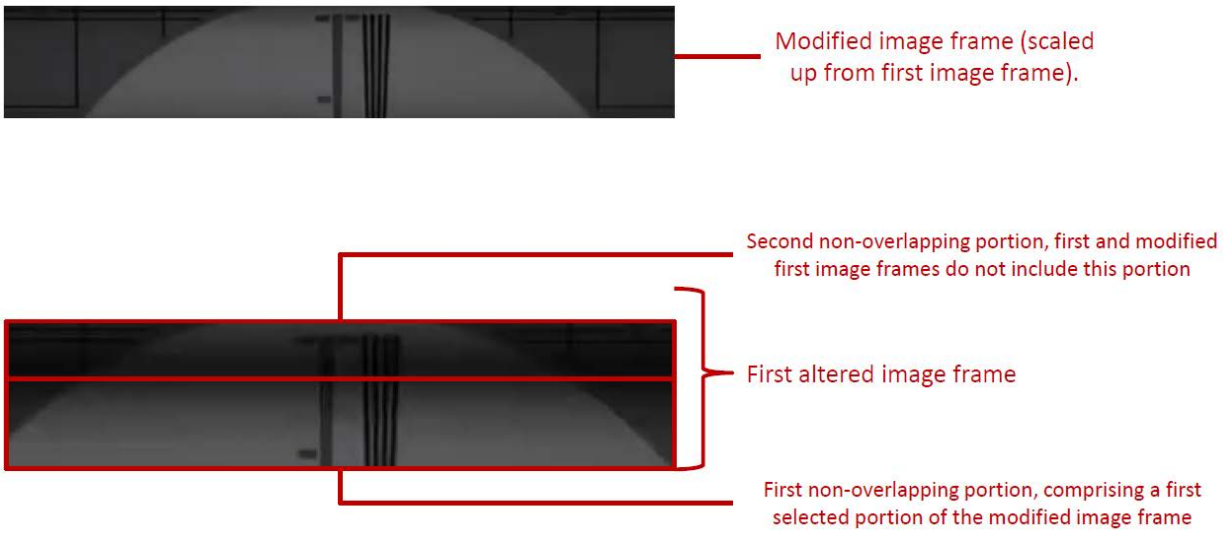
41. A plurality of bridge frames are generated by backlight scanning including a first bridge frame, illustrated below with a lower white rectangle and an upper black rectangle, and a second bridge frame, illustrated below with a lower black rectangle and an upper white rectangle, e.g.:

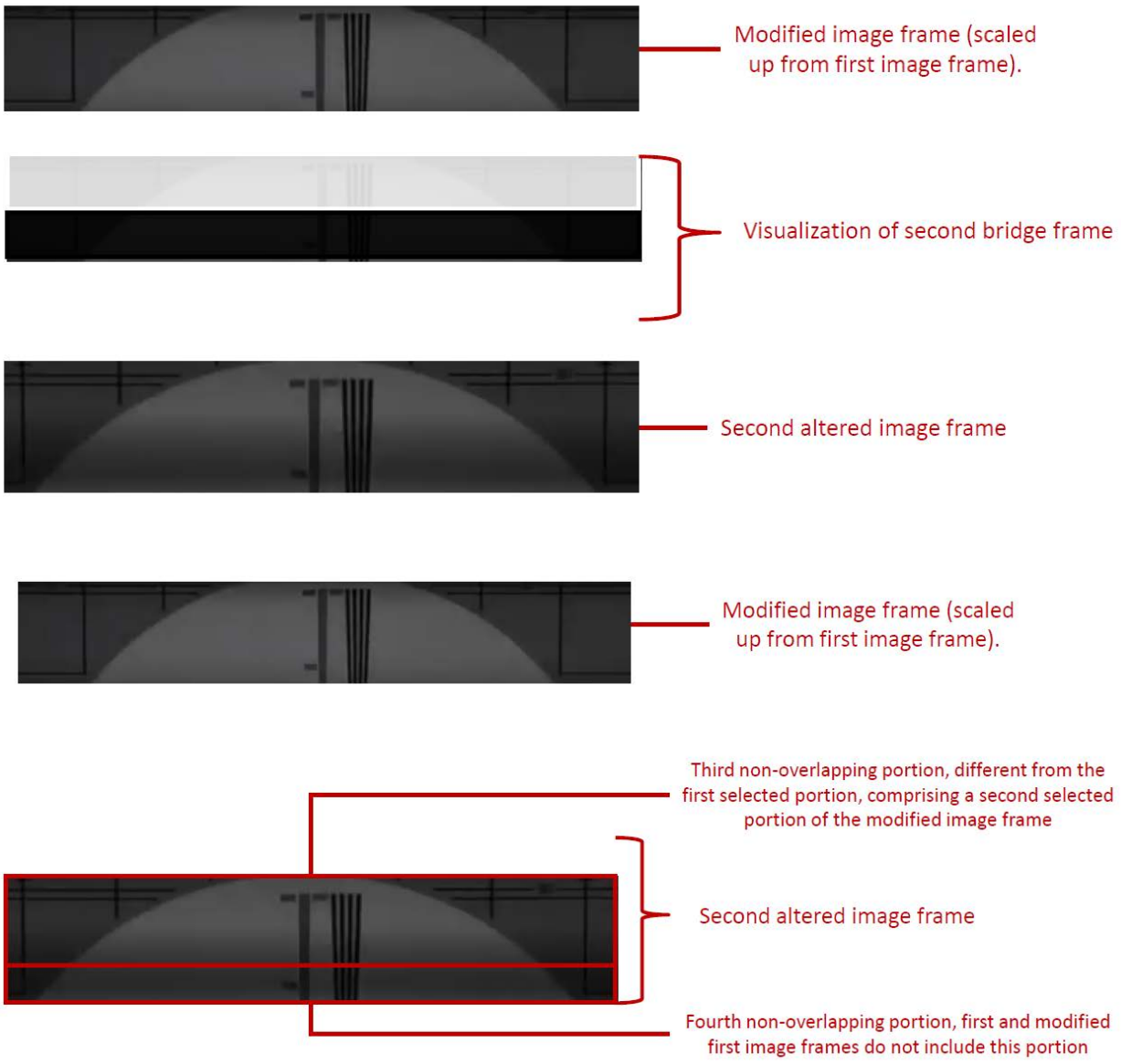


42. Below is a breakdown of an exemplary first altered image frame created by Samsung's TVs (e.g., the backlight scanning feature):



43. Below is a breakdown of an exemplary second altered image frame created by Samsung's TVs (e.g., the backlight scanning feature):





44. By making, using, selling, offering for sale, and importing Samsung TVs and other similar products, Samsung is infringing the claims of the ’874 Patent, including but not limited to claim 1. Samsung has committed these acts of infringement without license or authorization.

45. Samsung has injured VEI and is liable to VEI for direct and indirect infringement of the claims of the ‘874 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

46. As a result of Samsung's infringement of the '874 Patent, VEI has suffered harm and seeks monetary damages in an amount adequate to compensate for infringement, but in no event less than a reasonable royalty for the use made of the invention by Samsung, together with interest and costs as fixed by the Court.

PRAYER FOR RELIEF

Plaintiff respectfully requests the following relief from this Court:

A. That Samsung has directly and indirectly infringed the '444 and '874 Patents;

B. That Samsung be ordered to pay damages to VEI, together with costs, expenses, pre-judgment interest and post-judgment interest as allowed by law;

C. That the Court enter judgment against Samsung, and in favor of VEI in all respects;

D. For any such other and further relief as the Court deems just and equitable.

JURY TRIAL DEMANDED

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, VEI requests a trial by jury of any issues so triable by right.

Dated: September 13, 2017

Respectfully submitted,

By: /s/ Ryan E. Hatch

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