WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/068276

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding claim 66, Thorwirth teaches wherein: a set of encryption keys for each chunk of content (the chunks are protected using different watermark payloads, para 0052) and encrypt the set of encryption keys using one encryption key (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058). However, Thorwirth lacks the teaching of common cryptographic information. Amini teaches a content distribution with common cryptographic information for the alternate streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2; same key is used for different streams, para 0054, 0044 [protecting the content]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Amini to incorporate the common cryptographic information in the invention of Thorwirth for the purpose of encrypting and protecting the alternate streams of source content and allowing random access and joining a broadcasted multimedia stream at a point somewhere other than at the beginning of the stream (Amini, para 0041, 0054).

Claims 70-74, 87-93 lack an inventive step under PCT Article 33(3) as being obvious over Thorwirth and in view of Amini and Schnell.

Regarding claims 70 and 87, Thorwirth lacks the teaching wherein: the container files containing each of the alternative streams of protected content comprise at least one header including the common cryptographic information and information that describes the encoding of the stream of protected content; and the top level index file identifies the location of the at least one header within each container file. However, Thorwirth shows how well known in the art are container files (sections of files in a container file, para 0004, different media containers for adaptive streaming, para 0009 [background]) and a top level index file identifies a container file containing each of the alternative streams (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Thorwirth to incorporate the container file and top level index file in the invention for the purpose of providing a playlist with a list of URLS pointing to TS container files that contain alternative chunks for the sections of a piece of content (Thorwirth, para 0010). Further, Schnell teaches one header including the cryptographic information and information that describes the encoding of the stream of the protected content and identifies the location of one header within each container file (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036, written in a file segment 160, which has track objects 222 associated with the tracks or video tracks, para 0037, see fig. 2).Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM system in the invention of Thorwirth for the purpose of providing DRM associated features such as licenses that correspond to the media segments of the protected media (Schnell, para 0004). Further, Amini teaches a content distribution with common cryptographic information for the alternate streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2; same key is used for different streams, para 0054, 0044 [protecting the content]).

Regarding claims 71 and 88, Thorwirth teaches wherein cryptographic information is a set of encryption keys (the chunks are protected using different watermark payloads, para 0052). However, Thorwirth lacks the teaching of common cryptographic information. Amini teaches a content distribution with common cryptographic information for the alternate streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2; same key is used for different streams, para 0054, 0044 [protecting the content]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Amini to incorporate the common cryptographic information in the invention of Thorwirth for the purpose of encrypting and protecting the alternate streams of source content and allowing random access and joining a broadcasted multimedia stream at a point somewhere other than at the beginning of the stream (Amini, para 0041, 0054).

Regarding claim 72, Thorwirth teaches wherein set of encryption keys is encrypted (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058); and the client application configures the processor to securely receive cryptographic information used to unencrypt the set of encryption keys (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058). However, Thorwirth lacks the teaching of common cryptographic information. Amini teaches a content distribution with common cryptographic information for the alternate streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2; same key is used for different streams, para 0054, 0044 [protecting the content]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Amini to incorporate the common cryptographic information in the invention of Thorwirth for the purpose of encrypting and protecting the alternate streams of source content and allowing random access and joining a broadcasted multimedia stream at a point somewhere other than at the beginning of the stream (Amini, para 0041, 0054).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/068276

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding claims 73 and 92, Thorwirth lacks the teaching wherein the client application configures the processor to obtain the common cryptographic information by requesting at least one header of a container file identified in the top level index file. However, Thorwirth shows how well known in the art are container files (sections of files in a container file, para 0004, different media containers for adaptive streaming, para 0009 [background]) and a top level index file identifies a container file containing each of the alternative streams (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Thorwirth to incorporate the container file and top level index file in the invention for the purpose of providing a playlist with a list of URLS pointing to TS container files that contain alternative chunks for the sections of a piece of content (Thorwirth, para 0010). Further, Schnell teaches one header including the cryptographic information and information that describes the encoding of the stream of the protected content and identifies the location of one header within each container file (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036, written in a file segment 160, which has track objects 222 associated with the tracks or video tracks, para 0037, see fig. 2).Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM system in the invention of Thorwirth for the purpose of providing DRM associated features such as licenses that correspond to the media segments of the protected media (Schnell, para 0004). Further, Amini teaches a content distribution with common cryptographic information for the alternate streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2; same key is used for different streams, para 0054, 0044 [protecting the content]).

Regarding claims 74 and 93, Thorwirth lacks the teaching wherein: each container file containing one of the alternative streams of protected content further comprises an index; and the client application configures the processor to request a portion of content from one of the container files by configuring the processor to: request at least a portion of an index from the container file; identify the portion of the container file containing a specific portion of content using the index; and request the identified portion of the container file. However, Thorwirth shows how well known in the art are container files (sections of files in a container file, para 0004, different media containers for adaptive streaming, para 0009 [background]) and a top level index file identifies a container file containing each of the alternative streams (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009), request a portion of content from one of the container files (client device authenticated requests access to choose content choice for playback, para 0053); identify the portion of the container file containing a specific portion of content (link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); and request the identified portion of the container file (server provides access to the client based on the selection or chunks requested, para 0053). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Thorwirth to incorporate the container file and top level index file in the invention for the purpose of providing a playlist with a list of URLS pointing to TS container files that contain alternative chunks for the sections of a piece of content (Thorwirth, para 0010). Further, Schnell teaches one header including the cryptographic information and information that describes the encoding of the stream of the protected content and identifies the location of one header within each container file (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036, written in a file segment 160, which has track objects 222 associated with the tracks or video tracks, para 0037, see fig. 2).Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM system in the invention of Thorwirth for the purpose of providing DRM associated features such as licenses that correspond to the media segments of the protected media (Schnell, para 0004).

Regarding claim 89, Thorwirth teaches wherein: the set of encryption keys is encrypted so that it is accessible using cryptographic information obtained by the playback device (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058); and the method further comprising obtaining cryptographic information using the playback device (a copy of the encryption key used for the encryption of the content key is delivered securely to the specific user or client device, para 0058, hashing or encrypting the encrypted content and key, para 0064).

Regarding claim 90, Thorwirth teaches wherein the set of encryption keys is encrypted using at least one encryption key (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058); and the playback device securely obtains the at least one encryption key (copy of the encryption key used for the encryption of the content key is delivered securely to the specific user or client device, para 0058, hashing or encrypting the encrypted content and key, para 0064).

Regarding claim 91, Thorwirth lacks the teaching wherein the at least one encryption key is encrypted using at least one encryption key included in the cryptographic information bound to the playback device. However, Thorwirth teaches wherein the set of encryption keys is encrypted using at least one encryption key (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058); and the playback device securely obtains the at least one encryption key (copy of the encryption key used for the encryption of the content key is delivered securely to the specific user or client device, para 0058, hashing or encrypting the encrypted content and key, para 0064). Furthermore, defining multiple encryptions is well known in the art and the specifics would have been a matter of design choice. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Thorwirth to incorporate the encryption features in the invention for the purpose of providing protection against unauthorized used and distribution of content (Thorwirth, para 0058).

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0351
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/068276

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Claims 68, 75-83, 85, 94-102, 104 lack an inventive step under PCT Article 33(3) as being obvious over Thorwirth and in view of Amini and further in view of Schnell and further in view of Soroushian.

Regarding claims 68 and 85, Thorwirth teaches wherein the alternative streams of protected content are alternative streams of protected video (CDN stores six alternative chunks [video] created for each section with different encoding parameters and two different watermark payloads [alternative streams of protected content], para 0052); each of the alternative streams of protected video includes information indicating portions of frames of video that are encrypted and identifying at least a portion of the cryptographic information used to access the encrypted portions of the frames of video (CDN stores six alternative chunks created for each section with different encoding parameters and two different watermark payloads [alternative streams of protected content], para 0052; link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); and the client application configures the processor to: obtain a protected frame of video from one of the alternative streams of protected video (client device authenticated requests access to choose content choice for playback, para 0053; link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); obtain information indicating a portion of the protected frame of video that is encrypted (the chunks are protected using different watermark payloads, para 0052; link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); identify at least a portion of the cryptographic information that is used to access the encrypted portion of the protected frame using the information (a copy of the encryption key used for the encryption of the content key is delivered securely to the specific user or client device [this encryption key identifies the encrypted content to be sent], para 0058, hashing or encrypting the encrypted content and key, para 0064); decrypt the encrypted portion of the protected frame of video using the identified portion of the common cryptographic information (decryption of streamed file utilizes the content keys based on the sections, para 0059). Thorwirth lacks the teaching of common cryptographic information and a DRM server and decoding the frames of video. Schnell teaches a content distributor with a DRM system (content server 122 and a DRM system 118 distribute protected media content 120 to various wireless media devices 106, para 0028-0031). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM system in the invention of Thorwirth for the purpose of providing DRM associated features such as licenses that correspond to the media segments of the protected media (Schnell, para 0004). Further, Amini teaches a content distribution with common cryptographic information for the alternate streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2; same key is used for different streams, para 0054, 0044 [protecting the content]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Amini to incorporate the common cryptographic information in the invention of Thorwirth for the purpose of encrypting and protecting the alternate streams of source content and allowing random access and joining a broadcasted multimedia stream at a point somewhere other than at the beginning of the stream (Amini, para 0041, 0054). Furthermore, Soroushian teaches a playback can identify and decode the data (decode the appropriate data, para 0037). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Soroushian to incorporate the decoder in the invention of Thorwirth for the purpose of decoding multimedia and present audio, video and subtitle information in a synchronized manner (Soroushian, para 0003).

Regarding claims 75 and 94, Thorwirth lacks the teaching wherein the plurality of container files are Matroska container files. Soroushian teaches wherein the content is stored as chunks or elements in a Matroska container (MKV container composed of lists, chunks and/or elements, para 0031, see fig. 1c [Matroska is MKV, para 003]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Soroushian to incorporate the Matroska container files in the invention of Thorwirth for the purpose of providing a MKV container for distributing high-definition downloadable content on the internet and peer-to-peer networks (Soroushian, para 0003).
Regarding claims 76 and 95, Thorwirth lacks the teaching wherein the common cryptographic information is stored in a common DRM Header element contained within a Tracks element within each of the Matroska container files containing the alternative streams of protected content. Amini teaches wherein the encoding application configures the processor to write at least a portion of the common cryptographic information (a stream source 210 offers unencoded access units [frames] to the encoder, para 0031, see fig. 2; encryptor 240 where the streams are encrypted, para 0032, see fig. 2; same key is used for different streams [common cryptographic information], para 0054). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Amini to incorporate the common cryptographic information in the invention of Thorwirth for the purpose of encrypting and protecting the alternate streams of source content and allowing random access and joining a broadcasted multimedia stream at a point somewhere other than at the beginning of the stream (Amini, para 0041, 0054). Soroushian teaches wherein the content is stored as chunks or elements in a Matroska container (MKV container composed of lists, chunks and/or elements, para 0031, see fig. 1c [Matroska is MKV, para 003]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Soroushian to incorporate the Matroska container files in the invention of Thorwirth for the purpose of providing a MKV container for distributing high-definition downloadable content on the internet and peer-to-peer networks (Soroushian, para 0003). Schnell teaches writing a DRMHeader element to the tracksDATA element in a Tracks element within each of the content files, wherein the DRMHeader element includes an encrypted copy of the cryptographic information (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036, written in a file segment 160, which has track objects 222 associated i=with the tracks or video tracks, para 0037, see fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM elements in the invention of Thorwirth for the purpose of seamlessly rendering all of the segments of a movie, without managing a multitude of DRM licenses for the different versions of the median content segments (Schnell, para 0036).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/068276

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Regarding claims 77 and 96, Thorwirth teaches wherein: a set of encryption keys for each chunk of content (the chunks are protected using different watermark payloads, para 0052) and encrypt the set of encryption keys using one encryption key (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058). However, Thorwirth lacks the teaching of common cryptographic information and write the encrypted set of encryption keys to the DRMHeader element. Amini teaches a content distribution with common cryptographic information for the alternate streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2; same key is used for different streams, para 0054, 0044 [protecting the content]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Amini to incorporate the common cryptographic information in the invention of Thorwirth for the purpose of encrypting and protecting the alternate streams of source content and allowing random access and joining a broadcasted multimedia stream at a point somewhere other than at the beginning of the stream (Amini, para 0041, 0054). Schnell teaches writing encrypted set of encryption keys to the DRMHeader element (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM elements in the invention of Thorwirth for the purpose of seamlessly rendering all of the segments of a movie, without managing a multitude of DRM licenses for the different versions of the median content segments (Schnell, para 0036).

Regarding claims 78 and 97, Thorwirth teaches wherein set of encryption keys is encrypted (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058); and the client application configures the processor to securely receive cryptographic information used to unencrypt the set of encryption keys (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058). However, Thorwirth lacks the teaching of cryptographic information stored in a DRM header element. Schnell teaches writing encrypted set of encryption keys to the DRMHeader element (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM elements in the invention of Thorwirth for the purpose of seamlessly rendering all of the segments of a movie, without managing a multitude of DRM licenses for the different versions of the median content segments (Schnell, para 0036).

Regarding claims 79 and 98, Thorwirth lacks the teaching wherein the client application configures the processor to obtain the DRM Header element by requesting a Tracks element from one of the Matroska container files identified in the top level index file. However, Thorwirth shows how well known in the art are container files (sections of files in a container file, para 0004, different media containers for adaptive streaming, para 0009 [background]) and a top level index file identifies a container file containing each of the alternative streams (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Thorwirth to incorporate the container file and top level index file in the invention for the purpose of providing a playlist with a list of URLS pointing to TS container files that contain alternative chunks for the sections of a piece of content (Thorwirth, para 0010). Soroushian teaches wherein the content is stored as chunks or elements in a Matroska container (MKV container composed of lists, chunks and/or elements, para 0031, see fig. 1c [Matroska is MKV, para 003]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Soroushian to incorporate the Matroska container files in the invention of Thorwirth for the purpose of providing a MKV container for distributing high-definition downloadable content on the internet and peer-to-peer networks (Soroushian, para 0003). Schnell teaches writing a DRMHeader element to the tracksDATA element in a Tracks element within each of the content files, wherein the DRMHeader element includes an encrypted copy of the cryptographic information (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036, written in a file segment 160, which has track objects 222 associated i=with the tracks or video tracks, para 0037, see fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM elements in the invention of Thorwirth for the purpose of seamlessly rendering all of the segments of a movie, without managing a multitude of DRM licenses for the different versions of the median content segments (Schnell, para 0036).

Regarding claims 80 and 99, Thorwirth lacks the teaching wherein: each Mastroska container file containing an alternative stream of protected content further comprises an index contained within a Cues element; and the client application configures the processor to request a portion of content from one of the Matroska container files by configuring the processor to: request at least a portion of a Cues element from a Matroska container file containing one of the alternative streams of protected content; identify a portion of the Matroska container file containing a specific portion of content using at least one CueTrackPosition element within the Cues element; and request the portion of the Matroska container file identified by the at least one CueTrackPosition element. However, Thorwirth shows how well known in the art are container files (sections of files in a container file, para 0004, different media containers for adaptive streaming, para 0009 [background]) and a top level index file identifies a container file containing each of the alternative streams (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Thorwirth to incorporate the container file and top level index file in the invention for the purpose of providing a playlist with a list of URLS pointing to TS container files that contain alternative chunks for the sections of a piece of content (Thorwirth, para 0010).
Soroushian teaches wherein the content is stored as chunks or elements in a Matroska container (MKV container composed of lists, chunks and/or elements, para 0031, see fig. 1c [Matroska is MKV, para 003]) and identifying a portion of the MKV container using CueTrackPosition element (table with hierarchical index identifiers with CUEPOS_ID, table above para 0037). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Soroushian to incorporate the Matroska container files in the invention of Thorwirth for the purpose of providing a MKV container for distributing high-definition downloadable content on the internet and peer-to-peer networks (Soroushian, para 0003). Schnell teaches an index for each content field for the streams of protected content (file index 158 for each file and the corresponding segments, para 0031, see fig. 2); and write a Cues element containing the index to the indexed file (track objects 222 has the attributes and information included in a track [Cues element], para 0036, 0037, see fig. 2 and includes size, type, mode ID, index, Algorithm ID with index, para 0041 and table under it).Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM elements in the invention of Thorwirth for the purpose of seamlessly rendering all of the segments of a movie, without managing a multitude of DRM licenses for the different versions of the median content segments (Schnell, para 0036).

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0353
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/068276

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding claims 81 and 100, Thorwirth lacks the teaching wherein the index comprises a plurality of CueTrackPosition elements that identify the location of a plurality of Cluster elements within the Matroska container file. Soroushian teaches wherein the content is stored as chunks or elements in a Matroska container (MKV container composed of lists, chunks and/or elements, para 0031, see fig. 1c [Matroska is MKV, para 003]) and identifying a portion of the MKV container using CueTrackPosition element (table with hierarchical index identifiers with CUEPOS_ID, table above para 0037). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Soroushian to incorporate the Matroska container files in the invention of Thorwirth for the purpose of providing a MKV container for distributing high-definition downloadable content on the internet and peer-to-peer networks (Soroushian, para 0003). Schnell teaches an index for each content field for the streams of protected content (file index 158 for each file and the corresponding segments [segments can be interpreted as track elements or comprising of cluster elements], para 0031, see fig. 2); and write a Cues element containing the index to the indexed file (track objects 222 has the attributes and information included in a track [Cues element], para 0036, 0037, see fig. 2 and includes size, type, mode ID, index, Algorithm ID with index, para 0041 and table under it).Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM elements in the invention of Thorwirth for the purpose of seamlessly rendering all of the segments of a movie, without managing a multitude of DRM licenses for the different versions of the median content segments (Schnell, para 0036).

Regarding claims 82 and 101, Thorwirth lacks the teaching wherein: each Cluster element contains a plurality of BlockGroup elements including encoded portions of content; a Cue Track Position element indexes each Cluster element; and each CueTrackPosition element includes the size of the Cluster element that it indexes. Schnell teaches an index for each content field for the streams of protected content (file index 158 for each file and the corresponding segments [segments can be interpreted as track elements or comprising of cluster elements], para 0031, see fig. 2); and write a Cues element containing the index to the indexed file (track objects 222 has the attributes and information included in a track [Cues element], para 0036, 0037, see fig. 2 and includes size, type, mode ID, index, Algorithm ID with index, para 0041 and table under it). Furthermore, defining the specifics of file headers and clusters would have been a matter of design choice. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM elements in the invention of Thorwirth for the purpose of seamlessly rendering all of the segments of a movie, without managing a multitude of DRM licenses for the different versions of the median content segments (Schnell, para 0036).
Regarding claims 83 and 102, Thorwirth teaches wherein the alternative streams of protected content are alternative streams of protected video (CDN stores six alternative chunks [video] created for each section with different encoding parameters and two different watermark payloads [alternative streams of protected content], para 0052); each of the alternative streams of protected video includes information indicating portions of frames of video that are encrypted and identifying at least a portion of the cryptographic information used to access the encrypted portions of the frames of video (CDN stores six alternative chunks created for each section with different encoding parameters and two different watermark payloads [alternative streams of protected content], para 0052; link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); and the client application configures the processor to: obtain a protected frame of video from one of the alternative streams of protected video (client device authenticated requests access to choose content choice for playback, para 0053; link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); obtain information indicating a portion of the protected frame of video that is encrypted (the chunks are protected using different watermark payloads, para 0052; link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); identify at least a portion of the cryptographic information that is used to access the encrypted portion of the protected frame using the information (a copy of the encryption key used for the encryption of the content key is delivered securely to the specific user or client device [this encryption key identifies the encrypted content to be sent], para 0058, hashing or encrypting the encrypted content and key, para 0064); decrypt the encrypted portion of the protected frame of video using the identified portion of the common cryptographic information (decryption of streamed file utilizes the content keys based on the sections, para 0059). Thorwirth lacks the teaching of common cryptographic information, a Matroska container file and a DRM server and decoding the frames of video. Schnell teaches a content distributor with a DRM system (content server 122 and a DRM system 118 distribute protected media content 120 to various wireless media devices 106, para 0028-0031). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM system in the invention of Thorwirth for the purpose of providing DRM associated features such as licenses that correspond to the media segments of the protected media (Schnell, para 0004). Further, Amini teaches a content distribution with common cryptographic information for the alternate streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2; same key is used for different streams, para 0054, 0044 [protecting the content]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Amini to incorporate the common cryptographic information in the invention of Thorwirth for the purpose of encrypting and protecting the alternate streams of source content and allowing random access and joining a broadcasted multimedia stream at a point somewhere other than at the beginning of the stream (Amini, para 0041, 0054). Furthermore, Soroushian teaches wherein the content is stored as chunks or elements in a Matroska container (MKV container composed of lists, chunks and/or elements, para 0031, see fig. 1c [Matroska is MKV, para 003]) and further teaches a playback can identify and decode the data (decode the appropriate data, para 0037). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Soroushian to incorporate the decoder in the invention of Thorwirth for the purpose of decoding multimedia and present audio, video and subtitle information in a synchronized manner (Soroushian, para 0003).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No. PCT/US2011/068276

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding claim 104, Thorwirth teaches wherein the alternative streams of protected content are alternative streams of protected video (CDN stores six alternative chunks [video] created for each section with different encoding parameters and two different watermark payloads [alternative streams of protected content], para 0052); each of the alternative streams of protected video includes information indicating portions of frames of video that are encrypted and identifying at least a portion of the cryptographic information used to access the encrypted portions of the frames of video (CDN stores six alternative chunks created for each section with different encoding parameters and two different watermark payloads [alternative streams of protected content], para 0052; link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); and the client application configures the processor to: obtain a protected frame of video from one of the alternative streams of protected video (client device authenticated requests access to choose content choice for playback, para 0053; link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); obtain information indicating a portion of the protected frame of video that is encrypted (the chunks are protected using different watermark payloads, para 0052; link has a part that identifies the chunk to be accessed [part that identifies the chunk is the title with a unique identifier, para 0057]); identify at least a portion of the cryptographic information that is used to access the encrypted portion of the protected frame using the information (a copy of the encryption key used for the encryption of the content key is delivered securely to the specific user or client device [this encryption key identifies the encrypted content to be sent], para 0058, hashing or encrypting the encrypted content and key, para 0064); decrypt the encrypted portion of the protected frame of video using the identified portion of the common cryptographic information (decryption of streamed file utilizes the content keys based on the sections, para 0059). Thorwirth lacks the teaching of common cryptographic information and a DRM server and decoding the frames of video. Schnell teaches a content distributor with a DRM system (content server 122 and a DRM system 118 distribute protected media content 120 to various wireless media devices 106, para 0028-0031). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Schnell to incorporate the DRM system in the invention of Thorwirth for the purpose of providing DRM associated features such as licenses that correspond to the media segments of the protected media (Schnell, para 0004). Further, Amini teaches a content distribution with common cryptographic information for the alternate streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2; same key is used for different streams, para 0054, 0044 [protecting the content]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Amini to incorporate the common cryptographic information in the invention of Thorwirth for the purpose of encrypting and protecting the alternate streams of source content and allowing random access and joining a broadcasted multimedia stream at a point somewhere other than at the beginning of the stream (Amini, para 0041, 0054). Furthermore, Soroushian teaches a playback can identify and decode the data (decode the appropriate data, para 0037). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Soroushian to incorporate the decoder in the invention of Thorwirth for the purpose of decoding multimedia and present audio, video and subtitle information in a synchronized manner (Soroushian, para 0003).

Claims 1-105 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference D1.02459AB.PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 13/20572	International filing date *(day/month/year)* 07 January 2013 (07.01.2013)	(Earliest) Priority Date *(day/month/year)* 06 January 2012 (06.01.2012)
Applicant DIVX, LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0356
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 13/20572

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/16 (2013.01)
USPC - 726/9,10
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC: 726/9,10; IPC(8): G06F 15/16 (2013.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 726/2,3,5,9,10,21

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase; Google Scholar
Search Terms: digital rights management, DRM, processor, server, memory, storage, RAM, network, online, web, internet, electronic ticket, electronic receipt, electronic token, digital content, request content, DRM server, enable play, merchant server, send ticket

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0149450 A1 (STEFIK et al.) 07 July 2005 (07.07.2005), abstract and para [0017]-[0018], [0063]-[0066], [0083]-[0094], [0098], [0103], [0107]-[0108], [0120], [0127], [0129], [0134], [0136], [0138], [0140], [0152]-[0153], [0162], [0164], [0169], [0191], [0199]-[0200], [0212], [0215], [0219]-[0220], [0231], [0259]-[0260], [0277], [0292], [0308], [0317], [0346], [0353]-[0358], [0424], [0513], [0521], [0547], [0570], claim 6	1-60
A	US 2010/0138908 A1 (MEDVINSKY) 03 June 2010 (03.06.2010), entire document.	1-60
A	US 2008/0066181 A1 (HAVESON et al.) 13 March 2008 (13.03.2008), entire document.	1-60
A	US 2009/0228395 A1 (WEGNER et al.) 10 September 2009 (10.09.2009) entire document	1-60

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 March 2013 (19.03.2013)	29 APR 2013
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID J. BAILEY
KAUTH, POMEROY, PECK & BAILEY LLP
2400 E. KATELLA AVE., SUITE 1050
ANAHEIM, CA 92806

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	29 APR 2013
Applicant's or agent's file reference D1.02459AB.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 13/20572	07 January 2013 (07.01.2013)	06 January 2012 (06.01.2012)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/16 (2013.01)
USPC - 726/9

Applicant DIVX, LLC

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	19 March 2013 (19.03.2013)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 13/20572

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0359
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 13/20572

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	None	YES
	Claims	1-50	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-50	NO
Industrial applicability (IA)	Claims	1-50	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-50 lack novelty under PCT Article 33(2) as being anticipated by US 2005/0149450 A1 to Stefik, et al. (hereinafter 'Stefik').

As to claim 1, Stefik teaches a user device, comprising: (a) a processor (para [0134] - "processor element 1201 may be a microprocessor or other suitable computing component"); (b) a network interface (para [0136] - "external interface means 1205 may also provide network connectivity"). and (c) memory (para [0134] - "memory") configured to store: (i) an electronic ticket (para [0083] - "digital ticket"), and (ii) a ticket token (para [0083]-[0086], [0191] - "token"); (d) wherein the processor is configured by an application to: (i) send a request for digital content (para [0093] - "The digital work remains securely in Repository 1 until a request for access is received"); (ii) receive a ticket token from a merchant server, wherein the ticket token is generated by a DRM server and associated with an electronic ticket that enables playback of the requested digital content (para [0017], [0093], [0212], [0356] - "credit server"; "A transaction involving digital tickets must locate an appropriate digital ticket agent who can "punch" or otherwise validate the ticket before the transaction can proceed"); (iii) send the ticket token to a DRM server (para [0017], [0093], [0354]-[0356] - "requester sends the server a message to initiate the play transaction"); (iv) receive an electronic ticket that enables playback of requested digital content (para [0353]-[0358] - "server checks the validity of the player identification and the compatibility of the player identification with the player specification in the right"); (v) request the digital content associated with the electronic ticket (para [0353]-[0358] - "play transaction is a request to use the contents of a work"); and (vi) play back the requested digital content using the electronic ticket (para [0162], [0164], [0169], [0353]-[0358] - "The set of rights attached to a digital work define how that digital work may be transferred, used, performed or played"; "The requester plays the work contents, using the player").

As to claim 2, Stefik further teaches a user device wherein the electronic ticket includes a torn status (para [0083]-[0084], [0138] - "ticket agent which is used to "punch" a digital ticket").

As to claim 3, Stefik further teaches a user device wherein the electronic ticket is an XML file (para [0547], claim 6).

As to claim 4, Stefik further teaches a user device wherein the electronic ticket identifies the purchased digital content (para [0083]-[0086]).

As to claim 5, Stefik further teaches a user device wherein the electronic ticket includes a characteristic of the purchased content selected from the group consisting of: information identifying the content that was purchased, a license indicating how the content can be played back, a purchase price, a merchant transaction identifier, the identification of a customer who purchased the ticket, and the identification of a customer owning the ticket (para [0083], [0219], [0231] - "A ticket is an indicator that the ticket holder has already paid for or is otherwise entitled to some specified right, product or service").

As to claim 6, Stefik further teaches a user device wherein the electronic ticket is associated with cryptographic data that can be used to access the digital content to which the electronic ticket refers (para [0107], [0140], [0317]).

As to claim 7, Stefik further teaches a user device wherein the ticket token references the electronic ticket, a customer, and the requested digital content (para [0083], [0191], [0354]-[0355]).

As to claim 8, Stefik further teaches a user device wherein the processor is further configured to receive access information for the digital content (para [0017]-[0018], [0093], [0108]).

As to claim 9, Stefik further teaches a user device wherein the access information includes at least one piece of information selected from the group consisting of: a top level index of the digital content, an identifier for the digital content, and cryptographic data that can be used to access the digital content (para [0108] - "unique identifier for the work in the repository").

As to claim 10, Stefik further teaches a user device wherein the electronic ticket is embedded in the header of a multimedia file (para [0219], [0424], [0570]).

(See Continuation Box)

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0360
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 13/20572

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2. Citations and explanations:

As to claim 11, Stefik teaches a method for enabling playback of digital content on a user device using an electronic ticket and a ticket token, the method comprising: (a) sending a request for digital content from a user device to a merchant server (para [0017]-[0018], [0093] - "requestor device to request access to a digital work"); (b) receiving a ticket token from the merchant server using the user device, wherein the ticket token is generated by a DRM server and associated with an electronic ticket that enables playback of the requested digital content (para [0017]-[0018], [0093], [0212], [0356] - "credit server"; "A transaction involving digital tickets must locate an appropriate digital ticket agent who can "punch" or otherwise validate the ticket before the transaction can proceed"); (c) sending the ticket token to a DRM server using the user device (para [0017]-[0018], [0093], [0354]-[0356] - "requester sends the server a message to initiate the play transaction"); (d) receiving the electronic ticket from the DRM server using the user device (para [0017]-[0018], [0353]-[0358] - "server checks the validity of the player identification and the compatibility of the player identification with the player specification in the right"); (e) downloading the digital content associated with the electronic ticket from a content server using the user device (para [0017]-[0018], [0353]-[0358] - "play transaction is a request to use the contents of a work"; "The server and requester read and write the blocks of data as requested by the player according to the transmission protocol"); and (f) playing back the requested digital content (para [0162], [0164], [0169], [0353]-[0358] - "The set of rights attached to a digital work define how that digital work may be transferred, used, performed or played"; "The requester plays the work contents, using the player").

As to claim 12, Stefik further teaches a method wherein the electronic ticket includes a torn status (para [0083]-[0084], [0138] - "ticket agent which is used to "punch" a digital ticket").

As to claim 13, Stefik further teaches a method wherein the electronic ticket is an XML file (para [0547], claim 6).

As to claim 14, Stefik further teaches a method wherein the electronic ticket identifies the purchased digital content (para [0083]-[0086]).

As to claim 15, Stefik further teaches a method wherein the electronic ticket includes a characteristic of the purchased content selected from the group consisting of: information identifying the content that was purchased, a license indicating how the content can be played back, a purchase price, a merchant transaction identifier, the identification of a customer who purchased the ticket, and the identification of a customer owning the ticket (para [0083], [0219], [0231] - "A ticket is an indicator that the ticket holder has already paid for or is otherwise entitled to some specified right, product or service").

As to claim 16, Stefik further teaches a method wherein the electronic ticket is associated with cryptographic data that can be used to access the digital content to which the electronic ticket refers (para [0107], [0140], [0317]).

As to claim 17, Stefik further teaches a method wherein the ticket token references the electronic ticket, a customer, and the requested digital content (para [0083], [0191], [0354]-[0356]).

As to claim 18, Stefik further teaches a method further comprising receiving access information for the digital content (para [0017]-[0018], [0093], [0108]).

As to claim 19, Stefik further teaches a method wherein the access information includes at least one piece of information selected from the group consisting of: a top level index of the digital content, an identifier for the digital content, and cryptographic data that can be used to access the content (para [0108] - "unique identifier for the work in the repository").

As to claim 20, Stefik further teaches a method wherein the electronic ticket is embedded in the header of a multimedia file (para [0219], [0424], [0570]).

As to claim 21, Stefik teaches a machine readable medium containing processor instructions, where execution of the instructions by a processor causes the processor to perform a process comprising: (a) sending a request for digital content (para [0093] - "The digital work remains securely in Repository 1 until a request for access is received"); (b) receiving a ticket token, wherein the ticket token is generated by a DRM server and associated with an electronic ticket that enables playback of the requested digital content (para [0017]-[0018], [0093], [0212], [0356] - "credit server"; "A transaction involving digital tickets must locate an appropriate digital ticket agent who can "punch" or otherwise validate the ticket before the transaction can proceed"); (c) sending the ticket token to a DRM server (para [0017], [0093], [0354]-[0356] - "requester sends the server a message to initiate the play transaction"); (d) receiving the electronic ticket from the DRM server (para [0017]-[0018], [0353]-[0358] - "server checks the validity of the player identification and the compatibility of the player identification with the player specification in the right"); (e) downloading the digital content associated with the electronic ticket from a content server using the user device (para [0017]-[0018], [0353]-[0358] - "play transaction is a request to use the contents of a work"; "The server and requester read and write the blocks of data as requested by the player according to the transmission protocol"); and (f) playing back the requested digital content (para [0162], [0164], [0169], [0353]-[0358] - "The set of rights attached to a digital work define how that digital work may be transferred, used, performed or played"; "The requester plays the work contents, using the player").

(See Next Continuation Box)

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0361
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2. Citations and explanations:

As to claim 22, Stefik teaches a digital rights management server, comprising: (a) a processor (para [0134] - "processor element 1201 may be a microprocessor or other suitable computing component"); and (b) memory (para [0134] - "memory") configured to store: (i) an electronic ticket (para [0083] - "digital ticket"), (ii) a ticket token (para [0083]-[0086], [0191] - "token"); (c) wherein the processor is configured to: (i) authenticate a merchant server (para [0093], [0153], [0277] - "credit server will also need to have security and authentication functionality"); (ii) receive a request for a ticket token from the merchant server where the request identifies a piece of digital content (para [0083]-[0084], [0093], [0108], [0215] - "The digital work remains securely in Repository 1 until a request for access is received"; "unique identifier for the work in the repository"); (iii) generate a ticket token that expires after a predetermined time period (para [0199]-[0200], [0513] - "The Expiration-Date specifies the moment at which the usage right ends"; " time restrictions that invalidate the right after a period of time or a period of use"); (iv) associate the ticket token with an electronic ticket (para [0191], [0215], [0292] - "token can be used to simplify the expression of what rights to keep behind"); (v) send the ticket token to the merchant server for delivery to a user device (para [0017], [0093], [0354]-[0356] - "requester sends the server a message to initiate the play transaction"), (vi) receive a request to access the identified piece of digital content from the user device, where the request includes the ticket token (para [0017]-[0018], [0353]-[0358] - "play transaction is a request to use the contents of a work"; "The server and requester read and write the blocks of data as requested by the player according to the transmission protocol"); (vii) send the electronic ticket and access information for the identified piece of digital content associated with the electronic ticket to the user device (para [0017]-[0018], [0353]-[0358] - "requester sends the server a message to initiate the play transaction. This message indicates the work to be played, the version of the play right to be used in the transaction, the identity of the player being used, and the file data for the work"); and (viii) expire the ticket token (para [0199]-[0200], [0513] - "The play right can have various restrictions on its use. It could have a ticket that limits the number of times it is used. It could have internal restrictions that limit its functionality. It could have time restrictions that invalidate the right after a period of time or a period of use").

As to claim 23, Stefik further teaches a digital rights management server wherein the processor is further configured to authenticate a user device registered to a user account and associate an electronic ticket with the user account based upon the ticket token received from the user device (para [0152]-[0153], [0191], [0354]-[0356]).

As to claim 24, Stefik further teaches a digital rights management server wherein the request for a ticket token contains at least one field selected from the group consisting of: a customer identifier, a content identifier, a merchant identifier, an account link identifier, a license identifier, a stream identifier, a transaction identifier, and a price (para [0108], [0346] - "unique identifier for the work in the repository"; "requester identification, and the transaction ID").

As to claim 25, Stefik further teaches a digital rights management server wherein the processor is further configured to generate a new electronic ticket to represent a new purchase (para [0220], [0306], [0521]).

As to claim 26, Stefik further teaches a digital rights management server wherein the processor is further configured to send the electronic ticket to the merchant server (para [0083]-[0084], [0138], [0215]).

As to claim 27, Stefik further teaches a digital rights management server wherein the request to access the identified piece of digital content further includes identification of a user account to which the user device is registered (para [0152], [0162], [0277]).

As to claim 28, Stefik further teaches a digital rights management server wherein the processor is further configured to associate the electronic ticket with the user account (para [0083], [0152], [0152]).

As to claim 29, Stefik further teaches a digital rights management server wherein the processor is further configured to associate the user device with the user account (para [0017]-[0018], [0103], [0152]).

As to claim 30, Stefik further teaches a digital rights management server wherein the request to access the identified piece of digital content further includes information that identifies the characteristics or capabilities of the user device (para [0127], [0355]-[0356]).

As to claim 31, Stefik further teaches a digital rights management server wherein the processor is further configured to validate the ticket token (para [0212], [0354]-[0356]).

As to claim 32, Stefik further teaches a digital rights management server wherein the processor is further configured to enforce rules on the playback of content based upon the ticket token (para [0086], [0120], [0354]-[0356]).

As to claim 33, Stefik further teaches a digital rights management server wherein the processor is further configured to enforce rules on the playback of content based upon device characteristics (para [0017]-[0018], [0355]-[0356]).

As to claim 34, Stefik further teaches a digital rights management server wherein the access information includes at least one piece of information selected from the group consisting of: a top level index of the digital content, an identifier for the digital content, and cryptographic data that can be used to access the digital content (para [0108] - "unique identifier for the work in the repository").

(See Next Continuation Box)

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0362
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 13/20572

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2. Citations and explanations:

As to claim 35, Stefik teaches a method for enabling playback of digital content on a user device using an electronic ticket and an ticket token, the method comprising: (a) authenticating a merchant server using a DRM server (para [0093], [0129], [0153], [0277] - "credit server will also need to have security and authentication functionality"); (b) receiving a request for a ticket token from the merchant server at the DRM server, where the request identifies a piece of digital content (para [0083]-[0084], [0093], [0108], [0215] - "The digital work remains securely in Repository 1 until a request for access is received"; "unique identifier for the work in the repository"); (c) generating a ticket token that expires after a predetermined time period using the DRM server (para [0199]-[0200], [0513] - "The Expiration-Date specifies the moment at which the usage right ends"; " time restrictions that invalidate the right after a period of time or a period of use"); (d) associating the ticket token with an electronic ticket using the DRM server (para [0191], [0215], [0292] - "token can be used to simplify the expression of what rights to keep behind"); (e) sending the ticket token to the merchant server for delivery to a user device using the DRM server (para [0017], [0093], [0354]-[0356] - "requester sends the server a message to initiate the play transaction"); (f) authenticating a user device registered to a user account using the DRM server (para [0152]-[0153], [0259]-[0260], [0354]-[0356] - "Transactions occur between two repositories (one acting as a server), between a repository and a document playback platform (e.g. for executing or viewing), between a repository and a credit server or between a repository and an authorization server"; "server checks the validity of the player identification and the compatibility of the player identification with the player specification in the right"); (g) receiving a request to access the identified piece of digital content from the user device using the DRM server, where the request includes the ticket token (para [0017]-[0018], [0191], [0353]-[0356] - "play transaction is a request to use the contents of a work"; "The server and requester read and write the blocks of data as requested by the player according to the transmission protocol"); (h) associating an electronic ticket with the user account based upon the ticket token received from the user device using the DRM server (para [0152]-[0153], [0162], [0356] - "an instance of a usage right may specify a bank account, a digital ticket, etc"); (i) sending the electronic ticket and access information for the identified piece of digital content associated with the electronic ticket to the user device using the DRM server (para [0017]-[0018], [0353]-[0358] - "requester sends the server a message to initiate the play transaction. This message indicates the work to be played, the version of the play right to be used in the transaction, the identity of the player being used, and the file data for the work"; "server checks the validity of the player identification and the compatibility of the player identification with the player specification in the right"); and (j) expiring the ticket token using the DRM server (para [0199]-[0200], [0513] - "The play right can have various restrictions on its use. It could have a ticket that limits the number of times it is used. It could have internal restrictions that limit its functionality. It could have time restrictions that invalidate the right after a period of time or a period of use").

As to claim 36, Stefik further teaches a method further comprising authenticating a user device registered to a user account and associating an electronic ticket with the user account based upon the ticket token received from the user device (para [0152]-[0153], [0191], [0354]-[0356]).

As to claim 37, Stefik further teaches a method wherein the request for a ticket token contains at least one field selected from the group consisting of: a customer identifier, a content identifier, a merchant identifier, an account link identifier, a license identifier, a stream identifier, a transaction identifier, and a price (para [0108], [0346] - "unique identifier for the work in the repository"; "requester identification, and the transaction ID").

As to claim 38, Stefik further teaches a method further comprising generating a new electronic ticket to represent a new purchase (para [0220], [0306], [0521]).

As to claim 39, Stefik further teaches a method further comprising sending the electronic ticket to the merchant server (para [0083]-[0084], [0138], [0215]).

As to claim 40, Stefik further teaches a method wherein the request to access the identified piece of digital content further includes identification of a user account to which the user device is registered (para [0152], [0162], [0277]).

As to claim 41, Stefik further teaches a method further comprising associating the electronic ticket with the user account (para [0083], [0152], [0162]).

As to claim 42, Stefik further teaches a method further comprising associating the user device with the user account (para [0017]-[0018], [0103], [0152]).

As to claim 43, Stefik further teaches a method wherein the request to access the identified piece of digital content further includes information that identifies the characteristics or capabilities of the user device (para [0127], [0355]-[0356]).

As to claim 44, Stefik further teaches a method further comprising validating the ticket token (para [0212], [0354]-[0356]).

As to claim 45, Stefik further teaches a method further comprising enforcing rules on the playback of content based upon the ticket token (para [0086], [0120], [0354]-[0356]).

As to claim 46, Stefik further teaches a method further comprising enforcing rules on the playback of content based upon device characteristics (para [0017]-[0018], [0355]-[0356]).

As to claim 47, Stefik further teaches a method wherein the access information includes at least one piece of information selected from the group consisting of: a top level index of the digital content, an identifier for the digital content, and cryptographic data that can be used to access the digital content (para [0108] - "unique identifier for the work in the repository").

(See Next Continuation Box)

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0363
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 13/20572

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2. Citations and explanations:

As to claim 48, Stefik teaches a system comprising: (a) a merchant server (para [0093], [0098] - "credit server"); (b) a DRM server (para [0017]-[0018] - "server device processes the request to access the digital work based on the usage right specified in the request"); (c) a content server (para [0084], [0093]-[0094] - "Digital works are stored in repositories"; "When in the server mode, the repository will be receiving and processing access requests to digital works"); and (d) a user device (para [0017]-[0018], [0353], [0358] - "requestor device"; "requester plays the work contents, using the player"); (e) wherein the merchant server, DRM server, content server, and user device are configured to communicate via a network (para [0136], [0152], [0547] - "external interface means 1206 may also provide network connectivity"); (f) wherein the merchant server is configured to authenticate a user account maintained by the merchant server (para [0152]-[0153] - "user account"; "credit server will also need to have security and authentication functionality"); (g) wherein the user device is configured to request a piece of digital content from the merchant server (para [0017]-[0018], [0093] - "requestor device to request access to a digital work"); (h) wherein the DRM server is configured to authenticate the merchant server (para [0093], [0129], [0153], [0277] - "credit server will also need to have security and authentication functionality"); (i) wherein the merchant server is configured to request a ticket token associated with the requested piece of content from the DRM (para [0083]-[0084], [0093], [0108], [0191], [0215] - "The digital work remains securely in Repository 1 until a request for access is received"; "unique identifier for the work in the repository"); (j) wherein the merchant server is configured to provide the ticket token to the user device (para [0017], [0093], [0191], [0354]-[0356] - "For a digital ticket the player would be a digital ticket agent"; "requester sends the server a message to initiate the play transaction"); (k) wherein the DRM server is configured to authenticate the user device as being registered to a user account maintained by the DRM server (para [0152]-[0153], [0259]-[0260], [0354]-[0356] - "Transactions occur between two repositories (one acting as a server), between a repository and a document playback platform (e.g. for executing or viewing), between a repository and a credit server or between a repository and an authorization server"; "server checks the validity of the player identification"); (l) wherein the user device is configured to provide the ticket token to the DRM server (para [0017]-[0018], [0353]-[0358] - "server checks the validity of the player identification and the compatibility of the player identification with the player specification in the right"); (m) wherein the DRM server is configured to associate an electronic ticket with the user account to which the user device is registered (para [0152]-[0153], [0162], [0356] - "an instance of a usage right may specify a bank account, a digital ticket, etc"); and (n) wherein the DRM server is configured to provide the user device with access information for the requested digital content and the electronic ticket (para [0017]-[0018], [0353]-[0358] - "For a digital ticket the player would be a digital ticket agent"; "requester sends the server a message to initiate the play transaction. This message indicates the work to be played, the version of the play right to be used in the transaction, the identity of the player being used, and the file data for the work"; "The server checks the validity of the player identification and the compatibility of the player identification with the player specification in the right").

As to claim 49, Stefik teaches a method for enabling playback of digital content on a user device using an electronic ticket and an ticket token, the method comprising: (a) authenticating a user account maintained by a merchant server using the merchant server (para [0152]-[0153] - "user account"; "credit server will also need to have security and authentication functionality"); (b) requesting a piece of digital content from the merchant server using a user device (para [0017]-[0018], [0093] - "requestor device to request access to a digital work"); (c) authenticating the merchant server using a DRM server (para [0093], [0129], [0153], [0277] - "credit server will also need to have security and authentication functionality"); (d) requesting a ticket token associated with the requested piece of content from the DRM server using the merchant server (para [0083]-[0084], [0093], [0108], [0191], [0215] - "The digital work remains securely in Repository 1 until a request for access is received"; "unique identifier for the work in the repository"); (e) providing the ticket token to the user device using the merchant server (para [0017], [0093], [0354]-[0356] - "For a digital ticket the player would be a digital ticket agent"; "requester sends the server a message to initiate the play transaction"); (f) authenticating the user device as being registered to a user account maintained by the DRM server using the DRM server (para [0152]-[0153], [0259]-[0260], [0354]-[0356] - "Transactions occur between two repositories (one acting as a server), between a repository and a document playback platform (e.g. for executing or viewing), between a repository and a credit server or between a repository and an authorization server"; "server checks the validity of the player identification"); (g) providing the ticket token to the DRM server using the user device (para [0017]-[0018], [0353]-[0358] - "server checks the validity of the player identification and the compatibility of the player identification with the player specification in the right"); (h) associating an electronic ticket with the user account to which the user device is registered using the DRM server (para [0152]-[0153], [0162], [0356] - "an instance of a usage right may specify a bank account, a digital ticket, etc"); and (i) providing the user device with the electronic ticket and access information for the requested digital content using the DRM server (para [0017]-[0018], [0353]-[0358] - "For a digital ticket the player would be a digital ticket agent"; "requester sends the server a message to initiate the play transaction. This message indicates the work to be played, the version of the play right to be used in the transaction, the identity of the player being used, and the file data for the work". "The server checks the validity of the player identification and the compatibility of the player identification with the player specification in the right").

(See Next Continuation Box)

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0364
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 13/20572

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2. Citations and explanations:

As to claim 50, Stefik teaches a machine readable medium containing processor instructions, where execution of the instructions by a processor causes the processor to perform a process comprising: (a) authenticating a merchant server (para [0093], [0129], [0153], [0277] - "credit server will also need to have security and authentication functionality"); (b) receiving a request for a ticket token from the merchant server where the request identifies a piece of digital content (para [0083]-[0084], [0093], [0106], [0215] - "The digital work remains securely in Repository 1 until a request for access is received", "unique identifier for the work in the repository"); (c) generating a ticket token that expires after a predetermined time period (para [0199]-[0200], [0513] - "The Expiration-Date specifies the moment at which the usage right ends", " time restrictions that invalidate the right after a period of time or a period of use"); (d) associating the ticket token with an electronic ticket (para [0191], [0215], [0292] - "token can be used to simplify the expression of what rights to keep behind"); (e) sending the ticket token to the merchant server for delivery to a user device (para [0017], [0093], [0354]-[0356] - "requester sends the server a message to initiate the play transaction"); (f) authenticating a user device registered to a user account (para [0152]-[0153], [0259]-[0260], [0354]-[0356] - "Transactions occur between two repositories (one acting as a server), between a repository and a document playback platform (e.g. for executing or viewing), between a repository and a credit server or between a repository and an authorization server", "server checks the validity of the player identification:"); (g) receiving a request to access the identified piece of digital content from the user device, where the request includes the ticket token (para [0017]-[0018], [0353]-[0358] - "play transaction is a request to use the contents of a work", "The server and requester read and write the blocks of data as requested by the player according to the transmission protocol"); (h) associating an electronic ticket with the user account based upon the ticket token received from the user device (para [0152]-[0153], [0162], [0356] - "an instance of a usage right may specify a bank account, a digital ticket, etc"); (i) sending the electronic ticket and access information for the identified piece of digital content associated with the electronic ticket to the user device (para [0017]-[0018], [0353]-[0356] - "requester sends the server a message to initiate the play transaction. This message indicates the work to be played, the version of the play right to be used in the transaction, the identity of the player being used, and the file data for the work"); and (j) expiring the ticket token (para [0199]-[0200], [0513] - "The play right can have various restrictions on its use. It could have a ticket that limits the number of times it is used. It could have internal restrictions that limit its functionality. It could have time restrictions that invalidate the right after a period of time or a period of use").

Claims 1-50 have industrial applicability as defined by PCT Article 33(4), because the subject matter can be made or used in industry.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0365
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Europäisches Patentamt
European Patent Office
Office européen des brevets

SUPPLEMENTARY PARTIAL EUROPEAN SEARCH REPORT

under Rule 62a and/or 63 of the European Patent Convention. This report shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number EP 04 81 3918

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,P	WO 2004/097811 A1 (LG ELECTRONICS INC [KR]; KIM BYUNG JIN [KR]; KIM HYUNG SUN [KR]; YANG) 11 November 2004 (2004-11-11) * the whole document *	54-95	INV. G06F15/00
X	WO 02/01880 A1 (THOMSON LICENSING SA [FR]; STROTHMAN JAMES ALAN [US]; BARRON STEVEN AN) 3 January 2002 (2002-01-03) * the whole document *	54-95	
X	US 6 046 778 A (NONOMURA TOMOYUKI [JP] ET AL) 4 April 2000 (2000-04-04) * abstract *	54-95	
X	EP 0 757 484 A2 (SONY CORP [JP]) 5 February 1997 (1997-02-05) * abstract *	54-95	
X	WO 01/50732 A2 (VM LABS INC [US]) 12 July 2001 (2001-07-12) * abstract *	54-95	

TECHNICAL FIELDS SEARCHED (IPC)

G11B
H04N
G06F

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
The Hague	19 December 2012	Giannotti, Pantaleo

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

3

EPO FORM 1503 03.82 (P04E20)

Europäisches Patentamt
European Patent Office
Office européen des brevets

INCOMPLETE SEARCH
SHEET C

Application Number
EP 04 81 3918

Claim(s) completely searchable:
54-95

Claim(s) not searched:
1-53, 96-169

Reason for the limitation of the search:

The present application contains 169 claims, of which 20 are independent. There are so many claims and they are drafted in such a way that the claims as a whole do not comply with the provisions of clarity and conciseness in Article 84 EPC, as it is unduly burdensome for a skilled person to establish the subject-matter for which protection is sought. In particular, contrary to Article 84 EPC, the claims appear to be directed to a format whose features are not clearly defined. Non-compliance with the substantive provisions is such that a meaningful search of the whole claimed subject-matter can not be carried out. Under Rule 63 (1) EPC, the Applicant was therefore invited to file a statement indicating the subject-matter to be searched, with explicit reference to the specific claims on file. The Applicant indicated Claims 54-95. The search has therefore been directed to the subject matter of said claims.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 81 3918

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-12-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004097811 A1	11-11-2004	BR PI0409807 A	09-05-2006
		CN 1781143 A	31-05-2006
		EP 1623413 A1	08-02-2006
		JP 4790599 B2	12-10-2011
		JP 2006525742 A	09-11-2006
		KR 20060006952 A	20-01-2006
		TW I289298 B	01-11-2007
		US 2004218907 A1	04-11-2004
		WO 2004097811 A1	11-11-2004
WO 0201880 A1	03-01-2002	AU 6467401 A	08-01-2002
		US 8091106 B1	03-01-2012
		WO 0201880 A1	03-01-2002
US 6046778 A	04-04-2000	NONE	
EP 0757484 A2	05-02-1997	AT 232345 T	15-02-2003
		AU 702694 B2	04-03-1999
		BR 9603263 A	28-04-1998
		CA 2181864 A1	03-02-1997
		CN 1153977 A	09-07-1997
		CN 1444222 A	24-09-2003
		DE 69626072 D1	13-03-2003
		DE 69626072 T2	27-11-2003
		EP 0757484 A2	05-02-1997
		ES 2191740 T3	16-09-2003
		JP 3326670 B2	24-09-2002
		JP 9051502 A	18-02-1997
		MY 116664 A	31-03-2004
		US 5848217 A	08-12-1998
		US 6424792 B1	23-07-2002
WO 0150732 A2	12-07-2001	AU 2543001 A	16-07-2001
		US 6871008 B1	22-03-2005
		WO 0150732 A2	12-07-2001

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

Europäisches Patentamt
European Patent Office
Office européen des brevets

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number
EP 10 72 9513

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2005/108320 A1 (LORD ROBERT D [US] ET AL) 19 May 2005 (2005-05-19) * abstract * * figures 1,7 * * paragraphs [0015] - [0020] * * paragraphs [0032] - [0034] * -----	1-15	INV. G06F15/16 H04N21/231 H04N21/278
A	WO 02/08948 A2 (VIVCOM INC [US]; SULL SANGHOON [KR]; KIM HYEOKMAN [KR]; CHOI HYUNGSEOK) 31 January 2002 (2002-01-31) * abstract * * figures 2,3 * * page 30, line 2 - page 35, line 5 * -----	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

H04N
G06F

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

1

Place of search	Date of completion of the search	Examiner
The Hague	9 December 2013	Naci, Suphi Umut

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C04)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 72 9513

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-12-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005108320 A1	19-05-2005	US 2005108320 A1	19-05-2005
		US 2007192445 A1	16-08-2007
		US 2010185729 A1	22-07-2010
		WO 2005050373 A2	02-06-2005
WO 0208948 A2	31-01-2002	AU 8300401 A	05-02-2002
		KR 20050002681 A	10-01-2005
		KR 20070103728 A	24-10-2007
		US 2002069218 A1	06-06-2002
		US 2007033170 A1	08-02-2007
		US 2007033292 A1	08-02-2007
		US 2007033515 A1	08-02-2007
		US 2007033521 A1	08-02-2007
		US 2007033533 A1	08-02-2007
		US 2007038612 A1	15-02-2007
		US 2007044010 A1	22-02-2007
		US 2011093492 A1	21-04-2011
		WO 0208948 A2	31-01-2002

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

The examination is being carried out on the **following application documents**

Description, Pages

1-10	as published			

Claims, Numbers

1-15	received on	05-03-2012	with letter of	01-03-2012

Drawings, Sheets

1/4-4/4	as published

Reference is made to the following document; the numbering will be adhered to in the rest of the procedure.

D1 US 2005/108320 A1 (LORD ROBERT D [US] ET AL) 19 May 2005 (2005-05-19)

1 The present application does not meet the requirements of Article 52(1) EPC because the subject-matter of claim 1 is not new within the meaning of Article 54(1) and (2) EPC.

1.1 D1 discloses:

A content guide system (abstract) *comprising:*
a content server configured to provide access to content (§15 and 16)*;*
a tag server including a searchable database of tags (fig.1, 34 - database and §21)*; the content guide system characterized by:*
a tagging device in network communication with the tag server and the content server, where the tagging device is configured to access content via the content server referencing the accessed content that is provided to the tag server for inclusion into the searchable database of tags (§25 and 26)*; and*

a playback device in network communication with the tag server and the content server, where the playback device is configured to search the database, retrieve from the database a tag that references content accessible via the content server and access the content referenced by the retrieved tag via the content server (§33).

1.2 The subject-matter of claim 1 is therefore not new (Article 54(1) and (2) EPC).

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0371
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

2 Dependent claims 2-15 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the EPC with respect to novelty and/or inventive step:

Claims 2-4 and 15 introduce content and location identifiers like URLs, which is also disclosed in D1(§27).

Claims 5 and 6 specify merely well-known database operations like add, delete, etc...

Claims 7 and 8 further introduce search and recommendation operations, which is also disclosed in D1(§33).

Claims 9-14 introduce various design options like caching or not the parts of the content and tags locally, which are well-known in the art.

3 FURTHER PROSECUTION OF THE APPLICATION

3.1 It is not at present apparent which part of the application could serve as a basis for a new, allowable claim. Should the applicant nevertheless regard some particular matter as patentable, an independent claim should be filed taking account of Rule 43(1) EPC. The applicant should also indicate how the subject-matter of the new claim differs from the state of the art and the significance thereof.

3.2 To meet the requirements of Rule 42(1)(b) EPC, D1 should be identified in the description and the relevant background art disclosed therein should be briefly discussed.

3.3 In order to facilitate the examination of the conformity of the amended application with the requirements of Article 123(2) EPC, the applicant should clearly identify the amendments made, irrespective of whether they concern amendments by addition, replacement or deletion, and indicate the passages of the application as filed on which these amendments are based (see Guidelines E-II, 1).

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0372
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Europäisches Patentamt
European Patent Office
Office européen des brevets

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number
EP 11 77 4529

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	HEINZ H BAUSCHKE ET AL: "Recompression of JPEG Images by Requantization", IEEE TRANSACTIONS ON IMAGE PROCESSING, IEEE SERVICE CENTER, PISCATAWAY, NJ, US, vol. 12, no. 7, 1 July 2003 (2003-07-01), XP011074411, ISSN: 1057-7149 * the whole document *	1-15	INV. G06K9/36 G06K9/46 H04N19/124 H04N19/154 H04N19/176 H04N19/192 H04N19/196 H04N19/40 H04N19/60
X	US 6 850 650 B1 (BAUSCHKE HEINZ [CA] ET AL) 1 February 2005 (2005-02-01) * column 6, line 35 - column 8, line 49; figures 4-7 *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

H04N

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
The Hague	31 January 2014	Georgiou, Georgia

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

1

EPO FORM 1503 03.82 (P04C09)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 11 77 4529

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

31-01-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6850650 B1	01-02-2005	US 6850650 B1	01-02-2005
		US 2005111747 A1	26-05-2005

EPO FORM P0459

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: Jason D. Wolfe
KPPB LLP
2400 E. Katella, Suite 1050
Anaheim, CA 92806
United States of America

PCT

INVITATION TO PAY ADDITIONAL FEES
AND, WHERE APPLICABLE, PROTEST FEE

(PCT Article 17(3)(a) and Rules 40.1 and 40.2(e))

Applicant's or agent's file reference 03351AB.PCT	Date of mailing *(day/month/year)* 25 SEP 2014 **PAYMENT DUE** within **ONE MONTH** from the above date of mailing
International application No. PCT/US14/39852	International filing date *(day/month/year)* 28 May 2014 (28.05.2014)
Applicant SONIC IP, INC.	

1. This International Searching Authority

   (i) considers that there are 2 *(number of)* inventions claimed in the international application covered by the claims indicated below/on an extra sheet:

   Group I: Claims 1-18; Group II: Claims 19-41

   (ii) therefore considers that **the international application does not comply with the requirement of unity of invention** (Rules 13.1, 13.2 and 13.3) for the reasons indicated below/on an extra sheet:

   -***-Please see Supplemental Page-***-

   (iii) ☐ has carried out a partial international search (see Annex) ☒ will establish the international search report on those parts of the international application which relate to the invention first mentioned in claims Nos.:

   Group I: Claims 1-18

   (iv) will establish the international search report on the other parts of the international application only if, and to the extent to which, additional fees are paid.

2. Consequently, the applicant is hereby **invited to pay**, within the time limit indicated above, additional fees in the amount indicated below:

   $2080.00 (Fee per additional invention) x 1 (number of additional inventions) = $2080.00 (See Item 2 of annex) (total amount of additional fees/currency)

3. The applicant is informed that, according to Rule 40.2(c), **the payment of any additional fees may be made under protest**, that is, a reasoned statement to the effect that the international application complies with the requirement of unity of invention or that the amount of the required additional fees is excessive, where applicable, subject to the payment of a protest fee.

   Where the applicant pays additional fees under protest, the applicant is hereby invited, within the time limit indicated above, to pay a protest fee (Rule 40.2(e)) in the amount of _____ *(amount/currency)*

   Where the applicant has not, within the time limit indicated above, paid the required protest fee, the protest will be considered not to have been made and the International Searching Authority will so declare.

4. ☐ Claim(s) Nos. _____ have been found to be unsearchable under Article 17(2)(b) because of defects under Article 17(2)(a) and therefore have not been included with any invention.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Shane Thomas PCT Helpdesk: 571-272-4300

Form PCT/ISA/206 (April 2005)

INVITATION TO PAY ADDITIONAL FEES
AND, WHERE APPLICABLE, PROTEST FEE

International application No.
PCT/US14/39852

Item 2 (continued). For International Applications filed on or after 01 January 2014, Applicant is reminded that the search fee per additional invention indicated in item 2 is the undiscounted fee per additional invention. An Applicant may pay the search fee per additional invention fee reduced by 50% (small entity assertion) or 75% (micro entity certification), as appropriate. See 37 CFR 1.27 and 1.29.

-***-Continued from 1.(ii)-***-

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fee must be paid.

Group I: Claims 1-18 are directed toward a method, system, and non-transitory computer-readable storage medium for supporting video streaming with trick play.

Group II: Claims 19-41 are directed toward a method, system, and non-transitory computer-readable storage medium for video playback with trick play.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I include encoding video into multiple adaptive bitrate streams; receiving a playlist request for one of the adaptive bitrate streams; and sending a playlist identifying the stored files of the selected stream, which are not present in Group II.

The special technical features of Group II include playing back video from the down loaded selected stream files; downloading the trick play files based on the playlist; and playing back video from the downloaded trick play files, which are not present in Group I.

The common technical features shared by Groups I and II are a non-transitory computer readable medium encoded with a computer program including instructions to cause a processor to execute the steps of: downloading files of encoded video from a selected stream of encoded video; sending and receiving a trick play playlist request corresponding to the selected stream; and sending and receiving a trick play playlist identifying files of encoded video from a trick play stream of encoded video corresponding to the selected stream.

However, these common features are previously disclosed by US 2012/0311094 A1 to Biderman, D et al. (hereinafter "Biderman"). Biderman discloses a non-transitory computer readable medium encoded with a computer program including instructions to cause a processor to execute the steps (system may be implemented with a processor executing instructions stored on a memory, paragraph [0179]) of: downloading files of encoded video from a selected stream of encoded video (player device downloads and uses a standard playlist including URLs referring to all of the content coimprising segmented media files, which the player then downloads in order, paragraphs [0010] and [0047]); sending and receiving a trick play playlist request corresponding to the selected stream; and sending and receiving a trick play playlist identifying files of encoded video from a trick play stream of encoded video corresponding to the selected stream (player device may request and download from a server an I-frame playlist for the content that allows playback at a faster than normal rate, called a "trick play" mode, paragraphs [0010] and [0055]).

Since the common technical features are previously disclosed by the Biderman reference, these common features are not special and so Groups I and II lack unity.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
DAVID J. BAILEY
CHRISTIE, PARKER & HALE, LLP
P.O. BOX 7068
PASADENA, CA 91109

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Applicant's or agent's file reference 59264P/D579	Date of mailing (*day/month/year*) 19 MAR 2008 **FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US07/63950	14 March 2007 (14.03.2007)	14 March 2006 (14.03.2006)

International Patent Classification (IPC) or both national classification and IPC

IPC: **H04L 9/32**(2006.01);**H04L 9/14**(2006.01)
USPC: 713/156;380/45;726/6

Applicant

DIVX, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I — Basis of the opinion
- ☐ Box No. II — Priority
- ☐ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV — Lack of unity of invention
- ☒ Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI — Certain documents cited
- ☐ Box No. VII — Certain defects in the international application
- ☐ Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	01 March 2008 (01.03.2008)	/Tongoc Tran/ Telephone No. (571)272-3843

Form PCT/ISA/237 (cover sheet) (April 2007)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US07/63950

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
   - ☒ the international application in the language in which it was filed
   - ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of:

   a. type of material
      - ☐ a sequence listing
      - ☐ table(s) related to the sequence listing

   b. format of material
      - ☐ on paper
      - ☐ in electronic form

   c. time of filing/furnishing
      - ☐ contained in the international application as filed.
      - ☐ filed together with the international application in electronic form.
      - ☐ furnished subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US07/63950

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	NONE	YES
	Claims	1-29	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-29	NO
Industrial applicability (IA)	Claims	1-29	YES
	Claims	NONE	NO

2. Citations and explanations:

Please See Continuation Sheet

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0379
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US07/63950

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims NONE	YES
	Claims 1-29	NO
Inventive step (IS)	Claims NONE	YES
	Claims 1-29	NO
Industrial applicability (IA)	Claims 1-29	YES
	Claims NONE	NO

2. Citations and explanations:

Please See Continuation Sheet

Form PCT/ISA/237 (Box No. V) (April 2007)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US07/63950

Supplemental Box
In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

Claims 1-29 lack inventive step under PCT Article 33(3) as being obvious over Irwin et al. (U.S. Patent Application Publication No. 2005/007280 A1, hereinafter Irwin) in view of Wu (U.S. Patent Application Publication No. 2006/0036549).

Claims 1-3, 11, 13, 15-19 and 21-27 lack an inventive step under PCT Article 33(3) as being obvious over Irwin (U.S. Patent Application Publication No. 2005/007280 A1)
With respect to claim 1, Irwin discloses a content distributed network, a registration server, a content server, a device, a registration process and a process for issuing playback certifications, comprising:
A registration server connected to a network (e.g. Fig. 1, License Server, [0032], [0089], register client, establish communication link, [0177], package rights documents with decryption keys, process encryption key [0032] ;
A content server connected to the network and to a trusted system (e.g. repository of content [0085], client device interaction, process client request [0085], implementing encryption technology [0100], [0135];
A first device including a non-volatile memory that is connected to the network (e.g. Fig. 1, client device);
A second device including a non-volatile memory that is connected to the network; and
Wherein the registration server is configured to provide the first device with a first set of activation information in a first format (e.g. Fig. 1, license service and client device);
Wherein the registration server is configured to store the first set of activation information in non-volatile memory.
Wherein the registration server is configured to provide the second device with a second set of activation information in a second format; and
Wherein the second device is configured to store the second set of activation information in non-volatile memory (e.g. Fig. 1, DRM controller,license store, unique PKI certificate [0144].
Irwin does not explicitly disclose the content server provide playback certifications containing at least one encrypted copy of the encryption keys used to encrypt the stored content and transmit the certication via the network interface. However, Irwin discloses encrypted content and encryption information is communicated with the client device (e.g. rights documents are packaged with appropriate decryption key [0032]). Furthermore, Wu discloses a content key is encrypted with specific device key (e.g. Wu, [0092]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the playback certificate containing encrypted keys provided by the content server with Wu's teaching of encrypting content key with device key to ensure the integrity of the content key used to decrypt the content.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0381
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US07/63950

Supplemental Box
In case the space in any of the preceding boxes is not sufficient.

With respect to claims 4 and 8, Irwin and Wu disclose the content distribution network of claim 2, wherein:
The first set of activation information is protected by a base encryption key and includes a user encryption key;
the playback certification includes information encrypted using the user encryption key (Wu, e.g. [0092]). Furthermore, encryption key generated with random number is common in encryption schemes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the teaching Irwin and Wu's utilization of content protection with base key and user key (or device key) with random number to improve the security of the digital content.

With respect to claim 5, Irwin and Wu disclose the content distribution system of claim 4, wherein the information encrypted using the base encryption key and the user encryption key enables playback of the technically protected content (Wu, e.g. [0092]).

With respect to claim 6, Irwin and Wu discloses the content distribution system of claim 4, wherein:
Wherein the second set of activation information includes the same base encryption key and a different user encryption key (Wu, e.g. [0092]).

With respect to claim 7, Irwin and Wu disclose the content distribution system of claim 4, wherein the second set of activation information includes a different base encryption key and a different user encryption key (Wu, e.g. [0092]).

With respect to claim 9, Irwin and Wu discloses the distribution system of claim 4, wherein:
The registration server is configure to revoke the user encryption key (Irwin, e.g. [0137]).

With respect to claim 10, Irwin and Wu discloses the content distribution system of claim 4, wherein the registration server is configure to revoke the user encryption key (Irwin, e.g. [0137]).

With respect to claim 12, Irwin and Wu disclose the registration server of claim 11, wherein the activation information includes a base encryption key and a user encryption key (Wu, e.g. [0092]).

With respect to claim 14, Irwin and Wu disclose the registration server of claim 11, wherein:
The processor is configured to generate multiple base encryption keys and multiple user encryption keys;
The activation information includes the multiple base encryption keys and a single user encryption key and information concerning an active base encryption key; The processor is configured to store the multiple base encryption keys and the multiple user encryption keys in the storage device; and the processor is configured to store information indicative of the active base encryption key and the user encryption key included in the activation information in the storage device (Wu, e.g. [0092]).

With respect to claim 20, Irwin and Wu disclose the device of claim 19, wherein the activation information includes a base encryption key and a user encryption key (Wu, e.g. [0092]).

With respect to claim 28, a process for issuing playback certifications, comprising:
Receiving a content key from content provider; Receiving playback parameters from a content provider;
Locating a user key and a base key associated with a device; Encrypting the playback parameters using the base key; Encrypting the content key using the user key; and Providing a playback certification including the encrypted playback parameters and the encrypted content key (Wu, e.g. [0092]).

With respect to claim 29, the process of claim 28, further comprising:
Locating multiple user keys and multiple base keys associated with a device; forming a playback parameters table, where each entry in the table includes the playback parameters encrypted using a different base key; forming a content key table, where each entry in the table includes a copy of the content key encrypted usig a different user key (Wu, e.g. [0092]).

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0382
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
PATRICK Y. IKEHARA
KAUTH, POMEROY, PECK & BAILEY LLP
2975 MICHELLE DRIVE, SUITE 110
IRVINE, CA 92606

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	23 JUL 2009
Applicant's or agent's file reference D1:01393.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 09/46588	08 June 2009 (08.06.2009)	06 June 2008 (06.06.2008)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06T 11/00 (2009.01)
USPC - 345/471

Applicant DIVX, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	14 July 2009 (14.07.2009)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (April 2007)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 09/46588

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of:

   a. type of material

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material

      ☐ on paper

      ☐ in electronic form

   c. time of filing/furnishing

      ☐ contained in the international application as filed

      ☐ filed together with the international application in electronic form

      ☐ furnished subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 09/46588

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	11-24	YES
	Claims	1-10, 25-27	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-27	NO
Industrial applicability (IA)	Claims	1-27	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-10 and 25-27 lack novelty under PCT Article 33(2) as being anticipated by US 2006/0168639 A1 to Gan et al. (hereinafter 'Gan').

As to claim 1, Gan discloses a method of generating textual information for a multimedia file ('The partial font generator analyzes the text required for an application and produces a partial font file containing those characters needed by the application' see abstract, para [0006], para [0016]), the method comprising: receiving text data ('resource files 36'), an original font file ('complete character set of the language') and a multimedia file having audio and video data ('video/audio stream 32) by a processor (see FIG 2, abstract, para [0015]-[0016]); and generating an optimized font file from the text data and the original font file by the processor, the generated font file being specifically matched to the text data and different from the original font file ('partial font file', 'The partial font file consists of those characters necessary to support the instant application in one or more languages, and is less than the full set of characters for a given language', see abstract, para [0019]).

As to claim 2, Gan discloses a method wherein the text data includes a plurality of characters and the generated font file contains representations that only match the plurality of characters ('The partial font file consists of those characters necessary to support the instant application in one or more languages, and is less than the full set of characters for a given language', see abstract, para [0019]).

As to claim 3, Gan discloses a method wherein the text data additionally includes a plurality of predetermined characters and the generated font file contains representations that only match the plurality of the characters and the plurality of predetermined characters (see FIG. 6, abstract, para [0021]).

As to claim 4, Gan discloses a method wherein the generated font file is smaller in file size than the original font file ('The partial font file consists of those characters necessary to support the instant application in one or more languages, and is less than the full set of characters for a given language', see abstract, para [0019]).

As to claim 5, Gan discloses a method wherein generating the font file further comprises segmenting the original font file ('With this generator the service provider or application programmer can select the character set needed by a particular application, resulting in a relatively small character font file which can be quickly transmitted with reduced transmission time or bandwidth requirements' see para [0005]-[0006]).

As to claim 6, Gan discloses a method wherein the generated font file is not guaranteed to be useable for another multimedia file different from the received multimedia file ('The partial font generator analyzes the text required for an application and produces a partial font file containing those characters needed by the application. ....Repetitive transmission of small, custom-designed character font files reduce the overhead allocation of bandwidth and resultant slowdown of the interactive television broadcast' see abstract, para [0006]).

As to claim 7, Gan discloses a method wherein the generated font file is useable only for the received multimedia file ('('The partial font generator analyzes the text required for an application and produces a partial font file containing those characters needed by the application' see abstract, para [0006]).

As to claim 8, Gan discloses a method further comprising rendering textual information for display by using the text data and the generated font file ('The application processor 56 is configured to receiver the application program and process the strings of characters of the application program and render the characters for display on the television set 22' see para [0016]).

As to claim 9, Gan discloses a method further comprising incorporating the generated font file into the multimedia file ('The transportstream is generally processed by a set-top box which is specially designed to process and execute the applications interleaved with the video and audio data in the transportstream. The applications can provide the viewer with unique or auxiliary information about a broadcast such as program listings and real time textual commentary, or interactive applications such as the ability to shop for goods and services by means of the television set' see abstract, para [0002]).

As to claim 10, Gan discloses a method further comprising associating at least one track with the generated font file to the multimedia file ('This library of fonts is inserted as a character font object file in the carousel, then transmitted together with the application in the transportstream. Alternatively the library of fonts is embedded in the application for insertion into the carousel and subsequent transmission' see para [0019]).

--(Continued in Supplemental Box)--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 09/46588

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Box V. 2. Citations and explanations:

As to claim 25, Gan discloses a textual information rendering system for generating textual information for a multimedia file ('The partial font generator analyzes the text required for an application and produces a partial font file containing those characters needed by the application' see abstract, para [0006], para [0016]), the system comprising: a demultiplexer configured to extract text data from a multimedia file having audio and video data (see para [0016]); a processor configured to create a font file from the text data and an original font file, the generated font file being specifically matched to the extracted text data and at least one predetermined character (see abstract, para [0016]); and memory coupled to the processor and storing the generated font file ('store' see para [0019]-[0020]).

As to claim 26, Gan discloses a system further comprising: a video decoder module integrated with the processor and configured to decode the video data; an audio decoder module integrated with the processor and configured to decode the audio data; and a text rendering engine configured to decode the extracted text data and to display text information by utilizing the generated font file and the decoded text data (see abstract, para [0006], para [0014]).

As to claim 27, Gan discloses a system wherein the processor segments the original font file prior to storing the original font file('With this generator the service provider or application programmer can select the character set needed by a particular application, resulting in a relatively small character font file which can be quickly transmitted with reduced transmission time or bandwidth requirements' see para [0005]-[0006]).

Claims 11-24 lacks an inventive step under PCT Article 33(3) as being obvious over Gan in view of US 2008/0120330 A1 to Reed et al. (hereinafter 'Reed').

As to claim 11, Gan discloses a method further comprising associating the multimedia file with a textual element of the text data that is not a subtitle ('In an application of the present invention the application program includes textual information such as a menu, programming information, or text relating to a broadcast TV program, including strings of characters in one or more languages' see para [0016]) but does not specifically disclose at least one metadata tag. However, Reed discloses a metadata tag in para [0262]. It would have been obvious to one of ordinary skill in the art to add Reed's metadata tags to Gan's method of generating textual information for a multimedia file in order to improve the system by having time stamps that relate the Content with the text (see Reed - para [0262]).

As to claim 12, Gan discloses a method further comprising associating a hierarchy of tags with a plurality of textual element and a generated font file ('Every transmission from the carousel constitutes an entire file directory structure 92, including all of the data necessary to start using the content at a particular point in the broadcast', 'partial font file' see para [0016]-[0019]), but does not specifically disclose a hierarchy of tags. However, Reed discloses a a hierarchy of tags in para [0262]-[0263]. It would have been obvious to one of ordinary skill in the art to add Reed's hierarchy of tags to Gan's method of generating textual information for a multimedia file in order to improve the system by having time stamps that relate the Content with the text (see Reed - para [0262]).

As to claim 13, Gan discloses a method of generating textual information for a multimedia file ('The partial font generator analyzes the text required for an application and produces a partial font file containing those characters needed by the application' see abstract, para [0006], para [0016]), the method comprising: identifying a plurality of time segments of a multimedia file having audio and video data ('video/audio stream 32) by a processor (see FIG 2, abstract, para [0015]-[0016]); and generating a plurality of font files by the processor from text data ('resource files 36') and an original font file ('complete character set of the language'), each generated font file (('partial font file') being specifically matched to the text data for each identified time segment (see abstract, para [0019]) but does not specifically disclose time segments. Reed, discloses time segments ('time slices') in para [0137]-[0139], para [0262]. It would have been obvious to one of ordinary skill in the art to add Reed's time slices to Gan's method of generating textual information for a multimedia file in order to improve the system by having time stamps that relate the Content with the text (see Reed - para [0262]).

As to claim 14, Reed discloses a method further comprising associating a single font file with an identified time segment, spanning the entire duration of the movie ('the system will have time stamps that relate the Content with the text' see abstract, para [0262]-[0263]).

As to claim 15, Reed discloses a method further comprising associating each font file with each identified time segment ('the system will have time stamps that relate the Content with the text', 'content timeline 1400' see FIG.14A, abstract, para [0262]-[0263], para [0520]).

As to claim 16, Reed discloses a method further comprising marking each font file to signify a time period over which each font file is available for rendering the text data ('the system will have time stamps that relate the Content with the text' see abstract, para [0262]-[0263]).

As to claim 17, Reed discloses a method wherein the plurality of time segments collectively corresponds to an overall timeline of subtitle data ('content timeline 1400' see FIG.14A, para [0520]).

As to claim 18, Reed discloses a method further tracking the overall timeline and rendering subtitle information at specific time periods using only a font file of the plurality of font files that corresponds to the time segment associated with the tracked timeline (see FIG.14A, para [0520]).

As to claim 19, Gan discloses a method further comprising rendering textual information for display by using the text data and the plurality of font files ('The application processor 56 is configured to receiver the application program and process the strings of characters of the application program and render the characters for display on the television set 22' see para [0016]).

--(Continued in Supplemental Box)--

Form PCT/ISA/237 (Supplemental Box) (April 2007)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 09/46588

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Box V. 2. Citations and explanations:

As to claim 20, Gan discloses a method further comprising incorporating the generated font file into the multimedia file ('The transportstream is generally processed by a set-top box which is specially designed to process and execute the applications interleaved with the video and audio data in the transportstream. The applications can provide the viewer with unique or auxiliary information about a broadcast such as program listings and real time textual commentary, or interactive applications such as the ability to shop for goods and services by means of the television set' see abstract, para [0002]).

As to claim 21, Gan discloses a method wherein the text data includes a plurality of characters and the generated font file collectively contain representations that only match the plurality of characters ('The partial font file consists of those characters necessary to support the instant application in one or more languages, and is less than the full set of characters for a given language', see abstract, para [0019]).

As to claim 22, Gan discloses a method further comprising associating at least one track in the multimedia file with a generated font file ('This library of fonts is inserted as a character font object file in the carousel, then transmitted together with the application in the transportstream. Alternatively the library of fonts is embedded in the application for insertion into the carousel and subsequent transmission' see para [0019]).

As to claim 23, Gan discloses a method further comprising associating at least one track in the multimedia file with several font files simultaneously ('This library of fonts is inserted as a character font object file in the carousel, then transmitted together with the application in the transportstream. Alternatively the library of fonts is embedded in the application for insertion into the carousel and subsequent transmission' see para [0019]).

As to claim 24, Gan discloses a method further comprising associating the multimedia file with a textual element of the text data that is not a subtitle ('in an application of the present invention the application program includes textual information such as a menu, programming information, or text relating to a broadcast TV program, including strings of characters in one or more languages' see para [0016]) but does not specifically disclose at least one tag. However, Reed specifically discloses a tag in para [0262]. It would have been obvious to one of ordinary skill in the art to add Reed's tags to Gan's method of generating textual information for a multimedia file in order to improve the system by having time stamps that relate the Content with the text (see para [0282]).

Claims 1-27 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

Form PCT/ISA/237 (Supplemental Box) (April 2007)

PATENT IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 19, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Tess Langseth-DePaolis/
Tess Langseth-DePaolis

Appl No.	: 16/136,183	Confirmation No. 2864
Applicant	: DIVX, LLC	
Filed	: September 19, 2018	
Title	: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys	
TC/A.U.	: 2434	
Examiner	: Abiy Getachew	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

INFORMATION DISCLOSURE STATEMENT § 1.97(b)

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806
November 19, 2018

Commissioner

In compliance with the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the MPEP §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B with a listing of references that are known to applicant. Copies of each of the references listed under “Non-Patent Literature Documents" are enclosed.

It is respectfully requested that these references be considered in the examination of this application and identified on the list of references cited on the patent issuing on this application. Applicant also requests that an initialed copy of said FORM PTO/SB/08A/B be entered in the application file, and returned to the Applicant with the next official communication from the Office in accordance with MPEP § 609.

It is believed that there are no fees due in connection with this filing. If there are any fees due in connection with this filing, the Commissioner is authorized to charge Deposit Account 50-4407. Please show our docket number with any charge to the Deposit Account.

Respectfully submitted,

KPPB LLP

/Paul J. Lee/
Paul J. Lee
Registration No. 69,375
949.852.0000

PJL/tld

Enclosures

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0389
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]
		1553779	EP	A1	2005-07-13	Huetter et al.		
		1723696	CN		2006-01-18	Gan et al.		
		20060012398	IB	A2	2006-02-02	Grab, Eric W.		
		2006018843	WO	A2	2006-02-23	Carmel et al.		
		1657835	EP	A1	2006-05-17	Kisoda et al.		
		2006155500	JP	A	2006-06-15	Makino et al.		
		2006524007	JP	A	2006-10-19	Morten		
		1718074	EP	A1	2006-11-02	Kobayashi et al.		
		2006018843	WO	A3	2006-12-14	Carmel et al.		
		100669616	KR	B1	2007-01-16	Park		
		2007036666	JP	A	2007-02-08	Takemura		
		2007044590	WO	A2	2007-04-19	Gonsalves et al.		
		2007174375	JP	A	2007-07-05	Toyoda et al.		
		2007235690	JP	A	2007-09-13	Naito		
		2007113836	WO	A2	2007-10-11	Carmel et al.		
		2007535881	JP	A	2007-12-06	Major, Robert et al.		
		2008010275	WO	A1	2008-01-24	Hatano		
		2008042242	WO	A2	2008-04-10	Starkenburg et al.		
		2008086313	WO	A1	2008-07-17	Osborne et al.		
		2008235999	JP	A	2008-10-02	Tomonari et al.		
		2007113836	WO	A3	2008-11-13	Carmel et al.		
		2008135932	WO	A2	2008-11-13	Hannuksela		
		2007113836	WO	B1	2008-12-24	Carmel et al.		
		2009065137	WO	A1	2009-05-22	Soroushian et al.		
		1125765	HK	A	2009-08-14	Grab et al.		
		2009530917	JP	A	2009-08-27	Russell et al.		
		2010060106	WO	A1	2010-05-27	Kohli et al.		
		2010080911	WO	A1	2010-07-15	Soroushian et al.		
		2010089962	WO	A1	2010-08-12	Hashimoto		
		2010108053	WO	A1	2010-09-23	Ma, Kevin J. et al.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		2010111261	WO	A1	2010-09-30	Ma, Kevin J. et al.		
		2010122447	WO	A1	2010-10-28	Foo et al.		
		146026	SG		2010-12-15	Grab et al.		
		2010147878	WO	A1	2010-12-23	Furbeck et al.		
		2011042898	WO	A1	2011-04-14	Shoham et al.		
		2011042900	WO	A1	2011-04-14	Shoham et al.		
		2011068668	WO	A1	2011-06-09	Chan et al.		
		2011103364	WO	A1	2011-08-25	Thorwirth		
		2011132184	WO	A1	2011-10-27	Katz et al.		
		2011135558	WO	A1	2011-11-03	Shoham et al.		
		2012035533	WO	A2	2012-03-22	Shoham et al.		
		2012035534	WO	A2	2012-03-22	Shoham et al.		
		2012035534	WO	A3	2012-07-05	Shoham et al.		
		20120094181	WO	A2	2012-07-12	Soroushian et al.		
		20120094189	WO	A1	2012-07-12	Braness et al.		
		2012094171	WO	A1	2012-07-12	Braness et al.		
		2012035533	WO	A3	2012-08-09	Shoham et al.		
		2486517	EP	A1	2012-08-15	Shoham et al.		
		2486727	EP	A1	2012-08-15	Shoham et al.		
		2507995	EP	A1	2012-10-10	Wood et al.		
		2012162806	WO	A1	2012-12-06	Wang et al.		
		2012171113	WO	A1	2012-12-20	Wang et al.		
		2564354	EP	A1	2013-03-06	Shoham et al.		
		2013030833	WO	A1	2013-03-07	Shoham et al.		
		2013032518	WO	A2	2013-03-07	Kiefer et al.		

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Electronic Acknowledgement Receipt

EFS ID:	34353844
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee/Tess Langseth-DePaolis
Filer Authorized By:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	19-NOV-2018
Filing Date:	19-SEP-2018
Time Stamp:	22:01:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	EP1553779A1.pdf	19980260 6cb1a50f271ef1449b9338f300f79892fca66149	no	29
Warnings:					

Information:					
2	Foreign Reference	cn1723696wabstractr.pdf	13340235 b1234ddabf4a7cc337376c5be522ce17d6594871	no	17
Warnings:					
Information:					
3	Foreign Reference	IB20060012398.pdf	1280635 de86cc04472e2ef6e829380d969ac0e3d55e3aac	no	35
Warnings:					
Information:					
4	Foreign Reference	WO2006018843A2.pdf	1366161 feac3510753cdca990d35f2b607e227ae1340b21	no	57
Warnings:					
Information:					
5	Foreign Reference	EP1657835A1.pdf	1846143 e8fe2fa9d753f8d3a42eeb15d19da30f5c39b1fb	no	27
Warnings:					
Information:					
6	Foreign Reference	JP_2006155500_Awabstract.pdf	1122425 b8e7c34c44e80f9930223d53dba1ac1c4b94fec9	no	11
Warnings:					
Information:					
7	Foreign Reference	jp2006524007wenglishtranslationr.pdf	8184075 f98ea922a42343b3cbcf3d760811ecb040c7814d	no	56
Warnings:					
Information:					
8	Foreign Reference	EP1718074A1.pdf	15327164 836a21a14f79ec8ab1dd7285d654243d68cc426c	no	110
Warnings:					
Information:					

9	Foreign Reference	WO2006018843A3.pdf	122039 130fbdfd9c23b2d7b59398dc37ff2529abd20f15	no	2
Warnings:					
Information:					
10	Foreign Reference	kr100669616wabstractr.pdf	3132509 f4c645dfe58c5557ef4de29a35e20fe92dccf143	no	11
Warnings:					
Information:					
11	Foreign Reference	jp2007036666wabstractr.pdf	10933585 9725410fa265a24f1a98be50c12a06f8eff81987	no	20
Warnings:					
Information:					
12	Foreign Reference	WO2007044590A2.pdf	2428282 eb017b9979d1a4e224635be71d90ca0783b9b247	no	18
Warnings:					
Information:					
13	Foreign Reference	JP2007174375Awabstractr.pdf	14274189 e9c53e0802aa5d73a982e9185cd939c4f4be1237	no	23
Warnings:					
Information:					
14	Foreign Reference	jp2007235690wabstractr.pdf	10127358 4ad79b4c2dd1adbf48a014afc3eb56730bbe8893	no	62
Warnings:					
Information:					
15	Foreign Reference	WO2007113836A2.pdf	2196597 2a4be95e3398967b39c4f75985a24308ae5b2b56	no	68
Warnings:					
Information:					

16	Foreign Reference	JP2007535881Awabstractr.pdf	3385312 2dae3c7ffee3973eec6f6bcf88debb21af8f3eac	no	24
Warnings:					
Information:					
17	Foreign Reference	WO2008010275A1.pdf	6761737 8d3cc507394a32167280bf522071d68b42bd95eb	no	56
Warnings:					
Information:					
18	Foreign Reference	WO2008042242A2.pdf	6861550 b6ed517e2a754c401fb4c4ec425ad482fe9af539	no	108
Warnings:					
Information:					
19	Foreign Reference	wo2008086313A1.pdf	5505038 f81312c4eedae4cae6dd49ad3556db406aff61d6	no	37
Warnings:					
Information:					
20	Foreign Reference	JP2008235999Awabstractr.pdf	5480203 9ebf479e884baaf4eb895309dd3697b2c536f9bf	no	38
Warnings:					
Information:					
21	Foreign Reference	wo2007113836A3.pdf	695821 fb2aa5ca2891fb9ccbf6b554f4057ede72f11092	no	14
Warnings:					
Information:					
22	Foreign Reference	WO2008135932.pdf	1983009 a283b398ac0e04ab343ffc7b10f1de938bfcf7e1	no	36
Warnings:					
Information:					

23	Foreign Reference	WO2007113836B1.pdf	1694212 ecd30bcc8c0ca6b2b8186839b83d3f7b5f7e1252	no	14
Warnings:					
Information:					
24	Foreign Reference	wo20090165137.pdf	1619978 138e8c3834b570744dfe84fc219a02e8ebc1d520	no	35
Warnings:					
Information:					
25	Foreign Reference	HK1125765.pdf	8260830 2b5c8589ef26d4dd43ded7b32535302b1333fb9d	no	43
Warnings:					
Information:					
26	Foreign Reference	JP2009530917Awabstract.pdf	2476955 c003d53647297f756678059ee6b4ce833b61776e	no	29
Warnings:					
Information:					
27	Foreign Reference	wo2010060106.pdf	5300560 f62b7fdd24a3013b42b7fd28b9ea7f02cbb7a088	no	67
Warnings:					
Information:					
28	Foreign Reference	wo2010080911.pdf	18069280 cfdbd98555280d239c81afdc9c10f151de341320	no	20
Warnings:					
Information:					
29	Foreign Reference	WO2010089962A1.pdf	2202897 0977810fc6902214ffaba5be966bfea917c9a398	no	39
Warnings:					
Information:					

30	Foreign Reference	WO2010108053A1.pdf	854247 8f3b334219fdef1b348183b579ea4e8d4ee6d04e	no	50
Warnings:					
Information:					
31	Foreign Reference	WO2010111261A1.pdf	2987904 e786e64eea4356543ce1fa02647a913c21980194	no	65
Warnings:					
Information:					
32	Foreign Reference	WO2010122447A1.pdf	20066008 dd3c91fc850f57ac74d98f652c96afccee58d326	no	22
Warnings:					
Information:					
33	Foreign Reference	sg146026.pdf	3603860 fa36b28a2a3623b442e6fb770344b554458e70fb	no	38
Warnings:					
Information:					
34	Foreign Reference	WO2010147878A1.pdf	4764963 a655f1befbac3520bf95e90ec1a2cb099bb7636f	no	34
Warnings:					
Information:					
35	Foreign Reference	WO2011042898A1.pdf	5429736 007e4f71d4a90298b5ad0a950550d6f8f60fb293	no	268
Warnings:					
Information:					
36	Foreign Reference	WO2011042900A1.pdf	2487864 15339a1e247794f82ba237e37a76e722e6ddb704	no	73
Warnings:					
Information:					

37	Foreign Reference	wo2011068668a1.pdf	1240870 73b19f2d7a020fde180d8e6dd8d5b0abf1571d42	no	34
Warnings:					
Information:					
38	Foreign Reference	wo2011103364a1.pdf	4534658 cdd68b153585d52c0ff1fed760091775aece0fac	no	30
Warnings:					
Information:					
39	Foreign Reference	WO2011132184A1.pdf	965305 fb361d17799370ba7418280f7dbabb6b4d888250	no	40
Warnings:					
Information:					
40	Foreign Reference	WO2011135558A1.pdf	841032 2d537fd00ab218c6def1295cbacd2eb2d1e17b9f	no	47
Warnings:					
Information:					
41	Foreign Reference	WO2012035533A2.pdf	878243 55883e990b6664eae197da2124382a1bc0e00e5b	no	41
Warnings:					
Information:					
42	Foreign Reference	WO2012035534A2.pdf	1188729 914d667a3ffd21881ffff0478bd48ecda91ebd72	no	51
Warnings:					
Information:					
43	Foreign Reference	WO2012035534A3.pdf	2726203 428af974ab1210c07687c91051ce110487d53f70	no	3
Warnings:					
Information:					

44	Foreign Reference	wo2012094181a2.pdf	6306109 577d9cedb7c1e6c35fe3e1b74c8c5ea1130e63b5	no	61
Warnings:					
Information:					
45	Foreign Reference	wo2012094189a1.pdf	5619286 80996ed2fadd93eb51f7f4e58d7ad82994eef02c	no	67
Warnings:					
Information:					
46	Foreign Reference	wo2012094171a1.pdf	5741781 22a6168dcbff4a65394888ba5ad4a7dff6cef9d5	no	57
Warnings:					
Information:					
47	Foreign Reference	WO2012035533A3.pdf	2647566 6e0312ef53a971bd2582d5d97f3aa2e65f609b96	no	3
Warnings:					
Information:					
48	Foreign Reference	EP2486517.pdf	10516830 f7486272bc12f5302c07300a8117136fc2ccec34	no	269
Warnings:					
Information:					
49	Foreign Reference	EP2486727.pdf	4496503 60aac24ab9c03c5edec39626f0a1a74fe28e00ad	no	74
Warnings:					
Information:					
50	Foreign Reference	EP02507995A1.pdf	21751 4816584dc66bea15a2d94ed041cd9a0a2cb26ed3	no	1
Warnings:					
Information:					

51	Foreign Reference	WO2012162806A1.pdf	1440306 22ce63532852da411e3b02ef1e86471757bc2dab	no	55
Warnings:					
Information:					
52	Foreign Reference	WO2012171113A1.pdf	1685342 9ee6ca7431570b852050e387211b1ef2e346e4a4	no	61
Warnings:					
Information:					
53	Foreign Reference	EP2564354A1.pdf	19775 9010e2279ba565b52983892c98736d76a4f4d0a4	no	1
Warnings:					
Information:					
54	Foreign Reference	WO2013030833A1.pdf	991956 5069a28ec34beac3c7057adc02a86c857c2ff5e5	no	97
Warnings:					
Information:					
55	Foreign Reference	wo2013032518a2.pdf	2956273 b9572f7daa8ab538b61ed61e2b6d56e264ab8832	no	86
Warnings:					
Information:					
56	Transmittal Letter	02359acon5xtmlpart2.pdf	106714 2168d792a9746fc43cd7760d0dfdabcbbfb3448d	no	2
Warnings:					
Information:					
57	Information Disclosure Statement (IDS) Form (SB08)	02359acon5sb08part2.pdf	121659 a6ff33c30d627783f938d795464283311731d2f4	no	3
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
			Total Files Size (in bytes):	271200512	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 19, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Tess Langseth-DePaolis/
Tess Langseth-DePaolis

Appl No.	: 16/136,183	Confirmation No. 2864
Applicant	: DIVX, LLC	
Filed	: September 19, 2018	
Title	: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys	
TC/A.U.	: 2434	
Examiner	: Abiy Getachew	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

INFORMATION DISCLOSURE STATEMENT § 1.97(b)

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806
November 19, 2018

Commissioner

In compliance with the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the MPEP §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B with a listing of references that are known to applicant. Copies of each of the references listed under "Foreign Patent Documents" are enclosed.

It is respectfully requested that these references be considered in the examination of this application and identified on the list of references cited on the patent issuing on this application. Applicant also requests that an initialed copy of said FORM PTO/SB/08A/B be entered in the application file, and returned to the Applicant with the next official communication from the Office in accordance with MPEP § 609.

It is believed that there are no fees due in connection with this filing. If there are any fees due in connection with this filing, the Commissioner is authorized to charge Deposit Account 50-4407. Please show our docket number with any charge to the Deposit Account.

Respectfully submitted,

KPPB LLP

/Paul J. Lee/
Paul J. Lee
Registration No. 69,375
949.852.0000

PJL/tld

Enclosures

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0404
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
		PAPAGIANNAKI ET AL., "Experimental Characterization of Home Wireless Networks and Design Implications", INFOCOM 2006, 25th IEEE International Conference of Computer Communications, Proceedings, April 2006, 13 pgs.	
		PEEK, DAVID, "Consumer Distributed File Systems", Dissertation, Doctor of Philosophy, Computer Science and Engineering, The University of Michigan, 2009, 118 pgs.	
		PHAMDO, "Theory of Data Compression", printed on October 10, 2003, 12 pgs.	
		RGB NETWORKS, "Comparing Adaptive HTTP Streaming Technologies", November 2011, Retrieved from: http://btreport.net/wp-content/uploads/2012/02/RGB-Adaptive-HTTP-Streaming-Comparison-1211-01.pdf, 20 pgs.	
		ROSENBERG ET AL., "Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)", Network Working Group, RFC 3840, August 2004, 36 pgs.	
		SCHULZRINNE, H., "Real Time Streaming Protocol 2.0 (RTSP): draft-ietfmmusic-rfc2326bis-27", MMUSIC Working Group of the Internet Engineering Task Force (IETF), March 9, 2011, 296 pgs. (presented in two parts).	
		SIGLIN, "HTTP Streaming: What You Need to Know", streamingmedia.com, 2010, 15 pgs.	
		SIGLIN, "Unifying Global Video Strategies, MP4 File Fragmentation for Broadcast, Mobile and Web Delivery", Nov. 16, 2011, 16 pgs.	
		SILVIO, "adaptive HTTP streaming for open codecs", October 9, 2010, [retrieved on: March 2, 2018], 15 pgs.	
		TAN, YAP-PENG ET AL., "Video transcoding for fast forward/reverse video playback", IEEE ICIP, 2002, 4 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		TAXAN, "AVel LinkPlayer2 for Consumer", I-O Data USA - Products - Home Entertainment, printed May 4, 2007 from http://www.iodata.com/usa/products/products.php?cat=HNP&sc=AVEL&pId=AVLP2/DVDLA&ts=2&tsc, 1 page.	
		TRIPATHI ET AL., "Improving Multimedia Streaming with Content-Aware Video Scaling", Retrieved from: http://digitalcommons.wpi.edu/computerscience-pubs/96, 2001, 17 pgs.	
		UNKNOWN, "AVI RIFF File Reference (Direct X 8.1 C++ Archive)", printed from http://msdn.microsoft.com/archive/en-us/dx81_c/directx_cpp/htm/aviriifffilereference.asp?fr...on March 6, 2006, 7 pgs.	
		UNKNOWN, "Entropy and Source Coding (Compression)", TCOM 570, 1999-9, pp. 1-22.	
		VENKATRAMANI ET AL., "Securing Media for Adaptive Streaming", Multimedia 2003 Proceedings of the Eleventh ACM International Conference on Multimedia, November 2-8, 2003, Berkeley, California, 4 pgs.	
		WANG ET AL., "Image Quality Assessment: From Error Visibility to Structural Similarity", IEEE Transactions on Image Processing, April 2004, Vol. 13, No. 4, pp. 600-612.	
		WU, FENG ET AL., "Next Generation Mobile Multimedia Communications: Media Codec and Media Transport Perspectives", In China Communications, October 2006, pp. 30-44.	
		ZAMBELLI, "IIS Smooth Streaming Technical Overview", Microsoft Corporation, March 2009, 17 pgs.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Electronic Acknowledgement Receipt

EFS ID:	34354397
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee/Tess Langseth-DePaolis
Filer Authorized By:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	19-NOV-2018
Filing Date:	19-SEP-2018
Time Stamp:	22:05:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	papagiannakietal.pdf	5549862 4c5192c785471cc5629c48da40f7204099cb9f32	no	13

Warnings:

Information:					
2	Non Patent Literature	peek118pgs.pdf	645344 74007c225ce3c66b8b31be8e453aa8c67d63ae18	no	118
Warnings:					
Information:					
3	Non Patent Literature	phamdo12pgs.pdf	1671273 45dadad05efe79b965727f067e80daa36f9f0d7f	no	12
Warnings:					
Information:					
4	Non Patent Literature	rgbnetworks20pgs.pdf	1980675 e5d8a46580503a0914baff0cf2123afdd466a59c	no	20
Warnings:					
Information:					
5	Non Patent Literature	rosenberg36pgs.pdf	139178 75b1c148e6b199e2c53d4724eb4097ba86bac700	no	36
Warnings:					
Information:					
6	Non Patent Literature	part1of2schulzrinneretal296pgs.pdf	9343468 09de7434075de1c81f990096f181cff0243688bf	no	148
Warnings:					
Information:					
7	Non Patent Literature	part2of2schulzrinneretal296pgs.pdf	8285328 8e4e3a2d1d5f39151b3cc3caf564f6ecf2fe94f6	no	148
Warnings:					
Information:					
8	Non Patent Literature	siglinhttpstreamingwhatyou.pdf	1321101 9d597990f5d1920a25d71b57054313d801ec36e2	no	12
Warnings:					
Information:					

9	Non Patent Literature	siglinunifyingglobalvideo.pdf	290993 52de0de2621f85937a61e34b80e7e78f85e e83d7	no	16
Warnings:					
Information:					
10	Non Patent Literature	silvio15pgs.pdf	1199115 ab70975e2096c19226349effa26f17e74626 2fe2	no	15
Warnings:					
Information:					
11	Non Patent Literature	tanetali-713-i-716.pdf	605790 359c91679ddb60a4df3a1e5b1781d348548 60508	no	4
Warnings:					
Information:					
12	Non Patent Literature	taxanavellinkplayer2.pdf	123498 c87090bd00eb62cc65e1e80ba700bf68a78 e06a9	no	1
Warnings:					
Information:					
13	Non Patent Literature	tripathietal17pgs.pdf	1484766 3c4f155d669fa727c1b32ad6aa5e605aa41f 39b5	no	17
Warnings:					
Information:					
14	Non Patent Literature	avirifffilereference.pdf	764464 adc6ffefa5a7615fab7005f786f14b1b16d29 353	no	7
Warnings:					
Information:					
15	Non Patent Literature	entropyandsourcecoding.pdf	4832914 57b796e0719548e5f863e20f4659bc0f01b2 de85	no	22
Warnings:					
Information:					

16	Non Patent Literature	venkatramani-SecuringMedia.pdf	207251 3b28bdf2a4de3abb609c53561f3211d2b5159e94	no	4
Warnings:					
Information:					
17	Non Patent Literature	wangetal600-612.pdf	12285194 98abb6923f91f6b8bc4d03a8589b7492ce65f163	no	13
Warnings:					
Information:					
18	Non Patent Literature	wuetal30-44.pdf	531664 90d5c50477ab9105fec69b5430cc905fefece34e	no	15
Warnings:					
Information:					
19	Non Patent Literature	zambelli17pgs.pdf	1097767 5d15b1473580d7a5a447c0324d8b91e36fc42a96	no	17
Warnings:					
Information:					
20	Transmittal Letter	02359acon5xtmlpart7.pdf	106657 a84b09f0e60c3e3781ac96899c81e2afa1f718bb	no	2
Warnings:					
Information:					
21	Information Disclosure Statement (IDS) Form (SB08)	02359acon5sb08part7.pdf	119147 dbbb72ffa1f01ca905aa048bbb9a882df7925a70	no	3
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
		Total Files Size (in bytes):	52585449		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 19, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Tess Langseth-DePaolis/
Tess Langseth-DePaolis

Appl No.	: 16/136,183	Confirmation No. 2864
Applicant	: DIVX, LLC	
Filed	: September 19, 2018	
Title	: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys	
TC/A.U.	: 2434	
Examiner	: Abiy Getachew	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

INFORMATION DISCLOSURE STATEMENT § 1.97(b)

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806
November 19, 2018

Commissioner

In compliance with the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the MPEP §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B with a listing of references that are known to applicant. Copies of each of the references listed under “Non-Patent Literature Documents" are enclosed.

It is respectfully requested that these references be considered in the examination of this application and identified on the list of references cited on the patent issuing on this application. Applicant also requests that an initialed copy of said FORM PTO/SB/08A/B be entered in the application file, and returned to the Applicant with the next official communication from the Office in accordance with MPEP § 609.

It is believed that there are no fees due in connection with this filing. If there are any fees due in connection with this filing, the Commissioner is authorized to charge Deposit Account 50-4407. Please show our docket number with any charge to the Deposit Account.

Respectfully submitted,

KPPB LLP

/Paul J. Lee/
Paul J. Lee
Registration No. 69,375
949.852.0000

PJL/tld

Enclosures

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0414
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 5
		AUTHOR UNKNOWN, "Tunneling QuickTime RTSP and RTP over HTTP", Published by Apple Computer, Inc.: 1999 (month unknown), 6 pgs.	
		AUTHOR UNKNOWN, "Turbo-Charge Your Internet and PC Performance", printed October 30, 2008 from Speedtest.net - The Global Broadband Speed Test, 1 page.	
		AUTHOR UNKNOWN, "White paper, The New Mainstream Wireless LAN Standard", Broadcom Corporation, July 2003, 12 pgs.	
		BLASIAK, "Video Transrating and Transcoding: Overview of Video Transrating and Transcoding Technologies", Ingenient Technologies, TI Developer Conference, August 6-8, 2002, 22 pgs.	
		BLOOM ET AL., "Copy Protection for DVD Video", Proceedings of the IEEE, Vol. 87, No. 7, July 1999, pp. 1267-1276.	
		BOCHAROV ET AL., "Portable encoding of audio-video objects: The Protected Interoperable File Format (PIFF)", Microsoft Corporation, September 8, 2009, Revised: March 9, 2010, 32 pgs.	
		BROSS ET AL., "High Efficiency Video Coding (HEVC) text specification draft 10 (for FDIS & Last Call)", Joint Collaborative Team on Video Coding (JCT-VC) of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11, Document: JCTVC-L1003_v34, 12th Meeting: Geneva, CH, January 14 – 23, 2013, 310 pgs (presented in three parts).	
		CASARES ET AL., "Simplifying Video Editing Using Metadata", DIS2002, 2002, pp.157-166.	
		CONCOLATO ET AL., "Live HTTP Streaming of Video and Subtitles within a Browser", MMSys 2013, February 26- March 1, 2013, Oslo, Norway, 5 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		DEUTSCHER, "IIS Transform Manager Beta - Using the MP4 to Smooth Task", Retrieved from: https://web.archive.org/web/20130328111303/http://blog.johndeutscher.com/category/smooth-streaming, Blog post of April 29, 2011, 14 pgs.	
		ESKICIOGLU ET AL., "An Integrated Approach to Encrypting Scalable Video", Proceedings IEEE International Conference on Multimedia and Expo, August 26-29, 2002, Lausanne, Switzerland, 4 pgs.	
		FECHEYR-LIPPENS, "A Review of HTTP Live Streaming", INTERNET CITATION, 25 January 2010, pp. 1-37.	
		GANNES, "The Lowdown on Apple's HTTP Adaptive Bitrate Streaming", GigaOM, June 10, 2009, 12 pgs.	
		GARG ET AL., "An Experimental Study of Throughput for UDP and VoIP Traffic in IEEE 802.11b Networks", Wireless Communications and Networkings, March 2003, pp. 1748-1753.	
		GAST, "When is 54 Not Equal to 54? A Look at 802.11a, b and g Throughput", August 8, 2003, printed October 30, 2008 from www.oreillynet.com/pub/a/wireless/2003/08/08/wireless_throughput.html, 4 pgs.	
		GHOSH, "Enhancing Silverlight Video Experiences with Contextual Data", Retrieved from: http://msdn.microsoft.com/en-us/magazine/ee336025.aspx, 2010, 15 pgs.	
		GRIFFITH, ERIC, "The Wireless Digital Picture Frame Arrives", Wi-Fi Planet, printed May 4, 2007 from http://www.wi-fiplanet.com/news/article.php/3093141, October 16, 2003, 3 pgs.	
		HARTUNG ET AL., "DRM Protected Dynamic Adaptive HTTP Streaming", MMSys 2011 Proceedings of the Second Annual ACM Conference on Multimedia Systems, San Jose, California, February 23-25, 2011, pp. 277-282.	
		HURTADO GUZMAN, JUAN ESTEBAN, "Development and Implementation of an Adaptive HTTP Streaming Framework for H264/MVC Coded Media", Politecnico di Torino, November 2010, 108 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		HWANG ET AL., "Efficient and User Friendly Inter-domain Device Authentication/Access control for Home Networks", Proceedings of the 2006 International Conference on Embedded and Ubiquitous Computing, Seoul, Korea, August 1-4, 2006, pp. 131-140.	
		INLET TECHNOLOGIES, "Adaptive Delivery to iDevices", 2010, 2 pgs.	
		INLET TECHNOLOGIES, "Adaptive delivery to iPhone 3.0", 2009, 2 pgs.	
		INLET TECHNOLOGIES, "HTTP versus RTMP", 2009, 3 pgs.	
		INLET TECHNOLOGIES, "The World's First Live Smooth Streaming Event: The French Open", 2009, 2 pgs.	
		KASPAR ET AL., "Using HTTP Pipelining to Improve Progressive Download over Multiple Heterogeneous Interfaces", IEEE ICC proceedings, 2010, 5 pgs.	
		KIM, KYUHEON, "MPEG-2 ES/PES/TS/PSI", Kyung-Hee University, October 4, 2010, 66 pgs.	
		KOZINTSEV ET AL., "Improving last-hop multicast streaming video over 802.11", Workshop on Broadband Wireless Multimedia, October 2004, pp. 1-10.	
		KURZKE ET AL., "Get Your Content Onto Google TV", Google, Retrieved from: http://commondatastorage.googleapis.com/io2012/presentations/live%20to%20website/1300.pdf, 2012, 58 pgs.	
		LANG, "Expression Encoder, Best Practices for live smooth streaming broadcasting", Microsoft Corporation, 2010, retrieved from http://www.streamingmedia.com/conferences/west2010/presentations/SMWest-12010-Expression-Encoder.pdf, 20 pgs.	
		LEVKOV, "Mobile Encoding Guidelines for Android Powered Devices", Adobe Systems Inc., Addendum B, 22 December 2010, 42 pgs.	
		LI ET AL., "Content-Aware Playout and Packet Scheduling for Video Streaming Over Wireless Links", IEEE Transactions on Multimedia, Vol. 10, No. 5, August 2008, pp. 885-895.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		LIAN ET AL., "Efficient video encryption scheme based on advanced video coding", Multimed. Tools Appl. Vol. 38, 2008, pp. 75-89.	
		LIU ET AL., "A Formal Framework for Component Deployment", OOPSLA 2006, Proceedings of the 21st Annual ACM SIGPLAN Conference on Object-Oriented Programming Systems, Language, and Applications, Portland, Oregon, October 22-26, 2006, pp. 325-344.	
		LONG ET AL., "Silver: Simplifying Video Editing with Metadata", CHI 2003: New Horizons, April 5-10, 2003, pp. 628-629.	
		MATROSKA, "Diagram", Matroska, Technical/Info, Diagram, 2016, retrieved from https://www.matroska.org/technical/diagram/index.html on July 20, 2017, 9 pgs.	
		MATROSKA, "Specifications", Matroska, Technical/Info, Specifications, June 25, 2017, retrieved from https://www.matroska.org/technical/specs/index.html on July 20, 2017, 20 pgs.	
		MIRAS, "On Quality Aware Adaptation of Internet Video", University of London, PhD dissertation, 2004, 181 pgs.	
		MORRISON, "EA IFF 85 Standard for Interchange Format Files", January 14, 1985, printed from http://www.dcs.ed.ac.uk/home/mxr/gfx/2d/IFF.txt on March 6, 2006, 24 pgs.	
		MOSCOSO, PEDRO GOMES, "Interactive Internet TV Architecture Based on Scalable Video Coding", Instituto Superior Techico, Universidad Technica de Lisboa, May 2011, 103 pgs.	
		MSDN, "Adaptive streaming, Expression Studio 2.0", April 23, 2009, 2 pgs.	
		NELSON, "Arithmetic Coding + Statistical Modeling = Data Compression: Part 1 - Arithmetic Coding", Doctor Dobb's Journal, February 1991, USA, pp. 1-12.	
		NELSON, "Smooth Streaming Deployment Guide", Microsoft Expression Encoder, August 2010, 66 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		NELSON, MICHAEL, "IBM's Cryptolopes", Complex Objects in Digital Libraries Course, Spring 2001, Retrieved from http://www.cs.odu.edu/~mln/teaching/unc/inls210/?method=display&pkg_name=cryptolopes.pkg&element_name=cryptolopes.ppt, 12 pgs.	
		NOBORU, "Play Fast and Fine Video on Web! codec", Co.9 No.12, December 1, 2003, pp. 178-179.	
		NOE, A., "Matroska File Format (under construction!)", Retrieved from the Internet: URL:http://web.archive.org web/20070821155146/www.matroska.org/technical/specs/matroska.pdf [retrieved on 2011-01-19], 6/24/2007, pp. 1-51.	
		NOE, ALEXANDER, "AVI File Format", http://www.alexander-noe.com/video/documentation/avi.pdf, December 14, 2006, pp. 1-26.	
		NOE, ALEXANDER, "Definitions", April 11, 2006, retrieved from http://www.alexander-noe.com/video/amg/definitions.html on October 16, 2013, 2 pgs.	
		OOYALA, "Widevine Content Protection", Ooyala Support Center for Developers. Ooyala, Inc., 2013. June 3, 2013. http://support.ooyala.com/developers/documentation/concepts/player_v3_widevine_integration.html, 7 pgs.	
		OYMAN ET AL., "Quality of Experience for HTTP Adaptive Streaming Services", IEEE Communications Magazine, April 2012, Vol. 50, No. 4, DOI: 10.1109/MCOM.2012.6178830, pp. 20-27.	
		OZER, "The 2012 Encoding and Transcoding Buyers' Guide", Streamingmedia.com, Retrieved from: http://www.streamingmedia.com/Articles/Editorial/Featured-Articles/The-2012-Encoding-and-Transcoding-Buyers-Guide-84210.aspx, 2012, 8 pgs.	
		OZER, JAN, "Adaptive Streaming in the Field", Streaming Media, December 2010-January 2011, pp. 36-47.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		PADIADPU, RASHMI, "Towards Mobile Learning: A SCORM Player for the Google Android Platform", Master Thesis, Hamburg University of Applied Sciences, 2008, 66 pgs.	
		PANTOS, "HTTP Live Streaming, draft-pantos-http-live-streaming-10", IETF Tools, October 15, 2012, Retrieved from: http://tools.ietf.org/html/draft-pantos-http-live-streaming-10, 37 pgs.	
		PANTOS, R., "HTTP Live Streaming: draft-pantos-http-live-streaming-06", Published by the Internet Engineering Task Force (IETF), March 31, 2011, 24 pgs.	

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Electronic Acknowledgement Receipt

EFS ID:	34354343
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee/Tess Langseth-DePaolis
Filer Authorized By:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	19-NOV-2018
Filing Date:	19-SEP-2018
Time Stamp:	22:04:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	tunnelingquicktimertsp.pdf	141302 d32330b10c6c7452903320d3f2ef3d36599dbd8f	no	6

Warnings:

Information:					
2	Non Patent Literature	turbocharge.pdf	99358 735ba6c6a5dd173fe54dce85e2fc8ffabfbfe7ce	no	1
Warnings:					
Information:					
3	Non Patent Literature	whitepaperthenewmainstream.pdf	8351208 3653b5eb56e773917bf23225af2af3a4e5e70015	no	12
Warnings:					
Information:					
4	Non Patent Literature	blasiak22pgs.pdf	7991343 0ebfcc8beb9a946424c41e1180c7c652f6b230b2	no	22
Warnings:					
Information:					
5	Non Patent Literature	bloom1999.pdf	348601 208df31256b0758a738dd205701fa29c8ce5c3a3	no	10
Warnings:					
Information:					
6	Non Patent Literature	bocharovportableencoding.pdf	6289451 5e1054f90eabf5532f47560f77fe3b3c4591157e	no	32
Warnings:					
Information:					
7	Non Patent Literature	brossetal310pgspart1of3.pdf	19078534 0ecd122396f3ef3aa8987dcc7dd633829313351e	no	103
Warnings:					
Information:					
8	Non Patent Literature	brossetal310pgspart2of3.pdf	19082273 2eecd308c283360dae76cb1ec2e374ca54f42b9c	no	108
Warnings:					
Information:					

9	Non Patent Literature	brossetal310pgspart3of3.pdf	19362997 0ab814d9b4461df0361589f2eb8204177d7f02f2	no	100
Warnings:					
Information:					
10	Non Patent Literature	casares.pdf	8112001 97ad5fe9d57db3dbfb79ee0b07a8b901cb7d7cf3	no	10
Warnings:					
Information:					
11	Non Patent Literature	concolato.pdf	332322 3e49a11f13939af7becd902744cbff91ac325cfe	no	5
Warnings:					
Information:					
12	Non Patent Literature	deutscheriistransformmanager14pgs.pdf	1064216 b83a17b889436461eb1a8b3b5c1e91653a098534	no	14
Warnings:					
Information:					
13	Non Patent Literature	eskicioglu.pdf	166009 a958588d3246a611e5f98f364e8f0f6708a8fa48	no	4
Warnings:					
Information:					
14	Non Patent Literature	FECHEYR-LIPPENS.pdf	2175517 ef5a0005db150dfb131aa5e6955518ca7b210f9f	no	38
Warnings:					
Information:					
15	Non Patent Literature	gannes12pgs.pdf	2277215 bd085b6f52ddd6779e63c2c49ecf920eb814d2c0	no	12
Warnings:					
Information:					

16	Non Patent Literature	gargetal1748-1753.pdf	3927185 053867c41dbdc6fc8efb04647883345509b9a244	no	6
Warnings:					
Information:					
17	Non Patent Literature	gast-whenis54notequal.pdf	2508147 05e01f82758ff86364374f79859029f883909684	no	4
Warnings:					
Information:					
18	Non Patent Literature	ghoshenhancingsilverlightvideo15pgs.pdf	879482 c68dc12c3c08af0a5c58420b6e9c485491162937	no	15
Warnings:					
Information:					
19	Non Patent Literature	griffithwifiplanet3pgs.pdf	522805 998b523dcae7f0b7273998e816a621d2c45cc42b	no	3
Warnings:					
Information:					
20	Non Patent Literature	hartung2011.pdf	2788029 9f9aa4c9ec3771d184baaae4bc8b52cb02bdff79	no	6
Warnings:					
Information:					
21	Non Patent Literature	HurtadoGuzman.pdf	13811221 1c9daf26f48cf7660601c22753e0cd376158800d	no	108
Warnings:					
Information:					
22	Non Patent Literature	hwang2006.pdf	221947 47f2ef18b97caf2c6ec3d21b6100e472d0d9a8c0	no	10
Warnings:					
Information:					

23	Non Patent Literature	inlet-adaptivedeliverytoidevices2pgs.pdf	504115 579618374baab777dc3958af407bcf8760118f6b	no	2
Warnings:					
Information:					
24	Non Patent Literature	inletadaptivedeliveriphone30-2pgs.pdf	460973 c898acadd4149bb8972ba8e894658267411295 06	no	2
Warnings:					
Information:					
25	Non Patent Literature	inlet-httpversusrtmp3pgs.pdf	254318 ccd9074668c471629f8239c26d804c7fb0287e20	no	3
Warnings:					
Information:					
26	Non Patent Literature	inlet-worldsfirstlivestreamfrenchopenpdf2pgs.pdf	733061 092d685f2ba064e91804ff68b2d9627a474091 54	no	2
Warnings:					
Information:					
27	Non Patent Literature	kasparetal5pgs.pdf	505693 e415272deadeb9a46b794ed1e56d5e81a8177f9b	no	5
Warnings:					
Information:					
28	Non Patent Literature	KIM-mpeg2espestspsi.pdf	5387316 494f251c7a4e30af7929ff685875b04d378080d0	no	66
Warnings:					
Information:					
29	Non Patent Literature	kozintsevetal10pgs.pdf	4227940 d89c41e888771c821ae6ecf3a068477f2aaa0bbf	no	10
Warnings:					
Information:					

30	Non Patent Literature	kurzkeetal58pgs.pdf	3439341 7bf8851b5ee0fa70835d41787146d06cb17b85c2	no	58
Warnings:					
Information:					
31	Non Patent Literature	langexpressionencoder.pdf	1664576 8e4be64d6928827cd4a9110e6eaf1f7cdc900bf3	no	20
Warnings:					
Information:					
32	Non Patent Literature	levkov42pgs.pdf	5689465 779eb3c615c2067e728cac4bdf52de9e2c04d9db	no	42
Warnings:					
Information:					
33	Non Patent Literature	lietal885-895.pdf	8314140 246dda2217c17f789b747365533b8755b0ca1b51	no	11
Warnings:					
Information:					
34	Non Patent Literature	lianefficientvideo.pdf	295472 8fd38261e3e513e1b6b9ae2d7e43ffb8bc59d560	no	15
Warnings:					
Information:					
35	Non Patent Literature	liuetal325-344.pdf	736985 953bbae49e76e9a881e4276a7e17b21b8b4c55b6	no	19
Warnings:					
Information:					
36	Non Patent Literature	longetal628-629.pdf	2370466 02e1bc920eccb2818bff31e0f997cddcfde5219e	no	2
Warnings:					
Information:					

37	Non Patent Literature	Matroska-Diagram9pgs.pdf	2230131 fd3f07342b9e28a92fa2959ace534db77cd8046f	no	9
Warnings:					
Information:					
38	Non Patent Literature	Matroska-Specifications20pgs.pdf	5747271 d32c543392b5be1bd1c6e20f087f11451146d6f0	no	20
Warnings:					
Information:					
39	Non Patent Literature	miras.pdf	3446222 43d9a35594e634976db01d8e4572fa371318fb7d	no	181
Warnings:					
Information:					
40	Non Patent Literature	morrisoneaiff85.pdf	4255970 bda276008d2f48c54bfc3b729648bd2ac59a8863	no	24
Warnings:					
Information:					
41	Non Patent Literature	moscoso.pdf	2437574 c79a8b418433c599a4eb18343e563342b59b9aac	no	103
Warnings:					
Information:					
42	Non Patent Literature	msdnadaptivestreaming.pdf	40336 b3ea89e82172acfd365398e43af3d9131add30c2	no	2
Warnings:					
Information:					
43	Non Patent Literature	nelsonarithmeticcoding.pdf	12036354 4801d316e14ef967d7b5da9832323e533a8a4c53	no	12
Warnings:					
Information:					

44	Non Patent Literature	nelson66pgs.pdf	8886009 5792da4b5d5aec31f696c8a3ebc5f30b8acd19ba	no	66
Warnings:					
Information:					
45	Non Patent Literature	nelsonIBMsCryptolopes.pdf	150141 e63d53a0f674c49d120457eab4f37cccf65ca41a	no	12
Warnings:					
Information:					
46	Non Patent Literature	noboru.pdf	1513736 0f6780eddb9ce8e25de98c26d6a24979fdf3e213	no	2
Warnings:					
Information:					
47	Non Patent Literature	noematroskafileformat1-51.pdf	2639239 881fe902c571e9c3456673e923874e21ddeebd48	no	51
Warnings:					
Information:					
48	Non Patent Literature	noeavifileformat.pdf	2949086 59fd8b8e0bb24245a47cbcba88fa2c77c3416ec6	no	26
Warnings:					
Information:					
49	Non Patent Literature	noedefinitions.pdf	515064 c444baa1fbc7b8e8eae2563d9a52f068e34d858f	no	2
Warnings:					
Information:					
50	Non Patent Literature	ooyalaWidevineContentProtection.pdf	593081 ff69b042a5a09fbf525625a39b43a79c6df7981a	no	7
Warnings:					
Information:					

51	Non Patent Literature	oymanetal20-27.pdf	5633256 952449e9304fdcd6c2c6f95fef359cfc57cb2253	no	8
Warnings:					
Information:					
52	Non Patent Literature	ozerthe2012encoding.pdf	1154277 d66ebeff99ff5d490a06b9a3b1c0ac6dabe3ab54	no	8
Warnings:					
Information:					
53	Non Patent Literature	ozer2010.pdf	302382 f45fc4edd03a361dacdf24ed24c82c063ef0edd0	no	9
Warnings:					
Information:					
54	Non Patent Literature	padiadpu66pgs.pdf	3175447 bafd81fdfed9b294abc9013ff66acc3aae1ed215	no	66
Warnings:					
Information:					
55	Non Patent Literature	pantoshttplivestreamingdraft10.pdf	70810 ea69d853ab13a16a542a43709c307906e046bc54	no	37
Warnings:					
Information:					
56	Non Patent Literature	pantos24pgs.pdf	410257 467886b5b78debcb1421fb1c82209322b8162fc3	no	24
Warnings:					
Information:					
57	Transmittal Letter	02359acon5xtmlpart6.pdf	106663 e087ba9268721e5d1d012fc7c4e71e3549e4b9dc	no	2
Warnings:					
Information:					

58	Information Disclosure Statement (IDS) Form (SB08)	02359acon5sb08part6.pdf	140646 c2c80c6a8318674a7965f77913f3c408b8f3e9e6	no	6

Warnings:

Information:

This is not an USPTO supplied IDS fillable form

Total Files Size (in bytes):	212548976

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 19, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Tess Langseth-DePaolis/
Tess Langseth-DePaolis

Appl No.	: 16/136,183	Confirmation No. 2864
Applicant	: DIVX, LLC	
Filed	: September 19, 2018	
Title	: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys	
TC/A.U.	: 2434	
Examiner	: Abiy Getachew	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

INFORMATION DISCLOSURE STATEMENT § 1.97(b)

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806
November 19, 2018

Commissioner

In compliance with the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the MPEP §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B with a listing of references that are known to applicant. Copies of each of the references listed under “Non-Patent Literature Documents" are enclosed.

It is respectfully requested that these references be considered in the examination of this application and identified on the list of references cited on the patent issuing on this application. Applicant also requests that an initialed copy of said FORM PTO/SB/08A/B be entered in the application file, and returned to the Applicant with the next official communication from the Office in accordance with MPEP § 609.

It is believed that there are no fees due in connection with this filing. If there are any fees due in connection with this filing, the Commissioner is authorized to charge Deposit Account 50-4407. Please show our docket number with any charge to the Deposit Account.

Respectfully submitted,

KPPB LLP

/Paul J. Lee/
Paul J. Lee
Registration No. 69,375
949.852.0000

PJL/tld

Enclosures

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0432
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		4009331		1977-02-22	Goldmark et al.	
		4694357		1987-09-15	Rahman et al.	
		4802170		1989-01-31	Trottier, Lorne	
		4964069		1990-10-16	Ely, Joseph C.	
		5119474		1992-06-02	Beitel, Bradley J. et al.	
		5274758		1993-12-28	Beitel, Bradley J. et al.	
		5361332	A	1994-11-01	Yoshida et al.	
		5396497		1995-03-07	Veltman, Markus H.	
		5404436	A	1995-04-04	Hamilton, Robert H.	
		5420801		1995-05-30	Dockter, Michael J. et al.	
		5420974		1995-05-30	Morris, James K. et al.	
		5471576		1995-11-28	Yee, Raymond L.	
		5479303		1995-12-26	Suzuki et al.	
		5487167		1996-01-23	Dinallo, Chris A. et al.	
		5502766	A	1996-03-26	Boebert, William et al.	
		5509070	A	1996-04-16	Schull, Jonathan	
		5533021		1996-07-02	Branstad, Mark W. et al.	
		5537408		1996-07-16	Branstad, Mark W. et al.	
		5539908		1996-07-23	Chen, Fetchi et al.	
		5541662		1996-07-30	Adams, Robert et al.	
		5583652		1996-12-10	Ware, Malcohm S.	
		5589993	A	1996-12-31	Naimpally, Saiprasad et al.	
		5621794	A	1997-04-15	Matsuda, Masahiro et al.	
		5627936		1997-05-06	Prasad, Rama R.	
		5633472		1997-05-27	DeWitt, Frederick J. et al.	
		5642171		1997-06-24	Baumgartner et al.	
		5655117		1997-08-05	Goldberg et al.	
		5664044		1997-09-02	Ware, Malcolm S.	
		5675382		1997-10-07	Bauchspies	
		5675511		1997-10-07	Prasad, Rama R. et al.	
		5684542		1997-11-04	Tsukagoshi	
		5715403	A	1998-02-03	Stefik, Mark	
		5717816		1998-02-10	Boyce et al.	
		5719786		1998-02-17	Nelson et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		5745643		1998-04-28	Mishina, M.	
		5751280		1998-05-12	Abbott, Michael J.	
		5754648	A	1998-05-19	Ryan et al.	
		5763800		1998-06-09	Rossum, David P. et al.	
		5765164		1998-06-09	Prasad et al.	
		5794018		1998-08-11	Vrvilo, Benjamin et al.	
		5805700	A	1998-09-08	Nardone, Joseph et al.	
		5822524		1998-10-13	Chen et al.	
		5828370		1998-10-27	Moeller et al.	
		5841432	A	1998-11-24	Carmel, Sharon et al.	
		5844575	A	1998-12-01	Reid, J. L.	
		5848217		1998-12-08	Tsukagoshi, I et al.	
		5867625	A	1999-02-02	McLaren, David	
		5887110	A	1999-03-23	Sakamoto et al.	
		5892900	A	1999-04-06	Ginter et al.	
		5903261		1999-05-11	Walsh, Bruce E. et al.	
		5907597		1999-05-25	Mark	
		5946446		1999-08-31	Yanagihara, Naofumi	
		5956729		1999-09-21	Goetz et al.	
		5959690		1999-09-28	Toebes VIII, John A. et al.	
		5970147	A	1999-10-19	Davis, Derek L.	
		5999812	A	1999-12-07	Himsworth, Winston E.	
		6031622	A	2000-02-29	Ristow et al.	
		6038257	A	2000-03-14	Brusewitz, Harald et al.	
		6044469	A	2000-03-28	Horstmann, Cay S.	
		6046778	A	2000-04-04	Nonomura et al.	
		6047100		2000-04-04	McLaren, David L.	
		6058240		2000-05-02	McLaren, David L.	
		6064794	A	2000-05-16	McLaren et al.	
		6065050		2000-05-16	DeMoney	
		6018611		2000-06-25	Nogami et al.	
		6079566		2000-06-27	Eleftheriadis et al.	
		6097877	A	2000-08-01	Katayama et al.	
		6141754	A	2000-10-31	Choy, David	
		6155840	A	2000-12-05	Sallette, Alfred V.	
		6169242		2001-01-02	Fay, Tudor C. et al.	
		6175921	B1	2001-01-16	Rosen	
		6195388	B1	2001-02-27	Choi, Jae G. et al.	
		6204883	B1	2001-03-20	Tsukagoshi, I.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		6222981		2001-04-24	Rijckaert, Albert M.	
		6282653	B1	2001-08-28	Berstis, Viktors et al.	
		6289450	B1	2001-09-11	Pensak, David A. et al.	
		6292621		2001-09-18	Tanaka et al.	
		6308005	B1	2001-10-23	Ando et al.	
		6330286	B1	2001-12-11	Lyons, P. W. et al.	
		6374144		2002-04-16	Viviani et al.	
		6389218		2002-05-14	Gordon et al.	
		6389473	B1	2002-05-14	Carmel, Sharon et al.	
		6395969		2002-05-28	Fuhrer	
		6397230	B1	2002-05-28	Carmel, Sharon et al.	
		6418270		2002-07-09	Steenhof, Frits A. et al.	
		6449719	B1	2002-09-10	Baker, Brian	
		6466671	B1	2002-10-15	Maillard et al.	
		6466733		2002-10-15	Kim, Tae-eung	
		6510513	B1	2003-01-21	Danieli, Damon V.	
		6510554	B1	2003-01-21	Gordon, Donald F. et al.	
		6621979	B1	2003-09-16	Eerenberg, O. et al.	
		6625320	B1	2003-09-23	Nilsson et al.	
		6658056	B1	2003-12-02	Duruöz, Cem I. et al.	
		6665835		2003-12-16	Gutfreund, Steven et al.	
		6671408		2003-12-30	Kaku, Junya	
		6697568		2004-02-24	Kaku, Junya	
		6725281		2004-04-20	Zintel et al.	
		6771703	B1	2004-08-03	Oguz, Seyfullah H. et al.	
		6807306	B1	2004-10-19	Girgensohn, Andreas et al.	
		6810031	B1	2004-10-26	Hegde, Manju et al.	
		6810389	B1	2004-10-26	Meyer, Marc A.	
		6819394	B1	2004-11-16	Nomura, Toshio et al.	
		6850252	B1	2005-02-01	Hoffberg, Steven M.	
		6856997	B2	2005-02-15	Lee et al.	
		6859496	B1	2005-02-22	Boroczky, Lilla et al.	
		6917652		2005-07-12	Lyu	
		6931531	B1	2005-08-16	Takahashi, Toshiya	
		6944621	B1	2005-09-13	Collart, Todd R.	
		6944629	B1	2005-09-13	Shioi et al.	
		6956901	B2	2005-10-18	Boroczky, Lilla et al.	
		6965724		2005-11-15	Boccon-Gibod et al.	
		6965993	B2	2005-11-15	Baker, Brian	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		6985588	B1	2006-01-10	Glick, B. J. et al.	
		6988144		2006-01-17	Luken et al.	
		7007170	B2	2006-02-28	Morten, Glenn	
		7023924		2006-04-04	Keller et al.	
		7043473	B1	2006-05-09	Rassool, Reza et al.	
		7103906	B1	2006-09-05	Katz, Neil et al.	
		7127155		2006-10-24	Ando et al.	
		7150045	B2	2006-12-12	Koelle, Katharina et al.	
		7151832	B1	2006-12-19	Fetkovich, John et al.	
		7151833	B2	2006-12-19	Candelore, Brant et al.	
		7165175	B1	2007-01-16	Kollmyer, Brad et al.	
		7185363	B1	2007-02-27	Narin, Attila et al.	
		7197234	B1	2007-03-27	Chatterton, Geoff	
		7206940	B2	2007-04-17	Evans, Glenn F. et al.	
		7209892		2007-04-24	Galuten et al.	
		7231132		2007-06-12	Davenport, William	
		7237061	B1	2007-06-26	Boic	
		7242772	B1	2007-07-10	Tehranchi, Babak	
		7243346	B1	2007-07-10	Seth, Demsey M. et al.	
		7295673	B2	2007-11-13	Grab, Eric W. et al.	
		7328345	B2	2008-02-05	Morten, Glenn et al.	
		7330875		2008-02-12	Parasnis et al.	
		7340528	B2	2008-03-04	Noblecourt et al.	
		7349886	B2	2008-03-25	Morten, Glenn et al.	
		7356143	B2	2008-04-08	Morten, Glenn A.	
		7356245		2008-04-08	Belknap et al.	
		7366788		2008-04-29	Jones et al.	
		7376831	B2	2008-05-20	Kollmyer, Brad et al.	
		7406174	B2	2008-07-29	Palmer, Tomas E.	
		7421411	B2	2008-09-02	Kontio, Markku et al.	
		7454780	B2	2008-11-18	Katsube, Tomohiro et al.	
		7457359	B2	2008-11-25	Mabey, D. L. et al.	
		7460668	B2	2008-12-02	Grab et al.	
		7472280	B2	2008-12-30	Giobbi, John J.	
		7478325	B2	2009-01-13	Foehr, Oliver H.	
		7484103	B2	2009-01-27	Woo, Je-Hak et al.	
		7493018	B2	2009-02-17	Kim	
		7499938	B2	2009-03-03	Collart, Todd	
		7515710	B2	2009-04-07	Russell et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		7526450	B2	2009-04-28	Hughes, David A. et al.	
		7594271	B2	2009-09-22	Zhuk, Oscar et al.	
		7610365	B1	2009-10-27	Kraft, Reiner et al.	
		7640435	B2	2009-12-29	Morten, Glenn A.	
		7689510	B2	2010-03-30	Lamkin, Allan B. et al.	
		7720352	B2	2010-05-18	Belknap, William R. et al.	
		7747853	B2	2010-06-29	Candelore et al.	
		7761892	B2	2010-07-20	Ellis, Michael D. et al.	
		7779097	B2	2010-08-17	Lamkin, Allan B. et al.	
		7788271	B2	2010-08-31	Soma, Shunichi et al.	
		7817608	B2	2010-10-19	Rassool, Reza et al.	
		7869691	B2	2011-01-11	Kelly, Declan P. et al.	
		7882034	B2	2011-02-01	Hug, Joshua D. et al.	
		7949703	B2	2011-05-24	Matsuzaki, Natsume et al.	
		7962942	B1	2011-06-14	Craner, Michael L.	
		7974714	B2	2011-07-05	Hoffberg, Steven M.	
		7991156	B1	2011-08-02	Miller, Eric	
		8023562	B2	2011-09-20	Zheludkov et al.	
		8046453	B2	2011-10-25	Olaiya, Oladipupo	
		8054880	B2	2011-11-08	Yu, Guoyao et al.	
		8065708	B1	2011-11-22	Smyth, Aidan J. et al.	
		8069260	B2	2011-11-29	Speicher, Ashley C. et al.	
		8082442	B2	2011-12-20	Keljo, Jonathan et al.	
		8195714	B2	2012-06-05	Mckibben, Michael T. et al.	
		8201264	B2	2012-06-12	Grab, Eric et al.	
		8225061	B2	2012-07-17	Greenebaum, Kenneth	
		8233768	B2	2012-07-31	Soroushian, K. et al.	
		8245124	B1	2012-08-14	Gupta	
		8249168	B2	2012-08-21	Graves, Hans W.	
		8261356	B2	2012-09-04	Choi, Bum S. et al.	
		8265168	B1	2012-09-11	Masterson et al.	
		8270473	B2	2012-09-18	Chen, William et al.	
		8270819	B2	2012-09-18	Vannier, Eric	
		8275871	B2	2012-09-25	Ram et al.	
		8289338	B2	2012-10-16	Priyadarshi, Shaiwal et al.	
		8291460	B1	2012-10-16	Peacock, Gavin	
		8296434	B1	2012-10-23	Miller, Kevin C. et al.	
		8311111	B2	2012-11-13	Xu et al.	
		8311115	B2	2012-11-13	Gu, Chuang et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		8321556	B1	2012-11-27	Chatterjee, Manjirnath et al.	
		8341715	B2	2012-12-25	Sherkin, Alexander et al.	
		8386621	B2	2013-02-26	Park, Anthony N.	
		8396114	B2	2013-03-12	Gu, Chuang et al.	
		8401900	B2	2013-03-19	Cansler, James L. et al.	
		8407753	B2	2013-03-26	Kuo, Jenke W.	
		8412841	B1	2013-04-02	Swaminathan et al.	
		8423889	B1	2013-04-16	Zagorie, Aviram et al.	
		8452110	B2	2013-05-28	Shoham et al.	
		8456380	B2	2013-06-04	Pagan, William G.	
		8472792		2013-06-25	Ahsan Butt et al.	
		8473630	B1	2013-06-25	Galligan et al.	
		8510303		2013-08-13	Soroushian, Kourosh et al.	
		8510404	B2	2013-08-13	Carmel, Sharon et al.	
		8515265	B2	2013-08-20	Kwon, O-hoon et al.	
		8516529	B2	2013-08-20	Lajoie et al.	
		8527645	B1	2013-09-03	Proffit et al.	
		8595378	B1	2013-11-26	Cohn, Daniel	
		8606069	B2	2013-12-10	Okubo, Masafumi et al.	
		8640166	B1	2014-01-28	Craner et al.	
		8649669	B2	2014-02-11	Braness et al.	
		8656183	B2	2014-02-18	Russell et al.	
		8677428	B2	2014-03-18	Lewis, Jason et al.	
		8681866	B1	2014-03-25	Jia, Wei	
		8689267	B2	2014-04-01	Hunt, Neil D.	
		8726264	B1	2014-05-13	Allen, Nicholas et al.	
		8767825	B1	2014-07-01	Wang, Huisheng et al.	
		8774609	B2	2014-07-08	Drake, Edward C. et al.	
		8781122		2014-07-15	Chan, Francis Y. et al.	
		RE45052		2014-07-29	Li, Adam	
		8805109	B2	2014-08-12	Shoham et al.	
		8806188		2014-08-12	Braness, Jason et al.	
		8832434	B2	2014-09-09	Apostolopoulos, John G. et al.	
		8843586	B2	2014-09-23	Pantos, Roger et al.	
		8856218	B1	2014-10-07	Inskip, Thomas	
		8908984	B2	2014-12-09	Shoham et al.	
		8909922	B2	2014-12-09	Kiefer et al.	
		8914534	B2	2014-12-16	Braness, Jason et al.	
		8914836	B2	2014-12-16	Shivadas, Abhishek et al.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		8918535	B2	2014-12-23	Ma, Kevin J. et al.	
		8918636	B2	2014-12-23	Kiefer, Michael	
		8918908		2014-12-23	Ziskind et al.	
		8948249	B2	2015-02-03	Sun, Wendell et al.	
		8997161		2015-03-31	Priyadarshi, Shaiwal et al.	
		8997254	B2	2015-03-31	Amidei et al.	
		9014471	B2	2015-04-21	Shoham et al.	
		9025659	B2	2015-05-05	Soroushian, Kourosh et al.	
		9042670	B2	2015-05-26	Carmel et al.	
		9060207	B2	2015-06-16	Scherkus, Andrew et al.	
		9094737	B2	2015-07-28	Shivadas et al.	
		9098335	B2	2015-08-04	Muthiah et al.	
		9124773	B2	2015-09-01	Chan, Francis Y. et al.	
		9125073	B2	2015-09-01	Oyman, Ozgur et al.	
		9184920		2015-11-10	Grab, Eric W. et al.	
		9191457		2015-11-17	Van Der Schaar, Auke S.	
		9197685	B2	2015-11-24	Soroushian	
		9203816	B2	2015-12-01	Brueck, David F. et al.	
		9210481		2015-12-08	Braness, Jason et al.	
		9215466	B2	2015-12-15	Zhai, Jiefu et al.	
		9247311		2016-01-26	Kiefer, Michael G.	
		9247312		2016-01-26	Braness, Jason et al.	
		9247317		2016-01-26	Shivadas et al.	
		9253178	B2	2016-02-02	Blom, Rolf et al.	
		9264475		2016-02-16	Shivadas et al.	
		9294531	B2	2016-03-22	Zhang, Shaobo et al.	
		9313510		2016-04-12	Shivadas et al.	
		9343112		2016-05-17	Amidei et al.	
		9344517		2016-05-17	Shivadas et al.	
		9344721	B2	2016-05-17	Dikvall, Henrik	
		9479805	B2	2016-10-25	Rothschild, Keith A. et al.	
		9485546	B2	2016-11-01	Chen, Ying et al.	
		9571827	B2	2017-02-14	Su et al.	
		9584557	B2	2017-02-28	Panje, Krishna P. et al.	
		9584847	B2	2017-02-28	Ma, Kevin J. et al.	
		9621522	B2	2017-04-11	Kiefer et al.	
		9706259	B2	2017-07-11	Chan et al.	
		9712890	B2	2017-07-18	Shivadas et al.	
		9798863	B2	2017-10-24	Grab et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		9813740	B2	2017-11-07	Panje, Krishna P. et al.	
		9866878	B2	2018-01-09	Van Der Schaar et al.	
		9883204	B2	2018-01-30	Braness et al.	
		9906785	B2	2018-02-27	Naletov et al.	
		9967189	B2	2018-05-08	Patel et al.	
		9967305	B2	2018-05-08	Braness	

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code [1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		20010030710	A1	2001-10-18	Werner	
		20010036355	A1	2001-11-01	Kelly, Declan P. et al.	
		20010046299	A1	2001-11-29	Wasilewski et al.	
		20010053222	A1	2001-12-20	Wakao et al.	
		20020026560	A1	2002-02-28	Jordan et al.	
		20020034252	A1	2002-03-21	Owen et al.	
		20020051494	A1	2002-05-02	Yamaguchi et al.	
		20020057898	A1	2002-05-16	Normile, James	
		20020062313	A1	2002-05-23	Lee et al.	
		20020076112	A1	2002-06-20	Devara, Kavitha V.	
		20020087569	A1	2002-07-04	Fischer, Uwe et al.	
		20020091665	A1	2002-07-11	Beek et al.	
		20020093571	A1	2002-07-18	Hyodo	
		20020110193	A1	2002-08-15	Yoo et al.	
		20020116481	A1	2002-08-22	Lee, Raymond W.	
		20020118953	A1	2002-08-29	Kim, Jae-hyun	
		20020120934	A1	2002-08-29	Abrahams et al.	
		20020136298	A1	2002-09-26	Anantharamu et al.	
		20020143413	A1	2002-10-03	Fay et al.	
		20020143547	A1	2002-10-03	Fay et al.	
		20020147980	A1	2002-10-10	Satoda	
		20020159598	A1	2002-10-31	Rubinstein et al.	
		20020161462	A1	2002-10-31	Fay, Todor J.	
		20020180929	A1	2002-12-05	Tseng et al.	
		20020184159	A1	2002-12-05	Tadayon et al.	
		20020184515	A1	2002-12-05	Oho, Masahiro et al.	
		20020191112	A1	2002-12-19	Akiyoshi, Kozo et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20020191959	A1	2002-12-19	Lin, Shu et al.	
		20020191960	A1	2002-12-19	Fujinami et al.	
		20030001964	A1	2003-01-02	Masukura et al.	
		20030002578	A1	2003-01-02	Tsukagoshi et al.	
		20030005442	A1	2003-01-02	Brodersen et al.	
		20030021296	A1	2003-01-30	Wee, Susie J. et al.	
		20030031178	A1	2003-02-13	Haeri, Ali E.	
		20030035488	A1	2003-02-20	Barrau	
		20030035545	A1	2003-02-20	Jiang, S.	
		20030035546	A1	2003-02-20	Jiang et al.	
		20030041257	A1	2003-02-27	Wee et al.	
		20030061305	A1	2003-03-27	Copley, Devon et al.	
		20030061369	A1	2003-03-27	Aksu, Emre et al.	
		20030065777	A1	2003-04-03	Mattila, Marko et al.	
		20030078930	A1	2003-04-24	Surcouf et al.	
		20030093799	A1	2003-05-15	Kauffman et al.	
		20030123855	A1	2003-07-03	Okada et al.	
		20030128296	A1	2003-07-10	Lee, Chulhee	
		20030133506	A	2003-07-17	Haneda, T.	
		20030152370	A1	2003-08-14	Otomo, Hitoshi et al.	
		20030163824	A1	2003-08-28	Gordon et al.	
		20030165328		2003-09-04	Grecia, William	
		20030174844	A1	2003-09-18	Candelore, Brant L.	
		20030185302		2003-10-02	Abrams, Thomas A.	
		20030185542	A1	2003-10-02	McVeigh et al.	
		20030206558		2003-11-06	Parkkinen et al.	
		20030216922	A1	2003-11-20	Gonzales et al.	
		20030229900	A1	2003-12-11	Reisman, Richard	
		20030231863	A1	2003-12-18	Eerenberg, O. et al.	
		20030231867	A1	2003-12-18	Gates et al.	
		20030233464	A1	2003-12-18	Walpole et al.	
		20030236836	A1	2003-12-25	Borthwick, Ernest M.	
		20030236907	A1	2003-12-25	Stewart et al.	
		20040006701		2004-01-08	Kresina, Roman	
		20040021684		2004-02-05	Millner	
		20040024688	A1	2004-02-05	Bi, Depeng et al.	
		20040025180	A1	2004-02-05	Begeja, Lee et al.	
		20040031058	A1	2004-02-12	Reisman, Richard	
		20040039916	A1	2004-02-26	Aldis, David et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20040047614		2004-03-11	Green	
		20040052501		2004-03-18	Tam, Eddy C.	
		20040071453	A1	2004-04-15	Valderas, Harold M.	
		20040081333	A1	2004-04-29	Grab et al.	
		20040081434	A1	2004-04-29	Jung, Kil-Soo et al.	
		20040084035	A1	2004-05-06	Newton, Stephen J.	
		20040093618	A1	2004-05-13	Baldwin et al.	
		20040105549	A1	2004-06-03	Suzuki et al.	
		20040114687		2004-06-17	Ferris et al.	
		20040117347	A1	2004-06-17	Seo et al.	
		20040136698	A1	2004-07-15	Mock, Wayne E.	
		20040139335	A1	2004-07-15	Diamand et al.	
		20040143760		2004-07-22	Alkove et al.	
		20040146276		2004-07-29	Ogawa, Hideaki	
		20040158878	A1	2004-08-12	Ratnakar, Viresh et al.	
		20040184534	A1	2004-09-23	Wang, Albert S.	
		20040184616	A1	2004-09-23	Morten et al.	
		20040202320	A1	2004-10-14	Amini, Lisa D. et al.	
		20040217971	A1	2004-11-04	Kim, H	
		20040255115	A1	2004-12-16	DeMello et al.	
		20040255236	A1	2004-12-16	Collart, Todd R.	
		20050004875	A1	2005-01-06	Kontio, Markku et al.	
		20050005025	A1	2005-01-06	Harville, Michael et al.	
		20050015797	A1	2005-01-20	Noblecourt et al.	
		20050038826	A1	2005-02-17	Bae, Dae-gyu et al.	
		20050055399		2005-03-10	Savchuk	
		20050071280	A1	2005-03-31	Irwin et al.	
		20050108320	A1	2005-05-19	Lord et al.	
		20050114534	A1	2005-05-26	Lee, Aaron	
		20050114896	A1	2005-05-26	Hug, Joshua D.	
		20050149450	A1	2005-07-07	Stefik et al.	
		20050180641	A1	2005-08-18	Clark	
		20050183120	A1	2005-08-18	Jain, Saurabh et al.	
		20050193070	A1	2005-09-01	Brown et al.	
		20050193322	A1	2005-09-01	Lamkin, Allan B. et al.	
		20050196147	A1	2005-09-08	Seo et al.	
		20050204289	A1	2005-09-15	Mohammed et al.	
		20050207442	A1	2005-09-22	Van Zoest et al.	
		20050207578	A1	2005-09-22	Matsuyama et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20050254508	A1	2005-11-17	Aksu, Emre B. et al.	
		20050273695	A1	2005-12-08	Schnurr, Jeffrey R.	
		20050275656	A1	2005-12-15	Corbin, Toby et al.	
		20060015580	A1	2006-01-19	Gabriel, Michael et al.	
		20060026294	A1	2006-02-02	Virdi, Gurpratap et al.	
		20060026302	A1	2006-02-02	Bennett, James D. et al.	
		20060036549	A1	2006-02-16	Wu	
		20060037057	A1	2006-02-16	Xu, Shugong	
		20060052095	A1	2006-03-09	Vazvan, Behruz	
		20060053080	A1	2006-03-09	Edmonson et al.	
		20060064605	A1	2006-03-23	Giobbi, John J.	
		20060078301	A1	2006-04-13	Ikeda, Wataru et al.	
		20060093320	A1	2006-05-04	Hallberg et al.	
		20060120378	A1	2006-06-08	Usuki et al.	
		20060129909	A1	2006-06-15	Butt, Abou U. et al.	
		20060168639	A1	2006-07-27	Gan, Liang et al.	
		20060173887	A1	2006-08-03	Breitfeld et al.	
		20060179239	A1	2006-08-10	Fluhr, Eric	
		20060181965	A1	2006-08-17	Collart, Todd R.	
		20060235880	A1	2006-10-19	Qian, R.	
		20060245727	A1	2006-11-02	Nakano, Hiroshi et al.	
		20060259588	A1	2006-11-16	Lerman et al.	
		20060263056	A1	2006-11-23	Lin, Shu et al.	
		20060267986	A1	2006-11-30	Bae, Soo-Kang	
		20060274835		2006-12-07	Hamilton et al.	
		20060294164	A1	2006-12-28	Armangau et al.	
		20070005333	A1	2007-01-04	Setiohardjo et al.	
		20070031110	A1	2007-02-08	Rijckaert, Albert M.	
		20070033419	A1	2007-02-08	Kocher et al.	
		20070044010	A1	2007-02-22	Sull et al.	
		20070047901	A1	2007-03-01	Ando, Hideo et al.	
		20070053513	A1	2007-03-08	Hoffberg, Steven M.	
		20070058928	A1	2007-03-15	Naito, Hitoshi et al.	
		20070083617	A1	2007-04-12	Chakrabarti, A et al.	
		20070086528	A1	2007-04-19	Mauchly, J. W. et al.	
		20070100757	A1	2007-05-03	Rhoads, Geoffrey B.	
		20070133603	A1	2007-06-14	Weaver, Timothy H.	
		20070136817	A1	2007-06-14	Nguyen, Binh	
		20070140647	A1	2007-06-21	Kusunoki et al.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20070154165	A1	2007-07-05	Hemmeryckz-Deleersnijder et al.	
		20070168541	A1	2007-07-19	Gupta, Manish et al.	
		20070168542	A1	2007-07-19	Gupta, Manish et al.	
		20070178933	A1	2007-08-02	Nelson, Joakim	
		20070180125	A1	2007-08-02	Knowles et al.	
		20070185982	A1	2007-08-09	Nakanowatari et al.	
		20070192810	A1	2007-08-16	Pritchett et al.	
		20070217339	A1	2007-09-20	Zhao, Yun	
		20070217759	A1	2007-09-20	Dodd, Michael D.	
		20070234391	A1	2007-10-04	Hunter et al.	
		20070239839	A1	2007-10-11	Buday et al.	
		20070255940	A1	2007-11-01	Ueno	
		20070271317	A1	2007-11-22	Carmel et al.	
		20070271385	A1	2007-11-22	Davis, Andrew et al.	
		20070274679	A1	2007-11-29	Yahata, Hiroshi et al.	
		20070277219	A1	2007-11-29	Toebes, John et al.	
		20070277234	A1	2007-11-29	Bessonov et al.	
		20070280298	A1	2007-12-06	Hearn, John P. et al.	
		20070288745	A1	2007-12-13	Kwan, Nang K.	
		20070292107	A1	2007-12-20	Yahata, Hiroshi et al.	
		20070297422	A1	2007-12-27	Matsuo, Hideki et al.	
		20080005175	A1	2008-01-03	Bourke, A. et al.	
		20080008455	A1	2008-01-10	De Lange et al.	
		20080043832	A1	2008-02-21	Barkley et al.	
		20080046718	A1	2008-02-21	Grab, Eric	
		20080066099	A1	2008-03-13	Brodersen et al.	
		20080066181	A1	2008-03-13	Haveson et al.	
		20080077592	A1	2008-03-27	Brodie, Shane et al.	
		20080086456	A1	2008-04-10	Rasanen, K. et al.	
		20080086747	A1	2008-04-10	Rasanen et al.	
		20080101466	A1	2008-05-01	Swenson, Erik et al.	
		20080104633	A1	2008-05-01	Noblecourt et al.	
		20080120330	A1	2008-05-22	Reed, O et al.	
		20080120342	A1	2008-05-22	Reed, Ogden C. et al.	
		20080120389	A1	2008-05-22	Bassali et al.	
		20080126248	A1	2008-05-29	Lee et al.	
		20080137541	A1	2008-06-12	Agarwal et al.	
		20080137736	A1	2008-06-12	Richardson et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20080151817	A1	2008-06-26	Fitchett, Jeffrey W.	
		20080172441	A1	2008-07-17	Speicher et al.	
		20080187283	A1	2008-08-07	Takahashi, Eduardo	
		20080192818	A1	2008-08-14	DiPietro et al.	
		20080195664	A1	2008-08-14	Maharajh, Kavi et al.	
		20080195744	A1	2008-08-14	Bowra, Todd et al.	
		20080201705	A1	2008-08-21	Wookey, Michael J.	
		20080205860	A1	2008-08-28	Holtman, Koen J.	
		20080209534	A1	2008-08-28	Keronen et al.	
		20080240144	A1	2008-10-02	Kruse, David et al.	
		20080256105	A1	2008-10-16	Nogawa, Hiroshi et al.	
		20080263354	A1	2008-10-23	Beuque et al.	
		20080279535	A1	2008-11-13	Haque et al.	
		20080294453	A1	2008-11-27	Baird-Smith et al.	
		20080298358	A1	2008-12-04	John, Sunil S. et al.	
		20080310454	A1	2008-12-18	Bellwood et al.	
		20080310496	A1	2008-12-18	Fang, Nicholas J.	
		20090031220	A1	2009-01-29	Tranchant et al.	
		20090037959	A1	2009-02-05	Suh, Jong Y. et al.	
		20090048852	A1	2009-02-19	Burns, Gregory et al.	
		20090055546	A1	2009-02-26	Jung, Edward et al.	
		20090060452	A1	2009-03-05	Chaudhri, Imran A.	
		20090064341	A1	2009-03-05	Hartung, Frank et al.	
		20090066839	A1	2009-03-12	Jung et al.	
		20090097644	A1	2009-04-16	Haruki	
		20090132599	A1	2009-05-21	Soroushian et al.	
		20090132721	A1	2009-05-21	Soroushian et al.	
		20090132824	A1	2009-05-21	Terada et al.	
		20090136216	A1	2009-05-28	Soroushian et al.	
		20090150557	A1	2009-06-11	Wormley et al.	
		20090165148	A1	2009-06-25	Frey, Alexandre et al.	
		20090168795	A1	2009-07-02	Segel et al.	
		20090169181	A1	2009-07-02	Priyadarshi, S. et al.	
		20090172201	A1	2009-07-02	Carmel et al.	
		20090178090	A1	2009-07-09	Oztaskent, Ant	
		20090196139	A1	2009-08-06	Bates, Allen K. et al.	
		20090201988	A1	2009-08-13	Gazier, Michael et al.	
		20090217317	A1	2009-08-27	White et al.	
		20090226148	A1	2009-09-10	Nesvadba et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20090228395	A1	2009-09-10	Wegner, Susan et al.	
		20090265737	A1	2009-10-22	Issa et al.	
		20090276636	A1	2009-11-05	Grab, Eric W. et al.	
		20090290706	A1	2009-11-26	Amini, Lisa D. et al.	
		20090290708	A1	2009-11-26	Schneider et al.	
		20090293116	A1	2009-11-26	DeMello, Marco A.	
		20090303241	A1	2009-12-10	Priyadarshi, S. et al.	
		20090307258	A1	2009-12-10	Priyadarshi et al.	
		20090307267	A1	2009-12-10	Chen, Danny Y. et al.	
		20090310819	A1	2009-12-17	Hatano, Kouji	
		20090310933	A1	2009-12-17	Lee, Victor S.	
		20090313544	A1	2009-12-17	Wood, Policarpo et al.	
		20090313564	A1	2009-12-17	Rottler et al.	
		20090316783	A1	2009-12-24	Au, Oscar C. et al.	
		20090328124	A1	2009-12-31	Khouzam et al.	
		20090328228	A1	2009-12-31	Schnell, Patrik	
		20100040351	A1	2010-02-18	Toma et al.	
		20100057928	A1	2010-03-04	Kapoor, Abhinav et al.	
		20100058405	A1	2010-03-04	Ramakrishnan et al.	
		20100074324	A1	2010-03-25	Qian, Zhebin et al.	
		20100074333	A1	2010-03-25	Au et al.	
		20100083322	A1	2010-04-01	Rouse, Alan	
		20100094969	A1	2010-04-15	Zuckerman, Gal et al.	
		20100095121	A1	2010-04-15	Shetty, Pritham et al.	
		20100106968	A1	2010-04-29	Mori et al.	
		20100107260	A1	2010-04-29	Orrell et al.	
		20100111192	A1	2010-05-06	Graves, Hans W.	
		20100138903	A1	2010-06-03	Medvinsky, Alexander	
		20100142917	A1	2010-06-10	Isaji, Yutaka	
		20100158109	A1	2010-06-24	Dahlby, Joshua et al.	
		20100161825	A1	2010-06-24	Ronca, David et al.	
		20100166060	A1	2010-07-01	Ezure et al.	
		20100186092	A1	2010-07-22	Takechi, Hideaki et al.	
		20100189183	A1	2010-07-29	Gu, Chuang et al.	
		20100218208	A1	2010-08-26	Holden, Dan	
		20100228795	A1	2010-09-09	Hahn, Judah G.	
		20100235472	A1	2010-09-16	Sood, Vishal et al.	
		20100250532	A1	2010-09-30	Soroushian, K. et al.	
		20100290761	A1	2010-11-18	Drake et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20100299522	A1	2010-11-25	Khambete et al.	
		20100306249	A1	2010-12-02	Hill, James et al.	
		20100313225	A1	2010-12-09	Cholas, Chris et al.	
		20100313226	A1	2010-12-09	Cholas, Chris et al.	
		20100319014	A1	2010-12-16	Lockett, David et al.	
		20100319017	A1	2010-12-16	Cook, Michael	
		20100332595	A1	2010-12-30	Fullagar, David et al.	
		20110002381	A1	2011-01-06	Yang et al.	
		20110016225	A1	2011-01-20	Park et al.	
		20110047209	A1	2011-02-24	Lindholm et al.	
		20110055585	A1	2011-03-03	Lee, Kok-Wah	
		20110060808	A1	2011-03-10	Martin, John J. et al.	
		20110066673	A1	2011-03-17	Outlaw, B.	
		20110067057	A1	2011-03-17	Karaoguz et al.	
		20110078440	A1	2011-03-31	Feng, Chen H. et al.	
		20110080940	A1	2011-04-07	Bocharov, John A.	
		20110082924	A1	2011-04-07	Gopalakrishnan	
		20110096828	A1	2011-04-28	Chen et al.	
		20110107379	A1	2011-05-05	Lajoie et al.	
		20110116772	A1	2011-05-19	Kwon et al.	
		20110126191	A1	2011-05-26	Hughes, Richard et al.	
		20110129011	A1	2011-06-02	Cilli, Bruce R. et al.	
		20110135090	A1	2011-06-09	Chan et al.	
		20110138018	A1	2011-06-09	Raveendran et al.	
		20110142415	A1	2011-06-16	Rhyu	
		20110145726	A1	2011-06-16	Wei, Eugene C. et al.	
		20110149753	A1	2011-06-23	Bapst, Mark et al.	
		20110150100	A1	2011-06-23	Abadir, Essam	
		20110153785	A1	2011-06-23	Minborg et al.	
		20110153835	A1	2011-06-23	Rimac, Ivica et al.	
		20110184738	A1	2011-07-28	Kalisky et al.	
		20110191439	A1	2011-08-04	Dazzi et al.	
		20110191803	A1	2011-08-04	Baldwin et al.	
		20110197237	A1	2011-08-11	Turner, Steven E.	
		20110197267	A1	2011-08-11	Gravel, Vivianne et al.	
		20110213827	A1	2011-09-01	Kaspar et al.	
		20110222786	A1	2011-09-15	Carmel et al.	
		20110225302	A1	2011-09-15	Park et al.	
		20110225315	A1	2011-09-15	Wexler, Yosef et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20110225417	A1	2011-09-15	Maharajh, Kavi et al.	
		20110239078	A1	2011-09-29	Luby, Michael et al.	
		20110246657	A1	2011-10-06	Glow	
		20110246659	A1	2011-10-06	Bouazizi, Imed	
		20110252118	A1	2011-10-13	Pantos, Roger et al.	
		20110264530	A1	2011-10-27	Santangelo et al.	
		20110268178	A1	2011-11-03	Park et al.	
		20110276695	A1	2011-11-10	Maldaner et al.	
		20110283012	A1	2011-11-17	Melnyk, Miguel	
		20110291723	A1	2011-12-01	Hashimoto	
		20110302319	A1	2011-12-08	Ha et al.	
		20110305273	A1	2011-12-15	He et al.	
		20110314176	A1	2011-12-22	Frojdh et al.	
		20110314500	A1	2011-12-22	Gordon, Donald	
		20120005368	A1	2012-01-05	Knittle et al.	
		20120017282	A1	2012-01-19	Kang, Bo-gyeong et al.	
		20120023251	A1	2012-01-26	Pyle, Harry et al.	
		20120036365	A1	2012-02-09	Kyslov, Fedir Y. et al.	
		20120036544	A1	2012-02-09	Chen, Ying et al.	
		20120066360	A1	2012-03-15	Ghosh	
		20120093214	A1	2012-04-19	Urbach	
		20120114302	A1	2012-05-10	Randall	
		20120124191	A1	2012-05-17	Lyon, Barrett	
		20120137336	A1	2012-05-31	Applegate et al.	
		20120144117	A1	2012-06-07	Weare et al.	
		20120144445	A1	2012-06-07	Bonta, Jeffrey et al.	
		20120166633	A1	2012-06-28	Baumback et al.	
		20120170642	A1	2012-07-05	Braness et al.	
		20120170643	A1	2012-07-05	Soroushian, K. et al.	
		20120170906	A1	2012-07-05	Soroushian, K. et al.	
		20120170915	A1	2012-07-05	Braness, J. et al.	
		20120173751	A1	2012-07-05	Braness, J. et al.	
		20120177101	A1	2012-07-12	Van Der Schaar	
		20120179834	A1	2012-07-12	Van Der Schaar et al.	
		20120201475	A1	2012-08-09	Carmel, Sharon et al.	
		20120201476	A1	2012-08-09	Carmel, Sharon et al.	
		20120233345	A1	2012-09-13	Hannuksela	
		20120240176	A1	2012-09-20	Ma et al.	
		20120254455	A1	2012-10-04	Adimatyam et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20120260277	A1	2012-10-11	Kosciewicz	
		20120263434	A1	2012-10-18	Wainner et al.	
		20120265562	A1	2012-10-18	Daouk, Carine et al.	
		20120278496	A1	2012-11-01	Hsu, James K.	
		20120289147	A1	2012-11-15	Raleigh et al.	
		20120294355	A1	2012-11-22	Holcomb et al.	
		20120297039	A1	2012-11-22	Acuna, Jorge D. et al.	
		20120307883	A1	2012-12-06	Graves, Hans W.	
		20120311094	A1	2012-12-06	Biderman et al.	
		20120314778	A1	2012-12-13	Salustri et al.	
		20120317235	A1	2012-12-13	Nguyen et al.	
		20130007223	A1	2013-01-03	Luby et al.	
		20130013730	A1	2013-01-10	Li et al.	
		20130019107		2013-01-17	Grab, E. et al.	
		20130019273	A1	2013-01-17	Ma, Kevin J. et al.	
		20130041808	A1	2013-02-14	Pham, Nathalie et al.	
		20130044821	A1	2013-02-21	Braness et al.	
		20130046849	A1	2013-02-21	Wolf, Ethan	
		20130046902	A1	2013-02-21	Villegas Nuñez et al.	
		20130051554	A1	2013-02-28	Braness et al.	
		20130054958	A1	2013-02-28	Braness et al.	
		20130055084	A1	2013-02-28	Soroushian et al.	
		20130058480	A1	2013-03-07	Ziskind, Ben et al.	
		20130061040	A1	2013-03-07	Kiefer et al.	
		20130061045	A1	2013-03-07	Kiefer et al.	
		20130064466	A1	2013-03-14	Carmel, Sharon et al.	
		20130066838	A1	2013-03-14	Singla, Amit et al.	
		20130094565	A1	2013-04-18	Yang, Lei et al.	
		20130097309	A1	2013-04-18	Ma, Kevin J. et al.	
		20130114944	A1	2013-05-09	Soroushian et al.	
		20130124859	A1	2013-05-16	Pestoni et al.	
		20130128962	A1	2013-05-23	Rajagopalan et al.	
		20130152767	A1	2013-06-20	Katz, Itamar et al.	
		20130166580	A1	2013-06-27	Maharajh, Kavi	
		20130166765	A1	2013-06-27	Kaufman, Matthew	
		20130166906	A1	2013-06-27	Swaminathan et al.	
		20130170561	A1	2013-07-04	Hannuksela	
		20130170764	A1	2013-07-04	Carmel, Sharon et al.	
		20130173513	A1	2013-07-04	Chu, David et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20130179199	A1	2013-07-11	Ziskind et al.	
		20130179992	A1	2013-07-11	Ziskind, Ben et al.	
		20130182952	A1	2013-07-18	Carmel, Sharon et al.	
		20130196292	A1	2013-08-01	Brennen et al.	
		20130212228	A1	2013-08-15	Butler, Robert J.	
		20130223812	A1	2013-08-29	Rossi	
		20130226578	A1	2013-08-29	Bolton, Jeff M. et al.	
		20130226635	A1	2013-08-29	Fisher, Michelle	
		20130227081	A1	2013-08-29	Luby et al.	
		20130227122	A1	2013-08-29	Gao, Qiang	
		20130301424	A1	2013-11-14	Kotecha et al.	
		20130311670	A1	2013-11-21	Tarbox, Brian J. et al.	
		20130329781	A1	2013-12-12	Su, Yeping et al.	
		20140003516	A1	2014-01-02	Soroushian	
		20140019593	A1	2014-01-16	Reznik et al.	
		20140037620	A1	2014-02-06	Ferree, Sean M. et al.	
		20140052823	A1	2014-02-20	Gavade et al.	
		20140059156	A1	2014-02-27	Freeman, II et al.	
		20140096171	A1	2014-04-03	Shivadas, Abhishek et al.	
		20140101722	A1	2014-04-10	Moore	
		20140115650	A1	2014-04-24	Zhang et al.	
		20140119432	A1	2014-05-01	Wang et al.	
		20140140396	A1	2014-05-22	Wang, Zhou et al.	
		20140140417	A1	2014-05-22	Shaffer, Gary K. et al.	
		20140143301	A1	2014-05-22	Watson, Mark et al.	
		20140143431	A1	2014-05-22	Watson, Mark et al.	
		20140143440	A1	2014-05-22	Ramamurthy et al.	
		20140177734	A1	2014-06-26	Carmel, Sharon et al.	
		20140189065	A1	2014-07-03	Van Der Schaar et al.	
		20140201382	A1	2014-07-17	Shivadas et al.	
		20140211840	A1	2014-07-31	Butt, Abou U. et al.	
		20140211859	A1	2014-07-31	Carmel, Sharon et al.	
		20140241420	A1	2014-08-28	Orton-jay, Sam et al.	
		20140241421	A1	2014-08-28	Orton-jay et al.	
		20140247869	A1	2014-09-04	Su et al.	
		20140250473	A1	2014-09-04	Braness, Jason et al.	
		20140258714	A1	2014-09-11	Grab, Eric W.	
		20140269927	A1	2014-09-18	Naletov, Ivan V. et al.	
		20140269936	A1	2014-09-18	Shivadas et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		20140280763	A1	2014-09-18	Grab, Eric W. et al.	
		20140297804	A1	2014-10-02	Shivadas et al.	
		20140297881	A1	2014-10-02	Shivadas et al.	
		20140355668	A1	2014-12-04	Shoham et al.	
		20140359678	A1	2014-12-04	Shivadas et al.	
		20140359679	A1	2014-12-04	Shivadas et al.	
		20140359680	A1	2014-12-04	Shivadas et al.	
		20140376720	A1	2014-12-25	Chan et al.	
		20150006662	A1	2015-01-01	Braness	
		20150026677	A1	2015-01-22	Stevens et al.	
		20150049957	A1	2015-02-19	Shoham et al.	
		20150063693	A1	2015-03-05	Carmel et al.	
		20150067715	A1	2015-03-05	Koat et al.	
		20150104153	A1	2015-04-16	Braness, Jason et al.	
		20150117836	A1	2015-04-30	Amidei, William et al.	
		20150117837	A1	2015-04-30	Amidei, William et al.	
		20150139419	A1	2015-05-21	Kiefer et al.	
		20150188758	A1	2015-07-02	Amidei, William et al.	
		20150188842	A1	2015-07-02	Amidei, William et al.	
		20150188921	A1	2015-07-02	Amidei, William et al.	
		20150189017	A1	2015-07-02	Amidei, William et al.	
		20150189373	A1	2015-07-02	Amidei, William et al.	
		20150288996	A1	2015-10-08	Van Der Schaar et al.	
		20150334435	A1	2015-11-19	Shivadas et al.	
		20150373421	A1	2015-12-24	Chan et al.	
		20160070890	A1	2016-03-10	Grab et al.	
		20160112382		2016-04-21	Kiefer et al.	
		20160149981		2016-05-26	Shivadas et al.	
		20160219303	A1	2016-07-28	Braness et al.	
		20170214947	A1	2017-07-27	Kiefer et al.	
		20170280203	A1	2017-09-28	Chan et al.	
		20180007451	A1	2018-01-04	Shivadas et al.	
		20180060543	A1	2018-03-01	Grab et al.	
		20180131980	A1	2018-05-10	Van Der Schaar et al.	
		20180220153	A1	2018-08-02	Braness et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]
		1995015660	WO	A1	1995-06-08	Birch et al.		
		08046902	JP	A	1996-02-16	Uchiumi et al.		
		08111842	JP	A	1996-04-30	Sotoguchi, A et al.		
		1996013121	WO		1996-05-02	McLaren		
		08163488	JP	A	1996-06-21	Hiroshi et al.		
		08287613	JP	A	1996-11-01	Katayama		
		757484	EP	A2	1997-02-05	Tsukagoshi et al.		
		09037225	JP	A	1997-02-07	Tsushima et al.		
		813167	EP	A2	1997-12-17	Ristow et al.		
		1169229	CN		1997-12-31	McLaren et al.		
		1997031445	WO	A3	1998-04-02	Carmel et al.		
		1999010836	WO	A1	1999-03-04	Daboosh et al.		
		11164307	JP	A	1999-06-18	Sugiyama et al.		
		1221284	CN	A	1999-06-30	Kim, J		
		0936812	EP	A1	1999-08-18	Maillard et al.		
		100221423	KR	B1	1999-09-15	Masamichu et al.		
		11275576	JP	A	1999-10-08	Bun et al.		
		11328929	JP	A	1999-11-30	Hideo et al.		
		1999065239	WO	A2	1999-12-16	Eerenberg et al.		
		2000201343	JP	A	2000-07-18	Masahide		
		1056273	EP	A2	2000-11-29	Cornelio et al.		
		0104892	WO	A1	2001-01-18	Mcbirnie, Steven et al.		
		02001043668	JP	A	2001-02-16	Ishioka, Takayuki		
		2001031497	WO	A1	2001-05-03	Gonzalez, Ruben		
		2001050732	WO	A2	2001-07-12	Pintz et al.		
		2001209726	JP	A	2001-08-03	Hatakeyama et al.		
		2001065762	WO	A2	2001-09-07	Platt et al.		
		2001346165	JP	A	2001-12-14	Okada et al.		
		2002001880	WO	A1	2002-01-03	Strothman et al.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		2002008948	WO	A2	2002-01-31	Sull et al.		
		2002013664	KR		2002-02-21	Kim et al.		
		1187483	EP	A2	2002-03-13	Tehranchi, Babak		
		2002035832	WO	A2	2002-05-02	Davenport		
		2002037210	WO	A2	2002-05-10	Clark et al.		
		2002164880	JP	A	2002-06-07	Furuta et al.		
		2002170363	JP	A	2002-06-14	Hideo et al.		
		2002518898	JP	A	2002-06-25	Eerenberg et al.		
		2002054196	WO	A2	2002-07-11	Durand et al.		
		2002218384	JP	A	2002-08-02	Hyodo		
		1020020064888	KR	A	2002-08-10	Gonzales et al.		
		2003030000	WO	A1	2003-04-10	Mattila et al.		
		2003179597	JP	A	2003-06-27	Nakae et al.		
		2003250113	JP	A	2003-09-05	Ogawa		
		2003096136	WO	A2	2003-11-20	Aldis et al.		
		2004013823	JP	A	2004-01-15	Yokoyama		
		1420580	EP	A1	2004-05-19	Schiller et al.		
		2004515941	JP	A	2004-05-27	Davenport		
		2004172830	JP	A	2004-06-17	Takishima et al.		
		2004054247	WO	A1	2004-06-24	Gan et al.		
		2004187161	JP	A	2004-07-02	Hayashi et al.		
		2004234128	JP	A	2004-08-19	Fujisawa et al.		
		2004097811	WO	A1	2004-11-11	Kim et al.		
		2004102571	WO	A1	2004-11-25	Rijckaert		
		2005027153	JP		2005-01-27	Kunieda, T. et al.		
		2005080204	JP	A	2005-03-24	Watanabe		

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Electronic Acknowledgement Receipt

EFS ID:	34353633
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee/Tess Langseth-DePaolis
Filer Authorized By:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	19-NOV-2018
Filing Date:	19-SEP-2018
Time Stamp:	22:00:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	WO1995015660A1.pdf	2097355 2071a30d5f6b3c9560616641cb9f9f9cf7007868	no	53
Warnings:					

Information:					
2	Foreign Reference	JP08046902.pdf	364265 04042d17ff81928771c4e2cd00c14203318c18f2	no	8
Warnings:					
Information:					
3	Foreign Reference	JP08111842A.pdf	2747551 ea05bfbb67ae0d9dbc07a25c42e45ba07776d24d	no	15
Warnings:					
Information:					
4	Foreign Reference	WO1996013121.pdf	1537567 dd45be80e83501f2a0e456c66139523ef8aed8d6	no	31
Warnings:					
Information:					
5	Foreign Reference	JP08163488A.pdf	1114217 0b35bf6abfb0e0a1404ff59b01b890b550f37ab8	no	9
Warnings:					
Information:					
6	Foreign Reference	JP08287613A.pdf	9303237 495b865acaa826200410cf9fa6f9d8859bc570ec	no	22
Warnings:					
Information:					
7	Foreign Reference	EP0757484A2.pdf	1485206 329c547d5e8d94ce69bb6ab00ee879bb157adc4f	no	35
Warnings:					
Information:					
8	Foreign Reference	JP09037225A.pdf	565854 dca8d26a1390f682c828da9063ea64650cbf20fb	no	9
Warnings:					
Information:					

9	Foreign Reference	EP813167A2.pdf	818249 5f856b8d27e47e55cac9c5a29726c31d4d96cd84	no	15
Warnings:					
Information:					
10	Foreign Reference	CN1169229A.pdf	1681606 9e304f3f870e22de8f0dd999ddf35f34ac1aacc5	no	26
Warnings:					
Information:					
11	Foreign Reference	WO199731445A3.pdf	149467 792d8dacdc3bf9094c8753484cc8f1c823caa208	no	4
Warnings:					
Information:					
12	Foreign Reference	WO199910836A1.pdf	2745864 cacde53fdd6dbaf367ef816cca4601232b6e580a	no	69
Warnings:					
Information:					
13	Foreign Reference	JP11164307A.pdf	103659 68c6ef777f796f1dc0a0b07bd799550d0e659f83	no	2
Warnings:					
Information:					
14	Foreign Reference	CN1221284A.pdf	900039 9537789da258993f9cae1624a5509c7915213993	no	20
Warnings:					
Information:					
15	Foreign Reference	EP0936812A1.pdf	1448551 18c9dcf287479a77437416c0948a99e09adcd6b3	no	31
Warnings:					
Information:					

16	Foreign Reference	KR100221423B1.pdf	2092830 7c07df5a680c5daf9410575832e9ee895d7ea09a	no	74
Warnings:					
Information:					
17	Foreign Reference	JP11275576A.pdf	107806 8fb810ac8836f2f01e42d5a2f1daaa9355dcbe85	no	2
Warnings:					
Information:					
18	Foreign Reference	JP11328929Arr3.pdf	30072 9d8a57a4df8d333cf185580cdf0c0aca4da8e2e9	no	1
Warnings:					
Information:					
19	Foreign Reference	WO1999965239A2.pdf	2805246 e926a15848c7a438c10f7312583c50e6b57131f9	no	66
Warnings:					
Information:					
20	Foreign Reference	JP2000201343A.pdf	769410 14f7512ae596a57956e322aedf2f5d1ea0ae2010	no	14
Warnings:					
Information:					
21	Foreign Reference	EP1056273A2.pdf	1535260 45c61aca5c526ef479949ff3b5aed2448df25afb	no	29
Warnings:					
Information:					
22	Foreign Reference	WO0104892A1.pdf	1199232 e864faabfe2429264226e744c5f932afdc0ccc2c	no	30
Warnings:					
Information:					

23	Foreign Reference	JP2001043668A.pdf	2618938 c0d3bb7977651f436f103970a498b5968e1091b9	no	8
Warnings:					
Information:					
24	Foreign Reference	WO2001031497A1r.pdf	18986530 8364fe43ba4918aa2d830f15d2186e809d306482	no	254
Warnings:					
Information:					
25	Foreign Reference	WO2001050732A2.pdf	1808362 aadf84f24f444f3bbae713fc8d871472c7233d7c	no	37
Warnings:					
Information:					
26	Foreign Reference	JP2001209726Awabstract.pdf	2591726 a034b4a8fdcdf6613273f36f4d3389a269897f70	no	30
Warnings:					
Information:					
27	Foreign Reference	WO2001065762A2.pdf	19943873 5d06cec7c4a63b7433607705d5abf521ed7dd60d	no	17
Warnings:					
Information:					
28	Foreign Reference	JP2001346165Awabstractr.pdf	6787652 becae672246ed068720f219130443035e9d17e89	no	27
Warnings:					
Information:					
29	Foreign Reference	WO2002001880A1.pdf	24381757 f166dde7eb47284aecb7579386b34502ebd65404	no	24
Warnings:					
Information:					

30	Foreign Reference	WO2002008948.pdf	12249398 190ea262e0553190916752cf08a90b6764629e20	no	210
Warnings:					
Information:					
31	Foreign Reference	kr2002013664.pdf	145583 3c4796432bb3a0157bc71bc28150c4fe52fcbbff	no	3
Warnings:					
Information:					
32	Foreign Reference	EP1187483A2.pdf	211125 ef439185c2b3e64d21671a40ae37b9ab6709c85d	no	20
Warnings:					
Information:					
33	Foreign Reference	WO200235832A2.pdf	17977194 a3480ea52817d5b35d37dbbdeb6f3de02ebdf0b3	no	19
Warnings:					
Information:					
34	Foreign Reference	wo2002037210.pdf	1850378 bc50de1e4a24c5937b86aee9128aa2eae8c96c2d	no	45
Warnings:					
Information:					
35	Foreign Reference	JP_2002164880_Awabstract.pdf	1384444 ef957d67ad19749e3e7d92b155a3c63253862551	no	13
Warnings:					
Information:					
36	Foreign Reference	jp2002170363wabstractr.pdf	16183767 ba11323d51810416db89247b169eb7dd2928d7ff	no	51
Warnings:					
Information:					

37	Foreign Reference	jp2002518898wabstractr.pdf	7308613 37cc05a72accf01cab3eb9ee597bdef32c22ba56	no	88
Warnings:					
Information:					
38	Foreign Reference	wo2002054196.pdf	1867483 9939a65e9b1dbbb63380bb5208bec8382f42ffb0	no	34
Warnings:					
Information:					
39	Foreign Reference	JP2002218384Awabstractr.pdf	7939929 4ba5b656f2dfd0f9b55da3fea08887adbee2930e	no	12
Warnings:					
Information:					
40	Foreign Reference	KR1020020064888.pdf	19604596 e052e2f86b2dedd38b45d9c7f7075dd8878ec48b	no	364
Warnings:					
Information:					
41	Foreign Reference	WO2003030000.pdf	2994254 85ba252083ae0e9ace32efb748a062e90a0ed1f9	no	42
Warnings:					
Information:					
42	Foreign Reference	JP_2003179597_Awabstract.pdf	3237421 5ce098161e57051622792bf3fa251f940e23ca4f	no	33
Warnings:					
Information:					
43	Foreign Reference	JP2003250113Awabstractr.pdf	11334921 0b6dd25c2fedb73ac6bb803129bcc14d464c645b	no	6
Warnings:					
Information:					

44	Foreign Reference	WO2003096136.pdf	7843651 67fe145f7c276bc7c964ac1be2fa4c65e284b937	no	95
Warnings:					
Information:					
45	Foreign Reference	JP2004013823Awabstractr.pdf	5080654 52c6a7bc19d957f7038dd6a0c933cadf50011385	no	29
Warnings:					
Information:					
46	Foreign Reference	EP1420580A1.pdf	11486676 2b74a37ea9b49d0b324b94ecb862236489251443	no	10
Warnings:					
Information:					
47	Foreign Reference	jp2004515941wabstractr.pdf	1962811 a7ee263ee5469672e69c85ee801fdbca3dc3eae7	no	38
Warnings:					
Information:					
48	Foreign Reference	JP2004172830Awabstractr.pdf	7082052 982e8ac4ad2655d183bbdd558a9b03dd003fa16b	no	10
Warnings:					
Information:					
49	Foreign Reference	WO2004054247A1.pdf	16603783 8b7a237ff78915cadbc7d578fc38330e038c30c6	no	21
Warnings:					
Information:					
50	Foreign Reference	JP2004187161Awabstractr.pdf	7837023 46f46710b051c92593c9525f519615b4a97fd58a	no	15
Warnings:					
Information:					

51	Foreign Reference	JP2004234128Awabstractr.pdf	1651330 f75711822db60152cd09edd982129326520 29f87	no	19
Warnings:					
Information:					
52	Foreign Reference	WO2004097811A1.pdf	3995996 965d3fade37c8b18867119ccbe929b83bb5 2fb3b	no	28
Warnings:					
Information:					
53	Foreign Reference	WO2004102571.pdf	1463778 7596358014964a0de5d6f94113c86bfd457 8e6ed	no	25
Warnings:					
Information:					
54	Foreign Reference	jp200527153wabstractr.pdf	9302208 a2d4a114bd4812dd7adf4887172d12111a7 3a05c	no	44
Warnings:					
Information:					
55	Foreign Reference	jp2005080204wtranslationabst ractr.pdf	12499395 d4e00eb070711b7b9e217afe711e845930a aa762	no	22
Warnings:					
Information:					
56	Transmittal Letter	02359acon5xtmlpart1.pdf	106718 03e3c81bb971a0e320e1841369d252413a b82ce8	no	2
Warnings:					
Information:					
57	Information Disclosure Statement (IDS) Form (SB08)	02359acon5sb08part1.pdf	296993 b0ee85c73727e870647945ad860157e5a4b 30876	no	22
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
		Total Files Size (in bytes):	304223555		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 19, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Tess Langseth-DePaolis/
Tess Langseth-DePaolis

Appl No.	: 16/136,183	Confirmation No. 2864
Applicant	: DIVX, LLC	
Filed	: September 19, 2018	
Title	: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys	
TC/A.U.	: 2434	
Examiner	: Abiy Getachew	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

INFORMATION DISCLOSURE STATEMENT § 1.97(b)

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806
November 19, 2018

Commissioner

In compliance with the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the MPEP §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B with a listing of references that are known to applicant. Copies of each of the references listed under "Foreign Patent Documents" are enclosed.

It is respectfully requested that these references be considered in the examination of this application and identified on the list of references cited on the patent issuing on this application. Applicant also requests that an initialed copy of said FORM PTO/SB/08A/B be entered in the application file, and returned to the Applicant with the next official communication from the Office in accordance with MPEP § 609.

It is believed that there are no fees due in connection with this filing. If there are any fees due in connection with this filing, the Commissioner is authorized to charge Deposit Account 50-4407. Please show our docket number with any charge to the Deposit Account.

Respectfully submitted,

KPPB LLP

/Paul J. Lee/
Paul J. Lee
Registration No. 69,375
949.852.0000

PJL/tld

Enclosures

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0466
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
		"Draft CR: Trick Mode for HTTP Streaming", 3GPP TSG-SA4 Meeting #58, April 26-30, 2010, Vancouver, Canada, S4-100237, 3 pgs.	
		"DVD- MPeg differences", printed July 2, 2009 from http://dvd.sourceforge.net/dvdinfo/dvdmpeg.html, 1 page.	
		"DVD subtitles", sam.zoy.org/writings/dvd/subtitles, dated January 9, 2001, printed July 2, 2009, 4 pgs.	
		"Final Committee Draft of MPEG-4 streaming text format", International Organisation for Standardisation, February 2004, 22 pgs.	
		"IBM Spearheading Intellectual Property Protection Technology for Information on the Internet; Cryptolope Containers Have Arrived", May 1, 1996, Business Wire, Printed on August 1, 2014 from http://www.thefreelibrary.com/IBM+Spearheading+Intellectual+Property+Protection+Technology+for...-a018239381, 6 pgs.	
		"Information Technology - Coding of audio-visual objects - Part 14: MP4 file format", International Standard, ISO/IEC 14496-14, First Edition, November 15, 2003, 18 pgs.	
		"Information Technology - Coding of audio-visual objects - Part 17: Streaming text", International Organisation for Standardisation, February 2004, 22 pgs.	
		"Information technology - Coding of audio-visual objects - Part 18: Font compression and streaming", ISO/IEC 14496-18, First edition 7/1/04, 26 pgs.	
		"Information technology - Generic coding of moving pictures and associated audio information: Systems", International Standard ISO/IEC 13818-1, Second Edition, December 1, 2000, 174 pgs (presented in two parts).	
		"Information-Technology- Generic coding of moving pictures and associated audio: Systems, Recommendation H.222.0", International Standard, ISO/IEC 13818-1, Draft 1209, April 25, 1995, 151 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		"Information-Technology- Generic coding of moving pictures and associated audio: Systems, Recommendation H.222.0", International Standard, ISO/IEC 13818-1, Draft 1540, November 13, 1994, 161 pgs.	
		"Innovation of technology arrived", I-O Data, November 2004, Retrieved from http://www.iodata.com/catalogs/AVLP2DVDLA_Flyer200505.pdf on May 30, 2013, 2 pgs., I-O Data, 2 pgs.	
		"KISS Players, “KISS DP-500", retrieved from http://www.kiss-technology.com/?p=dp500 on May 4, 2007, 1 page.	
		"Matroska", Wikipedia, July 10, 2017, retrieved from https://en.wikipedia.org/wiki/Matroska on July 20, 2017, 3 pgs.	
		"Matroska Streaming | Matroska", Retrieved from the Internet: URL:http://web.archive.org/web/201 0121711431 O/http://matroska.org/ technical!streaming/index.html [retrieved on 2016-01-29], 12/17/2010, 2 pgs.	
		"MovieLabs Specification for Next Generation Video – Version 1.0", Motion Picture Laboratories, Inc., 2013, Retrieved from: http://movielabs.com/ngvideo/MovieLabs%20Specification%20for%20Next%20Generation%20Video%20v1.0.pdf, 5 pgs.	
		"MPEG-2", Wikipedia, June 13, 2017, retrieved from https://en.wikipedia.org/wiki/MPEG-2 on July 20, 2017, 13 pgs.	
		"MPEG-4 File Format, Version 2", Sustainability of Digital Formats: Planning for Library of Congress Collections, Retrieved from: https://www.loc.gov/preservation/digital/formats/fdd/fdd000155.shtml, Last updated February 21, 2017, 8 pgs.	
		"MPEG-4 Part 14", Wikipedia, July 10, 2017, retrieved from https://en.wikipedia.org/wiki/MPEG-4_Part_14 on July 20, 2017, 5 pgs.	
		"Netflix turns on subtitles for PC, Mac streaming", Yahoo! News, April 21, 2010, Printed on March 26, 2014, 3 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		"OpenDML AVI File Format Extensions", OpenDML AVI M-JPEG File Format Subcommittee, retrieved from www.the-labs.com/Video/odmlff2-avidef.pdf, September 1997, 42 pgs.	
		"OpenDML AVI File Format Extensions Version 1.02", OpenDMLAVI MJPEG File Format Subcommittee. Last revision: February 28, 1996. Reformatting: September 1997, 56 pgs.	
		"QCast Tuner for PS2", printed May 11, 2009 from http://web.archive.org/web/20030210120605/www.divx.com/software/detail.php?ie=39, 2 pgs.	
		"SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS Infrastructure of audiovisual services – Coding of moving video; High efficiency video coding", International Telecommunication Union, ITU-T H.265, April 2015, 634 pages (presented in six parts).	
		"Smooth Streaming Client", The Official Microsoft IIS Site, September 24, 2010, 4 pgs.	
		"Specifications | Matroska", Retrieved from the Internet: URL:http://web.archive.org/web/201 00706041303/http:/1 www.matroska.org/technical/specs/index.html [retrieved on 2016-01-29, 07/06/2010, 14 pgs.	
		"Specifications Matroska", December 17, 2010, [retrieved on March 2, 2018], 12 pgs.	
		"Supplementary European Search Report for Application No. EP 10834935", International Filing Date November 15, 2010, Search Completed May 27, 2014, 9 pgs.	
		"Supported Media Formats", Supported Media Formats, Android Developers, Printed on November 27, 2013 from developer.android.com/guide/appendix/media-formats.html, 3 pgs.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		"Text of ISO/IEC 14496-18/COR1, Font compression and streaming", ITU STUDY GROUP 16 - VIDEO CODING EXPERTS GROUP -ISO/IEC MPEG & ITU-T VCEG(ISO/IEC JTC1/SC29/WG11 AND ITU-T SG16 06), no. N8664, October 27, 2006, 8 pgs.	
		"Text of ISO/IEC 14496-18/FDIS, Coding of Moving Pictures and Audio", ITU STUDY GROUP 16 - VIDEOCODING EXPERTS GROUP -ISO/IEC MPEG & ITU-T VCEG(ISO/IEC JTC1/SC29/WG11 AND ITU-T SG16 06), no. N6215, December 2003, 26 pgs.	
		"Thread: SSME (Smooth Streaming Medial Element) config.xml review (Smooth Streaming Client configuration file)", Printed on March 26, 2014, 3 pgs.	
		"Transcoding Best Practices", From movideo, Printed on November 27, 2013 from code.movideo.com/Transcoding_Best_Practices, 5 pgs.	
		"Using HTTP Live Streaming", iOS Developer Library, http://developer.apple.com/library/ios/#documentation/networkinginternet/conceptual/streamingmediaguide/UsingHTTPLiveStreaming/UsingHTTPLiveStreaming.html#//apple_ref/doc/uid/TP40008332-CH102-SW1, February 11, 2014, 10 pgs.	
		"Video Manager and Video Title Set IFO file headers", printed August 22, 2009 from http://dvd.sourceforge.net/dvdinfo/ifo.htm, 6 pgs.	
		"What is a DVD?", printed August 22, 2009 from http://www.videohelp.com/dvd, 8 pgs.	
		"What is a VOB file", http://www.mpucoder.com/DVD/vobov.html, printed on July 2, 2009, 2 pgs.	
		"What's on a DVD?", printed August 22, 2009 from http://www.doom9.org/dvd-structure.htm, 5 pgs.	
		13/224,298, "Final Office Action Received", May 19, 2014, 26 pgs.	
		13/905,804, "Non-Final Office Action Received", July 25, 2014, 15 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		ADAMS ET AL, "Will http adaptive streaming become the dominant mode of video delivery in cable networks?", https://www.nctatechnicalpapers.com/Paper/2011/2011-will-http-adaptive-streaming-become-the-dominant-mode-of-video-delivery-in-cable-networks-, 10 pgs.	
		ADHIKARI ET AL., "Unreeling Netflix: Understanding and Improving Multi-CDN Movie Delivery", 2012 Proceedings IEEE InfoCom, March 25-30, 2012, Orlando, Florida, 9 pgs.	
		ADZIC ET AL., "Optimized Adaptive HTTP Streaming for Mobile Devices", International Society for Optics and Photonics, Applications of Digital Image Processing XXXIV, vol. 8135, September 2011, 10 pgs.	
		AKHSHABI ET AL., "An Experimental Evaluation of Rate-Adaptation Algorithms in Adaptive Streaming over HTTP", MMSys'11, February 23-25, 2011, 12 pgs.	
		ANONYMOUS, "Method for the encoding of a compressed video sequence derived from the same video sequence compressed at a different bit rate without loss of data", ip.com, ip.com number: IPCOM000008165D, May 22, 2002, 9 pgs.	
		AUTHOR UNKNOWN, "Blu-ray Disc - Blu-ray Disc - Wikipedia, the free encyclopedia", printed October 30, 2008 from http://en.wikipedia.org/wiki/Blu-ray_Disc, 11 pgs.	
		AUTHOR UNKNOWN, "Blu-ray Movie Bitrates Here - Blu-ray Forum", printed October 30, 2008 from http://forum.blu-ray.com/showthread.php?t=3338, 6 pgs.	
		AUTHOR UNKNOWN, "MPEG-4 Video Encoder: Based on International Standard ISO/IEC 14496-2", Patni Computer Systems, Ltd., printed Jan 24, 2007, USA, pp. 1-15.	
		AUTHOR UNKNOWN, "O'Reilly - 802.11 Wireless Networks: The Definitive Guide, Second Edition", printed October 30, 2008 from http://oreilly.com/catalog/9780596100520, 2 pgs.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Electronic Acknowledgement Receipt

EFS ID:	34354273
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee/Tess Langseth-DePaolis
Filer Authorized By:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	19-NOV-2018
Filing Date:	19-SEP-2018
Time Stamp:	22:04:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	DraftCRTrickModeforHTTPStreaming.pdf	213159 7d5c5c42e6d73c5be1e7525b2096e2f79e0fd78f	no	3

Warnings:

Information:					
2	Non Patent Literature	dvdmpegdifferences.pdf	370373 8c41a62ec1eb3307b943e202ba8733ca034e7afd	no	1
Warnings:					
Information:					
3	Non Patent Literature	dvdsubtitles.pdf	704402 dcdc5ce7570ac8eac7e505ab144e47b71094fcd8	no	4
Warnings:					
Information:					
4	Non Patent Literature	finalcommitteedraft.pdf	3998923 55f50f36443e13447491cc88a74ce2898478348c	no	22
Warnings:					
Information:					
5	Non Patent Literature	ibmspearheadingintel.pdf	863545 d2aef033b1261a7582b898c10d662a80487094c2	no	6
Warnings:					
Information:					
6	Non Patent Literature	informationtechnologypt14.pdf	2502249 16b9c81c5bb29787d2674b7efb432f53c95b03c5	no	18
Warnings:					
Information:					
7	Non Patent Literature	informationtechnologypart17.pdf	1977771 1a2d349f519deb214be1d9020ab1fa7b1696f279	no	22
Warnings:					
Information:					
8	Non Patent Literature	informationtechnologypart18.pdf	2452582 137bd7c92c5a79aed4ef69e879d6eafb8b77b7c2	no	26
Warnings:					
Information:					

9	Non Patent Literature	part1of2infotechgenericcoding-systems-ISOIEC138181-174pgs.pdf	14327139 767f3814613dd45976433f6681531297adb8a003	no	87
Warnings:					
Information:					
10	Non Patent Literature	part2of2infotechgenericcoding-systems-ISOIEC138181-174pgs.pdf	14085232 05ce49cc198e0aeb3a9d2b9ff429ad0a271427c7	no	87
Warnings:					
Information:					
11	Non Patent Literature	informationtechnologyh222draft1209.pdf	1021164 317a670463db1630f888ca50397eb3a0bbfc1af7	no	151
Warnings:					
Information:					
12	Non Patent Literature	informationtechnologyh222draft1540.pdf	1159192 9ed48fef1018d3f4f6411a240ef0cb399b83f134	no	161
Warnings:					
Information:					
13	Non Patent Literature	innovationoftechnologyarrived-iodata2pgs.pdf	4250357 740265c71527db6c291c372cf353dbdffea7acb3	no	2
Warnings:					
Information:					
14	Non Patent Literature	kissplayers.pdf	276343 e0b0b584ec3759a8a9a87d84491b7b17d000b6fd	no	1
Warnings:					
Information:					
15	Non Patent Literature	Matroska-wiki-3pgs.pdf	586034 95b9381a892c0630fe8e9cc5025b9fa40cf1867d	no	3
Warnings:					
Information:					

16	Non Patent Literature	matroskastreaming2pgs.pdf	1214501 ab4a33aa587c89a8271149ac34615b89bdfbbc9e	no	2
Warnings:					
Information:					
17	Non Patent Literature	movielabs-5pgs.pdf	612632 6fbbca2078915c17c7b84349b8236e3bc1353e07	no	5
Warnings:					
Information:					
18	Non Patent Literature	MPEG-2-Wikipedia-13pgs.pdf	4155585 e211818d00aa400d4cd2a947afabe768384bf255	no	13
Warnings:					
Information:					
19	Non Patent Literature	mpeg-4-fileformat-version2-8pgs.pdf	1030298 50dde2eeeb05dd77058423b0f562ec57a3794f52	no	8
Warnings:					
Information:					
20	Non Patent Literature	MPEG-4Part14-Wikipedia.pdf	179927 fa63f4cf49c268fa9a82776a2bc9d6b477e0d257	no	5
Warnings:					
Information:					
21	Non Patent Literature	netflixturnsonsubtitles.pdf	370953 f3793ee910fb8e8a5a02efc700b4896f86b953f2	no	3
Warnings:					
Information:					
22	Non Patent Literature	opendmlavifileformatextentions42pgs.pdf	3783165 7f4603545267e5d2c0c2fdb311e26ed8be2a472a	no	42
Warnings:					
Information:					

23	Non Patent Literature	openDMLAVIfileversion102.pdf	139046 74473bf0ad4314fd720c22c1f08a89004d665e77	no	42
Warnings:					
Information:					
24	Non Patent Literature	qcasttunerforps2.pdf	396889 d483c43747883159147500350042a232dde01c02	no	2
Warnings:					
Information:					
25	Non Patent Literature	part1of6-seriesh-audiovisualandmultimedia634pgs.pdf	23268813 06663cb729a741e748af7a27a27f6fa1af6187af	no	126
Warnings:					
Information:					
26	Non Patent Literature	part2of6-seriesh-audiovisualandmultimedia634pgs.pdf	21779703 978ec96d94f58c30429ab60a9d38de24e392e138	no	127
Warnings:					
Information:					
27	Non Patent Literature	part3of6-seriesh-audiovisualandmultimedia634pgs.pdf	25555791 f0c87da79d6c846b5bd74230d7d32ad338eda616	no	128
Warnings:					
Information:					
28	Non Patent Literature	part4of6-seriesh-audiovisualandmultimedia634pgs.pdf	24661895 4cedf68fc612f5465eeeedda63baa2a40bf61218	no	111
Warnings:					
Information:					
29	Non Patent Literature	part5of6-seriesh-audiovisualandmultimedia634pgs.pdf	19157774 15ac944010fe1062fe56c5518c45def0111e710c	no	101
Warnings:					
Information:					

30	Non Patent Literature	part6of6-seriesh-audiovisualandmultimedia634pgs.pdf	12954550 27945a7562c2700bf52b8a3b4e8c1e7a503612d1	no	41
Warnings:					
Information:					
31	Non Patent Literature	smoothstreamingclient-microsoft.pdf	62920 1d94b9888dbc4484b8204bf6d4e854bb233a3628	no	4
Warnings:					
Information:					
32	Non Patent Literature	specificationsmatroska14pgs.pdf	15228693 ae6b4f82a374bb5ffa8a2533231f32c2e73376d8	no	14
Warnings:					
Information:					
33	Non Patent Literature	specifications-matroska-march22018-12pgs.pdf	577761 a44c807ed61cacb4ce39742265d81c55f55ed181	no	12
Warnings:					
Information:					
34	Other Reference-Patent/App/Search documents	ep10834935eesr.pdf	372951 00182ab596879aa50db14b7ad91cb3f9ce88bdff	no	9
Warnings:					
Information:					
35	Non Patent Literature	SupportedMediaFormatsAndroidDevelopers3pgs.pdf	87607 d1361b05cc1de961e0303c1bdc32eef2ec6bcd67	no	3
Warnings:					
Information:					
36	Non Patent Literature	textof14496COR8pgs.pdf	598056 6314699791c809dde6536049a359296a423817e2	no	8
Warnings:					
Information:					

37	Non Patent Literature	textof14496FDIS26pgs.pdf	3768896 1c0d7bcfee8fafa0eae3bee4eabd60bad176de13	no	26
Warnings:					
Information:					
38	Non Patent Literature	threadssmeconfigxml.pdf	220324 387a1b5490afcd1b231720becd7ca750327ddc95	no	3
Warnings:					
Information:					
39	Non Patent Literature	TranscodingBestPractices-movideo.pdf	107612 8f6b1db70f2ea15c850d4d7f1a05c38a2a534796	no	5
Warnings:					
Information:					
40	Non Patent Literature	usinghttplivestreaming10pgs.pdf	289229 e8c188c7ad4da048d15bb4368e5880d5620f1da6	no	10
Warnings:					
Information:					
41	Non Patent Literature	videomanager6pgs.pdf	827191 14db3a71e2d4e8239fe6369bd0917554672dafd4	no	6
Warnings:					
Information:					
42	Non Patent Literature	whatisadvd.pdf	866919 94f3667931fabf3f3a0a1f1334da15301d6a1f43	no	8
Warnings:					
Information:					
43	Non Patent Literature	whatisavobfile.pdf	249419 13489b81250fce187a7d3a523acc96c1ba1944ea	no	2
Warnings:					
Information:					

44	Non Patent Literature	whatsonadvd.pdf	667846 e98a5e3ee58f42df4e416d1fe7b707a83db2bcc9	no	5
Warnings:					
Information:					
45	Other Reference-Patent/App/Search documents	13224298finalofficeaction.pdf	1561448 ba70721dedc9f3e05c8cb9d8fa3943ff6f885fce	no	26
Warnings:					
Information:					
46	Other Reference-Patent/App/Search documents	nonfinalofficeaction13905804.pdf	11917026 5030e3cc58d8aa1d97bc9be3bf56d43749943cb5	no	15
Warnings:					
Information:					
47	Non Patent Literature	adams10pgs.pdf	3894103 56f45dbb1f5c5aed6e84483e77d3b6883968bc22	no	10
Warnings:					
Information:					
48	Non Patent Literature	adhikari.pdf	1432096 8885e8a94873bafe68612f9db5a6b408437dc486	no	9
Warnings:					
Information:					
49	Non Patent Literature	adzicetal10pgs.pdf	4248538 ca0f021fdd5a09e214a1e15d5b813081f382a755	no	10
Warnings:					
Information:					
50	Non Patent Literature	akhshabianexperimental.pdf	1105963 09263701e1a9f3780208e9629a55f788a0778274	no	12
Warnings:					
Information:					

51	Non Patent Literature	methodfortheencoding.pdf	2922316 97b67d2a3d8479e4a217477cc71e9ee558f1efc6	no	9
Warnings:					
Information:					
52	Non Patent Literature	bluraydiscwiki.pdf	5108190 997342115b7796803fd6d799dfad8b47bec799f9	no	11
Warnings:					
Information:					
53	Non Patent Literature	bluraybitrateshere.pdf	3396761 9ca98aaf167c2d52d8a6c7680fbd8ebe7d7cc3dc	no	6
Warnings:					
Information:					
54	Non Patent Literature	mpeg4videoencoder15pgs.pdf	3492896 0fe276d88096bbdcdef0d5c88177191f38e01082	no	15
Warnings:					
Information:					
55	Non Patent Literature	oreilly80211wireless.pdf	869673 a2f1166bdbc96d6dd4b424e93b08b3e3975f51b1	no	2
Warnings:					
Information:					
56	Transmittal Letter	02359acon5xtmlpart5.pdf	106661 5d4682cfa297a6fb9622781d9e0c74086f03c6c1	no	2
Warnings:					
Information:					
57	Information Disclosure Statement (IDS) Form (SB08)	02359acon5sb08part5.pdf	138115 4adcd4f8120e5ec205d86fdee2d4de46d1b41e43	no	6
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
		Total Files Size (in bytes):	252169197		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 19, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Tess Langseth-DePaolis/
Tess Langseth-DePaolis

Appl No.	: 16/136,183	Confirmation No. 2864
Applicant	: DIVX, LLC	
Filed	: September 19, 2018	
Title	: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys	
TC/A.U.	: 2434	
Examiner	: Abiy Getachew	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

INFORMATION DISCLOSURE STATEMENT § 1.97(b)

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806
November 19, 2018

Commissioner

In compliance with the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the MPEP §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B with a listing of references that are known to applicant. Copies of each of the references listed under “Non-Patent Literature Documents" are enclosed.

It is respectfully requested that these references be considered in the examination of this application and identified on the list of references cited on the patent issuing on this application. Applicant also requests that an initialed copy of said FORM PTO/SB/08A/B be entered in the application file, and returned to the Applicant with the next official communication from the Office in accordance with MPEP § 609.

It is believed that there are no fees due in connection with this filing. If there are any fees due in connection with this filing, the Commissioner is authorized to charge Deposit Account 50-4407. Please show our docket number with any charge to the Deposit Account.

Respectfully submitted,

KPPB LLP

/Paul J. Lee/
Paul J. Lee
Registration No. 69,375
949.852.0000

PJL/tld

Enclosures

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0484
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]
		2013513298	JP	A	2013-04-18	Chan, Francis Y. et al.		
		5200204	JP	B2	2013-06-05	Russell et al.		
		2013103986	WO	A2	2013-07-11	Ziskind et al.		
		2616991	EP	A0	2013-07-24	Shoham et al.		
		2617192	EP	A0	2013-07-24	Shoham et al.		
		2013111126	WO	A3	2013-08-01	Carmel et al.		
		2013111126	WO	A2	2013-08-01	Carmel et al.		
		2013032518	WO	A3	2013-09-06	Kiefer et al.		
		2013144942	WO	A1	2013-10-03	Shoham et al.		
		2661696	EP	A1	2013-11-13	Soroushian et al.		
		2661875	EP	A1	2013-11-13	Braness et al.		
		2661895	EP	A2	2013-11-13	Soroushian et al.		
		1020130133830	KR		2013-12-09	Braness et al.		
		2486727	EP	A4	2014-03-12	Shoham et al.		
		2564354	EP	A4	2014-03-12	Shoham et al.		
		2616991	EP	A4	2014-03-12	Shoham et al.		
		2014506430	JP	A	2014-03-13	Braness et al.		
		2617192	EP	A4	2014-03-19	Shoham et al.		
		2716048	EP	A1	2014-04-09	Wang et al.		
		2721826	EP	A1	2014-04-23	Wang et al.		
		2486517	EP	A0	2014-06-11	Shoham et al.		
		2751990	EP	A0	2014-07-09	Shoham et al.		
		2014145901	WO	A1	2014-09-18	Grab et al.		
		2807821	EP	A0	2014-12-03	Shoham et al.		
		2014193996	WO	A2	2014-12-04	Shivadas et al.		
		2014193996	WO	A3	2015-02-19	Shivadas et al.		
		2015031982	WO	A1	2015-03-12	Zeng et al.		
		5723888	JP	B2	2015-04-03	Chan, Francis Y. et al.		
		2751990	EP	A4	2015-04-22	Shoham et al.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		2010203605	AU	B2	2015-05-14	Kourosh, Soroushian et al.		
		2015167357	JP	A	2015-09-24	Francis, Yee-dug C. et al.		
		6038805	JP	B2	2016-12-07	Braness et al.		
		6078574	JP	B2	2017-01-20	Chan, Francis Y. et al.		
		2017063453	JP		2017-03-30	Braness et al.		
		101874907	KR	B1	2018-07-06	Braness et al.		
		2018160923	JP	A	2018-10-11	Braness et al.		

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 5
		"IBM Closes Cryptolopes Unit," December 17, 1997, CNET News, Printed on April 25, 2014 from http://news.cnet.com/IBM-closes-Cryptolopes-unit/2100-1001_3206465.html, 3 pgs.	
		"Information Technology-Coding of Audio Visual Objects- Part 2: Visual" International Standard, ISO/IEC 14496-2, Third Edition, Jun. 1, 2004, pp. 1-724. (presented in three parts).	
		13/905,804, “Notice of Allowance,” August 12, 2015, 8 pgs.	
		Broadq - The Ultimate Home Entertainment Software, printed 5/11/09 from ittp://web.srchive.org/web/20030401122010/www.broadq.com/qcasttuner/, 1 pg.	
		Cloakware Corporation, "Protecting Digital Content Using Cloakware Code Transformation Technology", Version 1.2, May 2002, pp. 1-10.	
		European Search Report Application No. EP 08870152, Search Completed May 19, 2011, Mailed May 26, 2011, 9 pgs.	
		European Search Report for Application 11855103.5, search completed June 26, 2014, 9 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

		European Search Report for Application 11855237.1, search completed June 12, 2014, 9 pgs.	
		European Supplementary Search Report for Application EP09759600, completed January 25, 2011, 11 pgs.	
		Extended European Search Report for European Application EP10821672, completed Jan 30, 2014, 3 pgs.	
		Extended European Search Report for European Application EP11824682, completed Feb 6, 2014, 4 pgs.	
		Extended European Search Report for European Application No. 14763140.2, Search completed September 26, 2016, Mailed October 05, 2016, 9 pgs.	
		Federal Computer Week, "Tool Speeds Info to Vehicles", July 25, 1999, 5 pgs.	
		Final draft ETSI ES 202 109, V1.1.1, ETSI Standard, Terrestrial Trunked Radio (TETRA); Security; Synchronization mechanism for end-to-end encryption, October 2002, 17 pgs.	
		HTTP Live Streaming Overview, Networking & Internet, Apple, Inc., April 1, 2011, 38 pgs.	
		IBM CORPORATION and MICROSOFT CORPORATION, "Multimedia Programming Interface and Data Specifications 1.0", August 1991, printed from http://www.kk.iij4u.or.jp/~kondo/wave/mpidata.txt on March 6, 2006, 100 pgs.	
		InformationWeek, "Internet on Wheels", InformationWeek: Front End: Daily Dose, July 20, 1999, Printed on March 26, 2014, 3 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Electronic Acknowledgement Receipt

EFS ID:	34354067
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee/Tess Langseth-DePaolis
Filer Authorized By:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	19-NOV-2018
Filing Date:	19-SEP-2018
Time Stamp:	22:02:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	JP_2013513298_A.pdf	1378992 eb2f49565bedf7dd626f92c8edb855c598efa509	no	25
Warnings:					

Information:					
2	Foreign Reference	JP5200204B2wabstract.pdf	2373060 bee7ba4927e56dabf81498c13917e922d3a83786	no	25
Warnings:					
Information:					
3	Foreign Reference	WO2013103986A2.pdf	4853652 3345f5acf0a8a0120c12f08eeb9c5d4bbe6cbdf8	no	33
Warnings:					
Information:					
4	Foreign Reference	EP2616991A0.pdf	2601107 c07e3c2fc68b22f2c054ed2a46ed062bc797acad	no	54
Warnings:					
Information:					
5	Foreign Reference	EP2617192A0.pdf	1985099 a826efe0c831ae2ecae3c591625cd9e7de277446	no	46
Warnings:					
Information:					
6	Foreign Reference	WO2013111126A3.pdf	2613747 b5972daac37f93b63f8b0df80576e1ed241d878d	no	3
Warnings:					
Information:					
7	Foreign Reference	WO2013111126A2.pdf	7460079 e57b09c1565a1d36473becd97783fa90762cd952	no	51
Warnings:					
Information:					
8	Foreign Reference	WO2013032518A3.pdf	2486344 afb8771256d06635e5d42841137d538b247da66c	no	2
Warnings:					
Information:					

9	Foreign Reference	WO2013144942A1.pdf	338816 40fdb6a034f11ec0b7d132b45b379863f06e9ad0	no	48
Warnings:					
Information:					
10	Foreign Reference	EP2661696A1.pdf	12204363 23a55b8bedeb707c5eec37dbc09a134db7dc1c8c	no	58
Warnings:					
Information:					
11	Foreign Reference	EP2661875A1.pdf	85181 19144de73be3d69a4edfbe43ff232cbee81cc612	no	1
Warnings:					
Information:					
12	Foreign Reference	EP2661895A2.pdf	84836 bc5c9ad3aeb50a16ac4366a090eb42b11c18579f	no	1
Warnings:					
Information:					
13	Foreign Reference	KR20130133830wabstractr.pdf	12764027 61dfdcc85616773a9dffff827613c8a7f19c42db	no	46
Warnings:					
Information:					
14	Foreign Reference	EP2486727A4.pdf	108097 64cfe4d2e193ed9f8f67e8a61748b91e443cf62c	no	3
Warnings:					
Information:					
15	Foreign Reference	EP2564354A4.pdf	48674 ca0ab76fe80e5ef1fb785b9d7fec17ff228945db	no	2
Warnings:					
Information:					

16	Foreign Reference	EP2616991A4.pdf	52429 a79b153a5b56900d67c7933a4dc17b17bf7eb7e9	no	2
Warnings:					
Information:					
17	Foreign Reference	jp2014506430Awabstractr.pdf	7547310 6792e156fa9e851e7d5d7ce12ff140d201a8da99	no	49
Warnings:					
Information:					
18	Foreign Reference	EP2617192A4.pdf	135967 ca1d590d67823bd8716f80816fe3ba74e0881ac2	no	4
Warnings:					
Information:					
19	Foreign Reference	EP2716048.pdf	2331895 813d02a18d0c463abeb3989028a430147a5c7984	no	56
Warnings:					
Information:					
20	Foreign Reference	EP2721826.pdf	2797686 1c16f14c9bc55bcb2c2fbaa63eaae235c30bc83d	no	62
Warnings:					
Information:					
21	Foreign Reference	EP2486517A0.pdf	11135549 90e3e6e27f8a31a82e45c8620b440a404599d837	no	276
Warnings:					
Information:					
22	Foreign Reference	EP2751990A0.pdf	4842575 bb43ae413a8d46272bbfde0b4dc31f9f1923c165	no	98
Warnings:					
Information:					

23	Foreign Reference	wo2014145901.pdf	5945072 670f5a13304154575b7d9daebf0dc2c4c6411467	no	36
Warnings:					
Information:					
24	Foreign Reference	EP2807821A0.pdf	2325685 ed649648314e5970f333026007a4fb64d24f90ae	no	52
Warnings:					
Information:					
25	Foreign Reference	WO2014193996A2.pdf	2118084 fc1604963bc701a5d479e5f76a755025c120095d	no	54
Warnings:					
Information:					
26	Foreign Reference	WO2014193996A3.pdf	211351 7546c0ea42f6d853e3aa9b2aad7bfc63aa6aa770	no	4
Warnings:					
Information:					
27	Foreign Reference	WO2015031982A1.pdf	966943 b59ccbbc745109cef54c4c96eba42e66406a667f	no	45
Warnings:					
Information:					
28	Foreign Reference	5723888.pdf	840584 13f5a383bc78683355f069c7d5ded48533c2599a	no	27
Warnings:					
Information:					
29	Foreign Reference	EP2751990A4.pdf	110661 82eb7faa0de726fb2448d2b0d663343de14f0d29	no	2
Warnings:					
Information:					

30	Foreign Reference	AU2010203605B2.pdf	1681318 484337b23cb329484fc91749c09f2c1158d03328	no	21
Warnings:					
Information:					
31	Foreign Reference	JP_2015167357_A.pdf	9384854 97c8b3e7c8b0281e6081b30bc188e5fbaec4f801	no	27
Warnings:					
Information:					
32	Foreign Reference	JP6038805B2wabstractr.pdf	12057586 18923622f9d4185983654e615d888e4a807b016d	no	47
Warnings:					
Information:					
33	Foreign Reference	6078574.pdf	302412 53a1eaa7871c29b9c3888fc655e8e8274cc69900	no	20
Warnings:					
Information:					
34	Foreign Reference	JP2017063453wabstract.pdf	2187183 4607bbc63dc9974b7af3d3bb9487440abae4a92b	no	40
Warnings:					
Information:					
35	Foreign Reference	kr101874907.pdf	4399832 63b74a11eaeffa6a1d5edcd6d615dfa89c50047d	no	42
Warnings:					
Information:					
36	Foreign Reference	JP2018160923A.pdf	16644937 13fdb0353135d8e1a9a032c2a00c8ddf93deaa55	no	40
Warnings:					
Information:					

37	Non Patent Literature	IBMclosesCryptolopesunit.pdf	839930 1dbe1c21fd9252d85e4b21d32eb56c6e25008d7b	no	3
Warnings:					
Information:					
38	Non Patent Literature	part1of3informationtechnologycodingofaudiovisualpart2.pdf	18106886 3e935d71cabab7cf91389639d0455720cb5fb7d4	no	241
Warnings:					
Information:					
39	Non Patent Literature	part2of3informationtechnologycodingofaudiovisualpart2.pdf	17341535 b8b38e333e63424ca32b75a2e4ec28f4a3821048	no	242
Warnings:					
Information:					
40	Non Patent Literature	part3of3informationtechnologycodingofaudiovisualpart2.pdf	16492695 d636450b69be925598181fdb89bd73efe2cc2be7	no	241
Warnings:					
Information:					
41	Other Reference-Patent/App/Search documents	NOA13905804.pdf	417027 a6e75efd512b97439615950ccd8947bf80a394d8	no	7
Warnings:					
Information:					
42	Non Patent Literature	broadqtheultimatehome.pdf	779988 dbffccb2aecee0ed24be0cab63cfa99b219335bd	no	1
Warnings:					
Information:					
43	Non Patent Literature	cloakwareprotectingdigitalcontent10pgs.pdf	10107323 d0bf7986e905e44afe3c3764192501939a0ab7b0	no	10
Warnings:					
Information:					

44	Other Reference-Patent/App/Search documents	ep08870152eesr.pdf	8852602 ff6bb354c4f0dd715159a087aefc252e52b952234	no	9
Warnings:					
Information:					
45	Other Reference-Patent/App/Search documents	EP118551035eesr.pdf	8682208 21f452b9799b08472f3bd3c577f3508bbe2939a0	no	9
Warnings:					
Information:					
46	Other Reference-Patent/App/Search documents	EP118552371eesr.pdf	9575519 c1446ad1fafecc8f86c385069e2044970f6b60c0	no	9
Warnings:					
Information:					
47	Other Reference-Patent/App/Search documents	EP09759600eesr.pdf	12607423 76e9fec73d4795b57be5844639ef36abdf35d02a	no	11
Warnings:					
Information:					
48	Other Reference-Patent/App/Search documents	EP10821672sesr.pdf	2599931 791af9149e77a7703b7f7437c20cb659243bbdaa	no	3
Warnings:					
Information:					
49	Other Reference-Patent/App/Search documents	EP11824682sesr.pdf	227376 98ddf1ee2039c2976f9ef5642445a76f6db99b37	no	4
Warnings:					
Information:					
50	Other Reference-Patent/App/Search documents	ep147631402eesr.pdf	8600616 85e0d5d63e280d111e72330a83b481ff7bc74743	no	9
Warnings:					
Information:					

51	Non Patent Literature	federalcomputerwktoolspeeds5pgs.pdf	662194 5c40e97566e5a48807cbe5a648dfce5d06143a27	no	5
Warnings:					
Information:					
52	Non Patent Literature	finaldraftETSI.pdf	4126973 5fbfed564b0d126b84bb4c3d8138fb7dd4d4852b	no	17
Warnings:					
Information:					
53	Non Patent Literature	httplivestreamingingoverview38pgs.pdf	522290 4b8c7dd473138da75902088a0aa9c75fc78ec568	no	38
Warnings:					
Information:					
54	Non Patent Literature	ibmandmicrosoftmultimediaprogramming100pgs.pdf	12960223 5a8f443ef11f0d67f9a8e6f363c7133a0bf576e6	no	100
Warnings:					
Information:					
55	Non Patent Literature	informationweekfrontend3pgs.pdf	242035 5d20d13dda9d9dd81467a4b694e8531a8af6cf76	no	3
Warnings:					
Information:					
56	Transmittal Letter	02359acon5xtmlpart3.pdf	106974 9369f584c9357c8a66d5bc1c054a849ef8f93ca3	no	2
Warnings:					
Information:					
57	Information Disclosure Statement (IDS) Form (SB08)	02359acon5sb08part3.pdf	128665 8e2790c4bce41fc8cab0d3a7fe3c9d3685ec8833	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
		Total Files Size (in bytes):	273386400		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 19, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Tess Langseth-DePaolis/
Tess Langseth-DePaolis

Appl No.	: 16/136,183	Confirmation No. 2864
Applicant	: DIVX, LLC	
Filed	: September 19, 2018	
Title	: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys	
TC/A.U.	: 2434	
Examiner	: Abiy Getachew	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

INFORMATION DISCLOSURE STATEMENT § 1.97(b)

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806
November 19, 2018

Commissioner

In compliance with the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the MPEP §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B with a listing of references that are known to applicant. Copies of each of the references listed under “Foreign Patent Documents” and “Non-Patent Literature Documents" are enclosed.

It is respectfully requested that these references be considered in the examination of this application and identified on the list of references cited on the patent issuing on this application. Applicant also requests that an initialed copy of said FORM PTO/SB/08A/B be entered in the application file, and returned to the Applicant with the next official communication from the Office in accordance with MPEP § 609.

It is believed that there are no fees due in connection with this filing. If there are any fees due in connection with this filing, the Commissioner is authorized to charge Deposit Account 50-4407. Please show our docket number with any charge to the Deposit Account.

Respectfully submitted,

KPPB LLP

/Paul J. Lee/
Paul J. Lee
Registration No. 69,375
949.852.0000

PJL/tld

Enclosures

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0500
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

DocuSign Envelope ID: 15B3ED13-BE2B-4766-90FA-5336493DB8AF

PTO/AIA/80 (07-17)
Approved for use through 01/31/2018. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 71897

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 71897

OR

[ ]

Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address: DIVX, LLC
4350 La Jolla Village Drive, Suite 950
San Diego, CA 92122

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature /Noel Egnatios/	Date
Name Noel Egnatios	Telephone
Title VP, General Counsel	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	34368225
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee/Christina Ducksworth
Filer Authorized By:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	20-NOV-2018
Filing Date:	19-SEP-2018
Time Stamp:	20:22:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	02359acon5_xtml.pdf	101723 d1bfbb40edb8c49327b85ea1d853bd882e845dbd	no	1
Warnings:					

Information:					
2	Power of Attorney	02359acon5_poa.pdf	147516 b975a0f39ac6e5669af8bc7abadb380f52450056b	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	249239	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 20, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/ Christina Ducksworth /
Christina Ducksworth

Appl No.	: 16/136,183	Confirmation No. 2864
Applicant	: DIVX, LLC	
Filed	: September 19, 2018	
Title	: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys	
TC/A.U.	: 2434	
Examiner	: Getachew, Abiy	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

TRANSMITTAL OF POWER OF ATTORNEY BY APPLICANT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806
November 20, 2018

Commissioner:

Attached hereto is the Power of Attorney by Applicant for the above-referenced application.

The Commissioner is authorized to charge any fee under 37 CFR 1.16 and 1.17 which may be required during the **entire pendency** of the application to Deposit Account No. 50-4407. Please show our docket number with any transaction to the Deposit Account.

Respectfully submitted,

KPPB LLP

By /Paul J. Lee/
Paul J. Lee
Registration No. 69,375
949.852.0000

PJL/cd
Enclosure

Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed	PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT**
Application Number	16136183
Filing Date	19-Sep-2018
First Named Inventor	Michael Kiefer
Attorney Docket Number	D1-02359A.CON5
Title of Invention	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
DIVX, LLC	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

9247311

9621522

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request. ○ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status: ○ Small Entity ○ Micro Entity ◉ Regular Undiscounted I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application Registration Number 69375 ○ A sole inventor ○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ○ A joint inventor; all of whom are signing this request	
Signature	/Paul J. Lee/
Name	Paul J. Lee

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	16136183
Filing Date:	19-Sep-2018
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Filer:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**160**

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 16136183

Filing Date: 19-Sep-2018

Applicant/Patent under Reexamination: Kiefer

Electronic Terminal Disclaimer filed on November 26, 2018

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	34388068
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee
Filer Authorized By:	
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	26-NOV-2018
Filing Date:	19-SEP-2018
Time Stamp:	12:20:57
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$160
RAM confirmation Number	112618INTEFSW12205500
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	33632 5197d22df3a00f8d7829e2f5bc308ce004e9a2fc	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30932 bb821286c6a4b6e59261b555529fb1c9e62157a2	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	64564		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/136,183	09/19/2018	Michael George Kiefer	D1-02359A.CON5

CONFIRMATION NO. 2864

71897
KPPB LLP
2190 S. Towne Centre Place
Suite 300
Anaheim, CA 92806

POA ACCEPTANCE LETTER

OC000000104032622

Date Mailed: 11/27/2018

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/20/2018.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/mbeyene/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		20050132208	A1	2005-06-16	Hug et al.	
		20060165233	A1	2006-07-27	Nonaka et al.	
		20180332094	A1	2018-11-15	Braness	

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]
		2010/05673	WO	A2	2010-01-14	Hauan, Johan		

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
		"Microsoft Announces Breakthrough Technology Enabling Simple Access to Broad Set of Digital Content, Including Music, Games, Video, Ring Tones and Pictures", Microsoft, February 12, 2007, Retrieved from https://news.microsoft.com/2007/02/12/microsoft-announces-breakthrough-technology-enabling-simple-access-to-broad-set-of-digital-content-including-music-games-video-ring-tones-and-pictures/, 5 pgs.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
14 January 2010 (14.01.2010)

PCT

(10) International Publication Number
WO 2010/005673 A2

(51) International Patent Classification:
G01V 1/28 (2006.01) *G01V 1/16* (2006.01)
G01V 1/38 (2006.01)

(21) International Application Number:
PCT/US2009/047015

(22) International Filing Date:
11 June 2009 (11.06.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

61/061,330	13 June 2008 (13.06.2008)	US
12/468,477	19 May 2009 (19.05.2009)	US

(71) Applicant *(for all designated States except CA, CL, PE, US)*: **GECO TECHNOLOGY B.V.** [NL/NL]; Gevers Deynootweg 61, NL-2586 BJ S Gravenhage (NL).

(71) Applicant *(for CA only)*: **SCHLUMBERGER CANADA LIMITED** [CA/CA]; 525 - 3rd Avenue S.W., Calgary, Alberta T2P 0G4 (CA).

(71) Applicant *(for US only)*: **WESTERNGECO L.L.C.** [US/US]; 10001 Richmond Avenue, Houston, Texas 77042 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HAUAN, Johan** [NO/NO]; Etterstadkroken 5 C, N-0659 Oslo (NO). **HAGELUND, Rune** [NO/NO]; Fjellveien 19, N-1396 Billingstad (NO). **SOLHEIM, Stig** [NO/NO]; Eikskollen 5 F, N-1361 Oesteraas (NO).

(74) Agent: **YE, Liangang, Mark**; WESTERNGECO L.L.C., 10001 Richmond Avenue, Houston, Texas 77042 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR),

[Continued on next page]

(54) Title: METHOD TO DETERMINE THE DEVIATION OF SEISMIC EQUIPMENT FROM A PLANNED CURVED PATH

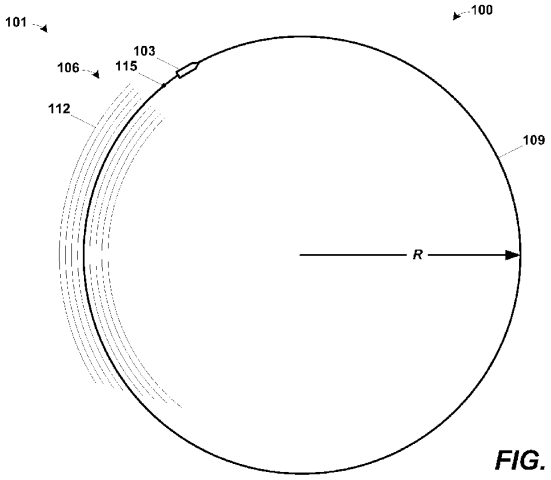


FIG. 1

(57) Abstract: A group of techniques can be used to determine if components of a seismic spread have deviated from a planned path during a coil or other curved and substantially circular acquisition pattern. In one aspect, and in general, the presently disclosed techniques include a computer-readable program storage medium for determining the deviation of spread array element from a planned curved path during a towed-array marine seismic survey. The method comprises: determining a nominal position of the spread array element at a given point in the planned curved path; determining the actual position of the spread array element; and performing an error analysis predicated on the nominal and actual positions.

WO 2010/005673 A2

OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

METHOD TO DETERMINE THE DEVIATION OF SEISMIC EQUIPMENT FROM A PLANNED CURVED PATH

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Priority from co-pending United States Provisional Application Serial No. 61/061,330, entitled "Method to Determine the Deviation of Seismic Equipment from a Planned Curved Path", filed June 13, 2008, in the name of the inventors Johan Hauan, Rune Hagelund, and Stig Solheim, is hereby claimed under 35 U.S.C. §119(e). This application is also hereby incorporated by reference for all purposes as if set forth herein verbatim.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not applicable.

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

[0003] The present invention pertains to towed-array marine seismic surveys, and, more particularly, to towed-array marine seismic surveys employing generally advancing curved sail lines.

2. DESCRIPTION OF THE RELATED ART

[0004] This section of this document is intended to introduce various aspects of the art that may be related to various aspects of the present invention described and/or claimed below. This section provides background information to facilitate a better understanding of the various aspects of the present invention. As the section's title implies, this is a discussion of related art. That such art is related in no way implies that it is also prior art. The related art may or may not be prior art. It should therefore be understood that the statements in this section of this document are to be read in this light, and not as admissions of prior art.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0517
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

[0005] The exercise of examining subterranean geological formations for deposits of hydrocarbon deposits is known as "seismic surveying". Sometimes the geological formations lie beneath a body of water. This type of seismic survey is known as a "marine" seismic survey. Marine seismic surveys may be performed in salt, fresh, or brackish waters and are not limited to saltwater environments.

[0006] One type of marine seismic survey is called a "towed-array" seismic survey. In such a survey, a tow vessel tows an array of equipment along a straight sail line. The array usually includes a number of seismic streamers, typically up to eight of them, up to several kilometers long. The streamers are populated with a number of instruments, most notably seismic receivers such as hydrophones. Sometimes the array will also include a plurality of seismic sources. As the array is towed, the streamers ideally straighten and roughly parallel each other. Sometimes environmental or survey conditions adversely impact the shape of the array, but this is the ideal shape.

[0007] Thus, in conventional seismic survey acquisition, it is typical to determine where the components of equipment deployed in the sea to acquire seismic data are in relation to the sail line. These lines are straight with the exception of special acquisition patterns such as undershoot obstruction avoidance. Another exception is 4D acquisition that has an objective to follow a path that was traversed during an earlier survey.

[0008] All these acquisition patterns can be examined with respect to the planned path with a conventional straight line reference. This is often described as "along" and "across" or "cross line" and "in line". Distance from the planned pre-plot line to the shot event position of the seismic equipment is determined for the purpose of quality control in this reference frame. In addition to quality control, steering equipment such as streamer and source steering devices and systems and the towing vessel itself can make decisions based on variations in the conventional reference frame. The reference frame used has the same origo and the axes the same direction for at least one shot. In the case of the vessel reference frame the vessel motion is irrelevant since the vessel structure rigid body reference system is the reference. In the case of a survey area reference frame the vessel and towed equipment are all evaluated with respect to an origo and orthogonal axes fixed with respect to the earth.

[0009] Traditionally seismic surveys have been shot along straight lines defined by a start and end point defining a sail line. A lot of quality control ("QC") and statistics to users are

simply based on a coordinate system with origo in the first point and Y axis in the direction of the second point. Two central numbers used are the "distance across" (or, "DC") and the "distance along", or ("DA").

[0010] The distance along is the y coordinate in this coordinate system, and distance across is the x coordinate. The direction from the first to the second point is called the line direction. The sources are usually fired evenly along this line—for example, every 25m. The point where the source fires is called a "shot point," and each shot point is given a shot point number. The shot point number will decrease or increase along the line.

[0011] The survey of some complex subterranean structures benefits from particular types of towed-array surveys sometimes called "wide-azimuth", "rich-azimuth", or multi-azimuth surveys. However, these types of surveys are typically expensive both in terms of survey time and survey resources. One recently developed approach to address these concerns is what is known as a "coil shoot". A coil shoot differs from a traditional shoot significantly in that the path is intended to be curved rather than straight. With coil shooting a seismic 'line' can consist of any sequence of circular segments and straight segments. One difficulty associated with coil shoots is that a lot of the existing statistics and attributes calculated make little sense with coil shooting. With coil shooting a seismic 'line' can consist of any sequence of circular segments and straight segments. The quality control techniques used in conventional surveys with respect to the plan are not meaningful when acquiring a curved acquisition pattern.

[0012] The present invention is directed to resolving, or at least reducing, one or all of the problems mentioned above.

SUMMARY OF THE INVENTION

[0013] The invention is a group of techniques that can be used to determine if components of a seismic spread have deviated from a planned path during a coil or other curved and substantially circular acquisition pattern. In one aspect, the presently disclosed techniques include a computer-readable program storage medium for determining the deviation of spread array element from a planned curved path during a towed-array marine seismic survey. The method comprises: determining a nominal position of the spread array element at a given point in the planned curved path; determining the actual position of the spread array element; and performing an error analysis predicated on the nominal and actual positions.

[0014] The above presents a simplified summary of the invention in order to provide a basic understanding of some aspects of the invention. This summary is not an exhaustive overview of the invention. It is not intended to identify key or critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concepts in a simplified form as a prelude to the more detailed description that is discussed later.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The invention may be understood by reference to the following description taken in conjunction with the accompanying drawings, in which like reference numerals identify like elements, and in which:

FIG. 1 is a plan, overhead schematic view of a first embodiment of a coil shoot with which the presently disclose technique may be used;

FIG. 2 is a computerized rendition of a plan view of the survey area covered by generally circular sail lines of the embodiment of **FIG. 1** over time during a shooting and recording survey;

FIG. 3 depicts one particular embodiment of the survey spread first shown in **FIG. 1** in a plan, overhead view;

FIG. 4 illustrates a preplot curve and the determination of various characteristics thereof—namely, distance across and distance along;

FIG. 5 illustrates the determination of nominal array element position given nominal offsets and a preplot curve;

FIG. 6 illustrates one particular embodiment of a method for determining the deviation of seismic equipment from a planned curved path;

FIG. 7 illustrates the instrumented sondes of the streamers of survey spread in **FIG. 3**;

FIG. 8 depicts a computing system on which some aspects of the present invention may be practiced in some embodiments;

FIG. 9A – FIG. 9B shows a rack mounted computer system such as may be used in some aspects of the present invention.

While the invention is susceptible to various modifications and alternative forms, the drawings illustrate specific embodiments herein described in detail by way of example. It should be understood, however, that the description herein of specific embodiments is not intended to limit the invention to the particular forms disclosed, but on the contrary, the

intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF THE INVENTION

[0016] Illustrative embodiments of the invention are described below. In the interest of clarity, not all features of an actual implementation are described in this specification. It will of course be appreciated that in the development of any such actual embodiment, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with system-related and business-related constraints, which will vary from one implementation to another. Moreover, it will be appreciated that such a development effort, even if complex and time-consuming, would be a routine undertaking for those of ordinary skill in the art having the benefit of this disclosure.

[0017] One or more specific embodiments of the present invention will be described below. It is specifically intended that the present invention not be limited to the embodiments and illustrations contained herein, but include modified forms of those embodiments including portions of the embodiments and combinations of elements of different embodiments as come within the scope of the following claims. It should be appreciated that in the development of any such actual implementation, as in any engineering or design project, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with system-related and business related constraints, which may vary from one implementation to another. Moreover, it should be appreciated that such a development effort might be complex and time consuming, but would nevertheless be a routine undertaking of design, fabrication, and manufacture for those of ordinary skill having the benefit of this disclosure. Nothing in this application is considered critical or essential to the present invention unless explicitly indicated as being "critical" or "essential."

[0018] The present invention will now be described with reference to the attached figures. Various structures, systems and devices are schematically depicted in the drawings for purposes of explanation only and so as to not obscure the present invention with details that are well known to those skilled in the art. Nevertheless, the attached drawings are included to describe and explain illustrative examples of the present invention.

[0019] The words and phrases used herein should be understood and interpreted to have a meaning consistent with the understanding of those words and phrases by those skilled in the relevant art. No special definition of a term or phrase, *i.e.*, a definition that is different from the ordinary and customary meaning as understood by those skilled in the art, is intended to be implied by consistent usage of the term or phrase herein. To the extent that a term or phrase is intended to have a special meaning, *i.e.*, a meaning other than that understood by skilled artisans, such a special definition will be expressly set forth in the specification in a definitional manner that directly and unequivocally provides the special definition for the term or phrase.

[0020] The invention is a description of algorithms and methods that allow real time and post survey quality control of positions with respect to a substantially non-straight pre-survey plan as would be used in coil, spiral or circular shooting. The key elements of the method relate the object subjected to quality control to a dynamic reference frame and relate the coordinates of the object to the correct current path plan. In addition, methods that present errors in actual positions with respect to planned positions are displayed and quantified in a straight line presentation.

[0021] The presently disclosed techniques addresses new statistics/attributes for coil shoot surveys replace existing attributes used in conventional, straight-line surveys. A goal is that these attributes will mean the same as the existing attributes for traditional surveys, but still be meaningful for coil surveys. For DA/DC calculations this means that the closest point on the sail line curve is found. The distance across is then simply the distance to this point. The distance along is the length of the sail line up to this point. This seems like an intuitive and natural way of calculating these statistics, and would give the same result as current calculations for traditional straight lines.

[0022] The techniques also determines where equipment is compared to where it ideally should be. The rightmost tail buoy might, for example, have a nominal crossline offset of 200 meter and an inline offset of 8000 meters. (That is, if the vessel was going straight, one would expect the equipment to be 8000 meters behind the vessel and 200 meters to the right.) So during the survey one might want to know where the tail buoy should be at, for example, shot number 1024. The vessel is in a curved segment. The technique finds this point by making a parallel line starting 200 meters from the nominal vessel position and moving 8000 meters backwards along this line.

[0023] Turning now to the drawings, **FIG. 1** depicts a portion of a towed-array, marine seismic survey 100. The seismic survey 100 includes a seismic spread 101, which comprises a survey vessel 103 towing an array 106 on a generally advancing curved path over a sail line 109. In the illustrated embodiment, the array 106 includes a plurality of streamers 112 (only one indicated) and a source 115. As will be discussed further below, the invention admits a high degree of variation in the implementation of the array 106 and the sail line 109. Those in the art will appreciate that the sail line 109 does not actually have a tangible manifestation, and that the line in the drawing graphically represents that which is intangible in practice.

[0024] Those in the art having the benefit of this disclosure will appreciate that the sail line 109 is not truly circular. Once the first pass is substantially complete, the survey 100 will move slightly in the *y*-direction (vertical) value of *DY*, as illustrated in **FIG. 2**. The spread may also move in the *x*-direction (horizontal) by a value *DX*. Note that "vertical" and "horizontal" are defined relative to the plane of the drawing.

[0025] **FIG. 2** is a computerized rendition of a plan view of the survey area covered by the generally circular sail lines of the seismic spread and method of **FIG. 1** over time during a shooting and recording survey, where the displacement from circle to circle is *DY* in the vertical direction and *DX* in the horizontal direction. In **FIG. 2**, several generally circular sail lines 109 (only one indicated) cover the survey area. In this example, the first generally circular sail line was acquired in the southeast ("SE") corner of the survey.

[0026] When a first generally circular sail line 109 is completed the vessel 103 (shown in **FIG. 1**) moves along the tangent with a certain distance, *DY*, in vertical direction, and starts a new generally circular sail line 109. Several generally circular sail lines 109may be traversed until the survey border is reached in the vertical direction. A new series of generally circular sail lines 109 may then be acquired in a similar way, but the origo will be moved with *DX* in the horizontal direction. This way of shooting continues until the survey area is completely covered.

[0027] The design parameters for designing the survey 100 the radius *R* of the circle, the radius being a function of the spread width and also of the coverage fold desired; *DY*, the roll in the *y*-direction; *DX*, the roll in the *x*-direction. *DX* and *DY* are functions of streamer spread width and of the coverage fold desired to be acquired. The radius *R* of the circle may be larger than the radius used during the turns and is a function of the streamer spread width.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0523
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

[0028] The total number of kilometers acquired over a given area depends on the circle radius R and the values DX and DY. The total number of shots acquired with the coil shooting technique disclosed herein increases with increased radius R. DX and DY may range from about $0.5W$ to about $2W$, or from about $0.5W$ to about W, where W is the streamer spread width. The value of DX and DY may be selected based on the survey objectives. For instance for a development type survey DX and DY should be smaller than for an exploration survey. Also, as DX and DY determine the source sampling, processing requirements should be considered when the survey is designed.

[0029] **FIG. 3** depicts one particular embodiment of the survey spread 101 in a plan, overhead view. In this particular embodiment, as mentioned above, the seismic spread 101 generally includes an array 106 towed by a survey vessel 103 on board of which is a computing apparatus 300. The computing apparatus 300 controls the seismic spread 101 in a manner discussed more fully below. The towed array 106 comprises eight marine streamers 112 (only one indicated). The seismic source 115 is also included. The survey spread 101 is shown after deployment but before embarking upon the sail line 109, shown in **FIG. 1**. Consequently, the streamers 112 are shown in a straight arrangement rather than curved one of **FIG. 1**. As alluded to above, one way of describing the position of various elements of the seismic spread 101 is in terms of inline and crossline offsets O_i and O_c, respectively. An example was given using the rightmost tail buoy 303.

[0030] As those in the art will appreciate, the sail lines 109 of the seismic survey 100 are determined with a great deal of consideration. Preliminary data about the area under survey is used to define the characteristics of the survey and the sail lines 109 are determined. These nominal sail lines 109 that are determined prior to the survey may be referred to as "preplots" for the actual sail lines 109 traversed by the seismic spread 101. In the present case, since the survey will employ a coil shoot, the preplots are at least in part curved, and so may be referred to as "preplot curves".

[0031] It is desirable for the sail lines 109 to precisely coincide with their preplot curves. This desire also extends to the elements of the array 106. This can be particularly difficult to achieve for the array. For example, the survey vessel 103 has its own means for propulsion and navigation, and can typically maintain its position on the preplot quite well. However, this is not true of the array. The streamers 112, for example, are particularly subject to strong currents and weather conditions to be driven off the preplot during the survey. The technique

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0524
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

disclosed herein is intended for use in determining deviation of the elements of the seismic spread 101 from the preplot curve so that position corrections can be made.

[0032] Turning now to **FIG. 4**, a preplot curve 400 is a sequence of geographical coordinates and a radius *R*. The preplot curve 400 gives the nominal position for some point in the survey. This normally coincides with the desired position of a survey element for this point. (For repeat/4D surveys this is not necessarily true—it then describes the nominal position, but not necessarily the desired position.) Often, the preplot curve describes the desired source mid-point position.

[0033] As described above relative to **FIG. 3**, all equipment has a nominal offset. That is the *x*-*y* coordinates in a coordinate system with origo in the vessel and y axis in the sail direction. It is assumed straight streamers *etc*. The values are calculated based on known characteristics of the seismic spread, such as lengths of equipment. In the example given above, the rightmost tail buoy 303 of the seismic spread 101 has an inline offset O_i of 8000 meters behind the survey vessel 103 and a crossline offset O_c, of 200 meters to the right. That is, if the survey vessel 103 was traveling in a straight line, one would expect the equipment to be 8000 meters behind the vessel and 200 meters to the right. The nominal offset will be known as a design feature of the seismic spread 101.

[0034] Consider first Distance Across and Distance Along calculations. The preplot itself usually states the position of one specific point, for example the source mid point, vessel position or CMP position. As long as one knows the individual offset differences between these points, one can easily compensate for this. All the nominal offsets might be stored relative to, for example, center first group, while the preplot itself denotes nominal source mid point positions. This 'mismatch' is easily compensated for as long as both the nominal offset for center first group and source mid point is known.

[0035] For example, assume that the line AB in **FIG. 4** is 500m, the half circle BD is 200m, and the line CE is 50m. To find the distance across and the distance along (collectively, "DC/DA") for point E, the determination is as follows:

$$DA = 500 + 200/2 = 600$$

$$DC = 50$$

[0036] Note that this defines a new type of coordinate system 'normalized' to a varying path. In the old way of calculating it was simple to transform between Easting/Northing and DA/DC since it was simply two different coordinate systems with different orientations and different origo. This new way of calculating still relatively easily transforms DA/DC to Easting/Northing. However the transform of Easting/ Northing to DA/DC does not make sense anymore because of the nature of the coil shoot.

[0037] Imagine two circles (not shown). A position can easily be as close to one as to the other. Also a position occurred at some time, which means it belongs to one of the circles. However the transform with the aid of a shot number makes sense:

$$\text{Easting / Northing + shotNumber} \rightarrow \text{DA/DC}$$

One will first find either a straight or curved segment where this shot number occur, then perform a local search to find the closest position in that area, calculate DA to this point, and the DC is given by the distance to this closest point.

[0038] Consider now the calculation of nominal positions for spread elements, in which it will be assumed that the spread elements follow the preplot curve 400 perfectly. In calculating nominal positions, given a shot number, one can calculate a corresponding preplot position 500, shown in **FIG. 5**. It is a bit more complex calculating a position given with a nominal crossline/inline offset from the preplot curve 400. Assume that other position 503 to be calculated has a crossline nominal offset of -100, and an inline nominal offset of -1000. To find the nominal offset, one moves 1000 meters backwards on the parallel line 506. The distance between the lines is then 100 meters.

[0039] In general, the task can be divided into two parts. First, the nominal (desired) positions for any piece of equipment is determined given equipment nominal offset and shot number. Second, error statistics are calculated given actual positions.

[0040] Returning to **FIG. 4**, the preplot curve 400 for a coil shoot survey consists of straight segments 401 and circular segments 403. Straight segments 401 and circular segments 403 are collectively referred to as "path segments". Each preplot curve 400 therefore comprises a plurality of path segments that are either straight segments 401 or circular segments 403. For each straight segment 400, the start position 406 and the end position 409 are known. For

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0526
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

each circular segment 403 the origo, the start position, and the total circle segment angle are known.

[0041] For each path segment certain attributes may be determined, and the determination will vary for the segments 401, 403. The segment length, for example, is a function of nominal offset *x*. The segment length for a straight segment 400 is the length of the segment from is start 406 to its end 409. For circular segments 403, segment length will vary with different crossline offsets because a crossline offset will effectively increase or decrease the circle radius. Position and heading are a function of along and across distance. Given a certain distance from the start of a segment and a certain crossline offset, one can calculate a position with a heading. For circular segments 403, this will be a tangent to the circle in that point. For a straight segment 400 it will be the direction from the start 406 to the end 409. The closest segment position and heading are a function of actual position. Given an actual position the closest position on the segment is found. Special handling will be triggered if the closest position is either at the start or the end of the segment.

[0042] Given a sequence of path segments 401, 403 and the shot increment, the shot distance, and the first shot number, one can calculate certain attributes. The shot increment is how the shot numbers change. Usually it is plus or minus one. If the first shot point is 1000, and the shot increment is 1, the next shot number will be 1001. The shot distance is the meter difference between two shots. If the shot distance is 25 meters, it should be 25 meters between where shot 1000, and 1001 is fired.

[0043] The higher level functions are nominal position and heading and across and along.

[0044] Nominal position and heading are a function of shot number, nominal offset x and nominal offset y. It is not difficult to convert a shot number to a distance along the preplot curve. Ignoring the offset, one can easily find which path segment 400, 403 contains the position for that shot because the length of each segment is known. Having found that position, certain other calculations are performed to compensate for the nominal offsets. This might bring one to another segment path altogether. This function is also used as a basis for calculating the difference between nominal position and actual position based on shot number. Returning the nominal position and the heading this can be done by making a coordinate system with origo in the nominal position, *y* axis in the heading direction and transforming the actual position to this coordinate system. The new *x* and *y* coordinates of the

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0527
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

transformed position would then denote crossline and inline position error compared to nominal positions.

[0045] Across and along are functions of shot number, nominal offset *x*, nominal offset *y* and actual position. Given an actual position, we cannot uniquely find a closest path position. Or rather it might not make much sense. An actual position might be just as close to a point on one circle as another, even though the position was actually 'occurred' on the other circle. Therefore really the shot number needs to be taken into consideration. We first find which segment the position nominally should belong to. (Just using shot numbers and nominal offsets) We then do a local search to find the closest position to the actual position. This may be on another segment altogether. The closest position will give us the distance along value. The distance between the closest position and the actual position will give the across value.

[0046] Thus, in one aspect, the presently disclosed techniques includes a computer-readable program storage medium 600, shown in **FIG. 6**, for determining the deviation of spread array element from a planned curved path during a towed-array marine seismic survey. The method 600 comprises:

- determining (at 603) a nominal position of the spread array element at a given point in the planned curved path;
- determining (at 606) the actual position of the spread array element; and
- performing (at 609) an error analysis predicated on the nominal and actual positions.

The error analysis can be the same types of error analyses performed in this context in conventional practice where the analysis is performed upon information from a conventional sail line following a straight path.

[0047] More particularly, performing (at 609) the error analysis in **FIG. 6** is what occurs after computing the nominal and the actual positions relative to the path. For example:

- the difference between the desired position and the actual position (of steered survey elements) is used by the steering system (DSC/Q-Pilot) to issue steering commands so that the path is followed;

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0528
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

- the difference may also be used to produce plots of the error (deviation from the desired position in an across/along reference frame) for display to the user (monitoring the system performance) in real time; and

- the path-relative across values (and across/along separations between survey elements) are used to compute statistics that can prove whether or not the certain survey specifications are being met, and also produce plots for display (manual QC) to the user.

This list is not exhaustive, and those of ordinary skill in the art having the benefit of this disclosure will appreciate still other error analyses that may be performed in addition to, or in lieu of, those listed. Note that such statistics (*e.g.*, crossline distance between seismic source arrays) are usually required in any seismic survey, but are meaningless in a conventional fixed coordinate system traditionally used for straight line seismic when used for a coil shoot. (Across and along blend as the circle is traversed).

[0048] The algorithm may be used for one or both of real time positioning (steering) of the vessel and spread, and afterwards for quality control and statistics. In real time, the algorithm is used by the applications that are responsible for steering the vessel, sources and streamers. In order to be able to automatically steer along the curved path, the control system needs to know the actual positions of the survey elements vs. the desired position, in an across/along sense. The presently disclose technique imparts this information. Afterwards, the algorithm is used to compute along/across values and along/across errors for use in Quality Control.

[0049] In the embodiments illustrated herein, the presently disclosed technique is not used to process errors out of the data. It is instead used to produce statistics that confirm that the specifications have been met, and to draw displays that enables to user to visually see along/across related data. For example:

- The specifications for the survey might contain Crossline separations between streamers shall be 100 m +/- 5%, for 90% of the shot points. The technique is involved in computing the statistics needed to verify whether this specification was met.

- The user views various plots (for example time-series plots) of crossline/inline values and differences for a variety of survey elements (such as GPS positions,

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0529
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

acoustic hydrophones *etc.*). Because all positions are stored in geographical coordinates, the technique is used to compute path-relative along/across values for display.

[0050] As was mentioned above, the present invention admits variation in the implementation of the sail lines 109 and those described above are exemplary only. The present invention may be used in connection with any of a number of coil shooting techniques known to the art. Several such techniques are disclosed in United States Application Serial Number 12/121,324, filed May 15, 2008, and in United States Application Serial Number 11/335,365, filed January 19, 2006. Both of these applications are incorporated by reference below for their teachings with regards to the coil shooting techniques disclosed therein.

[0051] As disclosed in those applications, a "generally curved advancing path" is one in which the vessels and streamers travel generally in a curve, and there is an advancement in one or more of the *x*- and *y*-directions. The path may be expressed as a coil. The curve may be circular, ovoid (including one or more ovals), elliptical (including one or more ellipses), figure 8, sinusoidal, or some other curved path. The path may vary within the same survey; for example, a first portion of the survey may follow an ovoid path, a second portion of the survey may follow an elliptical path, as one of many examples.

[0052] Note that the present technique includes methods wherein the survey vessels—and, hence, the seismic spread—travel clockwise or counterclockwise. Generally, there is no intrinsic advantage of one direction over the other. However, in embodiments where a single survey vessel travels along a sincurve both clockwise and counterclockwise there may be an advantage in the presence of localized strong currents. The clockwise *versus* counter-clockwise directions may be selected at the beginning of each new swath as a function of the currents. It is generally not practical to change direction from circle to circle (for example clockwise then counter-clockwise) due to loss of time.

[0053] Also as mentioned above, the invention admits variation in the implementation of the seismic survey spread by which the coil shooting is implemented. Several variations in the composition and configuration of the spread used for coil shooting are disclosed in United States Application Serial Number 12/121,324, filed May 15, 2008, and in United States Application Serial Number 11/335,365, filed January 19, 2006. Both of these applications are

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0530
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

incorporated by reference below for their teachings with regards to the coil shooting techniques disclosed therein, including the composition and configuration of the spread.

[0054] Some embodiments employ Q™ and Q-MARINE™ technologies. As used herein, "Q™" is the WesternGeco proprietary suite of advanced seismic technologies for enhanced reservoir location, description, and management. "Q-MARINE™" systems, as discussed herein, refer to the marine seismic spreads employed by WesternGeco and having an accurate positioning system; streamer steering; and advance noise attenuation capabilities. For additional information on Q-Marine™, a fully calibrated, point-receiver marine seismic acquisition and processing system, as well as Q-Land™ and Q-Seabed™, see http://www.westerngeco.com/q-technology.

[0055] In these systems, streamers may be equipped with acoustic transmitters and point receivers for accurate position determination, employing intrinsic ranging modulated acoustics, as taught in U.S. Letters Patent 5,668,775 ("the `775 patent"), incorporated below. As taught in the '775 patent, the streamer transmitters and point receivers may form a full-streamer-length acoustic network, wherein a unique spread spectrum code of acoustic frequencies are emitted by each of a plurality of acoustic transmitters placed within the streamers, all frequencies being within the seismic frequencies detected by the same receivers during shooting and recording, and the point receivers within the streamers are able to distinguish each transmitter's unique code. Thus, accurate positioning of seismic receivers is possible. Conventional streamers use arrays of hydrophones, such as 12 or 18 hydrophones per group, which are summed together in analog fashion and than recorded.

[0056] Furthermore, the single sensors or point receivers are placed in the streamer at intervals, for example one every 3m to 4m, and recorded. All point receivers route data to a computer, where digital filters are applied taking advantage of the very fine sampling of the receivers for very powerful coherent noise attenuation of line swell noise and/or streamer cable noise. During the turns the noise from marine current may be stronger, since at least portions of the streamers may be traveling cross-current. Noise can therefore be attenuated from each point receiver very well. Streamers may also be steered into desired positions by steering devices, as further described herein.

[0057] Returning now to **FIG. 3**, to further an understanding of the present invention, a more thorough discussion of the seismic spread 101 illustrated herein follows. As mentioned

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0531
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

above, the seismic spread 101 generally includes an array 106 towed by a survey vessel 103 on board of which is a computing apparatus 300. The towed array 106 comprises eight marine streamers 112 (only one indicated) that may, for instance, each be 6 km long and separated by up to 100m. Note that the number of streamers 112 in the towed array 106 is not material to the practice of the invention. These aspects of the apparatus may be implemented in accordance with conventional practice.

[0058] Note that these distances discussed herein are "approximate." As used herein, the term "approximate" acknowledges that which is commonly known in the art—namely, that it is difficult to consistently maintain the position of the streamers 112 throughout the entire seismic survey 101. Environmental conditions, such as tides and winds, frequently push all or parts of the streamers 112 out of their desired positions during the seismic survey 101. Accordingly, as is discussed further below, the streamers 112 include positioning devices to help offset these types of factors. Deviations from desired positions nevertheless occur and they may affect the crossline cable separation. The term "approximately" is a reflection of this reality and indicates that deviations from the modified distance that are within a degree commonly accepted by those in the industry in this context.

[0059] A seismic source 115 is also shown being towed by the survey vessel 103. Note that, in alternative embodiments, the seismic source 115 may not be towed by the survey vessel 103. Instead, the seismic source 115 may be towed by a second vessel (not shown), suspended from a buoy (also not shown), or deployed in some other fashion known to the art. The known seismic sources include impulse sources, such as explosives and air guns, and vibratory sources which emit waves with a more controllable amplitude and frequency spectrum. The seismic source 115 may be implemented using any such source known to the art. In the illustrated embodiment, the seismic source 115 comprises an air gun or an array of air guns

[0060] At the front of each streamer 112 is a deflector 306 (only one indicated) and at the rear of every streamer 112 is a tail buoy 309 (only one indicated). The deflector 306 laterally, or in the crossline direction, positions the front end 113 of the streamer 112 nearest the survey vessel 103. The tail buoy 309 creates drag at the tail end 114 of the streamer 112 farthest from the survey vessel 103. The tension created on the streamer 112 by the deflector 306 and the tail buoy 309 helps shape the streamer 112.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0532
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

[0061] Located between the deflector 306 and the tail buoy 309 are a plurality of seismic cable positioning devices known as "birds" 312. The birds 312 may be located at regular intervals along the seismic cable, such as every 200m to 400m. In this particular embodiment, the birds 312 are used to control the depth at which the streamers 112 are towed, typically a few meters. In one particular embodiment, the steerable birds 118 are implemented with Q-fin™ steerable birds as are employed by WesternGeco, the assignee hereof, in their seismic surveys.

[0062] The principles of design, operation, and use of such steerable birds are found in PCT International Application WO 00/20895, filed on September 28, 1999 ("the `895 application"). However, any type of steerable device may be employed. For instance, a second embodiment is disclosed in PCT International Application No. WO 98/28636 filed December 19, 1997 ("the `636 application"). In some embodiments, the birds 118 may even be omitted.

[0063] The streamers 112 also include a plurality of instrumented sondes 314 (only one indicated) distributed along their length. The instrumented sondes 314 house, in the illustrated embodiment, an acoustic sensor 700 (*e.g.*, a hydrophone) such as is known to the art, and a particle motion sensor 703, both conceptually shown in **FIG. 7**. The particle motion sensors 703 measure not only the magnitude of passing wavefronts, but also their direction. The sensing elements of the particle motions sensors may be, for example, a velocity meter or an accelerometer.

[0064] Suitable particle motion sensors are disclosed in: U.S. Application Serial No. 10/792,511, filed March 3, 2004; U.S. Application Serial No. 10/233,266 filed August 30, 2002; and U.S. Letters Patent 3,283,293, issued November 1, 1966. Each of these is incorporated below. Any suitable particle motion sensor known to the art may be used to implement the particle motion sensor 703. Thus, it would be possible to distinguish data representing upwardly propagating wavefronts, such as the reflections 135, from the downwardly propagating wavefronts, such as the multiple reflection 150.

[0065] In general, it is desirable for the noise measurements of the particle motion sensors 703 be taken as close to the point the seismic data is acquired by the acoustic sensors 700 as is reasonably possible. More distance between the noise data acquisition and the seismic data acquisition will mean less accuracy in the measurement of noise at the point of seismic data

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0533
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

acquisition. However, it is not necessary that the particle motion sensor 703 be positioned together with the acoustic sensor 700 within the sensor sonde 314. The particle motion sensor 703 need only be located sufficiently proximate to the acoustic sensor 700 that the noise data it acquires reasonably represents the noise component of the acquired seismic data.

[0066] The sensors of the instrumented sondes 314 then transmit data representative of the detected quantity over the electrical leads of the streamer 112. The data from the acoustic sensors 700 and the particle motion sensors 703 may be transmitted over separate lines. However, this is not necessary to the practice of the invention. However, size, weight and power constraints will typically make this desirable. The data generated by the particle motion sensor 703 will therefore need to be interleaved with the seismic data. Techniques for interleaving information with this are known to the art. For instance, the two kinds of data may be multiplexed. Any suitable techniques for interleaving data known to the art may be employed.

[0067] Thus, the data generated by the sensors of the instrumented sondes 314 is transmitted over the seismic cable to the computing apparatus 300. As those in the art will appreciate, a variety of signals are transmitted up and down the streamer 112 during the seismic survey. For instance, power is transmitted to the electronic components (*e.g.*, the acoustic sensor 700 and particle motion sensor 703), control signals are sent to positioning elements (not shown), and data is transmitted back to the vessel 103. To this end, the streamer 112 provides a number of lines (*i.e.*, a power lead 706, a command and control line 709, and a data line 712) over which these signals may be transmitted. Those in the art will further appreciate that there are a number of techniques that may be employed that may vary the number of lines used for this purpose. Furthermore, the streamer 112 will also typically include other structures, such as strengthening members (not shown), that are omitted for the sake of clarity.

[0068] As those in the art will appreciate, the sail lines preplots are generated prior to the conduct of the survey. Preliminary studies of the survey area are made to determine survey characteristics that inform the design of the survey itself. In association with the presently disclosed technique, this is done in accordance with conventional practice. This is typically performed at a central processing facility of some kind that houses a computing system such as the computing system 800 in **FIG. 8**, comprising more than one computing apparatus. For example, the preliminary data 801 may reside in a data structure residing on a server 803 and

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0534
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

the application 805 by which it is processed on a workstation 806 to generate the survey design 809.

[0069] The survey design 809 is then transported to the survey vessel 103 and loaded onto the computing apparatus 300. The computing apparatus 300 represents a variety of computing resources that fulfill a number of purposes in the survey 100. For example, and as will be appreciated by those in the art having the benefit of this disclosure, the survey vessel 103 will be equipped with computer-implemented navigation and control systems. However, these functionalities may be distributed across elements of the seismic spread 101 rather than concentrated in a single computing apparatus. Furthermore, the nature of the software control in terms of architecture or *situs* is material to the practice of the invention. For example, in some embodiments, the navigation and streamer steering may be performed by separate software components that may be, for instance, utilities or daemons.

[0070] **FIG. 9A** – **FIG. 9B** depict a rack-mounted computing apparatus 900 with which the navigation and control systems may be implemented. The computing apparatus 900 includes a processor 905 communicating with some storage 910 over a bus system 915. The storage 910 may include a hard disk and/or **r**andom **a**ccess **m**emory ("RAM") and/or removable storage such as a floppy magnetic disk 917 and an optical disk 920. The storage 910 is encoded with a data structure 925 storing the data set acquired as discussed above, an operating system 930, user interface software 935, and an application 965.

[0071] The user interface software 935, in conjunction with a display 940, implements a user interface 945. The user interface 945 may include peripheral I/O devices such as a key pad or keyboard 950, a mouse 955, or a joystick 960.

[0072] The processor 905 runs under the control of the operating system 930, which may be practically any operating system known to the art. The application 965 is invoked by the operating system 930 upon power up, reset, or both, depending on the implementation of the operating system 930. The application 965 issues navigation commands ("NAV") to the survey vessel 103 in accordance with its program to sail the survey vessel 103 on the generally advancing curved path of the sail line 109 and to tow the marine seismic streamers 112 and/or source 115, depending on the particular embodiment. The application 965 also, in this particular embodiment, receives positioning data ("POSITION") from the marine seismic streamers 112 and issues steering commands ("STEERING") to the steering devices thereon.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0535
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

[0073] The positioning and steering functionalities described herein relative to the presently disclosed technique are, in the illustrated embodiment, implemented in a pair of modified software packages called TRINAV™ and REPEAT™. In particularly, they are modified to perform the technique disclosed herein. They are proprietary to WesternGeco L.L.C., the assignee hereof.

[0074] However, similar software is commercially available from a variety of sources. Concept Systems Ltd. markets a suite of suitable software tools for which additional information may be obtained over the World Wide Web from the company's website at http://www.iongeo.com/About_Us/Business_Units_and_Subsidiaries/Concept_Systems/. Concept Systems can also be contacted directly at 1 Logie Mill, Beaverbank Business Park, Logie Green Road, Edinburgh, EH7 4HG, Scotland, United Kingdom—(ph) +44 131 557 5595, fax +44 131 557 2367. Quest Geo Solutions Ltd. also offers suitable software tools that may be suitable for which additional information may be found on the World Wide Web at http://www.qgsl.com/; or directly Passfield Business Centre, Lynchborough Road, Passfield, Liphook, Hampshire, GU30 7SB, United Kingdom; or at (ph, UK) +44 (0) 1428 751565, (ph, US) +1 281 660 5480, or (fax) +44 (0) 1428 751566. This list is not exhaustive, however. Those of ordinary skill in the art having the benefit of this disclosure will be able modify these and other commercially available software to implement the presently disclosed technique.

[0075] Returning to **FIG. 9A** – **FIG. 9B**, the application 965 will either implement or invoke a controller 975. The control technique employed by the controller 975 will be implementation specific. A variety of suitable control techniques are disclosed in United States Application Serial Number 12/121,324, filed May 15, 2008, and in United States Application Serial Number 11/335,365, filed January 19, 2006. Both of these applications are incorporated by reference below for their teachings with regards to the coil shooting techniques disclosed therein, including the control of the shape and position of the spread.

[0076] Some embodiments may incorporate one of the so-called Advance Spread Control systems and methods described in assignee's co-pending United States Application Serial No. 11/122,646, filed March 5, 2005, incorporated below. In these systems, a marine seismic spread includes a vessel-mounted acoustic Doppler current meter to measure at least a horizontal component of a current velocity vector at least at one location generally ahead of

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0536
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

the seismic spread elements. The measured horizontal component is then use to control position of a seismic spread element.

[0077] One particular embodiment implements these aspects of the disclosed technique include PID controllers. Controllers useful in the systems and methods of the invention may vary in their details. One PID controller useful in the invention may be expressed mathematically as:

$$u(t) = K_p [e(t) + 1/T_i \bullet \int e(t)dt + T_d \bullet \dot{e}(t)] \quad (1)$$

wherein:

$\int \equiv$ integrate;

$\dot{e}(t) \equiv$ the time derivative;

$u(t) \equiv$ controller output, either meters across to a tracking control device such as that known under the trade designation Robtrack/STS500, or heading to an autopilot;

$e(t) \equiv$ difference between wanted (planned, reference) and measured (current position, y) value;

$T_d \equiv$ a constant for describing the derivative part of the algorithm (the derivative part may be filtered to avoid deriving high frequencies);

$T_i \equiv$ a constant for describing the integrating part of the algorithm; and

$K_p \equiv$ a proportional gain constant.

[0078] In the s-plane (Laplace), the PID controller may be expressed as:

$$H_r(s) = K_p [1 + 1/ T_i s + T_d s/(1+ T_f s)] \quad (2)$$

wherein:

$s \equiv$ the variable in the s-plane; and

$T_f \equiv$ a constant describing the filtering part of the derivative part of the algorithm.

[0079] For discretization, a variety of transforms may be employed, and some constants may or may not be useful. For example, the T_f constant may not be necessary in some instances, but may be especially useful in other scenarios. As one discretization example, the z-

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0537
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

transform may be used, meaning that the integral part of the algorithm may be approximated by using a trapezoid model of the form:

$$s = (1 - z^{-1})/T \quad (3)$$

while the derivative part may be approximated using an Euler model:

$$s = 2/T \bullet (1 - z^{-1})/(1 + z^{-1}) \quad (4)$$

wherein T is the sampling time. The resulting discrete model may then be used directly in the steering algorithm. Other discrete models, derived using other transforms, are useful in the invention, and will be apparent to control technicians or control engineers of ordinary skill.

[0080] Model Predictive Control ("MPC") is an advanced multivariable control method for use in multiple input/multiple output ("MIMO") systems. An overview of industrial Model Predictive Control can be found at: www.che.utexas.edu/~qin/cpcv/cpcv14.html. MPC computes a sequence of manipulated variable adjustments in order to optimize the future behavior of the process in question. At each control time k, MPC solves a dynamic optimization problem using a model of the controlled system, so as to optimize future behavior (at time k+1, k+2…k+n) over a prediction horizon n. This is again performed at time k+1, k+2…. MPC may use any derived objective function, such as Quadratic Performance Objective, and the like, including weighting functions of manipulated variables and measurements.

[0081] Dynamics of the process and/or system to be controlled are described in an explicit model of the process and/or system, which may be obtained for example by mathematical modeling, or estimated from test data of the real process and/or system. Some techniques to determine some of the dynamics of the system and/or process to be controlled include step response models, impulse response models, and other linear or non-linear models. Often an accurate model is not necessary. Input and output constraints may be included in the problem formulation so that future constraint violations are anticipated and prevented, such as hard constraints, soft constraints, set point constraints, funnel constraints, return on capital constraints, and the like.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0538
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

[0082] It may be difficult to explicitly state stability of an MPC control scheme, and in certain embodiments of the present invention it may be necessary to use nonlinear MPC. In so-called advance spread control of marine seismic spreads, PID control may be used on strong mono-variable loops with few or non-problematic interactions, while one or more networks of MPC might be used, or other multivariable control structures, for strong interconnected loops. Furthermore, computing time considerations may be a limiting factor. Some embodiments may employ nonlinear MPC.

[0083] Feed forward algorithms, if used, will in the most general sense be task specific, meaning that they will be specially designed to the task they are designed to solve. This specific design might be difficult to design, but a lot is gained by using a more general algorithm, such as a first or second order filter with a given gain and time constants.

[0084] The introduction of a tracking point may serve at least two purposes. First, it gives a more flexible solution for a track that we want parts of the spread to follow. Second, if other means are used for controlling source positions, like a winch or a source deflector, the vessel will in many occasions have "spare" steering capacity available. This may mean that by moving the tracking point aft of the sources, streamer front ends and consequentially also the receivers may be closer to where they should be, which may help the streamer steering devices in achieving their steering objectives.

[0085] In certain embodiments, a tracking point will not be a static point in the spread, as time varying currents may result in the center of source steering objective and the tracking point steering objective unable to be met at the same time. In these embodiments, the tracking point may be moved, either dynamically or non-dynamically, until both objectives can be met with a certain slack. The reverse might also be the case, *i.e.*, having excess steering power resulting in moving the tracking point further aft. If the movement of the tracking point is above a predefined distance, a new set of parameters for both the controller and the feed forward controller may be used to optimize the controller performance.

[0086] Note that these are exemplary control techniques only and that they are not exhaustive. Alternative control techniques may be employed in alternative embodiments. The invention is not limited by the type of control technique employed.

[0087] Returning to **FIG. 3**, the computing apparatus 300 receives the seismic data (hydrophone as well as particle motion sensor data), and records it. The particle motion

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0539
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

sensor data is recorded in, for example, a data storage in any suitable data structure known to the art. The computing apparatus 300 interfaces with the navigation system (not shown) of the survey vessel 103. From the navigation system, the computing apparatus 300 obtains estimates of system wide parameters, such as the towing direction, towing velocity, and current direction and measured current velocity.

[0088] In the illustrated embodiment, the computing apparatus 300 also monitors the actual positions of each of the birds 312, as well as other elements of the streamers 112. The computing apparatus is programmed with the desired positions of or the desired minimum separations between the streamers 112 as well as other characteristics of the survey. The horizontal positions of the birds 312 can be derived using various techniques well known to the art. The vertical positions, or depths, of the birds 312 are typically monitored using pressure sensors (not shown) attached to the birds 312.

[0089] The shape of the streamer 112, and therefore the positions of its elements, during the survey may be determined using any of a variety of techniques known to the art. For instance, satellite-based global positioning system equipment can be used to determine the positions of the equipment. The Global Positioning System ("GPS"), or differential GPS, are useful, with GPS receivers (not shown) at the front and tail of the streamer. In addition to GPS based positioning, it is known to monitor the relative positions of streamers and sections of streamers through an acoustic positioning system comprised of a network of sonic transceivers 318 (only one indicated) that transmit and receive acoustic or sonar signals.

[0090] The computing apparatus 300, through execution of a controller 975, shown in **FIG. 9A – FIG. 9B**, then implements the method discussed above relative to **FIG. 6** to determine the deviation of the elements of the seismic spread 101 from the preplot, both of which are shown in **FIG. 1**. Once the deviation is determined, the controller 975 then takes appropriate action to correct the position of the element deviating from the planned position.

[0091] The presently disclosed technique can also be used to perform error analysis on seismic data previously acquired in a coil shoot, seismic survey. For example, and returning to **FIG. 8**, a second application 812 residing on the workstation 806 may be invoked to operate on the acquired seismic data 815 to perform the method 600 of **FIG. 6** to detect errors therein. The acquired seismic data 815 may have been recently acquired or it may be legacy data that has been archived for some time. The results of the error analysis can then be used

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0540
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

to correct the errors to obtain a superior set of processed seismic data 818. Note also that this technique may be useful in the processing of time-lapse, or 4D data, as well.

[0092] The present technique as disclosed above allows real time and post survey quality control of positions with respect to a substantially non-straight pre-survey plan as would be used in coil, spiral or circular shooting. The elements of the method relate the object subjected to quality control to a dynamic reference frame and relate the coordinates of the object to the correct current path plan. In addition, methods that present errors in actual positions with respect to planned positions are displayed and quantified in a straight line presentation. Furthermore, in addition to computing path-relative across and along positions/offsets, the presently disclosed technique can (and will) also compute path-relative across and along velocities for survey equipment elements, which are used in both real time steering and quality control.

[0093] As is apparent from the discussion above, some aspects of the present invention are implemented in software executed by a computing apparatus. Some portions of the detailed descriptions herein are consequently presented in terms of a software implemented process involving symbolic representations of operations on data bits within a memory in a computing system or a computing device. These descriptions and representations are the means used by those in the art to most effectively convey the substance of their work to others skilled in the art. The process and operation require physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical, magnetic, or optical signals capable of being stored, transferred, combined, compared, and otherwise manipulated. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, or the like.

[0094] It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated or otherwise as may be apparent, throughout the present disclosure, these descriptions refer to the action and processes of an electronic device, that manipulates and transforms data represented as physical (electronic, magnetic, or optical) quantities within some electronic device's storage into other data similarly represented as physical quantities within the storage, or in transmission or display devices. Exemplary of the

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0541
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

terms denoting such a description are, without limitation, the terms "processing," "computing," "calculating," "determining," "displaying," and the like.

[0095] Note also that the software implemented aspects of the invention are typically encoded on some form of program storage medium or implemented over some type of transmission medium. The program storage medium may be magnetic (*e.g.*, a floppy disk or a hard drive) or optical (*e.g.*, a compact disk read only memory, or "CD ROM"), and may be read only or random access. Similarly, the transmission medium may be twisted wire pairs, coaxial cable, optical fiber, or some other suitable transmission medium known to the art. The invention is not limited by these aspects of any given implementation.

[0096] The following documents are incorporated by reference herein for all purposes as modified by the teachings set forth above as if set forth herein *verbatim*:

- United States Provisional Application Serial Number 61/061,357, filed June 13, 2008, in the name of the inventors Stig Solheim and Kjell Saeten, and entitled, "Filtering and Presentation of Heading Observations for Coil Shooting"

- United States Application Serial Number 11/335,365, filed January 19, 2006, in the name of the inventors Nicolae Moldoveanu and Alan Strudley, and entitled, "Methods and Systems for Efficiently Acquiring Towed Streamer Seismic Surveys" (Attorney Docket No. 594-25619-US).

- United States Application Serial Number 12/121,324 , filed May 15, 2008, in the name of the inventors Nicolae Moldoveanu and Steven Fealy, and entitled, "Methods for Efficiently Acquiring Wide-Azimuth Towed Streamer Seismic Data" (Attorney Docket No. 594-25633-US2).

- United States Provisional Application Serial Number 60/938,547 filed May 17, 2007, entitled, "Methods for Efficiently Acquiring Wide-Azimuth Towed Streamer Seismic Data", and filed in the name of the inventors Nicolae Moldoveanu and Steven Fealy (Attorney Docket No. 594-25633-PRO).

- United States Provisional Application Serial Number 60/966,534 (converted from United States Application Serial Number 11/836,675, filed August 9,

2007, by petition filed August 31, 2007), entitled, "Methods for Efficiently Acquiring Wide-Azimuth Towed Streamer Seismic Data", and filed in the name of the inventors Nicolae Moldoveanu and Steven Fealy (Attorney Docket No. 594-25633-US-PRO2).

- United States Provisional Application Serial Number 60/969,203 filed August 31, 2007, entitled, "Methods for Efficiently Acquiring Wide-Azimuth Towed Streamer Seismic Data", and filed in the name of the inventors Nicolae Moldoveanu and Steven Fealy (Attorney Docket No. 594-25633-PRO3).

- United States Application Serial Number 11/836,675, filed August 9, 2007, entitled, "Methods for Efficiently Acquiring Wide-Azimuth Towed Streamer Seismic Data", and filed in the name of the inventors Nicolae Moldoveanu and Steven Fealy (Attorney Docket No. 594-25633), which was converted to United States Provisional Application Serial Number 60/966,534 (Attorney Docket No. 594-25633-US-PRO2) by petition filed August 31, 2007;

- United States Application Serial Number 11/114,773, filed April 26, 2005, entitled, "Seismic Streamer System and Method", and filed in the name of the inventors Rohitashva Singh, *et al.*, published October 26, 2006, as Patent Publication 20060239117 A1;

- United States Application Serial No. 11/122,646, filed Mar 5, 2005, entitled, "Forward looking systems and methods for positioning marine seismic equipment", and filed in the name of the inventors Rune Toennessen, *et al.*, published November 16, 2006, as Patent Publication 20060256653 A1;

- U.S. Letters Patent 5,668,775, entitled "Methods for determining the position of seismic equipment, and applications of the methods", and issued September 16, 1997, to GECO A.S. in the name of the inventor Kjell Hatteland;

- U.S. Letters Patent 6,671,223, entitled "Control devices for controlling the position of a marine seismic streamer", and issued December 30, 2003, to WesternGeco, L.L.C. in the name of the inventor Simon H. Bittleston;

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0543
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

- U.S. Letters Patent 3,774,570, entitled "Non-Rotating Depth Controller Paravane for Seismic Cables", and issued November 27, 1973, to Whitehall Electronics in the name of the inventors Raymond H. Pearson;

- U.S. Letters Patent 3,560,912, entitled "Control System for a Towed Vehicle", and issued February 2, 1971, to Westinghouse Electric Corporation in the name of the inventors P.G. Spink, *et al.*;

- U.S. Letters Patent 5,443,027, entitled "Lateral force device for underwater towed array", and issued August 22, 1995, to The United States of America as represented by the Secretary of the Navy in the name of the inventors Norman L. Owsley;

- U.S. Letters Patent 3,605,674, entitled "Underwater Cable Controller", and issued September 20, 1971, to Dresser Industries, Inc. in the name of the inventor Raymond C. Weese;

- U.S. Letters Patent 4,404,664, entitled "System for laterally positioning a towed marine cable and method of using same", and issued September 13, 1983, to Mobil Oil Corporation in the name of the inventor Robert G. Zachariadis;

- U.S. Letters Patent 6,525,992, entitled "Devices for controlling the position of an underwater cable", and issued February 25, 2003, to Input/Output, Inc. in the name of the inventors Andrew W. Olivier, *et al.*; and

- EP Patent Publication No. EP 0613025, entitled "A Device and Method for Positioning of Towing Systems for Use in Marine Seismic Systems", and filed February 22, 1994, in the name of the inventor Tor Elholm.

[0097] This concludes the detailed description. The particular embodiments disclosed above are illustrative only, as the invention may be modified and practiced in different but equivalent manners apparent to those skilled in the art having the benefit of the teachings herein. Furthermore, no limitations are intended to the details of construction or design herein shown, other than as described in the claims below. It is therefore evident that the particular embodiments disclosed above may be altered or modified and all such variations are

considered within the scope and spirit of the invention. Accordingly, the protection sought herein is as set forth in the claims below.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0545
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

CLAIMS

WHAT IS CLAIMED:

1. A computer-implemented method for determining the deviation of spread array element from a planned curved path during a towed-array marine seismic survey, the comprising:

determining a nominal position of the spread array element at a given point in the planned curved path;

determining the actual position of the spread array element; and

performing an error analysis predicated on the nominal and actual positions.

2. The computer-implemented method of claim 1, wherein determining the nominal position of the spread array element in the method includes determining the nominal position from an equipment nominal offset and a shot number.

3. The computer-implemented method of claim 1, wherein determining the nominal position of the spread array element in the method includes determining distance along and distance across.

4. The computer-implemented method of claim 1, wherein determining the actual position of the spread array element in the method includes acoustic ranging or GPS positioning.

5. The computer-implemented method of claim 1, wherein performing the error analysis in the method includes performing an error analysis during the survey to correct position errors for survey elements.

6. The computer-implemented method of claim 1, wherein performing the error analysis in the method includes performing an error analysis after the survey for quality control purposes.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0546
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

7. The computer-implemented method of claim 1, wherein performing the error analysis in the method includes any one of, or any combination of:

determining the difference between the desired position and the actual position of steered survey elements to issue steering commands;

determining the difference between the desired position and the actual position of steered survey elements to produce plots of the deviation from the desired position in an across/along reference frame for display to the user in real time; and

determine the path-relative across values and across/along separations between survey elements to compute statistics establishing whether certain survey specifications are being met; and

produce determine the path-relative across values and across/along separations between survey elements to plots for display (manual QC) to the user.

8. A towed-array, marine seismic survey apparatus, comprising:

means for determining a nominal position of the spread array element at a given point in the planned curved path;

means for determining the actual position of the spread array element; and

means for performing an error analysis predicated on the nominal and actual positions.

9. A computer-readable program storage medium encoded with instructions that, when executed by a computing device, perform a method as in claims 1-7.

10. A programmed computing apparatus, comprising:

a processor;

a bus system;

a storage communicating with the processor over the bus system;

a software component residing on the storage that, when executed by the processor, will perform a method as in claims 1-7.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0547
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

11. A method, comprising:

traversing a seismic survey spread over a sail line for a curved path; and

positioning the elements of the seismic survey spread during the traversal, including:

determining a nominal position of the spread array element at a given point in the planned curved path;

determining the actual position of the spread array element;

performing an error analysis predicated on the nominal and actual positions; and

correcting an error in the position of the spread array element obtained from the error analysis.

12. The method of claim 11, wherein determining the nominal position of the spread array element includes determining the nominal position from an equipment nominal offset and a shot number.

13. The method of claim 11, wherein determining the nominal position of the spread array element includes determining distance along and distance across.

14. The method of claim 11, wherein determining the actual position of the spread array element includes acoustic ranging or GPS positioning.

15. The method of claim 11, wherein performing the error analysis includes performing an error analysis during the survey to correct position errors for survey elements.

16. The method of claim 11, wherein performing the error analysis includes performing an error analysis after the survey for quality control purposes.

17. The method of claim 11, wherein performing the error analysis includes any one of, or any combination of:

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0548
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

determining the difference between the desired position and the actual position of steered survey elements to issue steering commands;

determining the difference between the desired position and the actual position of steered survey elements to produce plots of the deviation from the desired position in an across/along reference frame for display to the user in real time; and

determine the path-relative across values and across/along separations between survey elements to compute statistics establishing whether certain survey specifications are being met; and

produce determine the path-relative across values and across/along separations between survey elements to plots for display (manual QC) to the user.

18. A towed-array, marine seismic survey apparatus, comprising:

means for traversing a seismic survey spread over a sail line for a curved path; and

means for positioning the elements of the seismic survey spread during the traversal, including:

means for determining a nominal position of the spread array element at a given point in the planned curved path;

means for determining the actual position of the spread array element;

means for performing an error analysis predicated on the nominal and actual positions; and

means for correcting an error in the position of the spread array element obtained from the error analysis.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0549
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

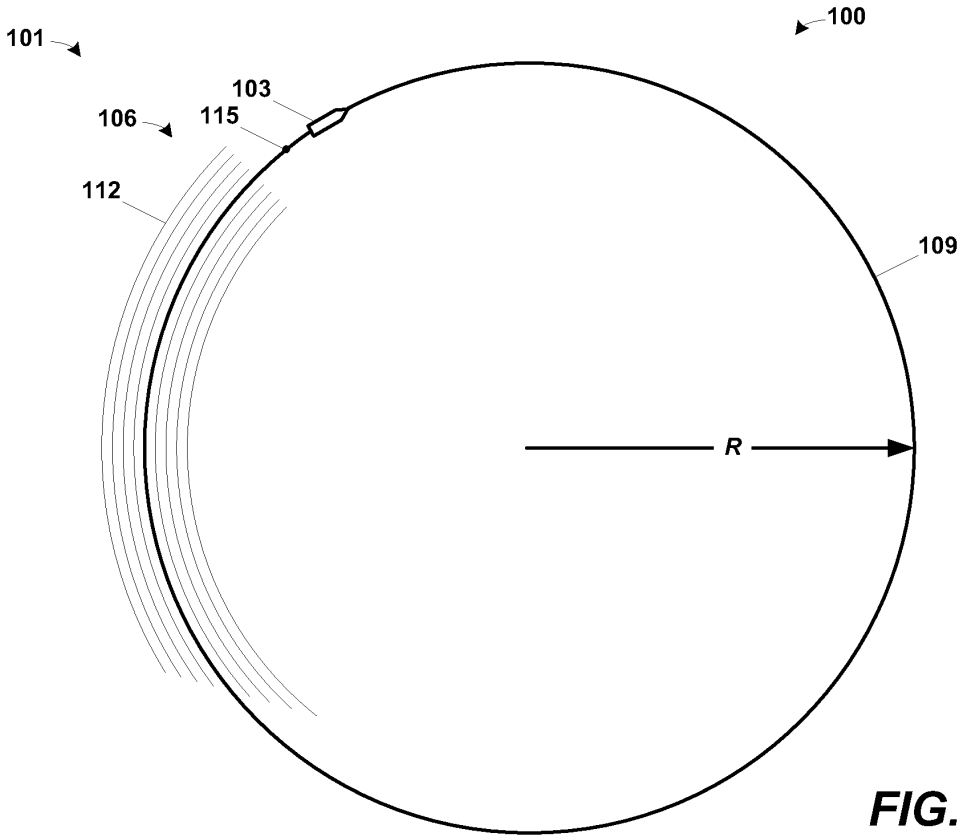


FIG. 1

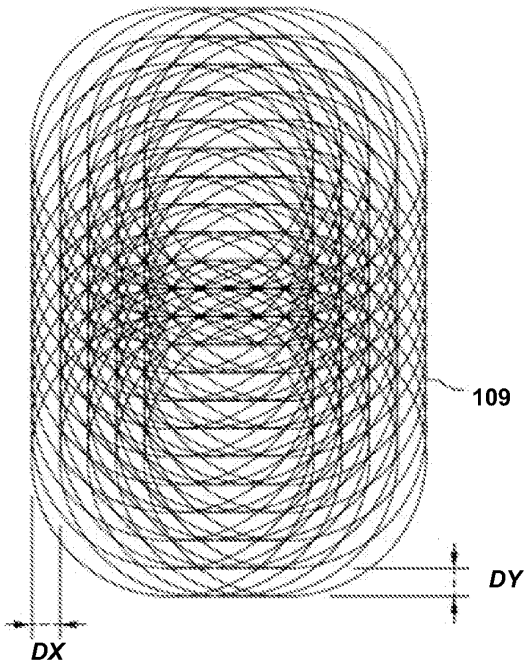


FIG. 2

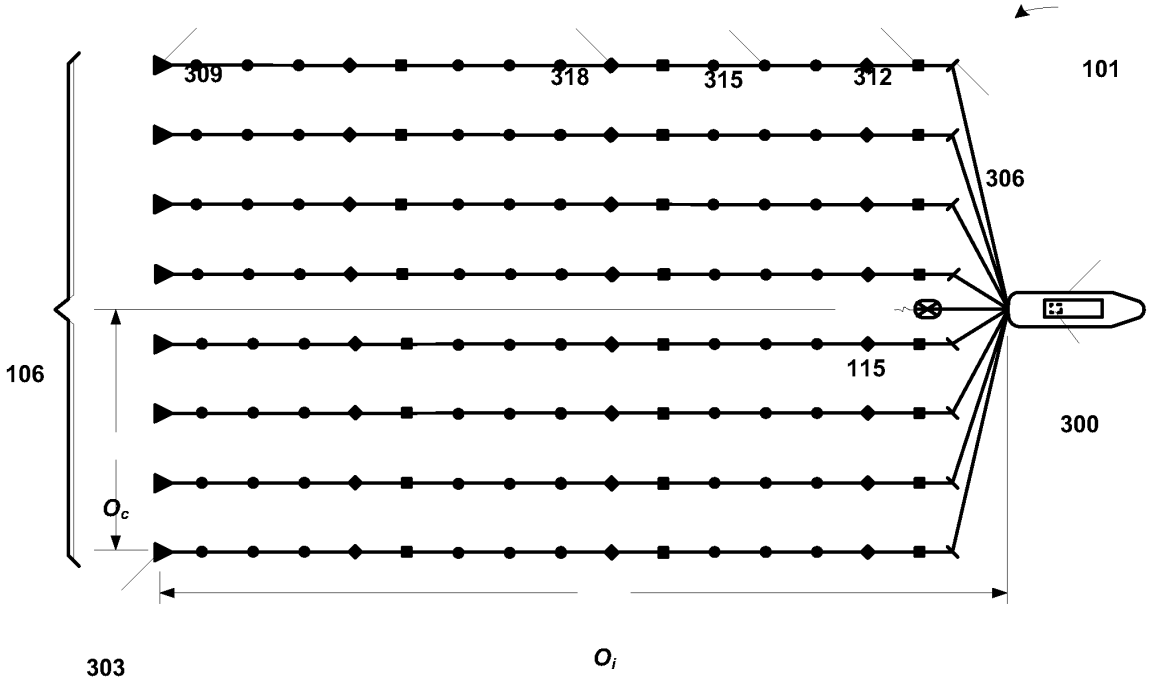

309
318
315
312
101
306
106
115
300
O_c
303
O_i

FIG. 3

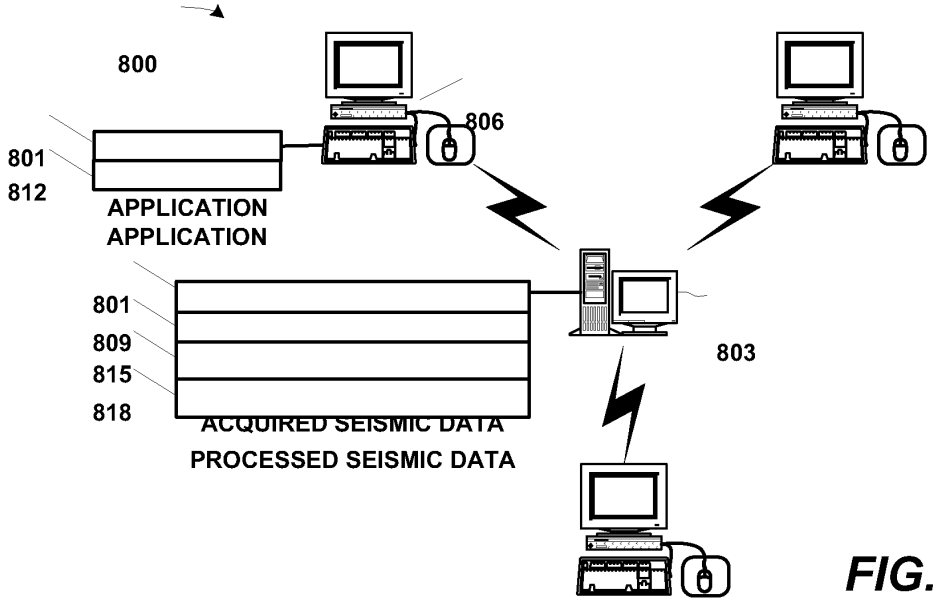

800
806
801
812
APPLICATION
APPLICATION
801
809
815
818
803
ACQUIRED SEISMIC DATA
PROCESSED SEISMIC DATA

FIG. 8

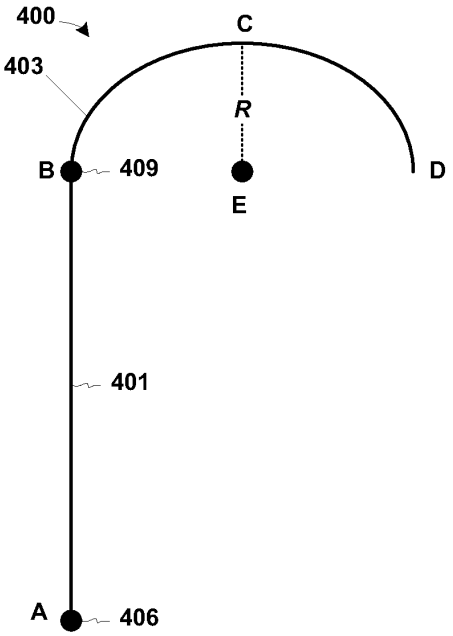


FIG. 4

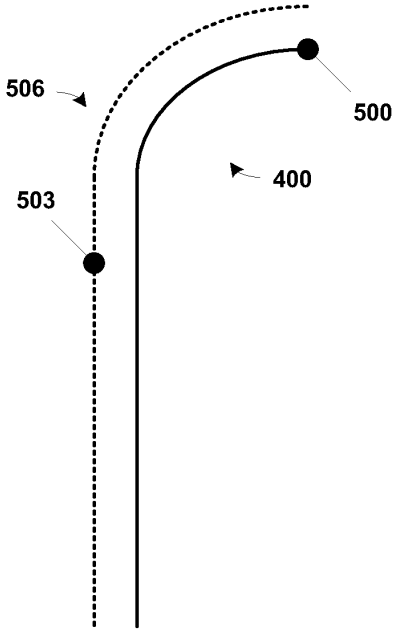


FIG. 5

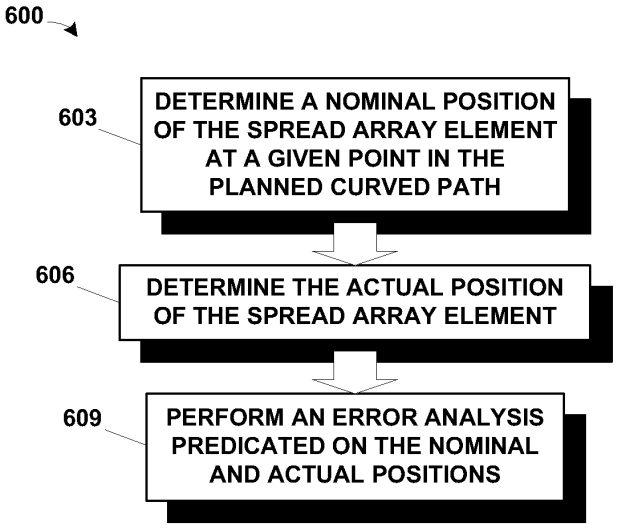


FIG. 6

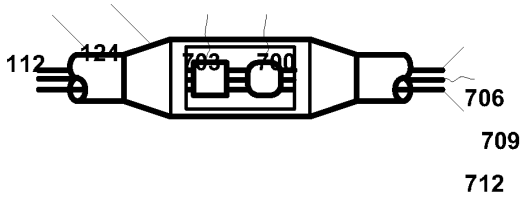


FIG. 7

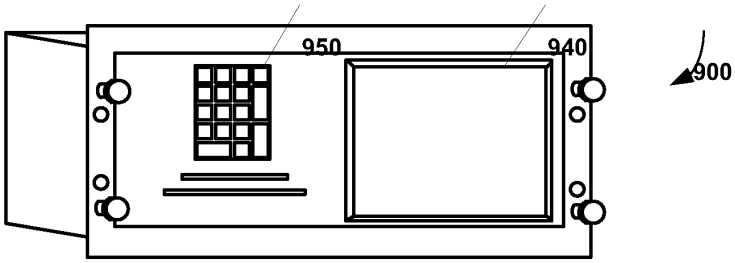


FIG. 9A

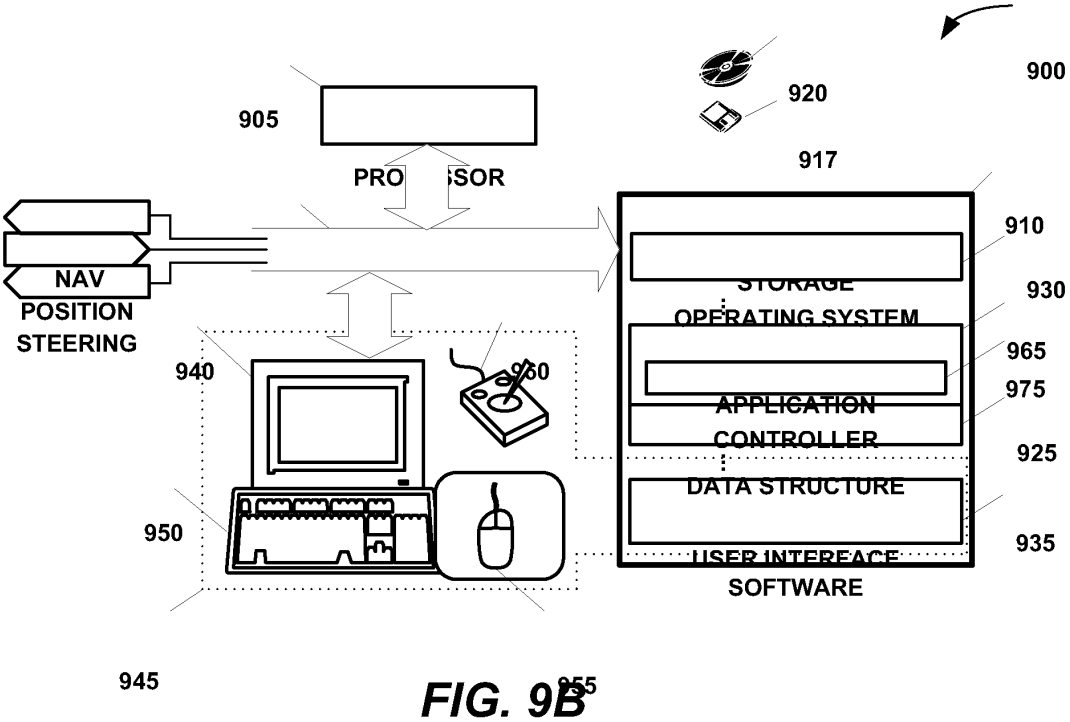


FIG. 9B

Electronic Acknowledgement Receipt

EFS ID:	34602814
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee/Tess Langseth-DePaolis
Filer Authorized By:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	17-DEC-2018
Filing Date:	19-SEP-2018
Time Stamp:	18:29:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	02359acon5xtml.pdf	106689 81e41595bd0b4f8c00e416cd9384aa51719ce9db	no	2
Warnings:					

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	02359acon5sb08.pdf	110877 ed97adb040f5aaba4cdd956a29dc71ef990d2af0	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	wo2010005673.pdf	1875682 30489bccc0c0ca62787916e5cbc58584e84ed432	no	39
Warnings:					
Information:					
4	Non Patent Literature	microsoft.pdf	284931 f8242c9be57ac2cdf539c2c7f0d831d88fa9a1c1	no	5
Warnings:					
Information:					
			Total Files Size (in bytes):	2378179	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on December 17, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Tess Langseth-DePaolis/
Tess Langseth-DePaolis

Appl No.	: 16/136,183	Confirmation No. 2864
Applicant	: DIVX, LLC	
Filed	: September 19, 2018	
Title	: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys	
TC/A.U.	: 2434	
Examiner	: Abiy Getachew	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

INFORMATION DISCLOSURE STATEMENT § 1.97(b)

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806
December 17, 2018

Commissioner

In compliance with the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the MPEP §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B with a listing of references that are known to applicant. Copies of each of the references listed under “Foreign Patent Documents” and “Non-Patent Literature Documents" are enclosed.

It is respectfully requested that these references be considered in the examination of this application and identified on the list of references cited on the patent issuing on this application. Applicant also requests that an initialed copy of said FORM PTO/SB/08A/B be entered in the application file, and returned to the Applicant with the next official communication from the Office in accordance with MPEP § 609.

It is believed that there are no fees due in connection with this filing. If there are any fees due in connection with this filing, the Commissioner is authorized to charge Deposit Account 50-4407. Please show our docket number with any charge to the Deposit Account.

Respectfully submitted,

KPPB LLP

/Paul J. Lee/
Paul J. Lee
Registration No. 69,375
949.852.0000

PJL/tld

Enclosures

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0557
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

71897 7590 12/18/2018

KPPB LLP
2190 S. Towne Centre Place
Suite 300
Anaheim, CA 92806

EXAMINER	
GETACHEW, ABIY	
ART UNIT	PAPER NUMBER
2434	

DATE MAILED: 12/18/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/136,183	09/19/2018	Michael George Kiefer	D1-02359A.CON5	2864

TITLE OF INVENTION: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	03/18/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0558
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

71897 7590 12/18/2018

KPPB LLP
2190 S. Towne Centre Place
Suite 300
Anaheim, CA 92806

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/136,183	09/19/2018	Michael George Kiefer	D1-02359A.CON5	2864

TITLE OF INVENTION: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	03/18/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
GETACHEW, ABIY	2434	713-160000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0559
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/136,183	09/19/2018	Michael George Kiefer	D1-02359A.CON5	2864

71897 7590 12/18/2018

KPPB LLP
2190 S. Towne Centre Place
Suite 300
Anaheim, CA 92806

EXAMINER	
GETACHEW, ABIY	
ART UNIT	PAPER NUMBER
2434	

DATE MAILED: 12/18/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0560
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 16/136,183	Applicant(s) Kiefer et al.	
	Examiner ABIY GETACHEW	Art Unit 2434	AIA Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 09/19/2018.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-7,9-19 and 21-26 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file areply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 11/19/2018.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☑ Interview Summary (PTO-413), Paper No./Mail Date. 20181119.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/ABIY GETACHEW/
Examiner, Art Unit 2434

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0562
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Remarks

2. Claims 1-7, 9-19 and 21-26 are pending. Claims 1 and 13 are independent form. Claims 1, 7, 11, 13, 19 and 23 are amended. Claims 8, and 20 are cancelled.

Response to Arguments

3. Applicant's arguments/amendments on November 15, 2018 have been fully considered and are persuasive.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on November 19, 2018 was filed. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Terminal Disclaimer

5. The terminal disclaimer filed on November 26, 2018 disclaiming the terminal portion of any patent granted on this application which would extend

beyond the expiration date of Patent U.S. 9,247,311 and 9,621,522 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Examiner's Amendment

6. An Examiner's Amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

In attempt to accelerate the prosecution process, the Examiner has contacted the Applicant's representative, Mr. Paul J. Lee (Reg. no. 69,375), and conducted a telephone interview on 11/15/2018. During the interview, the Examiner proposed an examiner amendment to the claim, to recite the claim limitations in an specific order for clarify the claim limitations and to remove 101, 112(b), Double patenting (DP) rejection and objection issues, and making similar changes to other independent claim 13 for putting the claims in condition for allowance.

Authorization for this examiner's amendment was given by applicant's representative Mr. Paul J. Lee on 11/15/2018. Mr. Lee has agreed and authorized the examiner to further amended claims 1, 7, 11, 13, 19 and 23. Claims 25 and 26 are new claims. Claims 8 and 20 are cancel.

7. **Amendments to the Claims:**

Replacing all claims as following:

1. (Currently Amended) A playback device for playing protected content from a plurality of alternative streams, comprising:

a set of one or more processors; and

a non-volatile storage containing an application for causing the set of one or more processors to perform the steps of:

obtaining a top level index file identifying a plurality of alternative streams of protected video, wherein each of the alternative streams of protected video includes partially encrypted video frames that are encrypted using a set of common keys comprising at least one key, and wherein the partially encrypted video frames contain encrypted portions and unencrypted portions of data;

obtaining a copy of the set of common keys;

detecting streaming conditions for the playback device;

selecting a stream from the plurality of alternative streams of protected video based on the detected streaming conditions;

receiving a container index that provides byte ranges for portions of the selected stream of protected video within an associated container file;

requesting portions of the selected stream of protected video based on the provided byte ranges;

locating encryption information that identifies encrypted portions of frames of video within the requested portions of the selected stream of protected video;

decrypting each encrypted portion of the frames of video identified within the located encryption information using the set of common keys; and

playing back the decrypted frames of~~portions of~~ video obtained from the requested portions of the selected ~~alternative~~ stream of protected video.

7. (Currently Amended) The playback device of claim 1, wherein the application is further for causing the set of processors to perform the steps of:

detecting a change in the streaming conditions;

identifying a second alternative stream of protected video based on the detected change;

receiving a container index that provides byte ranges for portions of the second alternative stream of protected video within a second associated container file;

requesting portions of the second alternative stream of protected video based on the provided byte ranges;

decrypting each encrypted portion of the frames of video from the requested portions of the second alternative stream of protected video using the set of common keys; and

playing back the decrypted frames of~~portions of~~ video from the requested portions of the second alternative stream of protected video.

8. (Canceled)

11. (Currently Amended) The playback device of claim 1, wherein the application is further for causing the set of processors to perform the step of obtaining [[a]]the container index from at least one file selected from the group consisting of: ~~that provides byte ranges for portions of the selected stream~~the associated container file containing the selected stream of protected content; and a separate file to the associated container file containing the selected stream of protected content.

~~, wherein the step of requesting portions of the selected stream further comprises the step of generating byte range requests for portions of the selected stream using the container index.~~

13. (Currently Amended) A method for playing protected content from a plurality of alternative streams on a playback device, the method comprising:

obtaining a top level index file identifying a plurality of alternative streams of protected video, wherein each of the alternative streams of protected video includes partially encrypted video frames that are encrypted using a set of common keys comprising at least one key, and wherein the partially encrypted video frames contain encrypted portions and unencrypted portions of data;

obtaining a copy of the set of common keys;

detecting streaming conditions for the playback device;

selecting a stream from the plurality of alternative streams of protected video based on the detected streaming conditions;

receiving a container index that provides byte ranges for portions of the selected stream of protected video within an associated container file;

requesting portions of the selected stream of protected video based on the provided byte ranges;

locating encryption information that identifies encrypted portions of frames of video within the requested portions of the selected stream of protected video;

decrypting each encrypted portion of the frames of video identified within the located encryption information using the set of common keys; and

playing back the decrypted frames of~~portions of~~ video obtained from the requested portions of the selected~~alternative~~ stream of protected video using a decoder.

19. (Currently Amended) The method of claim 13 further comprising:

detecting a change in the streaming conditions;

identifying a second alternative stream of protected video based on the detected change;

receiving a container index that provides byte ranges for portions of the second alternative stream of protected video within a second associated container file;

requesting portions of the second alternative stream of protected video based on the provided byte ranges;

decrypting each encrypted portion of the frames of video from the requested portions of the second alternative stream of protected video using the set of common keys; and

playing back the decrypted frames of~~portions of~~ video from the requested portions of the second alternative stream of protected video.

20. (Canceled)

23. (Currently Amended) The method of claim 13 further comprising obtaining [[a]]the container index from at least one file selected from the group consisting of: ~~that provides byte ranges for portions of the selected stream~~the associated container file containing the selected stream of protected content; and a separate file to the associated container file containing the selected stream of protected content.

~~, wherein the step of requesting portions of the selected stream further comprises the step of generating byte range requests for portions of the selected stream using the container index.~~

25. (New) The playback device of claim 1, wherein:

the container index is part of a hierarchical index; and

the application is further for causing the set of processors to perform the step of:

obtaining a lower layer index that identifies the location of frames within a specific requested portion of the selected stream of protected video; and

identify partially encrypted video frames from within the specific requested portion of the selected stream using the lower layer index.

26. (New) The method of claim 13, wherein:
the container index is part of a hierarchical index; and
the method further comprises:

obtaining a lower layer index that identifies the location of frames within a specific requested portion of the selected stream of protected video; and identify partially encrypted video frames from within the specific requested portion of the selected stream using the lower layer index.

Examiner's Statement of reason for Allowance

7. Claims 1-7, 9-19 and 21-26 are allowed.

8. The following is an examiner's statement of reasons for allowance:

The present invention is directed to "... obtaining a top level index file identifying a plurality of alternative streams of protected video, wherein each of the alternative streams of protected video includes partially encrypted video frames that are encrypted using a set of common keys comprising at least one key, and wherein the partially encrypted video frames contain encrypted portions and unencrypted portions of data; obtaining a copy of the set of common keys; detecting streaming conditions for the playback device; selecting a stream from

the plurality of alternative streams of protected video based on the detected streaming conditions; receiving a container index that provides byte ranges for portions of the selected stream of protected video within an associated container file; requesting portions of the selected stream of protected video based on the provided byte ranges; locating encryption information that identifies encrypted portions of frames of video within the requested portions of the selected stream of protected video; decrypting each encrypted portion of the frames of video identified within the located encryption information using the set of common keys; and playing back the decrypted frames of video obtained from the requested portions of the selectedalternative stream of protected video" as recited in claim 1 and "... wherein each of the alternative streams of protected video includes partially encrypted video frames that are encrypted using a set of common keys comprising at least one key, and wherein the partially encrypted video frames contain encrypted portions and unencrypted portions of data; obtaining a copy of the set of common keys; detecting streaming conditions for the playback device; selecting a stream from the plurality of alternative streams of protected video based on the detected streaming conditions;

receiving a container index that provides byte ranges for portions of the selected stream of protected video within an associated container file;

requesting portions of the selected stream of protected video based on the provided byte ranges; locating encryption information that identifies encrypted portions of frames of video within the requested portions of the selected stream of protected video; decrypting each encrypted portion of the frames of video

identified within the located encryption information using the set of common keys; and playing back the decrypted frames of video obtained from the requested portions of the selected stream of protected video using a decoder", as recited in claim 13.

The closest prior art, as previously recited, Braness et al. (US 8,806,188 B2) provides Systems and methods for performing adaptive bitrate streaming using top level index files automatically generated based upon the capabilities of a playback device in accordance with embodiments of the invention are disclosed. One embodiment of the method of the invention includes requesting a top level index file from a playback server using a playback device, where the request identifies a piece of content and includes information describing the capabilities of the playback device, receiving a top level index file from the playback server using the playback device, where the top level index file describes a plurality of streams accessible to the playback device and identifies the location of the streams, selecting initial streams using the playback device, and retrieving at least a portion of the initial streams from the locations identified in the top level index file using the playback device.

Prlyadarshi et al (US 2009/0169181) is generally directed to digital video distribution and playback systems and in particular to digital video distribution and playback systems providing enhanced playback control.

Gates et al (US 2003/0231867 A1) A computing system connected to storage medium and one or more rendering devices identifies and processes

only selected frames of data that are stored on the storage medium, thereby reducing the resources and bandwidth is required to process and transmit the data to the rendering device(s) at a desired playback. The computing system has various modes for selecting the frames to be processed and transmitted. In one mode, all frames are selected. In another mode, only the key frames are selected. In yet other modes, only certain key frames are selected. Upon selecting the frames to be transmitted to the rendering device(s), the time stamps assigned to the selected frames are scaled so that the selected frames will be displayed for an appropriate duration of time that corresponds with the desired playback rate.

None of the prior art of record, either taken by itself or in any combination, would have anticipated or made obvious the invention of the present application at or before the time it was filed. Therefore, claims 1 and 13 are considered to be allowable. Therefore, claims 1 and 13 are considered to be allowable for the same reasons as discussed with claims 1 and 13 above.

As to claims 2-7,9-12,14-19 and 21-26, the claims are dependent from claims 1 and 13 are also considered allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABIY GETACHEW whose telephone number is (571)272-6932. The examiner can normally be reached on Mon.-Fri. 9:00 AM - 5:30 PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kambiz Zand can be reached on (571) 272-3811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the

Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A.G.
December 8, 2018

/ABIY GETACHEW/
Examiner, Art Unit 2434

Examiner-Initiated Interview Summary	Application No. 16/136,183	Applicant(s) Kiefer et al.	
	Examiner ABIY GETACHEW	Art Unit 2434	AIA Status No

All participants (applicant, applicant's representative, PTO personnel):

(1) ABIY GETACHEW.

(3) Mr. Paul J. Lee (Reg. no. 69,375).

(2) _____.

(4) _____.

Date of Interview: 15 November 2018.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐ 101 ☐ 112 ☐ 102 ☐ 103 ☑ Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1 and 13.

Identification of prior art discussed: N/A..

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

See Continuation Sheet.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/ABIY GETACHEW/ Examiner, Art Unit 2434	11/15/2018

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0575
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: In attempt to accelerate the prosecution process, the Examiner has contacted the Applicant's representative, Mr. Paul J. Lee (Reg. no. 69,375), and conducted a telephone interview on 11/15/2018. During the interview, the Examiner proposed an examiner amendment to the claim, to recite the claim limitations in an specific order for clarify the claim limitations and to remove 101, 112(b), Double patenting (DP) rejection and objection issues, and making similar changes to other independent claim 13 for putting the claims in condition for allowance

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/136,183	Kiefer et al.
	Examiner	Art Unit
	ABIY GETACHEW	2434

CPC - Searched*		
Symbol	Date	Examiner
H04L2209/603 OR H04L63/0428 OR H04L9/0819 OR H04L9/0822 OR H04L9/0861 OR H04L9/14 OR H04L9/32 OR H04N21/2347 OR H04N21/2541 OR H04N21/4408 OR H04N21/4627 OR H04N21/6334 OR H04N21/64715	12/09/2018	A.G.

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
CPC with text search.	12/09/2018	A.G.
Inventor name search.	12/09/2018	A.G.
NPL search has been conducted.	12/09/2018	A.G.

/ABIY GETACHEW/ Examiner, Art Unit 2434	

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0577
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/136,183	Kiefer et al.
	Examiner	Art Unit
	ABIY GETACHEW	2434

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	((H04L2209/603 OR H04L63/0428 OR H04L9/0819 OR H04L9/0822 OR H04L9/0861 OR H04L9/14 OR H04L9/32 OR H04N21/2347 OR H04N21/2541 OR H04N21/4408 OR H04N21/4627 OR H04N21/6334 OR H04N21/64715).CPC.) AND 713/$.ccls. and (processor) same (memory with client with application) same (index with file) same (Streams with content with encryp$3).clm.	12/09/2018	A.G.
	713/$.ccls. and (processor) same (memory with client with application) same (index with file) same (Streams with content with encryp$3).clm.	12/09/2018	A.G.
	(index or indexing or indexed) near20 (streams with content) near20 (protected with content with cryptographic).clm.	12/09/2018	A.G.
	((((access$3 play$4 play$1back playback) and (Common same identical$5) with Key) and ((access $4 play$3 play$1back playback) with (common same identical$5) with key) and ((access$ play$1back playback) with (common same identical$5) with key))) .clm.	12/09/2018	A.G.
	((plurality with streams) near20 (index$3 list$3 or index)) near20 (identify or identifying or identified) same (plurality with alternative with streams).clm.	12/09/2018	A.G.
	(processor) and (memory with client with application) same (index with file) same (Streams with content with encryp$3).clm.	12/09/2018	A.G.

/ABIY GETACHEW/ Examiner, Art Unit 2434	

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0578
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/136,183	Kiefer et al.
	Examiner	**Art Unit**
	ABIY GETACHEW	2434

CPC						
Symbol					**Type**	**Version**
H04N	/	21	/	2347	F	2013-01-01
H04L	/	9	/	14	I	2013-01-01
H04L	/	9	/	0861	I	2013-01-01
H04L	/	9	/	0822	I	2013-01-01
H04L	/	63	/	0428	I	2013-01-01
H04N	/	21	/	6334	I	2013-01-01
H04N	/	21	/	4627	I	2013-01-01
H04N	/	21	/	4408	I	2013-01-01
H04N	/	21	/	2541	I	2013-01-01
H04N	/	21	/	64715	I	2013-01-01
H04L	/	9	/	32	I	2013-01-01
H04L	/	9	/	0819	I	2013-01-01
H04L	/	2209	/	603	A	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE (Assistant Examiner) (Date)		**Total Claims Allowed:** 24	
/ABIY GETACHEW/ Primary Examiner, Art Unit 2434 (Primary Examiner)	09 December 2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 6

U.S. Patent and Trademark Office — Part of Paper No.: 20181119

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0579
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/136,183	Kiefer et al.
	Examiner	**Art Unit**
	ABIY GETACHEW	2434

INTERNATIONAL CLASSIFICATION					
CLAIMED					
H04L	/	29	/	06	
NON-CLAIMED					
	/		/		

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	24	
/ABIY GETACHEW/ Primary Examiner, Art Unit 2434	09 December 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office — Part of Paper No.: 20181119

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0580
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/136,183	Kiefer et al.
	Examiner	**Art Unit**
	ABIY GETACHEW	2434

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☑ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	9	10	18	19										
2	2	10	11		20										
3	3	11	12	19	21										
4	4	12	13	20	22										
5	5	13	14	21	23										
6	6	14	15	22	24										
7	7	15	16	23	25										
	8	16	17	24	26										
8	9	17	18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	24	
/ABIY GETACHEW/ Primary Examiner, Art Unit 2434	09 December 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office Part of Paper No.: 20181119

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0581
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
/A.G/		PAPAGIANNAKI ET AL., "Experimental Characterization of Home Wireless Networks and Design Implications", INFOCOM 2006, 25th IEEE International Conference of Computer Communications, Proceedings, April 2006, 13 pgs.	
/A.G/		PEEK, DAVID, "Consumer Distributed File Systems", Dissertation, Doctor of Philosophy, Computer Science and Engineering, The University of Michigan, 2009, 118 pgs.	
/A.G/		PHAMDO, "Theory of Data Compression", printed on October 10, 2003, 12 pgs.	
/A.G/		RGB NETWORKS, "Comparing Adaptive HTTP Streaming Technologies", November 2011, Retrieved from: http://btreport.net/wp-content/uploads/2012/02/RGB-Adaptive-HTTP-Streaming-Comparison-1211-01.pdf, 20 pgs.	
/A.G/		ROSENBERG ET AL., "Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)", Network Working Group, RFC 3840, August 2004, 36 pgs.	
/A.G/		SCHULZRINNE, H., "Real Time Streaming Protocol 2.0 (RTSP): draft-ietfmmusic-rfc2326bis-27", MMUSIC Working Group of the Internet Engineering Task Force (IETF), March 9, 2011, 296 pgs. (presented in two parts).	
/A.G/		SIGLIN, "HTTP Streaming: What You Need to Know", streamingmedia.com, 2010, 15 pgs.	
/A.G/		SIGLIN, "Unifying Global Video Strategies, MP4 File Fragmentation for Broadcast, Mobile and Web Delivery", Nov. 16, 2011, 16 pgs.	
/A.G/		SILVIO, "adaptive HTTP streaming for open codecs", October 9, 2010, [retrieved on: March 2, 2018], 15 pgs.	
/A.G/		TAN, YAP-PENG ET AL., "Video transcoding for fast forward/reverse video playback", IEEE ICIP, 2002, 4 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		TAXAN, "AVel LinkPlayer2 for Consumer", I-O Data USA - Products - Home Entertainment, printed May 4, 2007 from http://www.iodata.com/usa/products/products.php?cat=HNP&sc=AVEL&pId=AVLP2/DVDLA&ts=2&tsc, 1 page.	
/A.G/		TRIPATHI ET AL., "Improving Multimedia Streaming with Content-Aware Video Scaling", Retrieved from: http://digitalcommons.wpi.edu/computerscience-pubs/96, 2001, 17 pgs.	
/A.G/		UNKNOWN, "AVI RIFF File Reference (Direct X 8.1 C++ Archive)", printed from http://msdn.microsoft.com/archive/en-us/dx81_c/directx_cpp/htm/aviriifffilereference.asp?fr...on March 6, 2006, 7 pgs.	
/A.G/		UNKNOWN, "Entropy and Source Coding (Compression)", TCOM 570, 1999-9, pp. 1-22.	
/A.G/		VENKATRAMANI ET AL., "Securing Media for Adaptive Streaming", Multimedia 2003 Proceedings of the Eleventh ACM International Conference on Multimedia, November 2-8, 2003, Berkeley, California, 4 pgs.	
/A.G/		WANG ET AL., "Image Quality Assessment: From Error Visibility to Structural Similarity", IEEE Transactions on Image Processing, April 2004, Vol. 13, No. 4, pp. 600-612.	
/A.G/		WU, FENG ET AL., "Next Generation Mobile Multimedia Communications: Media Codec and Media Transport Perspectives", In China Communications, October 2006, pp. 30-44.	
/A.G/		ZAMBELLI, "IIS Smooth Streaming Technical Overview", Microsoft Corporation, March 2009, 17 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature	/ABIY GETACHEW/	Date Considered	12/07/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field
PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]
/A.G/		2013513298	JP	A	2013-04-18	Chan, Francis Y. et al.		
		5200204	JP	B2	2013-06-05	Russell et al.		
		2013103986	WO	A2	2013-07-11	Ziskind et al.		
		2616991	EP	A0	2013-07-24	Shoham et al.		
		2617192	EP	A0	2013-07-24	Shoham et al.		
		2013111126	WO	A3	2013-08-01	Carmel et al.		
		2013111126	WO	A2	2013-08-01	Carmel et al.		
		2013032518	WO	A3	2013-09-06	Kiefer et al.		
		2013144942	WO	A1	2013-10-03	Shoham et al.		
		2661696	EP	A1	2013-11-13	Soroushian et al.		
		2661875	EP	A1	2013-11-13	Braness et al.		
		2661895	EP	A2	2013-11-13	Soroushian et al.		
		1020130133830	KR		2013-12-09	Braness et al.		
		2486727	EP	A4	2014-03-12	Shoham et al.		
		2564354	EP	A4	2014-03-12	Shoham et al.		
		2616991	EP	A4	2014-03-12	Shoham et al.		
		2014506430	JP	A	2014-03-13	Braness et al.		
		2617192	EP	A4	2014-03-19	Shoham et al.		
		2716048	EP	A1	2014-04-09	Wang et al.		
		2721826	EP	A1	2014-04-23	Wang et al.		
		2486517	EP	A0	2014-06-11	Shoham et al.		
		2751990	EP	A0	2014-07-09	Shoham et al.		
		2014145901	WO	A1	2014-09-18	Grab et al.		
		2807821	EP	A0	2014-12-03	Shoham et al.		
		2014193996	WO	A2	2014-12-04	Shivadas et al.		
		2014193996	WO	A3	2015-02-19	Shivadas et al.		
		2015031982	WO	A1	2015-03-12	Zeng et al.		
		5723888	JP	B2	2015-04-03	Chan, Francis Y. et al.		
		2751990	EP	A4	2015-04-22	Shoham et al.		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		2010203605	AU	B2	2015-05-14	Kourosh, Soroushian et al.		
/A.G/		2015167357	JP	A	2015-09-24	Francis, Yee-dug C. et al.		
/A.G/		6038805	JP	B2	2016-12-07	Braness et al.		
/A.G/		6078574	JP	B2	2017-01-20	Chan, Francis Y. et al.		
/A.G/		2017063453	JP		2017-03-30	Braness et al.		
/A.G/		101874907	KR	B1	2018-07-06	Braness et al.		
/A.G/		2018160923	JP	A	2018-10-11	Braness et al.		

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 5
/A.G/		"IBM Closes Cryptolopes Unit," December 17, 1997, CNET News, Printed on April 25, 2014 from http://news.cnet.com/IBM-closes-Cryptolopes-unit/2100-1001_3206465.html, 3 pgs.	
/A.G/		"Information Technology-Coding of Audio Visual Objects- Part 2: Visual" International Standard, ISO/IEC 14496-2, Third Edition, Jun. 1, 2004, pp. 1-724. (presented in three parts).	
/A.G/		13/905,804, "Notice of Allowance," August 12, 2015, 8 pgs.	
/A.G/		Broadq - The Ultimate Home Entertainment Software, printed 5/11/09 from ittp://web.srchive.org/web/20030401122010/www.broadq.com/qcasttuner/, 1 pg.	
/A.G/		Cloakware Corporation, "Protecting Digital Content Using Cloakware Code Transformation Technology", Version 1.2, May 2002, pp. 1-10.	
/A.G/		European Search Report Application No. EP 08870152, Search Completed May 19, 2011, Mailed May 26, 2011, 9 pgs.	
/A.G/		European Search Report for Application 11855103.5, search completed June 26, 2014, 9 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		European Search Report for Application 11855237.1, search completed June 12, 2014, 9 pgs.	
/A.G/		European Supplementary Search Report for Application EP09759600, completed January 25, 2011, 11 pgs.	
/A.G/		Extended European Search Report for European Application EP10821672, completed Jan 30, 2014, 3 pgs.	
/A.G/		Extended European Search Report for European Application EP11824682, completed Feb 6, 2014, 4 pgs.	
/A.G/		Extended European Search Report for European Application No. 14763140.2, Search completed September 26, 2016, Mailed October 05, 2016, 9 pgs.	
/A.G/		Federal Computer Week, "Tool Speeds Info to Vehicles", July 25, 1999, 5 pgs.	
/A.G/		Final draft ETSI ES 202 109, V1.1.1, ETSI Standard, Terrestrial Trunked Radio (TETRA); Security; Synchronization mechanism for end-to-end encryption, October 2002, 17 pgs.	
/A.G/		HTTP Live Streaming Overview, Networking & Internet, Apple, Inc., April 1, 2011, 38 pgs.	
/A.G/		IBM CORPORATION and MICROSOFT CORPORATION, "Multimedia Programming Interface and Data Specifications 1.0", August 1991, printed from http://www.kk.iij4u.or.jp/~kondo/wave/mpidata.txt on March 6, 2006, 100 pgs.	
/A.G/		InformationWeek, "Internet on Wheels", InformationWeek: Front End: Daily Dose, July 20, 1999, Printed on March 26, 2014, 3 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature	/ABIY GETACHEW/	Date Considered	12/09/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS PTO/SB/08a (01-10)
Doc description: Information Disclosure Statement (IDS) Field Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
/A.G/		International Preliminary Report for Application No. PCT/US2011/066927, Filed December 22, 2011, Report Issued July 10, 2013, 13 pgs.	
		International Preliminary Report for International Application No. PCT/US2011/067243, International Filing Date December 23, 2011, Issued July 10, 2013, 7 pgs.	
		International Preliminary Report on Patentability for International Application PCT/US14/30747, Report Issued September 15, 2015, Mailed September 24, 2015, 6 pgs.	
		International Preliminary Report on Patentability for International Application No. PCT/US2007/063950, Report Completed December 18, 2009, 3 pgs.	
		International Preliminary Report on Patentability for International Application No. PCT/US2008/083816, issued May 18, 2010, 6 pgs.	
		International Preliminary Report on Patentability for International Application No. PCT/US2010/56733, Issued June 5, 2012, pgs.	
		International Preliminary Report on Patentability for International Application No. PCT/US2011/068276, issue March 4, 2014, 23 pgs.	
		International Preliminary Report on Patentability for International Application PCT/US2011/067167, Issued February 25, 2014, 8 pgs.	
		International Preliminary Report on Patentability for International Application PCT/US2013/043181, issued Dec 31, 2014, Mailed Jan 8, 2015, 11 pgs.	
		International Preliminary Report on Patentability for International Application PCT/US2014/039852, issued Dec 1, 2015, mailed Dec 5, 2015, 8 pgs.	
		International Search Report and Written Opinion for International Application No. PCT/US07/63950, completed February 19, 2008; mailed March 19, 2008, 9 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		International Search Report and Written Opinion for International Application No. PCT/US08/87999, completed Feb 7, 2009, mailed March 19, 2009, 6 pgs.	
		International Search Report and Written Opinion for International Application No. PCT/US09/46588, completed July 13, 2009, mailed July 23, 2009, 7 pgs.	
		International Search Report and Written Opinion for International Application No. PCT/US2004/041667, completed May 24, 2007, mailed June 20, 2007, 6 pgs.	
		International Search Report and Written Opinion for International Application No. PCT/US2005/025845, completed Feb 5, 2007 and mailed May 10, 2007, 8 pgs.	
		International Search Report and Written Opinion for International Application No. PCT/US2008/083816, completed January 10, 2009, mailed January 22, 2009, 7 pgs.	
		International Search Report and Written Opinion for International Application No. PCT/US2010/020372, Completed Feb 10, 2009, Mailed Mar 1, 2010, 8 pgs.	
		International Search Report and Written Opinion for International Application No. PCT/US2010/56733, Completed Jan 3, 2011, Mailed Jan 14, 2011, 9 pgs.	
		International Search Report and Written Opinion for International Application No. PCT/US2011/067243, International Filing Date December 23, 2011, Search Completed April 24, 2012, Mailed May 8, 2012, 8 pgs.	
		International Search Report and Written Opinion for International Application No. PCT/US2013/043181, completed Nov 27, 2013, mailed Dec 6, 2013, 12 pgs.	
		International Search Report and Written Opinion for International Application PCT/US14/30747, completed July 30, 2014, Mailed Aug 22, 2014, 7 pgs.	
		International Search Report and Written Opinion for International Application PCT/US14/39852, completed Oct 21, 2014, mailed Dec 5, 2014, 11 pgs.	
		International Search Report and Written Opinion for International Application PCT/US2011/066927, completed April 3, 2012, Mailed April 20, 2012, 14 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		International Search Report and Written Opinion for International Application PCT/US2011/067167, completed June 19, 2012, Mailed July 2, 2012, 11 pgs.	
		International Search Report and Written Opinion for International Application PCT/US2011/068276, completed June 19, 2013, Mailed July 8, 2013, 24 pgs.	
		International Search Report and Written Opinion for PCT/US2013/020572, International Filing Date January 7, 2013, Search Completed March 19, 2013, Mailed April 29, 2013, 10 pgs.	
		International Telecommunication Union, Telecommunication Standardization Sector of ITU, H.233, Line Transmission of Non-Telephone Signals, Confidentiality System for Audiovisual Services, ITU-T Recommendation H.233, March 1993, 18 pgs.	
		ITS International, "Fleet System Opts for Mobile Server", August 26, 1999, Printed on October 21, 2011 from http://www.itsinternational.com/News/article.cfm?recordID=547, 2 pgs.	
		Lifehacker - Boxqueue Bookmarklet Saves Videos for Later Boxee Watching, printed June 16, 2009 from http://feeds.gawker.com/~r/lifehacker/full/~3/OHvDmrlgZZc/boxqueue-bookmarklet-saves-videos-for-late-boxee-watching, 2 pgs.	
		Linksys Wireless-B Media Adapter Reviews, printed May 4, 2007 from http://reviews.cnet.com/Linksys_Wireless_B_Media_Adapter/4505-6739_7-30421900.html?tag=box, 5 pgs.	
		Linksys, KISS DP-500, printed May 4, 2007 from http://www.kiss-technology.com/?p=dp500, 2 pgs.	
		LINKSYS®: "Enjoy your digital music and pictures on your home entertainment center, without stringing wires!", Model No. WMA 11B, printed May 9, 2007 from http://www.linksys.com/servlet/Satellite?c=L_Product_C2&childpagename=US/Layout&cid=1115416830950&p, 4 pgs.	
		MICROSOFT CORPORATION, "Chapter 8, Multimedia File Formats" 1991, Microsoft Windows Multimedia Programmer's Reference, 23 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		Microsoft Media Platform: Player Framework, "Microsoft Media Platform: Player Framework v2.5 (formerly Silverlight Media Framework)", May 3, 2011, 2 pgs.	
		Microsoft Media Platform: Player Framework, "Silverlight Media Framework v1.1", January 2010, 2 pgs.	
		Microsoft Windows® XP Media Center Edition 2005, Frequently asked Questions, printed May 4, 2007 from http://www.microsoft.com/windowsxp/mediacenter/evaluation/faq.mspx, 6 pgs.	
		Microsoft Windows® XP Media Center Edition 2005: Features, printed May 9, 2007, from http://www.microsoft.com/windowsxp/mediacenter/evaluation/features.mspx, 4 pgs.	
		Office Action for Chinese Patent Application No. CN200880127596.4, dated May 6, 2014, 8 pgs.	
		Office Action for U.S. Application No. 13/223,210, dated April 30, 2015, 14 pgs.	
		Office Action for U.S. Application No. 14/564,003, dated April 17, 2015, 28 pgs.	
		Open DML AVI-M-JPEG File Format Subcommittee, "Open DML AVI File Format Extensions", Version 1.02, February 28, 1996, 29 pgs.	
		PC WORLD.COM, Future Gear: PC on the HiFi, and the TV, from http://www.pcworld.com/article/id,108818-page,1/article.html, printed May 4, 2007, from IDG Networks, 2 pgs.	
		Qtv - About BroadQ, printed 5/11/09 from http://www.broadq.com/en/about.php, 1 page.	
		Supplementary European Search Report for Application No. EP 04813918, Search Completed December 19, 2012, 3 pgs.	
		Supplementary European Search Report for Application No. EP 10729513, completed December 9, 2013, 4 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		Supplementary European Search Report for EP Application 11774529, completed Jan 31, 2014, 2 pgs.	
		Supplementary European Search Report for International Application No. PCT/US2007063950, Report Completed January 25, 2013, 8 pgs.	
		Windows Media Center Extender for Xbox, printed May 9, 2007 from http://www.xbox.com/en-US/support/systemuse/xbox/console/mediacenterextender.htm, 2 pgs.	
		Windows® XP Media Center Edition 2005, “Experience more entertainment”, retrieved from http://download.microsoft.com/download/c/9/a/c9a7000a-66b3-455b-860b-1c16f2eecfec/MCE.pdf on May 9, 2007, 2 pgs.	
		Written Opinion for International Application No. PCT/US2007/063950 filed March 14, 2007, report completed March 1, 2008; report mailed March 19, 2008, 6 pgs.	
		Written Opinion for International Application No. PCT/US2009/046588, completed July 14, 2009, mailed July 23, 2009, 5 pgs.	
		Invitation to Pay Add'l Fees Rcvd for International Application PCT/US14/39852, Mailed Sep 25, 2014, 2 pgs.	
		3GPP TS 26.247, V1.3.0, 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects Transparent end-to-end Packet-switches Streaming Services (PSS);, Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH) (Release 10), March 2011, 72 pgs.	
		"Adaptive Streaming Comparison", January 28, 2010, 5 pgs.	
		“Best Practices for Multi-Device Transcoding", Kaltura Open Source Video, Printed on November 27, 2013 from knowledge.kaltura.com/best-practices-multi-device-transcoding, 13 pgs.	
		"Container format (digital)", printed August 22, 2009 from http://en.wikipedia.org/wiki/Container_format_(digital), 4 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		"Diagram | Matroska", December 17, 2010, Retrieved from http://web.archive.org/web/201 01217114656/http:l/matroska.org/ technical/diagram/index.html on January 29, 2016, 12/17/2010, 5 pgs.	

EXAMINER SIGNATURE

Examiner Signature	/ABIY GETACHEW/	Date Considered	12/09/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
/A.G/		"Draft CR: Trick Mode for HTTP Streaming", 3GPP TSG-SA4 Meeting #58, April 26-30, 2010, Vancouver, Canada, S4-100237, 3 pgs.	
/A.G/		"DVD- MPeg differences", printed July 2, 2009 from http://dvd.sourceforge.net/dvdinfo/dvdmpeg.html, 1 page.	
/A.G/		"DVD subtitles", sam.zoy.org/writings/dvd/subtitles, dated January 9, 2001, printed July 2, 2009, 4 pgs.	
		"Final Committee Draft of MPEG-4 streaming text format", International Organisation for Standardisation, February 2004, 22 pgs.	
/A.G/		"IBM Spearheading Intellectual Property Protection Technology for Information on the Internet; Cryptolope Containers Have Arrived", May 1, 1996, Business Wire, Printed on August 1, 2014 from http://www.thefreelibrary.com/IBM+Spearheading+Intellectual+Property+Protection+Technology+for...-a018239381, 6 pgs.	
/A.G/		"Information Technology - Coding of audio-visual objects - Part 14: MP4 file format", International Standard, ISO/IEC 14496-14, First Edition, November 15, 2003, 18 pgs.	
/A.G/		"Information Technology - Coding of audio-visual objects - Part 17: Streaming text", International Organisation for Standardisation, February 2004, 22 pgs.	
/A.G/		"Information technology - Coding of audio-visual objects - Part 18: Font compression and streaming", ISO/IEC 14496-18, First edition 7/1/04, 26 pgs.	
/A.G/		"Information technology - Generic coding of moving pictures and associated audio information: Systems", International Standard ISO/IEC 13818-1, Second Edition, December 1, 2000, 174 pgs (presented in two parts).	
/A.G/		"Information-Technology- Generic coding of moving pictures and associated audio: Systems, Recommendation H.222.0", International Standard, ISO/IEC 13818-1, Draft 1209, April 25, 1995, 151 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		"Information-Technology- Generic coding of moving pictures and associated audio: Systems, Recommendation H.222.0", International Standard, ISO/IEC 13818-1, Draft 1540, November 13, 1994, 161 pgs.	
/A.G/		"Innovation of technology arrived", I-O Data, November 2004, Retrieved from http://www.iodata.com/catalogs/AVLP2DVDLA_Flyer200505.pdf on May 30, 2013, 2 pgs., I-O Data, 2 pgs.	
/A.G/		"KISS Players, "KISS DP-500", retrieved from http://www.kiss-technology.com/?p=dp500 on May 4, 2007, 1 page.	
/A.G/		"Matroska", Wikipedia, July 10, 2017, retrieved from https://en.wikipedia.org/wiki/Matroska on July 20, 2017, 3 pgs.	
/A.G/		"Matroska Streaming | Matroska", Retrieved from the Internet: URL:http://web.archive.org/web/201 0121711431 O/http://matroska.org/ technical!streaming/index.html [retrieved on 2016-01-29], 12/17/2010, 2 pgs.	
/A.G/		"MovieLabs Specification for Next Generation Video – Version 1.0", Motion Picture Laboratories, Inc., 2013, Retrieved from: http://movielabs.com/ngvideo/MovieLabs%20Specification%20for%20Next%20Generation%20Video%20v1.0.pdf, 5 pgs.	
/A.G/		"MPEG-2", Wikipedia, June 13, 2017, retrieved from https://en.wikipedia.org/wiki/MPEG-2 on July 20, 2017, 13 pgs.	
/A.G/		"MPEG-4 File Format, Version 2", Sustainability of Digital Formats: Planning for Library of Congress Collections, Retrieved from: https://www.loc.gov/preservation/digital/formats/fdd/fdd000155.shtml, Last updated February 21, 2017, 8 pgs.	
/A.G/		"MPEG-4 Part 14", Wikipedia, July 10, 2017, retrieved from https://en.wikipedia.org/wiki/MPEG-4_Part_14 on July 20, 2017, 5 pgs.	
/A.G/		"Netflix turns on subtitles for PC, Mac streaming", Yahoo! News, April 21, 2010, Printed on March 26, 2014, 3 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		"OpenDML AVI File Format Extensions", OpenDML AVI M-JPEG File Format Subcommittee, retrieved from www.the-labs.com/Video/odmlff2-avidef.pdf, September 1997, 42 pgs.	
/A.G/		"OpenDML AVI File Format Extensions Version 1.02", OpenDMLAVI MJPEG File Format Subcommittee. Last revision: February 28, 1996. Reformatting: September 1997, 56 pgs.	
/A.G/		"QCast Tuner for PS2", printed May 11, 2009 from http://web.archive.org/web/20030210120605/www.divx.com/software/detail.php?ie=39, 2 pgs.	
/A.G/		"SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS Infrastructure of audiovisual services – Coding of moving video; High efficiency video coding", International Telecommunication Union, ITU-T H.265, April 2015, 634 pages (presented in six parts).	
/A.G/		"Smooth Streaming Client", The Official Microsoft IIS Site, September 24, 2010, 4 pgs.	
/A.G/		"Specifications | Matroska", Retrieved from the Internet: URL:http://web.archive.org/web/201 00706041303/http:/1 www.matroska.org/technical/specs/index.html [retrieved on 2016-01-29, 07/06/2010, 14 pgs.	
/A.G/		"Specifications Matroska", December 17, 2010, [retrieved on March 2, 2018], 12 pgs.	
/A.G/		"Supplementary European Search Report for Application No. EP 10834935", International Filing Date November 15, 2010, Search Completed May 27, 2014, 9 pgs.	
/A.G/		"Supported Media Formats", Supported Media Formats, Android Developers, Printed on November 27, 2013 from developer.android.com/guide/appendix/media-formats.html, 3 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		"Text of ISO/IEC 14496-18/COR1, Font compression and streaming", ITU STUDY GROUP 16 - VIDEO CODING EXPERTS GROUP -ISO/IEC MPEG & ITU-T VCEG(ISO/IEC JTC1/SC29/WG11 AND ITU-T SG16 06), no. N8664, October 27, 2006, 8 pgs.	
/A.G/		"Text of ISO/IEC 14496-18/FDIS, Coding of Moving Pictures and Audio", ITU STUDY GROUP 16 - VIDEOCODING EXPERTS GROUP -ISO/IEC MPEG & ITU-T VCEG(ISO/IEC JTC1/SC29/WG11 AND ITU-T SG16 06), no. N6215, December 2003, 26 pgs.	
/A.G/		"Thread: SSME (Smooth Streaming Medial Element) config.xml review (Smooth Streaming Client configuration file)", Printed on March 26, 2014, 3 pgs.	
/A.G/		"Transcoding Best Practices", From movideo, Printed on November 27, 2013 from code.movideo.com/Transcoding_Best_Practices, 5 pgs.	
/A.G/		"Using HTTP Live Streaming", iOS Developer Library, http://developer.apple.com/library/ios/#documentation/networkinginternet/conceptual/streamingmediaguide/UsingHTTPLiveStreaming/UsingHTTPLiveStreaming.html#//apple_ref/doc/uid/TP40008332-CH102-SW1, February 11, 2014, 10 pgs.	
/A.G/		"Video Manager and Video Title Set IFO file headers", printed August 22, 2009 from http://dvd.sourceforge.net/dvdinfo/ifo.htm, 6 pgs.	
/A.G/		"What is a DVD?", printed August 22, 2009 from http://www.videohelp.com/dvd, 8 pgs.	
/A.G/		"What is a VOB file", http://www.mpucoder.com/DVD/vobov.html, printed on July 2, 2009, 2 pgs.	
/A.G/		"What's on a DVD?", printed August 22, 2009 from http://www.doom9.org/dvd-structure.htm, 5 pgs.	
/A.G/		13/224,298, "Final Office Action Received", May 19, 2014, 26 pgs.	
/A.G/		13/905,804, "Non-Final Office Action Received", July 25, 2014, 15 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		ADAMS ET AL, "Will http adaptive streaming become the dominant mode of video delivery in cable networks?", https://www.nctatechnicalpapers.com/Paper/2011/2011-will-http-adaptive-streaming-become-the-dominant-mode-of-video-delivery-in-cable-networks-, 10 pgs.	
/A.G/		ADHIKARI ET AL., "Unreeling Netflix: Understanding and Improving Multi-CDN Movie Delivery", 2012 Proceedings IEEE InfoCom, March 25-30, 2012, Orlando, Florida, 9 pgs.	
/A.G/		ADZIC ET AL., "Optimized Adaptive HTTP Streaming for Mobile Devices", International Society for Optics and Photonics, Applications of Digital Image Processing XXXIV, vol. 8135, September 2011, 10 pgs.	
/A.G/		AKHSHABI ET AL., "An Experimental Evaluation of Rate-Adaptation Algorithms in Adaptive Streaming over HTTP", MMSys'11, February 23-25, 2011, 12 pgs.	
/A.G/		ANONYMOUS, "Method for the encoding of a compressed video sequence derived from the same video sequence compressed at a different bit rate without loss of data", ip.com, ip.com number: IPCOM000008165D, May 22, 2002, 9 pgs.	
/A.G/		AUTHOR UNKNOWN, "Blu-ray Disc - Blu-ray Disc - Wikipedia, the free encyclopedia", printed October 30, 2008 from http://en.wikipedia.org/wiki/Blu-ray_Disc, 11 pgs.	
/A.G/		AUTHOR UNKNOWN, "Blu-ray Movie Bitrates Here - Blu-ray Forum", printed October 30, 2008 from http://forum.blu-ray.com/showthread.php?t=3338, 6 pgs.	
/A.G/		AUTHOR UNKNOWN, "MPEG-4 Video Encoder: Based on International Standard ISO/IEC 14496-2", Patni Computer Systems, Ltd., printed Jan 24, 2007, USA, pp. 1-15.	
/A.G/		AUTHOR UNKNOWN, "O'Reilly - 802.11 Wireless Networks: The Definitive Guide, Second Edition", printed October 30, 2008 from http://oreilly.com/catalog/9780596100520, 2 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature	/ABIY GETACHEW/	Date Considered	12/07/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]
/A.G/		1553779	EP	A1	2005-07-13	Huetter et al.		
		1723696	CN		2006-01-18	Gan et al.		
		20060012398	IB	A2	2006-02-02	Grab, Eric W.		
		2006018843	WO	A2	2006-02-23	Carmel et al.		
		1657835	EP	A1	2006-05-17	Kisoda et al.		
		2006155500	JP	A	2006-06-15	Makino et al.		
		2006524007	JP	A	2006-10-19	Morten		
		1718074	EP	A1	2006-11-02	Kobayashi et al.		
		2006018843	WO	A3	2006-12-14	Carmel et al.		
		100669616	KR	B1	2007-01-16	Park		
		2007036666	JP	A	2007-02-08	Takemura		
		2007044590	WO	A2	2007-04-19	Gonsalves et al.		
		2007174375	JP	A	2007-07-05	Toyoda et al.		
		2007235690	JP	A	2007-09-13	Naito		
		2007113836	WO	A2	2007-10-11	Carmel et al.		
		2007535881	JP	A	2007-12-06	Major, Robert et al.		
		2008010275	WO	A1	2008-01-24	Hatano		
		2008042242	WO	A2	2008-04-10	Starkenburg et al.		
		2008086313	WO	A1	2008-07-17	Osborne et al.		
		2008235999	JP	A	2008-10-02	Tomonari et al.		
		2007113836	WO	A3	2008-11-13	Carmel et al.		
		2008135932	WO	A2	2008-11-13	Hannuksela		
		2007113836	WO	B1	2008-12-24	Carmel et al.		
		2009065137	WO	A1	2009-05-22	Soroushian et al.		
		1125765	HK	A	2009-08-14	Grab et al.		
		2009530917	JP	A	2009-08-27	Russell et al.		
		2010060106	WO	A1	2010-05-27	Kohli et al.		
		2010080911	WO	A1	2010-07-15	Soroushian et al.		
		2010089962	WO	A1	2010-08-12	Hashimoto		
		2010108053	WO	A1	2010-09-23	Ma, Kevin J. et al.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		2010111261	WO	A1	2010-09-30	Ma, Kevin J. et al.		
		2010122447	WO	A1	2010-10-28	Foo et al.		
		146026	SG		2010-12-15	Grab et al.		
		2010147878	WO	A1	2010-12-23	Furbeck et al.		
		2011042898	WO	A1	2011-04-14	Shoham et al.		
		2011042900	WO	A1	2011-04-14	Shoham et al.		
		2011068668	WO	A1	2011-06-09	Chan et al.		
		2011103364	WO	A1	2011-08-25	Thorwirth		
		2011132184	WO	A1	2011-10-27	Katz et al.		
		2011135558	WO	A1	2011-11-03	Shoham et al.		
		2012035533	WO	A2	2012-03-22	Shoham et al.		
		2012035534	WO	A2	2012-03-22	Shoham et al.		
		2012035534	WO	A3	2012-07-05	Shoham et al.		
		20120094181	WO	A2	2012-07-12	Soroushian et al.		
		20120094189	WO	A1	2012-07-12	Braness et al.		
		2012094171	WO	A1	2012-07-12	Braness et al.		
		2012035533	WO	A3	2012-08-09	Shoham et al.		
		2486517	EP	A1	2012-08-15	Shoham et al.		
		2486727	EP	A1	2012-08-15	Shoham et al.		
		2507995	EP	A1	2012-10-10	Wood et al.		
		2012162806	WO	A1	2012-12-06	Wang et al.		
		2012171113	WO	A1	2012-12-20	Wang et al.		
		2564354	EP	A1	2013-03-06	Shoham et al.		
		2013030833	WO	A1	2013-03-07	Shoham et al.		
		2013032518	WO	A2	2013-03-07	Kiefer et al.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature	/ABIY GETACHEW/	Date Considered	12/09/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/A.G/		4009331		1977-02-22	Goldmark et al.	
		4694357		1987-09-15	Rahman et al.	
		4802170		1989-01-31	Trottier, Lorne	
		4964069		1990-10-16	Ely, Joseph C.	
		5119474		1992-06-02	Beitel, Bradley J. et al.	
		5274758		1993-12-28	Beitel, Bradley J. et al.	
		5361332	A	1994-11-01	Yoshida et al.	
		5396497		1995-03-07	Veltman, Markus H.	
		5404436	A	1995-04-04	Hamilton, Robert H.	
		5420801		1995-05-30	Dockter, Michael J. et al.	
		5420974		1995-05-30	Morris, James K. et al.	
		5471576		1995-11-28	Yee, Raymond L.	
		5479303		1995-12-26	Suzuki et al.	
		5487167		1996-01-23	Dinallo, Chris A. et al.	
		5502766	A	1996-03-26	Boebert, William et al.	
		5509070	A	1996-04-16	Schull, Jonathan	
		5533021		1996-07-02	Branstad, Mark W. et al.	
		5537408		1996-07-16	Branstad, Mark W. et al.	
		5539908		1996-07-23	Chen, Fetchi et al.	
		5541662		1996-07-30	Adams, Robert et al.	
		5583652		1996-12-10	Ware, Malcohm S.	
		5589993	A	1996-12-31	Naimpally, Saiprasad et al.	
		5621794	A	1997-04-15	Matsuda, Masahiro et al.	
		5627936		1997-05-06	Prasad, Rama R.	
		5633472		1997-05-27	DeWitt, Frederick J. et al.	
		5642171		1997-06-24	Baumgartner et al.	
		5655117		1997-08-05	Goldberg et al.	
		5664044		1997-09-02	Ware, Malcolm S.	
		5675382		1997-10-07	Bauchspies	
		5675511		1997-10-07	Prasad, Rama R. et al.	
		5684542		1997-11-04	Tsukagoshi	
		5715403	A	1998-02-03	Stefik, Mark	
		5717816		1998-02-10	Boyce et al.	
		5719786		1998-02-17	Nelson et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		5745643		1998-04-28	Mishina, M.	
		5751280		1998-05-12	Abbott, Michael J.	
		5754648	A	1998-05-19	Ryan et al.	
		5763800		1998-06-09	Rossum, David P. et al.	
		5765164		1998-06-09	Prasad et al.	
		5794018		1998-08-11	Vrvilo, Benjamin et al.	
		5805700	A	1998-09-08	Nardone, Joseph et al.	
		5822524		1998-10-13	Chen et al.	
		5828370		1998-10-27	Moeller et al.	
		5841432	A	1998-11-24	Carmel, Sharon et al.	
		5844575	A	1998-12-01	Reid, J. L.	
		5848217		1998-12-08	Tsukagoshi, I et al.	
		5867625	A	1999-02-02	McLaren, David	
		5887110	A	1999-03-23	Sakamoto et al.	
		5892900	A	1999-04-06	Ginter et al.	
		5903261		1999-05-11	Walsh, Bruce E. et al.	
		5907597		1999-05-25	Mark	
		5946446		1999-08-31	Yanagihara, Naofumi	
		5956729		1999-09-21	Goetz et al.	
		5959690		1999-09-28	Toebes VIII, John A. et al.	
		5970147	A	1999-10-19	Davis, Derek L.	
		5999812	A	1999-12-07	Himsworth, Winston E.	
		6031622	A	2000-02-29	Ristow et al.	
		6038257	A	2000-03-14	Brusewitz, Harald et al.	
		6044469	A	2000-03-28	Horstmann, Cay S.	
		6046778	A	2000-04-04	Nonomura et al.	
		6047100		2000-04-04	McLaren, David L.	
		6058240		2000-05-02	McLaren, David L.	
		6064794	A	2000-05-16	McLaren et al.	
		6065050		2000-05-16	DeMoney	
		6018611		2000-06-25	Nogami et al.	
		6079566		2000-06-27	Eleftheriadis et al.	
		6097877	A	2000-08-01	Katayama et al.	
		6141754	A	2000-10-31	Choy, David	
		6155840	A	2000-12-05	Sallette, Alfred V.	
		6169242		2001-01-02	Fay, Tudor C. et al.	
		6175921	B1	2001-01-16	Rosen	
		6195388	B1	2001-02-27	Choi, Jae G. et al.	
		6204883	B1	2001-03-20	Tsukagoshi, I.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		6222981		2001-04-24	Rijckaert, Albert M.	
		6282653	B1	2001-08-28	Berstis, Viktors et al.	
		6289450	B1	2001-09-11	Pensak, David A. et al.	
		6292621		2001-09-18	Tanaka et al.	
		6308005	B1	2001-10-23	Ando et al.	
		6330286	B1	2001-12-11	Lyons, P. W. et al.	
		6374144		2002-04-16	Viviani et al.	
		6389218		2002-05-14	Gordon et al.	
		6389473	B1	2002-05-14	Carmel, Sharon et al.	
		6395969		2002-05-28	Fuhrer	
		6397230	B1	2002-05-28	Carmel, Sharon et al.	
		6418270		2002-07-09	Steenhof, Frits A. et al.	
		6449719	B1	2002-09-10	Baker, Brian	
		6466671	B1	2002-10-15	Maillard et al.	
		6466733		2002-10-15	Kim, Tae-eung	
		6510513	B1	2003-01-21	Danieli, Damon V.	
		6510554	B1	2003-01-21	Gordon, Donald F. et al.	
		6621979	B1	2003-09-16	Eerenberg, O. et al.	
		6625320	B1	2003-09-23	Nilsson et al.	
		6658056	B1	2003-12-02	Duruöz, Cem I. et al.	
		6665835		2003-12-16	Gutfreund, Steven et al.	
		6671408		2003-12-30	Kaku, Junya	
		6697568		2004-02-24	Kaku, Junya	
		6725281		2004-04-20	Zintel et al.	
		6771703	B1	2004-08-03	Oguz, Seyfullah H. et al.	
		6807306	B1	2004-10-19	Girgensohn, Andreas et al.	
		6810031	B1	2004-10-26	Hegde, Manju et al.	
		6810389	B1	2004-10-26	Meyer, Marc A.	
		6819394	B1	2004-11-16	Nomura, Toshio et al.	
		6850252	B1	2005-02-01	Hoffberg, Steven M.	
		6856997	B2	2005-02-15	Lee et al.	
		6859496	B1	2005-02-22	Boroczky, Lilla et al.	
		6917652		2005-07-12	Lyu	
		6931531	B1	2005-08-16	Takahashi, Toshiya	
		6944621	B1	2005-09-13	Collart, Todd R.	
		6944629	B1	2005-09-13	Shioi et al.	
		6956901	B2	2005-10-18	Boroczky, Lilla et al.	
		6965724		2005-11-15	Boccon-Gibod et al.	
		6965993	B2	2005-11-15	Baker, Brian	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		6985588	B1	2006-01-10	Glick, B. J. et al.	
		6988144		2006-01-17	Luken et al.	
		7007170	B2	2006-02-28	Morten, Glenn	
		7023924		2006-04-04	Keller et al.	
		7043473	B1	2006-05-09	Rassool, Reza et al.	
		7103906	B1	2006-09-05	Katz, Neil et al.	
		7127155		2006-10-24	Ando et al.	
		7150045	B2	2006-12-12	Koelle, Katharina et al.	
		7151832	B1	2006-12-19	Fetkovich, John et al.	
		7151833	B2	2006-12-19	Candelore, Brant et al.	
		7165175	B1	2007-01-16	Kollmyer, Brad et al.	
		7185363	B1	2007-02-27	Narin, Attila et al.	
		7197234	B1	2007-03-27	Chatterton, Geoff	
		7206940	B2	2007-04-17	Evans, Glenn F. et al.	
		7209892		2007-04-24	Galuten et al.	
		7231132		2007-06-12	Davenport, William	
		7237061	B1	2007-06-26	Boic	
		7242772	B1	2007-07-10	Tehranchi, Babak	
		7243346	B1	2007-07-10	Seth, Demsey M. et al.	
		7295673	B2	2007-11-13	Grab, Eric W. et al.	
		7328345	B2	2008-02-05	Morten, Glenn et al.	
		7330875		2008-02-12	Parasnis et al.	
		7340528	B2	2008-03-04	Noblecourt et al.	
		7349886	B2	2008-03-25	Morten, Glenn et al.	
		7356143	B2	2008-04-08	Morten, Glenn A.	
		7356245		2008-04-08	Belknap et al.	
		7366788		2008-04-29	Jones et al.	
		7376831	B2	2008-05-20	Kollmyer, Brad et al.	
		7406174	B2	2008-07-29	Palmer, Tomas E.	
		7421411	B2	2008-09-02	Kontio, Markku et al.	
		7454780	B2	2008-11-18	Katsube, Tomohiro et al.	
		7457359	B2	2008-11-25	Mabey, D. L. et al.	
		7460668	B2	2008-12-02	Grab et al.	
		7472280	B2	2008-12-30	Giobbi, John J.	
		7478325	B2	2009-01-13	Foehr, Oliver H.	
		7484103	B2	2009-01-27	Woo, Je-Hak et al.	
		7493018	B2	2009-02-17	Kim	
		7499938	B2	2009-03-03	Collart, Todd	
		7515710	B2	2009-04-07	Russell et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		7526450	B2	2009-04-28	Hughes, David A. et al.	
		7594271	B2	2009-09-22	Zhuk, Oscar et al.	
		7610365	B1	2009-10-27	Kraft, Reiner et al.	
		7640435	B2	2009-12-29	Morten, Glenn A.	
		7689510	B2	2010-03-30	Lamkin, Allan B. et al.	
		7720352	B2	2010-05-18	Belknap, William R. et al.	
		7747853	B2	2010-06-29	Candelore et al.	
		7761892	B2	2010-07-20	Ellis, Michael D. et al.	
		7779097	B2	2010-08-17	Lamkin, Allan B. et al.	
		7788271	B2	2010-08-31	Soma, Shunichi et al.	
		7817608	B2	2010-10-19	Rassool, Reza et al.	
		7869691	B2	2011-01-11	Kelly, Declan P. et al.	
		7882034	B2	2011-02-01	Hug, Joshua D. et al.	
		7949703	B2	2011-05-24	Matsuzaki, Natsume et al.	
		7962942	B1	2011-06-14	Craner, Michael L.	
		7974714	B2	2011-07-05	Hoffberg, Steven M.	
		7991156	B1	2011-08-02	Miller, Eric	
		8023562	B2	2011-09-20	Zheludkov et al.	
		8046453	B2	2011-10-25	Olaiya, Oladipupo	
		8054880	B2	2011-11-08	Yu, Guoyao et al.	
		8065708	B1	2011-11-22	Smyth, Aidan J. et al.	
		8069260	B2	2011-11-29	Speicher, Ashley C. et al.	
		8082442	B2	2011-12-20	Keljo, Jonathan et al.	
		8195714	B2	2012-06-05	Mckibben, Michael T. et al.	
		8201264	B2	2012-06-12	Grab, Eric et al.	
		8225061	B2	2012-07-17	Greenebaum, Kenneth	
		8233768	B2	2012-07-31	Soroushian, K. et al.	
		8245124	B1	2012-08-14	Gupta	
		8249168	B2	2012-08-21	Graves, Hans W.	
		8261356	B2	2012-09-04	Choi, Bum S. et al.	
		8265168	B1	2012-09-11	Masterson et al.	
		8270473	B2	2012-09-18	Chen, William et al.	
		8270819	B2	2012-09-18	Vannier, Eric	
		8275871	B2	2012-09-25	Ram et al.	
		8289338	B2	2012-10-16	Priyadarshi, Shaiwal et al.	
		8291460	B1	2012-10-16	Peacock, Gavin	
		8296434	B1	2012-10-23	Miller, Kevin C. et al.	
		8311111	B2	2012-11-13	Xu et al.	
		8311115	B2	2012-11-13	Gu, Chuang et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		8321556	B1	2012-11-27	Chatterjee, Manjirnath et al.	
		8341715	B2	2012-12-25	Sherkin, Alexander et al.	
		8386621	B2	2013-02-26	Park, Anthony N.	
		8396114	B2	2013-03-12	Gu, Chuang et al.	
		8401900	B2	2013-03-19	Cansler, James L. et al.	
		8407753	B2	2013-03-26	Kuo, Jenke W.	
		8412841	B1	2013-04-02	Swaminathan et al.	
		8423889	B1	2013-04-16	Zagorie, Aviram et al.	
		8452110	B2	2013-05-28	Shoham et al.	
		8456380	B2	2013-06-04	Pagan, William G.	
		8472792		2013-06-25	Ahsan Butt et al.	
		8473630	B1	2013-06-25	Galligan et al.	
		8510303		2013-08-13	Soroushian, Kourosh et al.	
		8510404	B2	2013-08-13	Carmel, Sharon et al.	
		8515265	B2	2013-08-20	Kwon, O-hoon et al.	
		8516529	B2	2013-08-20	Lajoie et al.	
		8527645	B1	2013-09-03	Proffit et al.	
		8595378	B1	2013-11-26	Cohn, Daniel	
		8606069	B2	2013-12-10	Okubo, Masafumi et al.	
		8640166	B1	2014-01-28	Craner et al.	
		8649669	B2	2014-02-11	Braness et al.	
		8656183	B2	2014-02-18	Russell et al.	
		8677428	B2	2014-03-18	Lewis, Jason et al.	
		8681866	B1	2014-03-25	Jia, Wei	
		8689267	B2	2014-04-01	Hunt, Neil D.	
		8726264	B1	2014-05-13	Allen, Nicholas et al.	
		8767825	B1	2014-07-01	Wang, Huisheng et al.	
		8774609	B2	2014-07-08	Drake, Edward C. et al.	
		8781122		2014-07-15	Chan, Francis Y. et al.	
		RE45052		2014-07-29	Li, Adam	
		8805109	B2	2014-08-12	Shoham et al.	
		8806188		2014-08-12	Braness, Jason et al.	
		8832434	B2	2014-09-09	Apostolopoulos, John G. et al.	
		8843586	B2	2014-09-23	Pantos, Roger et al.	
		8856218	B1	2014-10-07	Inskip, Thomas	
		8908984	B2	2014-12-09	Shoham et al.	
		8909922	B2	2014-12-09	Kiefer et al.	
		8914534	B2	2014-12-16	Braness, Jason et al.	
		8914836	B2	2014-12-16	Shivadas, Abhishek et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		8918535	B2	2014-12-23	Ma, Kevin J. et al.	
		8918636	B2	2014-12-23	Kiefer, Michael	
		8918908		2014-12-23	Ziskind et al.	
		8948249	B2	2015-02-03	Sun, Wendell et al.	
		8997161		2015-03-31	Priyadarshi, Shaiwal et al.	
		8997254	B2	2015-03-31	Amidei et al.	
		9014471	B2	2015-04-21	Shoham et al.	
		9025659	B2	2015-05-05	Soroushian, Kourosh et al.	
		9042670	B2	2015-05-26	Carmel et al.	
		9060207	B2	2015-06-16	Scherkus, Andrew et al.	
		9094737	B2	2015-07-28	Shivadas et al.	
		9098335	B2	2015-08-04	Muthiah et al.	
		9124773	B2	2015-09-01	Chan, Francis Y. et al.	
		9125073	B2	2015-09-01	Oyman, Ozgur et al.	
		9184920		2015-11-10	Grab, Eric W. et al.	
		9191457		2015-11-17	Van Der Schaar, Auke S.	
		9197685	B2	2015-11-24	Soroushian	
		9203816	B2	2015-12-01	Brueck, David F. et al.	
		9210481		2015-12-08	Braness, Jason et al.	
		9215466	B2	2015-12-15	Zhai, Jiefu et al.	
		9247311		2016-01-26	Kiefer, Michael G.	
		9247312		2016-01-26	Braness, Jason et al.	
		9247317		2016-01-26	Shivadas et al.	
		9253178	B2	2016-02-02	Blom, Rolf et al.	
		9264475		2016-02-16	Shivadas et al.	
		9294531	B2	2016-03-22	Zhang, Shaobo et al.	
		9313510		2016-04-12	Shivadas et al.	
		9343112		2016-05-17	Amidei et al.	
		9344517		2016-05-17	Shivadas et al.	
		9344721	B2	2016-05-17	Dikvall, Henrik	
		9479805	B2	2016-10-25	Rothschild, Keith A. et al.	
		9485546	B2	2016-11-01	Chen, Ying et al.	
		9571827	B2	2017-02-14	Su et al.	
		9584557	B2	2017-02-28	Panje, Krishna P. et al.	
		9584847	B2	2017-02-28	Ma, Kevin J. et al.	
		9621522	B2	2017-04-11	Kiefer et al.	
		9706259	B2	2017-07-11	Chan et al.	
		9712890	B2	2017-07-18	Shivadas et al.	
		9798863	B2	2017-10-24	Grab et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		9813740	B2	2017-11-07	Panje, Krishna P. et al.	
/A.G/		9866878	B2	2018-01-09	Van Der Schaar et al.	
/A.G/		9883204	B2	2018-01-30	Braness et al.	
/A.G/		9906785	B2	2018-02-27	Naletov et al.	
/A.G/		9967189	B2	2018-05-08	Patel et al.	
/A.G/		9967305	B2	2018-05-08	Braness	

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code [1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/A.G/		20010030710	A1	2001-10-18	Werner	
		20010036355	A1	2001-11-01	Kelly, Declan P. et al.	
		20010046299	A1	2001-11-29	Wasilewski et al.	
		20010053222	A1	2001-12-20	Wakao et al.	
		20020026560	A1	2002-02-28	Jordan et al.	
		20020034252	A1	2002-03-21	Owen et al.	
		20020051494	A1	2002-05-02	Yamaguchi et al.	
		20020057898	A1	2002-05-16	Normile, James	
		20020062313	A1	2002-05-23	Lee et al.	
		20020076112	A1	2002-06-20	Devara, Kavitha V.	
		20020087569	A1	2002-07-04	Fischer, Uwe et al.	
		20020091665	A1	2002-07-11	Beek et al.	
		20020093571	A1	2002-07-18	Hyodo	
		20020110193	A1	2002-08-15	Yoo et al.	
		20020116481	A1	2002-08-22	Lee, Raymond W.	
		20020118953	A1	2002-08-29	Kim, Jae-hyun	
		20020120934	A1	2002-08-29	Abrahams et al.	
		20020136298	A1	2002-09-26	Anantharamu et al.	
		20020143413	A1	2002-10-03	Fay et al.	
		20020143547	A1	2002-10-03	Fay et al.	
		20020147980	A1	2002-10-10	Satoda	
		20020159598	A1	2002-10-31	Rubinstein et al.	
		20020161462	A1	2002-10-31	Fay, Todor J.	
		20020180929	A1	2002-12-05	Tseng et al.	
		20020184159	A1	2002-12-05	Tadayon et al.	
		20020184515	A1	2002-12-05	Oho, Masahiro et al.	
		20020191112	A1	2002-12-19	Akiyoshi, Kozo et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20020191959	A1	2002-12-19	Lin, Shu et al.	
		20020191960	A1	2002-12-19	Fujinami et al.	
		20030001964	A1	2003-01-02	Masukura et al.	
		20030002578	A1	2003-01-02	Tsukagoshi et al.	
		20030005442	A1	2003-01-02	Brodersen et al.	
		20030021296	A1	2003-01-30	Wee, Susie J. et al.	
		20030031178	A1	2003-02-13	Haeri, Ali E.	
		20030035488	A1	2003-02-20	Barrau	
		20030035545	A1	2003-02-20	Jiang, S.	
		20030035546	A1	2003-02-20	Jiang et al.	
		20030041257	A1	2003-02-27	Wee et al.	
		20030061305	A1	2003-03-27	Copley, Devon et al.	
		20030061369	A1	2003-03-27	Aksu, Emre et al.	
		20030065777	A1	2003-04-03	Mattila, Marko et al.	
		20030078930	A1	2003-04-24	Surcouf et al.	
		20030093799	A1	2003-05-15	Kauffman et al.	
		20030123855	A1	2003-07-03	Okada et al.	
		20030128296	A1	2003-07-10	Lee, Chulhee	
		20030133506	A	2003-07-17	Haneda, T.	
		20030152370	A1	2003-08-14	Otomo, Hitoshi et al.	
		20030163824	A1	2003-08-28	Gordon et al.	
		20030165328		2003-09-04	Grecia, William	
		20030174844	A1	2003-09-18	Candelore, Brant L.	
		20030185302		2003-10-02	Abrams, Thomas A.	
		20030185542	A1	2003-10-02	McVeigh et al.	
		20030206558		2003-11-06	Parkkinen et al.	
		20030216922	A1	2003-11-20	Gonzales et al.	
		20030229900	A1	2003-12-11	Reisman, Richard	
		20030231863	A1	2003-12-18	Eerenberg, O. et al.	
		20030231867	A1	2003-12-18	Gates et al.	
		20030233464	A1	2003-12-18	Walpole et al.	
		20030236836	A1	2003-12-25	Borthwick, Ernest M.	
		20030236907	A1	2003-12-25	Stewart et al.	
		20040006701		2004-01-08	Kresina, Roman	
		20040021684		2004-02-05	Millner	
		20040024688	A1	2004-02-05	Bi, Depeng et al.	
		20040025180	A1	2004-02-05	Begeja, Lee et al.	
		20040031058	A1	2004-02-12	Reisman, Richard	
		20040039916	A1	2004-02-26	Aldis, David et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20040047614		2004-03-11	Green	
		20040052501		2004-03-18	Tam, Eddy C.	
		20040071453	A1	2004-04-15	Valderas, Harold M.	
		20040081333	A1	2004-04-29	Grab et al.	
		20040081434	A1	2004-04-29	Jung, Kil-Soo et al.	
		20040084035	A1	2004-05-06	Newton, Stephen J.	
		20040093618	A1	2004-05-13	Baldwin et al.	
		20040105549	A1	2004-06-03	Suzuki et al.	
		20040114687		2004-06-17	Ferris et al.	
		20040117347	A1	2004-06-17	Seo et al.	
		20040136698	A1	2004-07-15	Mock, Wayne E.	
		20040139335	A1	2004-07-15	Diamand et al.	
		20040143760		2004-07-22	Alkove et al.	
		20040146276		2004-07-29	Ogawa, Hideaki	
		20040158878	A1	2004-08-12	Ratnakar, Viresh et al.	
		20040184534	A1	2004-09-23	Wang, Albert S.	
		20040184616	A1	2004-09-23	Morten et al.	
		20040202320	A1	2004-10-14	Amini, Lisa D. et al.	
		20040217971	A1	2004-11-04	Kim, H	
		20040255115	A1	2004-12-16	DeMello et al.	
		20040255236	A1	2004-12-16	Collart, Todd R.	
		20050004875	A1	2005-01-06	Kontio, Markku et al.	
		20050005025	A1	2005-01-06	Harville, Michael et al.	
		20050015797	A1	2005-01-20	Noblecourt et al.	
		20050038826	A1	2005-02-17	Bae, Dae-gyu et al.	
		20050055399		2005-03-10	Savchuk	
		20050071280	A1	2005-03-31	Irwin et al.	
		20050108320	A1	2005-05-19	Lord et al.	
		20050114534	A1	2005-05-26	Lee, Aaron	
		20050114896	A1	2005-05-26	Hug, Joshua D.	
		20050149450	A1	2005-07-07	Stefik et al.	
		20050180641	A1	2005-08-18	Clark	
		20050183120	A1	2005-08-18	Jain, Saurabh et al.	
		20050193070	A1	2005-09-01	Brown et al.	
		20050193322	A1	2005-09-01	Lamkin, Allan B. et al.	
		20050196147	A1	2005-09-08	Seo et al.	
		20050204289	A1	2005-09-15	Mohammed et al.	
		20050207442	A1	2005-09-22	Van Zoest et al.	
		20050207578	A1	2005-09-22	Matsuyama et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20050254508	A1	2005-11-17	Aksu, Emre B. et al.	
		20050273695	A1	2005-12-08	Schnurr, Jeffrey R.	
		20050275656	A1	2005-12-15	Corbin, Toby et al.	
		20060015580	A1	2006-01-19	Gabriel, Michael et al.	
		20060026294	A1	2006-02-02	Virdi, Gurpratap et al.	
		20060026302	A1	2006-02-02	Bennett, James D. et al.	
		20060036549	A1	2006-02-16	Wu	
		20060037057	A1	2006-02-16	Xu, Shugong	
		20060052095	A1	2006-03-09	Vazvan, Behruz	
		20060053080	A1	2006-03-09	Edmonson et al.	
		20060064605	A1	2006-03-23	Giobbi, John J.	
		20060078301	A1	2006-04-13	Ikeda, Wataru et al.	
		20060093320	A1	2006-05-04	Hallberg et al.	
		20060120378	A1	2006-06-08	Usuki et al.	
		20060129909	A1	2006-06-15	Butt, Abou U. et al.	
		20060168639	A1	2006-07-27	Gan, Liang et al.	
		20060173887	A1	2006-08-03	Breitfeld et al.	
		20060179239	A1	2006-08-10	Fluhr, Eric	
		20060181965	A1	2006-08-17	Collart, Todd R.	
		20060235880	A1	2006-10-19	Qian, R.	
		20060245727	A1	2006-11-02	Nakano, Hiroshi et al.	
		20060259588	A1	2006-11-16	Lerman et al.	
		20060263056	A1	2006-11-23	Lin, Shu et al.	
		20060267986	A1	2006-11-30	Bae, Soo-Kang	
		20060274835		2006-12-07	Hamilton et al.	
		20060294164	A1	2006-12-28	Armangau et al.	
		20070005333	A1	2007-01-04	Setiohardjo et al.	
		20070031110	A1	2007-02-08	Rijckaert, Albert M.	
		20070033419	A1	2007-02-08	Kocher et al.	
		20070044010	A1	2007-02-22	Sull et al.	
		20070047901	A1	2007-03-01	Ando, Hideo et al.	
		20070053513	A1	2007-03-08	Hoffberg, Steven M.	
		20070058928	A1	2007-03-15	Naito, Hitoshi et al.	
		20070083617	A1	2007-04-12	Chakrabarti, A et al.	
		20070086528	A1	2007-04-19	Mauchly, J. W. et al.	
		20070100757	A1	2007-05-03	Rhoads, Geoffrey B.	
		20070133603	A1	2007-06-14	Weaver, Timothy H.	
		20070136817	A1	2007-06-14	Nguyen, Binh	
		20070140647	A1	2007-06-21	Kusunoki et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20070154165	A1	2007-07-05	Hemmeryckz-Deleersnijder et al.	
		20070168541	A1	2007-07-19	Gupta, Manish et al.	
		20070168542	A1	2007-07-19	Gupta, Manish et al.	
		20070178933	A1	2007-08-02	Nelson, Joakim	
		20070180125	A1	2007-08-02	Knowles et al.	
		20070185982	A1	2007-08-09	Nakanowatari et al.	
		20070192810	A1	2007-08-16	Pritchett et al.	
		20070217339	A1	2007-09-20	Zhao, Yun	
		20070217759	A1	2007-09-20	Dodd, Michael D.	
		20070234391	A1	2007-10-04	Hunter et al.	
		20070239839	A1	2007-10-11	Buday et al.	
		20070255940	A1	2007-11-01	Ueno	
		20070271317	A1	2007-11-22	Carmel et al.	
		20070271385	A1	2007-11-22	Davis, Andrew et al.	
		20070274679	A1	2007-11-29	Yahata, Hiroshi et al.	
		20070277219	A1	2007-11-29	Toebes, John et al.	
		20070277234	A1	2007-11-29	Bessonov et al.	
		20070280298	A1	2007-12-06	Hearn, John P. et al.	
		20070288745	A1	2007-12-13	Kwan, Nang K.	
		20070292107	A1	2007-12-20	Yahata, Hiroshi et al.	
		20070297422	A1	2007-12-27	Matsuo, Hideki et al.	
		20080005175	A1	2008-01-03	Bourke, A. et al.	
		20080008455	A1	2008-01-10	De Lange et al.	
		20080043832	A1	2008-02-21	Barkley et al.	
		20080046718	A1	2008-02-21	Grab, Eric	
		20080066099	A1	2008-03-13	Brodersen et al.	
		20080066181	A1	2008-03-13	Haveson et al.	
		20080077592	A1	2008-03-27	Brodie, Shane et al.	
		20080086456	A1	2008-04-10	Rasanen, K. et al.	
		20080086747	A1	2008-04-10	Rasanen et al.	
		20080101466	A1	2008-05-01	Swenson, Erik et al.	
		20080104633	A1	2008-05-01	Noblecourt et al.	
		20080120330	A1	2008-05-22	Reed, O et al.	
		20080120342	A1	2008-05-22	Reed, Ogden C. et al.	
		20080120389	A1	2008-05-22	Bassali et al.	
		20080126248	A1	2008-05-29	Lee et al.	
		20080137541	A1	2008-06-12	Agarwal et al.	
		20080137736	A1	2008-06-12	Richardson et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20080151817	A1	2008-06-26	Fitchett, Jeffrey W.	
		20080172441	A1	2008-07-17	Speicher et al.	
		20080187283	A1	2008-08-07	Takahashi, Eduardo	
		20080192818	A1	2008-08-14	DiPietro et al.	
		20080195664	A1	2008-08-14	Maharajh, Kavi et al.	
		20080195744	A1	2008-08-14	Bowra, Todd et al.	
		20080201705	A1	2008-08-21	Wookey, Michael J.	
		20080205860	A1	2008-08-28	Holtman, Koen J.	
		20080209534	A1	2008-08-28	Keronen et al.	
		20080240144	A1	2008-10-02	Kruse, David et al.	
		20080256105	A1	2008-10-16	Nogawa, Hiroshi et al.	
		20080263354	A1	2008-10-23	Beuque et al.	
		20080279535	A1	2008-11-13	Haque et al.	
		20080294453	A1	2008-11-27	Baird-Smith et al.	
		20080298358	A1	2008-12-04	John, Sunil S. et al.	
		20080310454	A1	2008-12-18	Bellwood et al.	
		20080310496	A1	2008-12-18	Fang, Nicholas J.	
		20090031220	A1	2009-01-29	Tranchant et al.	
		20090037959	A1	2009-02-05	Suh, Jong Y. et al.	
		20090048852	A1	2009-02-19	Burns, Gregory et al.	
		20090055546	A1	2009-02-26	Jung, Edward et al.	
		20090060452	A1	2009-03-05	Chaudhri, Imran A.	
		20090064341	A1	2009-03-05	Hartung, Frank et al.	
		20090066839	A1	2009-03-12	Jung et al.	
		20090097644	A1	2009-04-16	Haruki	
		20090132599	A1	2009-05-21	Soroushian et al.	
		20090132721	A1	2009-05-21	Soroushian et al.	
		20090132824	A1	2009-05-21	Terada et al.	
		20090136216	A1	2009-05-28	Soroushian et al.	
		20090150557	A1	2009-06-11	Wormley et al.	
		20090165148	A1	2009-06-25	Frey, Alexandre et al.	
		20090168795	A1	2009-07-02	Segel et al.	
		20090169181	A1	2009-07-02	Priyadarshi, S. et al.	
		20090172201	A1	2009-07-02	Carmel et al.	
		20090178090	A1	2009-07-09	Oztaskent, Ant	
		20090196139	A1	2009-08-06	Bates, Allen K. et al.	
		20090201988	A1	2009-08-13	Gazier, Michael et al.	
		20090217317	A1	2009-08-27	White et al.	
		20090226148	A1	2009-09-10	Nesvadba et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20090228395	A1	2009-09-10	Wegner, Susan et al.	
		20090265737	A1	2009-10-22	Issa et al.	
		20090276636	A1	2009-11-05	Grab, Eric W. et al.	
		20090290706	A1	2009-11-26	Amini, Lisa D. et al.	
		20090290708	A1	2009-11-26	Schneider et al.	
		20090293116	A1	2009-11-26	DeMello, Marco A.	
		20090303241	A1	2009-12-10	Priyadarshi, S. et al.	
		20090307258	A1	2009-12-10	Priyadarshi et al.	
		20090307267	A1	2009-12-10	Chen, Danny Y. et al.	
		20090310819	A1	2009-12-17	Hatano, Kouji	
		20090310933	A1	2009-12-17	Lee, Victor S.	
		20090313544	A1	2009-12-17	Wood, Policarpo et al.	
		20090313564	A1	2009-12-17	Rottler et al.	
		20090316783	A1	2009-12-24	Au, Oscar C. et al.	
		20090328124	A1	2009-12-31	Khouzam et al.	
		20090328228	A1	2009-12-31	Schnell, Patrik	
		20100040351	A1	2010-02-18	Toma et al.	
		20100057928	A1	2010-03-04	Kapoor, Abhinav et al.	
		20100058405	A1	2010-03-04	Ramakrishnan et al.	
		20100074324	A1	2010-03-25	Qian, Zhebin et al.	
		20100074333	A1	2010-03-25	Au et al.	
		20100083322	A1	2010-04-01	Rouse, Alan	
		20100094969	A1	2010-04-15	Zuckerman, Gal et al.	
		20100095121	A1	2010-04-15	Shetty, Pritham et al.	
		20100106968	A1	2010-04-29	Mori et al.	
		20100107260	A1	2010-04-29	Orrell et al.	
		20100111192	A1	2010-05-06	Graves, Hans W.	
		20100138903	A1	2010-06-03	Medvinsky, Alexander	
		20100142917	A1	2010-06-10	Isaji, Yutaka	
		20100158109	A1	2010-06-24	Dahlby, Joshua et al.	
		20100161825	A1	2010-06-24	Ronca, David et al.	
		20100166060	A1	2010-07-01	Ezure et al.	
		20100186092	A1	2010-07-22	Takechi, Hideaki et al.	
		20100189183	A1	2010-07-29	Gu, Chuang et al.	
		20100218208	A1	2010-08-26	Holden, Dan	
		20100228795	A1	2010-09-09	Hahn, Judah G.	
		20100235472	A1	2010-09-16	Sood, Vishal et al.	
		20100250532	A1	2010-09-30	Soroushian, K. et al.	
		20100290761	A1	2010-11-18	Drake et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20100299522	A1	2010-11-25	Khambete et al.	
		20100306249	A1	2010-12-02	Hill, James et al.	
		20100313225	A1	2010-12-09	Cholas, Chris et al.	
		20100313226	A1	2010-12-09	Cholas, Chris et al.	
		20100319014	A1	2010-12-16	Lockett, David et al.	
		20100319017	A1	2010-12-16	Cook, Michael	
		20100332595	A1	2010-12-30	Fullagar, David et al.	
		20110002381	A1	2011-01-06	Yang et al.	
		20110016225	A1	2011-01-20	Park et al.	
		20110047209	A1	2011-02-24	Lindholm et al.	
		20110055585	A1	2011-03-03	Lee, Kok-Wah	
		20110060808	A1	2011-03-10	Martin, John J. et al.	
		20110066673	A1	2011-03-17	Outlaw, B.	
		20110067057	A1	2011-03-17	Karaoguz et al.	
		20110078440	A1	2011-03-31	Feng, Chen H. et al.	
		20110080940	A1	2011-04-07	Bocharov, John A.	
		20110082924	A1	2011-04-07	Gopalakrishnan	
		20110096828	A1	2011-04-28	Chen et al.	
		20110107379	A1	2011-05-05	Lajoie et al.	
		20110116772	A1	2011-05-19	Kwon et al.	
		20110126191	A1	2011-05-26	Hughes, Richard et al.	
		20110129011	A1	2011-06-02	Cilli, Bruce R. et al.	
		20110135090	A1	2011-06-09	Chan et al.	
		20110138018	A1	2011-06-09	Raveendran et al.	
		20110142415	A1	2011-06-16	Rhyu	
		20110145726	A1	2011-06-16	Wei, Eugene C. et al.	
		20110149753	A1	2011-06-23	Bapst, Mark et al.	
		20110150100	A1	2011-06-23	Abadir, Essam	
		20110153785	A1	2011-06-23	Minborg et al.	
		20110153835	A1	2011-06-23	Rimac, Ivica et al.	
		20110184738	A1	2011-07-28	Kalisky et al.	
		20110191439	A1	2011-08-04	Dazzi et al.	
		20110191803	A1	2011-08-04	Baldwin et al.	
		20110197237	A1	2011-08-11	Turner, Steven E.	
		20110197267	A1	2011-08-11	Gravel, Vivianne et al.	
		20110213827	A1	2011-09-01	Kaspar et al.	
		20110222786	A1	2011-09-15	Carmel et al.	
		20110225302	A1	2011-09-15	Park et al.	
		20110225315	A1	2011-09-15	Wexler, Yosef et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20110225417	A1	2011-09-15	Maharajh, Kavi et al.	
		20110239078	A1	2011-09-29	Luby, Michael et al.	
		20110246657	A1	2011-10-06	Glow	
		20110246659	A1	2011-10-06	Bouazizi, Imed	
		20110252118	A1	2011-10-13	Pantos, Roger et al.	
		20110264530	A1	2011-10-27	Santangelo et al.	
		20110268178	A1	2011-11-03	Park et al.	
		20110276695	A1	2011-11-10	Maldaner et al.	
		20110283012	A1	2011-11-17	Melnyk, Miguel	
		20110291723	A1	2011-12-01	Hashimoto	
		20110302319	A1	2011-12-08	Ha et al.	
		20110305273	A1	2011-12-15	He et al.	
		20110314176	A1	2011-12-22	Frojdh et al.	
		20110314500	A1	2011-12-22	Gordon, Donald	
		20120005368	A1	2012-01-05	Knittle et al.	
		20120017282	A1	2012-01-19	Kang, Bo-gyeong et al.	
		20120023251	A1	2012-01-26	Pyle, Harry et al.	
		20120036365	A1	2012-02-09	Kyslov, Fedir Y. et al.	
		20120036544	A1	2012-02-09	Chen, Ying et al.	
		20120066360	A1	2012-03-15	Ghosh	
		20120093214	A1	2012-04-19	Urbach	
		20120114302	A1	2012-05-10	Randall	
		20120124191	A1	2012-05-17	Lyon, Barrett	
		20120137336	A1	2012-05-31	Applegate et al.	
		20120144117	A1	2012-06-07	Weare et al.	
		20120144445	A1	2012-06-07	Bonta, Jeffrey et al.	
		20120166633	A1	2012-06-28	Baumback et al.	
		20120170642	A1	2012-07-05	Braness et al.	
		20120170643	A1	2012-07-05	Soroushian, K. et al.	
		20120170906	A1	2012-07-05	Soroushian, K. et al.	
		20120170915	A1	2012-07-05	Braness, J. et al.	
		20120173751	A1	2012-07-05	Braness, J. et al.	
		20120177101	A1	2012-07-12	Van Der Schaar	
		20120179834	A1	2012-07-12	Van Der Schaar et al.	
		20120201475	A1	2012-08-09	Carmel, Sharon et al.	
		20120201476	A1	2012-08-09	Carmel, Sharon et al.	
		20120233345	A1	2012-09-13	Hannuksela	
		20120240176	A1	2012-09-20	Ma et al.	
		20120254455	A1	2012-10-04	Adimatyam et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20120260277	A1	2012-10-11	Kosciewicz	
		20120263434	A1	2012-10-18	Wainner et al.	
		20120265562	A1	2012-10-18	Daouk, Carine et al.	
		20120278496	A1	2012-11-01	Hsu, James K.	
		20120289147	A1	2012-11-15	Raleigh et al.	
		20120294355	A1	2012-11-22	Holcomb et al.	
		20120297039	A1	2012-11-22	Acuna, Jorge D. et al.	
		20120307883	A1	2012-12-06	Graves, Hans W.	
		20120311094	A1	2012-12-06	Biderman et al.	
		20120314778	A1	2012-12-13	Salustri et al.	
		20120317235	A1	2012-12-13	Nguyen et al.	
		20130007223	A1	2013-01-03	Luby et al.	
		20130013730	A1	2013-01-10	Li et al.	
		20130019107		2013-01-17	Grab, E. et al.	
		20130019273	A1	2013-01-17	Ma, Kevin J. et al.	
		20130041808	A1	2013-02-14	Pham, Nathalie et al.	
		20130044821	A1	2013-02-21	Braness et al.	
		20130046849	A1	2013-02-21	Wolf, Ethan	
		20130046902	A1	2013-02-21	Villegas Nuñez et al.	
		20130051554	A1	2013-02-28	Braness et al.	
		20130054958	A1	2013-02-28	Braness et al.	
		20130055084	A1	2013-02-28	Soroushian et al.	
		20130058480	A1	2013-03-07	Ziskind, Ben et al.	
		20130061040	A1	2013-03-07	Kiefer et al.	
		20130061045	A1	2013-03-07	Kiefer et al.	
		20130064466	A1	2013-03-14	Carmel, Sharon et al.	
		20130066838	A1	2013-03-14	Singla, Amit et al.	
		20130094565	A1	2013-04-18	Yang, Lei et al.	
		20130097309	A1	2013-04-18	Ma, Kevin J. et al.	
		20130114944	A1	2013-05-09	Soroushian et al.	
		20130124859	A1	2013-05-16	Pestoni et al.	
		20130128962	A1	2013-05-23	Rajagopalan et al.	
		20130152767	A1	2013-06-20	Katz, Itamar et al.	
		20130166580	A1	2013-06-27	Maharajh, Kavi	
		20130166765	A1	2013-06-27	Kaufman, Matthew	
		20130166906	A1	2013-06-27	Swaminathan et al.	
		20130170561	A1	2013-07-04	Hannuksela	
		20130170764	A1	2013-07-04	Carmel, Sharon et al.	
		20130173513	A1	2013-07-04	Chu, David et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20130179199	A1	2013-07-11	Ziskind et al.	
		20130179992	A1	2013-07-11	Ziskind, Ben et al.	
		20130182952	A1	2013-07-18	Carmel, Sharon et al.	
		20130196292	A1	2013-08-01	Brennen et al.	
		20130212228	A1	2013-08-15	Butler, Robert J.	
		20130223812	A1	2013-08-29	Rossi	
		20130226578	A1	2013-08-29	Bolton, Jeff M. et al.	
		20130226635	A1	2013-08-29	Fisher, Michelle	
		20130227081	A1	2013-08-29	Luby et al.	
		20130227122	A1	2013-08-29	Gao, Qiang	
		20130301424	A1	2013-11-14	Kotecha et al.	
		20130311670	A1	2013-11-21	Tarbox, Brian J. et al.	
		20130329781	A1	2013-12-12	Su, Yeping et al.	
		20140003516	A1	2014-01-02	Soroushian	
		20140019593	A1	2014-01-16	Reznik et al.	
		20140037620	A1	2014-02-06	Ferree, Sean M. et al.	
		20140052823	A1	2014-02-20	Gavade et al.	
		20140059156	A1	2014-02-27	Freeman, II et al.	
		20140096171	A1	2014-04-03	Shivadas, Abhishek et al.	
		20140101722	A1	2014-04-10	Moore	
		20140115650	A1	2014-04-24	Zhang et al.	
		20140119432	A1	2014-05-01	Wang et al.	
		20140140396	A1	2014-05-22	Wang, Zhou et al.	
		20140140417	A1	2014-05-22	Shaffer, Gary K. et al.	
		20140143301	A1	2014-05-22	Watson, Mark et al.	
		20140143431	A1	2014-05-22	Watson, Mark et al.	
		20140143440	A1	2014-05-22	Ramamurthy et al.	
		20140177734	A1	2014-06-26	Carmel, Sharon et al.	
		20140189065	A1	2014-07-03	Van Der Schaar et al.	
		20140201382	A1	2014-07-17	Shivadas et al.	
		20140211840	A1	2014-07-31	Butt, Abou U. et al.	
		20140211859	A1	2014-07-31	Carmel, Sharon et al.	
		20140241420	A1	2014-08-28	Orton-jay, Sam et al.	
		20140241421	A1	2014-08-28	Orton-jay et al.	
		20140247869	A1	2014-09-04	Su et al.	
		20140250473	A1	2014-09-04	Braness, Jason et al.	
		20140258714	A1	2014-09-11	Grab, Eric W.	
		20140269927	A1	2014-09-18	Naletov, Ivan V. et al.	
		20140269936	A1	2014-09-18	Shivadas et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		20140280763	A1	2014-09-18	Grab, Eric W. et al.	
		20140297804	A1	2014-10-02	Shivadas et al.	
		20140297881	A1	2014-10-02	Shivadas et al.	
		20140355668	A1	2014-12-04	Shoham et al.	
		20140359678	A1	2014-12-04	Shivadas et al.	
		20140359679	A1	2014-12-04	Shivadas et al.	
		20140359680	A1	2014-12-04	Shivadas et al.	
		20140376720	A1	2014-12-25	Chan et al.	
		20150006662	A1	2015-01-01	Braness	
		20150026677	A1	2015-01-22	Stevens et al.	
		20150049957	A1	2015-02-19	Shoham et al.	
		20150063693	A1	2015-03-05	Carmel et al.	
		20150067715	A1	2015-03-05	Koat et al.	
		20150104153	A1	2015-04-16	Braness, Jason et al.	
		20150117836	A1	2015-04-30	Amidei, William et al.	
		20150117837	A1	2015-04-30	Amidei, William et al.	
		20150139419	A1	2015-05-21	Kiefer et al.	
		20150188758	A1	2015-07-02	Amidei, William et al.	
		20150188842	A1	2015-07-02	Amidei, William et al.	
		20150188921	A1	2015-07-02	Amidei, William et al.	
		20150189017	A1	2015-07-02	Amidei, William et al.	
		20150189373	A1	2015-07-02	Amidei, William et al.	
		20150288996	A1	2015-10-08	Van Der Schaar et al.	
		20150334435	A1	2015-11-19	Shivadas et al.	
		20150373421	A1	2015-12-24	Chan et al.	
		20160070890	A1	2016-03-10	Grab et al.	
		20160112382		2016-04-21	Kiefer et al.	
		20160149981		2016-05-26	Shivadas et al.	
		20160219303	A1	2016-07-28	Braness et al.	
		20170214947	A1	2017-07-27	Kiefer et al.	
		20170280203	A1	2017-09-28	Chan et al.	
		20180007451	A1	2018-01-04	Shivadas et al.	
		20180060543	A1	2018-03-01	Grab et al.	
		20180131980	A1	2018-05-10	Van Der Schaar et al.	
		20180220153	A1	2018-08-02	Braness et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]
/A.G/		1995015660	WO	A1	1995-06-08	Birch et al.		
		08046902	JP	A	1996-02-16	Uchiumi et al.		
		08111842	JP	A	1996-04-30	Sotoguchi, A et al.		
		1996013121	WO		1996-05-02	McLaren		
		08163488	JP	A	1996-06-21	Hiroshi et al.		
		08287613	JP	A	1996-11-01	Katayama		
		757484	EP	A2	1997-02-05	Tsukagoshi et al.		
		09037225	JP	A	1997-02-07	Tsushima et al.		
		813167	EP	A2	1997-12-17	Ristow et al.		
		1169229	CN		1997-12-31	McLaren et al.		
		1997031445	WO	A3	1998-04-02	Carmel et al.		
		1999010836	WO	A1	1999-03-04	Daboosh et al.		
		11164307	JP	A	1999-06-18	Sugiyama et al.		
		1221284	CN	A	1999-06-30	Kim, J		
		0936812	EP	A1	1999-08-18	Maillard et al.		
		100221423	KR	B1	1999-09-15	Masamichu et al.		
		11275576	JP	A	1999-10-08	Bun et al.		
		11328929	JP	A	1999-11-30	Hideo et al.		
		1999065239	WO	A2	1999-12-16	Eerenberg et al.		
		2000201343	JP	A	2000-07-18	Masahide		
		1056273	EP	A2	2000-11-29	Cornelio et al.		
		0104892	WO	A1	2001-01-18	Mcbirnie, Steven et al.		
		02001043668	JP	A	2001-02-16	Ishioka, Takayuki		
		2001031497	WO	A1	2001-05-03	Gonzalez, Ruben		
		2001050732	WO	A2	2001-07-12	Pintz et al.		
		2001209726	JP	A	2001-08-03	Hatakeyama et al.		
		2001065762	WO	A2	2001-09-07	Platt et al.		
		2001346165	JP	A	2001-12-14	Okada et al.		
		2002001880	WO	A1	2002-01-03	Strothman et al.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		2002008948	WO	A2	2002-01-31	Sull et al.		
		2002013664	KR		2002-02-21	Kim et al.		
		1187483	EP	A2	2002-03-13	Tehranchi, Babak		
		2002035832	WO	A2	2002-05-02	Davenport		
		2002037210	WO	A2	2002-05-10	Clark et al.		
		2002164880	JP	A	2002-06-07	Furuta et al.		
		2002170363	JP	A	2002-06-14	Hideo et al.		
		2002518898	JP	A	2002-06-25	Eerenberg et al.		
		2002054196	WO	A2	2002-07-11	Durand et al.		
		2002218384	JP	A	2002-08-02	Hyodo		
		1020020064888	KR	A	2002-08-10	Gonzales et al.		
		2003030000	WO	A1	2003-04-10	Mattila et al.		
		2003179597	JP	A	2003-06-27	Nakae et al.		
		2003250113	JP	A	2003-09-05	Ogawa		
		2003096136	WO	A2	2003-11-20	Aldis et al.		
		2004013823	JP	A	2004-01-15	Yokoyama		
		1420580	EP	A1	2004-05-19	Schiller et al.		
		2004515941	JP	A	2004-05-27	Davenport		
		2004172830	JP	A	2004-06-17	Takishima et al.		
		2004054247	WO	A1	2004-06-24	Gan et al.		
		2004187161	JP	A	2004-07-02	Hayashi et al.		
		2004234128	JP	A	2004-08-19	Fujisawa et al.		
		2004097811	WO	A1	2004-11-11	Kim et al.		
		2004102571	WO	A1	2004-11-25	Rijckaert		
		2005027153	JP		2005-01-27	Kunieda, T. et al.		
		2005080204	JP	A	2005-03-24	Watanabe		

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature	/ABIY GETACHEW/	Date Considered	12/07/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	5	("8909922").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:07
L4	4	713/160.ccls. and ((plurality with streams) and (encrypt$3 adj key)) and (index$3 list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:09
L5	2	713/160.ccls. and (playback with device) with (processor with memory with client with application)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:16
L7	2	713/160.ccls. and (processor) with (memory with client with application) same (index with file) same (Streams with content with encryp$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:20
L14	358	((plurality with streams) and (encrypt$3 adj key)) and (index$3 or list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:27
L16	4	((plurality with streams) same (encrypt$3 adj key)) and (index$3 or list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:27
L17	20	((plurality with streams) near20 (index$3 list$3 or index)) near20 (identify or identifying or identified) same (plurality with alternative with streams)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:30
L18	3	713/$.ccls. and ((plurality with streams)	US-PGPUB;	OR	OFF	2018/12/09

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0626
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

		near20 (index$3 list$3 or index)) near20 (identify or identifying or identified) same (plurality with alternative with streams)	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			11:31
S2	19	(Access same control) with ("internet of things" or "OIT")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/15 17:12
S3	19	(Access with control) with ("internet of things" or "OIT")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/15 17:14
S4	9	(Access with control) near20 ("internet of things" or "OIT")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/15 17:14
S5	8831	((("MICROSOFT") near3 ("TECHNOLOGY") near3 ("LICENSING") near3 ("LLC"))).AS,AANM.	USPAT	OR	OFF	2018/11/15 17:22
S6	17	((("Samuel") near3 ("Arjmand"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:40
S7	428	((("Perez") near3 ("Juan"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:41
S8	428	((("Perez") near3 ("Juan"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:49
S9	17	((("Samuel") near3 ("Arjmand"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:58
S10	428	((("Perez") near3 ("Juan"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:59
S11	104	((("Braness") near3 ("Jason"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/18 14:09
S12	41	((("Grab") near3 ("Eric") near3 ("William"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/18 14:09
S13	104	((("Braness") near3 ("Jason"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/18 14:10
S14	20	((("Kiefer") near3 ("Michael") near3 ("George"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/18 14:12
S15	18	((("DIVX") near3 ("LLC"))).AS,AANM.	USPAT	OR	OFF	2018/11/18 14:15

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0627
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

S16	5	("9621522").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:17
S19	5	((((access$3 play$4 play$1back playback) and (Common same identical$5) with Key) and ((access$4 play$3 play$1back playback) with (common same identical$5) with key) and ((access$ play$1back playback) with (common same identical$5) with key))).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:22
S20	85	(playback with device) with (processor with memory with client with application)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:24
S22	20	((plurality with streams) near20 (index$3 list$3 or index)) near20 (identify or identifying or identified) same (plurality with alternative with streams)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:28
S23	40816	((plurality with streams) with (encrypt$3 adj key)) samei (index$3 list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:31
S24	40795	(playback with device) with (processor with memory with client with application) and ((plurality with streams) with (encrypt$3 adj key)) samei (index$3 list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:32
S27	85	(playback with device) with (processor with memory with client with application)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:32
S28	3	((plurality with streams) with (encrypt$3 adj key)) same (index$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:33
S29	20	(index or indexing or indexed) near20 (streams with content) near20 (protected with content with cryptographic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2018/11/18 14:42

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0628
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

			DERWENT; IBM_TDB			
S30	20	(index or indexing or indexed) near20 (streams with content) near20 (content with cryptographic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:45
S31	7	(client with application same processor) with (index or indexing or indexed) near20 (Streams with cryptographic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 15:29
S32	28	((((access$3 play$4 play$1back playback) and (Common same identical$5) with Key) and ((access$4 play$3 play$1back playback) with (common same identical$5) with key) and ((access$ play$1back playback) with (common same identical$5) with key)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 15:31
S48	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:15
S49	343	(Access same control) Same ("internet of things" or "OIT")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/21 12:16
S50	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" |	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:23

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0629
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

		"20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.				
S51	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:33
S52	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" |	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:38

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0630
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

		"5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.				
S53	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:39
S54	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:40
S55	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" |	US-PGPUB; USPAT	OR	OFF	2018/11/21 14:03

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0631
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

		"20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.				
S56	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 14:24
S57	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" |	US-PGPUB; USPAT	OR	OFF	2018/11/21 14:37

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0632
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

		"5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.				
S59	7	(processor) with (memory with client with application) same (index with file) same (Streams with content with encryp$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 10:28
S60	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/12/07 12:30
S61	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/12/07 14:05
S62	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" |	US-PGPUB; USPAT	OR	OFF	2018/12/07 15:17

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0633
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

		"20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.				
S63	455	((playback adj device) same (play$3 same protect$3 same content))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 15:51
S64	241	((playback adj device) same (play$3 same protect$3 same content)) and stream$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 15:52
S65	109	((playback adj device) same (play$3 same protect$3 same content)) and stream$3 and (protected same video)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 15:54
S66	503	(decrypt$3 or decipher$3 or public or decod$3) and (hashed or encoded or encrypted or coded) same (frames with video with identified)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 16:01
S67	7	((playback adj device) same (play$3 same protect$3 same content)) and stream$3 and (protected same video) and ((decrypt$3 or decipher$3 or public or decod$3) and (hashed or encoded or encrypted or coded) same (frames with video with identified))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 16:02
S68	7	((playback adj device) same2 (play$3 same protect$3 same content)) and stream$3 and (protected same video) and ((decrypt$3 or decipher$3 or public or decod$3) and (hashed or encoded or encrypted or coded) same (frames with	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2018/12/07 18:39

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0634
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

		video with identified))	IBM_TDB			
S69	2	("20090169181").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 10:14
S70	2	("20070271385").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 11:00
S71	28	((((access$3 play$4 play$1back playback) and (Common same identical$5) with Key) and ((access$4 play$3 play$1back playback) with (common same identical$5) with key) and ((access$ play$1back playback) with (common same identical$5) with key)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 21:11
S72	2	("20070271385").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 21:12
S73	2	("20030231867").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 21:44

12/ 9/ 2018 12:55:11 PM
C:\ Users\ agetachew\ Documents\ EAST\ Workspaces\ 16136183.wsp

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0635
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
/A.G/		AUTHOR UNKNOWN, "Tunneling QuickTime RTSP and RTP over HTTP", Published by Apple Computer, Inc.: 1999 (month unknown), 6 pgs.	
/A.G/		AUTHOR UNKNOWN, "Turbo-Charge Your Internet and PC Performance", printed October 30, 2008 from Speedtest.net - The Global Broadband Speed Test, 1 page.	
/A.G/		AUTHOR UNKNOWN, "White paper, The New Mainstream Wireless LAN Standard", Broadcom Corporation, July 2003, 12 pgs.	
/A.G/		BLASIAK, "Video Transrating and Transcoding: Overview of Video Transrating and Transcoding Technologies", Ingenient Technologies, TI Developer Conference, August 6-8, 2002, 22 pgs.	
/A.G/		BLOOM ET AL., "Copy Protection for DVD Video", Proceedings of the IEEE, Vol. 87, No. 7, July 1999, pp. 1267-1276.	
/A.G/		BOCHAROV ET AL., "Portable encoding of audio-video objects: The Protected Interoperable File Format (PIFF)", Microsoft Corporation, September 8, 2009, Revised: March 9, 2010, 32 pgs.	
/A.G/		BROSS ET AL., "High Efficiency Video Coding (HEVC) text specification draft 10 (for FDIS & Last Call)", Joint Collaborative Team on Video Coding (JCT-VC) of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11, Document: JCTVC-L1003_v34, 12th Meeting: Geneva, CH, January 14 – 23, 2013, 310 pgs (presented in three parts).	
/A.G/		CASARES ET AL., "Simplifying Video Editing Using Metadata", DIS2002, 2002, pp.157-166.	
/A.G/		CONCOLATO ET AL., "Live HTTP Streaming of Video and Subtitles within a Browser", MMSys 2013, February 26- March 1, 2013, Oslo, Norway, 5 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		DEUTSCHER, "IIS Transform Manager Beta - Using the MP4 to Smooth Task", Retrieved from: https://web.archive.org/web/20130328111303/http://blog.johndeutscher.com/category/smooth-streaming, Blog post of April 29, 2011, 14 pgs.	
/A.G/		ESKICIOGLU ET AL., "An Integrated Approach to Encrypting Scalable Video", Proceedings IEEE International Conference on Multimedia and Expo, August 26-29, 2002, Lausanne, Switzerland, 4 pgs.	
/A.G/		FECHEYR-LIPPENS, "A Review of HTTP Live Streaming", INTERNET CITATION, 25 January 2010, pp. 1-37.	
/A.G/		GANNES, "The Lowdown on Apple's HTTP Adaptive Bitrate Streaming", GigaOM, June 10, 2009, 12 pgs.	
/A.G/		GARG ET AL., "An Experimental Study of Throughput for UDP and VoIP Traffic in IEEE 802.11b Networks", Wireless Communications and Networkings, March 2003, pp. 1748-1753.	
/A.G/		GAST, "When is 54 Not Equal to 54? A Look at 802.11a, b and g Throughput", August 8, 2003, printed October 30, 2008 from www.oreillynet.com/pub/a/wireless/2003/08/08/wireless_throughput.html, 4 pgs.	
/A.G/		GHOSH, "Enhancing Silverlight Video Experiences with Contextual Data", Retrieved from: http://msdn.microsoft.com/en-us/magazine/ee336025.aspx, 2010, 15 pgs.	
/A.G/		GRIFFITH, ERIC, "The Wireless Digital Picture Frame Arrives", Wi-Fi Planet, printed May 4, 2007 from http://www.wi-fiplanet.com/news/article.php/3093141, October 16, 2003, 3 pgs.	
/A.G/		HARTUNG ET AL., "DRM Protected Dynamic Adaptive HTTP Streaming", MMSys 2011 Proceedings of the Second Annual ACM Conference on Multimedia Systems, San Jose, California, February 23-25, 2011, pp. 277-282.	
/A.G/		HURTADO GUZMAN, JUAN ESTEBAN, "Development and Implementation of an Adaptive HTTP Streaming Framework for H264/MVC Coded Media", Politecnico di Torino, November 2010, 108 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		HWANG ET AL., "Efficient and User Friendly Inter-domain Device Authentication/Access control for Home Networks", Proceedings of the 2006 International Conference on Embedded and Ubiquitous Computing, Seoul, Korea, August 1-4, 2006, pp. 131-140.	
/A.G/		INLET TECHNOLOGIES, "Adaptive Delivery to iDevices", 2010, 2 pgs.	
/A.G/		INLET TECHNOLOGIES, "Adaptive delivery to iPhone 3.0", 2009, 2 pgs.	
/A.G/		INLET TECHNOLOGIES, "HTTP versus RTMP", 2009, 3 pgs.	
/A.G/		INLET TECHNOLOGIES, "The World's First Live Smooth Streaming Event: The French Open", 2009, 2 pgs.	
/A.G/		KASPAR ET AL., "Using HTTP Pipelining to Improve Progressive Download over Multiple Heterogeneous Interfaces", IEEE ICC proceedings, 2010, 5 pgs.	
/A.G/		KIM, KYUHEON, "MPEG-2 ES/PES/TS/PSI", Kyung-Hee University, October 4, 2010, 66 pgs.	
/A.G/		KOZINTSEV ET AL., "Improving last-hop multicast streaming video over 802.11", Workshop on Broadband Wireless Multimedia, October 2004, pp. 1-10.	
/A.G/		KURZKE ET AL., "Get Your Content Onto Google TV", Google, Retrieved from: http://commondatastorage.googleapis.com/io2012/presentations/live%20to%20website/1300.pdf, 2012, 58 pgs.	
/A.G/		LANG, "Expression Encoder, Best Practices for live smooth streaming broadcasting", Microsoft Corporation, 2010, retrieved from http://www.streamingmedia.com/conferences/west2010/presentations/SMWest-12010-Expression-Encoder.pdf, 20 pgs.	
/A.G/		LEVKOV, "Mobile Encoding Guidelines for Android Powered Devices", Adobe Systems Inc., Addendum B, 22 December 2010, 42 pgs.	
/A.G/		LI ET AL., "Content-Aware Playout and Packet Scheduling for Video Streaming Over Wireless Links", IEEE Transactions on Multimedia, Vol. 10, No. 5, August 2008, pp. 885-895.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		LIAN ET AL., "Efficient video encryption scheme based on advanced video coding", Multimed. Tools Appl. Vol. 38, 2008, pp. 75-89.	
/A.G/		LIU ET AL., "A Formal Framework for Component Deployment", OOPSLA 2006, Proceedings of the 21st Annual ACM SIGPLAN Conference on Object-Oriented Programming Systems, Language, and Applications, Portland, Oregon, October 22-26, 2006, pp. 325-344.	
/A.G/		LONG ET AL., "Silver: Simplifying Video Editing with Metadata", CHI 2003: New Horizons, April 5-10, 2003, pp. 628-629.	
/A.G/		MATROSKA, "Diagram", Matroska, Technical/Info, Diagram, 2016, retrieved from https://www.matroska.org/technical/diagram/index.html on July 20, 2017, 9 pgs.	
/A.G/		MATROSKA, "Specifications", Matroska, Technical/Info, Specifications, June 25, 2017, retrieved from https://www.matroska.org/technical/specs/index.html on July 20, 2017, 20 pgs.	
/A.G/		MIRAS, "On Quality Aware Adaptation of Internet Video", University of London, PhD dissertation, 2004, 181 pgs.	
/A.G/		MORRISON, "EA IFF 85 Standard for Interchange Format Files", January 14, 1985, printed from http://www.dcs.ed.ac.uk/home/mxr/gfx/2d/IFF.txt on March 6, 2006, 24 pgs.	
/A.G/		MOSCOSO, PEDRO GOMES, "Interactive Internet TV Architecture Based on Scalable Video Coding", Instituto Superior Techico, Universidad Technica de Lisboa, May 2011, 103 pgs.	
/A.G/		MSDN, "Adaptive streaming, Expression Studio 2.0", April 23, 2009, 2 pgs.	
/A.G/		NELSON, "Arithmetic Coding + Statistical Modeling = Data Compression: Part 1 - Arithmetic Coding", Doctor Dobb's Journal, February 1991, USA, pp. 1-12.	
/A.G/		NELSON, "Smooth Streaming Deployment Guide", Microsoft Expression Encoder, August 2010, 66 pgs.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		NELSON, MICHAEL, "IBM's Cryptolopes", Complex Objects in Digital Libraries Course, Spring 2001, Retrieved from http://www.cs.odu.edu/~mln/teaching/unc/inls210/?method=display&pkg_name=cryptolopes.pkg&element_name=cryptolopes.ppt, 12 pgs.	
/A.G/		NOBORU, "Play Fast and Fine Video on Web! codec", Co.9 No.12, December 1, 2003, pp. 178-179.	
/A.G/		NOE, A., "Matroska File Format (under construction!)", Retrieved from the Internet: URL:http://web.archive.org web/20070821155146/www.matroska.org/technical/specs/matroska.pdf [retrieved on 2011-01-19], 6/24/2007, pp. 1-51.	
/A.G/		NOE, ALEXANDER, "AVI File Format", http://www.alexander-noe.com/video/documentation/avi.pdf, December 14, 2006, pp. 1-26.	
/A.G/		NOE, ALEXANDER, "Definitions", April 11, 2006, retrieved from http://www.alexander-noe.com/video/amg/definitions.html on October 16, 2013, 2 pgs.	
/A.G/		OOYALA, "Widevine Content Protection", Ooyala Support Center for Developers. Ooyala, Inc., 2013. June 3, 2013. http://support.ooyala.com/developers/documentation/concepts/player_v3_widevine_integration.html, 7 pgs.	
/A.G/		OYMAN ET AL., "Quality of Experience for HTTP Adaptive Streaming Services", IEEE Communications Magazine, April 2012, Vol. 50, No. 4, DOI: 10.1109/MCOM.2012.6178830, pp. 20-27.	
/A.G/		OZER, "The 2012 Encoding and Transcoding Buyers' Guide", Streamingmedia.com, Retrieved from: http://www.streamingmedia.com/Articles/Editorial/Featured-Articles/The-2012-Encoding-and-Transcoding-Buyers-Guide-84210.aspx, 2012, 8 pgs.	
/A.G/		OZER, JAN, "Adaptive Streaming in the Field", Streaming Media, December 2010-January 2011, pp. 36-47.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

/A.G/		PADIADPU, RASHMI, "Towards Mobile Learning: A SCORM Player for the Google Android Platform", Master Thesis, Hamburg University of Applied Sciences, 2008, 66 pgs.	
/A.G/		PANTOS, "HTTP Live Streaming, draft-pantos-http-live-streaming-10", IETF Tools, October 15, 2012, Retrieved from: http://tools.ietf.org/html/draft-pantos-http-live-streaming-10, 37 pgs.	
/A.G/		PANTOS, R., "HTTP Live Streaming: draft-pantos-http-live-streaming-06", Published by the Internet Engineering Task Force (IETF), March 31, 2011, 24 pgs.	

EXAMINER SIGNATURE

Examiner Signature	/ABIY GETACHEW/	Date Considered	12/07/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Electronic Patent Application Fee Transmittal

Application Number:	16136183
Filing Date:	19-Sep-2018
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Filer:	Paul Joon Lee/Tess Langseth-DePaolis
Attorney Docket Number:	D1-02359A.CON5

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1000**

Electronic Acknowledgement Receipt

EFS ID:	34796284
Application Number:	16136183
International Application Number:	
Confirmation Number:	2864
Title of Invention:	Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Paul Joon Lee/Tess Langseth-DePaolis
Filer Authorized By:	Paul Joon Lee
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	08-JAN-2019
Filing Date:	19-SEP-2018
Time Stamp:	18:02:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1000
RAM confirmation Number	010919INTEFSW18025400
Deposit Account	504407
Authorized User	Tess Langseth-DePaolis
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	02359acon5issuefee.pdf	169879 2f78c16dfc4f69dde37989658d29edbb35c8f8c1	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30698 5952b00646a65c0ca921dcb17a13e6052954ffa3	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	200577		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF TRANSMISSION

I hereby certify that the enclosed Fee(s) Transmittal is being electronically filed with the United States Patent and Trademark Office on January 8, 2019 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/Tess Langseth-DePaolis/
Tess Langseth-DePaolis

PART B--FEE(S) TRANSMITTAL

Complete and send this form, together with the applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22314-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note Use Block 1 for any change of address)

71897 7590 12/18/2018

KPPB LLP
2190 S. Towne Centre Place, Suite 300
Anaheim, CA 92806

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, EFS-Web transmitted, or facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's Name)
(Signature)
(Date)

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
16/136,183	September 19, 2018	Michael George Kiefer	D1-02359A.CON5	2864

TITLE OF INVENTION:

Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	undiscounted	$1000	$0	$0	$1000	March 18, 2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
Abiy Getachew	2434	713-160000

1. Change of correspondence address or indication of "Fee Address" (37CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered attorney or agent. If no name is listed, no name will be printed

1. KPPB LLP
2.
3.

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

1a. NAME OF ASSIGNEE: DIVX, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): San Diego, CA

Please check the appropriate assignee categories (will not be printed on the patent): ☐ Individual ☑ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☑ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies

4b. Payment of Fees(s): **(Please first reapply and previously paid fee shown above)**
☐ A check is enclosed
☐ Payment be credit card. Form PTO-2038 is attached
☑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 50-4407 (enclose an extra copy of this form)

5. Change of Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Paul J. Lee/ Date January 8, 2019

Typed or printed name Paul J. Lee Registration No. 69,375

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0647
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/136,183	09/19/2018	Michael George Kiefer	D1-02359A.CON5

CONFIRMATION NO. 2864

71897
KPPB LLP
2190 S. Towne Centre Place
Suite 300
Anaheim, CA 92806

PUBLICATION NOTICE

OC000000105160594

Title: Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys

Publication No.US-2019-0020907-A1
Publication Date:01/17/2019

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently https://portal.uspto.gov/pair/PublicPair. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0648
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/136,183	09/19/2018	Michael George Kiefer	D1-02359A.CON5	2864

71897 7590 01/29/2019

KPPB LLP
2190 S. Towne Centre Place
Suite 300
Anaheim, CA 92806

EXAMINER
GETACHEW, ABIY

ART UNIT	PAPER NUMBER
2434	

NOTIFICATION DATE	DELIVERY MODE
01/29/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PAIR@KPPB.COM

Corrected ***Notice of Allowability***	**Application No.** 16/136,183	**Applicant(s)** Kiefer et al.	
	Examiner ABIY GETACHEW	**Art Unit** 2434	**AIA Status** No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 01/09/2019.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-7,9-19 and 21-26 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file areply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 12/17/2018.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/ABIY GETACHEW/
Primary Examiner , Art Unit 2434

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0650
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	3	("20050132208" | "20060165233" | "20180332094").PN.	US-PGPUB; USPAT	OR	OFF	2019/01/22 14:50
S2	19	(Access same control) with ("internet of things" or "OIT")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/15 17:12
S3	19	(Access with control) with ("internet of things" or "OIT")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/15 17:14
S4	9	(Access with control) near20 ("internet of things" or "OIT")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/15 17:14
S5	8831	((("MICROSOFT") near3 ("TECHNOLOGY") near3 ("LICENSING") near3 ("LLC"))).AS,AANM.	USPAT	OR	OFF	2018/11/15 17:22
S6	17	((("Samuel") near3 ("Arjmand"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:40
S7	428	((("Perez") near3 ("Juan"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:41
S8	428	((("Perez") near3 ("Juan"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:49
S9	17	((("Samuel") near3 ("Arjmand"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:58
S10	428	((("Perez") near3 ("Juan"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 17:59
S11	104	((("Braness") near3 ("Jason"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/18 14:09
S12	41	((("Grab") near3 ("Eric") near3 ("William"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/18 14:09
S13	104	((("Braness") near3 ("Jason"))).INV.	US-PGPUB;	OR	OFF	2018/11/18

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0651
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

			USPAT; USOCR			14:10
S14	20	((("Kiefer") near3 ("Michael") near3 ("George"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/18 14:12
S15	18	((("DIVX") near3 ("LLC"))).AS,AANM.	USPAT	OR	OFF	2018/11/18 14:15
S16	5	("9621522").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:17
S19	5	((((access$3 play$4 play$1back playback) and (Common same identical$5) with Key) and ((access$4 play$3 play$1back playback) with (common same identical$5) with key) and ((access$ play$1back playback) with (common same identical$5) with key))).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:22
S20	85	(playback with device) with (processor with memory with client with application)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:24
S22	20	((plurality with streams) near20 (index$3 list$3 or index)) near20 (identify or identifying or identified) same (plurality with alternative with streams)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:28
S23	40816	((plurality with streams) with (encrypt$3 adj key)) samei (index$3 list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:31
S24	40795	(playback with device) with (processor with memory with client with application) and ((plurality with streams) with (encrypt$3 adj key)) samei (index$3 list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:32
S27	85	(playback with device) with (processor with memory with client with application)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:32
S28	3	((plurality with streams) with (encrypt$3 adj key)) same (index$3)	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2018/11/18 14:33

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0652
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

			EPO; JPO; DERWENT; IBM_TDB			
S29	20	(index or indexing or indexed) near20 (streams with content) near20 (protected with content with cryptographic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:42
S30	20	(index or indexing or indexed) near20 (streams with content) near20 (content with cryptographic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 14:45
S31	7	(client with application same processor) with (index or indexing or indexed) near20 (Streams with cryptographic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 15:29
S32	28	((((access$3 play$4 play$1back playback) and (Common same identical$5) with Key) and ((access$4 play$3 play$1back playback) with (common same identical$5) with key) and ((access$ play$1back playback) with (common same identical$5) with key)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/18 15:31
S48	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:15
S49	343	(Access same control) Same ("internet of things" or "OIT")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2018/11/21 12:16

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0653
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

			IBM_TDB			
S50	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:23
S51	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:33
S52	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" |	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:38

		"20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.				
S53	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:39
S54	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 12:40

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0655
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

S55	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 14:03
S56	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/11/21 14:24
S57	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" |	US-PGPUB; USPAT	OR	OFF	2018/11/21 14:37

		"4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.				
S59	7	(processor) with (memory with client with application) same (index with file) same (Streams with content with encryp$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 10:28
S60	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/12/07 12:30
S61	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" |	US-PGPUB; USPAT	OR	OFF	2018/12/07 14:05

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0657
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

		"5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.				
S62	61	("20010030710" | "20010036355" | "20010046299" | "20010053222" | "20020026560" | "20020034252" | "20020051494" | "20020057898" | "20020062313" | "20020076112" | "20020087569" | "20020091665" | "20020093571" | "20020110193" | "20020116481" | "20020118953" | "20020120934" | "20020136298" | "20020143413" | "20020143547" | "20020147980" | "20020159598" | "20020161462" | "20020180929" | "20020184159" | "20020184515" | "20020191112" | "4009331" | "4694357" | "4802170" | "4964069" | "5119474" | "5274758" | "5361332" | "5396497" | "5404436" | "5420801" | "5420974" | "5471576" | "5479303" | "5487167" | "5502766" | "5509070" | "5533021" | "5537408" | "5539908" | "5541662" | "5583652" | "5589993" | "5621794" | "5627936" | "5633472" | "5642171" | "5655117" | "5664044" | "5675382" | "5675511" | "5684542" | "5715403" | "5717816" | "5719786").PN.	US-PGPUB; USPAT	OR	OFF	2018/12/07 15:17
S63	455	((playback adj device) same (play$3 same protect$3 same content))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 15:51
S64	241	((playback adj device) same (play$3 same protect$3 same content)) and stream$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 15:52
S65	109	((playback adj device) same (play$3 same protect$3 same content)) and stream$3 and (protected same video)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 15:54
S66	503	(decrypt$3 or decipher$3 or public or decod$3) and (hashed or encoded or encrypted or coded) same (frames with video with identified)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 16:01
S67	7	((playback adj device) same (play$3 same protect$3 same content)) and stream$3 and (protected same video) and ((decrypt$3 or decipher$3 or public or	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2018/12/07 16:02

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0658
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

		decod$3) and (hashed or encoded or encrypted or coded) same (frames with video with identified))	EPO; JPO; DERWENT; IBM_TDB			
S68	7	((playback adj device) same2 (play$3 same protect$3 same content)) and stream$3 and (protected same video) and ((decrypt$3 or decipher$3 or public or decod$3) and (hashed or encoded or encrypted or coded) same (frames with video with identified))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/07 18:39
S69	2	("20090169181").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 10:14
S70	2	("20070271385").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 11:00
S71	28	((((access$3 play$4 play$1back playback) and (Common same identical$5) with Key) and ((access$4 play$3 play$1back playback) with (common same identical$5) with key) and ((access$ play$1back playback) with (common same identical$5) with key)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 21:11
S72	2	("20070271385").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 21:12
S73	2	("20030231867").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/08 21:44
S74	5	("8909922").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:07
S75	4	713/160.ccls. and ((plurality with streams) and (encrypt$3 adj key)) and (index$3 list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:09
S76	2	713/160.ccls. and (playback with device) with (processor with memory with client	US-PGPUB; USPAT;	OR	OFF	2018/12/09 11:16

		with application)	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S77	2	713/160.ccls. and (processor) with (memory with client with application) same (index with file) same (Streams with content with encryp$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:20
S78	358	((plurality with streams) and (encrypt$3 adj key)) and (index$3 or list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:27
S79	4	((plurality with streams) same (encrypt$3 adj key)) and (index$3 or list$3 or index) and (playback with content)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:27
S80	20	((plurality with streams) near20 (index$3 list$3 or index)) near20 (identify or identifying or identified) same (plurality with alternative with streams)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:30
S81	3	713/$.ccls. and ((plurality with streams) near20 (index$3 list$3 or index)) near20 (identify or identifying or identified) same (plurality with alternative with streams)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/12/09 11:31

1/22/2019 2:53:25 PM
C:\Users\agetachew\Documents\EAST\Workspaces\16136183.wsp

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0660
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/A.G/		20050132208	A1	2005-06-16	Hug et al.	
/A.G/		20060165233	A1	2006-07-27	Nonaka et al.	
/A.G/		20180332094	A1	2018-11-15	Braness	

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]
/A.G/		2010/05673	WO	A2	2010-01-14	Hauan, Johan		

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
/A.G/		"Microsoft Announces Breakthrough Technology Enabling Simple Access to Broad Set of Digital Content, Including Music, Games, Video, Ring Tones and Pictures", Microsoft, February 12, 2007, Retrieved from https://news.microsoft.com/2007/02/12/microsoft-announces-breakthrough-technology-enabling-simple-access-to-broad-set-of-digital-content-including-music-games-video-ring-tones-and-pictures/, 5 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16/136,183
	Filing Date	September 19, 2018
	First Named Inventor	Michael George Kiefer
	Art Unit	2434
	Examiner Name	Abiy Getachew
	Attorney Docket Number	D1-02359A.CON5

EXAMINER SIGNATURE			
Examiner Signature	/ABIY GETACHEW/	Date Considered	01/22/2019

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/136,183	03/05/2019	10225588	D1-02359A.CON5	2864

71897 7590 02/13/2019

KPPB LLP
2190 S. Towne Centre Place
Suite 300
Anaheim, CA 92806

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Michael George Kiefer, Lake Havasu City, AZ;
DIVX, LLC, San Diego, CA;
Eric William Grab, San Diego, CA;
Jason Braness, San Diego, CA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

This full text paper was peer reviewed at the direction of IEEE Communications Society subject matter experts for publication in the IEEE ICC 2010 proceedings

Using HTTP Pipelining to Improve Progressive Download over Multiple Heterogeneous Interfaces

Dominik Kaspar* Kristian Evensen* Paal Engelstad*†‡ Audun F. Hansen*
*Simula Research Laboratory, Norway †University of Oslo, Norway ‡Telenor R&I, Norway
{kaspar, kristrev, paalee, audunh}@simula.no

***Abstract*—Today, mobile devices like laptops and cell phones often come equipped with multiple network interfaces, enabling clients to simultaneously connect to independent access networks. Even though applications, such as multimedia streaming and video-on-demand delivery systems, could potentially benefit greatly from the aggregated bandwidth, implementation and standardization challenges have so far hindered the deployment of multilink solutions.**

Previously, we have explored the benefits of collaboratively using multiple Internet connections to progressively download and play back large multimedia files. In this paper, we present an improved version of our approach that utilizes HTTP's capability of request pipelining in combination with range retrieval requests. While, in our earlier work, the optimal choice of file segmentation size presented a tradeoff between throughput and startup latency, the enhanced solution is able to overcome this tradeoff. The use of very small segments no longer impairs the efficiency of throughput aggregation, which additionally makes our solution robust against link variances and agnostic to network heterogeneity.

I. Introduction

Multimedia streaming is increasing in popularity and has become one of the dominating services on the Internet today. At the same time, there is an ongoing trend of integrating multiple wireless network interfaces into user devices, such as laptops and cell phones. Such mobile devices, which are becoming increasingly popular for downloading and viewing multimedia content [1], are often located in the coverage area of multiple wireless networks, such as wide-area 3G access networks and local-area WiFi networks. Especially in environments with weak signal reception, the simultaneous utilization of all available network interfaces on multihomed clients has a great potential of improving the service quality and the user experience.

A major hurdle in the deployment of a multilink solution is the lack of server-side support. Although there exist suggested modifications to TCP (e.g., [2]) and SCTP (e.g., [3]), standard transport protocols are unable to provide host-based aggregation of individual flows. Thus, a common approach is to provide specialized libraries (such as PSockets [4]) for transparent partition of application-layer data into multiple independent transport streams. However, the implementation of such middleware requires software modifications to all involved clients and servers.

In order to provide easy deployment and interoperability with existing server infrastructure, we have previously proposed a purely client-based solution for progressively downloading a single large file over multiple interfaces [5]. As illustrated in Figure 1, this application-layer method is utilizing the *range retrieval request* feature of HTTP [6], allowing logical file segmentation and cooperative download over multiple access networks.

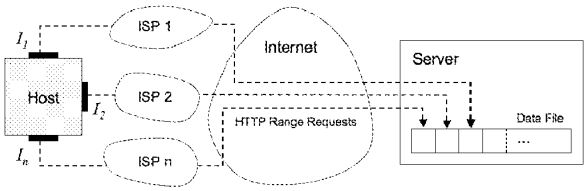


Fig. 1. General scenario of a multihomed host connected to n different access networks (i.e., ISPs). The host utilizes the interfaces I_1, ..., I_n to simultaneously download a file from a server in many fixed-size segments.

Our previous work demonstrated the tradeoff of achieving a high-bitrate multimedia playback versus the required waiting time (i.e., startup latency) before playback [5]. In other words, dividing the requested file into small-sized segments leads to a small startup latency and smooth playback, but requesting many segments introduces additional time overhead, which significantly reduces the efficiency of throughput aggregation. In addition to this tradeoff, we have identified numerous problems and potential solutions, as listed in Table I. The identified problem space can be translated into four main requirements for an improved solution (see Table II).

TABLE I
Problems with segmented file download over multiple links

	Problem	Possible solution
P1	The time overhead of frequently requesting small segments causes inefficient throughput aggregation.	Utilize a mechanism for pipelining requests and permanently keeping the server busy sending data.
P2	It is a challenge to predict the optimal segment size that maximizes the aggregated throughput and minimizes the startup latency.	Before the actual download begins, employ a short phase of link monitoring to gain knowledge of the delay and throughput characteristics.
P3	In highly dynamic networks, fixed-size segments increase the required startup latency and the buffer load.	Employ continuous link monitoring and adjust segment sizes in proportion to the links' throughput.
P4	The last segment is often downloaded by the slowest interface, causing idle time on all others.	The last segment may be split among all interfaces in a divide-and-conquer fashion.

The remainder of this paper is organized as follows: in Section II, related work on media content distribution using

978-1-4244-6404-3/10/$26.00 ©2010 IEEE

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0664
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

TABLE II
REQUIREMENTS FOR MULTILINK PROGRESSIVE DOWNLOAD

	Requirement
R1	The throughput of each additional interface must be efficiently aggregated to allow an increased throughput and a better playback quality.
R2	For achieving a smooth playback experience, the startup latency and the number of playback interruptions should be minimized.
R3	The solution should be agnostic to the heterogeneity of the used access networks.
R4	The solution should dynamically adapt to link variations.

file segmentation is described and compared to our ongoing research. After introducing our experimental testbed in Section III, the advantages and challenges with HTTP request pipelining are described and analyzed in Section IV. This paper's main contribution is the use of pipelining to eliminate idle time overhead, allowing a fine-grained file segmentation that ensures both a smooth progressive playback and efficient throughput aggregation of multiple interfaces. In Section V, it is discussed how this approach meets all the requirements listed in Table II. Before the final conclusions are made, Section VI demonstrates the performance of our system by means of a real-world experiment.

II. RELATED WORK

Application-layer techniques of file segmentation in content distribution systems have been suggested for two main reasons. First, the placement of multimedia file segments on replica proxies is a commonly used technique to improve the response time of video-on-demand distribution systems [7]. Second, dividing video files into segments and creating several versions of the content allows a smooth adaptation of video quality to the available bandwidth [8]. However, the schemes proposed in the literature fail to leverage the potential of hosts with multiple network interfaces and tend to ignore the variances and heterogeneity of wireless Internet connections.

In addition, the retrieval of video segments from multiple servers is a widely used practice in commercial content distribution. For example, *Move Networks* [9] offers a delivery service to video-on-demand providers that imports content into a delivery system and distributes it to clients. Each client implements an HTTP-based pull approach that makes transparent use of replicated servers.

HTTP range retrieval requests are also frequently used by *download managers* to achieve a larger throughput by opening multiple transport flows over a single network. Searching the Internet for existing download managers, we have found over 40 such tools [10]. Most of them are advertised with a multitude of features, such as the ability to connect to multiple mirror sites and multi-protocol support. However, to the best of our knowledge, not a single existing download manager actively supports data transfer over multiple access links.

III. TESTBED

The testbed used for the experiments presented in this paper is shown in Figure 1. All results were obtained in a real-world scenario with subscriptions to independent Internet service providers. The characteristics of the used wireless access networks are shown in Table III.

TABLE III
OBSERVED CHARACTERISTICS OF USED LINKS

	IEEE 802.11b	HSDPA
Maximum net bandwidth	1375 KB/s	450 KB/s
Typical experienced throughput (Φ)	600 KB/s	300 KB/s
Average RTT for header-only IP packets	20 ms	110 ms
Average RTT for full-size IP packets	30 ms	220 ms

We had full control over both the client and the server in the experiment and we configured the server as a common HTTP Web server running Apache 2.2 on a Linux platform (Ubuntu 9.04). The server was assigned a globally reachable IP address.

IV. HTTP PIPELINING

HTTP pipelining is, according to the protocol specification [6], a method that "allows a client to make multiple requests without waiting for each response, allowing a single TCP connection to be used much more efficiently, with much lower elapsed time". As depicted in Figure 2, in the absence of pipelining (as implemented and analyzed in our previous work [5]), each range retrieval request must be sequentially handled by the server before the client can send the next request. Thus, for each request, an average time overhead of one round-trip time is incurred. For a large number of small file segments, this overhead significantly impairs the throughput of high-latency connections (such as HSDPA).

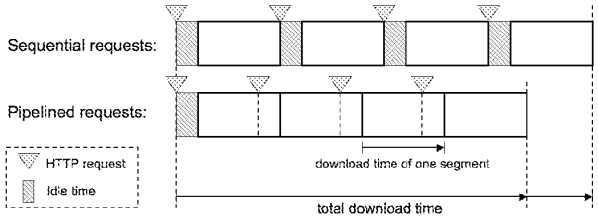


Fig. 2. From a client-side perspective, HTTP pipelining eliminates the time overhead incurred by a sequential processing of requests and replies.

If pipelining is not enabled, any attempt to achieve smoother playback by reducing the segment size is bound to increase the server's idle time and results in overall decreased throughput aggregation. However, if the client already sends a request for the next byte range before the currently downloading segment has completed, this time overhead can be eliminated. As shown in Figure 3, using HTTP pipelining helps to increase the aggregated throughput for small segment sizes.

A. Interleaved Startup Phase

If pipelining is enabled, the optimal point in time for sending the next request is not evident (illustrated with small triangles in Figure 2). Requesting the next segment too late obviously degrades the performance of pipelining, while requesting it too early increases the probability of two

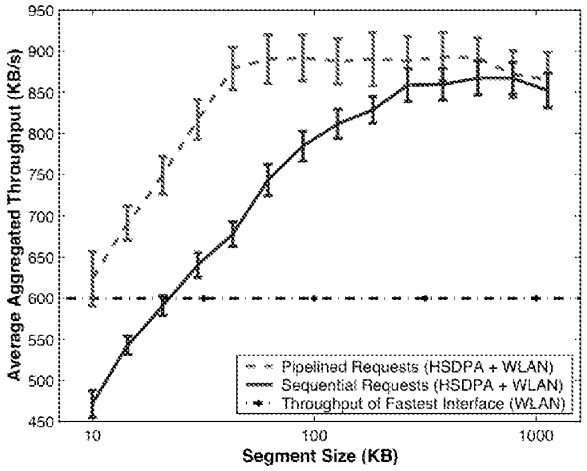


Fig. 3. The benefit of HTTP request pipelining – Using a pipelining mechanism eliminates the waiting time between successive requests and effectively increases the aggregated throughput. These results were obtained by simultaneously downloading a 50 MB large file over HSDPA and WLAN.

segments being assigned side-by-side, effectively resulting in double-size segments and one superfluous request. In order to overcome this dilemma, we suggest to schedule a predefined pipelining pattern during the startup phase (see Figure 4).

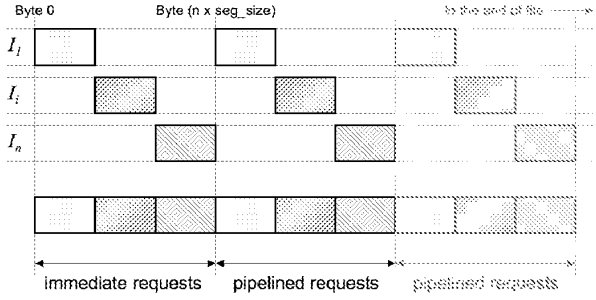


Fig. 4. Startup phase – Requesting segments over interfaces I_1, ..., I_n in an interleaved pattern helps to provide a smooth playback and reduces the initial response time.

During the interleaved startup phase it is guaranteed that byte ranges requested over the same interface are not assigned side-by-side. After the interleaved startup phase, the dilemma of when to send the next request is eliminated. Each interface may simply send a new request right after it has completed a segment and the server's pipeline will always contain at least one request to be processed.

B. The Minimum Segment Size Problem

In the attempt of achieving a smooth playback experience by employing a very fine-grained segmentation, there exists a risk of choosing the segment size too small. In this case, the server spends such a small fraction of time to process a request that the client has no time pipelining the next request. This happens if the one-way transmission delay d_i over interface I_i is larger than the time t_i it takes for the HTTP server to send out a segment, which is given by the segment size S and the average throughput Φ_i experienced over interface I_i:

$$t_i = S/\Phi_i \tag{1}$$

For example, for a 10 KB file segment over HSDPA, the server requires 33 ms (i.e., 10 KB / 300 KB/s) until the last byte of the segment is sent away. The problem here is that the 33 ms of sending out the data is much less than the average one-way transmission delay $d_i = 110$ ms experienced over the HSDPA link. Therefore, pipelining is not as efficient as expected, because the server has sent a segment and wants to send another one, but no other request is yet pipelined in the server's request queue.

For pipelining to work efficiently over a path with one-way delay d_i, a new request has to be sent from the client to the server at time t_{req} after the current time t_{now}:

$$t_{req} = t_{now} + S/\Phi_i - d_i \tag{2}$$

In the example of sending 10 KB segments over HSDPA, t_{req} is -77 ms. Thus, while the client is downloading a segment, the next segment must be requested *before* the current segment's download has even started. In other words, the segment size has been chosen too small.

The minimal segment size S_{min} required for fully efficient pipelining, can be calculated by setting $t_{req} = 0$ and solving Equation 2 for the segment size S:

$$S_{min} = d_i * \Phi_i \tag{3}$$

The minimum segment size for the HSDPA path in our scenario is therefore 110 ms * 300 KB/s = 30 KB, which is equivalent to the bandwidth-delay product of the path.

Figure 5 illustrates the experimental determination of the S_{min} value. Almost precisely at 30 KB, the graph reaches the typical experienced throughput. This figure also clearly shows that choosing too small segments causes a significant loss in throughput.

C. Multi-Segment Pipelining

In order to alleviate the minimum segment size problem, it must be guaranteed that the amount of pipelined data always exceeds the path's bandwidth-delay product, which can either be solved by increasing the segment size or by pipelining multiple segments. In our implementation, the most elegant way of filling the server queue with multiple requests was to increase the length of the interleaving pattern during the startup phase.

The performance gain of multi-segment pipelining is shown in Figure 6. While single-segment pipelining suffers from a rapid decrease in throughput for segment sizes below the bandwidth-delay product, multi-segment pipelining achieves close to optimal throughput with file segments sizes in the order of a few IP packets.

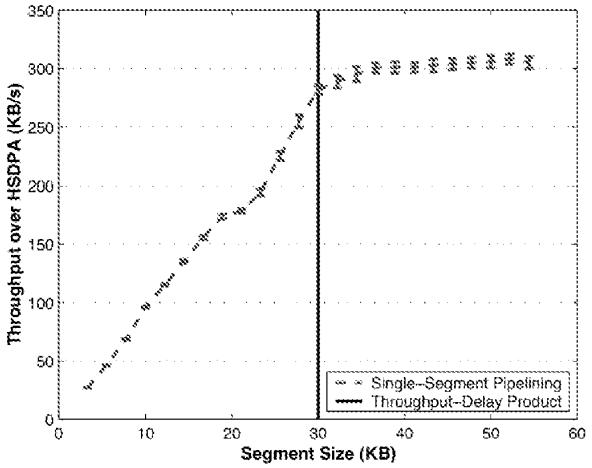


Fig. 5. The minimum segment size problem – pipelining a single segment is only useful for segment sizes larger than the bandwidth-delay product. Too small proportioned segments cause a significant performance penalty.

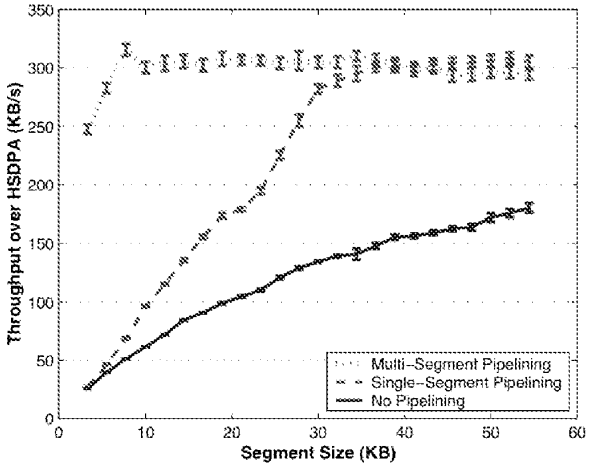


Fig. 6. By pipelining ("pre-requesting") multiple segments, the minimum segment size problem can be alleviated without the need for an increased segment size. This allows a high throughput aggregation efficiency at very small segment sizes and increases the chance for a smooth playback quality.

V. Discussion

Looking back at Table II, this section evaluates how a pipelining-based approach is capable of satisfying the requirements of progressive video playback over multiple concurrent Internet connections.

A. Overhead Elimination

The primary purpose of concurrently utilizing multiple network connections is to aggregate their throughput and provide a multimedia stream of higher quality. Section IV demonstrated how HTTP pipelining can be used to increase the throughput by eliminating any time overhead between consecutive requests. However, while the impact of byte overhead caused by HTTP header specifications has so far been ignored, such metadata noticeably reduces the throughput aggregation efficiency when the segmentation approaches a granularity of single IP packets. This effect is clearly visible in Figure 6 for the case of multi-segment pipelining when the segment size is less than 10KB.

In the approach described in this paper, each request includes the URL of the file to be retrieved, the server's IP address, and a byte range specification. For short URLs, the byte overhead of each request is therefore around 100 bytes. If a byte overhead of 1% is acceptable, the minimum segment size should be set to at least 10 KB. Despite this negligible tradeoff, the requirement R1 is fulfilled.

B. Smooth Playback

The main challenge associated with playing back a video file, while progressively downloading it over multiple network interfaces, is to provide a smooth viewing experience. For an optimal collaboration of heterogeneous connections, it is desirable to provide a segmentation of optimal granularity. Additionally, using smallest possible segments minimizes the startup latency and the probability of blocking the playback by requesting a too large first segment over a slow link. Due to the fact that our solution allows arbitrarily small segments – only at the cost of reduced throughput aggregation efficiency – the requirement R2 is met, as well.

However, due to the subjectivity of perceived video quality, there will never be a clear answer to the question of what the best choice of the segment size is. Some viewers might prefer a reliably smooth playback, while others put more value on high-definition video with occasional re-buffering.

C. Network Heterogeneity Independence

A frequent assumption in the literature on bandwidth aggregation and multihoming is the use of multiple interfaces of the same kind, such as multiple WLAN adapters (e.g., [11]), multiple 3G modems (e.g., [12], [13]), or otherwise homogeneous simulation parameters (e.g. [3]). In contrast, our implementation handles any type of heterogeneity and requires no a priori knowledge of the used interfaces before a file transfer starts. The reason is that a large number of small, fixed-size segments are naturally distributed over all links in proportion to their throughput.

Simply put, our brute-force scheme of using the smallest possible segment sizes trades off the complications of link monitoring and dynamic adaption at the cost of a negligible amount of byte overhead due to frequent HTTP requests. Requirement R3 can therefore be ticked off.

D. Robustness against Link Variances

While a pipelining scheme based on small, fixed-size segments is agnostic to link heterogeneity and robust to frequent fluctuations in throughput and delay, the probability of link failure increases with the number of interfaces.

However, our current prototype is yet unable to detect link failure and does not support failover. Thus, segments pipelined

over a broken connection would never complete. In the case of extreme throughput variances, multi-segment pipelining has the disadvantage that it is impossible to cancel already pipelined requests without closing the TCP connection. One solution to this problem is to detect broken connections and request segments redundantly. In the worst case, the amount of data pipelined over a broken link is lost. However, due to the smallness of the segments, this should not create any severe re-buffering during the movie experience. The smaller the segment size, the quicker is the download of a segment and the smaller the impact of a link that slows down.

Although certain optimizations are pending, from various successful experiments in our wireless testbed, we consider requirement R4 as satisfied.

VI. Live Media Playback

As a concluding example, we present the results from a real-world experiment within the previously introduced testbed. In this experiment, a 50 MB large file was downloaded over multiple interfaces and, after a short startup delay of 3 seconds, sequentially read through at a constant bitrate.

Rather than analyzing complex video metrics that depend on the type of content and codec used, this experiment is based on a much more demanding metric: pure success vs. any type of failure. Each occurrence of the constant-bitrate file reader seeking ahead of the received data is counted as a failure. A success is only recorded when the entire file was received and played back without any need for data re-buffering.

Figure 7 depicts a direct performance comparison of a single WLAN interface versus the use of an additional HSDPA interface. The simultaneous use of multiple interfaces increases the probability of an interruption-free playback experience at a given media bitrate. Another way to interpret these results is that the unreliable WLAN link, which performs poorly at any bitrates above 600 KB can be made 100% reliable by adding an additional HSDPA link.

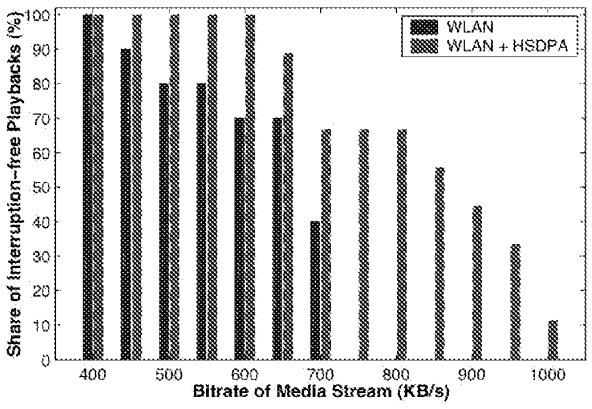


Fig. 7. Live media playback – Pipelining-based progressive download over multiple heterogeneous interfaces allows media streams of higher quality.

VII. Conclusions and Future Work

In this paper, we have experimentally analyzed a novel approach to achieve high-quality and reliable progressive file download over multiple heterogeneous wireless networks. The introduced proof-of-concept implementation operates in the application layer and exploits HTTP's features of range retrieval requests and request pipelining to optimize the aggregated throughput, while at the same time ensuring a smooth and robust multimedia playback.

From field experiments with HSDPA and WLAN networks, we have gained insight into the advantages and challenges of pipelining requests over network paths that vary in their throughput and latency characteristics. Using a fine-grained segmentation and always pipelining enough data to fill the bandwidth-delay product allows a natural adaption to network heterogeneity and increases the probability of an interruption-free playback experience at a given media bitrate.

In the future, we plan to explore options for failover support to fully secure our solution against extreme conditions and broken network connections. One idea would be to adapt to a changing bandwidth-delay product by dynamically adjusting the number of requests in the pipeline, similar to TCP's AIMD scheme. In addition, we plan to catch some fresh air by testing our system in mobile, outdoor scenarios.

References

[1] I. Cisco Systems, "Cisco Visual Networking Index: Forecast and Methodology, 2008–2013," tech. rep., Cisco Systems, Inc., June 9 2009.

[2] M. Zhang, J. Lai, A. Krishnamurthy, L. Peterson, and R. Wang, "A Transport Layer Approach for Improving End-to-end Performance and Robustness using Redundant Paths," in *ATEC '04: Proceedings of the USENIX Annual Technical Conference*, 2004.

[3] J. R. Iyengar, P. D. Amer, and R. Stewart, "Concurrent Multipath Transfer using SCTP Multihoming over Independent End-to-end Paths," *IEEE/ACM Trans. Netw.*, vol. 14, no. 5, pp. 951–964, 2006.

[4] H. Sivakumar, S. Bailey, and R. Grossman, "PSockets: The Case for Application-level Network Striping for Data Intensive Applications using High Speed Wide Area Networks," *Supercomputing, ACM/IEEE 2000 Conference*, pp. 38–38, Nov. 2000.

[5] D. Kaspar, K. Evensen, P. Engelstad, A. F. Hansen, P. Halvorsen, and C. Griwodz, "Enhancing Video-on-Demand Playout over Multiple Heterogeneous Access Networks," in *Consumer Communications and Networking Conference (CCNC)*, 2010.

[6] R. Fielding, J. Gettys, J. Mogul, H. Frystyk, L. Masinter, P. Leach, and T. Berners-Lee, "Hypertext Transfer Protocol – HTTP/1.1." IETF, 1999.

[7] C. Griwodz, *Wide-area True Video-on-Demand by a Decentralized Cache-based Distribution Infrastructure*. PhD thesis, Darmstadt University of Technology, 2000.

[8] D. Johansen, H. Johansen, T. Aarflot, J. Hurley, Å. Kvalnes, C. Gurrin, S. Sav, B. Olstad, E. Aaberg, T. Endestad, H. Riiser, C. Griwodz, and P. Halvorsen, "DAVVI: A Prototype for the Next Generation Multimedia Entertainment Platform (demo)," in *ACM Multimedia*, 2009.

[9] M. Networks, "Internet Television: Challenges and Opportunities," tech. rep., Move Networks, Inc., November 2008.

[10] Wikipedia, "Comparison of Download Managers," June 2009.

[11] S. Shakkottai, E. Altman, and A. Kumar, "The Case for Non-Cooperative Multihoming of Users to Access Points in IEEE 802.11 WLANs," in *INFOCOM*, 2006.

[12] A. Qureshi, J. Carlisle, and J. Guttag, "Tavarua: Video Streaming with WWAN Striping," in *ACM international conference on Multimedia*, (New York, NY, USA), pp. 327–336, ACM, 2006.

[13] K. Chebrolu and R. R. Rao, "Bandwidth Aggregation for Real-Time Applications in Heterogeneous Wireless Networks," *IEEE Transactions on Mobile Computing*, vol. 5, no. 4, pp. 388–403, 2006.



Media Lab
KyungHee University

MPEG-2 ES/PES/TS/PSI

Kyung-Hee UNIV.

Kyuheon Kim

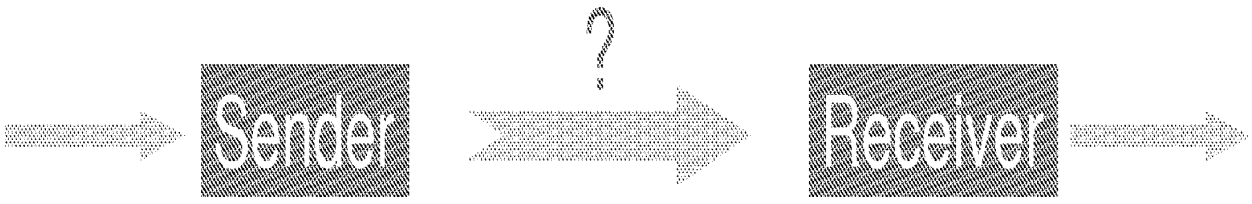
kyuheonkim@khu.ac.kr

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0669
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

contents

1. Introduction
2. PS(Program Stream) & TS(Transport Stream)
3. TS & PES(Packetized Elementary Stream) Packet
4. TS multiplexing process
5. TS packet structure & semantics
6. PES packet structure & semantics
7. PSI(Program specific information)
8. PAT(Program Association Table) structure & semantics
9. PMT(Program Map Table) structure & semantics
10. T-STD(TS-System Target Decoder) & buffer management
11. Clock reference
12. MPEG-2 & MPEG-4 Systems
13. TS bitstream analysis

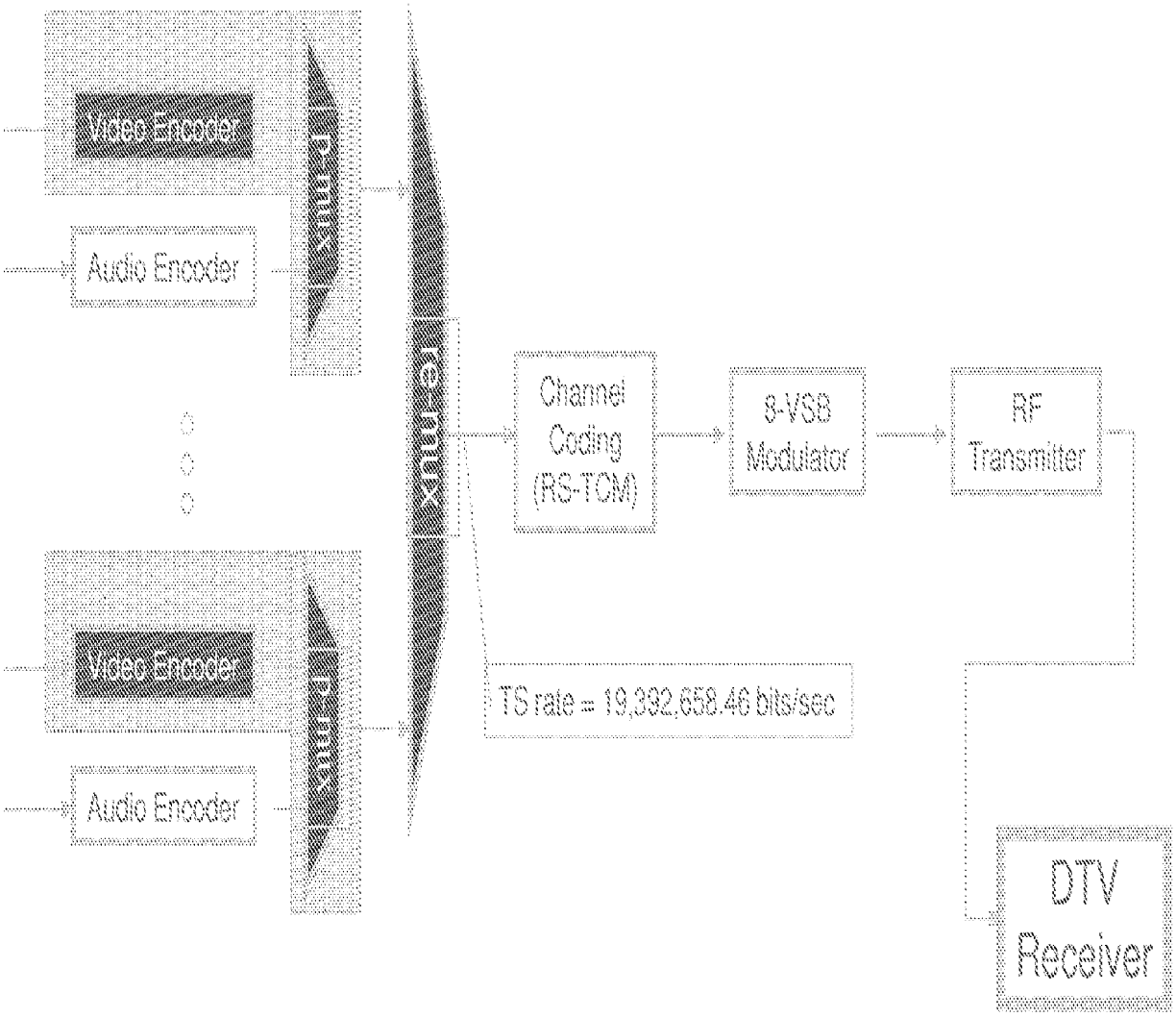
TS as a New DTV Format



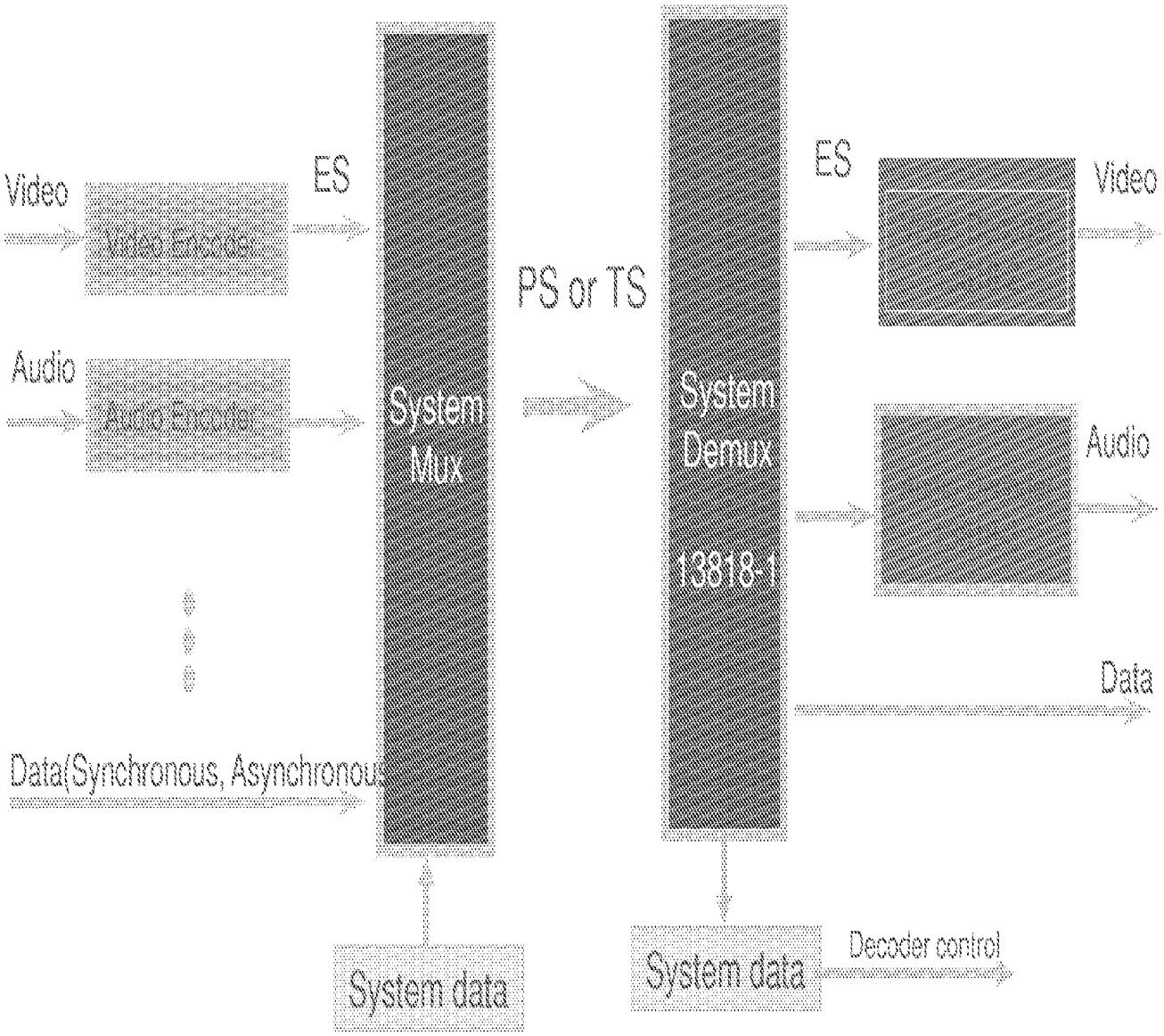
- Analog: NTSC/PAL/SECAM is used in all delivery chain.
- Digital:
  - Production: Multiple standards (component digital, composite digital, 24/30Hz film material)
  - Delivery: MPEG-2 Systems TS (Transport Stream) is considered as *a single world-wide standard* for digital broadcasting.
  - Reception: Multiple standards(PC, TV) (wide spread of non-interlaced display)

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0671
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

DTV: An Example

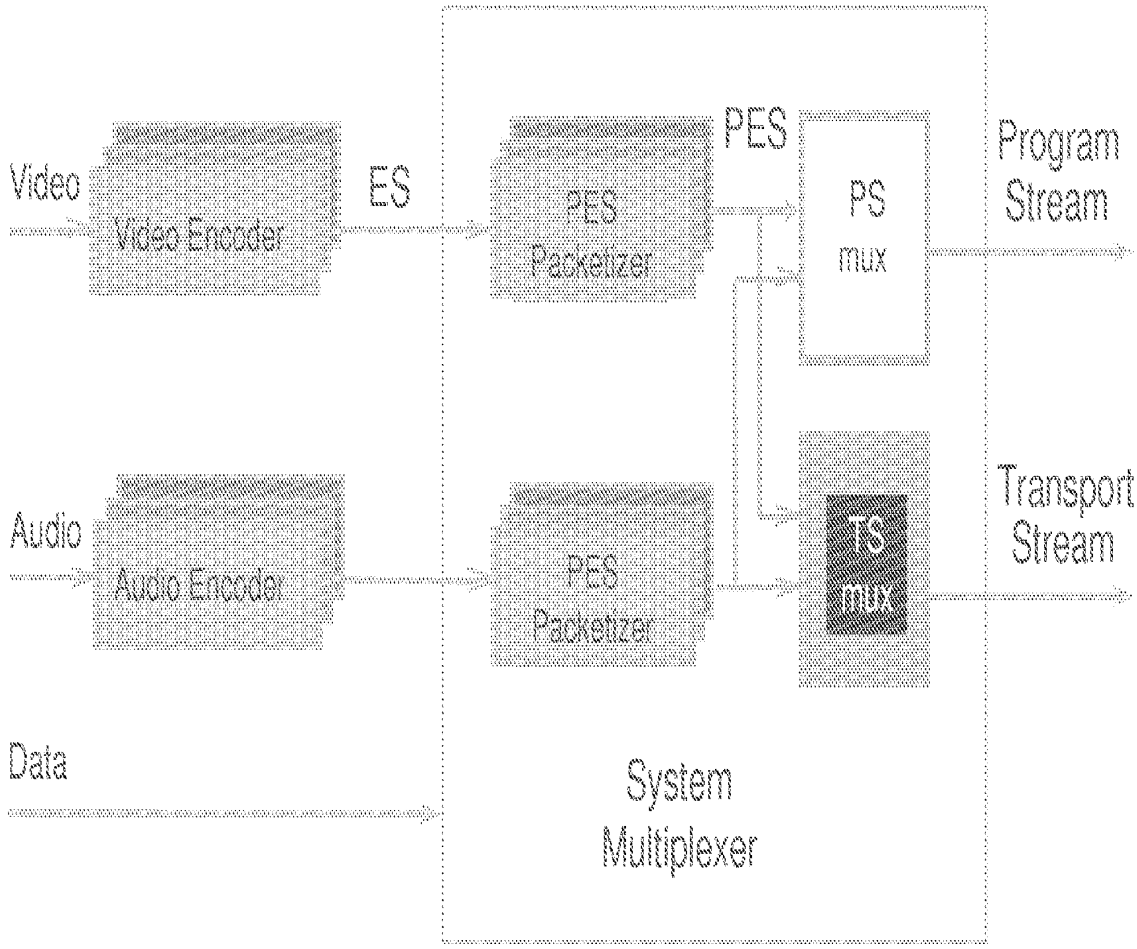


MPEG-2 Systems Spec.



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0673
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

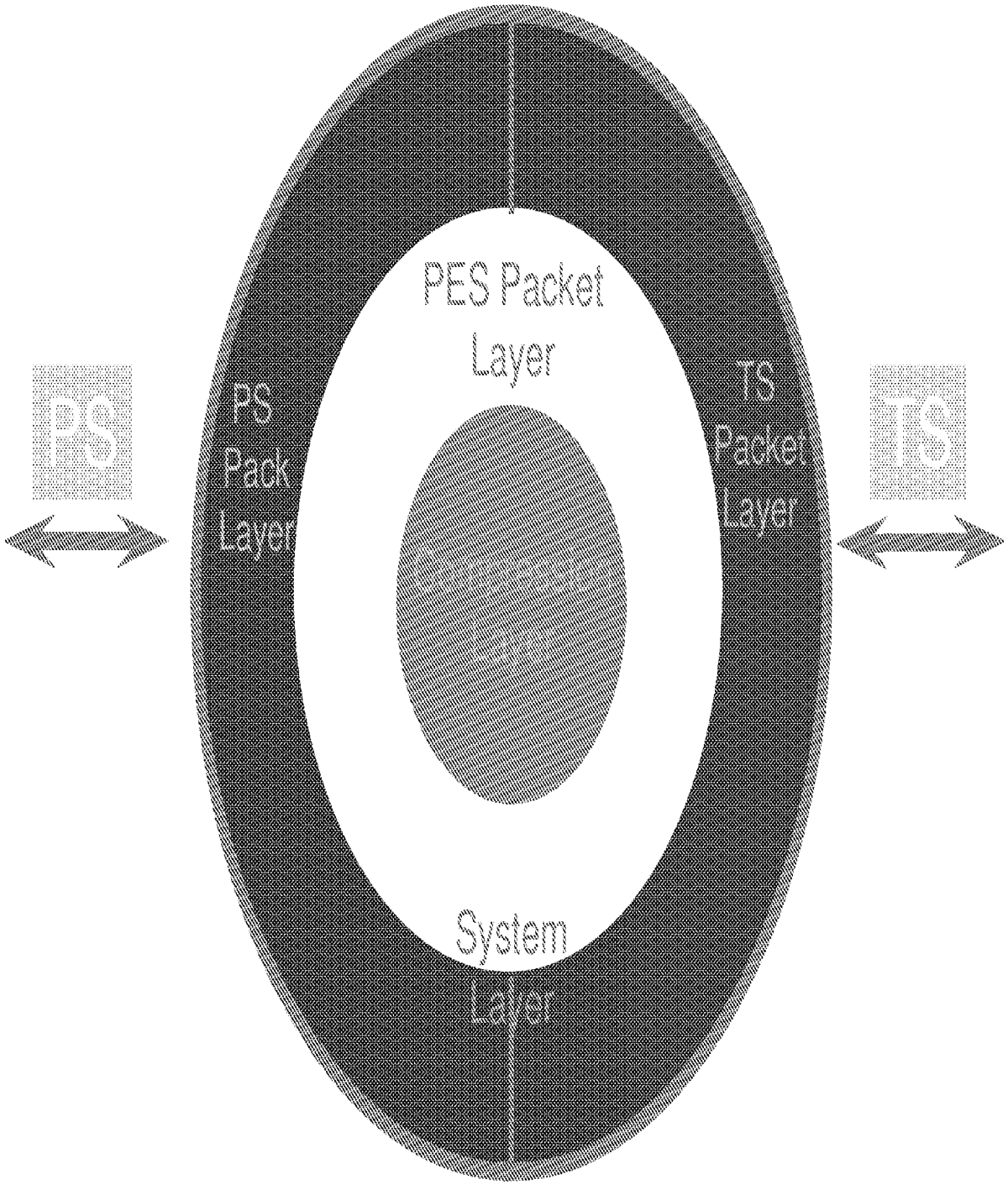
MPEG-2 TS & PS



ES : Elementary Stream
PES : Packetized Elementary Stream
PS : Program Stream
TS : Transport Stream

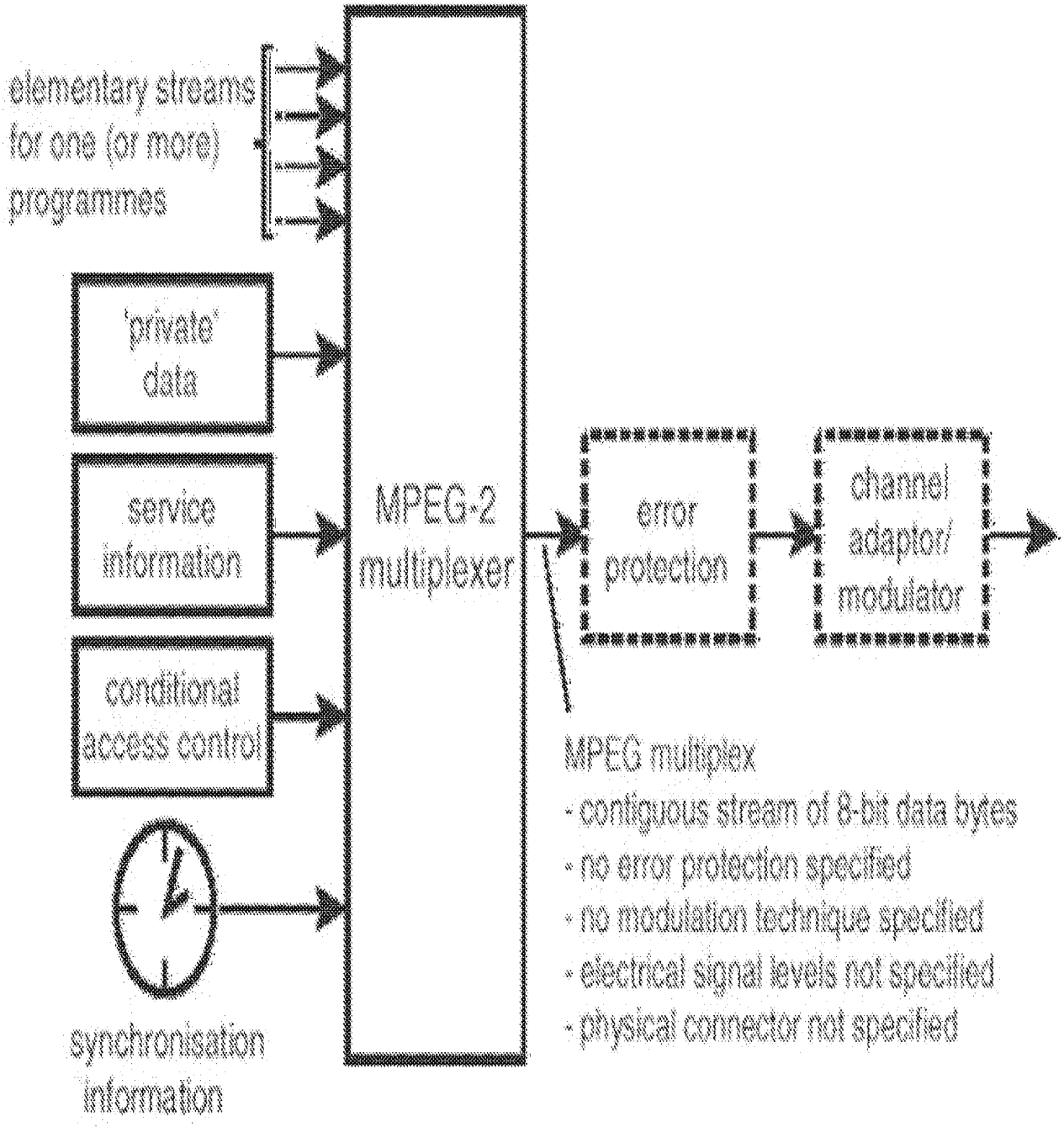
Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0674
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

MPEG-2 Systems Layers



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0675
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

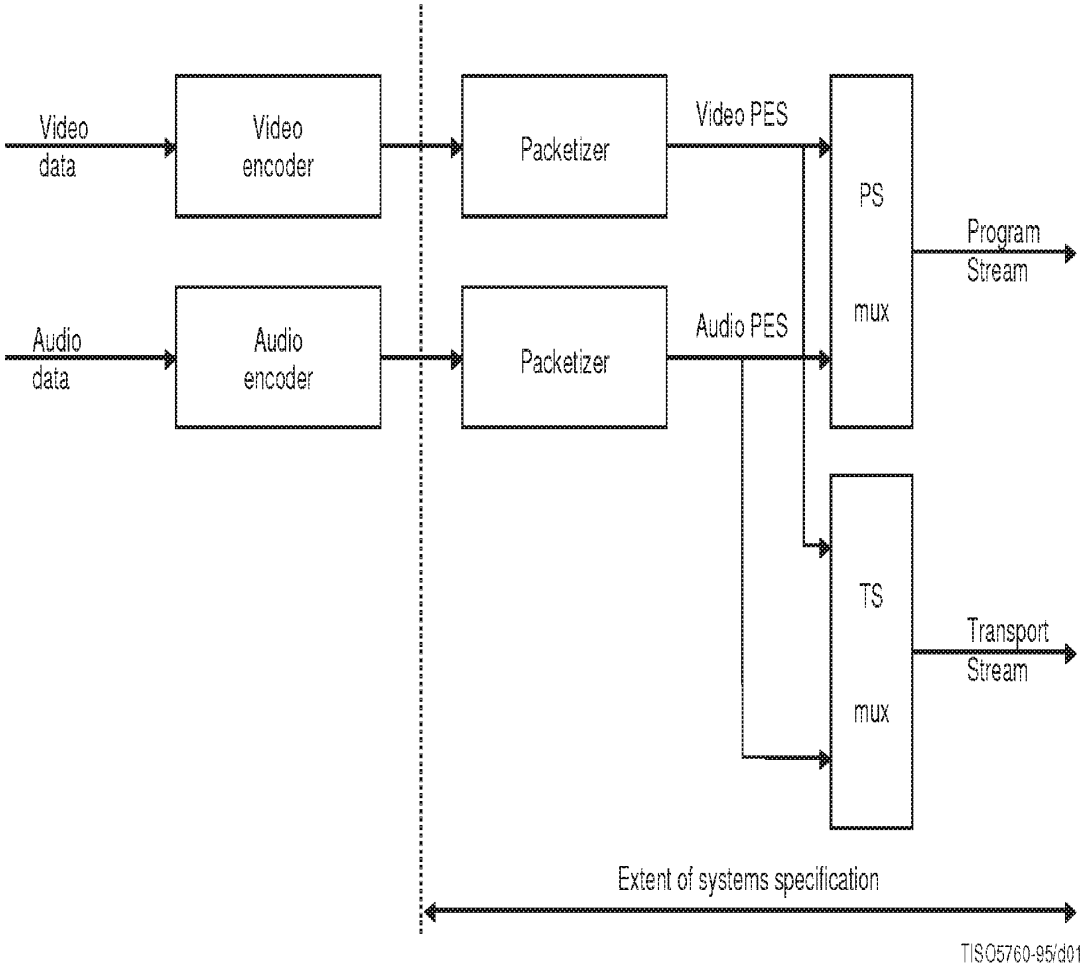
Details on the encoder side



Introduction

- Audio and Video
  - have different CODEC, data size, target application...
  - should be represented simultaneously.
- Synchronization, Multiplexing
  - The system layer support the delivery audio, video, (and other) information to the codec layer.
- Program
  - a set of audio and video data

- PS(Program Stream)
  - composed one program
  - error-free environments(e.g. storage)
- TS(Transport Stream)
  - composed one or more programs
  - environments highly prone to error and the loss of packets

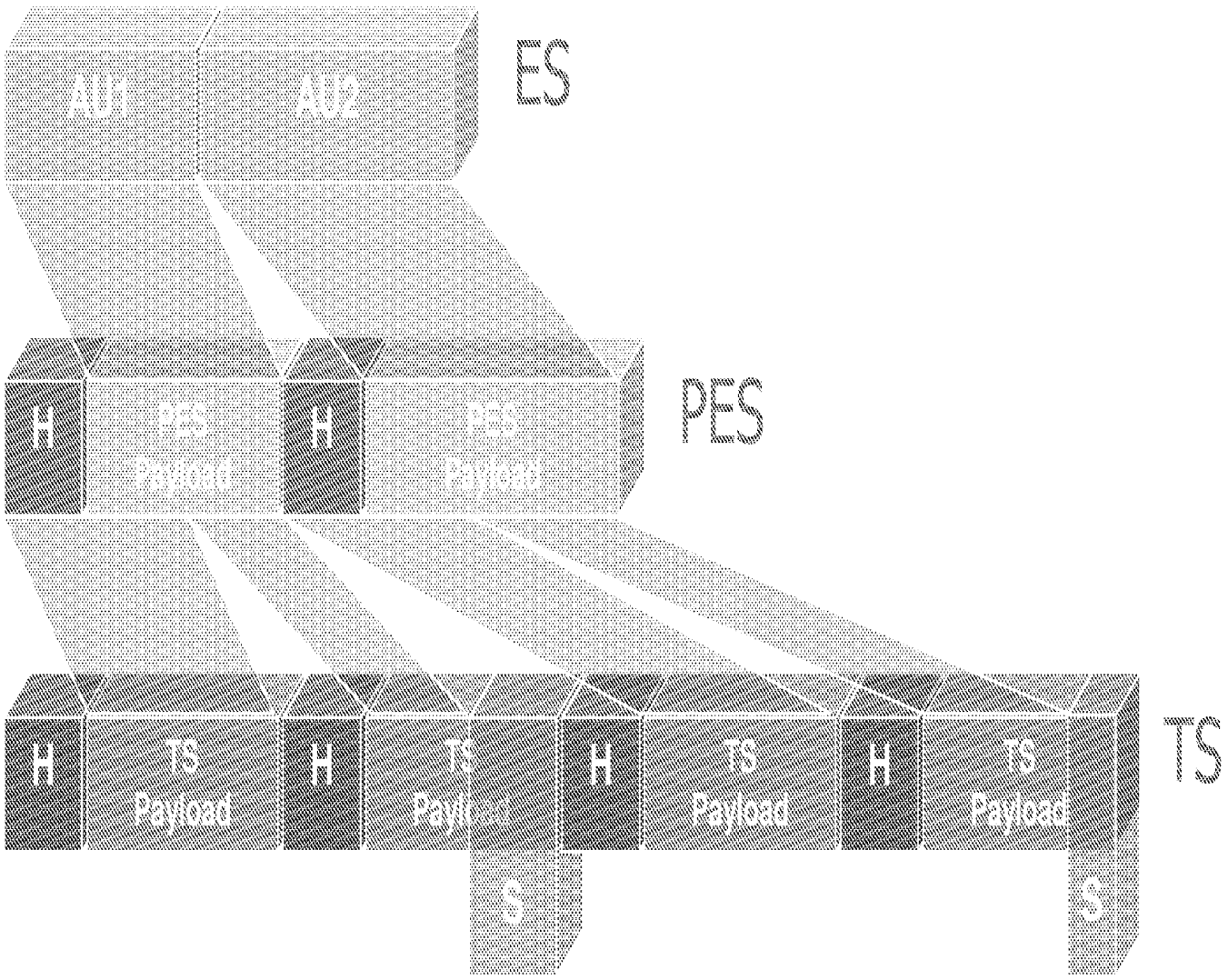


TS & PES Packet

- TS Packet
  - the unit composing TS
  - has 188 bytes fixed length
  - has transport and multiplexing information

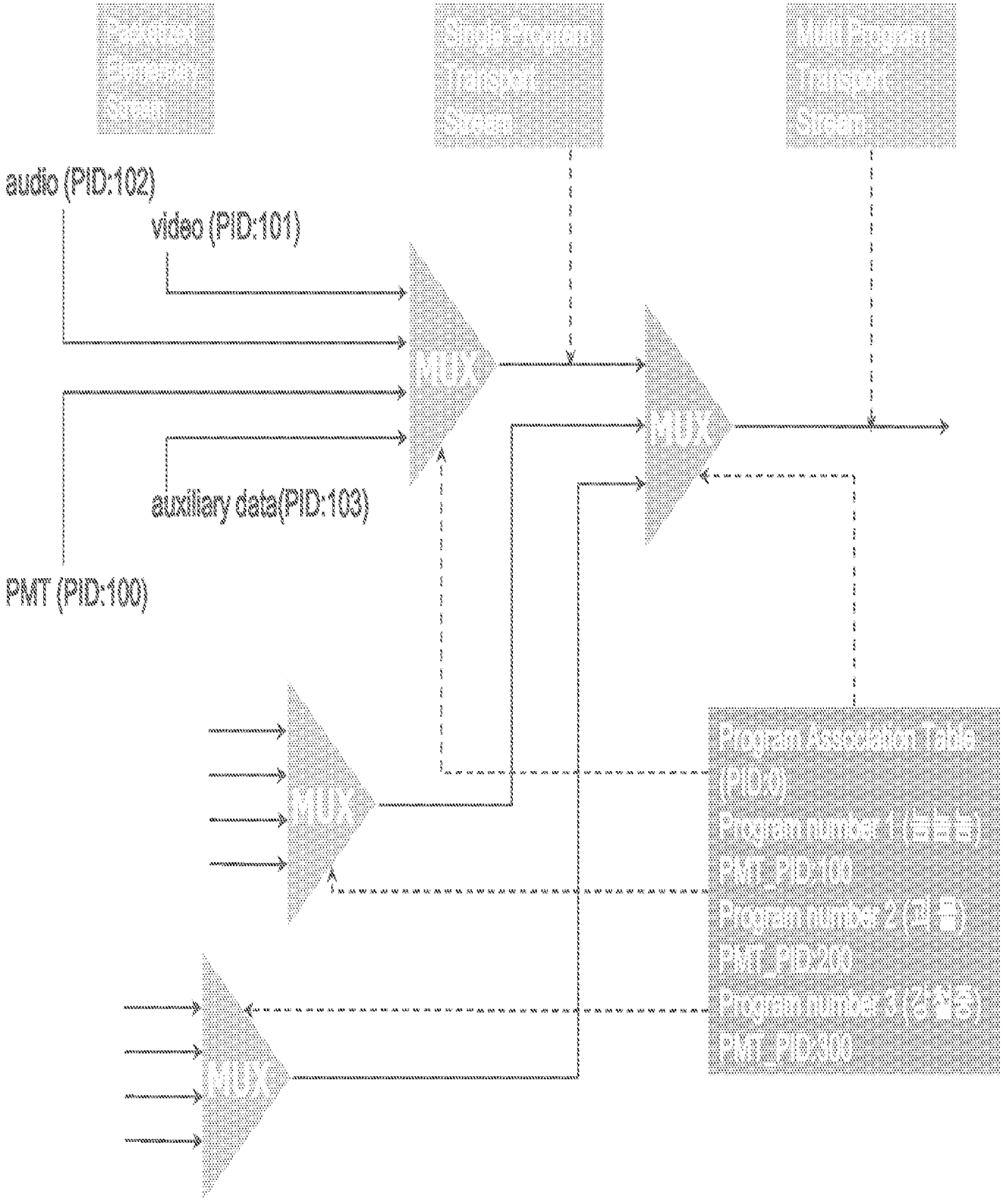
- PES(Packetized Elementary Stream) Packet
  - the unit composing PES
  - has variable length
  - has synchronization information

ES -> PES -> TS

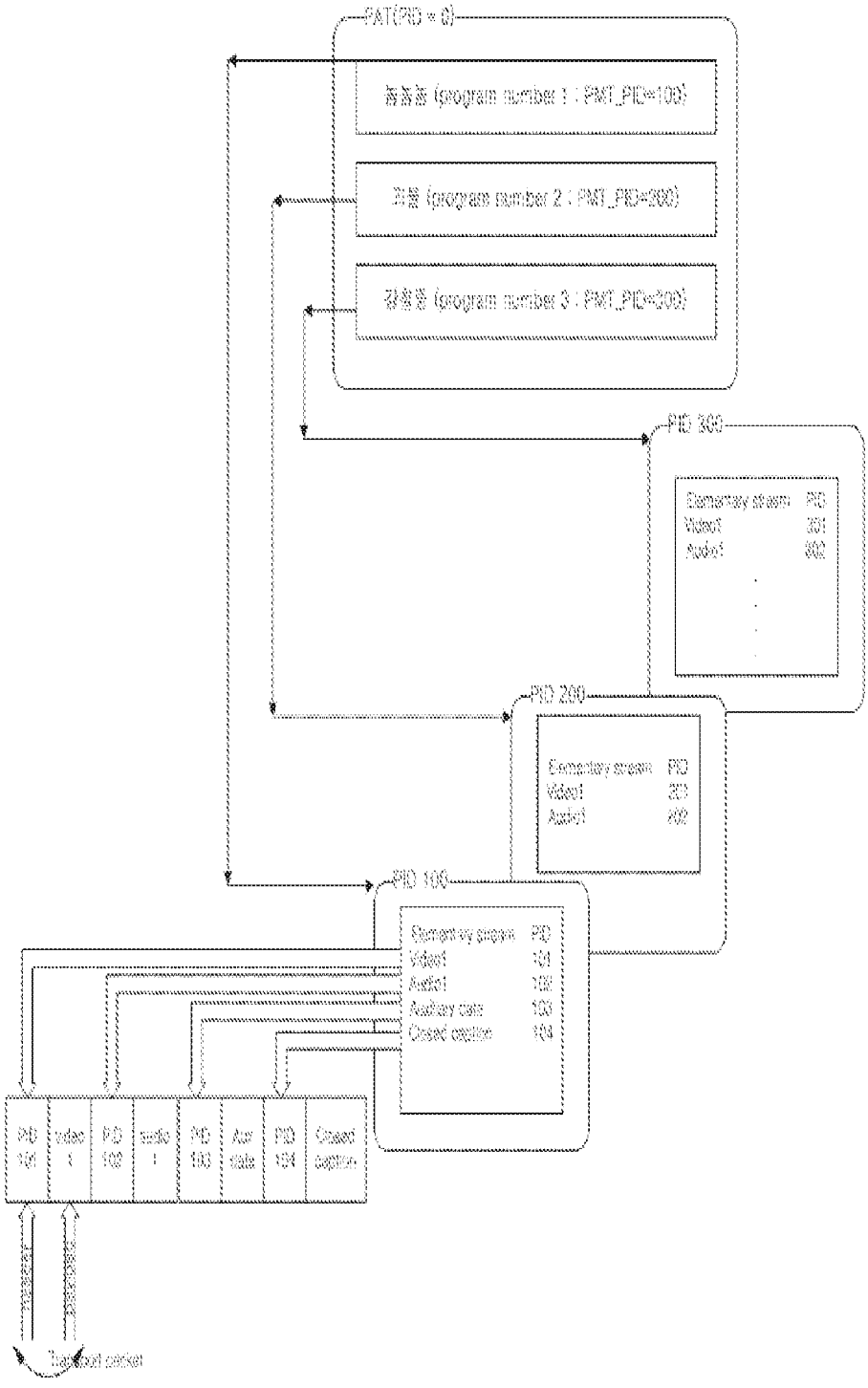

AU1
AU2
ES
H
PES Payload
H
PES Payload
PES
H
TS Payload
H
TS Payl
H
TS Payload
H
TS Payload
TS
S
S

Media Lab
Kyunghee University

TS multiplexing process



TS multiplexing process



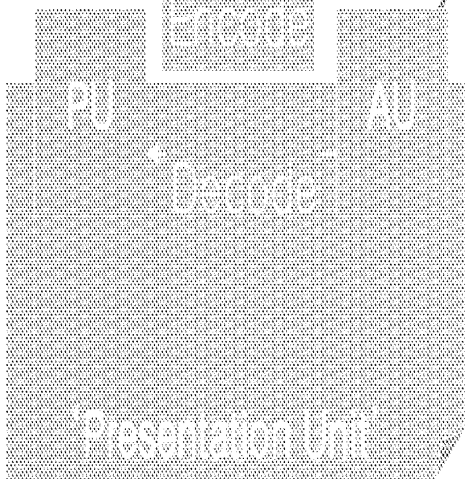
- 각 program의 PMT정보 및 program 1에 대한 transport stream 내용



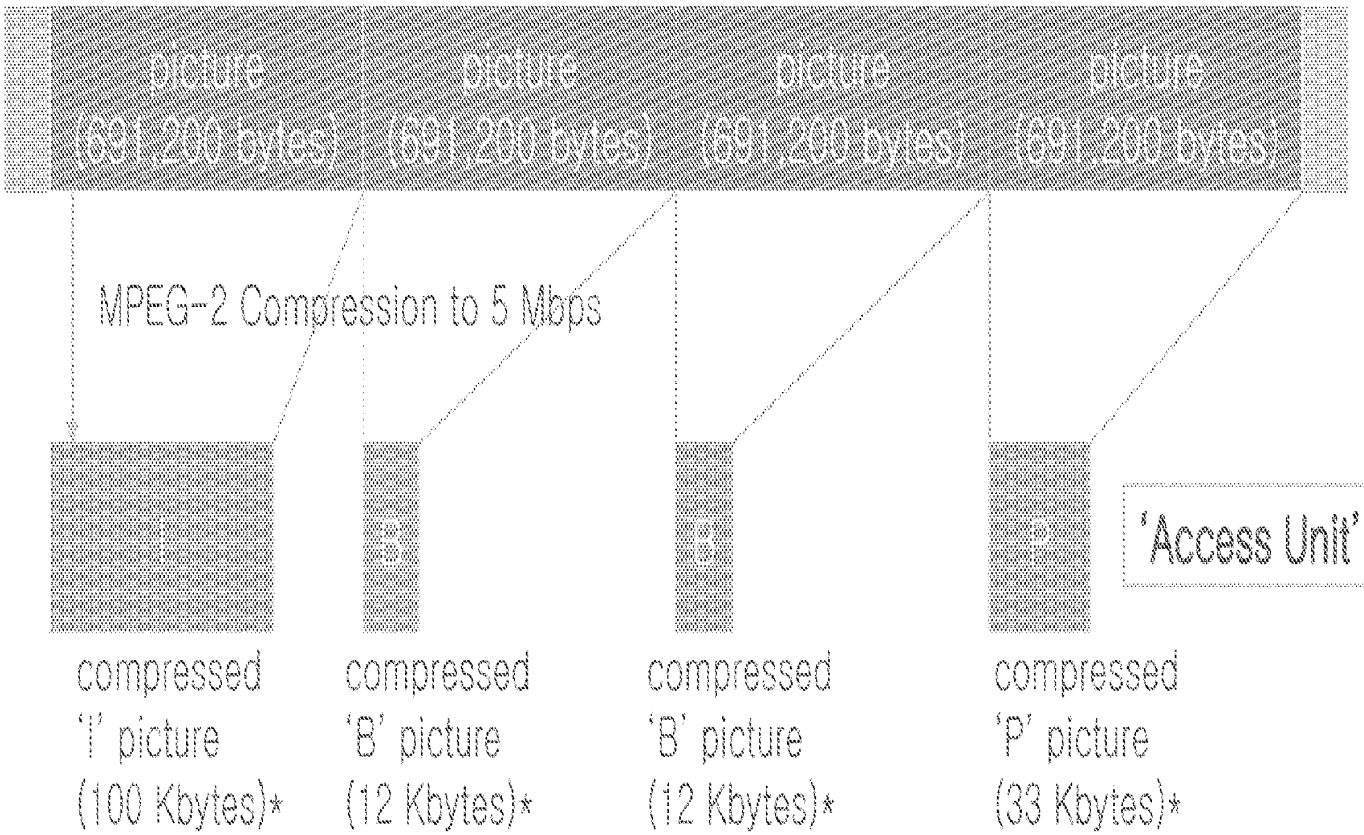
Media Lab
Kyunghee University

Elementary Stream

Elementary Stream (ES) (1)
(Access Unit vs. Presentation Unit)



uncompressed digital video stream
(eg. CCIR Rec. 601, 4:2:2)



compressed 'I' picture (100 Kbytes)*

compressed 'B' picture (12 Kbytes)*

compressed 'B' picture (12 Kbytes)*

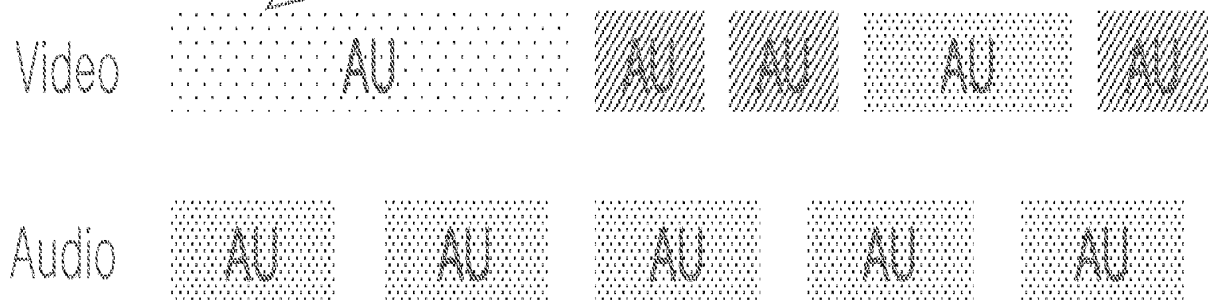
compressed 'P' picture (33 Kbytes)*

*The actual size depends on target bit-rate and complexity of picture

Elementary Stream (ES) (1)
(AUs can have timing informations)

PTS or both PTS and DTS

An access unit (AU) is the smallest data entity to which **timing information** can be attributed or A coded representation of a presentation unit. Eg., audio frame, video frame



Data from each elementary stream are multiplexed together with information that allows synchronized presentation of the elementary streams within the program



Media Lab
Kyunghee University

Packetised Elementary Stream

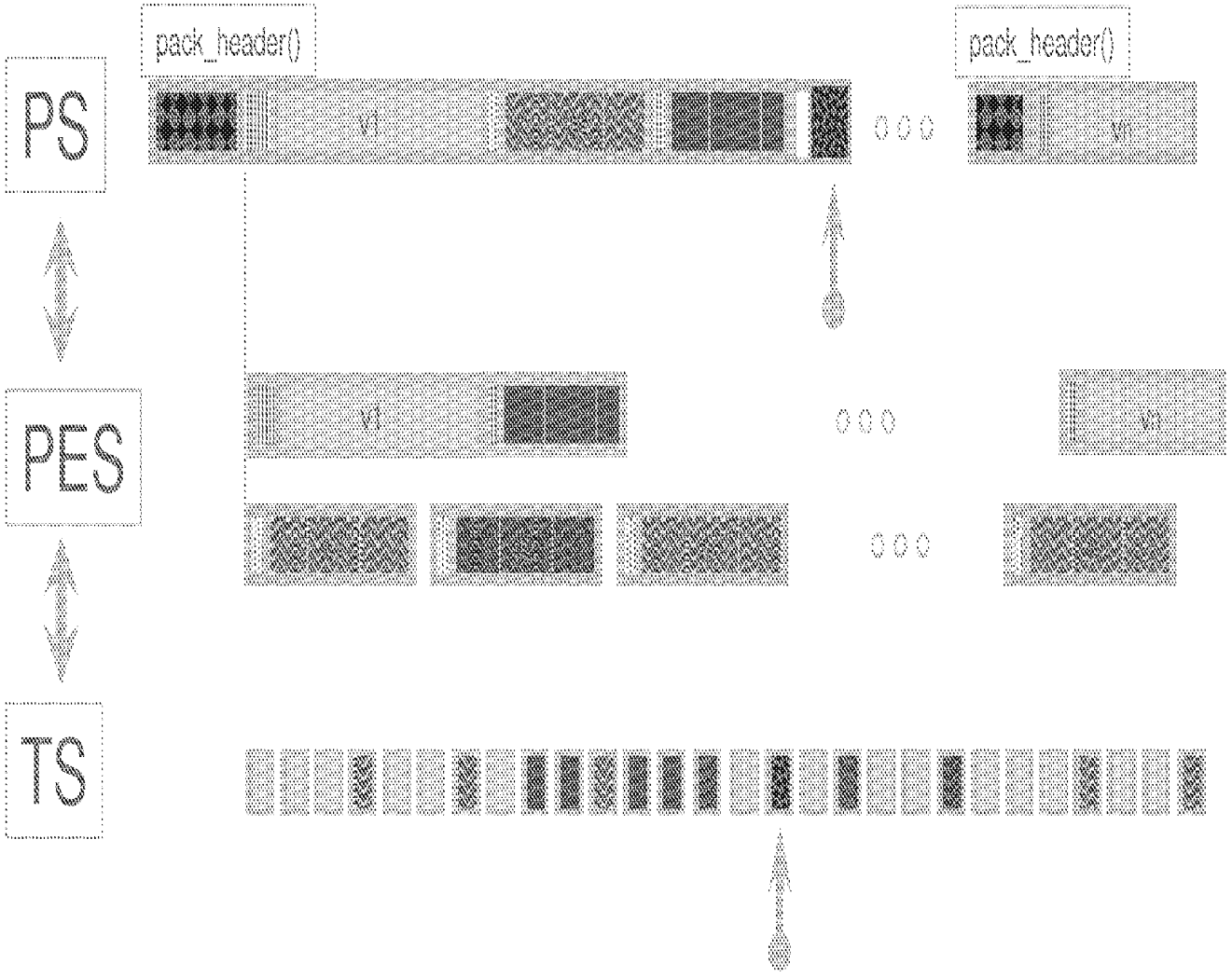
Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0686
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

The PES Packets

- The PES packets are used for constructing both of PS and TS.
- The PES packets include a AU(Access Unit) in the most of applications typically, but not mandatory.
- The PES packet delivers PTS or DTS.
- In the video PES packets, trick mode control information can be delivered here.
- The PES packets are identified by *stream_id*.

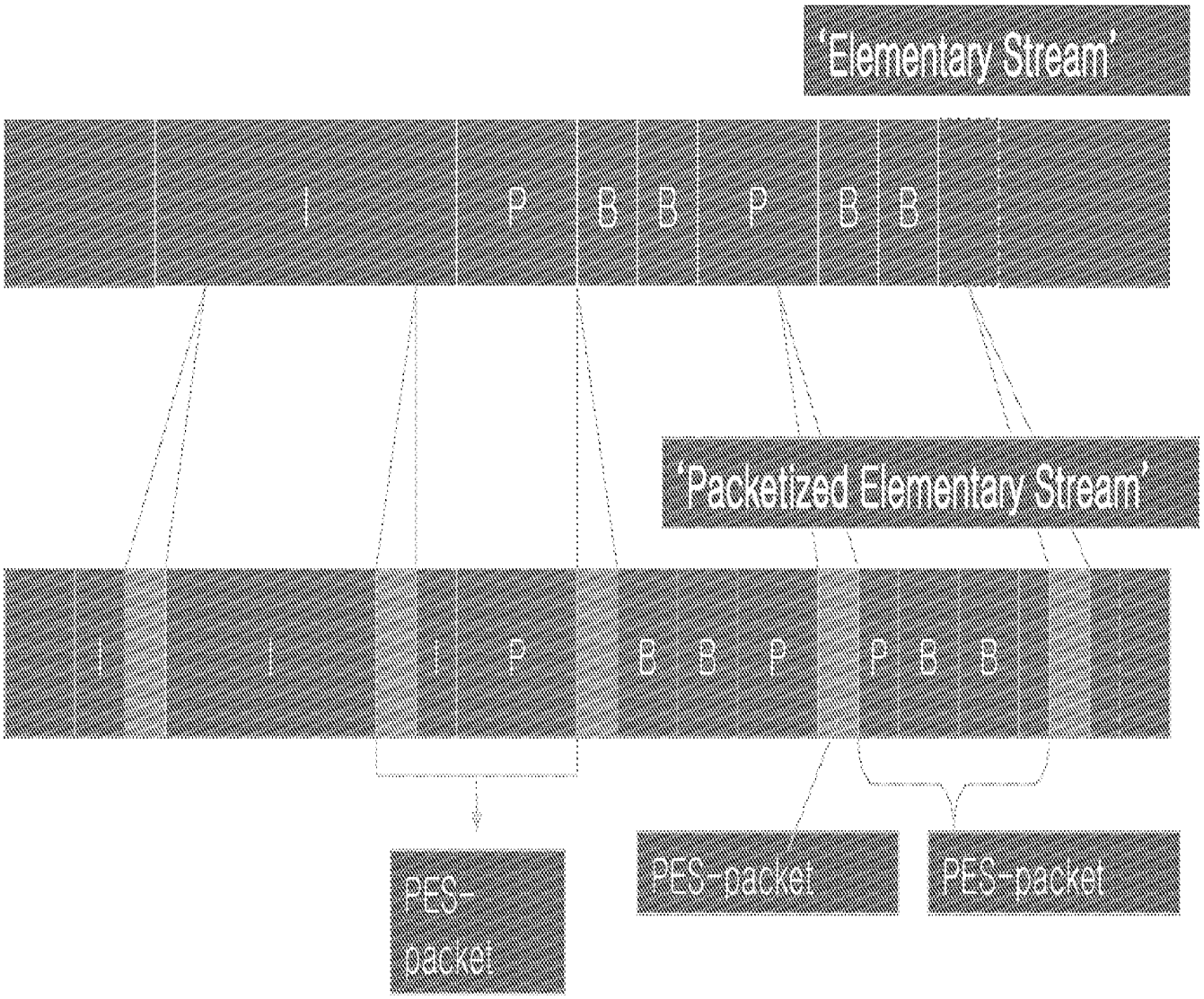
Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0687
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

PES Packets as a Common tools for PS and TS



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0688
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Packetized Elementary Stream (1)
(Creating a PES from an ES)



* The PES packet header is right where timing information(an PTS or both PTS and DTS) and optionally, either ESCR or ES_Rate can locate themselves.

Packetized Elementary Stream (4) (PES packet header syntax)

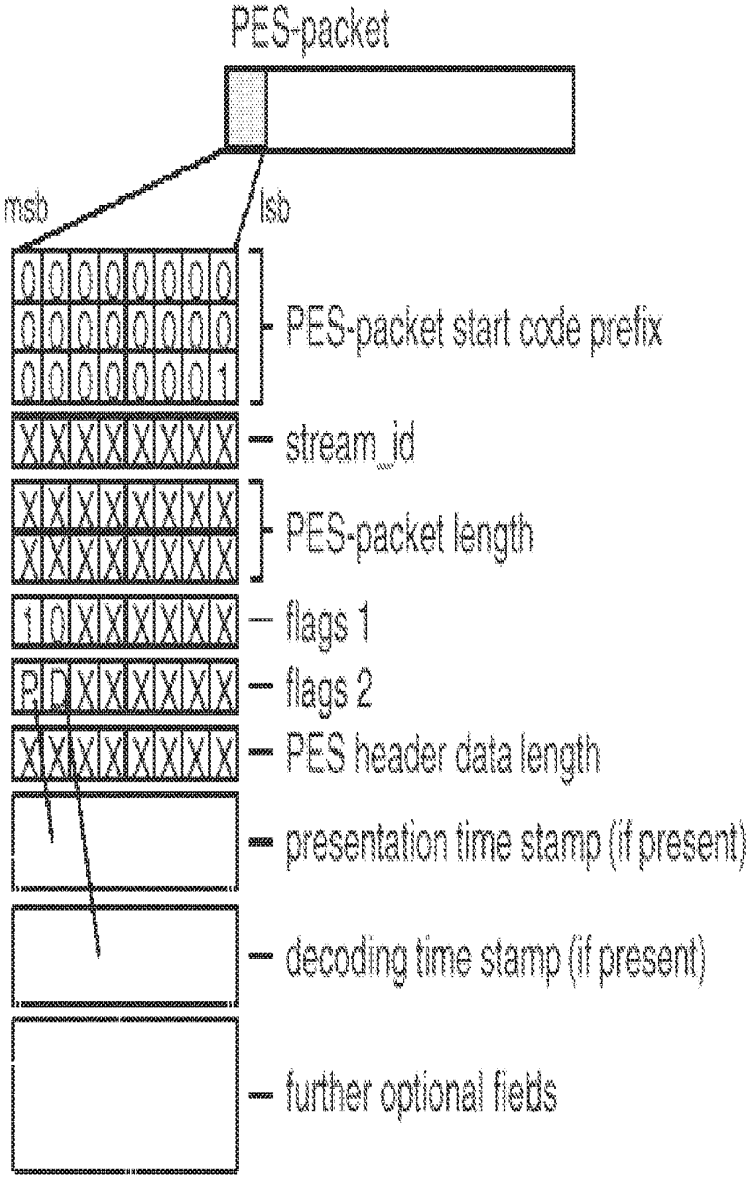
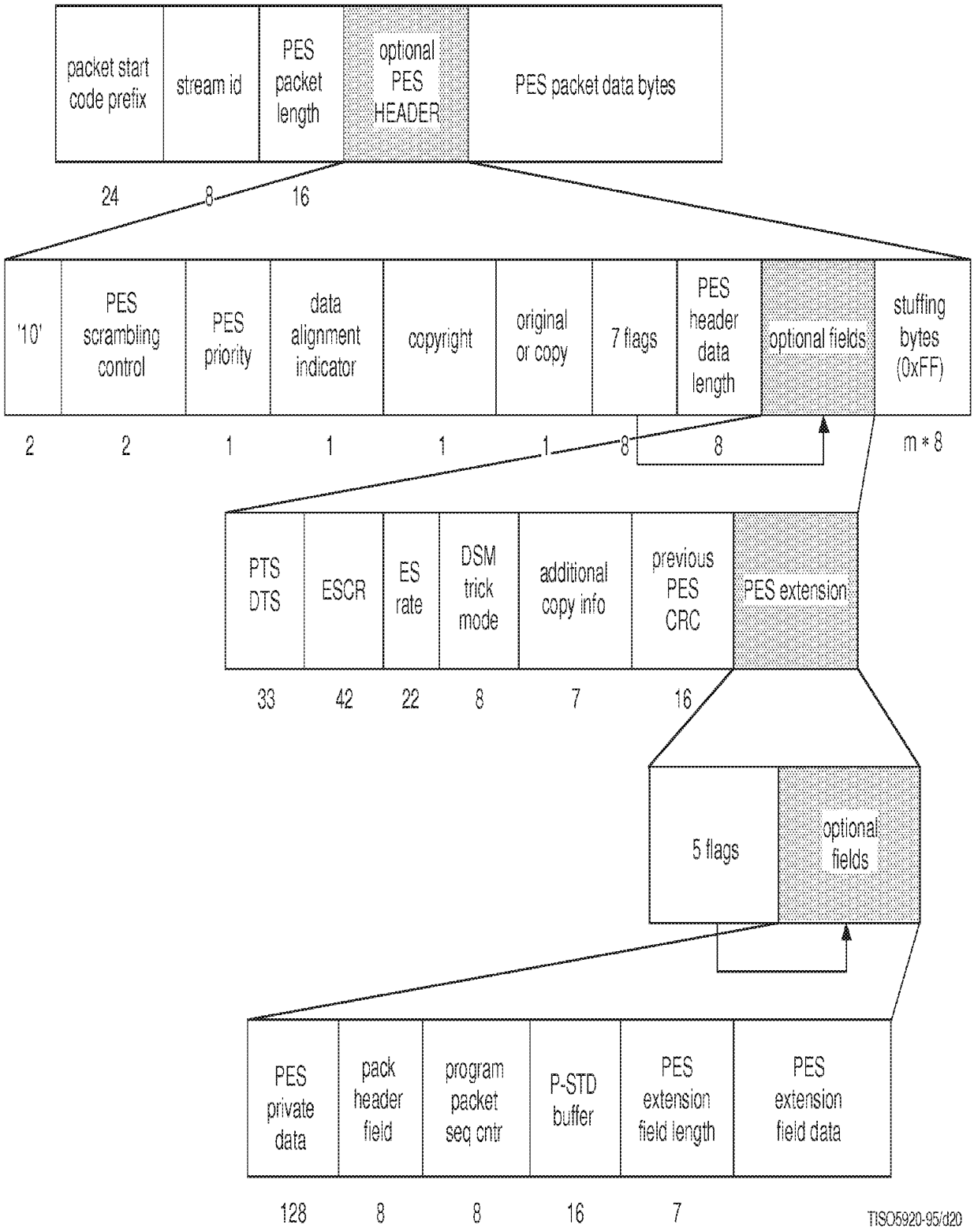


Fig. 4 - A PES-packet header.

PES packet structure



PES packet semantics

- **Packet_start_code_prefix** – (0x000001)
- **Stream_id** – describe the elementary stream type

stream_id	Note	stream coding
1011 1100	1	program_stream_map
1011 1101	2	private_stream_1
1011 1110		padding_stream
1011 1111	3	private_stream_2
110x xxxx		ISO/IEC 13818-3 or ISO/IEC 11172-3 or ISO/IEC 13818-7 or ISO/IEC 14496-3 audio stream number x xxxx
1110 xxxx		ITU-T Rec. H.262 | ISO/IEC 13818-2 or ISO/IEC 11172-2 or ISO/IEC 14496-2 or ITU-T Rec.H.264 | ISO/IEC 14496-10 video stream number xxxx
1111 0000	3	ECM_stream
1111 0001	3	EMM_stream
1111 0010	5	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 Annex A or ISO/IEC 13818-6_DSMCC_stream
1111 0011	2	ISO/IEC_13522_stream
1111 0100	6	ITU-T Rec. H.222.1 type A
1111 0101	6	ITU-T Rec. H.222.1 type B
1111 0110	6	ITU-T Rec. H.222.1 type C
1111 0111	6	ITU-T Rec. H.222.1 type D
1111 1000	6	ITU-T Rec. H.222.1 type E
1111 1001	7	ancillary_stream
1111 1010		ISO/IEC14496-1_SL-packetized_stream
1111 1011		ISO/IEC14496-1_FlexMux_stream
1111 1100		metadata stream
1111 1101	8	extended_stream_id
1111 1110		reserved data stream
1111 1111	4	program_stream_directory

- **Packet start code = packet_start_code_prefix + stream_id**

PES packet semantics

- **PES_scrambling_control** – indicate the scrambling mode of the PES packet payload.

Value	Description
00	Not scrambled
01	User-defined
10	User-defined
11	User-defined

- **Data_alignment_indicator** – When set to a value of '1', it indicates that the PES packet header is immediately followed by the video syntax element or audio sync word indicated in the data_stream_alignment_descriptor

- **Copyright** - When set to '1' it indicates that the material of the associated PES packet payload is protected by copyright.

- **Original_or_copy** - When set to '1' the contents of the associated PES packet payload is an original.

PES packet semantics

- **PTS(presentation time stamp)** - indicates the time of presentation, tpn(k), in the system target decoder of a presentation unit k of elementary stream n.
  - $PTS(k) = ((system\_clock\_frequency \times tpn(k)) DIV 300) \% 233$
  - where tpn(k) is the presentation time of presentation unit Pn(k).

- **DTS(decoding time stamp)** - It indicates the decoding time, tdn(j), in the system target decoder of an access unit j of elementary stream n.
  - $DTS(j) = ((system\_clock\_frequency \times tdn(j)) DIV 300) \% 233$
  - where tdn(j) is the decoding time of access unit An(j).

- **ES_rate** – specify the rate at which the system target decoder(STD) receives bytes of the PES packet in the case of a PES stream.

PES packet semantics

- **Trick_mode_control** – indicate which trick mode is applied to the associated video stream.

Value	Description
'000'	Fast forward
'001'	Slow motion
'010'	Freeze frame
'011'	Fast reverse
'100'	Slow reverse
'101'-'111'	Reserved

- **Additional_copy_info** – contain private data relating to copyright information.

Packetized Elementary Stream (2) (FAQ)

? : How to define the size of PES packet for a ES?

- The maximum size of PES packet is to be 64 Kbytes, which is defined by PES_packet_length.

- The size of PES packet can be chopped as long as satisfying the above definition

? : Does every PES packet have PTS?

- PES packet with the AU containing start_code shall have PTS. Thus, the rest of PES packets without the AU containing start_code do not have PTS. However, PTS shall be put in PES packets at least every 0.7 second for long-term synchronization.



Media Lab
Kyunghee University

Transport Stream

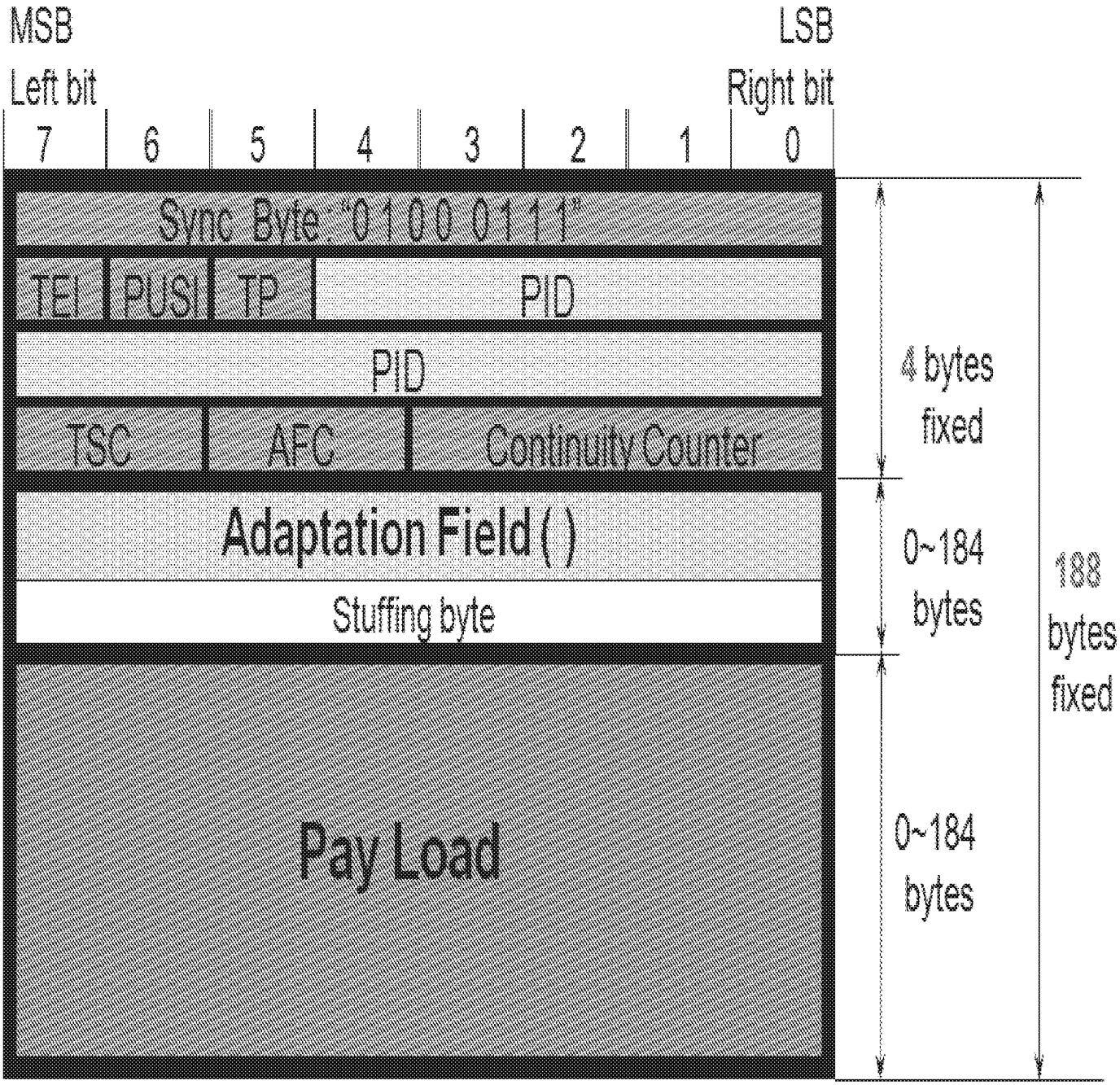
Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0697
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Transport Stream Syntax

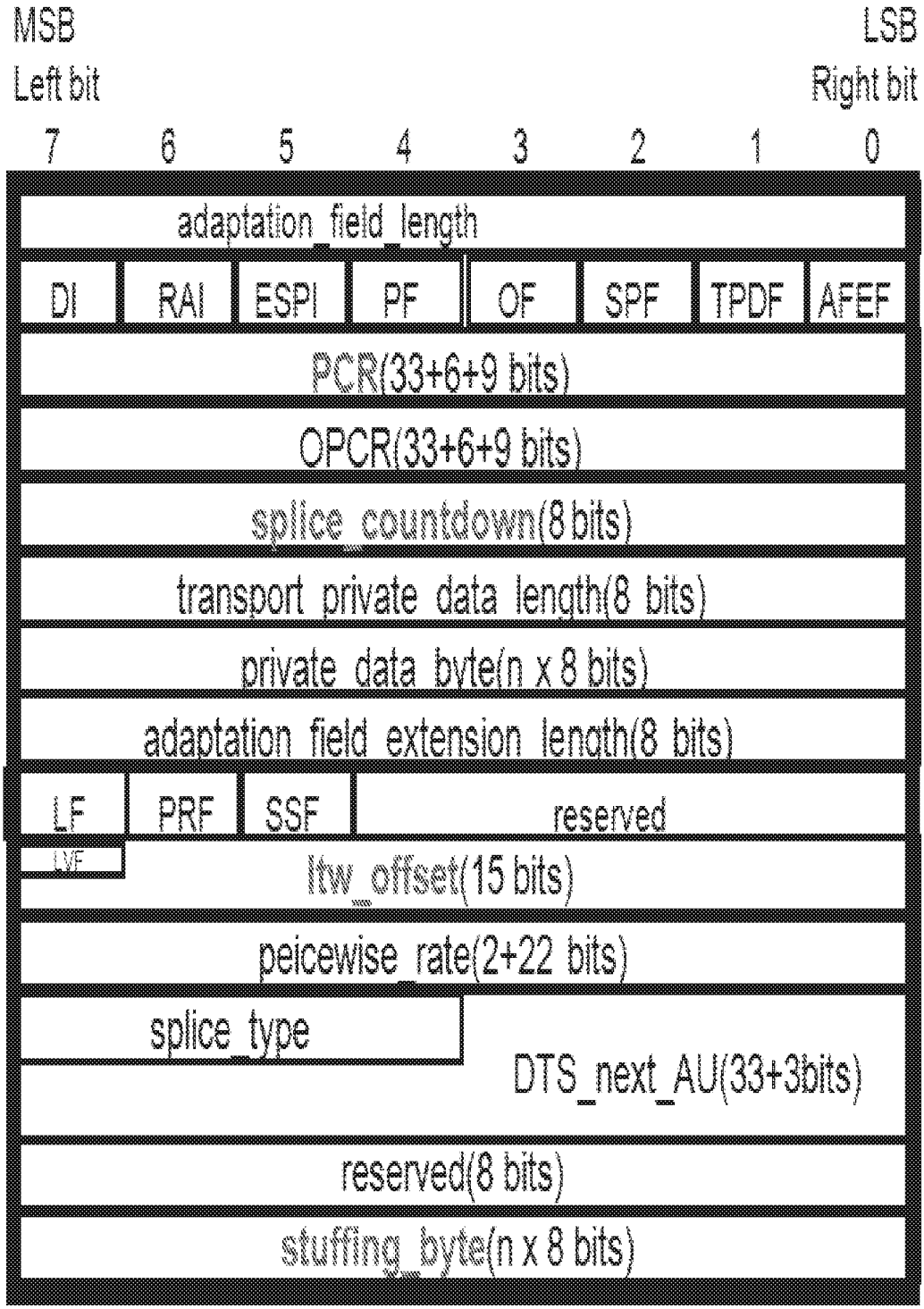
Syntax	No. of bits	Mnemonic
transport_packet(){		
sync_byte	8	bslbf
transport_error_indicator	1	bslbf
payload_unit_start_indicator	1	bslbf
transport_priority	1	bslbf
PID	13	uimsbf
transport_scrambling_control	2	bslbf
adaptation_field_control	2	bslbf
continuity_counter	4	uimsbf
if(adaptation_field_control=='10' || adaptation_field_control=='11'){		
adaptation_field()		
}		
if(adaptation_field_control=='01' || adaptation_field_control=='11') {		
for (i=0;i<N;i++){		
data_byte	8	bslbf
}		
}		
}		

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0698
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Transport Stream

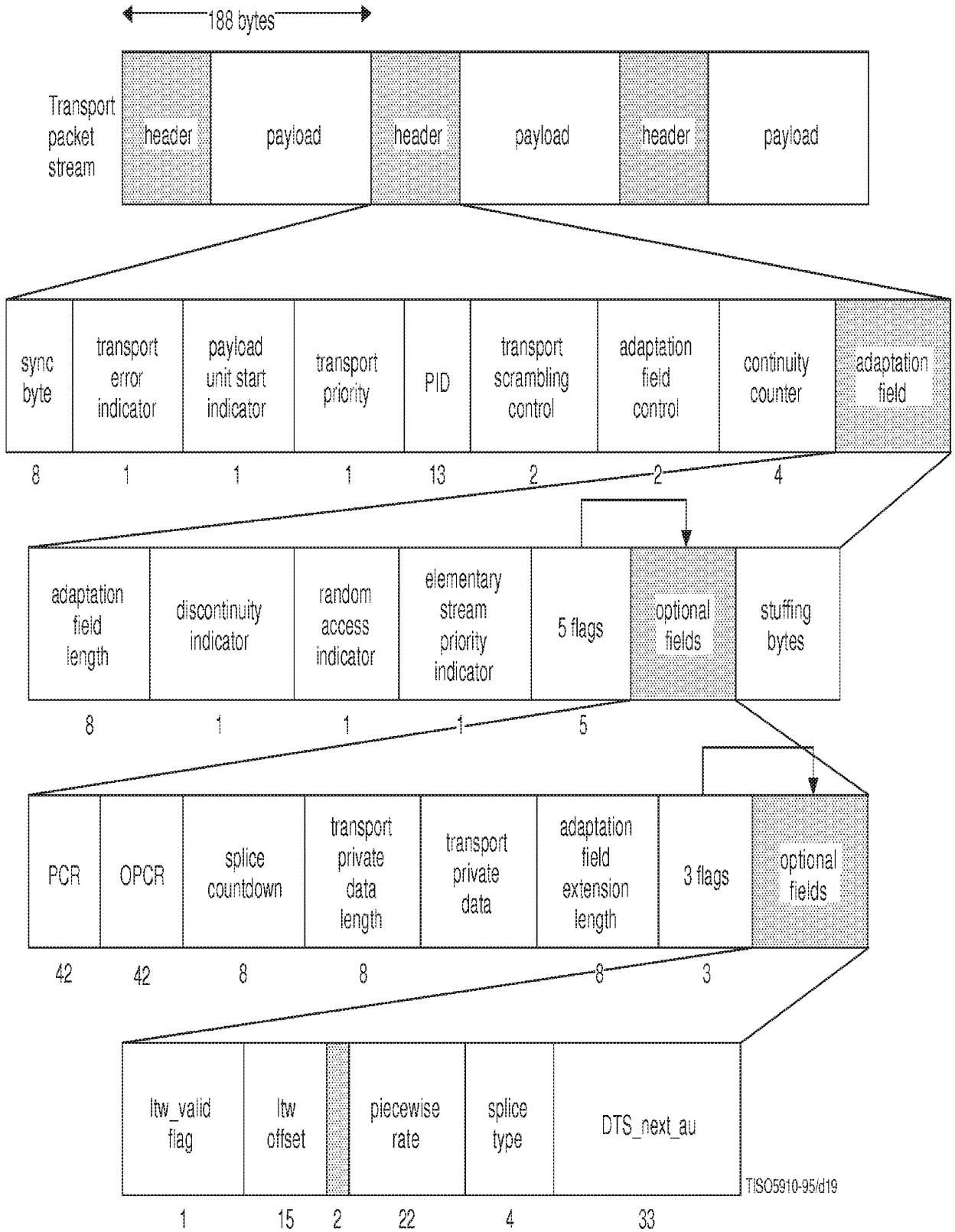


Adaptation Field

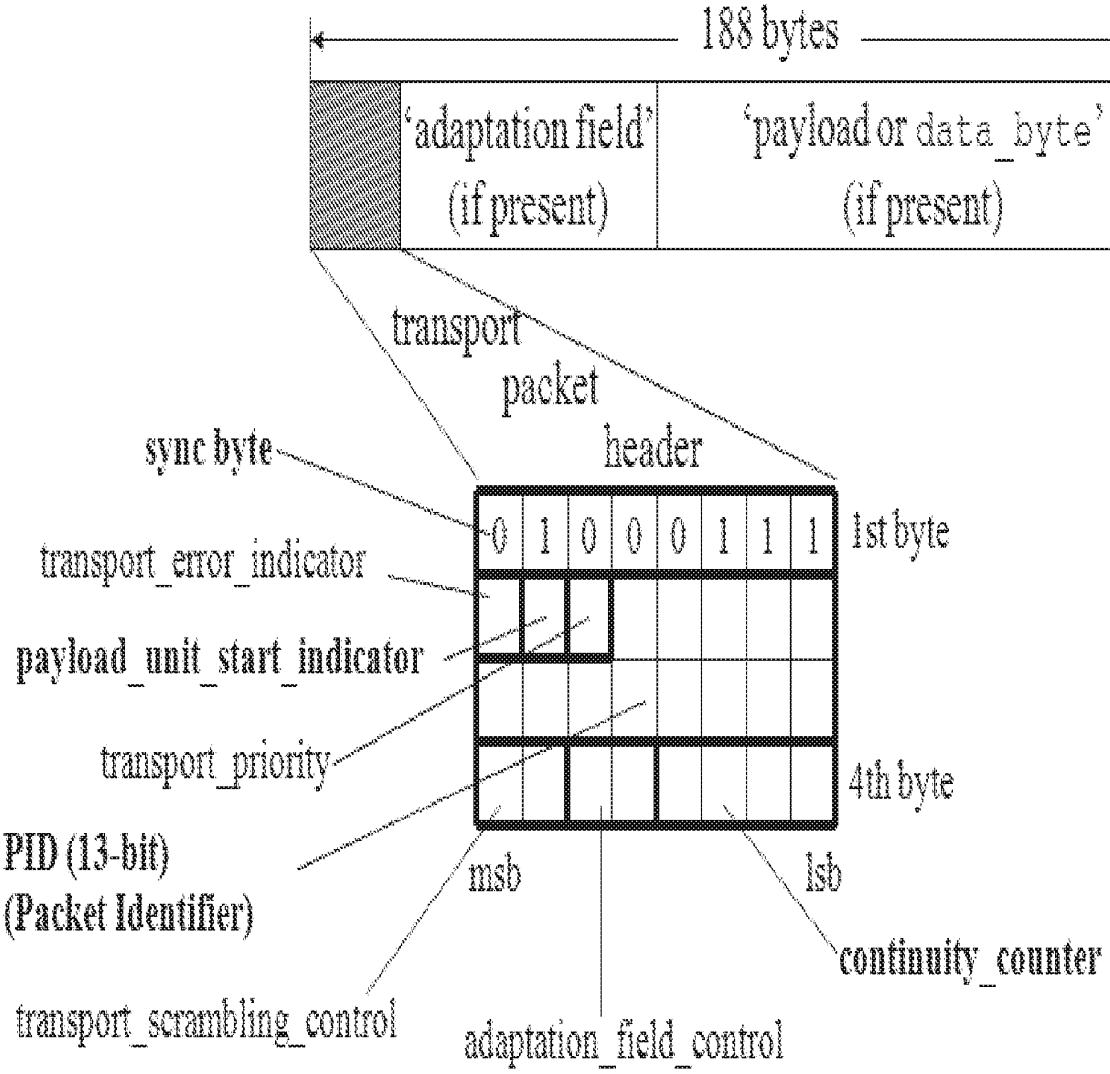


Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0700
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

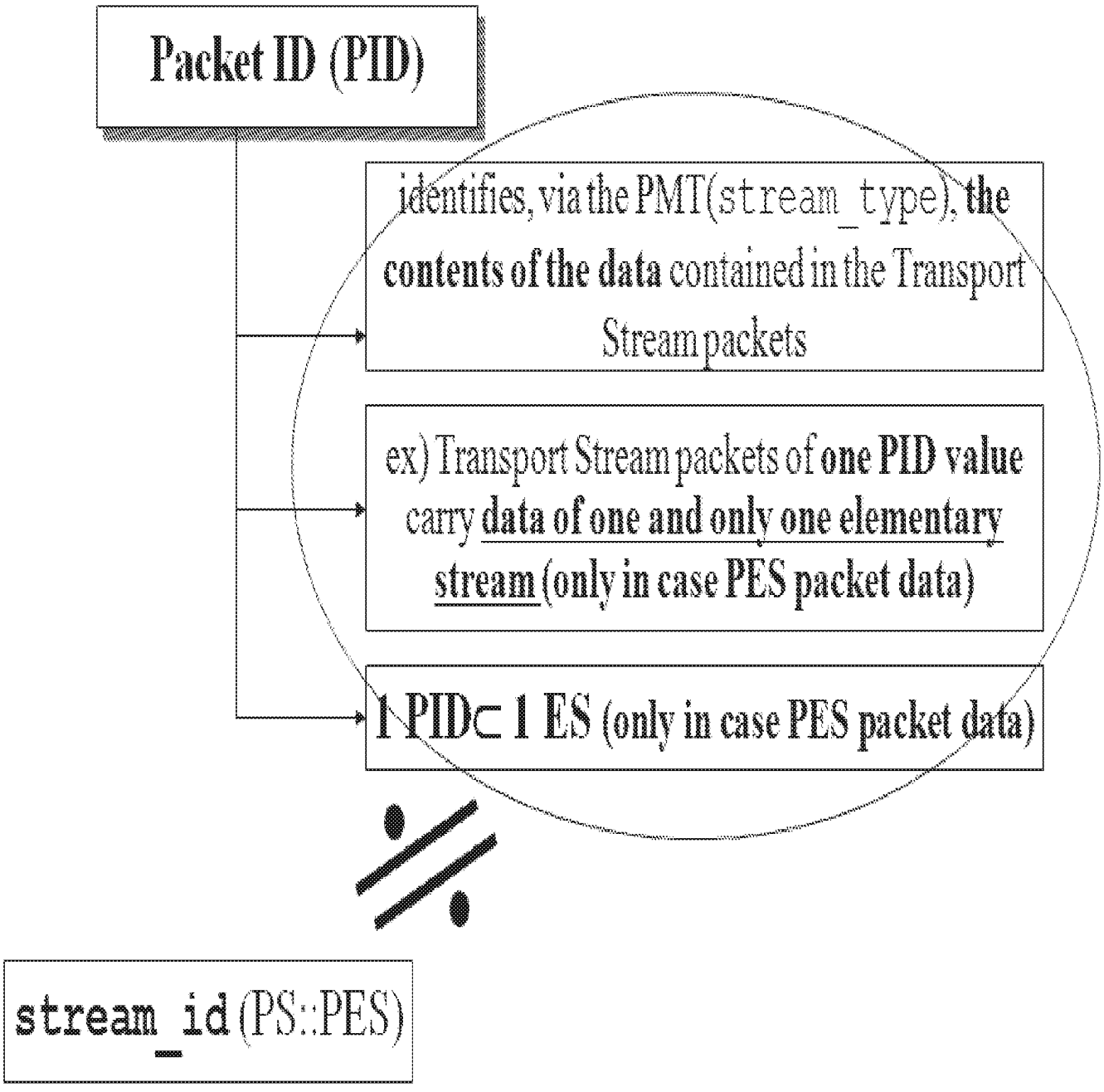
Transport Stream packet structure



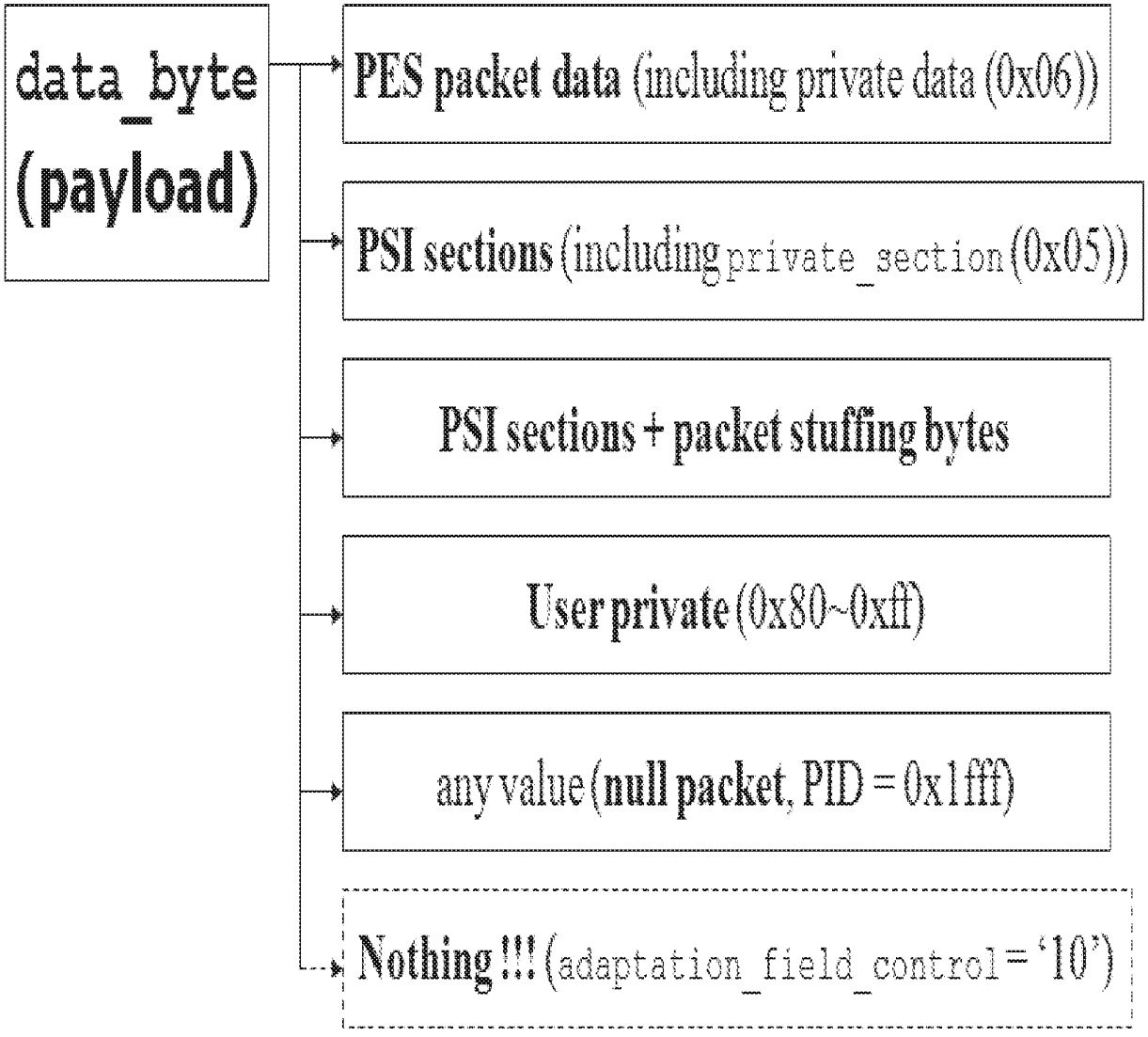
Transport Stream (TS)
(The structure of TS packet header)



Transport Stream (TS)
(PID)

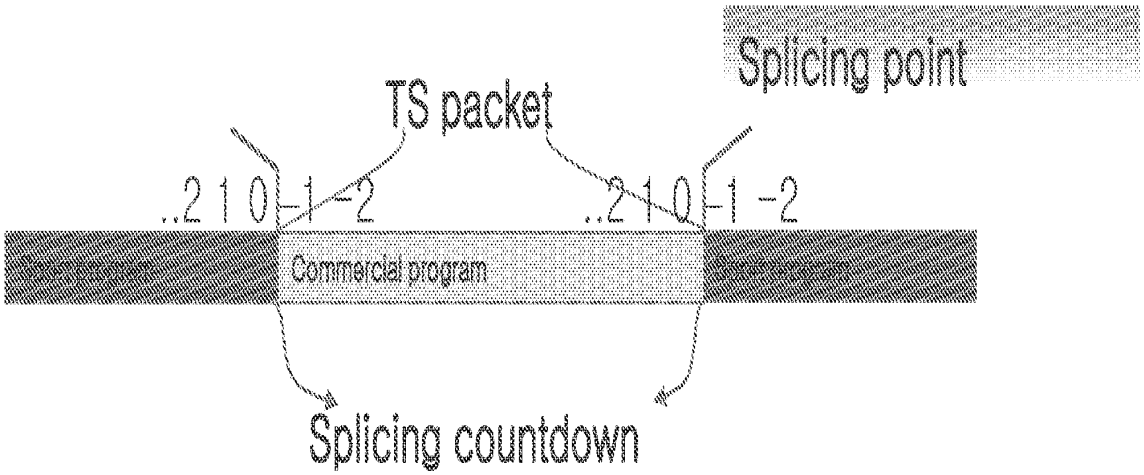


Transport Stream (TS)
(The types of data which the payload of a TS packet can have)

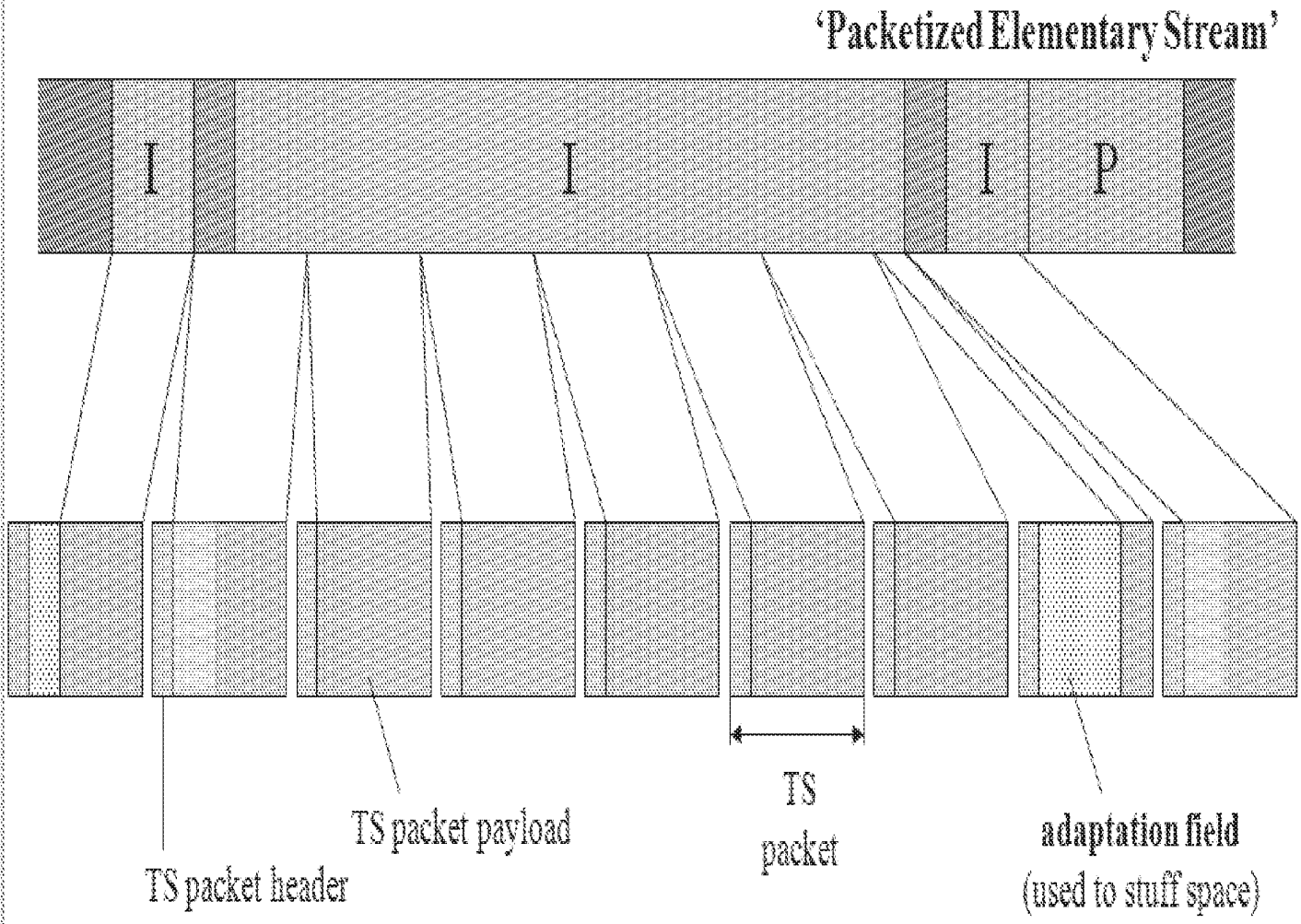


Transport Stream (TS) (Splicing)

Specifying the remaining number of TS packets following associated TS packet until splicing point is reached to zero.



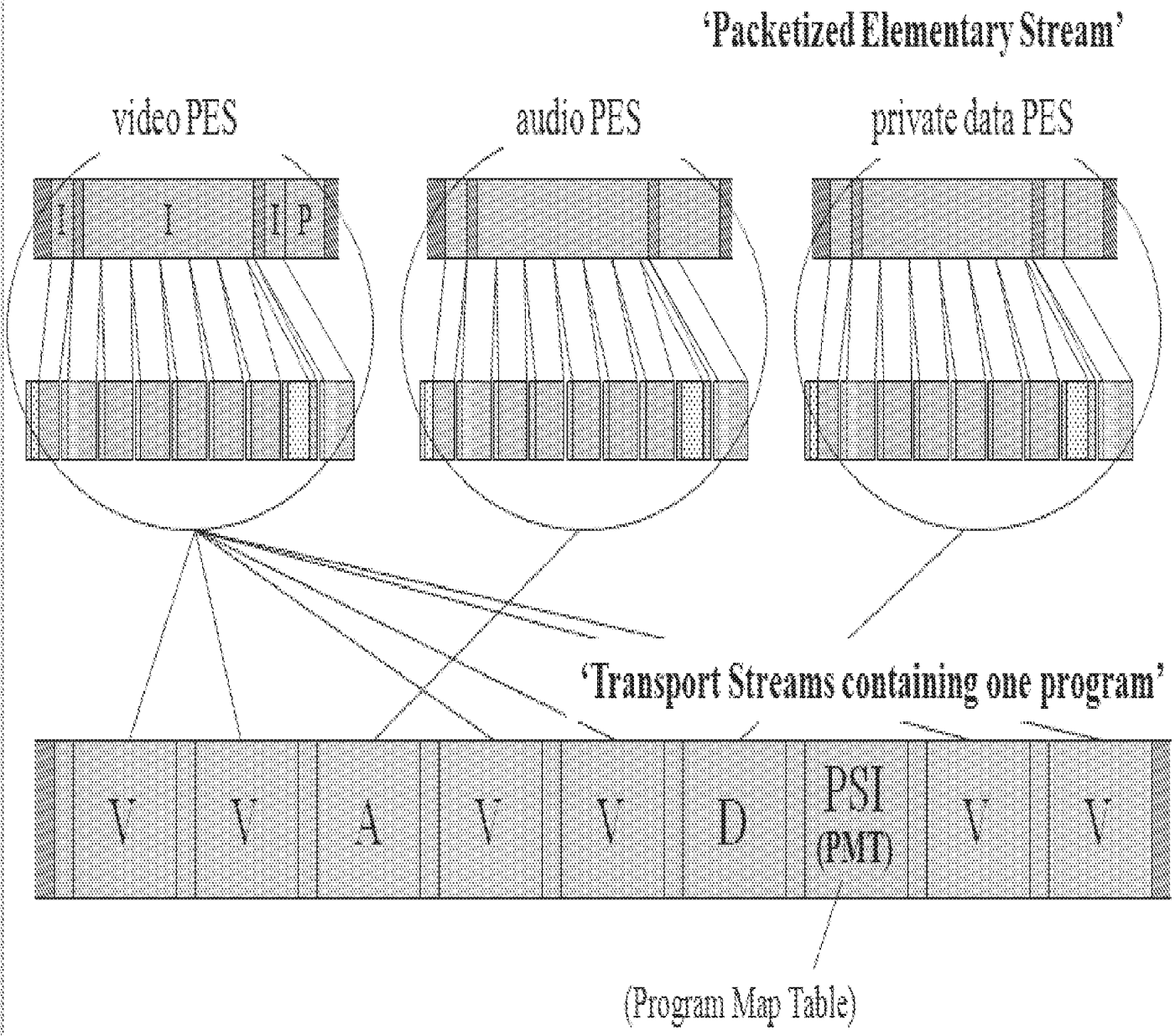
Transport Stream (TS)
(Creating an TS packet from an PES)



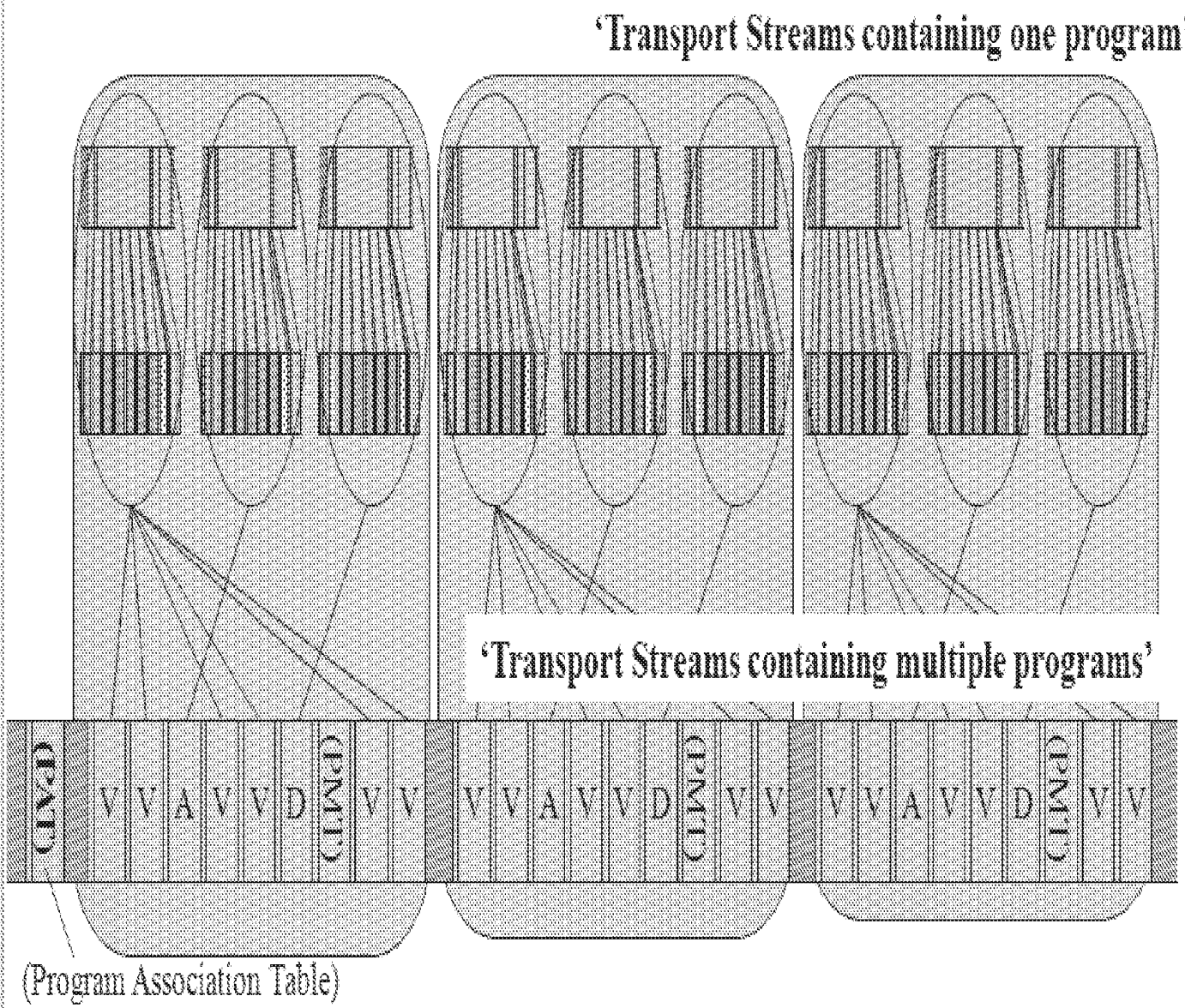
The Unique Rule of cutting or merging in the ISO/IEC 13818-1

The first byte of each PES packet headers is located at the first available payload location of a Transport Stream packet

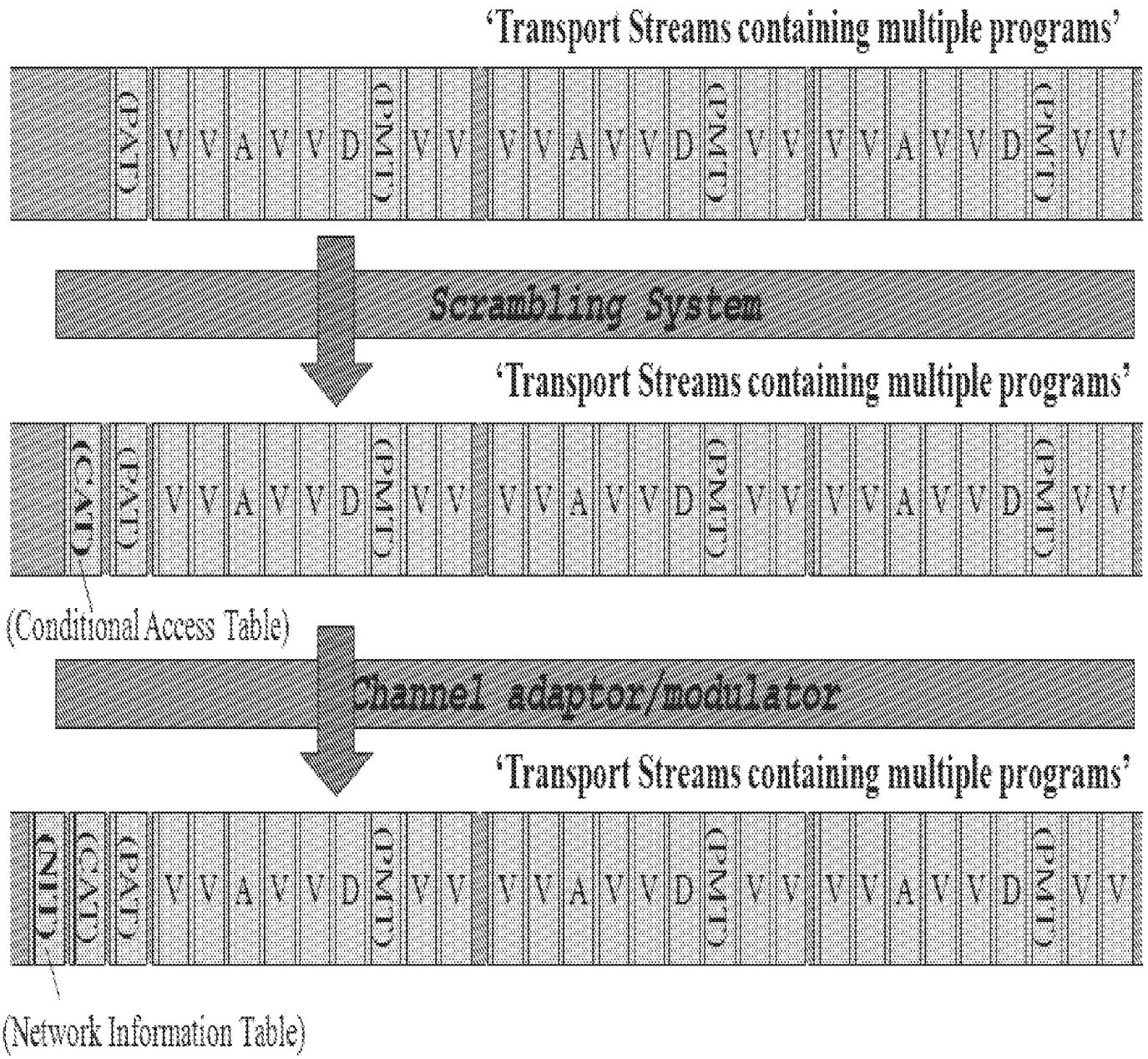
Transport Stream (TS)
(Creating an TS containing one program from some TS packets)



Transport Stream (TS) (Creating a TS containing multiple programs)



Transport Stream (TS)
(Adding some PSI tables to TS)



Transport Stream semantics

- **sync_byte** – is a fixed 8-bit field whose value is '0100 0111' (0x47).

- **transport_error_indicator** – When set to '1' it indicates that at least 1 uncorrectable bit error exists in the associated TS packet.

- **payload_unit_start_indicator** – When set to '1' it indicates that this TS packet contains the first PES packet.

- **transport_priority** – When set to '1' it indicates that the associated packet is greater priority than other packets having the same PID which do not have the bit set to '1'.

Transport Stream semantics

- **transport_scrambling_control** – indicates the scrambling mode of the TS packet payload.

Value	Description
00	Not scrambled
01	User-defined
10	User-defined
11	User-defined

- **adaptation_field_control** – indicates whether this TS packet header is followed by an adaptation field and/or payload.

Value	Description
00	Reserved for future use by ISO/IEC
01	No adaptation_field, payload only
10	Adaptation_field only, no payload
11	Adaptation_field followed by payload

- **continuity_counter** – is a 4-bit field incrementing with each TS packet with the same PID.

Transport Stream semantics

- **PID(Packet ID)** – is a 13-bit field, indicating the type of the data stored in the packet payload.

Value	Description
0x0000	Program Association Table
0x0001	Conditional Access Table
0x0002	Transport Stream Description Table
0x0003	IPMP Control Information Table
0x0004-0x000F	Reserved
0x00010 ... 0x1FFE	May be assigned as network_PID, Program_map_PID, elementary_PID, or for other purposes
0x1FFF	Null packet
NOTE – The transport packets with PID values 0x0000, 0x0001, and 0x0010-0x1FFE are allowed to carry a PCR.	

Transport Stream semantics

- **Discontinuity_indicator** – set to '1', indicate that the discontinuity state is true for the current TS packet.
- **Random_access_indicator** - contain some information to aid random access at this point.
- **PCR(Program Clock Reference)** - A time stamp in the Transport Stream from which decoder timing is derived.



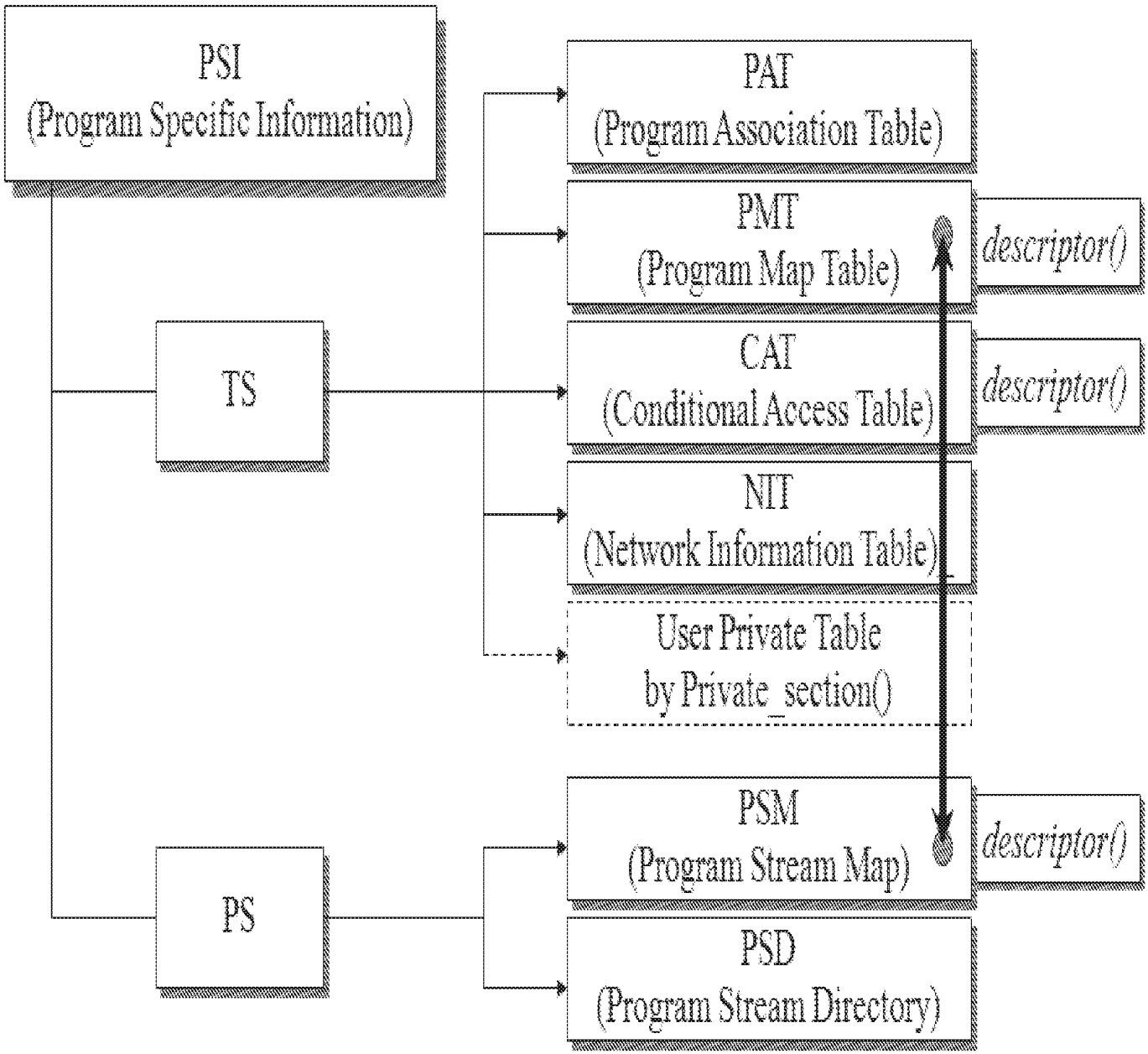
Media Lab
Kyunghee University

Program Specific Information

PSI(Program specific information) (1/2)

- PSI(Program specific information)
  - A structure stored in TS payload
  - Containes multiplexing information
  - PAT(Program Association Table)
    - Associates program number and program map table pid
    - Reserved PID : 0x00
  - PMT(Program Map Table)
    - Specifies PID values for components of one or more programs

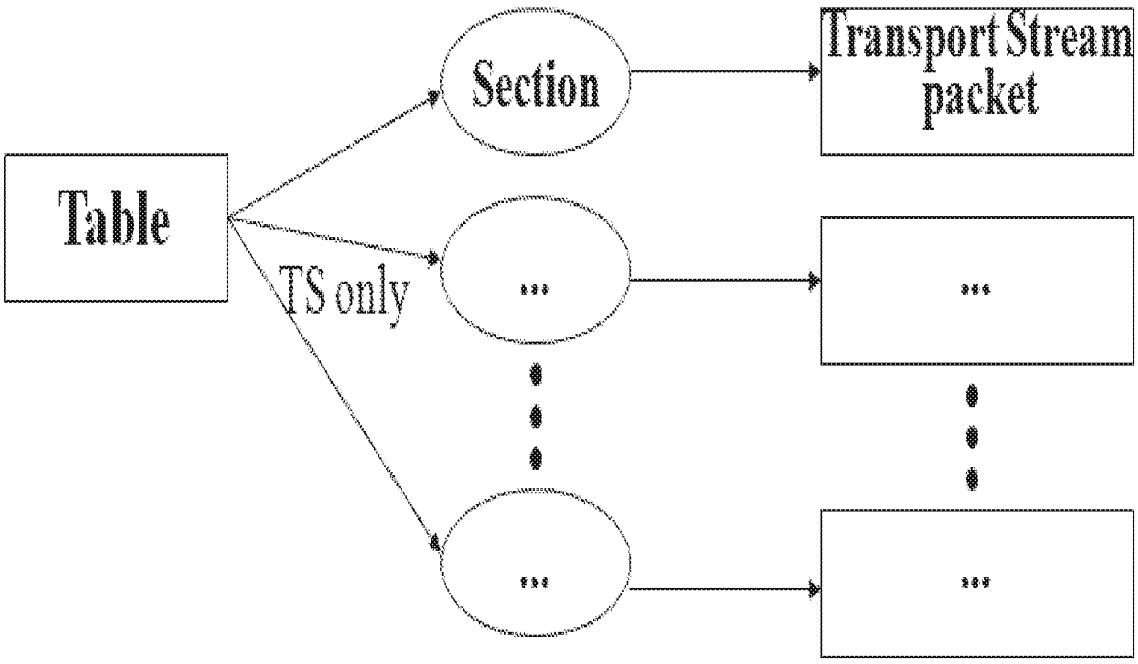
PSI(Program specific information) (2/2)



PSI Table Identifier

Value	Description
0x00	program_association_section
0x01	conditional_access_section(CA_section)
0x02	TS_program_map_section
0x03	TS_description_section
0x04 - 0x37	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 reserved
0x38 - 0x3F	defined in ISO/IEC 13818-6
0x40 - 0xFE	User private
0xFF	Forbidden

- A **table** is split up into **sections** to transport packet data
- PSI shall not be scrambled at all except for `private_data_byte` in `private_section`

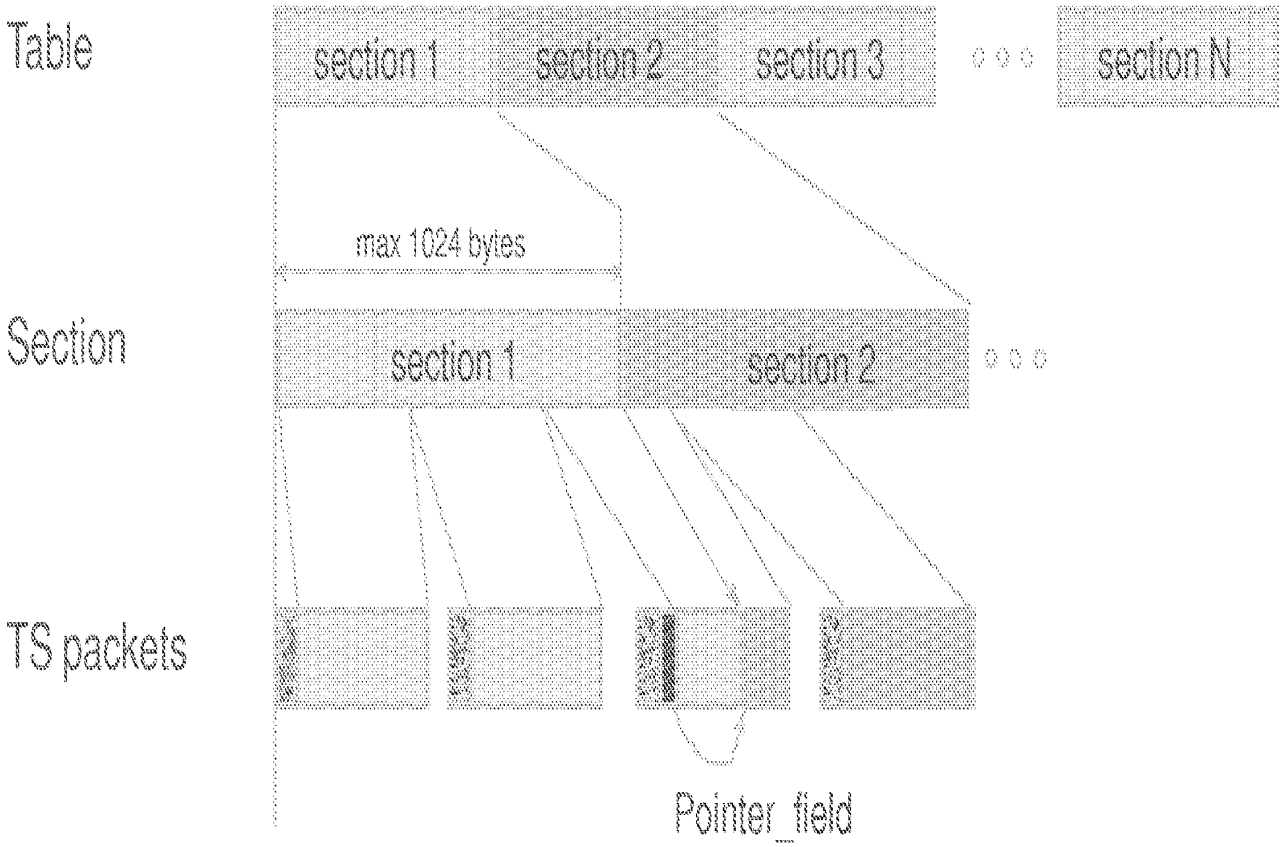


- PSI sections <= 1024 bytes
- private_sections <= 4096 bytes

» 188 bytes (TS packet)

`payload_unit_start_indicator` — 1 → PSI → **`pointer_field`**

Section and Table Relationships



- If *payload_unit_start_indicator* in the TS header is set to '1', the first byte of payload will start with pointer field.
- If set to '0', there is no pointer field in the payload.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0719
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

? : What is the rule for splitting a Table into Section?

• When the size of a table is larger than the maximum size such as 1024 byte, the table will bi splitted into a couple of sections. Even the size of the table is smaller than 1024 bytes, the table can be splited into a couple of sections.

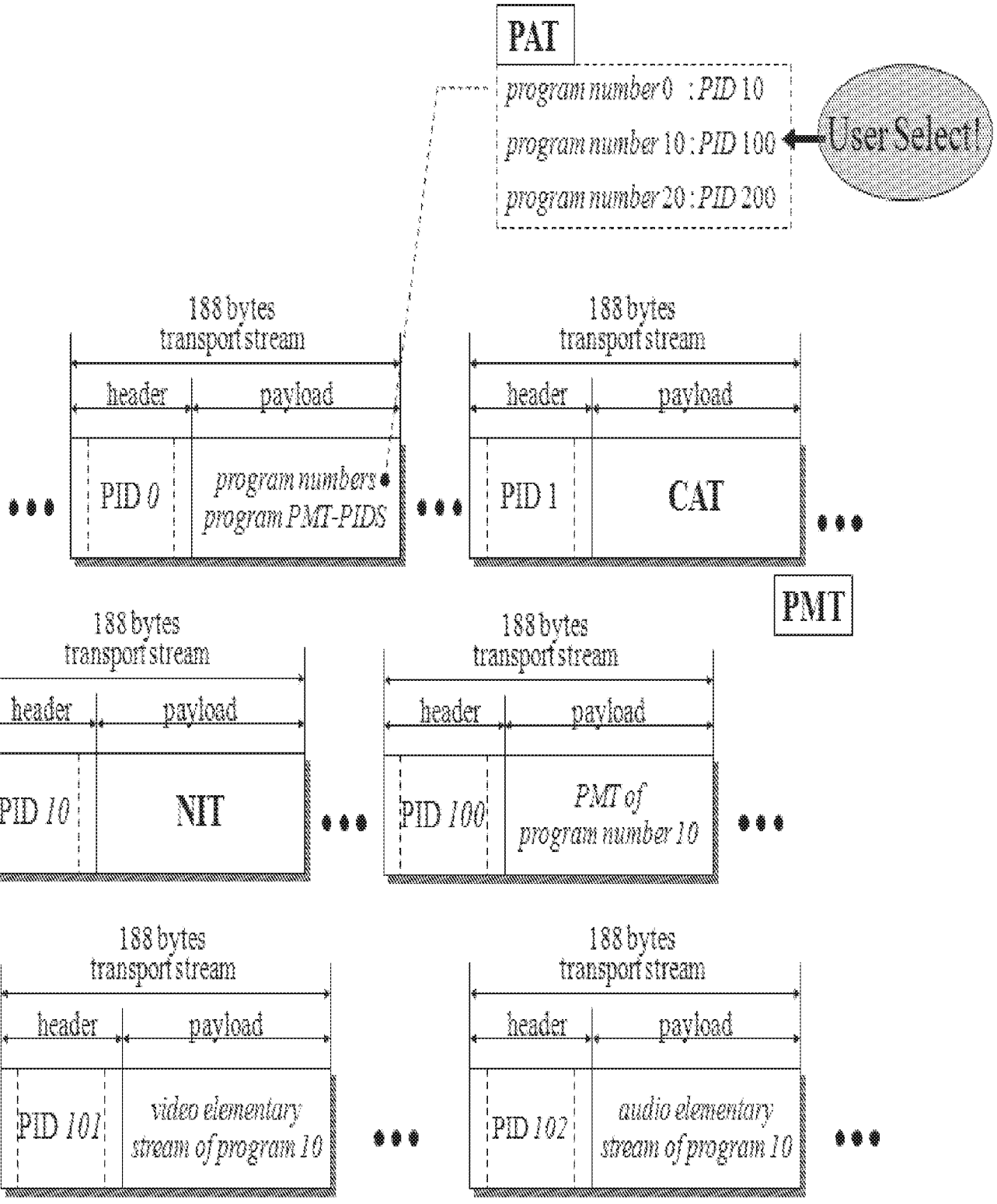
? : Why a point_field is needed?

• There is no regulation for the size of PSI.

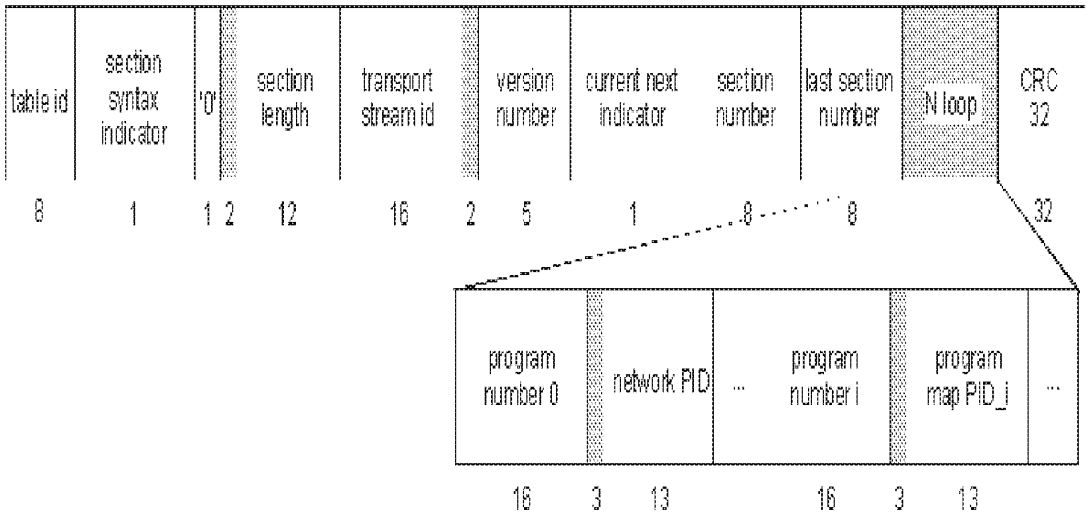
• Thus, a new section can be occurred in the middle of payload in a TS packet.

• recommend to use pointer_field for indication, and put offset for the starting position.

• Or use stuffing byte as PES packet does.


PAT
program number 0 : PID 10
program number 10 : PID 100
program number 20 : PID 200
User Select!
188 bytes transport stream
header
payload
PID 0
program numbers
program PMT-PIDS
188 bytes transport stream
header
payload
PID 1
CAT
PMT
188 bytes transport stream
header
payload
PID 10
NIT
188 bytes transport stream
header
payload
PID 100
PMT of program number 10
188 bytes transport stream
header
payload
PID 101
video elementary stream of program 10
188 bytes transport stream
header
payload
PID 102
audio elementary stream of program 10

PAT structure & semantics



- **Table_id** – shall be set 0x00

Value	description
0x00	program_association_section
0x01	conditional_access_section(CA_section)
0x02	TS_program_map_section
0x03	TS_description_section
0x04	ISO_IEC_14496_scene_description_section
0x05	ISO_IEC_14496_object_descriptor_section
0x06	Metadata_section
0x07	IPMP Control Information Section (defined in ISO/IEC 13818-11)
0x08-0x37	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 reserved
0x38-0x3F	Defined in ISO/IEC 13818-6
0x40-0xFE	User private
0xFF	forbidden

PAT semantics

- **section_length** – the first two bits of which shall be '00'. The remaining 10 bits specify the number of bytes of the section, starting immediately following the section_length field, and including the CRC. The value in this field shall not exceed 1021 (0x3FD).

- **Transport_stream_id** – identify this Transport Stream from any other multiplex within a network.

- **Current_next_indicator** – when set to '1' indicates that the Program Association Table sent is currently applicable.

- **Section_number** – The section_number of the first section in the Program Association Table shall be 0x00. It shall be incremented by 1 with each additional section in the Program Association Table.

- **Program_number** – specifies the program to which the program_map_PID is applicable. When set to 0x0000, then the following PID reference shall be the network PID.

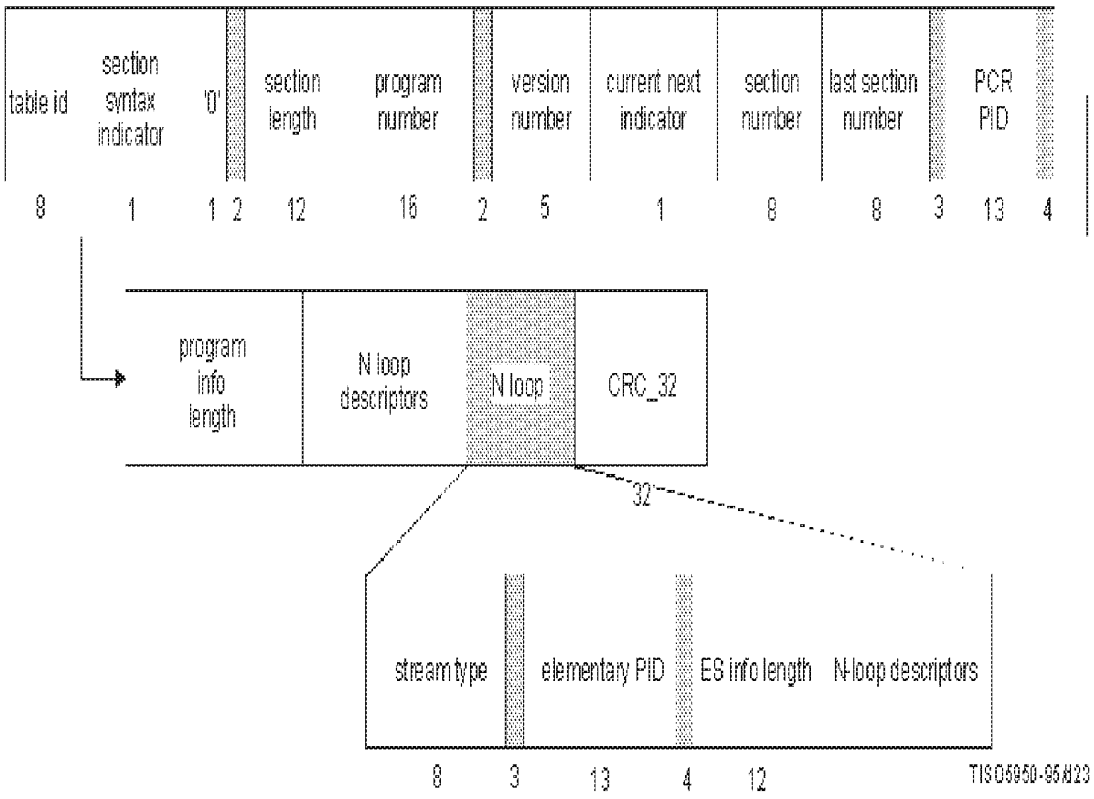
PAT semantics

- **Network_PID** – specifies the PID of the Transport Stream packets which shall contain the Network Information Table.

- **Program_map_PID** – specifying the PID of the Transport Stream packets which shall contain the program_map_section applicable for the program as specified by the program_number.

- **CRC_32** – CRC(circular redundancy check) value that gives a zero output of the registers in the decoder defined in 13818-1 Annex A.

PMT structure & semantics



- **Table_id** – set to '0x02'
- **Program_number** - specifies the program to which the program_map_PID is applicable.
- **PCR_PID** – indicate the PID of the Transport Stream packets which shall contain the PCR fields valid for the program specified by program_number.

PMT structure & semantics

구문	비트수	가변기호
TS_program_map_section() {		
table_id	8	uimsbf
section_syntax_indicator	1	bslbf
'0'	1	bslbf
reserved	2	bslbf
section_length	12	uimsbf
program_number	16	uimsbf
reserved	2	bslbf
version_number	5	uimsbf
current_next_indicator	1	bslbf
section_number	8	uimsbf
last_section_number	8	uimsbf
reserved	3	bslbf
PCR_PID	13	uimsbf
reserved	4	bslbf
program_info_length	12	uimsbf
for(i = 0; i < N; i++) {		
descriptor()		
}		
for(i = 0; i < N1; i++) {		
stream_type	8	uimsbf
reserved	3	bslbf
elementary_PID	13	uimsbf
reserved	4	bslbf
ES_info_length	12	uimsbf
for(i = 0; i < N2; i++) {		
descriptor()		
}		
}		
CRC_32	32	rpchof
}		

PMT semantics

- **Stream_type** – specify the type of program element carried within the packets with the PID whose value is specified by the elementary_PID.

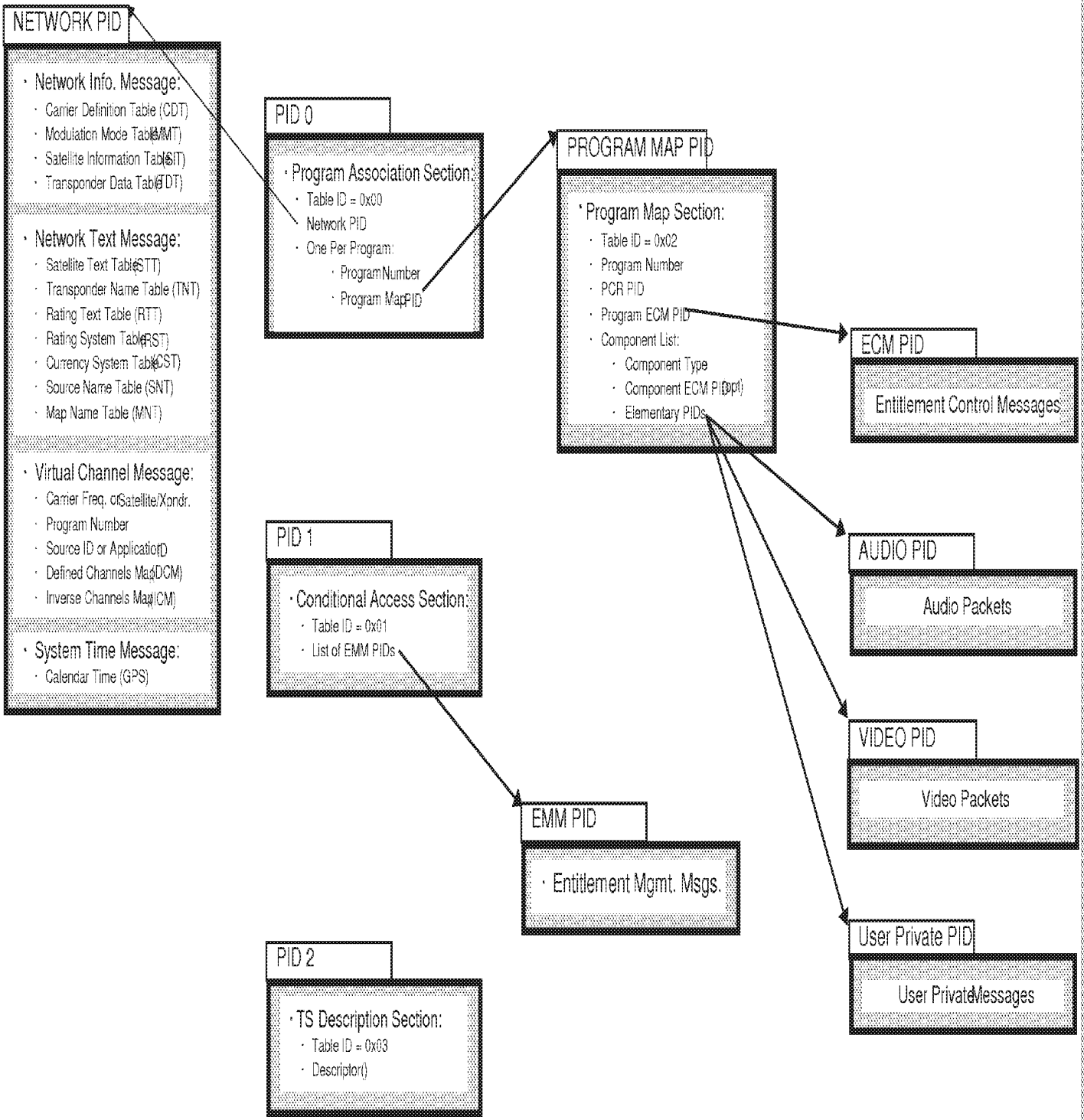
- **Elementary_PID** – specify the PID of the Transport Stream packets which carry the associated program element.

- **ES_info_length** – the first two bits of which shall be '00'. The remaining 10 bits specify the number of bytes of the descriptors of the associated program element immediately following the ES_info_length field.

Stream_Type

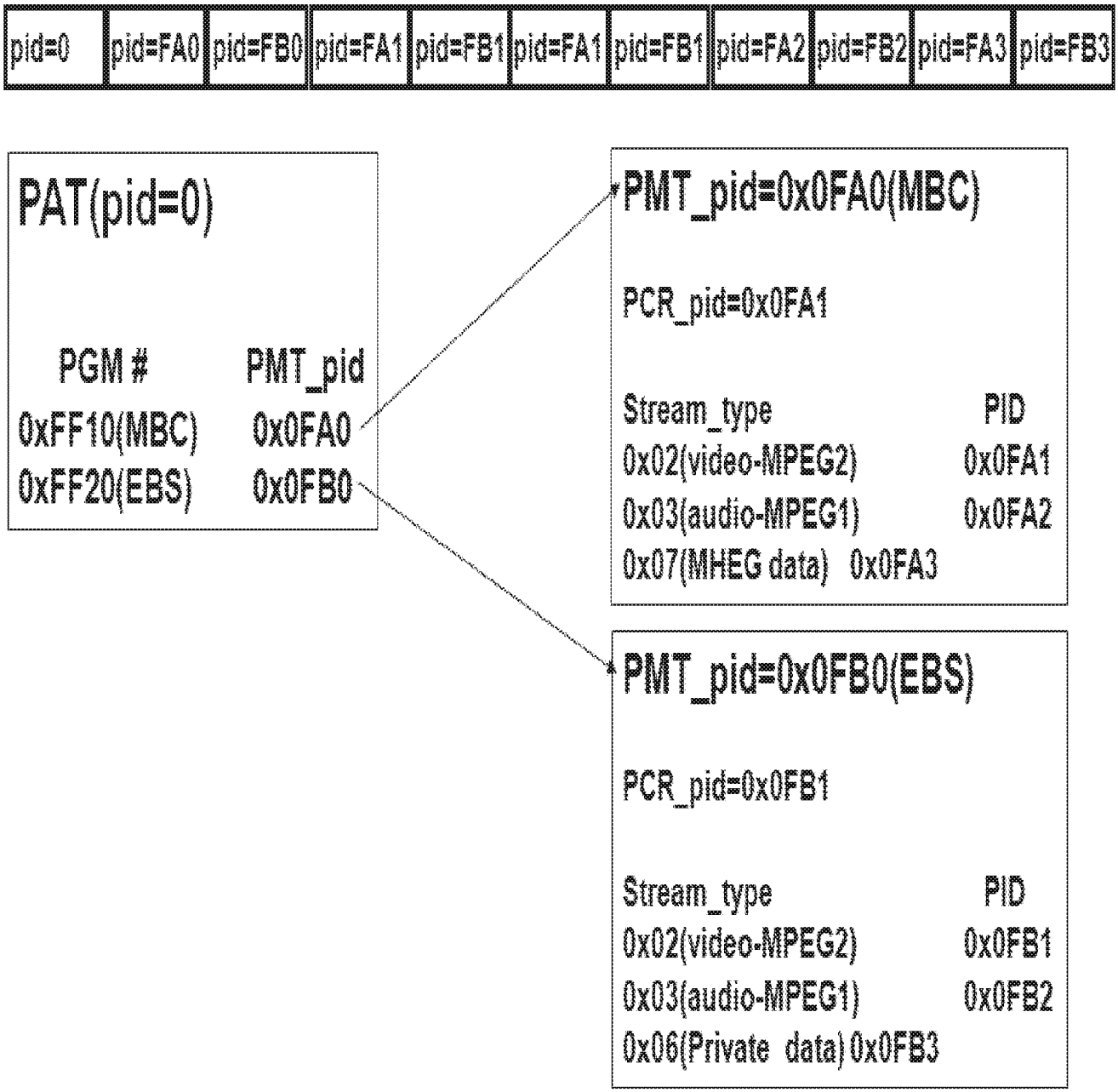
값	설명
0x00	ITU-T | ISO/IEC reserved
0x01	ISO/IEC 11172-2 Video
0x02	ITU-T Rec. H.262 | ISO/IEC 13818-2 Video or ISO/IEC 11172-2 constrained parameter video stream
0x03	ISO/IEC 11172-3 Audio
0x04	ISO/IEC 13818-3 Audio
0x05	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 private_sections
0x06	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 PES packets containing private data
0x07	ISO/IEC 13522 MHEG
0x08	Annex A - DSM CC
0x09	ITU-T Rec. H.222.1
0x0A	ISO/IEC 13818-6 type A
0x0B	ISO/IEC 13818-6 type B
0x0C	ISO/IEC 13818-6 type C
0x0D	ISO/IEC 13818-6 type D
0x0E	ISO/IEC 13818-1 auxiliary[1]
0x0F	ISO/IEC 13818-7 Audio with ADTS transport syntax
0x10	ISO/IEC 14496-2 Video
0x11	ISO/IEC 14496-3 Audio
0x12	ISO/IEC 14496 SL-packetized stream or FlexMux stream carried in PES
0x13	ISO/IEC 14496 SL-packetized stream or FlexMux stream carried in ISO/IEC 13818-1 sections
0x14	ISO/IEC 13818-6 Synchronized Download Protocol
0x0F - 0x7F	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 reserved
0x80 - 0xFF	User private

Transport Stream Relationships



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0729
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Demultiplexing Example



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0730
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Conditional Access Section

- When one or more ES are scrambled, CAT including CA_descriptor with shall be transmitted.

구문	비트수	간략기호
CA_section() {		
table_id	8	uimsbf
section_syntax_indicator	1	bslbf
'0'	1	bslbf
reserved	2	bslbf
section_length	12	uimsbf
reserved	18	bslbf
version_number	5	uimsbf
current_next_indicator	1	bslbf
section_number	8	uimsbf
last_section_number	8	uimsbf
for(i = 0; i < N; i++) {		
descriptor()		
}		
CRC_32	32	rpchof
}		

Private Section

구문	비트수	간략기호
private_section() {		
table_id	8	uimsbf
section_syntax_indicator	1	bslbf
private_indicator	1	bslbf
reserved	2	bslbf
private_section_length	12	uimsbf
if(section_syntax_indicator== '0') {		
for(i = 0; i < N; i++) {		
private_data_byte	8	bslbf
}		
}		
else {		
table_id_extension	16	uimsbf
reserved	2	bslbf
version_number	5	uimsbf
current_next_indicator	1	bslbf
section_number	8	uimsbf
last_section_number	8	uimsbf
for (i = 0; i < private_section_length-9; i++) {		
private_data_byte	8	bslbf
}		
CRC_32	32	rpchof
}		
}		

TS Description Section

- PID is assigned as 0x0002, and table_id to 0x03.
- TS decrioptor will be applied to all the TS.

구문	비트수	간략기호
TS_description_section() {		
table_id	8	ui msbf
section_syntax_indicator	1	bsl bf
'0'	1	bsl bf
reserved	2	bsl bf
section_length	12	ui msbf
reserved	18	bsl bf
version_number	5	ui msbf
current_next_indicator	1	bsl bf
section_number	8	ui msbf
last_section_number	8	ui msbf
for(i = 0; i < N; i++) {		
descriptor()		
}		
CRC_32	32	rp chsf
}		

TS Description Section

descriptor_tag	TS	PS	Identification
0	n/a	n/a	Reserved
1	n/a	n/a	Reserved
2	X	X	video_stream_descriptor
3	X	X	audio_stream_descriptor
4	X	X	hierarchy_descriptor
5	X	X	registration_descriptor
6	X	X	data_stream_alignment_descriptor
7	X	X	target_background_grid_descriptor
8	X	X	video_window_descriptor
9	X	X	CA_descriptor
10	X	X	ISO_639_language_descriptor
11	X	X	system_clock_descriptor
12	X	X	multiplex_buffer_utilization_descriptor
13	X	X	copyright_descriptor
14	X		maximum bitrate descriptor
15	X	X	private data indicator descriptor
16	X	X	smoothing buffer descriptor
17	X		STD_descriptor
18	X	X	IBP descriptor
19-26	X		Defined in ISO/IEC 13818-6
27	X	X	MPEG-4_video_descriptor
28	X	X	MPEG-4_audio_descriptor
29	X	X	IOD_descriptor
30	X	X	FMC_descriptor
31	X		SL_descriptor
32	X	X	OCR_ES_ID_descriptor
33	X	X	External_ES_ID_descriptor
34-63	n/a	n/a	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 Reserved
64-255	n/a	n/a	User Private

Improving last-hop multicast streaming video over 802.11

Igor Kozintsev, Jeff McVeigh
Intel Corporation

Abstract

In this paper we address the problem of robust real-time video streaming using multicast over wireless LANs. This scenario represents a significant challenge for existing 802.11 networks because it requires transmission over multiple unreliable channels to heterogeneous receivers with potentially different connection bit rates and very limited feedback information to the sender. The wireless channel is modeled as an equivalent multiple access packet erasure channel at the network level. We formulate the problem as an optimization of a regret criterion across the space of all users with the objective of maximizing the aggregate received quality. We formulate a proposed system solution that efficiently combines scalable source coding based on client rate adaptation coupled with channel packet erasure coding. Further work is required to validate the solution based on real-world wireless conditions in home and enterprise environments.

1 Introduction

The rapid adoption of broadband wireless local area networks (WLAN), specifically IEEE 802.11a/b/g, has generated significant demand for the wireless delivery of high quality video within the home and enterprise environments. Most research and commercial solutions to date have focused on the unicast wireless scenario, which attempts to deliver robust content to a single client via an access point within the WLAN. While the unicast case is still not a fully solved problem, our interest is on a "last hop" multicast, or broadcast, scenario where a large number of clients (potentially hundreds) attempt to wirelessly stream the same content from a single access point. Example applications of this scenario include the online gaming, redistribution of television content to various rooms within a home and the broadcast of a camera feed to audience members at a sporting event, conference, or lecture, where each client may contain local storage to enable limited control on the content. While we seek a solution to this problem for the 802.11 family of WLANs, the concepts presented here are applicable to other packet wireless networks that support rate adaptation.

The key problems related to video streaming over WLANs are dynamic fluctuations in channel quality and higher bit error rate, and correspondingly higher packet error rate, compared to wired networks. These characteristics are due to fading, interference and multi-path effects between the access point and client. Dynamic rate adaptation is employed in 802.11 to adjust the modulation scheme to achieve higher throughput based on channel characteristics. This implies that multiple clients might have significantly different link rates (e.g., 1, 2, 5.5 or 11 Mbps for 802.11b), which further complicates the multicast scenario compared to a single-hop wire-line scenario. While rate adaptation is effective at decreasing packet error rate in the presence of degraded channel quality, the throughput of other clients is negatively affected when some clients are connected at lower link rates due to the shared channel characteristic of the 802.11. Figure 1 illustrates a hypothetical last-hop multicast environment, where compressed media data is streamed to devices with different link rates.

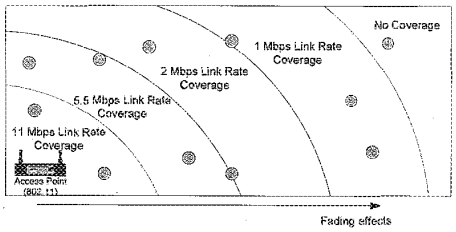


Figure 1. Last-hop scenario with multicast streaming to multiple clients with different channel characteristics. Clients are represented by grey circles and the concentric arcs provide the bounding region for hypothetical link rates based on rate adaptation.

The use of scalable media coding techniques has been

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0735
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

previously proposed to address client heterogeneity and ensure graceful quality degradation for the multicast scenario [8, 17, 19]. However, these hierarchical representations are sensitive to the position of packet loss, i.e., the received quality is a function of which packets are erased. Priority Encoding Transmission was proposed in [7] to eliminate this dependency, which allows for different protection of scalable layers based on their importance. Several proposals have been offered for the solution of the optimal amount of parity bits to protect each layer [12, 16, 14]. A near-optimal solution was described in [14], termed the Multiple Description Coding using Forward Error Correction (MDFEC), that can be solved using a Lagrangian optimization based O(N) complexity algorithm.

All known previous multicast streaming work has assumed that all packets are transmitted within a wireless network using the same modulation scheme or link data rate. In these formulations, the individual clients may receive varying throughput based on their channel characteristics, but the probability of receiving each packet transmitted from the access point is assumed to be constant for each specific client. Our approach differs in that we explicitly include the effect of dynamic rate adaptation into our problem formulation.

The major contribution of this paper is the incorporation of rate adaptation into the previously developed MDFEC algorithm. This is coupled with a systems approach that utilizes channel packet erasure coding and quality of service provisioning to achieve robust multicast streaming for a very large number of heterogeneous clients.

The rest of the paper is organized as follows. Section 2 provides an overview of scalable video coding and develops a model between compression ratio and perceived video quality, which is used to solve for the optimal aggregate quality across all multicast clients. Section 3 develops a packet erasure model of the 802.11 channel and provides details on appropriate channel coding techniques. Section 4 formulates our problem in terms of a minimum regret criterion. Section 5 discusses the system-level interaction for improving multicast streaming, and Section 6 provides concluding remarks and areas for future investigation.

2 Scalable video coding

The majority of current digital video applications operate within fixed transmission channel or storage capacity constraints. An illustrative example is high-definition digital television as defined by ATSC [1], where compressed source content is modulated using 8-VSB and broadcast terrestrially within a fixed 6 MHz bandwidth. Since the channel bandwidth is dedicated and known a priori, the source content is optimally encoded by compressing to a single target bit rate that fits within the channel bandwidth at a specific combination of spatial resolution and temporal sampling frequency (e.g., up to 19 Mbps, 1280x720 resolution, 60 frames per second). This process is referred to as *single-layer* or non-scalable coding since a single bitstream representation is obtained that satisfies the specific transmission channel constraints and client capabilities. Single-layered coding is also utilized effectively in digital cable, direct-broadcast satellite, and DVD applications, which are all based on the MPEG-2 video (Main Profile) standard [2].

Internet-based streaming video, conversely, operates in an environment where the effective transmission channel rate can vary dynamically and dramatically depending on network load and last-mile connectivity. These constraints preclude the use of a single, fixed bitstream representation for all clients. Bitstream switching is typically employed for point-to-point and multicast Internet streaming applications [11], where multiple, independent bitstreams are compressed and stored at the server with each bitstream tuned to particular connection data rate, channel loss characteristics, and client processing and display capabilities. In the unicast scenario, the client monitors the packet transmission rate and loss statistics and communicates with the server to send the representation that will yield the highest quality over the current channel. This technique has been extended to multicast delivery, where the individual streams are assigned to different multicast addresses. Clients then subscribe to the multicast address that provides the minimum distortion for the client's channel characteristics. Due to the temporal dependency within each stream, switching can only occur at specific synchronization points, which limits the potential rate of adaptation.

While the bitstream switching technique has achieved commercial success for unicast and multicast Internet streaming, this solution is not applicable for our target last-hop multicast wireless scenario. Specifically, the wireless channel is shared between clients that may have dramatically different connection rates, the throughput for each client may vary instantaneously due to multi-path fading, interference and transmitter-receiver distance, and the server (which is assumed to be a home PC or home media server in our scenario) has relatively limited storage and processing capabilities compared to a dedicated streaming server and is likely incapable of encoding multiple independent streams in real-time for each potential client channel. *Scalable video coding* is well suited to our scenario as it makes effective use of the shared channel and can quickly adapt to channel characteristics without the delay associated with synchronization points required for bitstream switching techniques.

Scalable coding techniques typically consist of a base layer representation and a collection of one or more enhancement layers. The base layer is independently decodable, while the enhancement layers hierarchically depend

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0736
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

on the base layer and/or lower enhancement layers. The enhancement layers can provide scalability across one or more orthogonal vectors of perceived visual quality, namely: 1) *spatial scalability* for improved image resolution or detail, 2) *temporal scalability* for improved smoothness of motion, and 3) *SNR scalability* for improved image fidelity.

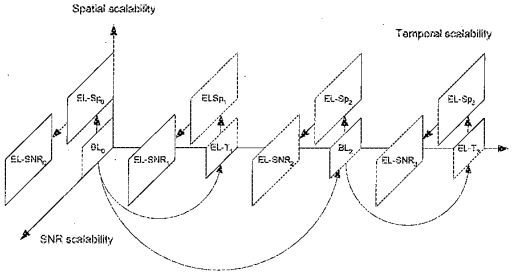


Figure 2. Example scalable bitstream representation.

Figure 2 illustrates an example scalable bitstream utilizing all three scalability vectors. The lowest bit rate, and hence lowest quality, representation is provided by the base layer (BL), shown as frames BL_0 and BL_2 in this simple example [1]. Clients with higher throughput can obtain improved smoothness of motion through the addition of the temporal enhancement layer (frames $EL{-}T_1$ and $EL{-}T_3$). Similarly, improved image resolution is provided by the spatial enhancement layer ($EL-S_p$), and finally improved image fidelity by the SNR enhancement layer ($EL{-}SNR$). This example hierarchical representation can service clients with up to four separate throughputs with an aggregate bit rate equal to the sum of the base layer and three enhancement layers.

The use of scalable coding techniques is not without its liabilities. These include degradation in rate-distortion performance compared to single-layered techniques for a specific rate, increased encoder / decoder complexity, and the interdependence between layers, which requires appropriate source-channel coding techniques in error prone environments [15, 10]. The rate-distortion "penalty" is the most significant factor for the lack of commercial deployment of scalable coding techniques even for applications that do not operate within fixed channel environments.

It is not surprising that a scalable representation would yield inferior rate-distortion performance compared to a single-layer representation due to the inherent overhead and redundancies that must be present in the hierarchical representation. Figure 3 depicts the rate-distortion performance for a theoretical single-layer and scalable coding scheme. We assume that the scalable scheme uses a base layer technique equivalent to the single-layer representation, which yields equivalent distortion at the base layer rate ($R'_0 = R_0$). Beyond this rate, the scalable representation requires an increased bit rate to achieve equivalent distortion (e.g., $R'_1 > R_1$). The superiority for single-layered coding is obvious for applications that operate within a fixed channel. However, for this example where we assume clients with four different transmission channels, it is clear that the scalable coding scheme requires lower aggregate bit rate provided that $R'_3 < R_0 + R_1 + R_2 + R_3$.

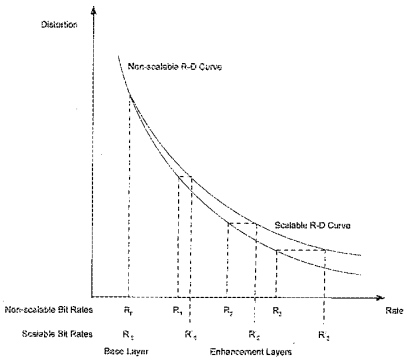


Figure 3. Rate-distortion comparison between theoretical single-layer and scalable coding schemes.

The reduction, or elimination, of the rate-distortion penalty is an area of active and challenging research. Recent advances have been obtained through the utilization of motion-compensated temporal filtering (MCTF), which is based on the lifting representation of a temporal subband filter bank [18]. MCTF provides improved coding efficiency in the wavelet domain in the presence of object motion. This work has gained the attention of the standards community, and forms the current basis of the MPEG-21 work item on Scalable Video Coding (SVC), which recently reached first Working Draft (WD 1.0) status. The current specification [2] calls for a base layer utilizing the recently defined H.264 / AVC standard [5], and a MCTF-based enhancement layer [6]. The H.264-compliant base layer provides compatibility with current and future single-layer systems that utilize this efficient codec, while the MCTF-based enhancement layers provide medium to fine-grain scalability across temporal, spatial and SNR vectors.

[1] This example is not intended to be definitive, but instead is used to illustrate the interaction between scalability vectors and inter-layer dependencies.

[2] Since SVC is still in the early definition stage, significant algorithmic changes are likely to occur prior to final standardization.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0737
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Since MPEG-21 SVC is anticipated to reach final standardization by ?????, we assume a scalable coding scheme similar to the current SVC definition. The objective then is to calculate the optimal bit allocation across the base and enhancement layers to achieve high-quality, robust multicast wireless streaming to a large number of clients within a specified service area. As we are interested in maximizing the aggregate perceived quality for all clients, we first construct a model of quality as a function of bit rate or, equivalently, compression ratio.

As a proxy for a true SVC implementation, we utilize an internally developed real-time H.264 implementation [13]. Although this is a non-scalable solution, we assume that an SVC encoder will be able to relatively closely track the operational rate-distortion curve of the H.264 implementation across a specified bit rate range (i.e., we assume that continued advances in the specification will yield a negligible rate-distortion penalty for the scalable coding capability).

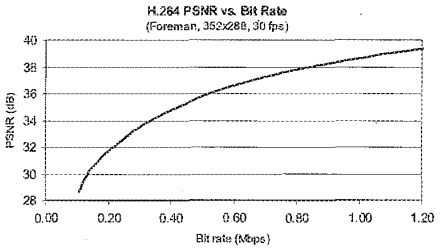


Figure 4. Peak signal-to-noise ratio versus bit rate for H.264 encoding of Foreman sequence (352x288 resolution, 30 frames per second).

Figure 4 shows a familiar rate-distortion plot of the H.264 encoder for the Foreman sequence, where distortion here is represented by the peak signal-to-noise ratio (PSNR), which is a logarithmic function of the mean-squared error between the reconstructed and original video frames. While PSNR is not directly correlated to perceived quality, it provides a simple to calculate quantitative measurement and is used extensively for comparisons between encoding algorithms; hence, we use it here for the basis of our quality model.

Since we are interested in the quality relationship across sequences with differing resolutions and frame rates, we similarly generated PSNR results for a variety of low, standard, and high definition sequences. These results were normalized with respect to compression ratio, where the compression ratio is defined as the ratio between the uncompressed source, assuming a 4:2:0 chrominance sampling, and the compressed bit rate. The results are shown in Figure 5, which demonstrates the inverse relationship between compression ratio and bit rate.

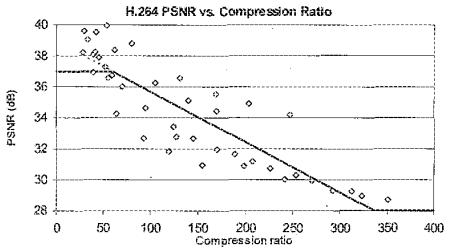


Figure 5. PSNR versus compression ratio for a variety of sequences encoding using an H.264 implementation.

Although PSNR vs. bit rate plots typically show a logarithmic relationship, this clustering over sequences with varying characteristics indicates that we can approximate with a linear relationship. We calculated a least-squares fit over this data, which is represented by the dotted diagonal line. The linear model can then be used to estimate the PSNR for a given bit rate and source resolution and frame rate.

Since we are ultimately interested in quality as perceived by an end-user, we propose to take some liberties and establish a mapping between PSNR and perceived quality. It is noted that perceived quality quickly saturates above a certain PSNR threshold. We postulate that 37 dB is a reasonable value for this threshold, which implies that a bit rate that yields a PSNR greater than 37 dB is equivalent perceptually to a lower bit rate (higher compression ratio) that yields a PSNR of 37 dB. Hence, there is no value, in terms of perceived quality, in using a higher bit rate than that which would achieve this threshold.

Similarly, perceived quality also reaches a minimum level of acceptance at a second PSNR threshold. We conjecture that 28 dB is a reasonable value for this threshold. This implies that for low bit rates (high compression ratios) that yield a PSNR of less than 28 dB, we assume that the received quality is so poor that it is equivalent to not even receiving the content. Hence, we must stay above this threshold by increasing bit rate or scaling back on the source resolution or frame rate. These thresholds are depicted on Figure 5 as the solid, discontinuous line.

Our final step in the modeling process is to map the thresholds and linear region to a measure of perceptual quality. The ITU has established a subjective video assessment methodology, as described in [4]. In this process, users sub-

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0738
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

jectively rate content based on comparison to original content using a 5-point rating systems: 5 = imperceptible, 4 = perceptible, but not annoying, 3 = slightly annoying, 4 = annoying, and 5 = very annoying. For simplicity, we use a direct mapping between our PSNR least-squares model and thresholds to this scale. Figure 6 depicts our model for mapping compression ratio to perceptual quality as defined by the ITU subjective scores.

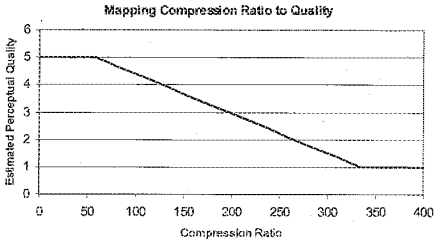


Figure 6. Mapping relationship between compression ratio and estimated perceptual quality.

This model, as we discuss in subsequent sections, can provide a practical alternative to the actual operating Distortion-Rate characteristics in real-time streaming applications. An approximate D-R function is used to establish the optimal bit rate partitioning of the scalable coding representation to achieve the highest aggregate perceived quality for all clients in our multicast scenario. Additionally, use of this model will eliminate the case where certain clients receive an excessively high bit rate stream at the expense of clients that can only receive a lower data rate (this is achieved through the upper threshold). It will also ensure the minimum level of quality received by clients that are only able to receive at low link rates.

3 IEEE 802.11 WLAN channel

The original IEEE 802.11 b standard [3] a 2.4GHz spread-spectrum wireless LAN capable of operation at bit rates of 1, 2, 5.5 and 11 Mbit/s (using a spread-spectrum BPSK modulation). IEEE 802.11 'a' and 'g' boosted the rate up to 54 MBit/s by using more advanced physical (PHY) layers and it also widened the range of available rates to provide more flexibility for channel adaptation. Available proprietary solutions advertise higher rates and the IEEE 802.11 groups are in the process of developing even faster wireless networking standards. As a result, effective throughput of WLANs can now achieve about 20-25 MBit/s and this finally enables applications like wireless video streaming. Figure 7 illustrates a typical effective throughput achieved by an 802.11b network under normal conditions. As a rule of thumb the effective throughput is 50 – 60% of the wireless rate due to media access and control overhead and for an 11 Mbit/s TCP connection is close to 5 – 5.5 Mbit/s.

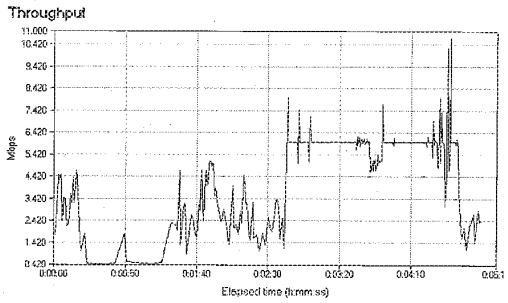


Figure 7. Example of throughput variation over time in 802.11 b network.

Effective throughput differs significantly for different PHY rates. Figure 8 illustrates the Packet Error Rate dependence on Signal to Noise Ration in the channel for different rates/modulation schemes for the packet size of 1024 Bytes. While the actual PER values may differ depending on implementations the relative behavior remains more or less the same: in most channel SNR regimes only a single modulation scheme performs relatively well (i.e., above around 10% PER in the Figure 8. This PER dependence on the channel SNR justifies the approximation in Figure 1 where the SNR is pictured to be proportional to the distance of a receiver from the sender. Another parameter of the 802.11 PHY that determines the the effective packet throughput is the size of the PHY frames. Longer packets in a high SNR regime offer higher throughput compared to the shorter packets due less relative overhead of headers, acknowledgements and so on. Conversely, when the channel gets noisier it may make sense to switch to shorter packets that have higher chances to get through. This tradeoff provides an additional degree of freedom in the overall optimization problem of media multicast.

Throughout the process of improving PHY layer of 802.11 networks, the Media Access Control (MAC) essentially remained the same. The IEEE 802.11 standard uses the same logical link layer as other 802-series networks (including the 802.3 wired Ethernet standard), and uses compatible 48-bit hardware Ethernet addresses to simplify routing between wired and wireless networks. Using radio transceivers for the network physical layer is complicated by the inability of radio transceivers to detect colli-

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0739
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

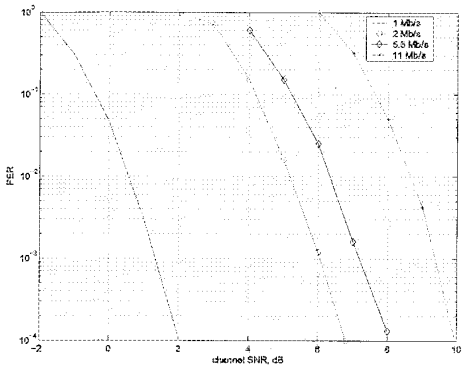


Figure 8. Typical Packet Error Rate for different wireless transmission rates as a function of Signal to Noise Ratio.

sions as they transmit, and the potential for devices outside the network to interfere with network transmissions. Communication is also hampered by the hidden node problem; two widely spaced nodes on the network may be unable to communicate with each other directly, and yet still interfere with transmissions to an intermediate point. To address these limitations, a complex Media Access Control that includes retransmissions of corrupt packets and collision avoidance is used. Link layer acknowledgements are used to detect corrupt packets and initiate fast retransmissions, perhaps with different rate. Because in this paper we are targeting a multicast transmission that does not use ACKs at the link layer, extra arrangements may be required to control the transmit rate and other parameters that are configured with the help of ACK mechanism.

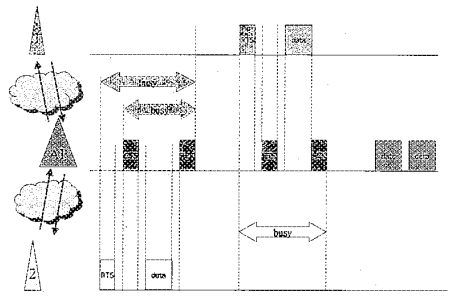


Figure 9. Example of IEEE 802.11b LAN operation.

Fig. 9 illustrates a Distributed Coordination Function (DCF) MAC using a typical example of two mobile stations communicating with an Access Point (AP). The Request To Send (RTS) / Clear To Send (CTS) mechanism is often used to avoid a hidden node problem. Station 2 accesses the channel (after sensing the channel as free for some interval of time) by sending an RTS frame. At this time all other stations that received the RTS frame set the state of the channel as "busy" for the duration of time advertised in the RTS frame. The AP broadcasts the CTS frame so that all other stations that are out of range of station 2 ("hidden" nodes) can also set the channel state as "busy". After this procedure Station 2 sends a data frame that is acknowledged by the AP. A similar process is then repeated by station 1 when it needs to transmit (the time between the acknowledgement frame and the RTS frame from station 1 is available for all stations to initiate transmission). Finally, the AP multicasts several unacknowledged data packets (in this example not using the RTS/CTS mechanism).

It was clear that the original 802.11 MAC protocol was inadequate for providing QoS for media streaming applications. IEEE 802.11 'e' group has been working on improving this situation and the results of its work are expected to become a standard in the near future. In the meantime, a subset of IEEE 802.11 'e' draft was adopted by several companies and is known as Wireless Multimedia Extension (WME). Among others, WME provides several important tools to improve QoS for multimedia including: maintaining 4 separate queues for wireless streams with different priorities, ability to use unacknowledged transmission mode and block acknowledgements, enhanced DCF media access. In practice, the QoS features give a basic set of tools to optimize the LAN-wide traffic - efficient way of using these tools is an ongoing research and development effort.

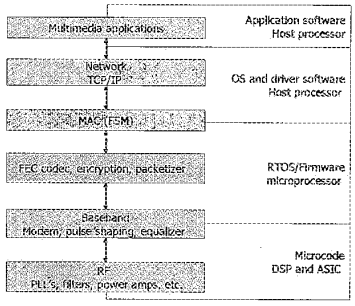


Figure 10. System view of a typical software and hardware stacks for wireless media streaming.

Modeling of an 802.11 channel can be done at multiple levels. Figure 10 illustrates a typical software and hard-

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0740
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

ware stack for a PC-like platform running a wireless media streaming application. The IEEE 802.11 MAC/Logical Link Control (LLC) and physical (PHY) layers are represented by the lower for blocks in the diagram and in practice are implemented as a combination of DSP/ASIC responsible for the RF and latency-critical processing, and the microprocessor implementing the MAC functionality. In contrast to this, TCP/IP stack along with all OS software and the actual media streaming applications are executed on a host processor. It is usually a common approach to design such multi-layer systems by allowing only adjacent layers to communicate with each other and thus separating the functionality and design efforts for those layers into independent problems. Under this practical constraint, user applications see the wireless channel as an IP packet channel with erasures—much like the wired Ethernet. Therefore in this paper we model the wireless network channel as a packet erasure channel at the network layer level. On the other hand, the specifics of media streaming in general and especially media multicast over WLAN require some cross-layer interaction to efficiently adapt source and channel coding. This avenue has been explored in academic research of Joint Source/Channel coding that was shown to offer potential gains over a traditional source-channel coding separation. This approach is yet to find its way into real-life systems.

To illustrate our channel model in Figure 11 we show a sample trace [3] which we obtained using an 802.11 AP and mobile station. The AP was sending UDP multicast packets at a constant rate and the receiving station was recording the sequence numbers of the correctly received packets. Each point on the trace corresponds to an average of about one hundred packets received. Note that the channel behavior in this experiment is the result of the interaction between the actual RF channel, the hardware responsible for PHY and the software/firmware responsible for MAC/LLC and IP implementation.

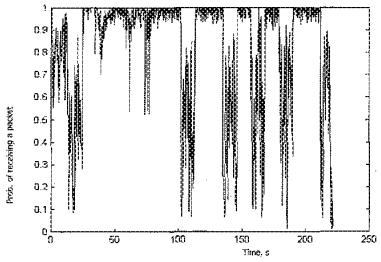
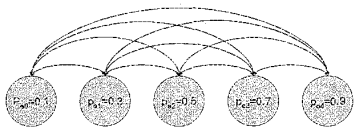


Figure 11. Packet erasure probability as a function of time in IEEE 802.11b trace.

[3] The trace shows a channel with a rather poor quality because of significant distance used in this measurement.

In the simplest case the packet channel illustrated in Figure 11 can be approximated as a memoryless packet erasure channel when packets are dropped independently of each other with probability p_e. However, by examining the trace in Figure 11 (and the one in Figure 7) we can conclude that there is significant amount of correlation between adjacent samples which suggests a better model with memory for approximating the channel. One possibility is to use a multi-state Markov channel model. Figure 12 illustrates a 5-state Markov model approximation and a sample transition probability matrix obtained for a trace shown in Figure 11 uniformly quantized to probabilities of packet erasure of 0.1, 0.3, 0.5, 0.7 and 0.8. The estimated transition probability matrix can be used to predict the next state of the channel with high fidelity. For the sample trace shown in Figure 11 prediction error is within 10% and the maximum error of one state (i.e., 0.2 in our case). This in practice means that the channel state can be very efficiently estimated using only sparse measurements of the packet error rates at the clients, which, in its turn, allows adapting coding scheme for c



0.7368	0.2174	0.0055	0	0
0.2211	0.4609	0.1803	0.0278	0.0014
0.0421	0.2957	0.5161	0.2083	0.0036
0	0.0281	0.2678	0.5276	0.0356
0	0	0.0273	0.2361	0.9595

Figure 12. Markov channel model with five states and a sample transition probability matrix.

3.2 Coding for Packet Erasure Channels

Two general classes of methods can be used to combat packet losses in a packet erasure channel. The Forward Error Control (FEC) is a method of transforming the data block into a set of packets of bigger size to ensure that if a number of a lost packets is below some designed threshold the original data can be extracted intact. This method (FEC) therefore provides error resilience by increasing the amount of data to be sent. The FEC does not require the return channel (aside from statistics and control data required for adaptation). There is no guarantee that the data will arrive to the receiver without errors. For multimedia streaming, however, the delay requirements often dominate the error-free transmission requirements and hence, error-free transmission is not required. Automatic Repeat Request (ARQ) is an alternative approach to robust data communications. It operates by requesting the transmitter to resend the erased

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0741
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

packets using the return channel. ARQ is implemented both in the WLAN MAC (for unicast traffic) and also at the TCP/IP level if TCP is used. Thus ARQ requires two-way communication channel to be present, which in the case of WLAN is the same physical medium as the forward channel so effectively ARQ also expands the data size because of acknowledgements and retransmissions. The difference from the FEC, however, that ARQ is inherently channel adaptive since only lost packets are resend (while FEC adds overhead to all packets). On the other hand, ARQ may introduce significant delays due to roundtrip propagation time and processing time. The last condition significantly limits the application of ARQ to multimedia communications.

Previous work on media streaming also suggested combining FEC and ARQ methods together (sometimes called Hybrid ARQ) which might be also applicable to the multicast scenario when the number of acknowledgements is not significant. In our approach we chose to avoid Acknowledgements and retransmissions at all and adopt an Unequal Error Protection (UEP) mechanism for protecting scalable media streams in the multicast applications.

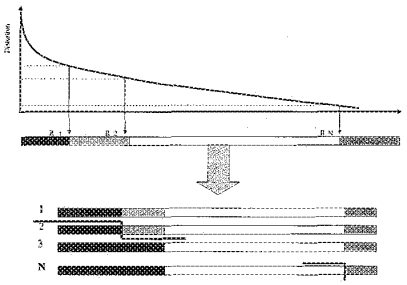


Figure 13. Scalable bit stream partitioned into m layers and encoded using packet erasure correcting scheme.

A part of source data (for example, a few macroblocks, a video frame or several frames) are first encoded using a scalable/progressive coding scheme as outlined in Section 2. Next, the encoded stream is divided into N segments that are mapped to N data packets as shown in Figure13. The i-th segment (quality layer) is split into i equal parts and a systematic $(N, i, N-i+1)$ Reed-Solomon code is applied to it to obtain the contribution of the i-th layer to each of the N packets. The Reed-Solomon code ensures that the i-th resolution layer can be decoded if the number of erasures does not exceed $N-i$. In other words, if in Figure 13 only (any) two packets are received out of total N the decoding can be performed up to the rate of at least R_2. This encoding scheme also guarantees that the first part of the bitstream is decoded successfully before any following part can be decoded.

For a unicast (single user) scenario the problem of designing the optimal channel coding scheme (as outlined above) for a given progressive source is equivalent to finding the locations of $N-1$ partitions (some partitions may occur in the same places meaning that certain channel rates are not used) subject to the total rate constraint. A fast, near-optimal solution, of complexity $O(N)$, based on Lagrangian optimization (MDFEC algorithm), to optimally partition the bit stream is described in [14]. As the input the MDFEC algorithm expects the Distortion-Rate function, channel statistics and the total rate constraint. The expected distortion is given by the equation ([14]):

$$E[d] = q_0 E + \sum_{j=1}^{N} q_j d(R_j)$$

where $q_i(N)$ is the probability of receiving i out of N packets, $d(r)$ is the distortion at rate r, E is the source variance, and $\mathbf{R} = (R_1, R_2, ..., R_n)$ is the rate partition (see Figure 13). The MDFEC algorithm attempts to find the minimum of $E[d]$ with respect to partitions R_j.

4 Problem formulation for media multicast

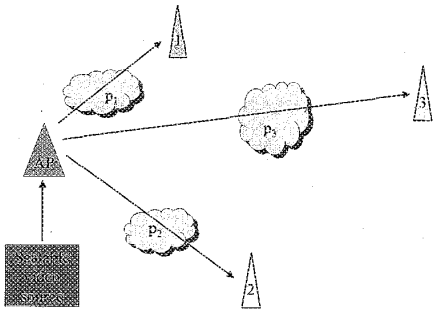


Figure 14. Wireless Multicast scenario with three users having different probabilities of packet erasure(p_1, p_2 and p_3).

In this section we formulate the problem of media multicast over a wireless LAN. We consider a specific case of a scalable data stream communication using UEP codes over several memoryless packet erasure channels with known probabilities of erasure as illustrated in Figure 14. We start with an observation that when there is only a single client, it is clear that an optimal coding scheme should seek to maximize the received user quality (minimize distortion) given a set of constraints on rate, bandwidth, power, etc. However,

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0742
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

we cannot directly apply this idea to the multicast scenario, since the scheme that maximizes the received quality for one client may not be the optimal one for other clients, due to the heterogeneity among the receivers. Hence, for the multicast scenario, we should attempt to maximize some overall quality criterion subject to a set of given constraints.

To state the problem formally, let $D(\mathbf{x}, \hat{\mathbf{x}})$ be a distortion measure, where $\mathbf{x}$ and $\hat{\mathbf{x}}$ are original and decoded data vectors (for example video frames). For real-valued sources we use Mean Squared Error (MSE) defined as $D(\mathbf{x}, \hat{\mathbf{x}}) = \frac{1}{n}\|\mathbf{x} - \hat{\mathbf{x}}\|^2$. Let $K = (K_e, K_d)$ be a set of block encoders/decoders. That is if $\mathbf{x}_0^{n-1} = x_0, \ldots, x_{n-1}$ are samples from the source $s \in S$ then the encoder is a mapping from the source alphabet $A_S{}^n$ into the channel alphabet $A_C{}^m$, i.e., $\mathbf{y}_0^{m-1} = K_e(\mathbf{x}_0^{n-1})$. The signal is transmitted through a channel $c \in C$ to produce the output $\mathbf{z}_0^{m-1}$. The decoded signal is then given by $\hat{\mathbf{x}}_0^{n-1} = K_d(\mathbf{z}_0^{m-1})$. For each coding scheme $k \in K$ we define its measure of robustness over the multiple users as:

$$\rho_k = L(D_k(i) - D_{opt}(i))$$

where L denotes some function (i.e., L_2 norm, weighted L_2 norm, maximum, etc) $D_k(i)$ is the distortion of the coding scheme k for the i-th user and $D_{opt}(i)$ is the optimal performance achievable by the coding scheme designed solely for user i. Additional constraints (blocklength, etc.) are taken care of by specifying the classes of encoders and decoders. Weighting is also easily incorporated in to this problem formulation. The performance of a coding scheme can then be optimized for a desired quality metric ρ_k. In a specific case of scalable source coding and UEP channel coding for packet erasure channel, K_e maps source data into a set of packets that are transmitted over a packet erasure channel to the users who finally map the received packets back to the source data using decoder K_d, perhaps with some quality degradation.

Assuming that rate-distortion curve is convex (not always true in practice for operational rate-distortion curves), the expected distortion must also be convex in the rate partition, as the weighted sum of convex functions with positive weights is another convex function. Hence, $D_i = (E[d_i] - E[d_i]_{min})$ is also convex in the rate partition.

Interesting special case can be further investigated if we assume a minimax optimization of D_i's. That is assuming that $L(.) == max(.)$ implies D has to be convex in the rate partition, as the maximum/supremum of a set of convex functions is convex [9]. Let $\mathbf{Q_i} = (q_0 q_1 ... q_n)^T$ represent the transmission profile of the ith client and let $\mathbf{P} = (d(R_0)d(R_1)...d(R_n))^T$, where $d(R_0)$ is the source variance. Then we can write the expected distortion of the ith client as

$$E[d_i] = \mathbf{Q_i}^T \mathbf{P}$$

It was demonstrated that for the case of 2 users, the optimal minimax solution is $D_1 = D_2$. Then at $D_1 = D_2$,

$$(\mathbf{Q_1}^T - \mathbf{Q_2}^T)\mathbf{P} = E[d_1]_{min} - E[d_2]_{min}.$$

$E[d_1]_{min}$, $E[d_2]_{min}$,$\mathbf{Q_1}$, and $\mathbf{Q_2}$ are known quantities and hence solving this equation for $\mathbf{P}$, we obtain the optimal rate partition. For more than 2 users we can simply repeat this procedure for all possible pairs.

Up to now in our derivations of optimal partitioning we implicitly assumed that the transmission happens at the same wireless rate. This is not true in practice where, for example in 802.11 'b' there are 4 possible rates that allow to improve the effective throughput depending on the actual channel conditions [4]. We can account for possibility to have multiple rates by introducing another index m to correspond to a particular modulation scheme. In this case probability of packet erasure for client i becomes a vector with elements p_{ei}^m and the rate profile becomes $\mathbf{R^m}$. The problem for a single user can be formulated as the one of finding R_i **and** the corresponding modulation rates m_{R_i} that minimizes the expected distortion subject to the total rate constraint[5]. In practice to solve this optimization problem we can use MD-FEC algorithm followed by an optimization over modulation index in an iterative manner. We are currently in the process of investigating this approach and extending it for a multicast problem formulation.

5 System approach to media multicast

In the previous section our goal was to formulate and solve the media multicast problem from a more theoretical point of view. The goal of this section is to outline a system view of a typical media multicast scenario and outline the practical aspects of our approach.

Regardless of the actual criteria used to optimize source and channel coding the algorithm for Unequal Error Protection of a scalable video source is expecting as an input the set of source and channel parameters. As we demonstrate in Figure 15 the optimization algorithm (in practice implemented as a part of user application) receives the source Distortion Rate function, that can be approximated by a few parameters as described in Section 2.

In order to find the optimal coding strategy the algorithm requires the information about the existing users and their corresponding channel conditions. Initial discovery can be performed using a standard mechanisms like Universal Plug and Play (UPnP) where devices manifest their presence and capabilities using a standard IP mechanism.

[4] Another tradeoff not discussed in here is based on ability to adjust the packet length for particular channel conditions.

[5] Note that this total rate also takes into account modulation rate which was not the case in the original formulation.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0743
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

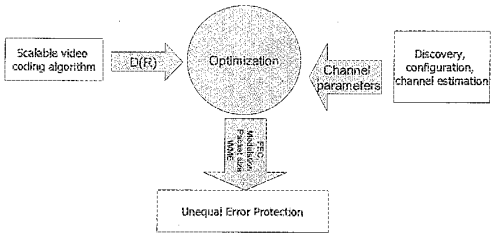


Figure 15. Implementation of video multicast over 802.11.

The devices themselves are also responsible for collecting the channel statistics (i.e., current probabilities of packet erasures) and communicating these information back to the multicast source performing optimization. As we demonstrated in Section 3 the channel state can be efficiently estimated using a simple Markov model with only several data points (one per $0.1 - 0.3$ seconds) needed to be collected and communicated back to the data source. The optimization algorithm then decides on the set of source and channel coding parameters (rate partitioning and code protection) as well as the modulation, packet size and QoS parameters passed directly to the 802.11 MAC level. In practice, the video multicast traffic will be assigned the top WME priority to ensure that the background best effort connections do not interfere with video (but at the same time have opportunity to transmit when channel conditions permit).

6 Concluding remarks

In this work we address the problem of reliable video multicast over 802.11 networks. The combination of scalable source coding and Unequal Error Protection channel coding is an attractive theoretical solution for this problem, which can also be efficiently implemented in real-life systems. This is a new area of research and development and the answers on a few problems outlined in this work are yet to be found.

References

[1] ATSC, "ATSC digital television standard", ATSC doc. A/53, September 1995.

[2] ISO/IEC 13818-2:1996(e), "Information technology - Generic coding of moving pictures and associated audio information: Video", 1996.

[3] Information technology - telecommunications and information exchange between systems - local and metropolitan area networks-specific requirements - part 11: Wireless lan medium access control (MAC) and physical layer (PHY) specifications. 1997.

[4] ITU-R BT 500-10, "Methodology for the subjective assessment of the quality of television pictures", March 2000.

[5] ITU-T and ISO/IEC JTC1, "Advanced video coding for generic audiovisual services," ITU-T Recommendation H.264, ISO/IEC 14496-10 AVC, September 2003.

[6] ISO/IEC JTC1/SC29/WG11, "Technologies under consideration for Working Draft 1.0 of ISO/IEC 21000-13 Scalable Video Coding," Doc. N6519, July 2004.

[7] A. Albanese, J. Blomer, J. Edmonds, M. Luby, and M. Sudan. Priority encoding transmission. *IEEE Trans. Inf. Theory*, (42):1737–1744, November 1996.

[8] A. Balachandran, A. Campbell, and M. Kounavis. Active filters: delivering scalable media to mobile devices. In *Proc. of NOSSDAV 97*, 1997.

[9] D. Bertsekas. *Nonlinear programming*. Athena Scientific, Belmont, 1995.

[10] L. Cheng, W. Zhang, and L. Chen. Rate-distortion optimized unequal loss protection for FGS compressed video. *IEEE Trans. Broadcasting*, 50(2):126–131, June 2004.

[11] G. Conklin, G. Greenbaum, K. Lillevoldand, Y. Lippman, and A. Reznik. Video coding for streaming media delivery on the internet. *IEEE Trans. on Circuits and Systems for Video Technology*, 11:269–281, March 2001.

[12] G. Davis and J. Danskin. Joint source and channel coding for image transmission over lossy packet networks. In *Conf. Wavelet Applications to Digital Image Proceedings, SPIE*, Denver, CO, Aug. 1996.

[13] V. Iverson, J. McVeigh, and B. Reese. "Real-time H.264/AVC codec on Intel architectures", to appear. In *Proc. IEEE Int. Conf. Image Proc.*, October 2004.

[14] K.-W. Lee, R. Puri, T.-E. Kim, K. Ramchandran, and V. Bharghavan. An integrated source coding and congestion control framework for video streaming in the internet. In *Proc. of INFOCOM 2000*, March 2000.

[15] A. Majumdar, D. Sachs, I. Kozintsev, K. Ramchandran, and M. Yeung. Multicast and unicast real-time video streaming over wireless LANs. 12(6):524–534, June 2002.

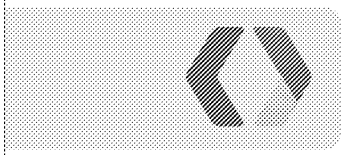
[16] A. E. Mohr, E. A. Riskin, and R. E. Ladner. Graceful degradation over packet erasure channels through forward error correction. In *Proc. Data Compression Conference*, Snowbird, UT, Mar. 1999.

[17] S.McCanne, V.Jacobson, and M.Vetterli. Receiver-driven layered multicast. In *ACM SIGCOMM 96*, 1996.

[18] W. Sweldens. A custom-design construction of biorthogonal wavelets,.

[19] D. Wu, T. Hou, and Y.-Q. Zhang. Scalable video transport over wireless IP networks. In *IEEE International Symposium on Personal, Indoor and Mobile Radio Communication*, pages 1185–1191, Sept. 2000.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0744
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)



Get Your Content Onto Google TV

Christian Kurzke
Developer Advocate

Andrew Jeon
Platform Manager

Mark Lindner
Tech Lead

Google I/O

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0745
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

New Google TV Devices

- New Google TV devices with **ARM** processors
- Available in USA and **Internationally**

"Content" Is King

Streaming
- High Quality
- Securely

Integrated
- One Interface



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0748
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

"Content" Is King
Streaming
•High Quality
•Securely
Integrated
•One Interface

HTTP "Streaming"

Android

```
MediaPlayer mPlayer = new MediaPlayer();
mPlayer.setAudioStreamType(AudioManager.STREAM_MUSIC);
mPlayer.setDataSource("http://music.foo.com/ForElise.mp3");
```

Simultaneous download & playback == Progressive Download

"OK" for music. Today's bandwidth is enough to download "perfect" audio quality.



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0750
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

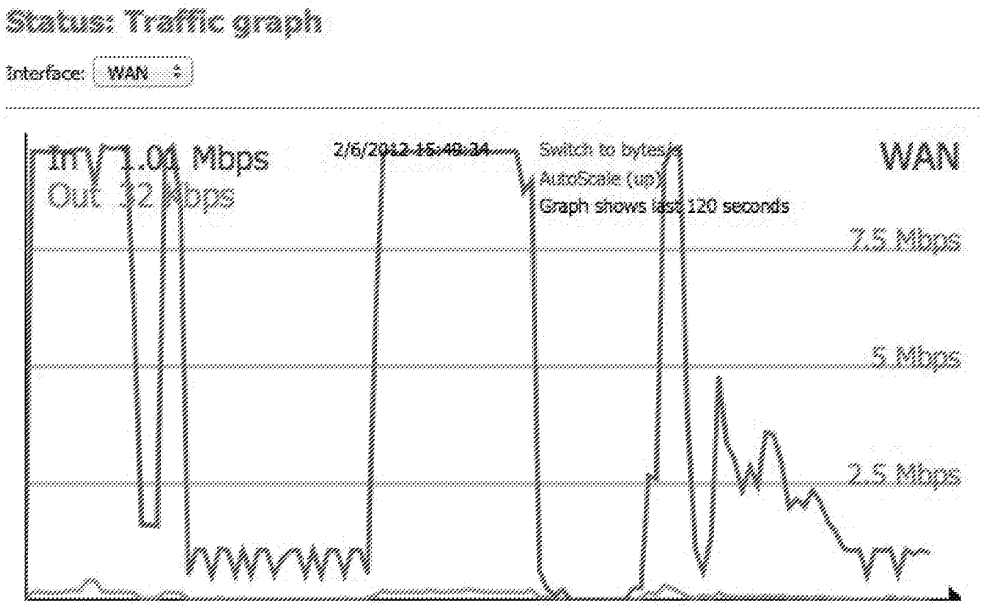
Utilizing Network Bandwidth

Bit rate < Bandwidth

- Not achieving best quality possible

Bit rate > Bandwidth

- Re-buffering



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0751
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Variable Bit Rate Encoding

VBR Benefits:

- Better **perceived** video quality than constant bit rate
- **Best use of bandwidth**

But:

- Variable bit rate **is not** adaptive to network capacity

Good choice for mobile, where primary goal is to **minimize overall bandwidth**.
Not ideal for TV where goal is to **maximize quality**.



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0752
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Adaptive Bit Rate Streaming

Goal: **Bit rate ~= Bandwidth**

Typically consists of:

- A set of VBR video content files (synchronized to switch seamlessly)
- Descriptor file (XML) with meta information
- Metadata also typically has "seek" information (jump forward, backward in stream)

- The MediaPlayer **URL** points to the **descriptor** file

Various Standards: HLS, MPEG Dash, Smooth Streaming etc.



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0753
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Android Adaptive Bitrate Streaming

Android

```
MediaPlayer mPlayer = new MediaPlayer();
mPlayer.setDataSource("http://video.foo.com/MyStream.m3u8");
```

Android (mobile) supports:

- HTTP Live Streaming (HLS) and RTSP
- Widevine

Google TV has all this -

And now also....



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0754
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Announcing Support for Smooth Streaming Protocol

To make it easier for content owners to deliver streaming video content to Google TV:

- We have **now added** the capability to play back video using the Microsoft **Smooth Streaming** protocol
  - Developers can simply use URL points to ***.ism URL** with **Android MediaPlayer API** on **Google TV**

```
MediaPlayer mPlayer = new MediaPlayer();
mPlayer.setDataSource("http://video.foo.com/test_video.ism");
```

- We are actively working on supporting **MPEG-DASH** streaming protocol in the future



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0755
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

But what if you have a "custom" Streaming Server?

Supporting Custom Streaming Protocols

Streaming protocols are evolving, and many content owners are using proprietary protocols:

- Unique needs
- Legacy versions
- Future "Standard" Protocol versions

The problem:

Android **MediaPlayer.setDataSource()** only allows URI objects, Strings or FileDescriptors. Does **not** allow generic **InputStream** object.



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0757
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Introducing The Google TV Media Source API

We created a set of APIs which:

- Enable Android Developers to create own
  - **Streaming Protocol** implementation
  - **Media Container** parsers

- Decode and play back content using platform **hardware accelerated** codecs.

```
GtvMediaPlayer.setMediaSource(myMediaSource)
```

MyMediaSource can **extend** either **PullMediaSource** or **PushMediaSource** class



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0758
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Implementing Your Custom Media Source

```
public abstract class MediaSource {

    protected int getNumberOfTracks() {
          // Returns the number of tracks in the variable, mMediaInfo.
    }
    protected abstract void onStart() {
          // Called when the NativePlayer is in the "preparing" state
    }
    protected abstract void onEnableTrack(int trackId, long startTimeUs) {
          // Called when a track is enabled
    }
    protected abstract void onDisableTrack(int trackId) {
          // Called when track is disabled. After this method is called
    }
    protected abstract void onHandleDiscontinuity (int trackId, int discontinuityType) {
          // Called when a media track is skipping (e.g. format change, time jump)
    }
    protected abstract void onSeekTo(long timeUs) {
          // Called when a media playback is seeked (ffwd, rwd).
    }
}
```



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0759
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Implementing A Custom Pull Media Source

Implement all the methods in **PullMediaSource** and
- The following Methods

```
public class MyCustomPullMediaSource extends PullMediaSource {

    ... implement all the "Media Source" methods


  /*  Called by NativePlayer request next unit of media stream.  */
  protected abstract AccessUnit onDequeueAccessUnit(int trackId) {

  // in a "real world" implementation, re-use byte[] and MediaStreamChunk object!!

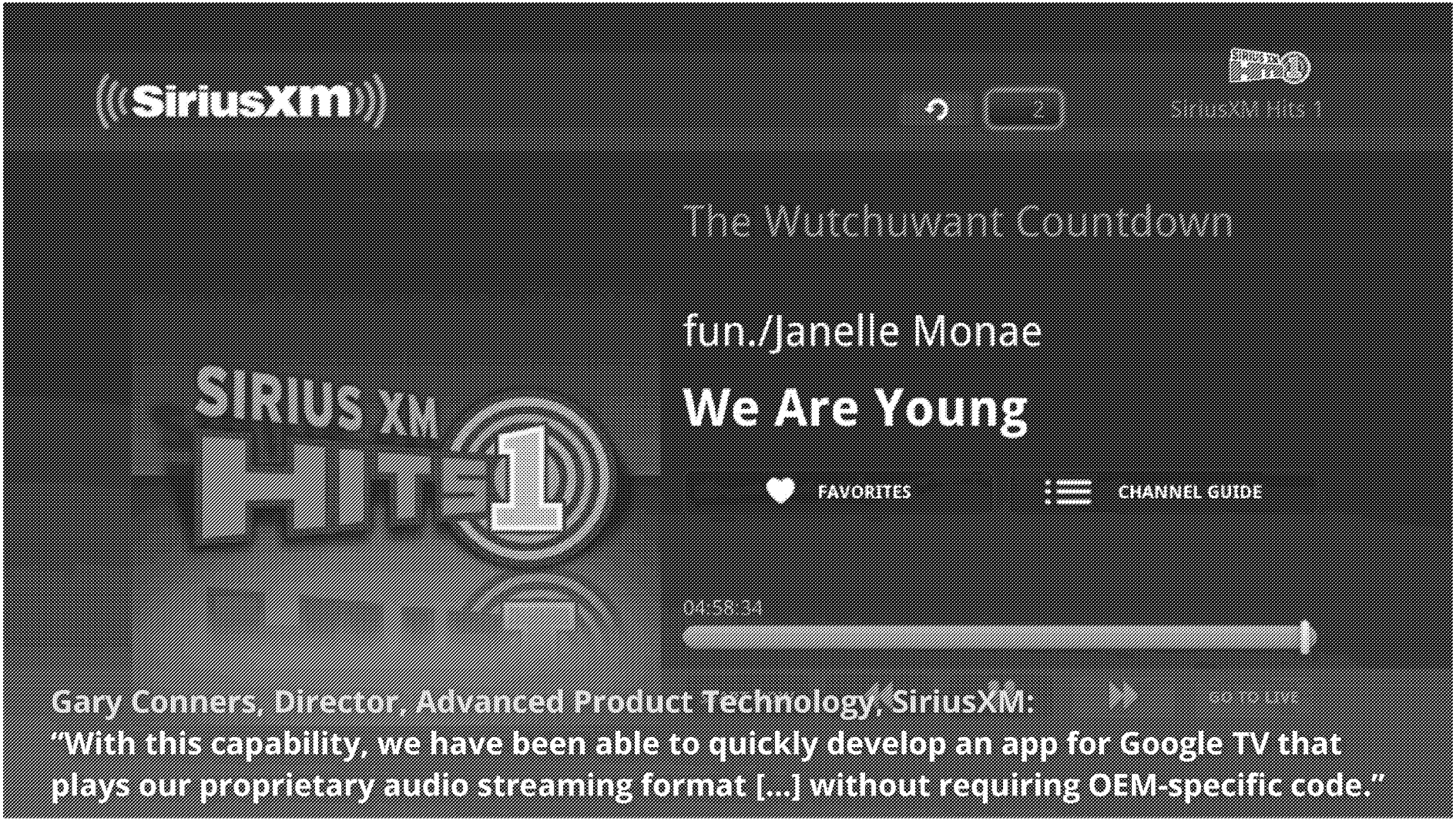
  byte[] myData = ...        // read, parse and extract from custom data stream

  AccessUnit myAccessUnit =
                  AccessUnit.createAccessUnit (myData, myDataLength, myMediaContext);

  return (myAccessUnit);
}
```



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0760
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0761
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Additional GtvMediaPlayer Features

We have added more AV features to improve media playback experience on Google TV

Support multiple audio tracks

- Separate language tracks

Closed Captions and Subtitle support

- Support for standard **Timed Text Markup Language** (TTML)
- Provide a widget which developers can freely modify and use in applications to easily display **Closed Captions** and **Subtitles** based on TTML



Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0762
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0763
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)