

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

DYNAMIC DATA TECHNOLOGIES, LLC,

Plaintiff,

v.

APPLE INC.,

Defendant.

Civil Action No. _____

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Dynamic Data Technologies, LLC (“Dynamic Data”) bring this action and make the following allegations of patent infringement relating to U.S. Patent Nos.: 8,135,073 (the “073 patent”); 6,714,257 (the “257 patent”); 8,073,054 (the “054 patent”); 6,774,918 (the “918 patent”); 8,184,689 (the “689 patent”); 6,996,177 (the “177 patent”); 8,311,112 (the “112 patent”); 6,646,688 (the “688 patent”); 7,894,529 (the “529 patent”); 7,542,041 (the “041 patent”); and 7,571,450 (the “450 patent”) (collectively, the “patents-in-suit”). Defendant Apple Inc. (“Apple” or “Defendant”) infringes each of the patents-in-suit in violation of the patent laws of the United States of America, 35 U.S.C. § 1 *et seq.*

INTRODUCTION

1. Dynamic Data’s portfolio of over 1,000 patent assets encompasses core technologies in the field of image and video processing. Dynamic Data’s patents arose from the research and development efforts of Koninklijke Philips N.V. (“Philips”). Founded in 1891, for well over a century, Philips pioneered ground breaking technologies, including compact audio cassettes, magnetic resonance imaging (MRI) machines, and compact discs.

2. In an effort to facilitate the licensing of Philips' foundational technology, Dynamic Data is pursuing remedies for infringement of its patents in venues throughout the world. Contemporaneous to the filing of this Complaint and complaints against other companies selling the technologies claimed by Dynamic Data's patent portfolio, Dynamic Data filed patent enforcement actions against Google LLC,¹ Advanced Micro Devices, Inc.,² and Microsoft Corporation³ in the Peoples Republic of China before the Nanjing Specialized Intellectual Property Tribunal. In addition, Dynamic Data has filed a patent enforcement action against Apple, Inc. in Düsseldorf, Germany.⁴

DYNAMIC DATA'S LANDMARK INVENTIONS

3. The groundbreaking inventions in image and video processing taught in the patents-in-suit were pioneered by Philips. Video and image processing were at the heart of Philips' business for over fifty years. In 1891, Philips, then known as Philips & Company, was founded in Eindhoven, Netherlands to manufacture carbon-filament lamps.⁵ In the 1920s, Philips began to produce vacuum tubes and small radios, which would augur Philips' later entry into video and audio processing.

¹ Asserting Patent Nos. CN1266944C; CN1333373C; and CN1329870C (南京专业知识产权法院).

² Asserting Patent Nos. CN1303818C; CN1333373C; and CN1266944C (南京专业知识产权法院).

³ Asserting Patent Nos. CN1266944C, CN1329870C, and CN1333373C (南京专业知识产权法院).

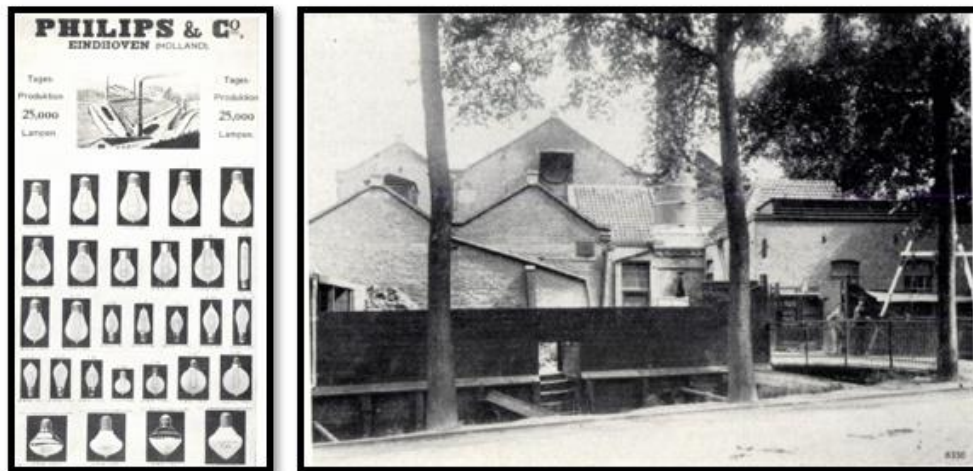
⁴ Asserting Patent No. EP1520409 (Landgericht Düsseldorf).

⁵ Gerard O'Regan, A BRIEF HISTORY OF COMPUTING at 99 (2012).



N.A. Halbertsma, *The Birth of a Lamp Factory In 1891*, PHILIPS TECHNICAL REVIEW, Vol. 23 at 230, 234 (1961).

4. In 1962, Philips introduced the first audio cassette tape.⁶ A year later, Philips launched a small battery-powered audio tape recorder that used a cassette instead of a loose spool.⁷ Philips C-cassette was later used as the first mass storage device for early personal computers in the 1970s and 1980s.



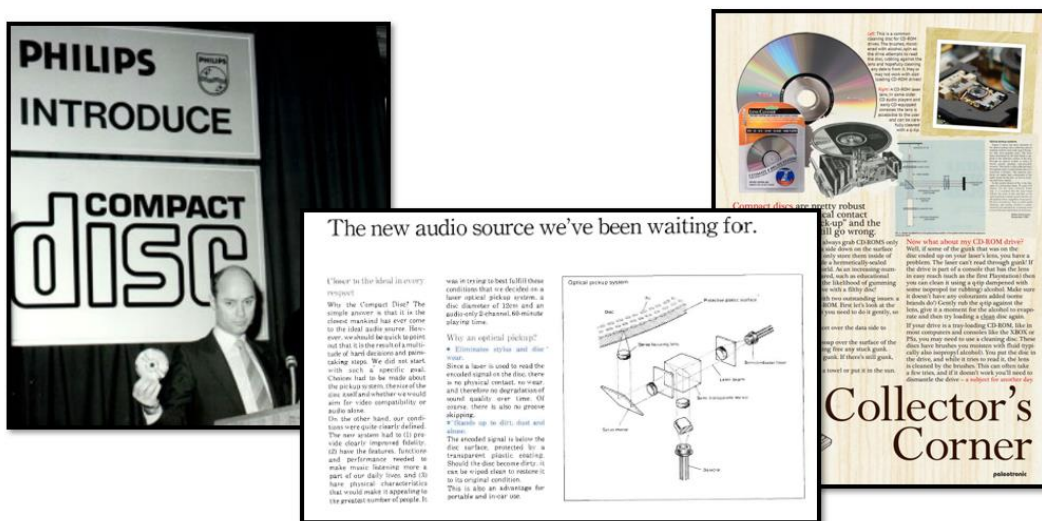
THE ROTARIAN MAGAZINE, Vol. 101 No. 6 at 70 (December 1962) (advertisement showing Philips Norelco device which used cassettes for recording audio for transcription); Fred Chandler,

⁶ Gerard O'Regan, PILLARS OF COMPUTING: A COMPENDIUM OF SELECT, PIVOTAL TECHNOLOGY FIRMS at 172 (2015) ("Philips invented the compact cassette for audio storage in 1962.")

⁷ Anthony Pollard, GRAMOPHONE: THE FIRST 75 YEARS at 231 (1998).

European Mfrs. Bid For Market Share, BILLBOARD MAGAZINE AT P-6 (April 8, 1967) (image of the Philips EL 3300 battery-operated tape recorder which was released in 1963); Jan Syrjala, *Car Stereo: How Does The Music Sound?*, N.Y. TIMES at 2-M (September 25, 1966) (showing Philips's Norelco Cassette “the Philips device has two tiny reels inside it, with the tape traveling from one to the other”).

5. In 1971, Philips demonstrated the world’s first videocassette records (VCR). A year later, Philips launched the world’s first home video cassette recorder, the N1500. In 1982, Philips teamed with Sony to launch the Compact Disc; this format evolved into the DVD and later Blu-ray, which Philips launched with Sony in 1997 and 2006 respectively.



Hans Peek, Jan Bergmans, Jos Van Haaren, Frank Toolenaar, and Sorin Stan, *ORIGINS AND SUCCESSORS OF THE COMPACT DISC: CONTRIBUTIONS OF PHILIPS TO OPTICAL STORAGE* at 15 (2009) (showing image of Joop Sinjou of Philips introducing the compact disc in March 1979); *Advertisements for Philip’s Compact Disc Products* (1982).

6. In the late 1990s and early 2000s, Philips pioneered the development of technologies for encoding and decoding of video and audio content. At the time most of the technologies claimed by the patents in Dynamic Data’s portfolio were invented, Philips’ subsidiary primarily responsible for Philips’ work in this field, Philips Semiconductor was the world’s sixth

largest semiconductor company.⁸ The video encoding technologies developed by Philips Semiconductor enable video streaming on set-top boxes, smartphones, popular gaming consoles, Internet-connected computers, and numerous other types of media streaming devices.

7. Philips Semiconductor dedicated significant research and development resources to advancing the technology of video compression and transmission by reducing file sizes and decreasing the processing resources required to transmit the data.⁹ Philips Semiconductor was among the first companies aggressively driving innovation in the field of video processing:

The late 1980s and early 1990s saw the announcement of several complex, programmable VSPs. Important examples include chips from Matsushita, NTT, Philips [Semiconductors], and NEC. All of these processors were high-performance parallel processors architected from the ground up for real-time video signal processing. . . . The Philips VSP-1 and NEC processor were probably the most heavily used of these chips.¹⁰

8. Starting in the 1960s Philips pioneered the development of audio and video technologies that would establish itself as a leader in the field that would later develop into the audio and video encoding fields. Continuing Philips' pioneering history in these fields, the patents-in-suit disclose cutting-edge video compression and transmission technologies.

DYNAMIC DATA'S PATENT PORTFOLIO

9. Dynamic Data's patent portfolio includes over 1,000 patent assets, with over 400 issued patents granted by patent offices around the world. Dynamic Data owns numerous patents issued by the United States Patent and Trademark Office, including each of the patents-in-suit,

⁸ *Company News; Philips in \$1 Billion Deal for VLSI Technology*, THE NEW YORK TIMES (May 4, 1999), available at: <https://www.nytimes.com/1999/05/04/business/company-news-philips-in-1-billion-deal-for-vlsi-technology.html>.

⁹ HU, YU HEN, PROGRAMMABLE DIGITAL SIGNAL PROCESSORS: ARCHITECTURE, PROGRAMMING, AND APPLICATIONS, at 190 (Dec. 6, 2001) ("Philips Semiconductors developed early dedicated video chips for specialized video processors.").

¹⁰ *Id.* at 191.

The State Intellectual Property Office of the People's Republic of China,¹¹ the European Patent Office,¹² the German Patent and Trademark Office,¹³ the Japan Patent Office,¹⁴ and many other national patent offices.

10. Philips Semiconductor's pioneering work in the area of video processing and encoding has resulted in various inventions that are fundamental to today's video processing technologies. Dynamic Data is the owner by assignment of over 1,000 of these patent assets, which include over 400 patents issued by patent offices around the world.

11. Highlighting the importance of the patents-in-suit is the fact that the patents-in-suit have been cited by over 400 U.S. and international patents and patent applications by a wide variety of the largest companies operating in the field. For example, the patents-in-suit have been cited by companies such as:

- Samsung Electronics Co., Ltd.¹⁵
- Qualcomm Inc.¹⁶
- Google LLC¹⁷
- Intel Corporation¹⁸
- Broadcom Corporation¹⁹
- Microsoft Corporation²⁰

¹¹ See, e.g., CN100504925C; CN100438609C; CN1679052B; CN1333373C; CN1329870C; CN1303818C.

¹² See, e.g., European Patent Nos. EP1032921B1; EP1650978B1; EP1213700B1; EP1520409B1.

¹³ See, e.g., German Patent Nos. DE60120762; DE50110537; DE60126151; DE60348978; DE602004049357.

¹⁴ See, e.g., Japanese Patent Nos. JP4583924B2; JP5059855B2; JP5153336B2; JP4637585B2.

¹⁵ See, e.g., U.S. Patent Nos. 6,930,729; 7,911,537; 7,532,764; 8,605,790; and 8,095,887.

¹⁶ See, e.g., U.S. Patent Nos. 7,840,085; 8,649,437; 8,750,387; 8,918,533; 9,185,439; 9,209,934; 9,281,847; 9,319,448; 9,419,749; 9,843,844; 9,917,874; and 9,877,033.

¹⁷ See, e.g., U.S. Patent No. 8,787,454 and U.S. Patent Appl. No. 10/003,793.

¹⁸ See, e.g., U.S. Patent Nos. 7,554,559; 7,362,377; and 8,462,164.

¹⁹ See, e.g., U.S. Patent Nos. 8,325,273 and 9,377,987.

²⁰ See, e.g., U.S. Patent Nos. 7,453,939; 7,670,227; 7,408,986; 7,421,129; 7,558,320; and 7,929,599.

- Sony Corporation²¹
- Fujitsu Ltd.²²
- Panasonic Corporation²³
- Matsushita Electric Industrial Company Limited²⁴

THE PARTIES

DYNAMIC DATA TECHNOLOGIES, LLC

12. Dynamic Data Technologies, LLC (“Dynamic Data” or “Plaintiff”) is a limited liability company organized under the laws of Delaware.

13. In an effort to obtain compensation for Philips’ pioneering work in the fields of video data encoding, decoding, and transmission, Dynamic Data acquired the patents-in-suit along with the several hundred additional issued United States and international Patents.

14. Dynamic Data pursues the reasonable royalties owed for Apple’s use of the inventions claimed in Dynamic Data’s patent portfolio, which primarily arise from Philips’ groundbreaking technology, both here in the United States and throughout the world.

APPLE INC.

15. On information and belief, Apple Inc. (“Apple”), is a California corporation with its principal place of business at 1 Infinite Loop, Cupertino, California 95014. Apple may be served through its registered agent CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201. On information and belief, Apple is registered to do business in the State of Texas, and maintains offices and facilities throughout the Eastern District of Texas and the State of Texas, including a facility in Austin, Texas employing more than 5,000 employees.

²¹ See, e.g., U.S. Patent Nos. 7,218,354 and 8,174,615.

²² See, e.g., U.S. Patent Nos. 7,092,032 and 8,290,308.

²³ See, e.g., U.S. Patent Nos. 8,164,687 and 8,432,495.

²⁴ See, e.g., U.S. Patent Nos. 7,362,378 and 7,423,961.

16. On information and belief, Apple conducts business operations within the Eastern District of Texas in its facilities at 6121 West Park Boulevard, Plano, Texas 75093 and 2601 Preston Road, Frisco, Texas 75034.

17. On information and belief, Apple has sells and markets its products within the Eastern District of Texas, including the products accused of infringing the patents-in-suit, from its retail location in Plano and Frisco.

18. On information and belief, Apple has entered into contracts with the State of Texas valued at several hundred thousand dollars.

JURISDICTION AND VENUE

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

20. Upon information and belief, this Court has personal jurisdiction over Apple in this action because Apple has committed acts within the Eastern District of Texas giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Apple would not offend traditional notions of fair play and substantial justice. Apple, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has committed and continues to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the patents-in-suit. Moreover, Apple is registered to do business in the State of Texas, has offices and facilities in the State of Texas and the Eastern District of Texas, and actively directs its activities to customers located in the State of Texas.

21. On information and belief, Apple has directly financially benefitted from doing business with the State of Texas. For example, Apple has entered into contract (DIR-TSO-3789) with the State of Texas whereby Apple is paid by the State of Texas to provide Apple products and related services.

22. Venue is proper in this district under 28 U.S.C. §§ 1391(b)-(d) and 1400(b). Defendant Apple is registered to do business in the State of Texas, has facilities in the State of Texas and the Eastern District of Texas, and upon information and belief, has transacted business in the Eastern District of Texas and has committed acts of direct and indirect infringement in the Eastern District of Texas. Apple maintains regular and established places of business within the Eastern District of Texas located at 6121 West Park Boulevard, Plano, Texas 75093 and 2601 Preston Road, Frisco, Texas 75034.

THE ASSERTED PATENTS

U.S. PATENT NO. 8,135,073

23. U.S. Patent No. 8,135,073 (the “’073 patent”) entitled, *Enhancing Video Images Depending On Prior Image Enhancements*, was filed on December 12, 2003, and claims priority to December 19, 2002. The ‘073 patent is subject to a 35 U.S.C. § 154(b) term extension of 1,799 days. Dynamic Data is the owner by assignment of all right, title, and interest in the ‘073 patent. A true and correct copy of the ‘073 patent is attached hereto as Exhibit 1.

24. The ‘073 patent discloses novel methods and systems for enhancing subsequent images of a video stream in which frames are encoded based on previous frames using prediction and motion estimation.

25. The inventions disclosed in the ‘073 patent reduce the processing capacity required for providing video enhancements to video processing through re-mapping of previous frames for subsequent frames.

26. Accordingly, the technologies disclosed in the '073 patent enable the provision of enhanced video pictures with minimal additional hardware costs for the components required to successfully process the video data.

27. The '073 patent discloses a video decoder comprising an input for receiving a video stream containing encoded frame based video information including an encoded first frame and an encoded second frame.

28. The '073 patent discloses a video decoder comprising an input for receiving video information wherein the encoding of the second frame depends on the encoding of the first frame, the encoding of the second frame includes motion vectors indicating differences in positions between regions of the second frame and corresponding regions of the first frame, the motion vectors define correspondence between regions of the second frame and corresponding regions of the first frame.

29. The '073 patent discloses a video decoder comprising a decoding unit for decoding the frames, wherein the decoding unit recovers the motion vectors for the second frame.

30. The '073 patent discloses a video decoder comprising a processing component configured to determine a re-mapping strategy for video enhancement of the decoded first frame using a region-based analysis, re-map the first frame using the re-mapping strategy, and re-map one or more regions of the second frame depending on the re-mapping strategy for corresponding regions of the first frame.

31. The '073 patent and its underlying patent application have been cited by 36 patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '073 patent and its underlying patent application as relevant prior art:

- Canon Inc.
- Microsoft Corporation

- International Business Machines Corporation
- Qualcomm Inc.
- Digital Fountain Incorporated
- Samsung Electronics Co., Ltd.
- SK Planet Co. Ltd.

U.S. PATENT NO. 6,714,257

32. U.S. Patent No. 6,714,257 (the “257 patent”) entitled, *Color Key Preservation During Sample Rate Conversion*, was filed on June 29, 2001. The ‘257 patent is subject to a 35 U.S.C. § 154(b) term extension of 445 days. Dynamic Data is the owner by assignment of all right, title, and interest in the ‘257 patent. A true and correct copy of the ‘257 patent is attached hereto as Exhibit 2.

33. The ‘257 patent claims specific methods and systems for processing a keyed image. For example, one or more of the ‘257 patent claims describe a method for scaling a keyed image where a key-only image corresponding to key regions in the keyed images is created. The key-only image is scaled to form a scaled key-only image. The keyed image is scaled for form a scaled keyed image, and the scaled key-only image is merged with the scaled keyed image.

34. The ‘257 patent discloses additional improvements to scaling and filtering color-keyed images.

35. The inventions taught in the ‘257 patent achieve improvements in scaling and filtering color-keyed images by allowing the replacement of color-keyed regions with background image information, without introducing visible artifacts.

36. The ‘257 patent discloses embodiments that extract the color-keyed regions from a color-keyed image, and independently scale the color-keyed regions and the non-color keyed regions.

37. The '257 patent discloses that blurring of edges in non-color-key regions are minimized by extending the non-color-key colors into color-keyed regions after the color-keyed information is extracted from the color-keyed image.

38. The '257 patent has been cited by several United States and International patents and patent applications as relevant prior art. Specifically, patents issued to Microsoft Corporation, Texas Instruments Incorporated, Samsung Corporation, Marvell International Limited, Innolux Corporation, and China Digital Video (Beijing) Limited have all cited the '257 patent as relevant prior art.

U.S. PATENT NO. 8,073,054

39. U.S. Patent No. 8,073,054 (the "'054 patent") entitled, *Unit For And Method Of Estimating A Current Motion Vector*, was filed on December 12, 2002, and claims priority to January 17, 2002. The '054 patent is subject to a 35 U.S.C. § 154(b) term extension of 1,162 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '054 patent. A true and correct copy of the '054 patent is attached hereto as Exhibit 3.

40. The '054 patent discloses novel methods and apparatuses for estimating a current motion vector for a group of pixels of an image.

41. The inventions disclosed in the '054 patent enable motion estimation with a relatively fast convergence in finding the appropriate motion vectors of the motion vector fields by adding a further candidate motion vector to the set of candidate motion vectors.

42. The '054 patent discloses a motion estimation unit comprising a generating unit for generating a set of candidate motion vectors for the group of pixels, with the candidate motion vectors being extracted from a set of previously estimated motion vectors.

43. The '054 patent discloses a motion estimation unit comprising a match error unit for calculating match errors of respective candidate motion vectors.

44. The '054 patent discloses a motion estimation unit comprising a selector for selecting the current motion vector from the candidate motion vectors by means of comparing the match errors of the respective candidate motion vectors, characterized in that the motion estimation unit is arranged to add a further candidate motion vector to the set of candidate motion vectors by calculating the further candidate motion vector on basis of a first motion vector and a second motion vector, both belonging to the set of previously estimated motion vectors.

45. The '054 patent discloses a motion estimation unit that calculates the further candidate motion vector on basis of the first motion vector and the second motion vector, with the first motion vector belonging to a first forward motion vector field and the second motion vector belonging to a second forward motion vector field, with the first forward motion vector field and the second forward motion vector field being different.

46. The '054 patent discloses a motion estimation unit that arranges to calculate the further candidate motion vector by means of calculating a difference between the second motion vector and the first motion vector.

47. The '054 patent and its underlying patent application have been cited by 14 patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '054 patent and its underlying patent application as relevant prior art:

- Canon Inc.
- Huawei Technologies, Ltd.
- Imagination Technologies Ltd.
- MediaTek Inc.
- Panasonic Corp.
- Samsung Electronics Co., Ltd.
- Siemens Healthcare GmbH
- Tencent Technology (Shenzhen) Co., Ltd.

U.S. PATENT NO. 6,774,918

48. U.S. Patent No. 6,774,918 (“the ‘918 patent”) entitled, *Video Overlay Processor with Reduced Memory And Bus Performance Requirements*, was filed on June 28, 2000. The ‘918 patent is subject to a 35 U.S.C. § 154(b) term extension of 591 days. Dynamic Data is the owner by assignment of all right, title, and interest in the ‘918 patent. A true and correct copy of the ‘918 patent is attached hereto as Exhibit 4.

49. The ‘918 patent claims specific methods and systems for providing an overlay such as a cursor in an on-screen display in a consumer electronic device. On-screen display (OSD) data for generating an image on a display device are downloaded to an OSD unit on an integrated circuit.

50. The ‘918 patent discloses downloading on-screen display (OSD) data for generating an image on a display device.

51. The ‘918 patent further discloses downloading the on-screen display (OSD) data in segments separated by gaps.

52. The ‘918 patent further discloses, during a gap in downloading the on-screen display data, downloading an amount of overlay data for generating an overlay on the image generated on a display device.

53. Further, the ‘918 patent discloses that the overlay data downloaded during a gap comprises a portion of the overlay data.

54. The inventions disclosed in the ‘918 patent improve the operation and efficiency of computer components because only a portion of the overlay data is downloaded during each burst gap, thus reducing the amount of memory needed to store the overlay data. The inventions disclosed in the ‘918 patent further eliminate the requirement that on-chip memory be large enough

to hold the data needed for an entire overlay. Instead, only one line or a part of one line of the overlay needs to be stored on-chip.

55. The '918 patent claims a technical solution to a problem unique to video processing.

56. The '918 patent has been cited by several United States patents and patent applications as relevant prior art. Specifically, patents issued to Realtek Semiconductor Corp., Samsung Electronics Co., Ltd., and Thomson Licensing SA have all cited the '918 patent as relevant prior art.

U.S. PATENT NO. 8,184,689

57. U.S. Patent No. 8,184,689 (the "'689 patent") entitled, *Method Video Encoding And Decoding Preserving Cache Localities*, was filed on August 7, 2006, and claims priority to August 17, 2005. The '689 patent is subject to a 35 U.S.C. § 154(b) term extension of 948 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '689 patent. A true and correct copy of the '689 patent is attached hereto as Exhibit 5.

58. The '689 patent discloses novel methods and apparatuses for encoding and decoding video data.

59. The inventions disclosed in the '689 patent processing time and power consumption associated with encoding and decoding video stream data is reduced by reducing off-chip memory accesses through using simultaneous encoded/decoded images as a reference image for encoding/decoding at least one of the other simultaneously encoded/decoded images.

60. The '689 patent discloses a method for encoding and decoding a video stream, including a plurality of images in a video processing apparatus having a processing unit coupled to a first memory, further comprising a second memory.

61. The '689 patent discloses a method for encoding and decoding a video stream comprising providing a subset of image data stored in the second memory in the first memory.

62. The '689 patent discloses a method for encoding and decoding a video stream comprising simultaneous encoding/decoding of more than one image of the video stream, by accessing said subset, wherein the simultaneously encoding/decoding is performed by access sharing to at least one image.

63. The '689 patent and its underlying patent application have been cited by several patents and patent applications as relevant prior art. Specifically, patents issued to Fujitsu Ltd., Qualcomm Inc., Sony Corporation, Sun Patent Trust, and VIXS Systems Incorporated have all cited the '689 patent and its underlying patent application as relevant prior art.

U.S. PATENT NO. 6,996,177

64. U.S. Patent No. 6,996,177 (the "'177 patent") entitled, *Motion Estimation*, was filed on July 24, 2000, and claims priority to August 22, 1999. The '177 patent is subject to a 35 U.S.C. § 154(b) term extension of 1,103 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '177 patent. A true and correct copy of the '177 patent is attached hereto as Exhibit 6.

65. The '177 patent claims specific methods and devices for motion estimation and motion-compensated picture signal processing.

66. The '177 patent discloses a motion vector estimation method and device that carries out a block-based motion vector estimation process that involves comparing a plurality of candidate vectors to determine block-based motion vectors.

67. The '177 patent discloses a motion vector estimation method and device that determines at least a most frequently occurring block-based motion vector.

68. The '177 patent discloses a motion vector estimation method and device that carries out a global motion vector estimation process using at least the most frequently occurring block-based motion vector to obtain a global motion vector.

69. The '177 patent discloses a motion vector estimation method and device that applies the global motion vector as a candidate vector to the block-based motion vector estimation process.

70. The inventions disclosed in the '177 patent improve the operation of the computer components necessary to the performance of picture signal processing by reducing the load on the central processing unit.

71. The '177 patent has been cited by 16 United States and International patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '177 patent as relevant prior art:

- Qualcomm Incorporated
- LG Electronics
- Microsoft Corporation
- Samsung Electronics Co., Ltd.
- VIXS Systems Incorporated
- General Instrument Corporation

U.S. PATENT NO. 8,311,112

72. U.S. Patent No. 8,311,112 (the "'112 patent") entitled, *System And Method For Video Compression Using Predictive Coding*, was filed on December 31, 2008. The '112 patent is subject to a 35 U.S.C. § 154(b) term extension of 847 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '112 patent. A true and correct copy of the '112 patent is attached hereto as Exhibit 7.

73. The '112 patent discloses novel methods and systems for video compression.

74. The '112 patent discloses novel technologies for video compression that perform predictive coding on a macroblock of a video frame such that a set of pixels of the macroblock is coded using some of the pixels from the same video frame as reference pixels and the rest of the macroblock is coded using reference pixels from at least one other video frame.

75. The '112 patent discloses a system for video compression comprising an intra-frame coding unit configured to perform predictive coding on a set of pixels of a macroblock of pixels using a first group of reference pixels, the macroblock of pixels and the first group of reference pixels being from a video frame.

76. The '112 patent discloses a system for video compression comprising an inter-frame coding unit configured to perform predictive coding on the rest of the macroblock of pixels using a second group of reference pixels, the second group of reference pixels being from at least one other video frame.

77. The '112 patent and its underlying patent application have been cited by 10 patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '112 patent and its underlying patent application as relevant prior art:

- British Broadcasting Corporation
- Google LLC
- Megachips Corp.
- Olympus Corp.
- Samsung Electronics Co., Ltd.
- Sony Corporation
- Toshiba Corporation

U.S. PATENT NO. 6,646,688

78. U.S. Patent No. 6,646,688 (the “‘688 patent”) entitled, *High Quality Video and Graphics Pipeline*, was filed on November 10, 2000. The ‘688 patent is subject to a 35 U.S.C. § 154(b) term extension of 407 days. Dynamic Data is the owner by assignment of all right, title,

and interest in the '688 patent. A true and correct copy of the '688 patent is attached hereto as Exhibit 8.

79. The '688 patent discloses multiple embodiments for optimally processing high quality video and graphics.

80. The '688 patent discloses a video/graphics data processing method wherein a stream of digital video/graphics data is pre-processed to output pre-processed data.

81. The '688 patent further discloses substituting the color key with a pre-selected color in the processing of a color key from the pre-processed data to output resulting data.

82. The '688 patent discloses processing and transforming the data resulting from the processing a color key from the pre-processed data to output resulting data.

83. The '688 patent has been cited by multiple United States patents and patent applications as relevant prior art. Specifically, patents and patent applications issued to Broadcom Corporation, Eastman Kodak Company, Nvidia Corporation, and Quantel Ltd. cited the '688 patent family as relevant prior art.

U.S. PATENT NO. 7,894,529

84. U.S. Patent No. 7,894,529 (the "'529 patent") entitled, *Method And Device For Determining Motion Vectors*, was filed on June 1, 2006, and claims priority to June 3, 2005. The '529 patent is subject to a 35 U.S.C. § 154(b) term extension of 1,301 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '529 patent. A true and correct copy of the '529 patent is attached hereto as Exhibit 9.

85. The '529 patent discloses novel methods and apparatuses for determining motion vectors that are each assigned to individual image regions.

86. The inventions disclosed in the '529 patent enable an increase in the resolution of video and image signals during the motion estimation process.

87. The '529 patent discloses a method for determining motion vectors which are assigned to individual image regions of an image.

88. The '529 patent discloses a method wherein an image is subdivided into a number of image blocks, and a motion estimation technique is implemented to assign at least one motion vector to each of the image blocks where a modified motion vector is generated for at least a first image block.

89. The '529 patent discloses a method that determines at least a second image block through which the motion vector assigned to the first image block at least partially passes.

90. The '529 patent discloses a method that generates the modified motion vector as a function of a motion vector assigned to at least the second image block.

91. The '529 patent discloses a method that assigns the modified motion vector as the motion vector to the first image block.

92. The '529 patent and its underlying patent application have been cited by multiple patents and patent applications as relevant prior art. Specifically, patents issued to Fujifilm Corp., and Samsung Electronics Co., Ltd. have cited the '529 patent and its underlying patent application as relevant prior art.

U.S. PATENT NO. 7,542,041

93. U.S. Patent No. 7,542,041 (the "041 patent") entitled, *Runtime Configurable Virtual Video Pipeline*, was filed on April 2, 2004, and claims priority to April 3, 2003. The '041 patent is subject to a 35 U.S.C. § 154(b) term extension of 288 days. Dynamic Data is the owner

by assignment of all right, title, and interest in the '041 patent. A true and correct copy of the '041 patent is attached hereto as Exhibit 10.

94. The '041 patent discloses novel systems for dynamically configuring a multi-pipe pipeline system.

95. The inventions disclosed in the '041 patent enable a multiple-pipeline system that is dynamically configurable to effect various combinations of functions for each pipeline.

96. The inventions disclosed in the '041 patent teach a multiple pipeline system that includes a pool of auxiliary function blocks that are provided as required to select pipelines.

97. In one embodiment of the '041 patent, each pipeline of the multiple-pipeline system is configured to include a homogenous set of core functions. A pool of auxiliary functions is provided for selective insertion of auxiliary functions between core functions of select pipelines.

98. In one embodiment of the '041 patent, each auxiliary function includes a multiplexer that allows it to be selectively coupled within each pipeline.

99. The '041 patent discloses, in one embodiment, a processing system that includes a plurality of pipelines, with each pipeline of the plurality including a plurality of core pipeline elements that are configured to sequentially process data as it traverses the pipeline.

100. The '041 patent discloses, in one embodiment, a processing system that includes a plurality of auxiliary elements, each auxiliary element of the plurality of auxiliary elements being configured to be selectively coupled to multiple pipelines of the plurality of pipelines.

101. The '041 patent discloses, in one embodiment, a processing system wherein the auxiliary elements are responsive to external coupling-select signals.

102. The '041 patent discloses, in one embodiment, a processing system wherein a plurality of auxiliary elements are within a selected pipeline of the multiple pipelines, between a

pair of core pipeline elements of the plurality of core pipeline elements to process the data as it traverses between the pair of core elements.

103. The '041 patent has been cited by several United States patents and patent applications as relevant prior art. Specifically, patents and patent applications issued to Microsoft Corporation, Xilinx Inc., Canon Inc., Intel Corporation, and Nokia Oyj have cited the '041 patent and its underlying patent application as relevant prior art.

U.S. PATENT NO. 7,571,450

104. U.S. Patent No. 7,571,450 (the "'450 patent") entitled, *System For And Method Of Displaying Information*, was filed on February 12, 2003, and claims priority to March 11, 2002. The '450 patent is subject to a 35 U.S.C. § 154(b) term extension of 846 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '450 patent. A true and correct copy of the '450 patent is attached hereto as Exhibit 11.

105. The '450 patent discloses novel methods and systems for displaying information. The inventions disclosed in the '450 patent enable methods and systems wherein a user does not need to make a new selection after being switched from one service to a second service.

106. The inventions disclosed in the '450 patent permit a user of an information display system to have selections made on a first service also presented when the user switches to a second service without requiring the user to browse through the menus to define the type of information to be displayed a second time.

107. In one embodiment of the '450 patent, the user selection being made on the basis of the provided options while the first service was selected is use to select the appropriate data elements of the stream of the second service.

108. The inventions disclosed in the '450 patent enable various content sources to share similar information models.

109. The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein receiving a transport stream comprises services, with the services having elementary streams of video and of data elements.

110. The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein user actions of making a user selection of a type of information to be displayed on the device are received.

111. The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein filtering to select a data element of a first one of the services on the basis of the user selection is performed.

112. The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein rendering to calculate an output image to be displayed on the display device, on the basis of the first data element selected by the filter is performed.

113. The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein switching from the first one of the services to a second one of the services, characterized in comprising a second step of filtering to select a second data-element of the second one of the services, on basis of the user selection is performed.

114. The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein being switched from the first one of the services to the second one of the services, with the data-element and the second data-element being mutually semantically related and a second step of rendering to calculate the output image to be displayed on the display device, on basis of the second data-element selected by the filter is performed.

115. The '450 patent and its underlying patent application have been cited by several patents and patent applications as relevant prior art. Specifically, patents issued to AT&T Intellectual Property I LP, Nokia Oyj, Samsung Electronics Co., Ltd., and ZTE Corporation have all cited the '450 patent and its underlying patent application as relevant prior art.

COUNT I
INFRINGEMENT OF U.S. PATENT NO. 8,135,073

116. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

117. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for enhancing subsequent images of a video stream in which frames are encoded based on previous frames using prediction and motion estimation.

118. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products with H.265 video capabilities. The Accused Products include, but are not limited to, Apple's iPhone, iPad, and Apple TV, and any other Apple products capable of implementing the H.265 standard (collectively, the "Apple '073 Product(s)").

119. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple '073 Products in regular business operations.

120. On information and belief, one or more of the Apple '073 Products include technology for enhancing subsequent images of a video stream in which frames are encoded based on previous frames using prediction and motion estimation.

121. On information and belief, Apple has directly infringed and continues to directly infringe the '073 patent by, among other things, making, using, offering for sale, and/or selling technology for enhancing subsequent images of a video stream in which frames are encoded based

on previous frames using prediction and motion estimation, including but not limited to the Apple '073 Products.

122. On information and belief, one or more of the Apple '073 Products reduce the processing capacity required for providing video enhancements to video processing through re-mapping of previous frames for subsequent frames.

123. On information and belief, one or more of the Apple '073 Products enable the provision of enhanced video pictures with minimal additional hardware costs for the components required to successfully process the video data.

124. On information and belief, one or more of the Apple '073 Products include an input for receiving a video stream containing encoded frame based video information including an encoded first frame and an encoded second frame.

125. On information and belief, one or more of the Apple '073 Products include a video decoder comprising an input for receiving video information wherein the encoding of the second frame depends on the encoding of the first frame, the encoding of the second frame includes motion vectors indicating differences in positions between regions of the second frame and corresponding regions of the first frame, the motion vectors define correspondence between regions of the second frame and corresponding regions of the first frame.

126. On information and belief, one or more of the Apple '073 Products include a video decoder comprising a decoding unit for decoding the frames, wherein the decoding unit recovers the motion vectors for the second frame.

127. On information and belief, one or more of the Apple '073 Products include a video decoder comprising a processing component configured to determine a re-mapping strategy for video enhancement of the decoded first frame using a region-based analysis, re-map the first frame

using the re-mapping strategy, and re-map one or more regions of the second frame depending on the re-mapping strategy for corresponding regions of the first frame.

128. On information and belief, the Apple '073 Products are available to businesses and individuals throughout the United States.

129. On information and belief, the Apple '073 Products are provided to businesses and individuals located in the Eastern District of Texas.

130. By making, using, testing, offering for sale, and/or selling products and services for enhancing subsequent images of a video stream in which frames are encoded based on previous frames using prediction and motion estimation, including but not limited to the Apple '037 Products, Apple has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '073 patent, including at least claim 14 pursuant to 35 U.S.C. § 271(a).

131. On information and belief, Apple also indirectly infringes the '073 patent by actively inducing infringement under 35 USC § 271(b).

132. Apple has had knowledge of the '073 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the '073 patent and knew of its infringement, including by way of this lawsuit.

133. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple '073 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the '073 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '073 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple

provides the Apple '073 Products that have the capability of operating in a manner that infringe one or more of the claims of the '073 patent, including at least claim 14, and Apple further provides documentation and training materials that cause customers and end users of the Apple '073 Products to utilize the products in a manner that directly infringe one or more claims of the '073 patent.²⁵ By providing instruction and training to customers and end-users on how to use the Apple '073 Products in a manner that directly infringes one or more claims of the '073 patent, including at least claim 14, Apple specifically intended to induce infringement of the '073 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple '073 Products, e.g., through Apple user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '073 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '073 patent, knowing that such use constitutes infringement of the '073 patent.

134. The '073 patent is well-known within the industry as demonstrated by multiple citations to the '073 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the '073 patent without paying a reasonable royalty. Apple is infringing the '073 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

²⁵ See, e.g., *iPhone User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/iphone/12/#/iph344652def> (last visited Nov. 2018); *iPad User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/ipad/12/> (last visited Nov. 2018); *Apple TV User Guide*, APPLE SUPPORT WEBSITE, available at: <https://support.apple.com/guide/tv/welcome/tvos> (last visited Nov. 2018); *Installing Apple Beta Software*, APPLE DEVELOPER SUPPORT WEBSITE, available at: <https://developer.apple.com/support/beta-software/install-beta/> (last visited Nov. 2018).

135. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '073 patent.

136. As a result of Apple's infringement of the '073 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT II
INFRINGEMENT OF U.S. PATENT NO. 6,714,257

137. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

138. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for image processing.

139. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products with chroma key capabilities. The Accused Products include, but are not limited to, Apple Final Cut Pro X (collectively, the "Apple '257 Product(s)").

140. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple '257 Products in regular business operations.

141. On information and belief, one or more of the Apple '257 Products include technology for image processing.

142. On information and belief, one or more of the Apple '257 Products include technology for scaling a keyed image.

143. On information and belief, the Apple '257 Products are available to businesses and individuals throughout the United States.

144. On information and belief, the Apple ‘257 Products are provided to businesses and individuals located in the Eastern District of Texas.

145. On information and belief, Apple has directly infringed and continues to directly infringe the ‘257 patent by, among other things, making, using, offering for sale, and/or selling technology for image processing, including but not limited to the Apple ‘257 Products.

146. On information and belief, the Apple ‘257 Products create a key-only image corresponding to key regions in a keyed image.

147. On information and belief, the Apple ‘257 Products scale the key-only image to form a scaled key-only image.

148. On information and belief, the Apple ‘257 Products scale the keyed image to form a scaled key image.

149. On information and belief, the Apple ‘257 Products merge the scaled key-only image and the scaled keyed image.

150. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Apple ‘257 Products, Apple has injured Dynamic Data and is liable for directly infringing one or more claims of the ‘257 patent, including at least claim 9, pursuant to 35 U.S.C. § 271(a).

151. On information and belief, Apple also indirectly infringes the ‘257 patent by actively inducing infringement under 35 USC § 271(b).

152. On information and belief, Apple has had knowledge of the ‘257 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the ‘257 patent and knew of its infringement, including by way of this lawsuit.

153. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple ‘257 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the ‘257 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the ‘257 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple provides the Apple ‘257 Products that have the capability of operating in a manner that infringe one or more of the claims of the ‘257 patent, including at least claim 9, and Apple further provides documentation and training materials that cause customers and end users of the Apple ‘257 Products to utilize the products in a manner that directly infringe one or more claims of the ‘257 patent.²⁶ By providing instruction and training to customers and end-users on how to use the Apple ‘257 Products in a manner that directly infringes one or more claims of the ‘257 patent, including at least claim 9, Apple specifically intended to induce infringement of the ‘257 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple ‘257 Products, e.g., through Apple user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the ‘257 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ‘257 patent, knowing that such use constitutes infringement of the ‘257 patent.

²⁶ See, e.g., *Final Cut Pro X: Use chroma keys*, APPLE SUPPORT WEBSITE, available at: https://support.apple.com/kb/PH12665?locale=en_US&viewlocale=en_US (April 12, 2018); *Final Cut Pro X*, APPLE USER GUIDE (2014); *Final Cut Pro X*, LOGIC EFFECTS REFERENCE GUIDE (2012).

154. The '257 patent is well-known within the industry as demonstrated by multiple citations to the '257 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the '257 patent without paying a reasonable royalty. Apple is infringing the '257 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

155. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '257 patent.

156. As a result of Apple's infringement of the '257 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT III
INFRINGEMENT OF U.S. PATENT NO. 8,073,054

157. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

158. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for estimating a current motion vector for a group of pixels of an image.

159. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products with H.265 video capabilities. The Accused Products include, but are not limited to, Apple's iPhone, iPad, and Apple TV and any other Apple products capable of implementing the H.265 standard (collectively, the "Apple '054 Product(s)").

160. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple '054 Products in regular business operations.

161. On information and belief, one or more of the Apple '054 Products include technology for estimating a current motion vector for a group of pixels of an image.

162. On information and belief, Apple has directly infringed and continues to directly infringe the '054 patent by, among other things, making, using, offering for sale, and/or selling technology for estimating a current motion vector for a group of pixels of an image, including but not limited to the Apple '054 Products.

163. On information and belief, one or more of the Apple '054 Products enable motion estimation with a relatively fast convergence in finding the appropriate motion vectors of the motion vector fields by adding a further candidate motion vector to the set of candidate motion vectors.

164. On information and belief, one or more of the Apple '054 Products include a motion estimation unit comprising a generating unit for generating a set of candidate motion vectors for the group of pixels, with the candidate motion vectors being extracted from a set of previously estimated motion vectors.

165. On information and belief, one or more of the Apple '054 Products include a motion estimation unit comprising a match error unit for calculating match errors of respective candidate motion vectors.

166. On information and belief, one or more of the Apple '054 Products include a motion estimation unit comprising a selector for selecting the current motion vector from the candidate motion vectors by means of comparing the match errors of the respective candidate motion vectors, characterized in that the motion estimation unit is arranged to add a further candidate motion vector

to the set of candidate motion vectors by calculating the further candidate motion vector on basis of a first motion vector and a second motion vector, both belonging to the set of previously estimated motion vectors.

167. On information and belief, one or more of the Apple '054 Products include a motion estimation unit that calculates the further candidate motion vector on basis of the first motion vector and the second motion vector, with the first motion vector belonging to a first forward motion vector field and the second motion vector belonging to a second forward motion vector field, with the first forward motion vector field and the second forward motion vector field being different.

168. On information and belief, one or more of the Apple '054 Products include a motion estimation unit that arranges to calculate the further candidate motion vector by means of calculating a difference between the second motion vector and the first motion vector.

169. On information and belief, the Apple '054 Products are available to businesses and individuals throughout the United States.

170. On information and belief, the Apple '054 Products are provided to businesses and individuals located in the Eastern District of Texas.

171. By making, using, testing, offering for sale, and/or selling products and services for estimating a current motion vector for a group of pixels of an image, including but not limited to the Apple '054 Products, Apple has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '054 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

172. On information and belief, Apple also indirectly infringes the '054 patent by actively inducing infringement under 35 USC § 271(b).

173. Apple has had knowledge of the '054 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the '054 patent and knew of its infringement, including by way of this lawsuit.

174. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple '054 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the '054 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '054 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple provides the Apple '054 Products that have the capability of operating in a manner that infringe one or more of the claims of the '054 patent, including at least claim 1, and Apple further provides documentation and training materials that cause customers and end users of the Apple '054 Products to utilize the products in a manner that directly infringe one or more claims of the '054 patent.²⁷ By providing instruction and training to customers and end-users on how to use the Apple '054 Products in a manner that directly infringes one or more claims of the '054 patent, including at least claim 1, Apple specifically intended to induce infringement of the '054 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple '054 Products, e.g., through Apple user manuals, product support, marketing materials, and training

²⁷ See, e.g., *iPhone User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/iphone/12/#/iph344652def> (last visited Nov. 2018); *iPad User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/ipad/12/> (last visited Nov. 2018); *Apple TV User Guide*, APPLE SUPPORT WEBSITE, available at: <https://support.apple.com/guide/tv/welcome/tvos> (last visited Nov. 2018); *Installing Apple Beta Software*, APPLE DEVELOPER SUPPORT WEBSITE, available at: <https://developer.apple.com/support/beta-software/install-beta/> (last visited Nov. 2018).

materials to actively induce the users of the accused products to infringe the '054 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '054 patent, knowing that such use constitutes infringement of the '054 patent.

175. The '054 patent is well-known within the industry as demonstrated by multiple citations to the '054 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the '054 patent without paying a reasonable royalty. Apple is infringing the '054 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

176. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '054 patent.

177. As a result of Apple's infringement of the '054 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT IV
INFRINGEMENT OF U.S. PATENT NO. 6,774,918

178. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

179. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for image processing.

180. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products that implement Dynamic Adaptive Streaming over HTTP (“MPEG-DASH”) or HTTP Live Streaming (“HLS”). The Accused Products include, but are not limited to, Apple’s iPhone, iPad, and Apple TV, and any other products capable of implementing MPEG-DASH or HLS (collectively, the “Apple ‘918 Product(s)”).

181. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple ‘918 Products in regular business operations.

182. On information and belief, one or more of the Apple ‘918 Products include technology for image processing.

183. On information and belief, the Apple ‘918 Products are available to businesses and individuals throughout the United States.

184. On information and belief, the Apple ‘918 Products are provided to businesses and individuals located in the Eastern District of Texas.

185. On information and belief, Apple has directly infringed and continues to directly infringe the ‘918 patent by, among other things, making, using, offering for sale, and/or selling video processing technology, including but not limited to the Apple ‘918 Products.

186. On information and belief, one or more of the Apple ‘918 Products provide an overlay such as a cursor in an on-screen display in a consumer electronic device.

187. On information and belief, one or more of the Apple ‘918 Products enable downloading on-screen display (OSD) data for generating an image on a display device.

188. On information and belief, one or more of the Apple ‘918 Products download the on-screen display (OSD) data in segments separated by gaps.

189. On information and belief, one or more of the Apple ‘918 Products download, during a gap in downloading the on-screen display data, an amount of overlay data for generating an overlay on the image generated on a display device.

190. On information and belief, one or more of the Apple ‘918 Products contain overlay data downloaded during a gap that comprises a portion of the overlay data.

191. On information and belief, the Apple ‘918 Products comprise a computer-usable medium having computer-readable program code embodied therein for causing a video processor to download on-screen display (OSD) data for generating an image on a display device, with said downloading occurring in segments separated by gaps.

192. On information and belief, the Apple ‘918 Products comprise a computer-usable medium having computer-readable program code embodied therein for causing a video processor to download an amount of overlay data for generating an overlay on an image during a gap in downloading the on-screen display (OSD) data, wherein the amount of overlay data comprises a portion of said overlay.

193. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Apple ‘918 Products, Apple has injured Dynamic Data and is liable for directly infringing one or more claims of the ‘918 patent, including at least claim 18, pursuant to 35 U.S.C. § 271(a).

194. On information and belief, Apple also indirectly infringes the ‘918 patent by actively inducing infringement under 35 USC § 271(b).

195. On information and belief, Apple has had knowledge of the ‘918 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the ‘918 patent and knew of its infringement, including by way of this lawsuit.

196. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple '918 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the '918 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '918 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple provides the Apple '918 Products that have the capability of operating in a manner that infringe one or more of the claims of the '918 patent, including at least claim 18, and Apple further provides documentation and training materials that cause customers and end users of the Apple '918 Products to utilize the products in a manner that directly infringe one or more claims of the '918 patent.²⁸ By providing instruction and training to customers and end-users on how to use the Apple '918 Products in a manner that directly infringes one or more claims of the '918 patent, including at least claim 18, Apple specifically intended to induce infringement of the '918 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple '918 Products, e.g., through Apple user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '918 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the

²⁸ See, e.g., *iPhone User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/iphone/12/#/iph344652def> (last visited Nov. 2018); *iPad User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/ipad/12/> (last visited Nov. 2018); *Apple TV User Guide*, APPLE SUPPORT WEBSITE, available at: <https://support.apple.com/guide/tv/welcome/tvos> (last visited Nov. 2018); *Installing Apple Beta Software*, APPLE DEVELOPER SUPPORT WEBSITE, available at: <https://developer.apple.com/support/beta-software/install-beta/> (last visited Nov. 2018).

accused products in their ordinary and customary way to infringe the '918 patent, knowing that such use constitutes infringement of the '918 patent.

197. The '918 patent is well-known within the industry as demonstrated by multiple citations to the '918 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the '918 patent without paying a reasonable royalty. Apple is infringing the '918 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

198. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '918 patent.

199. As a result of Apple's infringement of the '918 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT V
INFRINGEMENT OF U.S. PATENT NO. 8,184,689

200. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

201. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for encoding and decoding video data.

202. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products and services that encode/decode video data by simultaneous encoding/decoding of more than one image of the video stream by access sharing to at least one image. By way of illustrative example,

the Accused Products include, but are not limited to, Apple's devices that implement iOS 10.3 and later versions of iOS and tvOS 10.2 and later versions of tvOS, including: iPhone, iPad, and Apple TV (collectively, the "Apple '689 Product(s)").

203. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple '689 Products in regular business operations.

204. On information and belief, one or more of the Apple '689 Products include technology for encoding and decoding video data.

205. On information and belief, Apple has directly infringed and continues to directly infringe the '689 patent by, among other things, making, using, offering for sale, and/or selling technology for encoding and decoding video data, including but not limited to the Apple '689 Products.

206. On information and belief, one or more of the Apple '689 Products reduce processing time and power consumption associated with encoding and decoding video stream data by reducing off-chip memory accesses through using simultaneous encoded/decoded images as a reference image for encoding/decoding at least one of the other simultaneously encoded/decoded images.

207. On information and belief, one or more of the Apple '689 Products perform a method for encoding and decoding a video stream, including a plurality of images in a video processing apparatus having a processing unit coupled to a first memory, further comprising a second memory.

208. On information and belief, one or more of the Apple '689 Products perform a method for encoding and decoding a video stream comprising providing a subset of image data stored in the second memory in the first memory.

209. On information and belief, one or more of the Apple '689 Products perform a method for encoding and decoding a video stream comprising simultaneous encoding/decoding of more than one image of the video stream, by accessing said subset, wherein the simultaneously encoding/decoding is performed by access sharing to at least one image.

210. On information and belief, the Apple '689 Products are available to businesses and individuals throughout the United States.

211. On information and belief, the Apple '689 Products are provided to businesses and individuals located in the Eastern District of Texas.

212. By making, using, testing, offering for sale, and/or selling products and services for encoding and decoding video data, including but not limited to the Apple '689 Products, Apple has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '689 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

213. On information and belief, Apple also indirectly infringes the '689 patent by actively inducing infringement under 35 USC § 271(b).

214. Apple has had knowledge of the '689 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the '689 patent and knew of its infringement, including by way of this lawsuit.

215. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple '689 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the '689 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '689 patent

and with the knowledge that the induced acts would constitute infringement. For example, Apple provides the Apple ‘689 Products that have the capability of operating in a manner that infringe one or more of the claims of the ‘689 patent, including at least claim 1, and Apple further provides documentation and training materials that cause customers and end users of the Apple ‘689 Products to utilize the products in a manner that directly infringe one or more claims of the ‘689 patent.²⁹ By providing instruction and training to customers and end-users on how to use the Apple ‘689 Products in a manner that directly infringes one or more claims of the ‘689 patent, including at least claim 1, Apple specifically intended to induce infringement of the ‘689 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple ‘689 Products, e.g., through Apple user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the ‘689 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ‘689 patent, knowing that such use constitutes infringement of the ‘689 patent.

216. The ‘689 patent is well-known within the industry as demonstrated by multiple citations to the ‘689 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the ‘689 patent without paying a reasonable royalty. Apple is infringing the ‘689 patent in a manner best described

²⁹ See, e.g., *iPhone User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/iphone/12/#/iph344652def> (last visited Nov. 2018); *iPad User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/ipad/12/> (last visited Nov. 2018); *Apple TV User Guide*, APPLE SUPPORT WEBSITE, available at: <https://support.apple.com/guide/tv/welcome/tvos> (last visited Nov. 2018); *Installing Apple Beta Software*, APPLE DEVELOPER SUPPORT WEBSITE, available at: <https://developer.apple.com/support/beta-software/install-beta/> (last visited Nov. 2018).

as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

217. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '689 patent.

218. As a result of Apple's infringement of the '689 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT VI
INFRINGEMENT OF U.S. PATENT NO. 6,996,177

219. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

220. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for motion estimation.

221. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products with H.265 video capabilities. The Accused Products include but are not limited to Apple's iPhone, iPad, and Apple TV, and any other Apple products capable of implementing the H.265 standard (collectively, the "Apple '177 Product(s)").

222. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple '177 Products in regular business operations.

223. On information and belief, one or more of the Apple '177 Products include technology for motion estimation and motion-compensated picture signal processing.

224. On information and belief, the Apple '177 Products are available to businesses and individuals throughout the United States.

225. On information and belief, the Apple '177 Products are provided to businesses and individuals located in the Eastern District of Texas.

226. On information and belief, Apple has directly infringed and continues to directly infringe the '177 patent by, among other things, making, using, offering for sale, and/or selling products and services for motion estimation and motion-compensated picture signal processing.

227. The Apple '177 Products comprise methods and devices for motion estimation and motion-compensated picture signal processing.

228. The Apple '177 Products incorporate a motion vector estimation method and device that carries out a block-based motion vector estimation process that involves comparing a plurality of candidate vectors to determine block-based motion vectors.

229. The Apple '177 Products determine at least a most frequently occurring block-based motion vector.

230. The Apple '177 Products carry out a global motion vector estimation process using at least the most frequently occurring block-based motion vector to obtain a global motion vector.

231. The Apple '177 Products applies the global motion vector as a candidate vector to the block-based motion vector estimation process.

232. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Apple '177 Products, Apple has injured Dynamic Data and is liable for directly infringing one or more claims of the '177 patent, including at least claim 1, pursuant to 35 U.S.C. § 271(a).

233. On information and belief, Apple also indirectly infringes the ‘177 patent by actively inducing infringement under 35 USC § 271(b).

234. On information and belief, Apple has had knowledge of the ‘177 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the ‘177 patent and knew of its infringement, including by way of this lawsuit.

235. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple ‘177 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the ‘177 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the ‘177 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple provides the Apple ‘177 Products that have the capability of operating in a manner that infringe one or more of the claims of the ‘177 patent, including at least claim 1, and Apple further provides documentation and training materials that cause customers and end users of the Apple ‘177 Products to utilize the products in a manner that directly infringe one or more claims of the ‘177 patent.³⁰ By providing instruction and training to customers and end-users on how to use the Apple ‘177 Products in a manner that directly infringes one or more claims of the ‘177 patent, including at least claim 1, Apple specifically intended to induce infringement of the ‘177 patent. On

³⁰ See, e.g., *iPhone User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/iphone/12/#/iph344652def> (last visited Nov. 2018); *iPad User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/ipad/12/> (last visited Nov. 2018); *Apple TV User Guide*, APPLE SUPPORT WEBSITE, available at: <https://support.apple.com/guide/tv/welcome/tvos> (last visited Nov. 2018); *Installing Apple Beta Software*, APPLE DEVELOPER SUPPORT WEBSITE, available at: <https://developer.apple.com/support/beta-software/install-beta/> (last visited Nov. 2018).

information and belief, Apple engaged in such inducement to promote the sales of the Apple '177 Products, e.g., through Apple user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '177 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '177 patent, knowing that such use constitutes infringement of the '177 patent.

236. The '177 patent is well-known within the industry as demonstrated by multiple citations to the '177 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the '177 patent without paying a reasonable royalty. Apple is infringing the '177 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

237. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '177 patent.

238. As a result of Apple's infringement of the '177 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT VII
INFRINGEMENT OF U.S. PATENT NO. 8,311,112

239. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

240. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for video compression.

241. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products with H.265 video capabilities. The Accused Products include, but are not limited to, Apple's iPhone, iPad, and Apple TV, and any other Apple products capable of implementing the H.265 standard (collectively, the "Apple '112 Product(s)").

242. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple '112 Products in regular business operations.

243. On information and belief, one or more of the Apple '112 Products include technology for video compression.

244. On information and belief, Apple has directly infringed and continues to directly infringe the '112 patent by, among other things, making, using, offering for sale, and/or selling technology for video compression, including but not limited to the Apple '112 Products.

245. On information and belief, one or more of the Apple '112 Products perform predictive coding on a macroblock of a video frame such that a set of pixels of the macroblock is coded using some of the pixels from the same video frame as reference pixels and the rest of the macroblock is coded using reference pixels from at least one other video frame.

246. On information and belief, one or more of the Apple '112 Products include a system for video compression comprising an intra-frame coding unit configured to perform predictive coding on a set of pixels of a macroblock of pixels using a first group of reference pixels, the macroblock of pixels and the first group of reference pixels being from a video frame.

247. On information and belief, one or more of the Apple '112 Products include a system for video compression comprising an inter-frame coding unit configured to perform predictive

coding on the rest of the macroblock of pixels using a second group of reference pixels, the second group of reference pixels being from at least one other video frame.

248. On information and belief, the Apple '112 Products are available to businesses and individuals throughout the United States.

249. On information and belief, the Apple '112 Products are provided to businesses and individuals located in the Eastern District of Texas.

250. By making, using, testing, offering for sale, and/or selling products and services for interpolating a pixel during the interlacing of a video signal, including but not limited to the Apple '112 Products, Apple has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '112 patent, including at least claim 11 pursuant to 35 U.S.C. § 271(a).

251. On information and belief, Apple also indirectly infringes the '112 patent by actively inducing infringement under 35 USC § 271(b).

252. Apple has had knowledge of the '112 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the '112 patent and knew of its infringement, including by way of this lawsuit.

253. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple '112 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the '112 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '112 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple provides the Apple '112 Products that have the capability of operating in a manner that infringe

one or more of the claims of the ‘112 patent, including at least claim 11, and Apple further provides documentation and training materials that cause customers and end users of the Apple ‘112 Products to utilize the products in a manner that directly infringe one or more claims of the ‘112 patent.³¹ By providing instruction and training to customers and end-users on how to use the Apple ‘112 Products in a manner that directly infringes one or more claims of the ‘112 patent, including at least claim 11, Apple specifically intended to induce infringement of the ‘112 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple ‘112 Products, e.g., through Apple user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the ‘112 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ‘112 patent, knowing that such use constitutes infringement of the ‘112 patent.

254. The ‘112 patent is well-known within the industry as demonstrated by multiple citations to the ‘112 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the ‘112 patent without paying a reasonable royalty. Apple is infringing the ‘112 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

³¹ See, e.g., *iPhone User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/iphone/12/#/iph344652def> (last visited Nov. 2018); *iPad User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/ipad/12/> (last visited Nov. 2018); *Apple TV User Guide*, APPLE SUPPORT WEBSITE, available at: <https://support.apple.com/guide/tv/welcome/tvos> (last visited Nov. 2018); *Installing Apple Beta Software*, APPLE DEVELOPER SUPPORT WEBSITE, available at: <https://developer.apple.com/support/beta-software/install-beta/> (last visited Nov. 2018).

255. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the ‘112 patent.

256. As a result of Apple’s infringement of the ‘112 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple’s infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT VIII
INFRINGEMENT OF U.S. PATENT NO. 6,646,688

257. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

258. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for processing video and graphics data.

259. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products with chroma key capabilities. The Accused Products include, but are not limited to, Apple Final Cut Pro X (collectively, the “Apple ‘688 Product(s)”).

260. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple ‘688 Products in regular business operations.

261. On information and belief, one or more of the Apple ‘688 Products include technology for processing video and/or graphics data.

262. On information and belief, the Apple ‘688 Products are available to businesses and individuals throughout the United States.

263. On information and belief, the Apple ‘688 Products are provided to businesses and individuals located in the Eastern District of Texas.

264. On information and belief, Apple has directly infringed and continues to directly infringe the '688 patent by, among other things, making, using, offering for sale, and/or selling technology for processing video and/or graphics data, including but not limited to the Apple '688 Products.

265. On information and belief, the Apple '688 Products process video and graphics data.

266. On information and belief, the Apple '688 Products pre-process a stream of digital video or graphics data to output pre-processed data.

267. On information and belief, the Apple '688 Products process a color key from the pre-processed data to output resulting data.

268. On information and belief, the Apple '688 Products substitute the color key with a pre-selected color.

269. On information and belief, the Apple '688 Products process and transform the data resulting from the processing a color key from the pre-processed data.

270. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Apple '688 Products, Apple has injured Dynamic Data and is liable for directly infringing one or more claims of the '688 patent, including at least claim 6, pursuant to 35 U.S.C. § 271(a).

271. On information and belief, Apple also indirectly infringes the '688 patent by actively inducing infringement under 35 USC § 271(b).

272. On information and belief, Apple has had knowledge of the '688 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the '688 patent and knew of its infringement, including by way of this lawsuit.

273. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple ‘688 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the ‘688 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the ‘688 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple provides the Apple ‘688 Products that have the capability of operating in a manner that infringe one or more of the claims of the ‘688 patent, including at least claim 6, and Apple further provides documentation and training materials that cause customers and end users of the Apple ‘688 Products to utilize the products in a manner that directly infringe one or more claims of the ‘688 patent.³² By providing instruction and training to customers and end-users on how to use the Apple ‘688 Products in a manner that directly infringes one or more claims of the ‘688 patent, including at least claim 6, Apple specifically intended to induce infringement of the ‘688 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple ‘688 Products, e.g., through Apple user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the ‘688 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ‘688 patent, knowing that such use constitutes infringement of the ‘688 patent.

³² See, e.g., *Final Cut Pro X: Use chroma keys*, APPLE SUPPORT WEBSITE, available at: https://support.apple.com/kb/PH12665?locale=en_US&viewlocale=en_US (April 12, 2018); *Final Cut Pro X*, APPLE USER GUIDE (2014); *Final Cut Pro X*, LOGIC EFFECTS REFERENCE GUIDE (2012).

274. The '688 patent is well-known within the industry as demonstrated by multiple citations to the '688 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the '688 patent without paying a reasonable royalty. Apple is infringing the '688 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

275. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '688 patent.

276. As a result of Apple's infringement of the '688 patent, Dynamic Data has suffered monetary damages, and seek recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT IX
INFRINGEMENT OF U.S. PATENT NO. 7,894,529

277. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

278. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for determining motion vectors that are each assigned to individual image regions.

279. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products with H.265 video capabilities. The Accused Products include, but are not limited to, Apple's iPhone, iPad, and Apple TV, and any other Apple products capable of implementing the H.265 standard (collectively, the "Apple '529 Product(s)").

280. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple '529 Products in regular business operations.

281. On information and belief, one or more of the Apple '529 Products include technology for determining motion vectors that are each assigned to individual image regions.

282. On information and belief, Apple has directly infringed and continues to directly infringe the '529 patent by, among other things, making, using, offering for sale, and/or selling technology for determining motion vectors that are each assigned to individual image regions, including but not limited to the Apple '529 Products.

283. On information and belief, one or more of the Apple '529 Products enable an increase in the resolution of video and image signals during the motion estimation process.

284. On information and belief, one or more of the Apple '529 Products perform a method for determining motion vectors which are assigned to individual image regions of an image.

285. On information and belief, one or more of the Apple '529 Products perform a method wherein an image is subdivided into a number of image blocks, and a motion estimation technique is implemented to assign at least one motion vector to each of the image blocks where a modified motion vector is generated for at least a first image block.

286. On information and belief, one or more of the Apple '529 Products perform a method that determines at least a second image block through which the motion vector assigned to the first image block at least partially passes.

287. On information and belief, one or more of the Apple '529 Products perform a method that generates the modified motion vector as a function of a motion vector assigned to at least the second image block.

288. On information and belief, one or more of the Apple ‘529 Products perform a method that assigns the modified motion vector as the motion vector to the first image block.

289. On information and belief, the Apple ‘529 Products are available to businesses and individuals throughout the United States.

290. On information and belief, the Apple ‘529 Products are provided to businesses and individuals located in the Eastern District of Texas.

291. By making, using, testing, offering for sale, and/or selling products and services for interpolating a pixel during the interlacing of a video signal, including but not limited to the Apple ‘529 Products, Apple has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the ‘529 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

292. On information and belief, Apple also indirectly infringes the ‘529 patent by actively inducing infringement under 35 USC § 271(b).

293. Apple has had knowledge of the ‘529 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the ‘529 patent and knew of its infringement, including by way of this lawsuit.

294. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple ‘529 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the ‘529 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the ‘529 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple provides the Apple ‘529 Products that have the capability of operating in a manner that infringe

one or more of the claims of the '529 patent, including at least claim 1, and Apple further provides documentation and training materials that cause customers and end users of the Apple '529 Products to utilize the products in a manner that directly infringe one or more claims of the '529 patent.³³ By providing instruction and training to customers and end-users on how to use the Apple '529 Products in a manner that directly infringes one or more claims of the '529 patent, including at least claim 1, Apple specifically intended to induce infringement of the '529 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple '529 Products, e.g., through Apple user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '529 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '529 patent, knowing that such use constitutes infringement of the '529 patent.

295. The '529 patent is well-known within the industry as demonstrated by multiple citations to the '529 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the '529 patent without paying a reasonable royalty. Apple is infringing the '529 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

³³ See, e.g., *iPhone User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/iphone/12/#/iph344652def> (last visited Nov. 2018); *iPad User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/ipad/12/> (last visited Nov. 2018); *Apple TV User Guide*, APPLE SUPPORT WEBSITE, available at: <https://support.apple.com/guide/tv/welcome/tvos> (last visited Nov. 2018); *Installing Apple Beta Software*, APPLE DEVELOPER SUPPORT WEBSITE, available at: <https://developer.apple.com/support/beta-software/install-beta/> (last visited Nov. 2018).

296. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '529 patent.

297. As a result of Apple's infringement of the '529 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT X
INFRINGEMENT OF U.S. PATENT NO. 7,542,041

298. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

299. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for dynamically configuring a multi-pipe pipeline system.

300. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products and services that dynamically configure a multi-pipe pipeline system to sequentially process data as it traverses the pipeline. By way of illustrative example, these infringing products include, without limitation, Apple's devices that implement iOS 10.3 and later versions of iOS and tvOS 10.2 and later versions of tvOS, including: iPhone, iPad, and Apple TV (collectively, the "Apple '041 Product(s)").

301. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple '041 Products in regular business operations.

302. On information and belief, one or more of the Apple '041 Products include technology for dynamically configuring a multi-pipe pipeline system.

303. On information and belief, Apple has directly infringed and continues to directly infringe the '041 patent by, among other things, making, using, offering for sale, and/or selling technology for dynamically configuring a multi-pipe pipeline system, including but not limited to the Apple '041 Products.

304. On information and belief, one or more of the Apple '041 Products enable a multiple-pipeline system that is dynamically configurable to effect various combinations of functions for each pipeline.

305. On information and belief, one or more of the Apple '041 Products include a multiple pipeline system that includes a pool of auxiliary function blocks that are provided as required to select pipelines.

306. On information and belief, one or more of the Apple '041 Products consist of a multiple-pipeline system wherein each pipeline is configured to include a homogenous set of core functions.

307. On information and belief, one or more of the Apple '041 Products include a pool of auxiliary functions is provided for selective insertion of auxiliary functions between core functions of select pipelines.

308. On information and belief, one or more of the Apple '041 Products includes auxiliary functions wherein each auxiliary function includes a multiplexer that allows it to be selectively coupled within each pipeline.

309. On information and belief, one or more of the Apple '041 Products contain a processing system that includes a plurality of pipelines, with each pipeline of the plurality including a plurality of core pipeline elements that are configured to sequentially process data as it traverses the pipeline.

310. On information and belief, one or more of the Apple '041 Products contain a processing system that includes a plurality of auxiliary elements, each auxiliary element of the plurality of auxiliary elements being configured to be selectively coupled to multiple pipelines of the plurality of pipelines.

311. On information and belief, one or more of the Apple '041 Products contain a processing system wherein the auxiliary elements are responsive to external coupling-select signals.

312. On information and belief, one or more of the Apple '041 Products contain a processing system wherein a plurality of auxiliary elements are within a selected pipeline of the multiple pipelines, between a pair of core pipeline elements of the plurality of core pipeline elements to process the data as it traverses between the pair of core elements.

313. On information and belief, the Apple '041 Products are available to businesses and individuals throughout the United States.

314. On information and belief, the Apple '041 Products are provided to businesses and individuals located in the Eastern District of Texas.

315. By making, using, testing, offering for sale, and/or selling products and services for dynamically configuring a multi-pipe pipeline system, including but not limited to the Apple '041 Products, Apple has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '041 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

316. On information and belief, Apple also indirectly infringes the '041 patent by actively inducing infringement under 35 USC § 271(b).

317. Apple has had knowledge of the '041 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the '041 patent and knew of its infringement, including by way of this lawsuit.

318. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple '041 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the '041 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '041 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple provides the Apple '041 Products that have the capability of operating in a manner that infringe one or more of the claims of the '041 patent, including at least claim 1, and Apple further provides documentation and training materials that cause customers and end users of the Apple '041 Products to utilize the products in a manner that directly infringe one or more claims of the '041 patent.³⁴ By providing instruction and training to customers and end-users on how to use the Apple '041 Products in a manner that directly infringes one or more claims of the '041 patent, including at least claim 1, Apple specifically intended to induce infringement of the '041 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple '041 Products, e.g., through Apple user manuals, product support, marketing materials, and training

³⁴ See, e.g., *iPhone User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/iphone/12/#/iph344652def> (last visited Nov. 2018); *iPad User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/ipad/12/> (last visited Nov. 2018); *Apple TV User Guide*, APPLE SUPPORT WEBSITE, available at: <https://support.apple.com/guide/tv/welcome/tvos> (last visited Nov. 2018); *Installing Apple Beta Software*, APPLE DEVELOPER SUPPORT WEBSITE, available at: <https://developer.apple.com/support/beta-software/install-beta/> (last visited Nov. 2018).

materials to actively induce the users of the accused products to infringe the '041 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '041 patent, knowing that such use constitutes infringement of the '041 patent.

319. The '041 patent is well-known within the industry as demonstrated by multiple citations to the '041 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the '041 patent without paying a reasonable royalty. Apple is infringing the '041 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

320. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '041 patent.

321. As a result of Apple's infringement of the '041 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

COUNT XI
INFRINGEMENT OF U.S. PATENT NO. 7,571,450

322. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

323. Apple designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for displaying information.

324. Apple designs, makes, sells, offers to sell, imports, and/or uses Apple products that implement Dynamic Adaptive Streaming over HTTP (“MPEG-DASH”) or HTTP Live Streaming (“HLS”). The Accused Products include, but are not limited to, Apple’s iPhone, iPad, and Apple TV, and any other products capable of implementing MPEG-DASH or HLS (collectively, the “Apple ‘450 Product(s)”).

325. On information and belief, one or more Apple subsidiaries and/or affiliates use the Apple ‘450 Products in regular business operations.

326. On information and belief, one or more of the Apple ‘450 Products include technology for displaying information.

327. On information and belief, Apple has directly infringed and continues to directly infringe the ‘450 patent by, among other things, making, using, offering for sale, and/or selling technology for displaying information, including but not limited to the Apple ‘450 Products.

328. On information and belief, one or more of the Apple ‘450 Products enable methods and systems wherein a user does not need to make a new selection after being switched from one service to a second service.

329. On information and belief, one or more of the Apple ‘450 Products permit a user of an information display system to have selections made on a first service also presented when the user switches to a second service without requiring the user to browse through the menus to define the type of information to be displayed a second time.

330. On information and belief, one or more of the Apple ‘450 Products enable a user selection being made on the basis of the provided options while the first service was selected is use to select the appropriate data elements of the stream of the second service.

331. On information and belief, one or more of the Apple '450 Products enable various content sources to share similar information models.

332. On information and belief, one or more of the Apple '450 Products perform a method of displaying information on a display device wherein receiving a transport stream comprises services, with the services having elementary streams of video and of data elements.

333. On information and belief, one or more of the Apple '450 Products perform a method of displaying information on a display device wherein user actions of making a user selection of a type of information to be displayed on the device are received.

334. On information and belief, one or more of the Apple '450 Products perform a method of displaying information on a display device wherein filtering to select a data element of a first one of the services on the basis of the user selection is performed.

335. On information and belief, one or more of the Apple '450 Products perform a method of displaying information on a display device wherein rendering to calculate an output image to be displayed on the display device, on the basis of the first data element selected by the filter is performed.

336. On information and belief, one or more of the Apple '450 Products perform a method of displaying information on a display device wherein switching from the first one of the services to a second one of the services, characterized in comprising a second step of filtering to select a second data-element of the second one of the services, on basis of the user selection is performed.

337. On information and belief, one or more of the Apple '450 Products perform a method of displaying information on a display device wherein being switched from the first one of the services to the second one of the services, with the data-element and the second data-element

being mutually semantically related and a second step of rendering to calculate the output image to be displayed on the display device, on basis of the second data-element selected by the filter is performed.

338. On information and belief, the Apple '450 Products are available to businesses and individuals throughout the United States.

339. On information and belief, the Apple '450 Products are provided to businesses and individuals located in the Eastern District of Texas.

340. By making, using, testing, offering for sale, and/or selling products and services for displaying information, including but not limited to the Apple '450 Products, Apple has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '450 patent, including at least claim 8 pursuant to 35 U.S.C. § 271(a).

341. On information and belief, Apple also indirectly infringes the '450 patent by actively inducing infringement under 35 USC § 271(b).

342. Apple has had knowledge of the '450 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Apple knew of the '450 patent and knew of its infringement, including by way of this lawsuit.

343. On information and belief, Apple intended to induce patent infringement by third-party customers and users of the Apple '450 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Apple specifically intended and was aware that the normal and customary use of the accused products would infringe the '450 patent. Apple performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '450 patent and with the knowledge that the induced acts would constitute infringement. For example, Apple

provides the Apple ‘450 Products that have the capability of operating in a manner that infringe one or more of the claims of the ‘450 patent, including at least claim 8, and Apple further provides documentation and training materials that cause customers and end users of the Apple ‘450 Products to utilize the products in a manner that directly infringe one or more claims of the ‘450 patent.³⁵ By providing instruction and training to customers and end-users on how to use the Apple ‘450 Products in a manner that directly infringes one or more claims of the ‘450 patent, including at least claim 8, Apple specifically intended to induce infringement of the ‘450 patent. On information and belief, Apple engaged in such inducement to promote the sales of the Apple ‘450 Products, e.g., through Apple user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the ‘450 patent. Accordingly, Apple has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ‘450 patent, knowing that such use constitutes infringement of the ‘450 patent.

344. The ‘450 patent is well-known within the industry as demonstrated by multiple citations to the ‘450 patent in published patents and patent applications assigned to technology companies and academic institutions. Apple is utilizing the technology claimed in the ‘450 patent without paying a reasonable royalty. Apple is infringing the ‘450 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

³⁵ See, e.g., *iPhone User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/iphone/12/#/iph344652def> (last visited Nov. 2018); *iPad User Guide*, APPLE HELP WEBSITE, available at: <https://help.apple.com/ipad/12/> (last visited Nov. 2018); *Apple TV User Guide*, APPLE SUPPORT WEBSITE, available at: <https://support.apple.com/guide/tv/welcome/tvos> (last visited Nov. 2018); *Installing Apple Beta Software*, APPLE DEVELOPER SUPPORT WEBSITE, available at: <https://developer.apple.com/support/beta-software/install-beta/> (last visited Nov. 2018).

345. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '450 patent.

346. As a result of Apple's infringement of the '450 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple together with interest and costs as fixed by the Court.

PRAYER FOR RELIEF

WHEREFORE, Dynamic Data respectfully requests that this Court enter:

- A. A judgment in favor of Dynamic Data that Apple has infringed, either literally and/or under the doctrine of equivalents, the '073, '257, '054, '918, '689, '177, '112, '688, '529, '041, and '450 patents;
- B. An award of damages resulting from Apple's acts of infringement in accordance with 35 U.S.C. § 284;
- C. A judgment and order finding that Apple's infringement was willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate within the meaning of 35 U.S.C. § 284 and awarding to Dynamic Data enhanced damages.
- D. A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Dynamic Data its reasonable attorneys' fees against Apple.
- E. Any and all other relief to which Dynamic Data may show themselves to be entitled.

JURY TRIAL DEMANDED

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

Dated: November 5, 2018

Respectfully submitted,

/s/ Daniel P. Hipskind

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