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

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| DIVX, LLC, a Delaware limited liability company,<br><br>Plaintiff,<br><br>v.<br><br>SAMSUNG ELECTRONICS CO., LTD., a Korean business entity, and SAMSUNG ELECTRONICS AMERICA, INC., a New York corporation,<br><br>Defendants. | Case No. _____<br><br>**JURY TRIAL DEMANDED** |

# COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff DivX, LLC, alleges that Defendants Samsung Electronics Co., Ltd. ("SEC") and its U.S. subsidiary and related entity, Samsung Electronics America, Inc. ("SEA") (individually or collectively, "Defendants" or "Samsung") have infringed and continue to infringe its patents as follows:

## INTRODUCTION

1. DivX brings this action for patent infringement under the Patent Laws of the United States, 35 U.S.C. § 1 *et seq.* DivX alleges that Samsung has infringed and continues to infringe, directly and indirectly, four DivX patents: U.S. Patent Nos. 10,708,521 (the '521 patent), 10,992,955 (the '955 patent), 11,012,641 (the '641 patent), and 11,017,816 ("'816 patent") (collectively, the "DivX Patents"). *See* Exs. 1-4.

2. The DivX Patents cover foundational video streaming technologies that

facilitate, secure, and improve chunk-based adaptive bitrate streaming to consumer electronics devices.

3. Samsung has infringed and continues to infringe the DivX Patents, directly and indirectly, by making, using, offering for sale, and/or selling in, and/or importing into, the United States consumer electronics devices configured to stream and/or capable of streaming video over the internet as the DivX Patents claim; by inducing third parties to use, offer for sale, sell, and/or import those devices, with knowledge of the DivX Patents and the specific intent to cause the third parties to infringe; and by contributing to third parties' direct infringement by offering to sell and/or selling, with knowledge of the DivX patents, components of DivX's patented inventions having no substantial noninfringing use.

4. DivX seeks damages and other relief for Samsung's infringement of the DivX Patents.

## THE PARTIES

5. DivX is a Delaware limited liability company. Its principal place of business is 4350 La Jolla Village Drive, Suite 950, San Diego, California, 92122. DivX owns patents covering foundational video streaming technologies, including those asserted here.

6. Defendant SEC is a corporation organized and existing under the laws of the Republic of Korea that lists its global headquarters as 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea.

7. Defendant SEA is a corporation organized and existing under the laws of

the New York, with corporate offices in the Eastern District of Texas at 6625 Excellence Way, Plano, Texas 75023. Defendant SEA may be served with process through its registered agent, CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201-3136.

8. Defendant SEA is a wholly owned subsidiary of SEC.

9. Samsung has authorized sellers and sales representatives that offer for sale and sell devices pertinent to this complaint throughout Texas, including in this District and to consumers throughout this District, including: Best Buy, 422 W TX-281 Loop, Suite 100, Longview, Texas 75605; AT&T Store, 1712 E. Grand Avenue, Marshall, Texas 75670; Verizon authorized retailers, including Russell Cellular, 1111 E. Grand Avenue, Marshall, Texas 75670, and Victra, 1006 East End Boulevard N, Marshall, Texas 75670; and Amazon.com.

## JURISDICTION AND VENUE

10. This is an action for patent infringement under the Patent Laws of the United States, 35 U.S.C. § 101 *et seq.*

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

12. This Court has personal jurisdiction over the Defendants consistent with the requirements of the Due Process Clause of the United States Constitution and the Texas Long Arm Statute. On information and belief, each Defendant has sufficient minimum contacts with the forum because each Defendant transacts substantial business in Texas and in this District. On information and belief, SEA has more than 1,000 employees at its

Plano, Texas facility, working in areas such as engineering, research and development, marketing, sales, and customer support for wireless devices. Further, each Defendant has, directly or through subsidiaries or intermediaries, committed and continues to commit acts of patent infringement in Texas and in this District as alleged in this complaint.

13. Venue is proper in this District pursuant to 28 U.S.C. §§ 1400(b) and 1391(b) and (c) because each Defendant is subject to personal jurisdiction in this District and has committed acts of patent infringement in this District. SEA has a regular and established place of business and employees in this District. Each Defendant, through its own acts and/or through the acts of the other Defendant, makes, uses, offers to sell, and/or sells infringing products within this District, regularly does and solicits business in this District, and has the requisite minimum contacts with the District. As a result, this District is a fair and reasonable venue. Further, the Defendants have admitted or not contested proper venue in this District in other patent infringement actions.

## FACTUAL BACKGROUND

### I. DivX

14. For more than 20 years, DivX has invested in developing innovative technology for delivering digital video over the internet. In 2000, delivering digital video over the internet to consumers presented many technical challenges without existing solutions. Jérôme Rota and Jordan Greenhall founded DivX to address those challenges and to improve the consumer digital video experience.

15. DivX recognized that consumers wanted accessible, high-quality digital video content. To satisfy that demand, DivX created a new implementation of the MPEG-

4 video standard. DivX completed this new implementation in 2001 and released it as the DivX Codec 4.0. A codec is a computer program for encoding—that is, compressing—and decoding digital video. Over the next decade, DivX developed and released numerous new and improved versions of the DivX Codec. DivX bundled the DivX Codec with other features for video encoding, decoding, and playback and packaged it as the "DivX Software."

16. In addition to providing the DivX Codec, the DivX Software functioned like a master translator for digital video files, allowing for variations in codecs and playback across different file types on different devices. It allowed consumers to compress, decode, and play back digital video using a single program that allowed users to access and use the variety of technologies available on the market, all in one place.

17. During the same period that DivX continuously evolved and improved its DivX Codec and DivX Software, consumer access to and use of digital video over the internet became more widespread as computing power and network bandwidth increased. These developments led to widespread adoption of the DivX Software, a large base of DivX users, and creation of billions of DivX video files (with the ".divx" file extension).

**A. DivX Digital Rights Management (DRM)**

18. Many of DivX's innovations were with respect to Digital Rights Management, or DRM. A robust DRM system allows video content owners (like movie studios) to control access to the video content and provide increased protection against piracy. DRM is therefore fundamental to distributing video over the internet, because DRM enables secure downloading and playback.

19. In 2000, when DivX began creating an internet video platform, content owners such as Hollywood studios would not release their premium video content on an internet platform because they feared that piracy and losing control of their content would severely diminish the value of their rights.

20. From 2000 to 2005, DivX met with content owners such as Disney, Warner Bros., Sony, Universal, and Paramount Pictures about technical solutions to overcome their concerns and to implement the strict security requirements that the owners demanded. During the same time period, DivX also met with major consumer electronics (CE) manufacturers—including Samsung—about overcoming challenges to implementing DRM features in CE devices. DivX recognized at the time that existing technologies would not alleviate studios' content protection concerns, and it had to innovate to serve that market need.

21. DivX's engineers worked to build a DRM system that would solve these long-standing technical problems, and as a result of DivX's research and development efforts, DivX DRM became one of the first DRM systems accepted by major Hollywood studios.

**B. DivX Open Video System (OVS)**

22. DivX was one of the first companies in the world to create a commercially viable internet video streaming platform, called the "Open Video System" (OVS). DivX OVS was an internet-based video-on-demand system that built on the quality and performance of the DivX Software. Eric Grab, a named inventor on the '521 and '641 patents, led the engineering team that created the innovations necessary to build the

platform. DivX OVS officially launched on September 6, 2001, at a time when broadband internet access was not yet ubiquitous, and in a business environment where Hollywood studios were not yet ready to embrace digital distribution. After the launch of DivX OVS, DivX engineers continued to invest in technical improvements and innovations for the platform, and their innovations expanded the platform to enable playback on a wide variety of playback devices.

23. DivX's investments in OVS produced many key innovations for delivering video over the internet:

- A flexible, key-based DRM system that tied purchased video content to a viewer rather than a device, preventing unauthorized access when the device was sold or obtained by others while improving the viewer experience.
- A core codec that offered industry-best compression and performance enabling full-screen, DVD-like quality that was vastly superior to the pixelated, postage-stamp size viewing experience associated with internet video at the time.
- A "progressive download" feature that allowed the viewer to begin watching a purchased or rented video almost instantaneously while the file continued to download in the background.

24. DivX OVS was a successful video streaming platform. Throughout the mid-2000s, hundreds of millions of devices spanning virtually every major consumer electronics manufacturer—including Samsung—were released supporting DivX OVS

playback. Blockbuster, Netflix, Amazon, and others approached DivX about using DivX's technology to power their streaming platforms.

### C. DivX Stage6

25. In 2006, DivX launched "Stage6"—one of the first HTTP-based websites for sharing and streaming high-resolution video. Streaming video from an HTTP-based website allows a web server to continuously send data to a viewer over a single HTTP connection that remains open. DivX Stage6 implemented DivX's video compression, codec, and playback technology in an HTTP-based environment and allowed users to upload, share, and view larger video files than other competing platforms from that time, like YouTube.

26. A key technical innovation from DivX's efforts leading to Stage6—the improved multimedia file structure claimed in the '641 patent, among others—became the foundation of HTTP-based adaptive streaming systems. Specifically, the '641 patent enabled secure HTTP progressive download, which formed the basis of HTTP-based adaptive streaming systems.

27. DivX Stage6 was one of the earliest websites that supported sharing and streaming high-resolution video. Even in 2007, when computing resources and network bandwidth were far more limited than today, DivX Stage6 supported streaming of 720p and 1080p high-definition video. The quality of the high-resolution video playback on Stage6 surprised reviewers, with one commenting "DivX has clearly got something right

with web playback of higher-resolution video!" [1] DivX Stage6 enjoyed rapid user traffic growth, and by January 2008, it had over 10,000,000 monthly views.

**D. DivX SDKs and CTKs**

28. The success of the DivX Software and the DivX Codec created consumer demand for playing DivX video files on many CE devices, including DVD and other media players. To meet CE manufacturers' needs to satisfy this demand, DivX created CE software development kits ("SDKs") that would allow DVD players and other media players to play DivX files (from CD, DVD, USB, or network), while also incorporating a secure DRM protocol to protect against piracy and offering a variety of other features that created a high-quality video playback experience. DivX also developed Certification Test Kits ("CTKs") for CE manufacturers to certify their licensed devices and communicate to customers that their devices were compatible with DivX files. DivX SDKs and CTKs incorporated DivX's video compression, codec, playback, and DRM technology to provide an enjoyable user experience on a wide range of devices.

29. DivX has licensed its SDKs and CTKs to many CE companies, including Samsung. DivX's innovative technologies have been integrated into more than one and a half billion CE devices via the DivX SDKs and CTKs. To this day, numerous CE companies license DivX's SDKs and CTKs, including leading digital television, smartphone, in-car video device, DVD / Blu-ray disc, integrated circuit (IC), and other CE device manufacturers.

[1] *DivX Stage6 (beta)—the high-def rival to YouTube*, Hexus.net, May 1, 2007.

**E. DivX Plus Streaming**

30. In 2011, DivX released the DivX Plus Streaming SDK, end-to-end internet video streaming software that rivaled Blu-ray in quality and feature-set (for example, supporting user commands for seeking in the video, fast-forwarding, and rewinding). The DivX innovations incorporated in DivX Plus Streaming include several that provide the foundation for the widespread technological success of video streaming today.

31. DivX Plus Streaming was one of the earliest secure streaming software packages that supported Dynamic Adaptive Streaming over HTTP, abbreviated "DASH." DASH standardizes certain aspects of adaptive bitrate streaming of video over the internet and has been widely adopted as a protocol used by many of today's video streaming services. Fast start and smooth switching among video streams of different resolutions, depending on bandwidth, both improve the viewer experience during DASH. The innovations incorporated in DivX Plus Streaming improve both aspects of the streaming user experience.

32. DivX's engineers' efforts to create DivX Plus Streaming produced many innovations fundamental to today's video streaming services, including:

- Adaptive bitrate streaming that delivered video streams configured for each specific screen size on which the user wanted to watch the video. Configuring video streams based on the characteristics of individual playback devices ensures the optimal balance of video quality and playback performance.
- Trick play that allowed the user to pause, rewind, fast-forward, seek to a

new point in the video, and quickly resume playback. Although now common in today's streaming platforms, these features required significant innovations to deliver them in 2011, when the streaming playback experience was far more limited.

## II. Samsung

33. Samsung is a global leader in the consumer electronics market, which includes smartphones, tablets, notebook computers, and smart televisions. On information and belief, Samsung designs, manufactures, uses, offers for sale, sells, and/or imports into the United States—including into the Eastern District of Texas—billions of dollars of consumer electronics every year.

34. Samsung had global revenue of approximately $198 billion across all product lines in 2019, a significant portion of which is attributable to SEA. In 2019, SEA had revenue of approximately $28 billion. On information and belief, in 2019, Samsung had approximately $17.9 billion in revenue from smartphone sales in the United States.

35. Samsung has a long history with DivX. As early as 2003, Samsung began licensing DivX technology—including SDKs and other consumer technologies—to provide DivX video playback on a variety of consumer electronics devices. Indeed, the world's first DivX-certified mobile device was the Samsung Ultra Video (SGH-F500) mobile phone, the first mobile device "to achieve DivX Certification to ensure true interoperability between the device and the over 70 million DivX Certified consumer

electronics devices in the world" at that time.[2] Samsung consistently integrated DivX technology on its comprehensive range of consumer electronics devices through 2020. DivX terminated Samsung's IC license on September 1, 2020, after Samsung failed to provide accurate and complete reporting over a period of more than eight years. And Samsung's CE software license expired on December 31, 2020.

36. Samsung was notified of its infringement of the DivX Patents according to 35 U.S.C. § 287(a).

## THE DIVX PATENTS

37. DivX alone owns all rights, titles, and interests in and to the DivX Patents.

### I. Video Streaming: Technical Background

38. The DivX Patents are directed to improvements to video streaming systems. Video streaming refers to the computing process of providing digital video to a remote end user through a computing device.

39. Video streaming is accomplished by providing digital video files from server computers that host (store) the video files, over the interconnected computer networks that make up the internet, to client computers (consumer devices, including laptop computers, smartphones, and smart televisions) that can interpret the video files and convert them to pixels displayed on the screen during playback.

40. The ability to perform video streaming, and the level of performance that can be provided to an end user (such as high-resolution, smooth playback, without stalls

[2] https://www.divx.com/press/worlds-first-divx-certifiedr-mobile-phone-is-unveiled/.

or errors), depends on the computing resources of the computing devices—server computers, network computers, and client computers—used in the video streaming system. Those computing resources include the processing power of the computers, the input/output (I/O) and data transmission capabilities of the computers, and the memory (storage) available on the computers.

41. Before digital video, video was stored on analog media such as tape. Transition from analog media to digital video brought new challenges. For example, the amount of data required to represent a video in digital form at its full recorded resolution is massive. The computing resources of servers, networks, and client computers, however, are limited. Streaming digital video, therefore, requires computing techniques to reduce the amount of data that must be processed by server computers, transmitted over networks, and interpreted and converted to displayed video by client devices. These techniques are generally referred to as "encoding" (converting the data to a particular digital format) and "decoding" (translating the digital format to a format that can be rendered and displayed on a display device).

42. Video encoding and decoding rely on a computing technique called "compression" to reduce the size of the digital video files that must be processed and transmitted while simultaneously preserving sufficient playback performance and quality on the client device. Video compression employs data compression techniques specific to digital video content to reduce file sizes while maintaining playback quality. Because digital video is frequently represented as a series of still image "frames" played back quickly (for example, at a rate of 30 frames per second), video compression techniques

take advantage of similarities among pixels in a single frame (spatial redundancy) and similarities among pixels across different frames (temporal redundancy) to reduce the amount of data that must be stored in the digital video file, transmitted over computer networks, and decoded by the client computer and converted to pixel data for display during playback.

43. Video compression presents unique computing challenges different from other data compression techniques (for example, audio, text, or pictures). Consumers expect the same high-quality experience from video streamed on smartphones, televisions, and personal computers as they do from cable programming and physical media (such as DVD or Blu-ray discs). Video compression, digital video files, encoding, and decoding techniques, therefore, must overcome the technical challenge of delivering superior video quality on all types of devices in the most bandwidth-efficient way possible with the least latency (the time it takes to transmit the digital video files over the network).

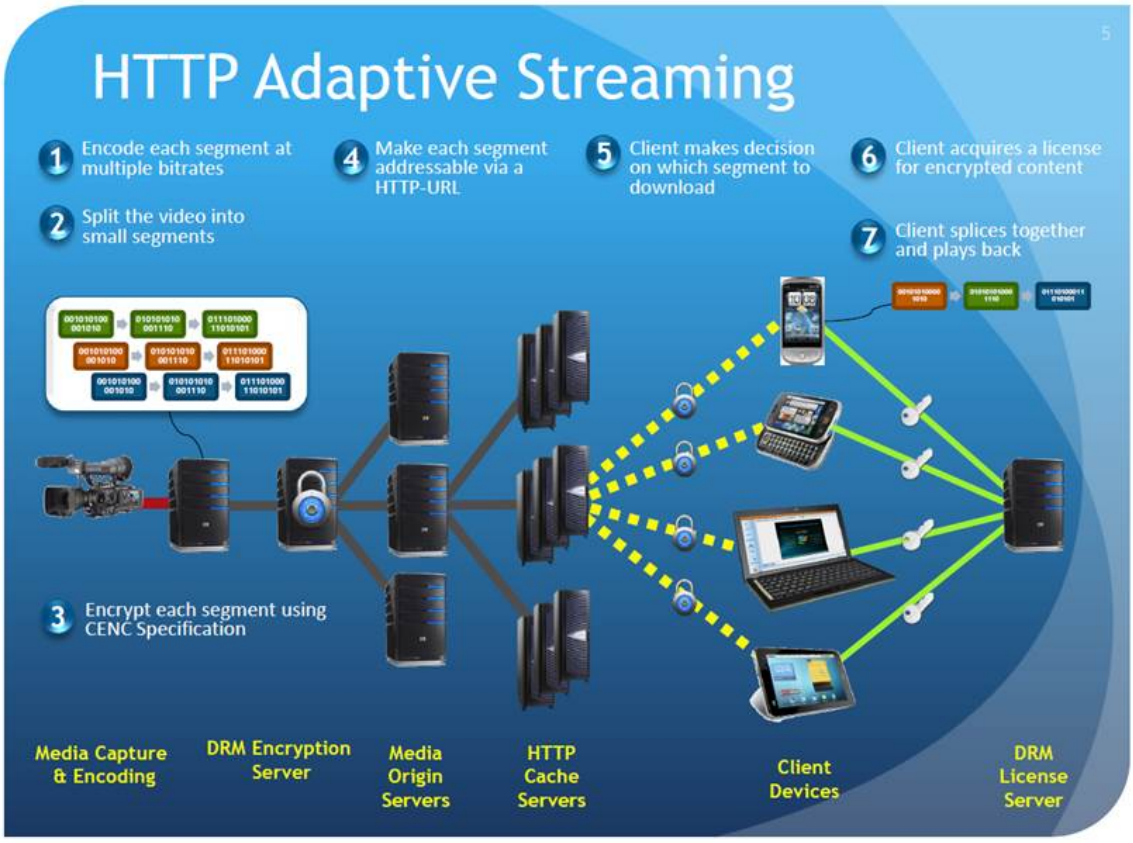
44. Different codecs implement different video compression techniques, and different file formats store the compressed video data. These files structure data in a certain, defined way to represent both the video data and other information required to effectively decode and play back the video on the display of a playback device (client computer). Examples of video files used for video streaming include DivX files, AVI files, MP4 files, and Matroska files. Indeed, DivX pioneered improvements to known file formats, including the AVI file format, including "packing" chunks within the file with multiple frames, to enable use of bidirectional predicted frames (B frames).

45. Preventing piracy of digital video is another significant technical challenge for streaming video. DRM is an access control method that has been developed to protect digital media. DRM is designed to prevent the end user that has obtained digital media from modifying, copying, converting, or using the digital media in any way other than that permitted by the digital content provider. DRM often includes encryption of digital video data in specific ways using specific encryption structures and encryption and decryption mechanisms. Video streaming involves sending portions of files over a network for decryption and decoding on devices on which other software may be executing. Video streaming technology providers face unique technical challenges in providing adequate security of the video content and control over access rights while reducing the burdens on the encoding and decoding devices relating to encryption and decryption.

46. Adaptive bitrate streaming (ABS) is a specific technique used when streaming multimedia over computer networks to playback devices. A significant limitation of services available before DivX's innovations was that they placed the intelligence that implemented ABS on the *server*. Server-based systems were expensive and difficult to scale. DivX instead placed the intelligence within the playback device. DivX pioneered an approach that significantly reduced the cost and increased the scalability of ABS services.

47. ABS differs from other types of streaming because it involves detecting the streaming conditions in real time and adjusting the quality of the streamed media accordingly so the user does not experience stalls in video playback caused by changes in

bandwidth or processing capabilities. For ABS, the playback server system encodes a particular video title in separate, multiple streams, at different bitrates, to be streamed consistent with the capabilities of the network and playback device, including bandwidth. If available bandwidth changes, for example, ABS allows the device to switch to a lower-resolution stream of the same video data, which requires less data transmission and processing. This allows the video content to keep playing without stalling. The process of stream switching in ABS requires the ability to jump to (seek) a particular location in a video file and commence playback without needing to access all of the preceding portions of the file.[3]




[3] https://dashif.org/docs/DASH264-v1.5.pdf.

48. Trick play is a feature that gives viewers visual feedback while they are rewinding or fast-forwarding a stream (e.g., "scrubbing" through it). For time-based trick play, users are presented with a progress bar that displays their location in the content and allows them to seek to the desired timestamp using the standard trick play controls. When scene information is not available, a user only has a visual timeline and numeric time information to locate the desired position in the content. Once the new location is selected, the system buffers a minimal amount of stream data and begins playback. A scene-based trick mode is based on the availability of scene information in the form of BIF-files, a common file format for carousels of still frame images that are often used in systems that implement DASH or HLS (HTTP Live Streaming). If such data are accessible for a given title, the scene-based trick mode can be used during playback.

49. In sum, streaming digital video data presents unique technical challenges relating to video compression and content protection that affect the computing systems that encode and encrypt digital video, the digital video file types created by those computing systems, and the computing systems that process those file types to decrypt and decode the digital video to provide streaming users with a high-quality experience. DivX's patented inventions provide technical solutions, through computing improvements, to these technical challenges.

## II. The '521 Patent

50. The '521 patent, entitled "Multimedia Distribution System for Multimedia Files with Interleaved Media Chunks of Varying Types," duly and legally issued on July 7, 2020. The '521 patent names Jason Braness, Jérôme Rota, Eric William Grab, Jerald

Donaldson, Heather Hitchcock, Damien Chavarria, Michael John Floyd, Brian T. Fudge, and Adam H. Li as inventors. The '521 patent claims priority to U.S. Patent No. 8,731,639, filed on December 17, 2004, and U.S. Patent No. 7,519,274, filed on December 8, 2003.

51. The '521 patent is directed to a new, improved multimedia file structure and systems for encoding and decoding those files. The '521 patent claims a new file structure compatible with standard file formats (e.g., .avi) that improves video compression and reduces out-of-sync playback. The improved file structure includes "chunks" containing encoded video frames and, in particular, at least one chunk containing two encoded video frames and a "marker" chunk that contains a non-coded P frame. Chunks 1 through N-1 provide information sufficient to generate frame N.

52. For example, claim 1 of the '521 patent recites:

> 1. A system for decoding multimedia files, the system comprising:
>
> a set of one or more processors; and
>
> a non-volatile storage containing a decoding application;
>
> wherein the decoding application causes the set of processors to perform the steps of:
>
> receiving a multimedia file, wherein:
>
> the multimedia file comprises a plurality of chunks for carrying information, said chunks including a plurality of video chunks and a plurality of audio chunks;

the video chunks are portions of at least one video track comprising a series of encoded video frames including at least encoded video frames 1 through N, said video chunks including at least video chunks 1 through N, wherein each of said encoded video frames 1 through N correspond to a chunk from video chunks 1 through N;

the video chunks include a marker video chunk N where sufficient information is contained in chunks 1 through N-1 to generate video frame N, wherein the marker video chunk N includes a non-coded P-frame in the series of encoded video frames; and

the audio chunks are portions of at least one audio track; and

decoding frame N using corresponding marker video chunk N together with video chunks 1 through N-1.

'521 patent, claim 1.

53. The '521 inventions address problems related to computing and processing burdens and file size. A need existed for an improved multimedia file structure to streamline video files and decrease the processing power required to decode video content.

54. The '521 patent's new, improved multimedia file structure, and its systems for encoding and decoding those files, provide technical benefits that improve the functionality and capabilities of computer systems used to stream video. "Packing" one

video chunk with two encoded video frames (frame N and frame N-1)—"where sufficient information is contained in chunks 1 through N-1 to generate video frame N"—and including a marker chunk N with a non-coded P-frame improves compression of .avi container files, enabling use of bidirectional predicted frames (B frames). The non-coded P frame may use timing information identical to a previous encoded video frame, maintaining timing and reducing the risk of out-of-sync playback. *See also id.* at 50:29-46.

55. The claims of the '521 patent are not directed to abstract ideas and are not merely attempting to limit a method of organizing human activity or an idea itself to a particular technological environment. The claimed technology is expressly directed to new, improved multimedia file structures and systems for encoding and decoding those files, which are not abstract methods or abstract ideas. The systems configured to encode and decode improved multimedia files claimed in the '521 patent exist only in a concrete and tangible form, and the claimed inventions cannot be accomplished through pen-and-paper or the human mind. As alleged above, the claimed file structures and systems provided a technical solution to an existing technical problem. Accordingly, the claims of the '521 patent are not directed to an abstract idea.

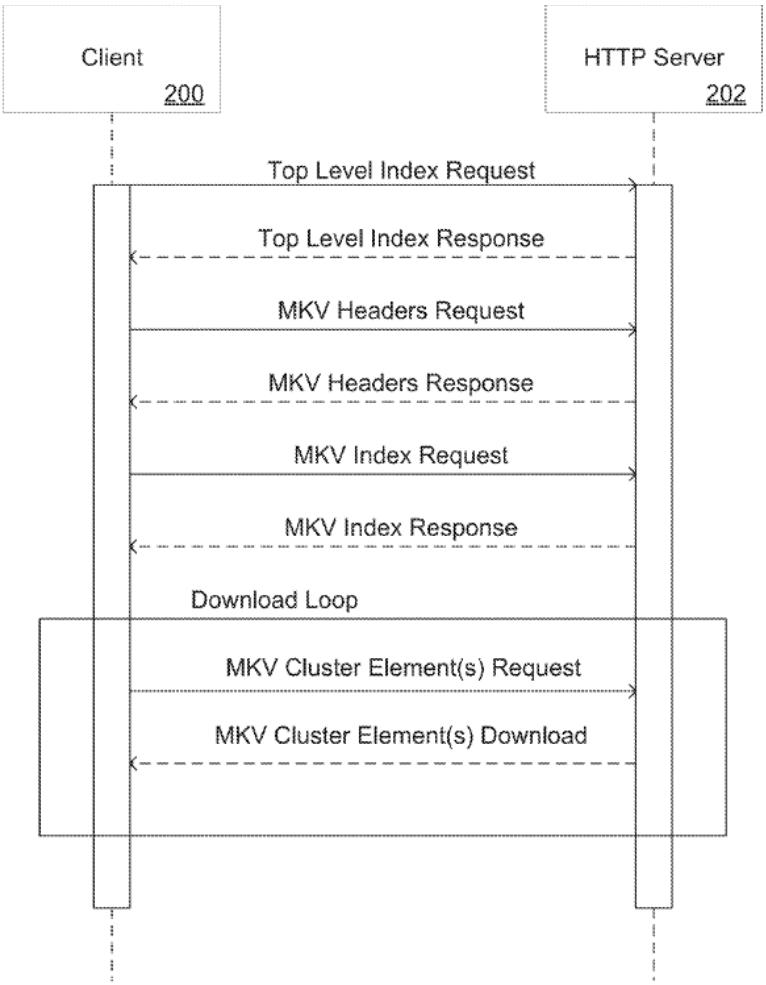
56. When viewed as a whole, the claims, including as an ordered combination, are not merely a recitation of well-understood, routine, or conventional technologies or components. The claimed inventions were not well-known, routine, or conventional at the time of the invention and represent specific improvements over the prior art and existing systems and methods. The claimed technology (e.g., new, improved multimedia file

structures) was not known in the prior art at the time of the invention, let alone well-known, routine, or conventional.

## III. The '955 Patent

57. The '955 patent, entitled "Systems and Methods for Performing Adaptive Bitrate Streaming," duly and legally issued on April 27, 2021. The '955 patent names Jason Braness, Auke Sjoerd van der Schaar, and Kourosh Soroushian as inventors. The '955 patent claims priority to U.S. Patent No. 9,247,312, filed on Aug. 30, 2011. The '955 patent also claims priority to U.S. Provisional Application No. 61/430,110, filed on Jan. 5, 2011.

58. The '955 patent is directed to new, improved playback devices configured to perform adaptive streaming of multimedia files. The '955 patent's new, improved playback devices integrate four concepts: (1) an index to encoded media stored in separate container files, (2) using the index to retrieve encoded media from the container file, (3) information concerning the encoding of the video within the container file, and (4) using the encoding information to playback encoded media:




'955 patent, FIG. 8, 21:26-22:20.

59. For example, claim 1 of the '955 patent recites:

> 1. A playback device configured to perform adaptive bitrate streaming, the playback device comprising a processor configured, via a client application, to request a top level index file and container files via a network;
>
> wherein the client application further configures the processor to:
>
> commence playback by retrieving at least a portion of the top

level index file that identifies a plurality of container files that contain the streams available to the playback device for use in adaptive bitrate streaming, where:

the available streams include a plurality of alternative video streams,

each or a group of the alternative video streams is the same source video content encoded at a different bitrate and is stored in a separate container file as a plurality of portions of video, and

each container file includes information concerning the encoding of the video contained within the container file and an index to the encoded media within the container file and the at least a portion of the top level index file indicates the portions of each container file containing this information;

select one or more streams including one of the plurality of alternative video streams to utilize in the playback of media based upon the retrieved at least a portion of the top level index file;

using the at least a portion of the top level index file to request the portions of the container file that include the information concerning the encoding of the video contained within the container file and the index to the encoded media

within the container file;

configure a video decoder to playback the encoded video using the retrieved information concerning the encoding of the video;

retrieve encoded media from the container file of the selected alternative video stream using the requested index information to the encoded media within the container file;

playback the retrieved portions of video from the selected alternative video stream using the decoder; and

when a change in streaming conditions is detected, select a new alternative video stream that is more appropriate for the streaming conditions than the previously selected alternative video stream.

*Id.* at claim 1.

60. The '955 inventions address problems related to adaptive streaming performance. During adaptive streaming, streaming conditions experienced by the playback device are likely to change during the playback of the streaming media, and the playback device can request media from alternative streams to provide the best picture quality for the streaming conditions experienced by the playback device. In addition, the playback device may switch streams to perform a trick play function that utilizes a trick play track stream. *Id.* at 21:29-37. A reduction in available resources can be exacerbated by a need to download index information in addition to media. *Id.* at 22:35-37, FIG. 9b.

Therefore, a need existed for an improved playback device configured to retrieve index information and using the index information to download and switch between video streams.

61. The ’955 patent’s new, improved playback devices provide technical benefits that improve the functionality and capabilities of computer systems streaming video. Specifically, the playback devices are configured to playback video streams stored in separate container files, compared to, for example, fragmented container files used in HTTP Live Streaming (HLS). The playback devices are also configured to perform client-side adaptive streaming, compared to, for example, server-side adaptive streaming. The ’955 patent enables client-side adaptive streaming by retrieving information identifying the encoding and index information within a container file, and requesting the encoding and index information to configure the decoder and to request portions of the video stream. The ’955 patent’s client-side adaptive streaming process makes the retrieval of media using HTTP more efficient and scalable. *Id.* at 6:23-24. Further, when the playback device needs to switch back to a previous stream, it can access the received index and encoding information from that previous stream, simplifying the switching back process. *Id.* at 22:21-41. The likelihood of interruption to playback is therefore reduced by increasing the speed with which the playback device can switch between streams and reducing the amount of overhead data downloaded to achieve the switch. *Id.*

62. The claims of the ’955 patent are not directed to abstract ideas and are not merely attempting to limit a method of organizing human activity or an idea itself to a particular technological environment. The claimed technology (e.g., new, improved

playback devices configured to perform adaptive streaming of multimedia files integrating specific concepts) are expressly directed to playback devices configured to perform adaptive streaming of multimedia files, which are not abstract methods or abstract ideas. The playback devices configured to perform adaptive streaming of multimedia files claimed in the '955 patent exist only in a concrete and tangible form, and the claimed inventions cannot be accomplished through pen-and-paper or the human mind. As alleged above, the claimed playback devices provided a technical solution to an existing technical problem. Accordingly, the claims of the '955 patent are not directed to an abstract idea.

63. When viewed as a whole, the claims, including as an ordered combination, are not merely a recitation of well-understood, routine, or conventional technologies or components. The claimed inventions were not well-known, routine, or conventional at the time of the invention and represent specific improvements over the prior art and existing systems and methods. The claimed technology (e.g., new, improved playback devices configured to perform adaptive streaming of multimedia files integrating specific concepts) was not known in the prior art at the time of the invention, let alone well-known, routine, or conventional.

## IV. The '641 Patent

64. The '641 patent, entitled "Multimedia Distribution System for Multimedia Files with Interleaved Media Chunks of Varying Types," duly and legally issued on May 18, 2021. The '641 patent names Jason Braness, Jérôme Rota, Eric William Grab, Jerald Donaldson, Heather Hitchcock, Damien Chavarria, Michael John Floyd, Brian T. Fudge,

and Adam H. Li as inventors. The '641 patent claims priority to U.S. Patent No. 8,731,639, filed on December 17, 2004, and U.S. Patent No. 7,519,274, filed on December 8, 2003.

65. The '641 patent is directed to a new, improved multimedia file structure and systems for encoding and decoding those files. The '641 patent claims an improved multimedia file that includes "chunks" containing encoded video frames, an index to access specific encoded video frames within the chunks within the file, a set of DRM information, and partial frame encryption, to enable secure, efficient streaming and faster decryption and playback. For example, the new, improved decoder is capable of requesting and processing a "chunk" containing encoded video frames, an index to those encoded video frames, and corresponding decryption information, creating processing efficiencies. The '641 patent's new, improved file structure integrates three concepts: (1) partial frame encryption, (2) chunk-based adaptive bitrate streaming, and (3) a set of DRM information containing decryption information for a corresponding video chunk:

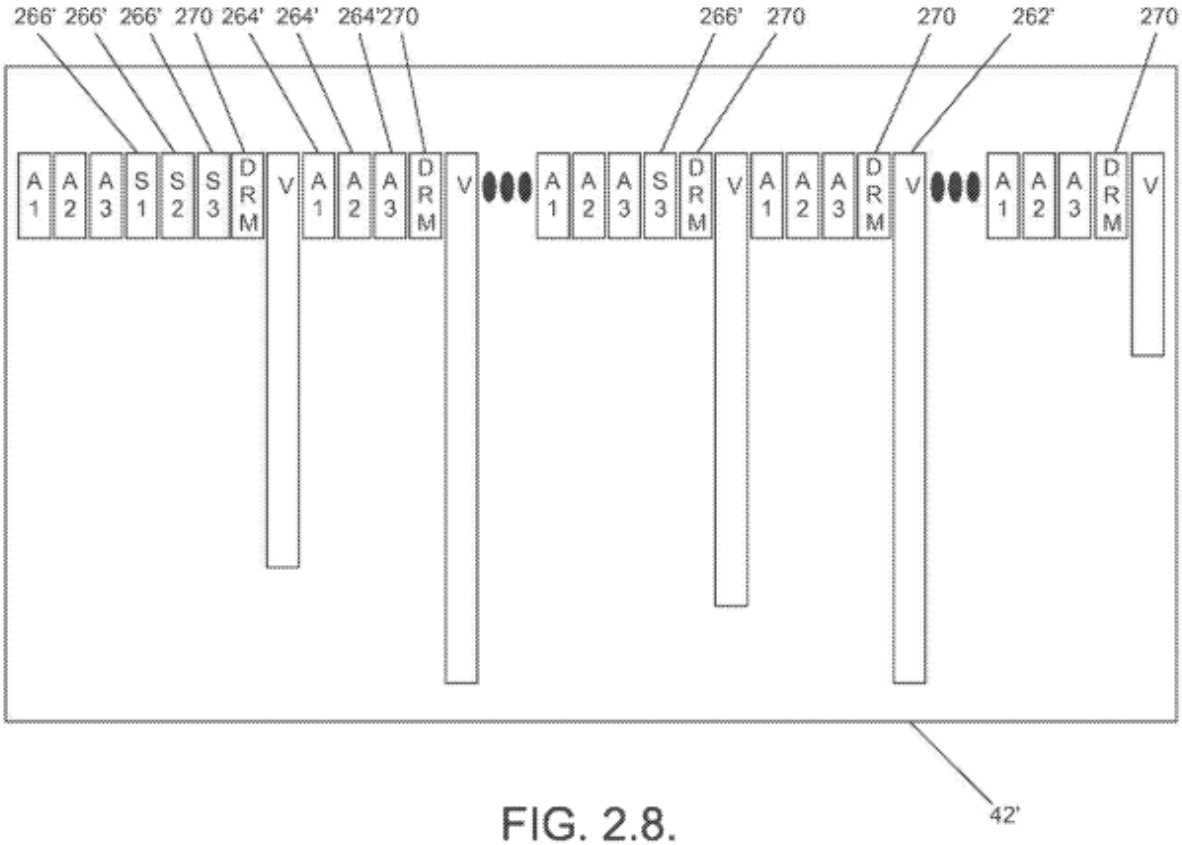



FIG. 2.8.

'641 patent, FIG. 2.8, 27:32-52.

66. For example, claim 12 of the '641 patent recites:

12. A decoder, comprising:

a processor capable of playing back video stored in at least a portion of a multimedia file, where the multimedia file comprises:

a sequence of encoded video frames contained within a plurality of chunks, where:

a number of the encoded video frames are at least partially encrypted encoded video frames that include at least one

block of encrypted bytes; and

each chunk includes a subset of video frames from the sequence of encoded video frames;

an index that includes information indicative of locations of each encoded video frame within the sequence of encoded video frames;

a set of digital rights management (DRM) information, where DRM information corresponding to an encoded video frame that includes at least one block of encrypted bytes comprises:

an offset value that indicates the start of a block of encrypted bytes within an encoded video frame and a number value that indicates a number of encrypted bytes in the block of encrypted bytes; and

cryptographic information that can be used to decrypt the encrypted block indicated by the offset value and the number value;

wherein the processor is further capable of:

processing the index to identify location information for a particular encoded video frame, where the particular encoded video frame is a partially encrypted encoded video frame that includes at least one block of encrypted bytes;

locating the particular encoded video frame within a specific

chunk;

identifying DRM information corresponding to the particular encoded video frame within the set of DRM information;

decrypting at least one block of encrypted bytes within the particular encoded video frame using offset and number values, and cryptographic information from the identified DRM information corresponding to the particular encoded video frame, where the decryption of the particular encoded video frame occurs prior to commencing decoding the decrypted video frame;

decoding the particular encoded video frame; and

playing back video frames including the decoded video frame.

*Id.* at claim 12.

67. The ’641 inventions address problems related to computing burdens and delays associated with processing and playing back compressed, encrypted video content. A multimedia file’s structure facilitates its delivery to and decryption, decoding, and playback on playback devices, including, for example, smart televisions, smartphones, tablets, and other consumer electronics devices. *See, e.g.*, *id.* at 13:6-14:17, FIG. 2.0. A need existed for an improved multimedia file structure to streamline the playback device’s access to decryption information and decrease the processing power required to decrypt video content, all while maintaining security and supporting seeking

functionality.

68. The ’641 patent’s new, improved multimedia file structure and its systems for encoding and decoding those files provide technical benefits that improve the functionality and capabilities of computer systems streaming video. The file structure allows the playback device to more efficiently identify, decrypt, and decode relevant video data for playback. *See, e.g.*, *id.* at 51:30-36 (“In embodiments where DRM is used to protect the video content of a multimedia file, the DRM information can be generated concurrently with the encoding of the video chunks. As each chunk is generated, the chunk can be encrypted and a DRM chunk generated containing information concerning the encryption of the video chunk.”); *see also id.* at 1:29-38, 27:19-28:6, 51:30-46, 52:66-53:14, 53:36-41, FIG. 2.8, FIG. 2.9, FIG. 4.0.

69. The claims of the ’641 patent are not directed to abstract ideas and are not merely attempting to limit a method of organizing human activity or an idea itself to a particular technological environment. The claimed technology is expressly directed to new, improved multimedia file structures and systems for encoding and decoding those files, which are not abstract methods or abstract ideas. The systems configured to encode and decode improved multimedia files claimed in the ’641 patent exist only in a concrete and tangible form, and the claimed inventions cannot be accomplished through pen-and-paper or the human mind. As alleged above, the claimed file structures and systems provided a technical solution to an existing technical problem. Accordingly, the claims of the ’641 patent are not directed to an abstract idea.

70. When viewed as a whole, the claims, including as an ordered combination,

are not merely a recitation of well-understood, routine, or conventional technologies or components. The claimed inventions were not well-known, routine, or conventional at the time of the invention and represent specific improvements over the prior art and existing systems and methods. The claimed technology (e.g., new, improved multimedia file structures) was not known in the prior art at the time of the invention, let alone well-known, routine, or conventional.

## V. The '816 Patent

71. The '816 patent, entitled "Multimedia Distribution System," duly and legally issued on May 25, 2021. The '816 patent names Abou Ul Aala Ahsan, Stephen R. Bramwell, and Brian T. Fudge as inventors. The '816 patent claims priority to U.S. Patent No. 8,472,792, filed on October 24, 2005, U.S. Patent No. 8,731,639, filed on December 17, 2004, and U.S. Patent No. 7,519,274, filed on December 8, 2003.

72. The '816 patent is directed to a new, improved multimedia file structure and systems for encoding and decoding those files. The new file structure improves the playback device's ability to navigate and stream video content. '816 patent, Abstract, 1:28-29, 1:46-48, 1:56-61. The '816 patent claims a specific dual-index structure—including a first index for accessing the file's "chunks" containing encoded video frames and a second index for accessing specific frames within those chunks—that allows the playback device to more quickly access index information and, as a result, navigate and more efficiently request the video content during streaming. The '816 patent's dual-index structure improves the user playback experience by enabling chunk-based adaptive bitrate streaming, trick play, and "fast start" functionality.

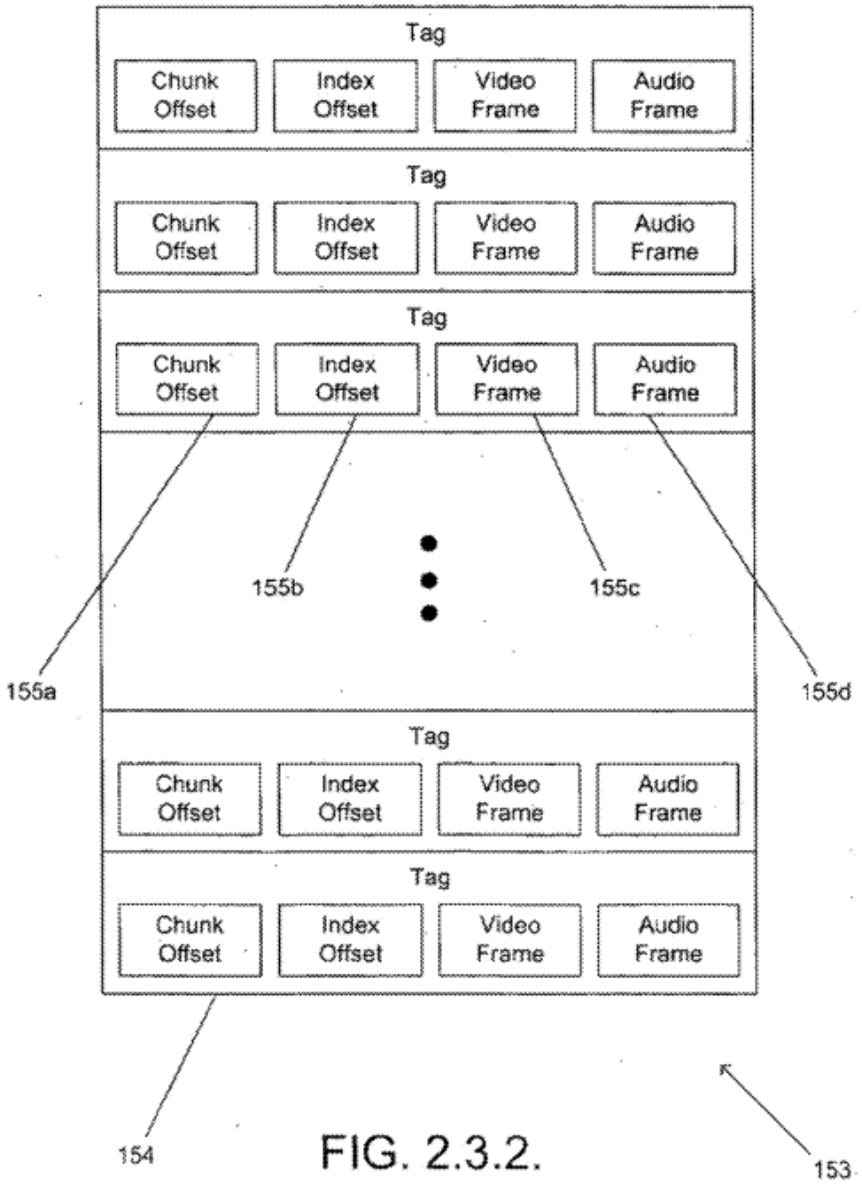



FIG. 2.3.2.

*Id.* at FIG. 2.3.2.

73. For example, claim 42 of the '816 patent recites:

42. A decoder, comprising:

a processor capable of playing back video from a media file,

where the media file comprises:

a track of encoded video frames;

a first index that includes an entry for each of a plurality of chunks in the media file, where:

each of the plurality of chunks in the media file includes a segment of the track of encoded video frames, the entry in the first index for a given chunk of the plurality of chunks in the media file contains information indicative of:

a location of the given chunk within the media file; and

timing information for the given chunk; and

a separate second index that includes an entry for each encoded video frame of the track of encoded video frames, where the entry in the second index for a given encoded video frame of the track of encoded video frames includes information indicative of a location of the given encoded video frame within the media file;

wherein the processor is further capable of:

downloading a first portion of the media file via a network;

prior to downloading the second index, processing the first index to identify information indicative of a location of a specific chunk within the media file based upon a time value;

downloading a second portion of the media file containing at least a portion of the second index via the network;

processing the at least a portion of the second index to

identify information indicative of a location of a particular encoded video frame within the specific chunk identified using the first index;

decoding the particular encoded video frame located using the second index to obtain a decoded video frame within the specific chunk located using the first index; and

playing back video frames including the decoded video frame.

*Id.* at claim 42.

74. The '816 inventions address a technical problem related to processing burdens during video streaming. Before the '816 inventions, video files transmitted over the internet often included a single index to all video data within the file. As digital video became more sophisticated and complex, the size of this index and the computing resources needed to process it increased. The process of obtaining the index to access the remote video file, therefore, was time- and resource-intensive and either delayed the start of playback for the user or prevented the user from using desirable technical playback features, like seeking, fast forward, and rewind. Accordingly, a need existed for a multimedia file structure with an improved index structure that could enable chunk-based streaming and more efficient access to particular frames within the video file.

75. The '816 patent's new, improved multimedia file structure and its systems for encoding and decoding those files provide technical benefits that improve the functionality and capabilities of computer systems streaming video. *See, e.g.*, *id.* at 15:39-

50 (explaining that the first index is different than the second, complete index because "the 'index' chunk does not include information concerning every 'data' chunk in the 'movi' list chunk," that "[t]ypically, the 'index' chunk includes information concerning a subset of the 'data' chunks," and that the dual-index structure "can enable rapid location of a specific video frame"), 16:57-67 (describing packaging the new multimedia file to include a first index to "chunks," for example, "before the 'movi' list chunk" including the video frame data, and explaining that the dual-index structure "can enable a device to start playing and performing other functions, such as fast forward, rewind and scene skipping, prior to the downloading of the [full index]"), 48:64-50:22 (describing that the first index "can be used to skip frames either in a regular fashion (such as during fast forwarding or rewinding) or in an irregular fashion (such as when skipping between scenes or chapters)"). By packaging a multimedia file with two indexes, the '816 patent's new file structure solves the technical problems and resource-intensive computing issues associated with complex video files. *Id.*

76. The claims of the '816 patent are not directed to abstract ideas and are not merely attempting to limit a method of organizing human activity or an idea itself to a particular technological environment. The claimed technology is expressly directed to new, improved multimedia file structures and systems for encoding and decoding those files, which are not abstract methods or abstract ideas. The systems configured to encode and decode improved multimedia files claimed in the '816 patent exist only in a concrete and tangible form, and the claimed inventions cannot be accomplished through pen-and-paper or the human mind. As alleged above, the claimed file structures and systems

provided a technical solution to an existing technical problem. Accordingly, the claims of the '816 patent are not directed to an abstract idea.

77. When viewed as a whole, the claims, including as an ordered combination, are not merely a recitation of well-understood, routine, or conventional technologies or components. The claimed inventions were not well-known, routine, or conventional at the time of the invention and represent specific improvements over the prior art and existing systems and methods. The claimed technology (e.g., new, improved multimedia file structures) was not known in the prior art at the time of the invention, let alone well-known, routine, or conventional.

**SAMSUNG'S DIRECT INFRINGEMENT AND THE ACCUSED PRODUCTS**

78. Samsung has directly infringed and continues to directly infringe one or more claims of each DivX Patent under 35 U.S.C. § 271(a). Samsung makes, uses, offers to sell, and/or sells in the United States, and/or imports into the United States, consumer electronics devices configured to stream or play back, or capable of streaming or playing back, video as claimed, including but not limited to Samsung smartphones, tablets, notebook computers, and smart televisions ("Accused Products"). The Accused Products, as Samsung provides them, comprise decoders and include at least preinstalled Samsung Gallery and/or Netflix applications.

79. On information and belief, SEC sells Accused Products in the United States and/or imports Accused Products into the United States. On information and belief, SEA uses and/or sells Accused Products in the United States and/or imports Accused Products into the United States.

80. The Accused Products include devices configured to stream or play back, or capable of streaming or playing back, video as claimed, including but not limited to:

- Samsung smartphones and tablets, including but not limited to Galaxy S, Galaxy Note, Galaxy Z, and Galaxy A smartphones and Galaxy Tab tablets, including the exemplary Samsung Galaxy S21 5G smartphone;
- Samsung notebook computers, including but not limited to Galaxy Book Galaxy Chromebook computers;
- Samsung smart televisions; and
- Additional Samsung devices configured to stream or playback or capable of streaming or playing back video as described in this complaint.

81. Playback devices configured to stream or playback or capable of streaming or playing back video, including but not limited to through the Netflix, Hulu, and/or Samsung TV Plus[4] applications, infringe one or more claims of each DivX Patent, as shown in greater detail using the exemplary Hulu application implemented on the exemplary Samsung Galaxy S21 5G. *See* Counts I-IV, *infra*.

82. The Accused Products include products made, used, offered for sale, and/or sold in the United States, and/or imported into the United States, at least since the first DivX Patent issued on July 7, 2020.

83. Counts I-IV, *infra*, demonstrate Samsung's direct infringement using an

[4] Accused Products using the Samsung TV Plus application infringe at least one claim of the '641 patent.

exemplary Samsung Galaxy S21 5G smartphone and the exemplary Hulu application.

**SAMSUNG'S INDIRECT INFRINGEMENT (INDUCED AND CONTRIBUTORY)**

84. Samsung has indirectly infringed and continues to indirectly infringe one or more claims of each DivX Patent by inducing third parties to directly infringe, including importers, resellers, customers, and end users of the Accused Products, under 35 U.S.C. § 271(b), and by contributing to those third parties' direct infringement under 35 U.S.C. § 271(c). Samsung indirectly infringes the DivX Patents in this District and elsewhere in the United States and Texas.

85. At the very latest, Samsung had knowledge of the DivX Patents and of its infringement as of the date of service of this complaint.

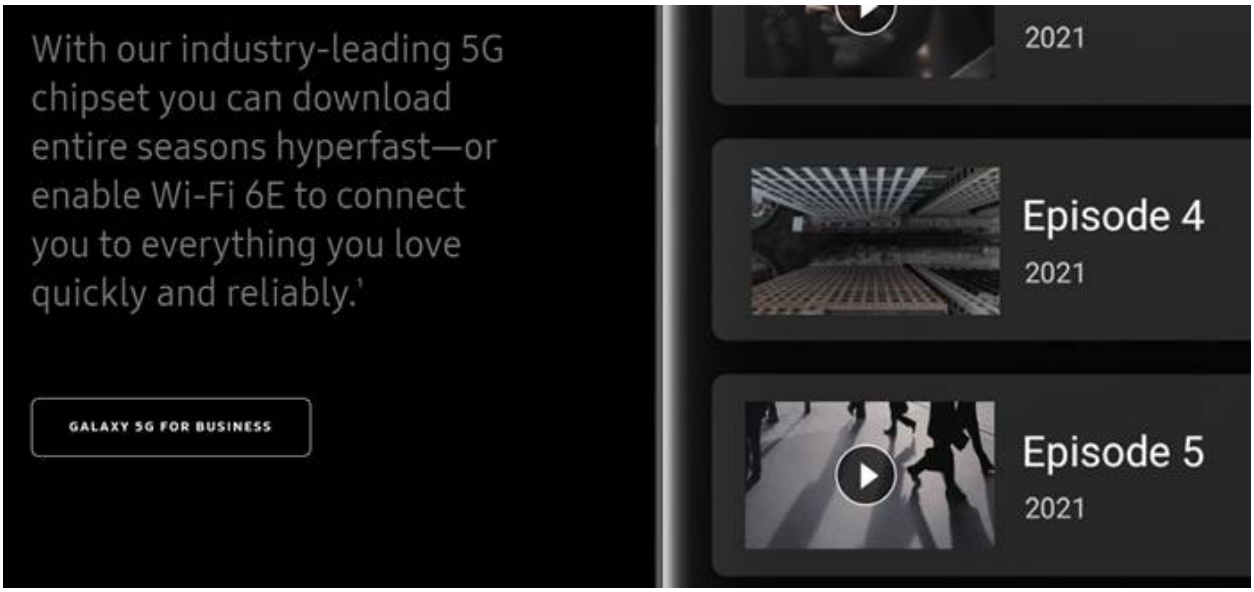
86. On information and belief, Samsung had knowledge of the DivX Patents and of its infringement as of the patents' issue dates, based on its long-term licensing relationship with DivX. *See* ¶ 35, *supra*.

87. Samsung is a known market leader in consumer electronics devices used for streaming and playing back video.

88. Samsung possesses the technical expertise required to understand the scope of the inventions claimed in the DivX Patents.

89. Samsung induces and specifically intends to induce third parties, including, for example, its end users, to stream video on its consumer electronics devices. For example, Samsung markets its smartphones, including the exemplary Galaxy S21 5G smartphone, as providing an "industry-leading 5G chipset" so users "can download entire

seasons hyperfast" and "download, stream and play at blazing 5G speeds."[5]

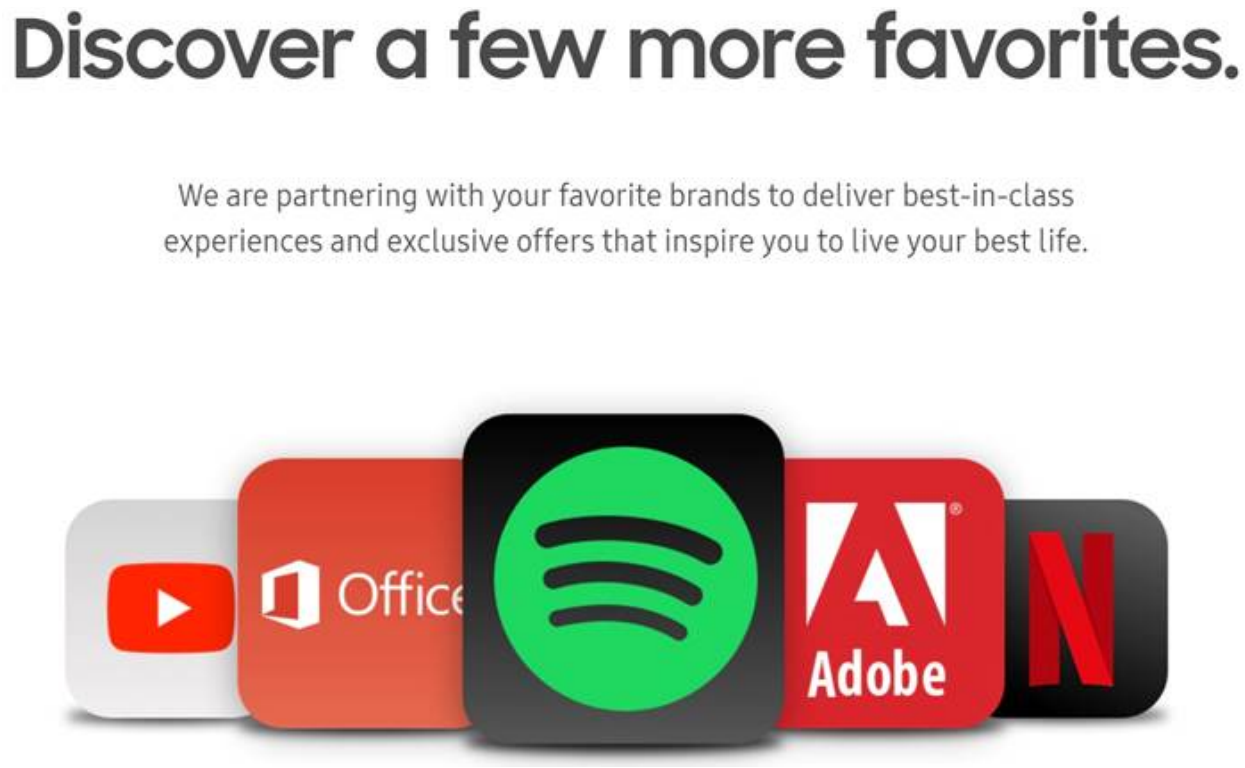




[5] https://www.samsung.com/us/smartphones/galaxy-s21-ultra-5g/; https://www.samsung.com/us/galaxy/why-galaxy/.


90. The Netflix application comes preinstalled on the Accused Products, including, but not limited to, the exemplary Samsung Galaxy S21 5G smartphone.[6]

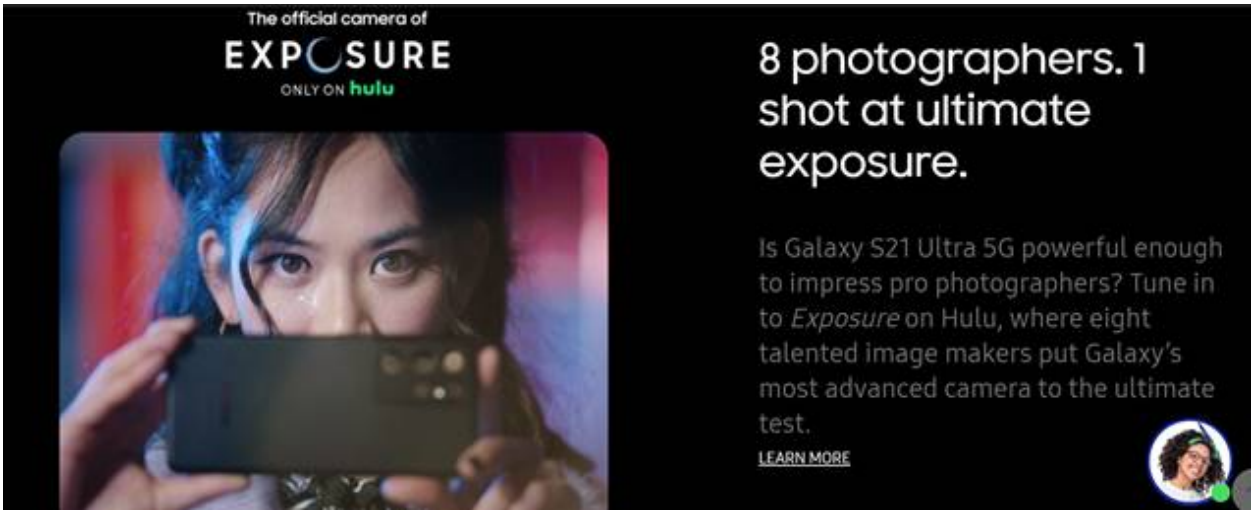
[6] https://www.samsung.com/us/apps/.




91. On information and belief, Samsung partners with Hulu and encourages its end users to install the application and "tune in."[7]

[7] https://www.samsung.com/us/smartphones/galaxy-s21-ultra-5g/.


Is Galaxy S21 Ultra 5G powerful enough to impress pro photographers? Tune in to EXPOSURE on Hulu to witness Galaxy's most advanced camera put to the ultimate test.




92. Samsung knows that it provides streaming and video playback applications with its consumer electronics devices and encourages end users to install additional streaming applications that cause the devices and their importers, resellers, customers, and end users to directly infringe the DivX Patents, when used as intended with, for example, the Netflix, Hulu, or Samsung TV Plus applications, or similar streaming

applications. Samsung knows that third parties—including importers, resellers, customers, and end users—use, offer to sell, and/or sell in the United States, and/or import into the United States, playback devices that incorporate and enable streaming applications, including the Netflix, Hulu, and Samsung TV Plus applications. Indeed, Samsung encourages it. And Samsung knows that it induces direct infringement of the DivX Patents.

93. Further, to the extent that the Accused Products do not directly infringe the DivX Patents as Samsung provides them, and in the alternative to those claims, Samsung offers to sell and/or sells in the United States, and/or imports into the United States, a component of the DivX-patented machines. Samsung contributes to the direct infringement of the DivX Patents by third parties, including end users, by providing streaming and video playback applications, including the Netflix and Samsung Gallery applications, on its Accused Products. Those application-equipped Accused Products constitute a material part of the claimed inventions, and Samsung provides the Accused Products for an infringing use (e.g., to stream or play back video). Third parties directly infringe the DivX patents by using the component sold by Samsung—for example, the Netflix or Samsung Gallery application implemented on the Accused Products—as intended (by streaming or playing back video).

94. At least as of the date of this complaint, and based on its knowledge of the scope of the DivX Patents and its Accused Products, Samsung knows that importers, resellers, customers, end users, and other third parties have directly infringed and continue to directly infringe at least one claim of each DivX Patent, as set forth in

exemplary detail in Counts I-IV, *infra*.

95. On information and belief, Samsung has designed, marketed, and sold the Accused Products to third parties with knowledge and the specific intent to cause the third parties to use, offer to sell, or sell in the United States, and/or import into the United States, products incorporating and enabling streaming platforms, including but not limited to the Netflix, Hulu, and Samsung TV Plus applications.

96. On information and belief, at least as of the date of this complaint, Samsung intends and continues to intend to induce and/or contribute to patent infringement by these third parties, has knowledge that the inducing and/or contributory acts would cause infringement, or is willfully blind to the possibility that Samsung's acts would cause infringement.

97. The above-described acts of indirect infringement have caused injury and damage to DivX and will cause additional severe and irreparable injury and damages in the future.

**COUNT I: INFRINGEMENT OF U.S. PATENT NO. 10,708,521**

98. The allegations in paragraphs 1 through 97 of this complaint are incorporated by reference as though fully set forth herein.

99. Pursuant to 35 U.S.C. § 282, the '521 patent is presumed valid.

100. Samsung has directly infringed and continues to directly infringe at least claim 1 of the '521 patent under 35 U.S.C. § 271(a). The infringing products include the Accused Products, based on the exemplary infringement evidence obtained from a Samsung Galaxy S21 5G smartphone.

101. The Accused Products, including, but not limited to, the Samsung Galaxy S21 5G, comprise "[a] system for decoding multimedia files." For example, the Samsung Galaxy S21 5G comes with (preinstalled) the Samsung Gallery App, so it can decode multimedia files. The Samsung Galaxy S21 5G supports the AVI file format.

102. The Accused Products, including, but not limited to, the Samsung Galaxy S21 5G, comprise "a set of one or more processors" and "a non-volatile storage containing a decoding application," "wherein the decoding application causes the set of processors to perform the steps of receiving a multimedia file." The Samsung Galaxy S21 5G is capable of receiving a multimedia file via, for example, the internet. The device receives and accesses the multimedia file via, for example, the Samsung Gallery App.

103. The Accused Products, including, but not limited to, the Samsung Galaxy S21 5G, receive a multimedia file, wherein "the multimedia file comprises a plurality of chunks for carrying information, said chunks including a plurality of video chunks and a plurality of audio chunks." The Samsung Galaxy S21 5G receives, for example, AVI files. The AVI file format specifies two mandatory LIST chunks: the "hdrl" chunk, which contains the format data, and the "movi" list chunk, which contains the video and audio data in subchunks.

104. The Accused Products, including, but not limited to, the Samsung Galaxy S21 5G, receive a multimedia file, wherein "the video chunks are portions of at least one video track comprising a series of encoded video frames including at least encoded video frames 1 through N, said video chunks including at least video chunks 1 through N, wherein each of said encoded video frames 1 through N correspond to a chunk from

video chunks 1 through N." An AVI file contains video subchunks in the "movi" list chunk. Those video subchunks ("video chunks 1 through N") contain encoded video frames 1 through N. For example, encoded video frames 1 through N are stored in subchunks 1 through N-1, subchunk N-1 containing encoded video frame N-1 *and* encoded video frame N (subchunk N-1 is "packed" with two frames). Analysis of an exemplary AVI file on the Samsung Galaxy S21 5G confirms infringement. For example, the exemplary AVI file includes a video track comprising a series of encoded video frames, including encoded video frames 1 through 5. Encoded video frames 1 through 3 are contained in video subchunks "struct genericblock gb[1]," "struct genericblock gb[3]," and "struct genericblock gb[5]," respectively. The subsequent video subchunk contains encoded video frames 5 and 4, in decode order, but encoded video frame 5 has a later timestamp than encoded video frame 4 (i.e., decode order does not match playback order). Thus, the encoded video frames 1 through 5 correspond to a video subchunk within the file.

105. The Accused Products, including, but not limited to, the Samsung Galaxy S21 5G, receive a multimedia file, wherein "the video chunks include a marker video chunk N where sufficient information is contained in chunks 1 through N-1 to generate video frame N, wherein the marker video chunk N includes a non-coded P-frame in the series of encoded video frames." Encoded video frame N is available to the decoder during the decoding of encoded video frame N-1. When encoded video frame N is available to the decoder during the decoding of encoded video frame N-1, encoded video frame N-1 can depend from encoded video frame N (e.g., it can be a B frame). Because

frame N is packed with frame N-1 (B frame), sufficient information is contained in chunks 1 through N-1 to generate frame N (in this example, frame 5). Encoded video frame 5's timestamp matches the *next* video subchunk, a marker video chunk containing a non-coded P frame (no subsequent data, references the most recently decoded P frame).

106. The Accused Products, including, but not limited to, the Samsung Galaxy S21 5G, receive a multimedia file, wherein "the audio chunks are portions of at least one audio track." AVI files contain multiple audio subchunks in the "movi" list chunk, which are portion of the file's audio track.

107. The Accused Products, including, but not limited to, the Samsung Galaxy S21 5G, comprise non-volatile storage containing a decoding application, wherein the decoding application causes the set of processors to perform the steps of "decoding frame N using corresponding marker video chunk N together with video chunks 1 through N-1." The Samsung Galaxy S21 5G, using the Samsung Gallery App, displays frame N corresponding to marker chunk N when the non-coded P frame is received by the decoder, based on the fact that the device plays back the frames in playback order.

108. Samsung has indirectly infringed and continues to indirectly infringe at least claim 1 of the '521 patent by inducing the direct infringement of the '521 patent in the United States, Texas, and the Eastern District of Texas.

109. At least as of the date of service of this complaint, Samsung knows that it provides and specifically intends to provide playback devices that meet the limitations of claim 1. Samsung therefore has induced and continues to induce infringement of at least claim 1 of the '521 patent in violation of 35 U.S.C. § 271(b), in the exemplary manner

described here.

110. Samsung has indirectly infringed and continues to indirectly infringe at least claim 1 of the '521 patent by contributing to the direct infringement of the '521 patent in the United States, Texas, and the Eastern District of Texas.

111. At least as of the date of service of this complaint, Samsung knows that it provides playback devices that, when a user plays back AVI video on the device as Samsung enables on the device, meet the limitations of claim 1. Samsung therefore has indirectly infringed and continues to indirectly infringe at least claim 1 of the '521 patent in violation of 35 U.S.C. § 271(c), in the exemplary manner described here.

112. On information and belief, Samsung was aware of the '521 patent and the infringing activities accused here and nevertheless elected to infringe and continue to infringe. At minimum, Samsung was aware of the '521 patent at least as of the date of service of this complaint, and its continued infringement is willful. Samsung's infringement of the '521 patent has been and continues to be deliberate and willful, and thus this case is exceptional and warrants an award of enhanced damages and attorneys' fees pursuant to 35 U.S.C. §§ 284 and 285.

113. Samsung's infringement has caused and continues to cause damage to DivX, and DivX is entitled to recover damages sustained as a result of Samsung's wrongful acts in an amount subject to proof at trial.

**COUNT II: INFRINGEMENT OF U.S. PATENT NO. 10,992,955**

114. The allegations in paragraphs 1 through 113 of this complaint are incorporated by reference as though fully set forth herein.

115. Pursuant to 35 U.S.C. § 282, the '955 patent is presumed valid.

116. Samsung has directly infringed and continues to directly infringe at least claim 1 of the '955 patent under 35 U.S.C. § 271(a). The infringing products include the Accused Products, based on the exemplary infringement evidence obtained from a Samsung Galaxy S21 5G smartphone using the Hulu application.

117. The Accused Products, including, for example, the Samsung Galaxy S21 5G, are "playback device[s] configured to perform adaptive bitrate streaming." For example, the Samsung Galaxy S21 5G is configured to play back video files distributed via the Dynamic Adaptive Streaming over HTTP (DASH) protocol. DASH is a streaming protocol for performing adaptive bitrate streaming.

118. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise "a processor configured, via a client application, to request a top level index file and container files via a network." For example, the Media Presentation Description (MPD) is a document that contains metadata required by a DASH client to construct appropriate HTTP-URLs to access segments and to provide the streaming service to the user. The MPD is therefore a top level index file identifying a plurality of alternative video streams. The DASH streaming protocol requires each Adaptation Set to include Representations, which contain one or more media streams, stored in media container files. The Samsung Galaxy S21 5G has a processor configured, via the Hulu application (i.e., client application), to request an MPD (i.e., top level index file) via https://manifest.hulustream.com (i.e., network). The Samsung Galaxy S21 5G has a processor configured, via the Hulu application (i.e., client application), to also request,

for example, .mp4 files (i.e., container files) via https://manifest.hulustream.com (i.e., network).

119. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor, "wherein the client application further configures the processor to: commence playback by retrieving at least a portion of the top level index file that identifies a plurality of container files that contain the streams available to the playback device for use in adaptive bitrate streaming." For example, the Samsung Galaxy S21 5G has a processor configured, via the Hulu application (i.e., client application), to retrieve at least a portion of the MPD (i.e., top level index file). The retrieved portion of the MPD identifies a plurality of .mp4 files (i.e., container files), and the .mp4 files contain the streams available to the playback device for use in adaptive bitrate streaming. The available streams include a plurality of Representations (i.e., alternative video streams) with different Representation IDs and resolutions. Each group of the Representations is the same source video content. The .mp4 file includes information concerning the encoding of the video contained within the container file, such as the encoding method. The .mp4 file also includes an index to the encoded media within the container file. The .mp4 file contains a segment index ('sidx') box, which provides a compact index of one media stream within the media segment to which it applies. The Samsung Galaxy S21 5G is configured to playback an .mp4 file showing a reference element in the 'sidx' box. The 'sidx' box is used to identify the location of each movie fragment ('moof') box and following media data ('mdat') box. The portion of the MPD indicates the portions of each .mp4 file containing information concerning the encoding of the video (e.g., encoding

method) and the index to the encoded media (e.g., index range).

120. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor, wherein the client application further configures the processor to: "select one or more streams including one of the plurality of alternative video streams to utilize in the playback of media based upon the retrieved at least a portion of the top level index file." For example, the Samsung Galaxy S21 5G has a processor configured, via the Hulu application, to select the 2500K stream based on the portion of the MPD.

121. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor, wherein the client application further configures the processor to: "using the at least a portion of the top level index file to request the portions of the container file that include the information concerning the encoding of the video contained within the container file and the index to the encoded media within the container file." For example, the Samsung Galaxy S21 5G has a processor configured, via the Hulu application, to request the 2500K stream based on the portion of the MPD. The requested portions of the .mp4 file include information concerning the encoding of the video contained within the container file, such as the encoding method. The requested portions of the .mp4 file also include an index to the encoded media within the container file. The .mp4 file contains a segment index ('sidx') box, which provides a compact index of one media stream within the media segment to which it applies. The Samsung Galaxy S21 5G has a processor configured, via the Hulu application, to also playback an .mp4 file showing a reference element in the 'sidx.' The 'sidx' is used to identify the location of each 'moof' box and following 'mdat' box.

122. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor, wherein the client application further configures the processor to: "configure a video decoder to playback the encoded video using the retrieved information concerning the encoding of the video." For example, the Samsung Galaxy S21 5G has a processor configured, via the Hulu application, to support playing back .mp4 files using a video decoder and to support dynamic video resolution and frame rate switching through the standard Android APIs within the same stream for all VP8, VP9, H.264, and H.265 codecs in real time and up to the maximum resolution supported by each codec on the device. Further, the MediaCodec class on the Android OS includes a video decoder that uses a MediaExtractor that facilitates extraction of demuxed, typically encoded, media data from a data source.

123. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor, wherein the client application further configures the processor to: "retrieve encoded media from the container file of the selected alternative video stream using the requested index information to the encoded media within the container file." For example, the Samsung Galaxy S21 5G has a processor configured, via the Hulu application, to implement the BaseBox.java module that retrieves encoded media from the container file, using the 'sidx' box (i.e., index information).

124. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor, wherein the client application further configures the processor to: "playback the retrieved portions of video from the selected alternative video stream using the decoder." For example, the Samsung Galaxy S21 5G has a processor

configured, via the Hulu application, to playback the decoded video using the decoder. Further, the MediaCodec class on the Android OS includes a video decoder.

125. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor, wherein the client application further configures the processor to: "when a change in streaming conditions is detected, select a new alternative video stream that is more appropriate for the streaming conditions than the previously selected alternative video stream." For example, the Samsung Galaxy S21 5G has a processor configured, via the Hulu application, to respond to a change in network conditions by switching from the 3200K stream to the lower bitrate 2500K stream. The Samsung Galaxy S21 5G has a processor configured, via the Hulu application, to implement the "m5940" method from the aoG(1).java file. The "m5940" method determines which stream to select ("mpcVodQualitySwitchRule") based on channel conditions ("newBandwidthPrediction"). The observed stream switching from 3200K to 2500K and the "m5940" method in the code confirm that when a change in streaming conditions is detected, the playback device is configured to select a new alternative video stream that is more appropriate for the streaming conditions than the previously selected alternative video stream.

126. Samsung has indirectly infringed and continues to indirectly infringe at least claim 1 of the '955 patent by inducing the direct infringement of the '955 patent in the United States, Texas, and the Eastern District of Texas.

127. At least as of the date of service of this complaint, Samsung knows that it provides and specifically intends to provide playback devices that meet the limitations of

claim 1. Samsung therefore has induced and continues to induce infringement of at least claim 1 of the '955 patent in violation of 35 U.S.C. § 271(b) in the exemplary manner described here.

128. Samsung has indirectly infringed and continues to indirectly infringe at least claim 1 of the '955 patent by contributing to the direct infringement of the '955 patent in the United States, Texas, and the Eastern District of Texas.

129. At least as of the date of service of this complaint, Samsung knows that it provides playback devices that, when a user streams video on the device as Samsung enables on the device, meet the limitations of claim 1. Samsung therefore has indirectly infringed and continues to indirectly infringe at least claim 1 of the '955 patent in violation of 35 U.S.C. § 271(c), in the exemplary manner described here.

130. On information and belief, Samsung was aware of the '955 patent and the infringing activities accused here and nevertheless elected to infringe and continue to infringe. At minimum, Samsung was aware of the '955 patent at least as of the date of service of this complaint, and its continued infringement is willful. Samsung's infringement of the '955 patent has been and continues to be deliberate and willful, and thus this case is exceptional and warrants an award of enhanced damages and attorneys' fees pursuant to 35 U.S.C. §§ 284 and 285.

131. Samsung's infringement has caused and continues to cause damage to DivX, and DivX is entitled to recover damages sustained as a result of Samsung's wrongful acts in an amount subject to proof at trial.

**COUNT III: INFRINGEMENT OF U.S. PATENT NO. 11,012,641**

132. The allegations in paragraphs 1 through 131 of this complaint are incorporated by reference as though fully set forth herein.

133. Pursuant to 35 U.S.C. § 282, the '641 patent is presumed valid.

134. Samsung has directly infringed and continues to directly infringe at least claim 12 of the '641 patent under 35 U.S.C. § 271(a). The infringing products include the Accused Products, based on the exemplary infringement evidence obtained from a Samsung Galaxy S21 5G smartphone using the Hulu application.

135. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a "decoder." For example, the Samsung Galaxy S21 5G decodes video files, including those that the device plays using streaming applications, like Hulu.

136. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise "a processor capable of playing back video stored in at least a portion of a multimedia file," where the multimedia file comprises "a sequence of encoded video frames contained within a plurality of chunks." The Samsung Galaxy S21 5G is capable of playing back video stored in at least a portion of a multimedia file, for example, when a user streams video using the Hulu application. Hulu video files comprise a sequence of encoded video frames contained within a plurality of chunks, e.g., movie fragments. A movie fragment includes a movie fragment or 'moof' box and a media data or 'mdat' box. An 'mdat' box contains actual media data—in Hulu video files, encoded video frames. A 'moof' box contains data related to the video frames, or "samples," stored in its corresponding 'mdat' box. Thus, the Samsung Galaxy S21 5G is capable of playing back

video files comprising a sequence of encoded video frames contained within a plurality of chunks (movie fragments).

137. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video stored in at least a portion of a multimedia file, where the multimedia file comprises a sequence of encoded video frames contained within a plurality of chunks, where "a number of the encoded video frames are at least partially encrypted encoded video frames that include at least one block of encrypted bytes." The Samsung Galaxy S21 5G is capable of playing back video stored in at least a portion of a multimedia file, for example, when a user streams video using the Hulu application. Hulu video files comprise partially encrypted encoded video frames that include at least one block of encrypted bytes. Hulu encodes and encrypts video files consistent with the ISO BMFF Standard and using Microsoft PIFF Specification and ISO Common Encryption Specification extensions. Hulu video files contain a track encryption box, and it encodes and encrypts video files using the 'cenc' encryption scheme and subsample encryption, consistent with the ISO Common Encryption Specification. Hulu video files contain PIFF sample encryption boxes containing information indicating that the track includes at least some partially encrypted video frames, including subsample entries indicating the number of clear (non-encrypted) bytes (NumClearBytes) and the number of encrypted bytes (NumEncryptedBytes) for that subsample. The non-zero NumClearBytes and NumEncryptedBytes values indicate that the frame containing the subsample is only partially encrypted: it contains clear bytes followed by a block of encrypted bytes.

138. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video stored in at least a portion of a multimedia file, where the multimedia file comprises a sequence of encoded video frames contained within a plurality of chunks, where "each chunk includes a subset of video frames from the sequence of encoded video frames." The Samsung Galaxy S21 5G is capable of playing back, for example, Hulu video files, which comprise movie fragments (chunks), each of which includes an 'mdat' box, which includes a subset of the track's video frames.

139. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video stored in at least a portion of a multimedia file, where the multimedia file comprises "an index that includes information indicative of locations of each encoded video frame within the sequence of encoded video frames." For example, the Samsung Galaxy S21 5G is capable of playing back Hulu video files using the Hulu application. Those files includes track run or 'trun' boxes, which together provide an index that includes information indicative of locations of each encoded video frame within the sequence of encoded video frames. Hulu video files contain 'moof' box + 'mdat' box pairs. A 'moof' box always precedes an 'mdat' box and contains information concerning the frames (samples) in that 'mdat' box. A 'moof' box may contain one or more track fragment or 'traf' boxes. A 'traf' box may contain a track run ('trun') box, which documents a contiguous run of samples (e.g., frames) for that track. The 'trun' boxes contain TrackRunEntry elements. A 'trun' box includes a TrackRunEntry for each encoded video frame in its related 'mdat' box, and the

TrackRunEntry includes information indicative of the location of the frame. Each 'trun' box entry relates to a sample, or one frame.

140. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video stored in at least a portion of a multimedia file, where the multimedia file comprises "a set of digital rights management (DRM) information . . . corresponding to an encoded video frame that includes at least one block of encrypted bytes." The ISO Common Encryption Specification and the Microsoft PIFF Specification teach that each encrypted frame (or sample) has an associated initialization vector (IV), i.e., a per-sample IV. Hulu video files include a set of DRM information, including per-sample IVs and information specifying encrypted blocks of the video frames to be decrypted (i.e., NumClearBytes and NumEncryptedBytes). That information is stored in PIFF sample encryption boxes and corresponds to encoded video frames that include at least one block of encrypted bytes.

141. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video stored in at least a portion of a multimedia file, where the multimedia file comprises a set of digital rights management (DRM) information, where DRM information corresponding to an encoded video frame that includes at least one block of encrypted bytes comprises "an offset value that indicates the start of a block of encrypted bytes within an encoded video frame and a number value that indicates a number of encrypted bytes in the block of encrypted bytes." The "NumClearBytes" provides an offset value that indicates the start of a block of encrypted bytes within an encoded video frame, and the "NumEncryptedBytes" provides

a number value that indicates a number of encrypted bytes in the block of encrypted bytes.

142. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video stored in at least a portion of a multimedia file, where the multimedia file comprises a set of digital rights management (DRM) information, where DRM information corresponding to an encoded video frame that includes at least one block of encrypted bytes comprises "cryptographic information that can be used to decrypt the encrypted block indicated by the offset value and the number value." PIFF sample encryption boxes contain a per-sample IV for decrypting the sample, including the subsamples having encrypted blocks indicated by offset values and the number values.

143. The Accused Products, including, for example, the Samsung Galaxy S21 5G, are further capable of "processing the index to identify location information for a particular encoded video frame, where the particular encoded video frame is a partially encrypted encoded video frame that includes at least one block of encrypted bytes." The Hulu application implemented on a Samsung Galaxy S21 5G parses the 'trun' box to use it as an index to the received 'mdat' box. The 'trun' box includes information to locate frames in the received 'mdat' box. The 'trun' points to the size of each frame in the 'mdat box and the device extracts each frame.

144. The Accused Products, including, for example, the Samsung Galaxy S21 5G, are further capable of "locating the particular encoded video frame within a specific chunk," using the 'trun' box for that particular 'mdat' box.

145. The Accused Products, including, for example, the Samsung Galaxy S21 5G, are further capable of "identifying DRM information corresponding to the particular encoded video frame within the set of DRM information," by accessing the per-sample DRM information within the PIFF sample encryption box within the 'traf' box within the 'moof' box for the received movie fragment.

146. The Accused Products, including, for example, the Samsung Galaxy S21 5G, are further capable of "decrypting at least one block of encrypted bytes within the particular encoded video frame using offset and number values, and cryptographic information from the identified DRM information corresponding to the particular encoded video frame, where the decryption of the particular encoded video frame occurs prior to commencing decoding the decrypted video frame." The device uses the per-sample IV (and other DRM information) as an input to the AES-CTR cipher to obtain an applicable frame decryption key to decrypt at least one block of encrypted bytes within the particular encoded video frame, generating a decrypted—but not yet decoded—frame. The device decrypts at least one block of encrypted bytes within the particular encoded video frame using offset and number values (NumClearBytes, NumEncryptedBytes), and cryptographic information (per-sample IV) from the identified DRM information corresponding to the particular encoded video frame.

147. The Accused Products, including, for example, the Samsung Galaxy S21 5G, are further capable of "decoding the particular encoded video frame." Digital video streamed over the internet requires decoding before playback. Data transferred to the device's decoder input buffer is a frame of video and, thus, corresponds to a 'trun' box

entry. On information and belief, the device decodes the particular encoded video frame because it plays the video.

148. The Accused Products, including, for example, the Samsung Galaxy S21 5G, are further capable of "playing back video frames including the decoded video frame." The Samsung Galaxy S21 5G is capable of playing back video using, for example, the Hulu application.

149. Samsung has indirectly infringed and continues to indirectly infringe at least claim 12 of the '641 patent by inducing the direct infringement of the '641 patent in the United States, Texas, and the Eastern District of Texas.

150. At least as of the date of service of this complaint, Samsung knows that it provides and specifically intends to provide playback devices that meet the limitations of claim 12. Samsung therefore has induced and continues to induce infringement of at least claim 12 of the '641 patent in violation of 35 U.S.C. § 271(b) in the exemplary manner described here.

151. Samsung has indirectly infringed and continues to indirectly infringe at least claim 12 of the '641 patent by contributing to the direct infringement of the '641 patent in the United States, Texas, and the Eastern District of Texas.

152. At least as of the date of service of this complaint, Samsung knows that it provides playback devices that, when a user streams video on the device as Samsung enables on the device, meet the limitations of claim 12. Samsung therefore has indirectly infringed and continues to indirectly infringe at least claim 12 of the '641 patent in violation of 35 U.S.C. § 271(c), in the exemplary manner described here.

153. On information and belief, Samsung was aware of the '641 patent and the infringing activities accused here and nevertheless elected to infringe and continue to infringe. At minimum, Samsung was aware of the '641 patent at least as of the date of service of this complaint, and its continued infringement is willful. Samsung's infringement of the '641 patent has been and continues to be deliberate and willful, and thus this case is exceptional and warrants an award of enhanced damages and attorneys' fees pursuant to 35 U.S.C. §§ 284 and 285.

154. Samsung's infringement has caused and continues to cause damage to DivX, and DivX is entitled to recover damages sustained as a result of Samsung's wrongful acts in an amount subject to proof at trial.

**COUNT IV: INFRINGEMENT OF U.S. PATENT NO. 11,017,816**

155. The allegations in paragraphs 1 through 154 of this complaint are incorporated by reference as though fully set forth herein.

156. Pursuant to 35 U.S.C. § 282, the '816 patent is presumed valid.

157. Samsung has directly infringed and continues to directly infringe at least claim 42 of the '816 patent under 35 U.S.C. § 271(a). The infringing products include the Accused Products, based on the exemplary infringement evidence obtained from a Samsung Galaxy S21 5G smartphone using the Hulu application.

158. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a "decoder." For example, the Samsung Galaxy S21 5G decodes video files, including those that the device plays using streaming applications, like Hulu.

159. The Accused Products, including, for example, the Samsung Galaxy S21

5G, comprises "a processor capable of playing back video from a media file, where the media file comprises: a track of encoded video frames." The Samsung Galaxy S21 5G is capable of playing back video from a media file, for example, when a user streams video using the Hulu application. Hulu video files comprise a track of encoded video frames. For example, Hulu video files comprise a movie or 'moov' box containing a track or 'trak' box for a single track of a presentation. Hulu video files also comprise movie fragments. A movie fragment includes a movie fragment or 'moof' box and a media data or 'mdat' box. An 'mdat' box contains actual media data—in Hulu video files, encoded video frames. A 'moof' box contains data related to the video frames, or "samples," stored in its corresponding 'mdat' box. Thus, the Samsung Galaxy S21 5G is capable of playing back video files (for example, Hulu video files) comprising a track of encoded video frames.

160. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video from a media file, where the media file comprises "a first index that includes an entry for each of a plurality of chunks in the media file." For example, the Samsung Galaxy S21 5G is capable of playing back Hulu video files, using the Hulu application. Those files include a segment index or 'sidx' box, which is a first index that includes an entry for each of a plurality of chunks in the media file. The 'sidx' box is an index that includes entries for a video file's movie fragments (i.e., 'moof' box + 'mdat' box pairs). For example, an entry will provide size information that equals the size of a particular movie fragment, e.g., the sum of the 'moof' box and the 'mdat' box.

161. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video from a media file, where the media file comprises a first index that includes an entry for each of a plurality of chunks in the media file, where "each of the plurality of chunks in the media file includes a segment of the track of encoded video frames, the entry in the first index for a given chunk of the plurality of chunks in the media file contains" certain information. For example, the Samsung Galaxy S21 5G is capable of playing back Hulu video files, which contain a 'sidx' box, which contains an entry for each movie fragment within the file. Each 'mdat' box within each movie fragment includes a segment of the track of encoded video frames. The 'sidx' box entries provide certain information for movie fragments, including size, duration, and SAP_type.

162. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video from a media file, where the media file comprises a first index that includes an entry for each of a plurality of chunks in the media file, where each of the plurality of chunks in the media file includes a segment of the track of encoded video frames, the entry in the first index for a given chunk of the plurality of chunks in the media file contains information indicative of "a location of the given chunk within the media file." The 'sidx' box entries point to movie fragments and provide size information, in bytes, that allows the device to identify the beginning of each movie fragment, thus providing a movie fragment's location within the file.

163. The Accused Products, including, for example, the Samsung Galaxy S21

5G, comprise a processor capable of playing back video from a media file, where the media file comprises a first index that includes an entry for each of a plurality of chunks in the media file, where each of the plurality of chunks in the media file includes a segment of the track of encoded video frames, the entry in the first index for a given chunk of the plurality of chunks in the media file contains information indicative of "timing information for the given chunk." The 'sidx' box entries point to movie fragments and provide duration, or timing, information.

164. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor capable of playing back video from a media file, where the media file comprises "a separate second index that includes an entry for each encoded video frame of the track of encoded video frames, where the entry in the second index for a given encoded video frame of the track of encoded video frames includes information indicative of a location of the given encoded video frame within the media file." For example, the Samsung Galaxy S21 5G is capable of playing back Hulu video files using the Hulu application. Those files includes track run or 'trun' boxes, which together provide a separate second index that includes an entry for each encoded video frame of the track of encoded video frames. Hulu video files contain 'moof' box + 'mdat' box pairs. A 'moof' box always precedes an 'mdat' box and contains information concerning the frames (samples) in that 'mdat' box. A 'moof' box may contain one or more track fragment or 'traf' boxes. A 'traf' box may contain a track run ('trun') box, which documents a contiguous run of samples (e.g., frames) for that track. The 'trun' boxes contain TrackRunEntry elements. A 'trun' box includes a TrackRunEntry for each

encoded video frame in its related 'mdat' box, and the TrackRunEntry includes information indicative of the location of the frame. Each 'trun' box entry relates to a sample, or one frame.

165. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a "processor [that] is further capable of downloading a first portion of the media file via a network." To play, for example, a Hulu video file, the Hulu application implemented on a Samsung Galaxy S21 5G requests a first portion of the file, sending a first byte range request (beginning at "0") to the remote server. The device then receives the requested byte range and downloads the portion of the file, including the 'sidx' box.

166. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor that is further capable of, "prior to downloading the second index, processing the first index to identify information indicative of a location of a specific chunk within the media file based upon a time value." After requesting and receiving the 'sidx' box (the first index), the Hulu application implemented on a Samsung Galaxy S21 5G processes the 'sidx' box to identify information indicative of a location of a specific chunk within the media file based upon a time value. At this point, the device has not yet requested any movie fragments and, as a result, has not downloaded any 'trun' boxes (the second index). For example, the device can parse the 'sidx' box to identify and request a particular movie fragment that contains frames approximately two minutes into the video. The 'sidx' box provides a timescale (ticks per second) and duration information corresponding to specific byte ranges and playback times and, as a result, provides information that allows the device to locate and request a specific chunk

within the media file based on a time value.

167. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor that is further capable of "downloading a second portion of the media file containing at least a portion of the second index via the network." In response to a byte range request, the Samsung Galaxy S21 5G receives and downloads a second portion of the video file containing a portion of the second index—a 'trun' box for the received movie fragment.

168. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor that is further capable of "processing the at least a portion of the second index to identify information indicative of a location of a particular encoded video frame within the specific chunk identified using the first index." For example, the Hulu application implemented on a Samsung Galaxy S21 5G parses the 'trun' box to use it as an index to the received 'mdat' box. The 'trun' box includes information to locate frames in the received 'mdat' box. Data transferred to the device's decoder input buffer is a video frame and, thus, corresponds to a 'trun' box entry.

169. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor that is further capable of "decoding the particular encoded video frame located using the second index to obtain a decoded video frame within the specific chunk located using the first index." Digital video streamed over the internet requires decoding before playback. On information and belief, the device decodes the particular encoded video frame located using the second index to obtain a decoded video frame within the specific chunk located using the first index because it plays the video.

170. The Accused Products, including, for example, the Samsung Galaxy S21 5G, comprise a processor that is further capable of "playing back video frames including the decoded video frame." The Samsung Galaxy S21 5G is capable of playing back video using, for example, the Hulu application.

171. Samsung has indirectly infringed and continues to indirectly infringe at least claim 42 of the '816 patent by inducing the direct infringement of the '816 patent in the United States, Texas, and the Eastern District of Texas.

172. At least as of the date of service of this complaint, Samsung knows that it provides and specifically intends to provide playback devices that meet the limitations of claim 42. Samsung therefore has induced and continues to induce infringement of at least claim 42 of the '816 patent in violation of 35 U.S.C. § 271(b) in the exemplary manner described here.

173. Samsung has indirectly infringed and continues to indirectly infringe at least claim 42 of the '816 patent by contributing to the direct infringement of the '955 patent in the United States, Texas, and the Eastern District of Texas.

174. At least as of the date of service of this complaint, Samsung knows that it provides playback devices that, when a user streams video on the device as Samsung enables on the device, meet the limitations of claim 42. Samsung therefore has indirectly infringed and continues to indirectly infringe at least claim 42 of the '816 patent in violation of 35 U.S.C. § 271(c), in the exemplary manner described here.

175. On information and belief, Samsung was aware of the '816 patent and the infringing activities accused here and nevertheless elected to infringe and continue to

infringe. At minimum, Samsung was aware of the '816 patent at least as of the date of service of this complaint, and its continued infringement is willful. Samsung's infringement of the '816 patent has been and continues to be deliberate and willful, and thus this case is exceptional and warrants an award of enhanced damages and attorneys' fees pursuant to 35 U.S.C. §§ 284 and 285.

176. Samsung's infringement has caused and continues to cause damage to DivX, and DivX is entitled to recover damages sustained as a result of Samsung's wrongful acts in an amount subject to proof at trial.

**JURY TRIAL DEMANDED**

177. DivX demands a trial by jury on all claims and issues so triable.

**PRAYER FOR RELIEF**

WHEREFORE, DivX respectfully requests that this Court:

A. Enter judgment that Samsung has directly infringed one or more claims of one or more of the DivX Patents, either literally or under the doctrine of equivalents, in violation of 35 U.S.C. § 271(a);

B. Enter judgment that Samsung has induced infringement of one or more claims of one or more of the DivX Patents, in violation of 35 U.S.C. § 271(b);

C. Enter judgement that Samsung has contributed to direct infringement of one or more claims of one or more of the DivX Patents, in violation of 35 U.S.C. § 271(c);

D. Enter an order, pursuant to 35 U.S.C. § 284, awarding to DivX damages adequate to compensate for Samsung's infringement of the DivX Patents (and, if

necessary, related accountings), in an amount to be determined at trial, but not less than a reasonable royalty;

E. Enter an order, pursuant to 35 U.S.C. § 285, deeming Samsung's infringement to have been willful and this to be an "exceptional case" and thereby awarding to DivX its reasonable attorneys' fees, costs, and expenses;

F. Enter an order that Samsung account for and pay to DivX the damages to which DivX is entitled as a consequence of the infringement;

G. Enter an order for a post-judgment equitable accounting of damages for the period of infringement of the DivX Patents following the period of damages established at trial;

H. Enter an order awarding to DivX pre- and post-judgment interest at the maximum rates allowable under the law; and

I. Enter an order awarding to DivX such other and further relief, whether at law or in equity, that this Court deems just and proper.

Dated: May 28, 2021

Respectfully submitted,

*s/ Charles Everingham IV*

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