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9 *Attorney for Plaintiff Visual Effect Innovations, LLC*

10 **UNITED STATES DISTRICT COURT**
11 **FOR THE NORTHERN DISTRICT OF CALIFORNIA**

12 VISUAL EFFECT INNOVATIONS,) CASE NO. 3:17-CV-03187
13 LLC)
14 Plaintiff,) **SECOND AMENDED COMPLAINT**
15 vs.) **JURY TRIAL DEMANDED**
16 NVIDIA CORPORATION)
17 Defendant.)

18 **SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT**

19 This is an action for patent infringement arising under the Patent Laws of the
20 United States of America, 35 U.S.C. § 1 et seq. in which Plaintiff Visual Effect
21 Innovations, LLC (“VIE” or “Plaintiff”) files this patent infringement action against
22 Defendant NVIDIA Corporation (“NVIDIA” or “Defendant”).

23 **BACKGROUND**

24 1. Plaintiff VIE is the assignee of all right, title, and interest in and to U.S.
25 Patent No. 8,864,304, entitled “Continuous adjustable 3Deeps Filter spectacles for
26 optimized 3Deeps stereoscopic viewing and its control method and means” (“the
27 ’304 Patent,” attached as Exhibit A), U.S. Patent No. 9,167,235 (“the ‘235 Patent,”
28 attached as Exhibit B), entitled “Faster state transitioning for continuous adjustable

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1 3Deeps filter spectacles using multi-layered variable tint materials”), U.S. Patent
2 No. 9,699,444, entitled “Faster state transitioning for continuous adjustable 3Deeps
3 filter spectacles using multi-layered variable tint materials” (“the ’444 Patent,”
4 attached as Exhibit C), and U.S. Patent No. 7,030,902, entitled “Eternalism, a
5 method for creating an appearance of sustained three-dimensional motion-direction
6 of unlimited duration, using a finite number of pictures” (“the ’902 Patent,” attached
7 as Exhibit D), (collectively, the “Patents-in-Suit”). VIE has the exclusive right to
8 assert all causes of action arising under the Patents-in-Suit and the right to remedies
9 for infringement thereof.

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

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

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

23 5. By making, using, selling, offering for sale, and importing products
24 including but not limited to active 3d glasses, and graphics cards, NVIDIA is
25 infringing the claims of the Patents-in-Suit.

26 **PARTIES**

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

1 demonstrated a prototype of continuously adjustable Pulfrich spectacles. Mr. Karpf
2 also made written and oral presentations of the inventors' technology.
3

4 14. On information and belief, NVIDIA and its employees became aware
5 of the inventions through their attendance at SDA conferences, and through other
6 contact with the inventors.

7 **COUNT ONE**
8 **INFRINGEMENT OF U.S. PATENT NO. 8,864,304**

9 15. Plaintiff incorporates by reference each of the allegations in the
10 foregoing paragraphs, and further alleges as follows:
11

12 16. On October 21, 2014, the United States Patent and Trademark Office
13 issued the '304 Patent for inventions covering an electronically controlled spectacle
14 for viewing a video. In one claimed embodiment, the electronically controlled
15 spectacle comprises a spectacle frame; optoelectronic lenses housed in the frame,
16 the lenses comprising a left lens and a right lens, each of the lenses having a dark
17 state and a light state, wherein the state of the left lens is independent of the state of
18 the right lens; and a control unit housed in the frame, the control unit being adapted
19 to control the state of the each of the lenses independently. A true and correct copy
20 of the '304 Patent is attached as Exhibit A.
21

22 17. NVIDIA has been and is now directly and indirectly infringing one or
23 more claims of the '304 Patent, in this judicial District and elsewhere in the United
24 States.
25

26 18. For example, NVIDIA directly infringes the '304 Patent, including but
27 not limited to claim 1, by making, using, selling, offering for sale and importing
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1 active 3D glasses with Independent Lens Control.



<http://www.nvidia.com/object/3d-vision-main.html>

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13 19. NVIDIA's active 3d glasses are electronically controlled spectacles for
14 viewing a video, e.g.:

Overview Specifications Drivers & Downloads Support	
3D Vision Specifications Glasses Wireless	
Infrared receiver	Receive signal between 1.5 and 15 feet
Power	
Battery Life	60 hours
Power button	On button
Rechargeable battery connector	USB 2.0 mini-B power connector
Indicator Lights	
Battery Level	Green and red indicator lights
Charging	Flashing amber light when charging, solid amber when fully charged
Dimensions	
Product Dimensions	6.5" x 6.4" x 1.6"
Weight	
Product Weight	56 grams/ 1.96 ounces

<http://www.nvidia.com/object/product-geforce-3d-vision2-wireless-glasses-us.html>

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21. The lenses of NVIDIA’s active 3d glasses are housed in the frame and have a dark state and a light state, e.g.:

The GeForce 3D Vision glasses work by blocking the light to alternating eyes. Each lens is essentially a monochrome LCD display that can be turned on or off. When off, light can pass through; when on, it cannot. This effect allows only certain frames in a game to be viewed by each eye, and each alternating frame is slightly offset, which in turn is perceived by our brains as a 3D image. Much in the same way our eyes actually work. We should note that the glasses provide better viewing angles and resolution than most passive glasses, through the use of higher-quality optics.

<http://hothardware.com/reviews/nvidia-geforce-3d-vision-glasses?page=2>

22. The state of the left and right lens of NVIDIA’s active 3d glasses are independent of one another, e.g.:

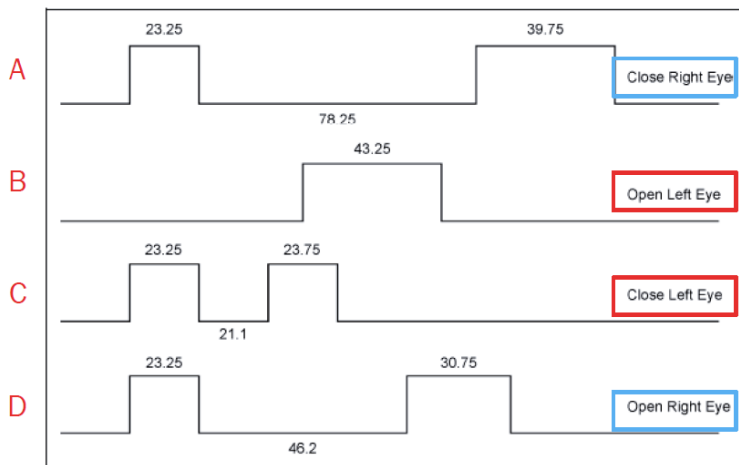


Figure 9: The 3D sync IR protocol for the NVIDIA 3D VISION stand-alone emitter and glasses. (Units: μ s)
 NB: This is a four token protocol and hence allows the display to specify the duty cycle for the glasses to operate.

http://cmst.curtin.edu.au/wp-content/uploads/sites/4/2016/05/2012-28-woods-helliwell-cross-compatibility_of_shutter_glasses.pdf

NVIDIA's synchronization system uses different signals to control each lens independently.

If, for example, signals A and C were first transmitted, then both lenses would be dark, then if signal B is transmitted, only the left lens would be light with no change to the right lens.

23. NVIDIA's active 3d glasses have a control unit housed in the frame that controls the state of each lens, e.g.:



<http://3dvision-blog.com/wp-content/uploads/2009/09/3d-vision-open-1.jpg>

24. By making, using, selling, offering for sale, and importing active 3d glasses, NVIDIA is infringing the claims of the '304 Patent, including but not limited to claim 1. NVIDIA has committed these acts of infringement without license or authorization.

25. NVIDIA has injured VIE and is liable to VIE for direct and indirect

1 infringement of the claims of the '701 Patent pursuant to 35 U.S.C. § 271(a), (b),
2 and (c).

3
4 26. As a result of NVIDIA's infringement of the '304 Patent, VIE has
5 suffered harm and seeks monetary damages in an amount adequate to compensate
6 for infringement, but in no event less than a reasonable royalty for the use made of
7 the invention by NVIDIA, together with interest and costs as fixed by the Court.

8
9 **COUNT TWO**
INFRINGEMENT OF U.S. PATENT NO. 9,167,235

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

12
13 28. On October 20, 2015, the United States Patent and Trademark Office
14 issued the '235 Patent for inventions covering an electronically controlled spectacle
15 for viewing a video. In one claimed embodiment, the electronically controlled
16 spectacle comprises a spectacle frame; optoelectronic lenses housed in the frame,
17 the lenses comprising a left lens and a right lens, each of the optoelectrical lenses
18 having a plurality of states, wherein the state of the left lens is independent of the
19 state of the right lens; and a control unit housed in the frame, the control unit being
20 adapted to control the state of each of the lenses independently. A true and correct
21 copy of the '235 Patent is attached as Exhibit B.

22
23
24 29. NVIDIA has been and is now directly and indirectly infringing one or
25 more claims of the '235 Patent, in this judicial District and elsewhere in the United
26 States.

27
28 30. For example, NVIDIA directly infringes the '235 Patent, including but

not limited to claim 1, by making, using, selling, offering for sale and importing active 3D glasses with Independent Lens Control.



<http://www.nvidia.com/object/3d-vision-main.html>

31. NVIDIA's active 3d glasses are electronically controlled spectacles for viewing a video, e.g.:

Overview	Specifications	Drivers & Downloads	Support
3D Vision Specifications Glasses Wireless			
Infrared receiver		Receive signal between 1.5 and 15 feet	
Power			
Battery Life		60 hours	
Power button		On button	
Rechargeable battery connector		USB 2.0 mini-B power connector	
Indicator Lights			
Battery Level		Green and red indicator lights	
Charging		Flashing amber light when charging, solid amber when fully charged	
Dimensions			
Product Dimensions		6.5" x 6.4" x 1.6"	
Weight			
Product Weight		56 grams / 1.96 ounces	

<http://www.nvidia.com/object/product-geforce-3d-vision2-wireless-glasses-us.html>

32. NVIDIA's active 3D glasses have a frame, e.g.:

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33. The lenses of NVIDIA’s active 3d glasses are housed in the frame and have a plurality of states (e.g., a dark state and a light state), e.g.:

The GeForce 3D Vision glasses work by blocking the light to alternating eyes. Each lens is essentially a monochrome LCD display that can be turned on or off. When off, light can pass through; when on, it cannot. This effect allows only certain frames in a game to be viewed by each eye, and each alternating frame is slightly offset, which in turn is perceived by our brains as a 3D image. Much in the same way our eyes actually work. We should note that the glasses provide better viewing angles and resolution than most passive glasses, through the use of higher-quality optics.

<http://hothardware.com/reviews/nvidia-geforce-3d-vision-glasses?page=2>

34. The state of the left and right lens of NVIDIA’s active 3d glasses are independent of one another, e.g.:

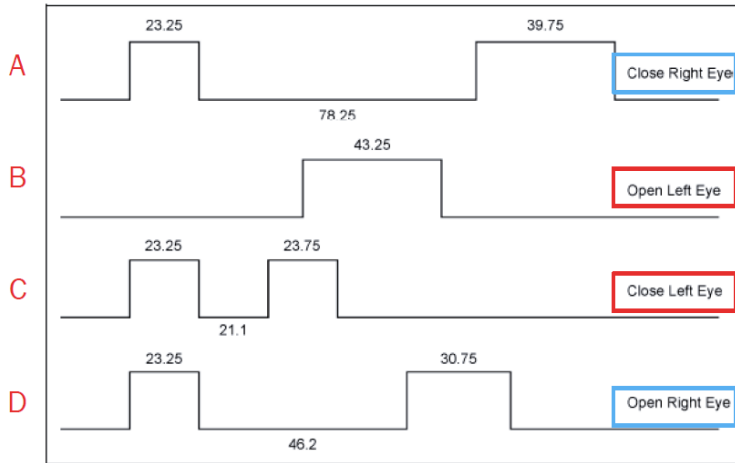


Figure 9: The 3D sync IR protocol for the NVIDIA 3D VISION stand-alone emitter and glasses. (Units: μ s)
 NB: This is a four token protocol and hence allows the display to specify the duty cycle for the glasses to operate.

http://cmst.curtin.edu.au/wp-content/uploads/sites/4/2016/05/2012-28-woods-helliwell-cross-compatibility_of_shutter_glasses.pdf

NVIDIA's synchronization system uses different signals to control each lens independently.

If, for example, signals A and C were first transmitted, then both lenses would be dark, then if signal B is transmitted, only the left lens would be light with no change to the right lens.

35. NVIDIA's active 3d glasses have a control unit housed in the frame that controls the state of each lens, e.g.:



<http://3dvision-blog.com/wp-content/uploads/2009/09/3d-vision-open-1.jpg>

36. By making, using, selling, offering for sale, and importing active 3d glasses, NVIDIA is infringing the claims of the '235 Patent, including but not limited to claim 1. NVIDIA has committed these acts of infringement without license or authorization.

37. NVIDIA has injured VIE and is liable to VIE for direct and indirect

1 infringement of the claims of the '235 Patent pursuant to 35 U.S.C. § 271(a), (b),
2 and (c).

3
4 38. As a result of Defendant's infringement of the '235 Patent, VIE has
5 suffered harm and seeks monetary damages in an amount adequate to compensate
6 for infringement, but in no event less than a reasonable royalty for the use made of
7 the invention by NVIDIA, together with interest and costs as fixed by the Court.

8
9 **COUNT THREE**
INFRINGEMENT OF U.S. PATENT NO. 9,699,444

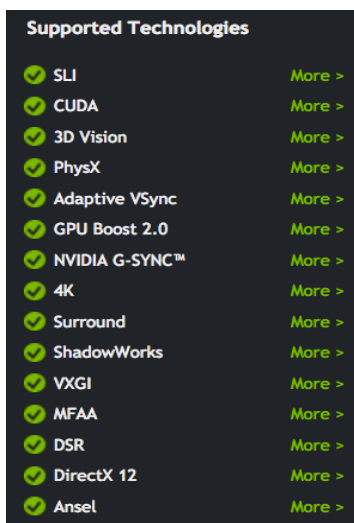
10 39. Plaintiff incorporates by reference each of the allegations in the
11 foregoing paragraphs, and further alleges as follows:

12
13 40. On July 04, 2017, the United States Patent and Trademark Office
14 issued the '444 Patent for inventions covering an apparatus, which in one claimed
15 embodiment comprises a storage adapted to: store one or more image frames; and a
16 processor adapted to: obtain a first image frame from a first video stream; generate
17 a modified image frame by performing at least one of expanding the first image
18 frame, shrinking the first image frame, removing a portion of the first image frame,
19 stitching together the first image frame with a second image frame, inserting a
20 selected image into the first image frame, and reshaping the first image frame,
21 wherein the modified image frame is different from the first image frame; generate
22 a bridge frame, wherein the bridge frame is a solid color, wherein the bridge frame
23 is different from the first image frame and different from the modified image frame;
24 display the modified image frame; and display the bridge frame. A true and correct
25 copy of the '444 Patent is attached as Exhibit C.

26
27
28 41. Nvidia has been and is now directly and indirectly infringing one or

1 more claims of the '444 Patent, in this judicial District and elsewhere in the United
2 States.

3
4 42. For example, NVIDIA directly infringes the '444 Patent, including but
5 not limited to claim 26, by making, using, selling, offering for sale and importing
6 active GTX 690 graphics card. The GTX 690 is representative of the products
7 accused, which encompass other NVIDIA products having similar features,
8 including but not limited to the NVIDIA GeForce GTX 1060, GeForce GTX TITAN
9 X, GeForce GTX 980 Ti, GeForce GTX 980, GeForce GTX 970, GeForce GTX
10 960, GeForce GTX 950, GeForce GTX 965M, GeForce GTX 970M, and GeForce
11 GTX 980M products.



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<https://www.geforce.com/hardware/desktop-gpus/geforce-gtx-690>

43. The Nvidia GTX 690 has memory that is at least capable of temporarily storing one or more image frames, e.g.:

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GTX 690 Memory Specs:	
Memory Speed (Gbps)	6.0
Standard Memory Config	4096 MB (2048 MB per GPU) GDDR5
Memory Interface Width	512-bit (256-bit per GPU)
Memory Bandwidth (GB/sec)	384

<https://www.geforce.com/hardware/desktop-gpus/geforce-gtx-690/specifications>

“GPUs use a frame buffer to store a rendered image before they’re scanned on to a monitor.”

GeForce Tech Demo: DSR by Nvidia @ <https://www.youtube.com/watch?v=rSUSYaa6C9s&feature=youtu.be>

44. The Nvidia GTX 690 is a Graphics Processing Unit that, accordingly, includes a processor capable of obtaining a first image frame from a first video stream, such as the video stream from a video game running on the computer the GPU is installed in, e.g.:

GTX 690 GPU Engine Specs:	
CUDA Cores	3072
Base Clock (MHz)	915
Boost Clock (MHz)	1019
Texture Fill Rate (billion/sec)	234

<https://www.geforce.com/hardware/desktop-gpus/geforce-gtx-690/specifications>

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<http://www.nvidia.com/object/3d-vision-geforce-cards.html>

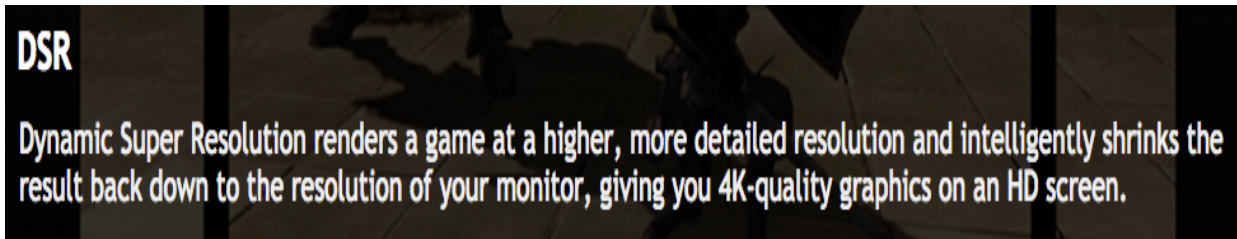
45. The Nvidia GTX 690 utilizes Dynamic Super Resolution, which renders frames at a higher, more detailed resolution and intelligently shrinks the result back down to the resolution of a monitor. The initial high-resolution image is the first image frame and the smaller image is a generated modified image frame created by shrinking the first image frame. Since the image frame and the modified image frame are different sizes, the modified image frame is different from the first image frame, e.g.:



<https://www.geforce.com/hardware/desktop-gpus/geforce-gtx-690>

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<https://www.geforce.com/hardware/technology/dsr>

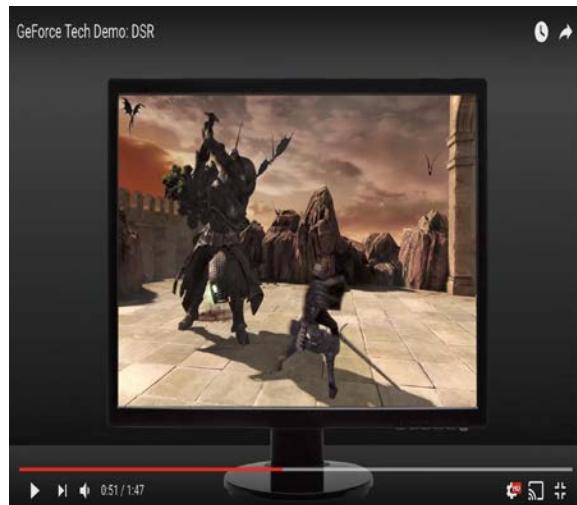
“DSR however goes the other way. With super resolution technology, we allow the game to specify a resolution that’s actually larger than your monitor. This means that your GPU will generate a very high quality image in the local frame buffer and then use a sophisticated filter to downscale it and put it onto your monitor.”

GeForce Tech Demo: DSR by Nvidia @ <https://www.youtube.com/watch?v=rSUSYaa6C9s&feature=youtu.be>

First Image



Modified Image



GeForce Tech Demo: DSR by Nvidia @ <https://www.youtube.com/watch?v=rSUSYaa6C9s&feature=youtu.be>

46. The Nvidia GTX 690 utilizes Nvidia G-Sync, of which ultra-low motion blur (UMLB) is a feature. UMLB uses a strobe backlight to lower

1 persistence by flashing the backlight only on fully refreshed frames. This technique
2 creates solid black bridge frames between the refreshed image frames of a video.
3 These solid black bridge frames are different from the first and modified image
4 frames, e.g.:



<https://www.geforce.com/hardware/desktop-gpus/geforce-gtx-690>



<https://www.geforce.com/hardware/technology/g-sync>

All G-SYNC monitors include a LightBoost sequel called **ULMB**, which stands for **Ultra Low Motion Blur**. This is activated by a button on the monitor, activatable during 85Hz/100Hz/120Hz mode, and eliminates most motion blur, in the same manner as [LightBoost](#). ULMB is a motion blur reduction strobe backlight ([high speed video](#)) to lower persistence, by flashing the backlight only on fully refreshed frames (and almost completely bypassing GtG pixel transitions on LCD).

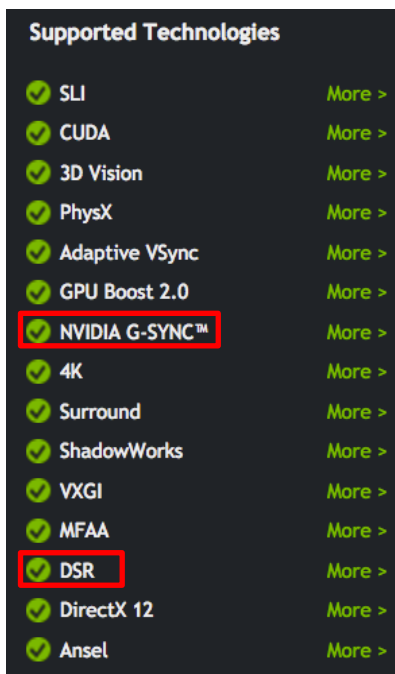
<http://www.blurbusters.com/gsync/preview2/>

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1 pictures that are substantially similar. In electronic media,
2 the bridge-picture may simply be a timed unlit-screen pause
3 50 between serial re-appearances of the two or more similar
4 image pictures. The rolling movements of pictorial forms

'444 column 4, lines 48-51

5
6 47. The Nvidia GTX 690 displays the modified image frame (i.e.,
7 downscaled image) from DSR and the bridge frame (i.e., black frame) from UMLB
8 on a computer monitor via one of its many video outputs, e.g.:



21 <https://www.geforce.com/hardware/desktop-gpus/geforce-gtx-690>

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Display Support:	
Multi Monitor	4 displays
Maximum Digital Resolution ⁴	4096x2160
Maximum VGA Resolution	2048x1536
HDCP	Yes
HDMI ³	Yes (via dongle)
Standard Display Connectors	Two Dual Link DVI-I. One Dual link DVI-D. One Mini-Displayport 1.2
Audio Input for HDMI	Internal

<https://www.geforce.com/hardware/desktop-gpus/geforce-gtx-690/specifications>

“GPUs use a frame buffer to store a rendered image before they’re scanned on to a monitor.”

GeForce Tech Demo: DSR by Nvidia @

<https://www.youtube.com/watch?v=rSUSYaa6C9s&feature=youtu.be>

48. By making using, selling, offering for sale, and importing active GTX 690 and other similar products, NVIDIA is infringing the claims of the ’444 Patent, including but not limited to claim 26. NVIDIA has committed these acts of infringement without license or authorization.

49. NVIDIA has injured VIE and is liable to VIE for direct and indirect infringement of the claims of the ’444 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

50. As a result of Defendant’s infringement of the ’444 Patent, VIE 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 NVIDIA, together with interest and costs as fixed by the Court.

COUNT FOUR
INFRINGEMENT OF U.S. PATENT NO. 7,030,902

51. Plaintiff incorporates by reference each of the allegations in the

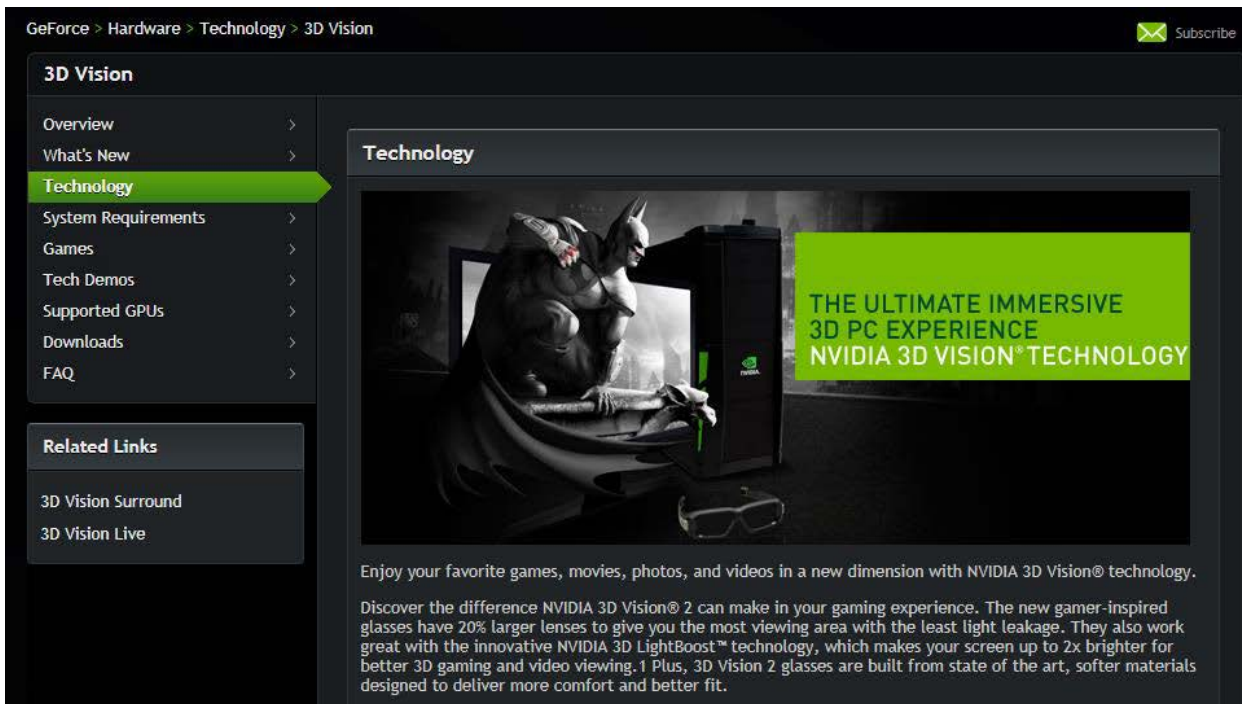
1 foregoing paragraphs, and further alleges as follows:
2

3 52. On April 18, 2006, the United States Patent and Trademark Office
4 issued the '902 Patent. In one claimed embodiment, a method for creating an
5 appearance of continuous movement with a plurality of picture frames using two or
6 more pictures, said method comprises a) selecting at least two image pictures which
7 are visually similar, a first image picture and a second image picture; b) selecting a
8 bridging picture which is dissimilar to said image picture; c) arranging said pictures
9 in a sequential order to create a first series of pictures, said sequential order being
10 one or more first image pictures, one or more second image pictures, and one or
11 more bridging pictures; d) placing said first series of pictures on a plurality of picture
12 frames wherein each picture of said first series is placed on a single frame; and e)
13 repeating the first series of pictures a plurality of times to create a continuous
14 plurality of picture frames having said first series thereon, such that when said
15 plurality of picture frames are viewed an appearance of continuous movement is
16 perceived by a viewer. A true and correct copy of the '902 Patent is attached as
17 Exhibit D.
18
19

20
21 53. NVIDIA has been and is now directly and indirectly infringing one or
22 more claims of the '902 Patent in this judicial District and elsewhere in the United
23 States.

24
25 54. For example, NVIDIA directly infringes the '902 Patent, including but
26 not limited to claim 1, by making, using, selling, offering for sale and importing the
27 GTX 670 graphics card 3D Vision product. The GTX 670 is representative of the
28 products accused, which encompass other NVIDIA products having similar

1 features.



<https://www.geforce.com/hardware/technology/3d-vision/technology>

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16 55. NVIDIA’s 3D Vision product creates an appearance of continuous
17 movement (e.g., 3D video game) by generating a plurality of picture frames using
18 multiple pictures. The bottom-right image shows a 2013 Toshiba Qosmio Laptop
19 X75-Q7390 with NVIDIA’s 3D Vision that is displaying a 3D video game, e.g.:
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TOSHIBA Qosmio X875-Q7390 17.3" Intel Core i7 3rd Gen 3630QM (2.40 GHz) NVIDIA Geforce GTX 670(3D Vision) 16 GB Memory 2 TB HDD Windows 8 Gaming Laptop

★★★★★ (22) Write a Review See 8 Questions | 11 Answers

- NVIDIA Geforce GTX 670(3D Vision) 3 GB
- Intel Core i7 3rd Gen 3630QM (2.40 GHz)
- 16 GB Memory 2 TB HDD
- 17.3" 1920 x 1080
- 16.5" x 10.7" x 1.16"-1.7" 7.5 lbs.
- Blu-Ray Burner
- 1 x VGA 1 x HDMI
- 4 x USB 3.0 (2 with USB Sleep Charge)



<https://www.newegg.com/Product/Product.aspx?Item=N82E16834216023>; Images captured using Casio EX-ZR100 high-speed camera at 240 FPS

56. NVIDIA'S 3D Vision product displays content to the viewer by

1 selecting a first image picture (i.e., left-eye picture) and a second image picture (i.e.,
2 right-eye picture). The photo below shows that the first (left-eye) image picture is
3 selected, e.g.:

4
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8 **Left-Eye
Image**



Images captured using Casio EX-ZR100 high-speed camera at 240 FPS

11
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16 57. The photo below shows a second, visually similar, (right-eye) image
17 picture is selected by NVIDIA'S 3D Vision product, e.g.:

18
19
20 **Right-Eye
Image**
21
22 **Note the
23 figures right
24 foot which is
25 different from
26 that in the left-
27 eye image.**



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Images captured using Casio EX-ZR100 high-speed camera at 240 FPS

58. NVIDIA’S 3D Vision product selects as a bridging picture a solid black picture. The photo below shows that the solid black bridging picture is selected. The bridging picture is dissimilar to the left-eye image picture and the right-eye image picture, e.g.:



Images captured using Casio EX-ZR100 high-speed camera at 240 FPS

59. NVIDIA’S 3D Vision product “arrang[es] the pictures in a sequential order to create a first series of pictures, said sequential order being one or more first image pictures, one or more second image pictures, and one or more bridging pictures.”

60. A person of skill in the art at the time of the invention would not understand the term “arranging the pictures in a sequential order to create a first series of pictures, said sequential order being one or more first image pictures, one or more second image pictures, and one or more bridging pictures” to preclude additional bridging pictures.

1 61. A person of skill in the art would understand that including additional
2 bridging pictures in the sequence leads to an increase in “flicker,” which the
3 invention purposely uses to create the appearance of continuous motion.
4

5 62. For example, the ‘902 Patent teaches that the appearance of continuous
6 motion is created in the invention by employing “flicker,” which is “the contrast
7 created by viewing the slight shifting of a pictured form or forms between the image
8 pictures in opposition to the bridging picture.” (‘902 Patent, col. 7, lines 26-30.)

9 63. The inventors “purposely makes flicker apparent, utilizing the effects
10 of emphatic flicker on the human optical/nervous system to create uncanny time and
11 space illusions.” (*Id.* at col. 7, lines 39-43.) The inventors further taught that
12 “[v]isible flicker is essential” to their technique. (*Id.* at col. 11, line 53.)

13 64. Therefore, a person of skill in the art would understand that the use of
14 an additional bridging frame, for example as between the first and third frames,
15 increases “flicker,” and is therefore consistent with the goals of the claimed
16 invention.
17

18 65. The claim’s preamble also uses the term “comprising,” which is open-
19 ended and does not preclude use of additional elements such as bridging frames.
20

21 66. A person of skill in the art would also understand that the inventors
22 disclosed embodiments where the image pictures were interrupted by bridging
23 pictures.
24

25 67. For example, the specification teaches that “[s]imple alternation of a
26 single image picture with intervals of blackness (or any other interrupting color/s)
27 is enough to create subtle illusions of continual sliding movement across the screen.”
28 (*Id.*, col. 7, lines 43-47.)

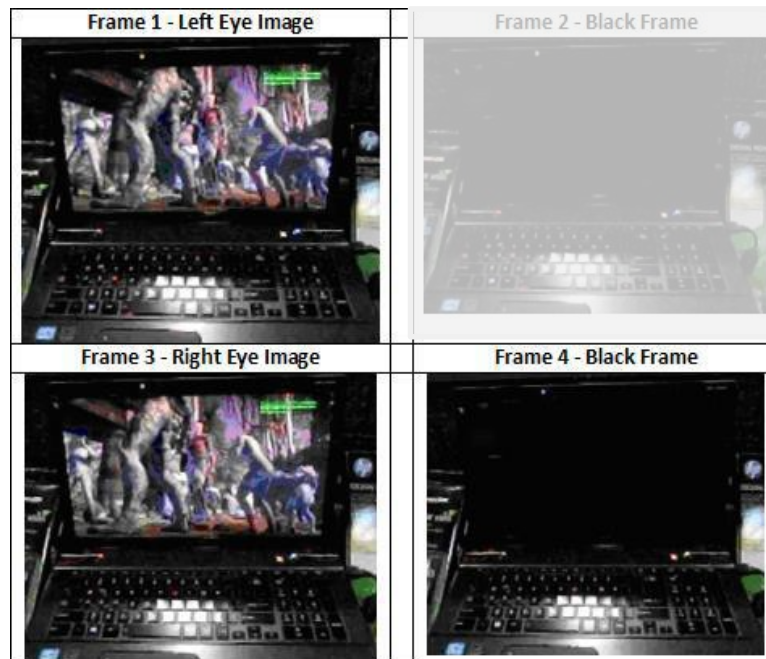
1 68. As another example, the specification teaches “momentary unit-
2 replacement or interjection by other picture units, as for instance: A,A, B,B, C,C,
3 A,D, B,B, C,E,C, A,A.” (*Id.*, col. 12, lines 31-35.) A person of skill in the art would
4 understand that the sequence “B, C, E, C, A” is a sequence of image frames B, E
5 and A, interrupted by the bridging frame C.
6

7 69. Based on such disclosures, a person of skill in the art would understand
8 that the claim does not preclude “interrupting” bridging pictures, and that the
9 inventors contemplated and disclosed embodiments including interrupting bridging
10 pictures as being within the scope of the claimed “sequential order.”
11

12 70. The term “arranging the pictures in a sequential order to create a first
13 series of pictures, said sequential order being one or more first image pictures, one
14 or more second image pictures, and one or more bridging pictures” therefore does
15 not preclude additional bridging pictures.
16

17 71. NVIDIA literally infringes this element. For example, the photos
18 below show successive images from filming a 3D video game running through
19 NVIDIA’S 3D Vision technology. The successive images are labeled Frame 1 -
20 Frame 4. Frame 1 uses a first (left-eye) image picture, Frame 3 uses a second (right-
21 eye) picture, and Frame 4 uses a solid black bridging picture, e.g.:
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Images captured using Casio EX-ZR100 high-speed camera at 240 FPS

72. Even if the term “arranging the pictures in a sequential order to create a first series of pictures, said sequential order being one or more first image pictures, one or more second image pictures, and one or more bridging pictures” precludes additional bridging pictures, which it does not, NVIDIA still infringes this element under the doctrine of equivalents.

73. A person of skill in the art at the time of the invention would consider the difference between a sequence that *is* interrupted by a bridging picture, on the one hand, and a sequence that *is not* interrupted by a bridging picture, on the other hand, as being insubstantial.

74. For example, a person of skill in the art at the time of invention would recognize that a sequence that *is* interrupted by a bridging picture performs substantially the same function (e.g., including two pictures and a bridge interval in

1 a set of images), in substantially the same way (e.g., using the effects of “flicker”),
2 to yield substantially the same result (e.g., creating the appearance of continuous
3 movement) as a sequence that *is not* interrupted by a bridging picture.
4

5 75. The two elements are interchangeable, and a person with ordinary skill
6 in the art would have known that the elements were interchangeable at the times of
7 invention and infringement.

8 76. A person of skill in the art would further understand that such
9 differences would be insubstantial because the ‘902 Patent teaches that “various
10 arrangements of the pictures and the blends can be employed in the present invention
11 and need not be the same each time” (‘902 Patent, col. 3, lines 6-8); that “[s]trict
12 mechanical repetition can give way to flexible variation within the limits imposed
13 by what is necessary to sustain the motion/depth illusion” (‘902 patent, col. 12, lines
14 11-14); and that “[n]o less than three basic units, two pictures and a bridge-interval
15 (A, B, C), are necessary” to achieve the desired effect (‘902 Patent, col. 11, lines
16 64-65).
17

18 77. NVIDIA’S 3D Vision product places the first series of pictures (i.e.,
19 left-eye picture, right-eye picture, and solid black bridging picture) on a plurality of
20 picture frames, with each picture being placed in a single frame. The photos below
21 show that each picture of the first series of pictures are placed in their own individual
22 frames (Frame 1 - Frame 4), e.g.:
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Images captured using Casio EX-ZR100 high-speed camera at 240 FPS

78. NVIDIA'S 3D Vision product repeats the first series of pictures (first in Frames 1 - 4, and then in Frames 5 - 8) to create a continuous plurality of picture frames. The photo below shows the NVIDIA's 3D Vision repeating the first series of pictures a plurality of times, e.g.:

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Images captured using Casio EX-ZR100 high-speed camera at 240 FPS

1 79. NVIDIA 3D Vision product displays Frames 1 - Frame 8 for a 3D
2 Video Game such that when it is viewed there is an appearance of continuous
3 motion. The photos below show NVIDIA's 3D Vision displaying Frames 1 - Frame
4 8, e.g.:



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Images captured using Casio EX-ZR100 high-speed camera at 240 FPS

80. By making using, selling, offering for sale, and importing GTX 670 active 3D Vision and other similar products, NVIDIA is infringing the claims of the '902 Patent, including but not limited to claim 1. NVIDIA has committed these acts of infringement without license or authorization.

81. NVIDIA has injured VIE and is liable to VIE for direct and indirect infringement of the claims of the '902 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

82. As a result of Defendant's infringement of the '902 Patent, VIE 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 NVIDIA, together with interest and costs as fixed by the Court.

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PRAYER FOR RELIEF

Plaintiff respectfully requests the following relief from the Court:

- 1. That Defendant has directly and indirectly infringed the Patents-in-Suit;
- 2. That Defendant be ordered to pay damages to VIE, together with costs, expenses, pre-judgment, interest and post-judgment interest as allowed by law;
- 3. That the Court enter judgment against Defendant, and in favor of VIE in all respects; and
- 4. 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, VIE requests a trial by jury of any issues so triable by right.

Dated: August 31, 2017

Respectfully submitted,

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/s/ Ryan E. Hatch

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